R. K. Saxena
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A Catalogue of Tertiary Spores and Pollen from India

Diamond Jubilee Special Publication

Birbal Sahni Institute of Palaeobotany
Lucknow
2006

A Catalogue of Tertiary Spores and Pollen from India

R. K. Saxena & G. K. Trivedi

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(1989-2004)

Total number of genera 521; Total number of species 1172
(excluding taxa that are nomina nuda or invalid combinations
or where no binomials are given)

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ISBN 81-86382-05-4

Includes index
1. Catalogue 2. Spores 3. Pollen 4. Tertiary 5. India

Printed in India

Diamond Jubilee Special Publication
Joint Editor - Dr. Mukund Sharma

Proof-Reading:	Rattan Lal Mehra
Typesetting:	Syed Rashid Ali
Produced by:	Publication Unit, BSIP
Printed at:	Dream Sketch, 29 Brahm Nagar, Lucknow - 226 020, India
Cover Photo:	*Varisculptinaperturites sphericus* Saxena et al. 1999 from DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Issued November, 2006

FOREWORD

The task to collate, edit, update and create a systematic inventory of fossil plants known from Indian sedimentary successions was first initiated by scientists of the Birbal Sahni Institute of Palaeobotany after the Silver Jubilee Celebrations in November, 1971. Though it was a daunting task as the information was scattered in various journals and many other publications, this effort materialized with the publication of "A Catalogue of Indian Fossil Plants" by R. N. Lakhanpal *et al.* in 1976. This single volume catalogue included all plant mega- and microfossil records published from 1821 to 1970. As enormous data had subsequently gathered in the next two decades, another Catalogue was released during the Birbal Sahni Birth Centenary Celebrations in 1991. However, due to the wealth of the available data impossible to be incorporated in a single compendium, 11 Fascicules on different fossil groups and/or geologic time span were prepared, each authored by subject experts from the Institute.

In connection with the Diamond Jubilee Celebrations of the Institute this year, the idea to again update the information came up during discussions in our group meetings sometimes in January, 2006. Despite the short notice and a tall order, several of my Institute colleagues readily volunteered to take up the uphill task. It is indeed heartening to see that these Catalogues/Atlases have been completed in record time. I wish to express my most sincere appreciation to all those who contributed their energy and skill in giving shape to these individual compilations.

The present book, "A Catalogue of Tertiary Spores and Pollen from India: 1989-2004" by R. K. Saxena & G. K. Trivedi, is a welcome addition to the list of Institute's publications. The catalogue includes all records of spores and pollen from the Indian Tertiary sediments published after 1988 up to 2004, with each entry containing name of the species, its author(s), year of publication, page number(s), reference to plate(s), figure(s) and text-figure(s), age and name of the horizon, locality and names of district and state where it is situated. Such information will surely be useful in the study and identification of Tertiary spores and pollen and in deducing their horizontal and vertical distribution for biostratigraphic application. I believe this compendium would prove equally useful for researchers and scholars in Academia and Industry.

October 16, 2006

Dr. N. C. Mehrotra
Director
Birbal Sahni Institute of Palaeobotany

PREFACE

During the last five decades, records of fossil plants reported from India have been rapidly increasing due to the intensive research activities at the Birbal Sahni Institute of Palaeobotany and other palaeobotanical centres in the country. The first catalogue, incorporating all plant fossil records from India published from 1821 to 1970, was published by Lakhanpal et al. (1976). This was followed by the publication of the second catalogue in 1991, which contains all plant fossil records from India published from 1971 to 1988 and was published in the form of 11 fascicules, each authored by different scientists. Of these, "A Catalogue of Fossil Plants from India-Part 5A. Cenozoic (Tertiary) Spores and Pollen" (Saxena 1991) includes tertiary spores and pollen.

The present catalogue is an extension of the above and is expected to be useful in palynological studies of the Tertiary sediments. Since the earlier catalogues (Lakhanpal et al. 1976; Saxena 1991) incorporated palynofloral records up to 1988, Tertiary spores-pollen published after 1988 up to 2004 are included in the present catalogue. In order to include all available records, published during the above period, taxa that are nomina nuda or invalid combinations or where no binomials are given have also been included. Junior homonyms are also included without proposing replacement names therefor. In case replacement name of a junior homonym is already published, both are given linked with an equal mark (=).

The entries are made under three paragraphs, the first and second beginning from extreme left margin pertain to genus and species respectively, and the third, beginning with indented margin, pertains to synonyms and basionyms, if any. Spores and pollen records are arranged alphabetically according to their generic names. Where generic names are not known, supra-generic names are used. Under each genus, its species are also arranged alphabetically.

The genus entry contains name of the genus in capital letters - validly published in bold face and nomina nuda in italics, full surname(s) of its author(s) and family or infraturma or taxon of higher rank. Orthography and authorship of genera have been checked from their original valid

publication and have been corrected accordingly, wherever necessary. However, where original publication could not be procured, the same have been given in accordance with Genera File of Fossil Spores (Jansonius & Hills, 1976, 1977, 1978, 1979, 1981, 1982, 1987, 1992) and Index Nominum Genericorum (Farr et al. 1979, 1986). Authorship of the genus is ascribed to the person(s) who first validly published it. Where a genus is not validly published in its first appearence, name of its author(s) is followed by the author(s) who validated it. When a genus is published jointly by two authors, names of both are cited, linked by an ampersand (Rec. 46C1, I.C.B.N., Greuter et al. 2000) but in case of more than two authors ony first author is cited followed by et al. (Rec. 46C2, I.C.B.N., Greuter et al. 2000). This holds good for species too.

The species entry contains name of the species, its author(s), year of publication, page number(s), reference to plate(s), figure(s) and text-figure(s), age (in capital letters) and name of the horizon in parentheses, locality and names of district and state where it is situated. Where a particular species has again been reported either from the same or from other localities, all such details are mentioned in chronological order.

The entries of synonyms and basionyms are given under the respective species, wherever required. Cross references of synonyms and basionyms are given at their respective alphabetical positions, with older name in italics and present one in bold face. Synonyms, basionyms and taxa, that are nomina nuda or invalid combinations, are given in italics. The junior homonym species are given seperately alongwith their records next to their respective senior homonyms and records thereof. Terminations of the specific epithets, based on personal names, have been corrected, wherever required, in accordance with Article 60.11 and Rec.60C of I.C.B.N., (Greuter et al. 2000). Authorship of the species has been checked from its original valid publication, as far as possible, and corrected accordingly, wherever wrongly given.

The geological ages are generally given as per record of a particular species, even if they are in variance with the generally accepted age of the horizon. Geographical names have been corrected according to their present

application. Places published with varying orthography have been changed in order to bring uniformity and avoid confusion, e.g. Ankleswar is changed to Ankleshwar; Bhaunagar to Bhavnagar; Cutch and Kachchh to Kutch; Dehradun District, Uttar Pradesh to Dehradun District, Uttaranchal; Nangwalbibra to Nongwal Bibra; Palamu District, Bihar to Palamu District, Jharkhand; Tarkesvar and Tarkeswar to Tarkeshwar; Kundara to Kundra; and Varkalla and Warkalli to Varkala, etc.

Full bibliographical details are given of all the papers cited in the Catalogue, for easy access to relevant literature for consultation.

The authors express their gratefulness to the Director, Birbal Sahni Institute of Palaeobotany, Lucknow for facilities and for permitting to publish the Catalogue.

R. K. Saxena
G. K. Trivedi

CATALOGUE

ABIES (pollen). Phadtare *et* al. 1994: 74, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

ABIESPOLLENITES Thiergart in Raatz, **PINOSACCITI.**

Abiespollenites cognatus Kar. Kar 1990a: 176, pl 4, fig 65, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 236, 237, 240, MIDDLE OLIGOCENE-EARLY MIOCENE (Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Sarkar *et* al. 1994: 201, pl 2, fig 23, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002b: 21, pl 2, fig 15, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Abiespollenites surmaensis Rao. Saxena & Rao 1996: 46, pl 2, fig 5, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao & Patnaik 2001: 270, pl 2, fig 4, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Abiespollenites sp. Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Abiespollenites sp. Misra *et* al. 1996: 95, 96, EARLY MIOCENE (Baghmara Formation), Tura-Dalu Road Section along Bugi River and in the vicinity of Baghmara, Garo Hills, Meghalaya.

Abiespollenites spp. A-B. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

ABIETINEAEPOLLENITES Potonié *ex* Delcourt & Sprumont, **PINOSACCITI.**

Abietineaepollenites sp. Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya (Reworked).

ACANTHOTRICOLPITES Kar, **TRIPORINES.**

Acanthotricolpites brevicolpus Kar 1990a: 181, pl 8, figs 111-113, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole

No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Acanthotricolpites brevispinosus Saxena & Khare 2004: 74, 85, pl 2, fig 12, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Acanthotricolpites bulbospinosus Kar. Singh & Misra 1991c: 224, pl 1, fig 8, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Singh *et al.* 1992: 56, pl 1, fig 8, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Mandaokar 1993: 139, pl 1, fig 33, pl 2, fig 32, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et al.* 1994: 186, pl 1, fig 14, pl 2, fig 27, TERTIARY, subsurface sediments in Upper Assam; Misra & Kapoor 1994: 152, pl 1, fig 22, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Kar & Sharma 2001: 128, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Samant & Tapaswi 2001: 128, pl 1, figs 4-5, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Acanthotricolpites complexus Singh & Misra 1991c: 226-227, pl 2, figs 7-9, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Acanthotricolpites intermedius Singh & Misra 1991c: 226, pl 2, figs 10-12, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Acanthotricolpites karii Saxena & Khare 2004: 74, 86, pl 2, figs 17-18, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Acanthotricolpites kutchensis (Venkatachala & Kar) Singh & Misra 1991c: 224, 226, pl 2, figs 3-6, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Samant & Tapaswi 2001: 128, pl 1, figs 6-7, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Mandal *et al.* 2003: 104, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Neocouperipollis kutchensis (Venkatachala & Kar) Kar & Kumar. Kar 1990b: 236, 237, MIDDLE-LATE OLIGOCENE (Jenam and Renji formations), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Rao 1990: 246, pl 1, figs 25-26, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Ambwani 1993: 160, PALAEOCENE-EARLY

EOCENE, Seam Nos. 1, 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Mandaokar 1993: 139, pl 1, figs 12, 18, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et al.* 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Rao 1995a: 327, pl 3, fig 12, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Mandal *et al.* 1996: 80, pl 1, fig 18, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Mandal 1997: 100, pl 1, fig 10, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Saxena 2000c: 163, pl 2, fig 2, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Saxena & Sarkar 2000: 257, pl 2, fig 7, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Sharma 2000: 52, pl 1, fig 12, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Trivedi & Saxena 2000: 275, pl 1, fig 2, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandaokar 2002b: 21, pl 1, figs 11, 14, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Couperipollis kutchensis Venkatachala & Kar. Kar 1990a: 176, 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Shanmukhappa & Koshal 1993: 195, 201, EARLY-MIDDLE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Acanthotricolpites microreticulatus Saxena & Khare 2004: 74, 85, pl 2, figs 10-11, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Acanthotricolpites multitypicus Singh & Misra 1991c: 226, pl 2, figs 1-2, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Acanthotricolpites robustus Saxena & Khare 2004: 74, 86, pl 2, figs 8, 16, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Acanthotricolpites tiruchirapalliensis Saxena & Khare 2004: 74, 85, pl 2, figs 2, 15, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Acanthotricolpites sp. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

cf. Acanthotricolpites sp. Saxena & Khare 2004: 74, 86, pl 2, fig 3, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

ACANTHOTRILETES Naumova *ex* Naumova, **APICULATI.**

Acanthotriletes triangulatus Kumar & Takahashi 1991: 581-582, pl 13, fig 8, pl 14, fig 10, pl 16, fig 6, text-fig 17, MIOCENE (Upper Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 72, 84, 94, pl 39, fig 8, pl 40, figs 11-12, 15, pl 41, fig 4, pl 45, fig 5, pl 46, fig 3, MIOCENE-PLIOCENE (Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

Acanthotriletes sp. Salujha *et* al. 1991: 68, NEOGENE, Adamtila Well-A, Cachar District, Assam (Reworked).

Acanthotriletes sp. Kumar 1994: 22, pl 2, fig 5, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Acanthotriletes sp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE-EARLY PLIOCENE (Middle Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Acanthotriletes sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

ACERPOLLENITES in Misra & Kapoor. *Nomen nudum.*

Acerpollenites sp. Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

ACROSTICHUMSPORITES Kar, **APICULATI.**

Acrostichumsporites meghalayaensis Kar 1992a: 34, pl 1, figs 1-9, EARLY PALAEOCENE (Langpar Formation), Therriaghat, Umsohryngkew River Section, Khasi Hills, Meghalaya.

AEQUITRIRADITES Delcourt & Sprumont, **HILATES.**

Aequitriradites dubius Delcourt & Sprumont. Mandal *et* al. 1996: 80, pl 1, fig 28, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandal *et* al. 2003: 102, 104, pl 3, fig 2, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Aequitriradites spinulosus (Cookson & Dettmann) Cookson & Dettmann. Kar 1990a: 179, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Aequitriradites sp. Chandra & Kumar 1998: 64, pl 2, fig 19, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean (Reworked).

AGLAOREIDIA Erdtman, **MONOPORINES.**

Aglaoreidia sp. Singh & Sarkar 1994: 50, pl 1, fig 10, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

ALANGIOPOLLIS Krutzsch, **PTYCHOTRIPORINES.**

Alangiopollis arcotense Navale & Misra. Singh *et* al. 1992: 57, pl 2, fig 2, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Saxena & Khare 2004: 74, pl 2, fig 20, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Alangiopollis gemmatus Navale & Misra. Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Alangiopollis sp. Mandal *et* al. 2003: 104, 106, pl 1, fig 1, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

Alangium type pollen. Srivastava & Bhattacharyya 2000: 375, pl 1, fig 6, EARLY TERTIARY, Kimin-Ziro Road Section, Lower Subansiri District, near

Rilu village, West Siang District and Pasighat to Rengging Section, East Siang District, Arunachal Pradesh.

ALBERTIPOLLENITES Srivastava, **TRIPTYCHES.**

Albertipollenites aquifoliaceaeformis (Biswas) Mandal & Rao 2001: 342.

Tricolpopites aquifoliaceaeformis Biswas 1962: 38, pl 5, fig 18, EARLY EOCENE (Tura Formation), Tura-Dalu Road Section, Garo Hills, Meghalaya.

Albertipollenites baculatus (Jain *et* al.) Mandal & Rao 2001: 344.

Tricolpites baculatus Jain *et* al. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan.

Albertipollenites crassireticulatus (Dutta & Sah) Mandal & Rao 2001: 344.

Tricolpites crassireticulatus Dutta & Sah. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Rao 1990: 248, pl 2, fig 21, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 187, pl 1, fig 11, TERTIARY, subsurface sediments in Upper Assam; Kumaran *et* al. 1995: 1026, fig 4i, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao 1995a: 328, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Tripathi 1995: 47, pl 1, fig 3, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Tripathi *et* al. 2000: 245, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Tricolpites crassisexinus Venkatachala & Rawat 1973: 244, pl 4, fig 9, OLIGOCENE-MIOCENE, Cauvery Basin, Tamil Nadu.

Albertipollenites gracilis (Salujha *et* al.) Mandal & Rao 2001: 344.

Tricolpites gracilis Salujha *et* al. Saxena *et* al. 1996: 21, pl 3, fig 9, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Albertipollenites karii Mandal & Rao 2001: 344, 346, pl 5, figs 8-9, LATE PALAEOCENE (Lakadong Sandstone), Shillong-Cherra Road Section, Meghalaya.

Albertipollenites kumarii Mandal & Rao 2001: 346, pl 4, figs 6-8, LATE PALAEOCENE (Lakadong Sandstone), Shillong-Cherra Road Section, Meghalaya.

Albertipollenites kutchensis Mandal & Rao 2001: 346, pl 4, figs 3-5, MIDDLE-LATE EOCENE, near Rataria, Kutch District, Gujarat.

Albertipollenites medireticulatus (Mathur) Mandal & Rao 2001: 346.

Retitricolpites medireticulatus Mathur 1966: 41, pl 1, fig 18, PALAEOCENE (Supratrappeans), Kutch District, Gujarat.

Albertipollenites proboscideus (Biswas) Mandal & Rao 2001: 346.

Tricolpopites proboscideus Biswas 1962: 42, pl 8, fig 44, EARLY EOCENE (Tura Formation), Tura-Dalu Road Section, Garo Hills, Meghalaya.

Albertipollenites retibaculatus (Saxena) Mandal & Rao 2001: 348, pl 3, figs 4-6, PALAEOCENE (Matanomadh Formation), Kutch District, Gujarat.

Tricolpites retibaculatus Saxena. Rao 1990: 248, pl 2, fig 23, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Rao 1995a: 328, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandaokar 2000c: 43, pl 1, fig 8, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Albertipollenites robustus (Sah & Kar) Mandal & Rao 2001: 348, pl 1, figs 2-3, EARLY EOCENE (Naredi Formation), Kutch District, Gujarat.

Retitricolpites robustus Sah & Kar. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan.

ALISPORITES Daugherty, **PINOSACCITI.**

Alisporites grandis (Cookson) Dettmann. Mandal *et* al. 1996: 80, pl 1, fig 23, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandal *et* al. 2003: 100, 102, 104, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Alisporites grandis Saksena [non (Cookson) Dettmann 1963] = **Alisporites saksenae** Saxena.

Alisporites saksenae Saxena 1993: 195.

Alisporites grandis Saksena 1971 [non (Cookson) Dettmann 1963]: 253, pl 6, figs 69-70, PERMIAN (Ganjra Nala Beds), Johilla Coalfield, Madhya Pradesh.

Alisporites sp. Salujha *et* al. 1991: 66, pl 1, fig 27, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Alisporites sp. Misra & Kapoor 1994: 152, pl 1, fig 19, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Alisporites sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin.

Alisporites sp. Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

ALNIPOLLENITES Potonié *ex* Potonié, **POLYPORINES.**

Alnipollenites verus (Potonié) Potonié. Banerjee & Nandi 1994: 219, pl 1, fig 14, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Mitra *et* al. 2000: 126, pl 1, fig 31, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Alnipollenites sp. Salujha *et* al. 1991: 67, pl 2, fig 53, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Alnipollenites sp. Hait & Banerjee 1994: 118, pl 3, fig 53, LATE MIOCENE, around Champhai, Mizoram.

ALSOPHILIDITES Cookson *ex* Potonié, **LAEVIGATI.**

Alsophilidites kerguelensis Cookson *ex* Potonié. Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Mandaokar 2000b: 183, pl 1, fig 1, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Alsophilidites psilatus Kumar. Mandal *et* al. 1996: 78, pl 1, fig 10, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

Alsophilidites sp. Kar 1990a: 182, pl 1, fig 1, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Alsophilidites spp. A-B. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Alsophilidites spp. Kar 1990b: 234, 237, MIDDLE-LATE OLIGOCENE (Jenam and Renji formations), Silchar-Haflong Road Section, Assam.

Alsophilidites sp. Kumar & Takahashi 1991: 582, pl 13, fig 7, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 73, pl 35, fig 8, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (described as *Alsophilidites* sp. A).

Alsophilidites sp. Kar & Bhattacharya 1992: 256, pl 1, fig 14, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Alsophilidites sp. Kar *et* al. 1994: 185, pl 1, fig 1, TERTIARY, subsurface sediments in Upper Assam.

Alsophilidites sp. Kumar 1994: 84, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Alsophilidites sp. Mitra *et* al. 2000: 126, pl 1, fig 11, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

AMARANTH/CHENOPODIACEAE (pollen). Phadtare *et* al. 1994: 74, 75, pl 1, fig K, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

AMTASPORA Sarkar & Singh, **APICULATI.**

Amtaspora pseudostriata Sarkar & Singh. Sarkar 1991: 3, EARLY EOCENE (Kakara Series), near Kakara-Chapla group of villages, north of Gambhar River, Shimla District, Himachal Pradesh.

ANACOLOSIDITES Cookson & Pike, **TRIPORINES.**

Anacolosidites luteoides Cookson & Pike. Ramanujam *et* al. 1991: 54, pl 1, figs 21-22, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1992: 22, fig 3P, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Misra & Kapoor 1994: 154, pl 3, fig 59, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Rao 1995a: 327, pl 4, fig 8, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Anacolosidites trilobatus Venkatachala & Rawat. Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Samant & Phadtare 1997: 15, pl 2, fig 12, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 2, fig 1, EARLY EOCENE (Kharsalia

Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, pl 1, fig 11, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Anacolosidites sp. Mehrotra *et* al. 2000: 153, LATE EOCENE (Kopili Formation), Upper Assam.

Angiosperm pollen type Singh & Sarkar 1994: 50, pl 1, fig 21, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

Angiosperm pollen type 1. Sarkar *et* al. 1994: 202, pl 2, fig 24, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Angiosperm pollen type 2. Sarkar *et* al. 1994: 202, pl 1, fig 7, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

ANGULOCOLPORITES Kar, **PTYCHOTRIPORINES.**

Angulocolporites microreticulatus Kar. Kar & Bhattacharya 1992: 251, pl 2, fig 32, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Mandal 1997: 100, pl 2, fig 2, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Angulocolporites sp. Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

ANNONACEAE (pollen). Phadtare *et* al. 1994: 74, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

Anonidium-like pollen. Ambwani & Kar 2000: 219-220, pl 1, fig 1, PALAEOCENE (Tura Formation), Nongwal Bibra Section, Garo Hills, Meghalaya.

ANNUTRIPORITES González Guzmán, **TRIPORINES.**

Annutriporites iversenii (van der Hammen) González Guzmán. Kumar & Takahashi 1991: 537, pl 5, fig 19, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam (wrongly spelt as *Annutriporites inversenii*); Kumar 1994: 24, pl 19, fig 17, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Annutriporites sp. Kumar 1994: 24, pl 20, fig 8, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

APICULATISPORIS Potonié & Kremp, **APICULATI.**

Apiculatisporis sp. Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

AQUILAPOLLENITES Rouse, **ANGIOSPERMAE.**

Aquilapollenites banerjii in Misra & Kapoor 1994: 154, pl 3, figs 67-68, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Aquilapollenites jawalamukhii in Misra & Kapoor 1994: 154, pl 3, fig 66, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Aquilapollenites kangrai in Misra & Kapoor 1994: 154, pl 3, fig 62, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Aquilapollenites karaikalensis in Misra & Kapoor 1994: 154, pl 3, figs 69-70, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part

of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Aquilapollenites spp. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

ARACEAEPITES Biswas, **MONOPTYCHES.**

Araceaepites wodehouseii Biswas = **Neocouperipollis wodehousei** (Venkatachala & Kar) Saxena & Khare.

ARALIACEOIPOLLENITES Potonié ex Potonié, **PROLATI.**

Araliaceoipollenites descretus Venkatachala & Rawat. Samant & Phadtare 1997: 15, pl 2, figs 13-15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 2, fig 3, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Araliaceoipollenites euphorii Potonié. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Gupta *et al.* 2003: 213, pl 1, fig 9, PALAEOCENE-EOCENE, Ganga Basin.

Araliaceoipollenites mannargudii Venkatachala & Rawat. Misra & Kapoor 1994: 152, pl 1, fig 15, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Araliaceoipollenites matanomadhensis Venkatachala & Kar. Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Araliaceoipollenites psilatus Dutta & Sah. Hait & Banerjee 1994: 115, pl 1, fig 13, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Araliaceoipollenites reticulatus Dutta & Sah. Banerjee & Nandi 1994: 219, pl 1, fig 13, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Mitra *et al.* 2000: 126, pl 1, fig 26, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Araliaceoipollenites sp. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Araliaceoipollenites sp. 1. Saxena 1995: 98, figs 18, 21, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

Araliaceoipollenites sp. 2. Saxena 1995: 98, figs 11, 39, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

ARAUCARIACITES Cookson ex Couper, **GRANULONAPITI.**

Araucariacites australis Cookson ex Couper. Saxena & Bhattacharyya 1990: 112, pl 1, fig 10, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Manjhi Khad Section near Dharmsala, Kangra District, Himachal Pradesh; Trivedi 1991: 67, pl 1, fig 9, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked); Mandal *et al.* 1996: 80, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands; Chandra & Kumar 1998: 65, pl 3, fig 3, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan,

Indian Ocean; Trivedi & Saxena 2000: 275, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Mandal *et* al. 2003: 100, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked); Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Araucariacites indicus (Singh et al.) Kumar (non Dev 1961) = **Araucariacites singhii** Saxena.

Araucariacites singhii Saxena 1993: 196.

Araucariacites indicus (Singh et al.) Kumar 1973 (non Dev 1961): 121, pl 6, fig 131-132, LATE JURASSIC (Jabalpur Formation), Harad River near Hathnapur, Narsinghpur District, Madhya Pradesh.

Laricoidites indicus Singh et al. 1964: 299, pl 8, figs 111-112, EARLY CRETACEOUS (Bhuj Series), Ghuneri, Kutch District, Gujarat.

cf. Araucariacites sp. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam.

Araucariacites sp. Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya (Reworked).

Araucariacites sp. Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana.

Araucariacites sp. Gupta et al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin.

Araucariacites sp. Mandal et al. 2003: 104, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

ARAUCARIAPOLLENITES Reyre, **ALETES.**

Araucariapollenites sp. Mandal et al. 2003: 102, pl 2, fig 12, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

ARCUATIPOLLENITES Teteryuk in Araslanova & Teteryuk, **TRILETES.**

Arcuatipollenites sp. Srivastava & Bhattacharyya 2000: 379, pl 3, fig 8, EARLY TERTIARY, Arunachal Pradesh (Reworked).

ARECIPITES Wodehouse, **MONOPTYCHES.**

Arecipites bellus Sah & Kar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, pl 1, fig 19, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Samant 2000: 114, pl 2, fig 2, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Arecipites communis Mathur & Chopra. Kumar & Takahashi 1991: 537-538, pl 6, fig 13, pl 11, fig 12, LATE OLIGOCENE and LATE EARLY-MIDDLE MIOCENE (Renji and Middle Bhuban formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 43, 57, 97, pl 22, fig 3, pl 32, fig 8, LATE OLIGOCENE-PLIOCENE (Renji, Bhuban and Dupitila formations), Silchar-Haflong Road Section, Assam.

Arecipites indicus Venkatachala & Rawat. Kumar & Takahashi 1991: 538, pl 1, fig 14, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 14-15, 24, pl 4, fig 5, pl 5, fig 9, pl 14, fig 5, pl 15, fig 8, pl 16, fig 12, EARLY-MIDDLE OLIGOCENE (Laisong and Jenam formations), Silchar-Haflong

Road Section, Assam; Misra & Kapoor 1994: 153, pl 2, fig 35, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Arecipites intrapunctatus Kar & Saxena. Kar *et* al. 1994: 186, pl 2, fig 16, TERTIARY, subsurface sediments in Upper Assam; Kumar 1996: 112, pl 2, fig 14, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Saxena *et* al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Samant & Phadtare 1997: 15, pl 3, figs 1-2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Arecipites matanomadhensis (Saxena) Kar. Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Arecipites punctatus Wodehouse. Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Shanmukhappa & Koshal 1993: 200, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Arecipites wodehousei Samant & Phadtare 1997: 16, pl 3, figs 3-4, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Arecipites sp. Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam.

Arecipites sp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE (Lower Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Arecipites sp. Samant & Phadtare 1997: 17, pl 3, fig 5, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Arecipites sp. Ramanujam *et* al. 1998c: 55, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh.

Arecipites sp. Ramanujam *et* al. 1999: 35, pl 1, fig 14, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Arecipites sp. Srivastava & Bhattacharyya 2000: 375, pl 2, fig 9, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Kimin-Ziro Road Section, Lower Subansiri District, near Rilu village, West Siang District and Pasighat to Rengging Section, East Siang District, Arunachal Pradesh.

Arecipites sp. Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

ARENGAPOLLENITES Kar, **MONOPTYCHES.**

Arengapollenites achinatus Kar. Kar & Bhattacharya 1992: 251, pl 2, fig 2, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat (wrongly spelt as *Arengapollenites echinatus)*; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Samant & Phadtare 1997: 17-18, pl 3, figs 7-10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Ramanujam *et* al. 1999: 35, pl 1, fig 22, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Samant 2000: 114, pl 2, fig 8, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Kumar *et* al. 2001: 245, EARLY-MIDDLE MIOCENE (Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat;

Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Arengapollenites clavatus Samant & Phadtare 1997: 17, pl 3, fig 6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Arengapollenites ovatus Kar & Bhattacharya 1992: 254, pl 2, figs 29-30, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Kumar 1996: 112, pl 1, fig 6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Arengapollenites sp. Ramanujam *et* al. 1999: 38, pl 1, figs 18-19, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

ASSAMIALETES Singh **=** *RETIALETES* Sah & Dutta (non Staplin 1960), **SPHAEROZONISULCATES.**

Assamialetes crassimurus (Sah & Dutta) Singh & Tripathi. Kumar & Takahashi 1991: 538-539, pl 8, fig 3, EARLY MIOCENE (Lower Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 24-25, 79, pl 16, figs 2, 4, 15, pl 43, fig 2, MIDDLE OLIGOCENE and LATE MIOCENE (Jenam and Bokabil formations), Silchar-Haflong Road Section, Assam.

Schizosporis crassimurus Sah & Dutta 1966: 78, pl 1, figs 18-19, PALAEOCENE (Cherra Formation), Shillong Plateau, Meghalaya.

Assamialetes emendatus (Sah & Dutta) Singh. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan.

Assamialetes minutus Kumar & Takahashi 1991: 539-540, pl 8, figs 5, 9, text-fig 4, EARLY MIOCENE (Lower Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 49, pl 24, figs 5-6, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

cf. Assamialetes minutus Kumar & Takahashi. Kumar 1994: 24, pl 7, fig 4, pl 16, figs 7, 33, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Assamialetes spp. Kumar 1994: 50, pl 26, figs 10, 15, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

?Assamialetes sp. Kumar 1994: 15, pl 3, fig 10, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

?Assamialetes sp. Kumar 1994: 57, pl 31, fig 11, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

cf. Assamialetes sp. Kumar 1994: 97, LATE MIOCENE-PLIOCENE (Dupitila Formation), Silchar-Haflong Road Section, Assam.

Assamialetes sp. Tripathi 1995: 47, pl 1, figs 18-19, PALAEOCENE-EOCENE, Well MK-327 near Kapurdi, Barmer District, Rajasthan.

ASSAMIAPOLLENITES Singh, **TUBERINI.**

Assamiapollenites ghoshii Singh & Saxena. Singh & Tripathi 1990: 326, pl 1, fig 10, MIOCENE (Siwalik sediments), Arunachal Pradesh; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Saxena 2000c: 163, pl 1, fig 9, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

Assamiapollenites sp. Saxena & Misra 1990: 264, pl 3, fig 5, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Assamiapollenites sp. Rao & Rajendran 1996: 68, 70, pl 1, figs 16-17, MIOCENE (Quilon Forma-

tion), Meenkunnu Phase II, Cannanore District, Kerala.

Assamiapollenites sp. Kumar *et* al. 2004: 158, pl 1, fig 5, NEOGENE and PLEISTOCENE, Site 218, Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean.

ASSAMIASPORITES Mehrotra & Sah, **MURORNATI.**

Assamiasporites bellus (Sah & Kar) Mehrotra & Sah. Samant & Phadtare 1997: 7, pl 1, fig 1, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Assamiasporites tertiarus Mehrotra & Sah. Saxena & Misra 1990: 264, pl 3, fig 4, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

AURANGAPOLLENITES Srivastava, **PODOCARPOIDITI.**

Aurangapollenites brevizonatus (Tiwari) Bharadwaj & Dwivedi. Mandal *et* al. 2003: 100, 102, pl 3, fig 7, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

AZOLLA Lamarck in Lamarck & Poiret, **SALVINIACEAE.**

Azolla aglochidia Kar. Kar 1990a: 176, pl 6, figs 99-100, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 236, 239, MIDDLE OLIGOCENE and EARLY MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam.

BACUBREVITRICOLPITES Rao & Ramanujam, **TRIPTYCHES.**

Bacubrevitricolpites rotundus Rao & Ramanujam. Ramanujam *et* al. 1992: 21, fig 2O, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

BACULATISPORITES Pflug & Thomson in Thomson & Pflug, **APICULATI.**

Baculatisporites cahenii Sah. Salujha *et* al. 1991: 65, pl 1, fig 19, NEOGENE, Adamtila Well-A, Cachar District, Assam.

?Baculatisporites sp. Kumar & Takahashi 1991: 582, pl 7, fig 9, EARLY MIOCENE (Lower Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 55, pl 25, fig 8, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked; described as *Baculatisporites*).

Baculatisporites sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

BACULIMONOCOLPITES Mandal *et* al., **MONOPTYCHES.**

Baculimonocolpites andamanensis Mandal *et* al. 1994: 210, pl 1, figs 5-6, 12, EARLY EOCENE, Kadamtala, Baratang Island, Andaman and Nicobar Islands; Mandal *et* al. 1996: 80, pl 1, fig 12, MIDDLE-LATE EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandal *et* al. 2003: 102, 104, pl 1, fig 3, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

BACUSPINULOPOLLENITES Singh & Misra, **PTYCHOTRIPORINES.**

Bacuspinulopollenites baculatus Singh & Misra 1991a: 60, pl 1, figs 1-4, 9-10, MIOCENE (Cuddalore Formation), Borehole No. NLE-27, Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh *et* al. 1992: 57, pl 2, fig 11, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Bacuspinulopollenites spinulosus Singh & Misra 1991a: 61, pl 1, figs 5-8, 11-12, MIOCENE (Cuddalore Formation), Borehole No. NLE-27,

Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu.

BACUSTEPHANOCOLPITES González Guzmán, **POLYPTYCHES.**

Bacustephanocolpites sp. Singh et al. 1992: 57, pl 2, fig 14, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

BACUTRIPORITES Jan du Chene et al., **TRIPORINES.**

Bacutriporites venkatachalae Rao 1995a: 333, pl 4, fig 10, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Mandal & Vijaya 2004: 497, fig 4B, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Bacutriporites sp. Mandal et al. 2003: 102, pl 1, fig 14, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

BAKSIPOLLIS Ramanujam et al., **PTYCHOTRIPORINES.**

Baksipollis miocenicus (Ramanujam) Ramanujam et al. Ramanujam et al. 1991: 54, pl 1, fig 27, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam et al. 1991: 3, pl 3, fig 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam et al. 1992: 22, fig 2U, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

BARRINGTONIAPOLLENITES Kar & Sharma, **PTYCHOTRIPORINES.**

Barringtoniapollenites retibaculatus Kar & Sharma 2001: 130, 134, pl 4, figs 2, 11, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Barringtoniapollenites retipilatus Kar & Sharma 2001: 130, 134, pl 4, figs 4, 7, pl 8, fig 1, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

BETULACEOIPOLLENITES Potonié ex Potonié**, TRIPORINES.**

Betulaceoipollenites betulaceaeformis (Biswas) Kumar 1994: 15, pl 5, fig 4, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Triporipites betulaceaeformis Biswas 1962: 45, pl 10, fig 11, EARLY-MIDDLE EOCENE (Sylhet Limestone Formation), Therriaghat, Shillong Plateau, Meghalaya.

BETULAEPOLLENITES Potonié ex Potonié, **TRIPORINES.**

Betulaepollenites betuloides (Pflug) Nagy. Kumar 1994: 57, 79, pl 33, fig 9, pl 44, fig 24, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Betulaepollenites microexcelsus (Potonié) Potonié. Kumar & Takahashi 1991: 540, pl 12, fig 11, pl 18, figs 13, 20, MIDDLE-LATE MIOCENE (Middle Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 57, 79, pl 33, fig 13, pl 44, figs 13-14, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Betulaepollenites sp. Kumar & Takahashi 1991: 540, pl 12, fig 12, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam.

Betulaepollenites sp. Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Betulaepollenites sp. Hait & Banerjee 1994: 117, pl 3, fig 60, EARLY and LATE MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram.

Betulaepollenites sp. Kumar 1994: 68, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

BHATIAPOLLIS Dogra et al. **TRIPORINES.**

Bhatiapollis indicus Dogra et al. Kapoor et al. 2003: 183, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Bhatiapollis sp. Misra & Kapoor 1994: 155, EARLY MIOCENE (Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

BICINGULISPORA Frederiksen et al., **CINGULATI.**

Bicingulispora sp. Chandra & Kumar 1998: 64, pl 1, fig 5, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean (Reworked).

BIRETISPORITES Delcourt & Sprumont, **LAEVIGATI.**

Biretisporites bellus Sah & Kar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh & Kar 2002: 215, pl 1, figs 6-7, PALAEOCENE (Deccan Intertrappean Beds), 3 km northeast of Papro village, Latitpur District, Uttar Pradesh; Singh & Kar 2003: 219, pl 1, fig 7, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

Biretisporites convexus Sah & Kar. Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Saxena & Rao 1996: 46, pl 1, fig 3, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Singh & Kar 2003: 219, pl 1, figs 6, 8, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

Biretisporites meghalayaensis Rao & Singh. Kumar 1994: 100, PLIO-PLEISTOCENE (Dupitila Formation), Silchar-Haflong Road Section, Assam; Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Rao 1995a: 327, pl 1, fig 9, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Biretisporites minimus Kumar 1994: 19-20, 94, pl 2, fig 3, pl 3, figs 5-6, pl 46, fig 4, EARLY OLIGOCENE and LATE MIOCENE-PLIOCENE (Laisong and Tipam formations), Silchar-Haflong Road Section, Assam.

Biretisporites cf. minimus Kumar 1994: 84, pl 39, figs 10, 13, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Biretisporites oligocenicus Rao & Singh. Kumar 1994: 35, pl 10, fig 2, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Rao 2000: 295, pl 2, fig 1, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Biretisporites singularis Salujha et al. Salujha et al. 1991: 65, pl 1, fig 4, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Biretisporites sp. A. Kumar & Takahashi 1991: 583, pl 9, fig 8, pl 10, fig 7, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 62, pl 29, figs 10, 14, pl 30, fig 14, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Biretisporites sp. B. Kumar & Takahashi 1991: 583, pl 16, fig 10, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Biretisporites sp. B. Kumar 1994: 62, pl 29, fig 13, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Biretisporites spp. Kumar 1994: 52, 94, pl 25, fig 2, pl 46, fig 4, MIOCENE-PLIOCENE (Bhuban and Tipam formations), Silchar-Haflong Road Section, Assam.

cf. Biretisporites sp. Kumar 1994: 35, pl 10, fig 3, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Biretisporites sp. Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Bisaccate pollen. Kumar 1994: 22, 41, pl 3, fig 14, pl 21, fig 10, EARLY-MIDDLE OLIGOCENE (Laisong and Jenam formations), Silchar-Haflong Road Section, Assam (Reworked).

BISWASIASPORA Kar & Saxena, **INCERTAE-SEDIS.**

Biswasiaspora pseudoreticulata Kar & Saxena. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Biswasiaspora sp. Kar & Bhattacharya 1992: 252, pl 1, fig 25, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat.

BITHNOKIAPOLLIS, Kar & Sharma, **TRIPTYCHES.**

Bithnokiapollis retipilatus Kar & Sharma 2001: 129, 133, pl 3, figs 2, 6, 13, pl 4, fig 8, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Bithnokiapollis striatus Kar & Sharma 2001: 129, 133, pl 3, fig 9, pl 4, fig 1, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

BOMBACACEAE (pollen). Phadtare *et* al. 1994: 74, 75, pl 1, fig O, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

BOMBACACIDITES Couper, **PROLATI.**

Bombacacidites africanus Sah. Saxena 2000c: 163, pl 1, figs 10-11, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Bombacacidites assamicus Sah & Dutta. Handique *et* al. 1992: 219, MIOCENE (Surma and Tipam groups), Moran Oilfield, Upper Assam; Hait & Banerjee 1994: 117, pl 2, fig 29, LATE MIOCENE, around Champhai, Mizoram.

Bombacacidites bombaxoides Couper. Hait & Banerjee 1994: 117, pl 2, fig 28, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

Bombacacidites clarus Sah. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Bombacacidites triangulatus Kar. Rao *et* al. 1993: 82, pl 1, fig 21, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Kar *et* al. 1994: 187, pl 2, fig 26, TERTIARY, subsurface sediments in Upper Assam; Rao *et* al. 1995: 374, fig 26, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Acharya 2000: 22, EARLY EOCENE,

Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Samant 2000: 114, pl 2, fig 6, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Kar & Sharma 2001: 129, pl 4, figs 2, 11, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

Bombacacidites sp. Ramanujam *et* al. 1991: 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Bombacacidites sp. Ramanujam *et* al. 1992: 22, fig 2N, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Bombacacidites sp. Singh *et* al. 1992: 57, pl 2, fig 6, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Bombacacidites sp. Misra & Kapoor 1994: 155, EARLY MIOCENE (Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Bombacacidites sp. Tripathi 1997: 170, EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan.

BOMBACACIPITES Anderson, **TRIPTYCHES.**

Bombacacipites nacimientoensis Anderson. Mitra *et* al. 2000: 126, pl 1, fig 22, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya (wrongly spelt as *Bombacipites nacimientos*)

BRACHYSACCUS Maedler, **QUASILAEVIGATI.**

Brachysaccus sp. Mandal *et* al. 2003: 102, pl 3, fig 12, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

BREVICOLPORITES Anderson, **PTYCHOTRIPORINES.**

cf. Brevicolporites colpella Anderson. Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

BREVITRILETES Bharadwaj & Srivastava, **VARITRILETI.**

Brevitriletes sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

CAHENIASACCITES Bose & Kar, **DIVARISACCITI.**

Caheniasaccites indicus Srivastava. Mandal *et* al. 2003: 102, pl 2, fig 1, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Caheniasaccites ovatus Bose & Kar. Singh *et* al. 1991: 41, pl 1, fig 3, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

CALAMOSPORA Schopf *et* al., **LAEVIGATI.**

Calamospora aplata Bharadwaj & Salujha. Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked).

Calamospora hartungiana Schopf *et* al. Misra & Kapoor 1994: 158, pl 6, fig 111, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

Calamospora microrugosa (Ibrahim) Schopf *et* al. Mehrotra *et* al. 2001: 241, pl 1, fig 2, EARLY EOCENE (Panna Formation), Bombay Offshore, Arabian Sea (Reworked).

Calamospora cf. perrugosa (Loose) Schopf *et* al. Mehrotra *et* al. 2001: 241, pl 1, fig 1, EARLY EOCENE (Panna Formation), Bombay Offshore, Arabian Sea (Reworked).

cf. Calamospora sp. Kumar 1994: 22, pl 3, fig 13, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam (Reworked).

Calamospora sp. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

CALLIALASPORITES Dev, **SACCIZONATI.**

Callialasporites dampieri (Balme) Dev. Kumar *et* al. 2001: 250, fig 6.13, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam (Reworked); Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked); Mandal *et* al. 2003: 102, pl 2, fig 7, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Callialasporites lucidus (Pocock) Maheshwari. Mandal *et* al. 2003: 102, pl 2, fig 4, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Callialasporites monoalasporus Dev. Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

Callialasporites segmentatus (Balme) Dev. Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked); Trivedi 1991: 67, pl 1, fig 6, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked); Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana (Reworked).

Callialasporites trilobatus (Balme) Dev. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Trivedi 1991: 67, pl 1, figs 10-11, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked); Mandal *et* al. 1996: 80, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands; Saxena & Rao 1996: 48, pl 3, fig 14, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya (Reworked); Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram (Reworked); Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya (Reworked); Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana (Reworked) Srivastava & Bhattacharyya 2000: 375, pl 3, fig 5, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked); Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland (Reworked).

Callialasporites sp. Kar & Bhattacharya 1992: 257, pl 1, fig 29, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat (Reworked).

Callialasporites spp. Kumar 1994: 22, pl 3, figs 11, 15, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam (Reworked).

Callialasporites sp. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern

part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

Callialasporites sp. Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Callialasporites sp. Mandal *et* al. 2003: 104, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

CALLUMISPORA Bharadwaj & Srivastava, **LAEVIGATI.**

Callumispora gretensis (Balme & Hennelly) Bharadwaj & Srivastava. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked).

Callumispora sp. Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked).

CANNANOROPOLLIS Potonié & Sah, **APERTACORPITI.**

Cannanoropollis malabarensis Potonié & Sah. Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked).

Cannanoropollis medius Potonié & Sah. Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked).

Cannanoropollis obscurus (Lele) Bose & Maheshwari. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked).

Cannanoropollis trilobatus (Bose & Kar) Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked). *Invalid combination.*

Cannanoropollis sp. Singh *et* al. 1991: 41, pl 2, fig 1, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

CAPRIFOLIIPITES Wodehouse**, PROLATI.**

Caprifoliipites descretus Venkatachala & Rawat. Kumar 1994: 25, pl 18, fig 16, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Caprifoliipites subglobosus Sah & Kar. Tripathi 1995: 47, pl 1, fig 8, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Caprifoliipites sp. Ramanujam *et* al. 1992: 22, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

CARPINIPITES Srivastava, **TRIPORINES.**

Carpinipites spp. Kumar 1994: 25, 43, 57, 68, pl 7, fig 5, pl 18, fig 12, pl 19, fig 2, pl 23, fig 13, pl 33, fig 14, MIDDLE OLIGOCENE-MIDDLE MIOCENE (Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam.

CARYAPOLLENITES Raatz ex Potonié, **TRIPORINES.**

Caryapollenites sp. Hait & Banerjee 1994: 118, pl 3, fig 59, LATE MIOCENE, around Champhai, Mizoram.

CARYOPHYLLIDITES Couper, **PERIPORITI.**

Caryophyllidites warkalliensis Ramanujam. Ramanujam *et* al. 1991: 3, pl 3, fig 19, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 22, fig 3Y,

EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

CAUVERIPOLLIS Venkatachala & Rawat, **TRIPORINES.**

Cauveripollis sp. Mandal & Vijaya 2004: 497, fig 4F, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

CEDRIPITES Wodehouse, **CEDROSACCITI.**

Cedripites miocenicus Krutzsch. Sarkar *et* al. 1994: 201, pl 2, fig 10, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Cedripites nudis Kar & Sah. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 2002b: 21, pl 2, fig 10, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Cedripites sp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE-EARLY PLIOCENE (Middle Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Cedripites sp. Singh & Sarkar 1994: 50, pl 1, fig 13, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

CERATOPTERIS (spore). Phadtare *et* al. 1994: 74, 75, pl 1, fig D, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

CERATOSPORITES Cookson & Dettman, **APICULATI.**

Ceratosporites sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

CEREBROPOLLENITES (Nilsson) Singh & Kumar, **MONOSACCITES.**

Cerebropollenites sp. Mandal *et* al. 2003: 102, pl 3, fig 8, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

CHEILANTHOIDSPORA Sah & Kar, **MURORNATI.**

Cheilanthoidspora enigmata Sah & Kar. Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

Cheilanthoidspora mioceneca Kar & Jain. Rao 1990: 248, pl 1, fig 13, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Sarkar *et* al. 1994: 201, pl 1, fig 6, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Kumar *et* al. 2001: 244, 245, fig 5.10, OLIGOCENE and MIO-PLIOCENE (Barail Group and Namsang Formation), Tinali Well-7, Upper Assam; Mandal & Vijaya 2004: 497, fig 5H, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Cheilanthoidspora monoleta Sah & Kar. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Rao 1990: 248, pl 1, figs 11-12, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Kumaran

et al. 1995: 1024, fig 4*e*, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao 1995a: 327, pl 1, fig 4, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 46, pl 1, fig 10, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Mandaokar 2003: 187, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Rao 2004: 125, pl 1, fig 10, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

Cheilanthoidspora reticulata Sah & Kar. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Cheilanthoidspora sp. Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

CHENOPODIPOLLIS Krutzsch, **PERIPORITI.**

Chenopodipollis miocenica Kar & Jain. Rao 1990: 248, pl 3, fig 6, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Saxena 1995: 97, figs 22, 42-43, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Rao 1996: 157, pl 1, fig 19, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Saxena & Rao 1996: 46, pl 3, fig 3, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mitra *et* al. 2000: 126, pl 1, fig 36, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Rao & Patnaik 2001: 270, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Chenopodipollis sp. Hait & Banerjee 1994: 118, pl 3, fig 48, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Chenopodipollis sp. Kumar 1994: 77, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Chenopodipollis sp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE-EARLY PLIOCENE (Lower-Middle Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Chenopodipollis sp. Saxena & Rao 1996: 52-53, pl 2, fig 22, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

CHIRANTHODENDRONPOLLENITES Kar & Sharma, **PTYCHOTRIPORINES.**

Chiranthodendronpollenites bikanerensis Kar & Sharma 2001: 129, 138, pl 3, figs 5, 10, 14, pl 4, fig 5, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

CHOANOPOLLENITES Stover in Stover et al., **TRIPORINES.**

Choanopollenites consanguineus Tschudy. Gupta et al. 2003: 591, fig 3e, PALAEOGENE, Ganga Basin (wrongly apelt as *Choanopollenites consanguieus*).

CHORDASPORITES Klaus, **STRIATITI.**

Chordasporites sp. Mandal et al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

CICATRICOSISPORITES Potonié & Gelletich, **MURORNATI.**

Cicatricosisporites australiensis (Cookson) Potonié. Mandal et al. 1996: 80, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands.

Cicatricosisporites crassiterminatus Hedlund. Kar 1990a: 176, pl 3, fig 56, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Cicatricosisporites hughesii Dettmann. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Cicatricosisporites ludbrookii Dettmann. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Cicatricosisporites macrocostatus (Baksi) Sah & Dutta. Banerjee & Nandi 1994: 216, pl 1, fig 6, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Cicatricosisporites multicostatus in Banerjee & Nandi 1994: 219, pl 1, fig 8, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram. *Invalid combination.*

Cicatricosisporites pachyexinus (Rao & Singh) Kumar & Takahashi 1991: 583-584, pl 7, fig 5, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam.

Striatriletes pachyexinus Rao & Singh. Kumar 1994: 40, 64, 87, pl 10, fig 6, MIDDLE OLIGOCENE and MIOCENE (Jenam, Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Cicatricosisporites pudens Salujha et al. Kumar & Takahashi 1991: 584, pl 4, fig 4, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Salujha et al. 1991: 65, pl 1, fig 14, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Cicatricosisporites susannae (van der Hammen) Kumar & Takahashi 1991: 584-585, pl 9, fig 4, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam.

Striatriletes susannae van der Hammen. Kar 1990a: 175, pl 3, figs 57-59, pl 9, figs 137-138, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 236, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Rao 1990: 246, pl 1, fig 28, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena & Bhattacharyya 1990: 110, pl 1, fig 1, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad and Manjhi Khad sections near Dharmsala, Kangra Dis-

trict, Himachal Pradesh; Saxena & Misra 1990: 264, pl 3, fig 15, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Ramanujam et al. 1991: 53, pl 1, fig 5, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Handique et al. 1992: 219, MIOCENE (Surma and Tipam groups), Moran Oilfield, Upper Assam; Mandaokar 1993: 139, pl 1, fig 35, pl 2, fig 15, 26, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Rao et al. 1993: 81, pl 1, figs 8-9, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Kar et al. 1994: 185, pl 1, fig 25, pl 2, fig 35, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 40, 64, 95, pl 8, figs 5-6, 10, pl 25, fig 7, pl 29, fig 12, pl 30, figs 5, 7, pl 31, fig 13, pl 45, fig 3, MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Jenam, Bhuban and Tipam formations), Silchar-Haflong Road Section, Assam; Sarkar et al. 1994: 201, pl 3, fig 5, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Rao et al. 1995: 372, figs 10-11, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Rao 1995a: 327, pl 1, fig 10, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Mandal et al. 1996: 81, pl 1, fig 5, OLIGOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Saxena & Rao 1996: 46, pl 1, figs 18-19, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandal 1997: 99, pl 1, fig 1, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Chandra & Kumar 1998: 64, pl 1, fig 4, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 180, pl 1, figs 5, 15, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 2, fig 4, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 295, pl 2, fig 18, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Sarkar & Prasad 2000a: 171, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), Koshalia Nala Section near Koti, Shimla Hills, Solan District, Himachal Pradesh; Srivastava & Bhattacharyya 2000: 375, pl 1, fig 9, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh; Tripathi et al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, pl 2, figs 7-8, 14, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Kumar et al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Rao & Patnaik 2001: 269, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Gupta et al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin; Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik),

Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh (Reworked); Mandal *et* al. 2003: 102, pl 1, fig 5, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Chakraborty 2004: 116, pl 1, fig 9, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Mandal & Vijaya 2004: 495, fig 5A, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal; Rao 2004: 125, pl 1, fig 9, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

Cicatricosisporites sp. Kumar 1994: 20, pl 3, fig 4, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

cf. Cicatricosisporites sp. Kumar 1994: 36, pl 8, fig 3, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Cicatricosisporites sp. Mandal *et* al. 1994: 210, pl 1, fig 4, EARLY EOCENE, Kadamtala, Baratang Island, Andaman and Nicobar Islands.

Cicatricosisporites sp. Misra & Kapoor 1994: 150, EARLY MIOCENE (Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Cicatricosisporites sp. Mehrotra *et* al. 2000: 153, LATE EOCENE (Kopili Formation), Upper Assam.

Cicatricosisporites sp. Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana.

Cicatricosisporites sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

Cicatricosisporites sp. Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

CICATRICOSOSPORITES Pflug & Thomson in Thomson & Pflug, **MONOLETES**.

Cicatricososporites spp. Kumar 1994: 84, 94, pl 40, fig 6, LATE MIOCENE-PLIOCENE (Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

CINGULATISPORITES Thomson in Thomson & Pflug**, CINGULATI.**

Cingulatisporites sp. Kar 1990a: 182, pl 1, fig 17, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Cingulatisporites spp. A-B. Kar 1990a: 179, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Cingulatisporites sp. Ramanujam *et* al. 1991: 2, pl 1, fig 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Cingulatisporites sp. Kumaran *et* al. 1995: 1024, fig 4f, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Cingulatisporites sp. Singh & Kar 2003: 219, pl 2, fig 2, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

CINGUTRILETES Pierce, **CINGULATI.**

Cingutriletes spp. Kumar & Takahashi 1991: 585, pl 3, fig 1, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 36, 84, pl 8, fig 2, MIDDLE OLIGOCENE and LATE MIOCENE (Jenam and Bokabil formations), Silchar-Haflong Road Section, Assam.

CIRRATRIRADITES Wilson & Coe, **ZONATI.**

Cirratriradites sp. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

CLASSOPOLLIS Pflug, **PTYCHOTRIPORINES.**

Classopollis classoides Pflug. Kumar 1994: 77, pl 36, fig 10, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Classopollis indicus Maheshwari. Gupta *et al.* 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

Classopollis sp. Kumar 1994: 77, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

CLAVADIPOROPOLLENITES Ambwani & Singh, **DIPORINES.**

Clavadiporopollenites raneriensis Ambwani & Singh 1996: 140, pl 1, figs 1-13, PALAEOCENE, Bore core no. RGBH 33/14 (Depth 90.2 m), Raneri, Bikaner District, Rajasthan; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

CLAVAINAPERTURITES van der Hammen & Wijmstra**, SUBPILONAPITI.**

Clavainaperturites clavatus van der Hammen & Wijmstra. Rao 1990: 246, pl 1, fig 9, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Saxena & Rao 1996: 46, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

CLAVAMONOCOLPITES González Guzmán, **MONOPTYCHES.**

Clavamonocolpites indicus Singh 1990: 225, pl 1, figs 4-5, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

CLAVAPALMAEDITES Rao & Ramanujam**, MONOPTYCHES.**

Clavapalmaedites hammenii Rao & Ramanujam. Ramanujam *et al.* 1991: 3, pl 2, fig 6, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Samant & Phadtare 1997: 18, pl 3, figs 11-12, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Ramanujam *et al.* 1999: 35, pl 1, fig 8, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Clavapalmaedites longisulcatus Samant & Phadtare 1997: 18, pl 3, fig 13, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Clavapalmaedites sp. Hait & Banerjee 1994: 115, pl 1, fig 9, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

CLAVAPERIPORITES Ramanujam, **PERIPORITI.**

Clavaperiporites clavatus Navale & Misra. Singh *et al.* 1992: 57, pl 2, fig 19, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Kumar 1996: 112, pl 1, figs 8-9, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Clavaperiporites heteroclavatus Samant & Phadtare 1997: 20, pl 3, figs 14-19, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Clavaperiporites homoclavatus Samant & Phadtare 1997: 19, pl 4, figs 1-3, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Clavaperiporites jacobii Ramanujam. Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Ramanujam *et* al. 1991: 54, pl 1, fig 30, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 3, figs 16-18, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 22, fig 3V, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Rao 1995a: 327, pl 4, fig 9, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Kumar 1996: 112, pl 1, fig 4, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Rao 1996: 157, pl 1, fig 20, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 2, figs 13-14, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Clavaperiporites ramanujamii Samant & Phadtare 1997: 20, pl 4, figs 4-8, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Clavaperiporites sp. Saxena & Misra 1990: 264, pl 2, fig 6, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

CLAVATRICOLPORITES Leidelmeyer, **PTYCHOTRIPORINES.**

Clavatricolporites sp. Misra & Kapoor 1994: 159, MIDDLE EOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

CLAVATRILETES De Silva Pares Regali *et* al., **APICULATI.**

Clavatriletes disperitis in Mehrotra *et* al. 2000: 153, MIDDLE-LATE EOCENE (Sylhet and Kopili formations), Upper Assam. *Nomen nudum.*

COLLOSPERMUMPOLLIS Tripathi & Singh**, MONOPTYCHES.**

Collospermumpollis laevigatus Tripathi & Singh. Singh & Tripathi 1990: 330, pl 1, fig 30, MIOCENE (Siwalik sediments), Arunachal Pradesh.

COMPOSITAE (pollen). Phadtare *et* al. 1994: 74, 75, pl 1, fig R, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

COMPOSITOIPOLLENITES Potonié *ex* Potonié, **PTYCHOTRIPORINES.**

Compositoipollenites africanus Sah. Hait & Banerjee 1994: 117, pl 2, figs 33-34, LATE MIOCENE, around Champhai, Mizoram; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Compositoipollenites alleppeyensis Rao 1995a: 328, 331, pl 3, figs 1-3, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Kumar *et* al. 2001: 245, LATE MIOCENE and PLEISTOCENE (Girujan Clay and Dhekiajuli formations), Tinali Well-7, Upper Assam.

Compositoipollenites argutus Sah. Ramanujam *et* al. 1991: 54, pl 1, figs 19, 26, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 3, figs 1-2, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Compositoipollenites conicus Sah. Kar 1990a: 194, pl 5, fig 80, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar et al. 1994: 186, pl 2, figs 15, 28, TERTIARY, subsurface sediments in Upper Assam; Singh & Sarkar 1994: 50, pl 1, fig 3, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Chandra & Kumar 1998: 66, pl 2, figs 10-11, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Mandaokar 2000b: 181, pl 2, figs 39, 51, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Saxena & Sarkar 2000: 257, pl 2, figs 10-11, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya.

Compositoipollenites minimus Ramanujam. Ramanujam et al. 1992: 22, figs 3B, C, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao et al. 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Kumaran et al. 1995: 1024, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Nirkunnam Borehole, Alleppey District, Kerala.

Compositoipollenites sentis Sah. Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

Compositoipollenites serratus Sah. Sarkar et al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Compositoipollenites tricolporatus Kar. Kar et al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 2000c: 38, pl 1, fig 2, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002b: 21, pl 2, figs 1, 4, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Compositoipollenites sp. Kar et al. 1994: 186, pl 1, fig 8, TERTIARY, subsurface sediments in Upper Assam.

Compositoipollenites spp. Kumar 1994: 25, 79, pl 17, fig 9, MIDDLE OLIGOCENE and LATE MIOCENE (Jenam and Bokabil formations), Silchar-Haflong Road Section, Assam.

?Compositoipollenites sp. Kumar 1994: 57, pl 33, fig 16, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Compositoipollenites spp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE-EARLY PLIOCENE (Lower-Middle Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Compositoipollenites sp. Kumar et al. 2001: 245, LATE MIOCENE (Girujan Clay Formation), Tinali Well-7, Upper Assam.

CONBACULATISPORITES Klaus, **APICULATI.**

Conbaculatisporites sp. A. Kumar & Takahashi 1991: 586, pl 14, fig 3, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 73, pl 35, fig 9, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Conbaculatisporites sp. B. Kumar & Takahashi 1991: 586, pl 14, fig 5, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 73, pl 35, fig 7, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

CONEOPOLLIS Venkatachala & Rawat**, TRIPORINES.**

Coneopollis decorus Venkatachala & Rawat. Kumar 1994: 97, pl 50, fig 4, LATE MIOCENE-PLIOCENE (Dupitila Formation), Silchar-Haflong Road Section, Assam.

CONIFERIPITES Baksi, **PODOCARPOIDITI.**

Coniferripites abiesmilis Baksi. Misra et al. 1996: 95, EARLY MIOCENE (Baghmara Formation), Tura-Dalu Road Section along Bugi River and in the vicinity of Baghmara, Garo Hills, Meghalaya.

CONITRICOLPORITES Kar, **PTYCHOTRIPORINES.**

Conitricolporites triangulus Kar 1990a: 194, pl 5, figs 70-72, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 2000b: 183, pl 8, figs 8, 10, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

CONTIGNISPORITES Dettmann, **CINGULATI.**

Contignisporites dettmanniae Singh & Kumar. Mandal et al. 1996: 80, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands.

Contignisporites fornicatus Dettmann. Gupta et al. 2003: 212, pl 2, fig 3, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

Contignisporites glebulentus Dettmann. Kar & Sharma 2001: 128, pl 1, figs 4, 6, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Contignisporites sp. Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked).

Contignisporites sp. Mandal et al. 2003: 102, pl 2, fig 10, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

CONTOURIPOLLIS in Misra & Kapoor. *Nomen nudum.*

Contouripollis concentricus in Misra & Kapoor 1994: 157, pl 5, figs 86-88, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Contouripollis minor in Misra & Kapoor 1994: 157, pl 5, fig 89, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

CONVERRUCOSISPORITES Potonié & Kremp, **APICULATI.**

Converrucosisporites parvus (Nagy) Nagy. Kumar 1994: 62, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

COOKSONITES Pocock, **HILATES.**

Cooksonites variabilis Pocock. Mandal et al. 1996: 80, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands.

COPTOSPORA Dettmann, **HILATES.**

Coptospora cauveriana Venkatachala. Kumar 1994: 77, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Coptospora meghalayaensis Saxena 1993: 195.

Coptospora mesozoica Singh & Tewari 1978 (non Kumar 1973): 489, pl 2, figs 33, 38, LATE CRETACEOUS (Gumaghat and Mahadek Formatios), Meghalaya.

Coptospora mesozoica Singh & Tewari **(**non Kumar 1973) **= Coptospora meghalayaensis** Saxena.

CORISACCITES Venkatachala & Kar, **STRIATITI.**

Corisaccites alutas Venkatachala & Kar. Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked); Mandal *et* al. 2003: 100, pl 3, fig 11, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Corisaccites vanus Venkatachala & Kar. Kar 1990a: 181, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

CORRUGATISPORITES Thomson & Pflug, **MURORNATI.**

Corrugatisporites formosus Dutta & Sah. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Tripathi et al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Corrugatisporites sp. Kumar 1994: 20, pl 2, fig 9, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Corrugatisporites sp. Misra *et* al. 1996: 95, OLIGOCENE (Simsang Formation), Tura-Dalu Road near Kherapara, Garo Hills, Meghalaya.

CORRUSPORIS Krutzsch, **MURORNATI.**

Corrusporis indicus Kumar & Takahashi 1991: 586-587, pl 18, fig 10, text-fig 18, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 79, 98, pl 49, figs 2, 5, LATE MIOCENE-PLIOCENE (Bokabil and Dupitila formations), Silchar-Haflong Road Section, Assam.

CORSINIPOLLENITES Nakoman, **TRIPORINES.**

Corsinipollenites jussiaeensis Jan du Chene *et* al. Mandal & Kumar 2000: 199-201, pl 2, figs 11-12, OLIGOCENE (Barail Group), Tinali Well-7, Tinali Oilfield, Upper Assam; Kumar et al. 2001: 244, fig 5.9, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

COUPERIPOLLIS Venkatachala & Kar, **RETECTINES.**

Couperipollis achinatus Sah & Kar = **Spinomonocolpites achinatus** (Sah & Kar) Singh & Misra.

Couperipollis brevispinosus (Biswas) Venkatachala & Kar = **Spinomonosulcites brevispinosus** (Biswas) Kumar.

Couperipollis cymbatus Venkatachala & Rawat = **Neocouperipollis cymbatus** (Venkatachala & Rawat) Saxena & Khare.

Couperipollis donaensis Rao *et* al. = **Neocouperipollis donaensis** (Rao *et* al.) Saxena & Khare.

Couperipollis exsertus Salujha *et* al. Salujha *et* al. 1991: 66, pl 2, figs 37-38, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Couperipollis kutchensis Venkatachala & Kar = **Acanthotricolpites kutchensis** (Venkatachala & Kar) Singh & Misra.

Couperipollis magnus (Dutta & Sah) Kar & Kumar = **Spinomonosulcites magnus** (Dutta & Sah) Singh & Misra.

Couperipollis rarispinosus (Sah & Dutta) Venkatachala & Kar = **Neocouperipollis rarispinosus** (Sah & Dutta) Kar & Kumar.

Couperipollis robustus Saxena = **Neocouperipollis robustus** (Saxena) Saxena & Khare.

Couperipollis spinorobustus Kar & Kumar = **Spinomonosulcites spinorobustus** (Kar & Kumar) Singh & Misra.

Couperipollis sp. Singh & Tripathi 1990: 329, pl 1, fig 7, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Couperipollis spp. Shanmukhappa & Koshal 1993: 195, 200, 202, EARLY-LATE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Couperipollis spp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

CRASSORETITRILETES Germeraad et al., **MURORNATI.**

Crassoretitriletes vanraadshoovenii Germeraad et al. Ramanujam et al. 1989: 28, pl 1, figs 1-4, MIOCENE, subsurface sediments of eastern coast of southern India; Kar 1990a: 175, pl 3, figs 49-51, pl 9, fig 140, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Rao 1990: 246, pl 1, fig 19, pl 3, fig 26, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam et al. 1991: 53, pl 1, fig 6, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam et al. 1991: 2-3, pl 1, fig 9, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Saxena 1991: 369, fig 13, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Ramanujam et al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao et al. 1993: 81, pl 1, figs 1-2, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Kar et al. 1994: 185, pl 1, fig 22, pl 2, fig 23, TERTIARY, subsurface sediments in Upper Assam; Rao et al. 1995: 372, fig 9, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Rao 1995a: 327, pl 1, fig 7, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Mandal et al. 1996: 81, OLIGOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Aswal & Singh 2000: 125, PLIOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 180, pl 1, figs 7, 19, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 17, pl 2, fig 16, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Srivastava & Bhattacharyya 2000: 375, pl 2, fig 2, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh; Kumar et al. 2001: 244, 245, OLIGOCENE, EARLY-MIDDLE MIOCENE and MIO-PLIOCENE (Barail Group, Surma and Tipam groups excluding Girujan Clay Formation and Namsang Formation), Tinali Well-7, Upper Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Crassoretitriletes sp. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Crassoretitriletes sp. Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Crassoretitriletes sp. Srivastava & Bhattacharyya 2000: 375, pl 1, fig 4, EARLY TERTIARY, Arunachal Pradesh.

CRESCENTIPOLLENITES Bharadwaj *et* al., **STRIATITI.**

Crescentipollenites fusus (Bharadwaj) Bharadwaj *et* al. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandal *et* al. 2003: 102, pl 3, fig 9, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Crescentipollenites sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

CRICOTRIPORITES Leidelmeyer, **TRIPORINES.**

Cricotriporites camerouensis Salard-Cheboldaeff. Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 3, fig 4, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 22, figs 3J, M, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Cricotriporites sp. Ramanujam *et* al. 1991: 10, pl 3, fig 5, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Cricotriporites sp. Rao *et* al. 1995: 374, fig 22, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

CROTONIPOLLIS Baksi *et* al. (non De Lima 1976) = **INCROTONIPOLLIS** Jansonius & Hills, ALETES.

Crotonipollis mannargudensis Acharya 2000: 26, pl 1, figs 3, 5, 9, EARLY EOCENE, Borehole No. MII 128 (depth 124.1-124.2 m), Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

CROTONISULCITES Rao & Ramanujam, **MONOPTYCHES.**

Crotonisulcites sp. Rao & Rajendran 1996: 70, pl 1, fig 14, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala.

CROTONOIDAEPOLLENITES Rao & Ramanujam, **SUBPILONAPITI.**

Crotonoidaepollenites euphorbioides Rao & Ramanujam. Kumaran *et* al. 1995: 1024, fig 3f, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao & Rajendran 1996: 66, pl 1, fig 10, MIOCENE, Cannanore District, Kerala; Saxena 2000c: 163, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

CRUCIFEROIPOLLENITES Navale & Misra**, TRIPTYCHES.**

Cruciferoipollenites elongatus Navale & Misra. Singh *et* al. 1992: 56, pl 1, fig 13, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

CRYPTOPOLYPORITES Venkatachala & Kar**, PERIPORITI.**

Cryptopolyporites cryptus Venkatachala & Kar. Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Samant & Phadtare 1997: 21, pl 4, figs 9-10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 2, fig 4, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, pl 1, fig 8, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Cryptopolyporites indicus Saxena & Khare 2004: 74, 87, pl 2, fig 23, LATE PALAEOCENE-MID-

DLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Cryptopolyporites scrobibaculatus Samant & Phadtare 1997: 21-22, pl 4, figs 11-12, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Cryptopolyporites sp. Saxena & Khare 2004: 74, 87, pl 2, fig 14, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

CTENOLOPHONIDITES van Hoeken-Klinkenberg**, PTYCHOPOLYPORINES.**

Ctenolophonidites costatus (van Hoeken-Klinkenberg) van Hoeken-Klinkenberg. Rao 1990: 246, pl 2, figs 18-19, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Singh & Tripathi 1990: 330, pl 1, fig 32, MIOCENE (Siwalik sediments), Arunachal Pradesh; Ramanujam *et* al. 1991: 54, pl 1, figs 28, 33, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, figs 15-18, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Saxena 1991: 370, fig 1, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Ramanujam *et* al. 1992: 22, figs 2R, S, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 82, pl 1, fig 16, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Kumaran *et* al. 1995: 1024, fig 4b, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao *et* al. 1995: 374, figs 18-19, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Rao 1995a: 327, pl 4, figs 1-2, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Saxena 1995: 99, figs 8, 35, 38, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Phadtare & Samant 1996: 673-674, pl 2, figs 8-12, pl 3, figs 1-6, EARLY EOCENE (Rajpardi lignite), Rajpardi, Bharuch District, Gujarat; Rao 1996: 157, pl 1, figs 11-12, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 2, figs 17-18, MIOCENE, Cannanore District, Kerala; Samant & Phadtare 1997: 22, pl 4, fig 13, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Rao & Nair 1998: 53, pl 1, fig 15, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Samant 2000: 114, pl 2, fig 9, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, pl 1, fig 10, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

Ctenolophonidites magnus Saxena & Khare 2004: 74, 84, pl 2, fig 4, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Ctenolophonidites palaeoparvifolius Kar & Jain. Saxena 1991: 369, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Saxena 1995: 99, fig 6, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

Ctenolophonidites saadii Ramanujam & Rao. Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Ctenolophonidites stellatus Navale & Misra. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Ctenolophonidites cf. stellatus Navale & Misra. Singh *et* al. 1992: 57, pl 2, fig 9, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Ctenolophonidites sp. Kar & Bhattacharya 1992: 258, pl 1, fig 32, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Ctenolophonidites sp. Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam.

Ctenolophonidites sp. Rao *et* al. 1995: 373, fig 27, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Ctenolophonidites sp. Mandal 1997: 105-106, pl 1, fig 11, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Ctenolophonidites sp. Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

CUDDALORIPOLLIS Singh & Misra, **PTYCHOTRIPORINES.**

Cuddaloripollis complexa Singh & Misra 1991a: 71, pl 2, figs 1-4, 6-7, 9-10, text-fig 4, MIOCENE (Cuddalore Formation), Borehole No. NLE-27, Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh *et* al. 1992: 57, pl 2, fig 17, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

Cuddaloripollis simplex Singh & Misra 1991a: 71-72, pl 2, figs 5, 8, 11-16, text-fig 5, MIOCENE (Cuddalore Formation), Borehole No. NLE-35, Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu.

CUNEATISPORITES Leschik**, PODOCARPOIDITI.**

Cuneatisporites exiguous Salujha. Mandal *et* al. 2003: 104, pl 1, fig 6, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Cuneatisporites radialis Leschik. Kar 1990b: 237, 240, LATE OLIGOCENE-EARLY MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam (Reworked).

Cuneatisporites rarus Kar. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Trivedi 1991: 67, pl 1, fig 1, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked); Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram (Reworked).

Cuneatisporites reticulatus Kar *et* al. Kar 1990b: 237, 240, LATE OLIGOCENE-EARLY MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam (Reworked).

Cuneatisporites sp. Singh *et* al. 1991: 41, pl 2, fig 14, OLIGOCENE-EARLY MIOCENE (Barail and Surma groups), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Cuneatisporites sp. Gupta *et* al. 2003: 212, pl 2, fig 9, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

CUPANIEIDITES Cookson & Pike**, TRIPTYCHES.**

Cupanieidites decoratus Venkatachala & Rawat. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Cupanieidites flaccidiformis Venkatachala & Rawat. Samant & Phadtare 1997: 23, pl 4, figs 16-17, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 2, fig 10, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Forma-

tion), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Cupanieidites rugulatus Samant & Tapaswi 2001: 123-124, pl 1, fig 9, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

CUPULIFEROIDAEPOLLENITES Potonié *et* al. *ex* Potonié, **TRIPTYCHES.**

Cupuliferoidaepollenites liblarensis (Thomson in Potonié *et* al.) Potonié. Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Kumar 1994: 16, 26, pl 5, figs 1, 6, pl 17, fig 19, EARLY-MIDDLE OLIGOCENE (Laisong and Jenam formations), Silchar-Haflong Road Section, Assam.

?Cupuliferoidaepollenites liblarensis (Thomson in Potonié *et* al.) Potonié. Kumar 1994: 16, pl 4, fig 9, pl 5, fig 2, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Cupuliferoidaepollenites quisqualis Potonié. Mitra *et* al. 2000: 126, pl 1, fig 23, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Cupuliferoidaepollenites vulgaris (Takahashi) Takahashi. Kumar 1994: 16, 26, pl 4, figs 6, 12, 14, EARLY-MIDDLE OLIGOCENE (Laisong and Jenam formations), Silchar-Haflong Road Section, Assam.

Cupuliferoidaepollenites weylandii (Takahashi) Takahashi. Kumar & Takahashi 1991: 542, pl 18, fig 19, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 68, 80, pl 38, figs 17, 20, 24, pl 44, figs 12, 16, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Cupuliferoidaepollenites sp. Kumar & Takahashi 1991: 542-543, pl 1, figs 15, 17, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Cupuliferoidaepollenites spp. Kumar 1994: 26, 43-44, 57, 80, 98, pl 20, fig 6, pl 22, fig 14, pl 44, fig 15, pl 50, fig 11, MIDDLE OLIGOCENE-PLIOCENE (Jenam, Renji, Bhuban, Bokabil and Dupitila formations), Silchar-Haflong Road Section, Assam.

?Cupuliferoidaepollenites sp. Kumar & Takahashi 1991: 543, pl 5, fig 17, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

cf. Cupuliferoidaepollenites sp. Kumar 1994: 26, pl 15, fig 10, pl 18, fig 5, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

CUPULIFEROIPOLLENITES Potonié *ex* Potonié, **PTYCHOTRIPORINES.**

Cupuliferoipollenites ovatus Venkatachala & Kar. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Mandal 1997: 99, pl 1, fig 19, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Mandaokar 2000b: 181, pl 2, fig 47, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 43, pl 1, fig 5, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Cupuliferoipollenites pusillus Potonié. Hait & Banerjee 1994: 116, pl 2, fig 26, EARLY and LATE MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram; Kar et al. 1994: 186, pl 2, fig 22, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Cupuliferoipollenites spp. Kumar 1994: 12, 25-26, 43, 80, pl 19, fig 3, pl 23, fig 3, pl 44, fig 11, LATE CRETACEOUS-EOCENE, MIDDLE-LATE OLIGOCENE and LATE MIOCENE (Disang, Jenam, Renji and Bokabil formations), Silchar-Haflong Road Section, Assam.

Cupuliferoipollenites sp. Gupta et al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

CYATHEA (spore). Phadtare et al. 1994: 74, 75, pl 1, fig A, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

CYATHIDITES Couper, **LAEVIGATI.**

Cyathidites australis Couper. Kar 1990a: 174, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 218, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Handique et al. 1992: 219, MIOCENE (Surma and Tipam groups), Moran Oilfield, Upper Assam; Mandaokar 1993: 139, pl 2, fig 22, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Banerjee & Nandi 1994: 219, pl 1, fig 4, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Kar et al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 36, 94, 100, pl 6, fig 1, pl 9, figs 4, 9, pl 10, fig 8, MIDDLE OLIGOCENE and LATE MIOCENE-PLIOCENE (Jenam, Tipam and Dupitila formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Sarkar et al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandal et al. 1996: 78, pl 1, fig 1, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao & Rajendran 1996: 65, pl 1, fig 4, MIOCENE, Cannanore District, Kerala; Saxena et al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Saxena & Rao 1996: 46, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 8, pl 1, fig 2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Sarkar 1997: 109, EOCENE (Subathu Formation), 20 km southeast of Bilaspur on Shimla-Bilaspur Highway, Bilaspur District, Himachal Pradesh; Chandra & Kumar 1998: 65, pl 2, fig 18, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Mandaokar 2000b: 180, pl 1, figs 4, 9, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Samant 2000: 114, pl 1, fig 1, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Srivastava & Bhattacharyya 2000: 375, pl 2, fig 1, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West

Kameng District, Kimin-Ziro Road Section, Lower Subansiri District, near Rilu village, West Siang District and Pasighat to Rengging Section, East Siang District, Arunachal Pradesh; Trivedi & Saxena 2000: 273, pl 2, fig 4, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Singh & Kar 2003: 219, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh; Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Cyathidites congoensis Sah. Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Cyathidites cooksoniae Khanna & Singh. Singh *et* al. 2003: 203, pl 2, fig 6, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Cyathidites cutchensis Singh *et* al. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Cyathidites dehiscensis (Baksi) Salujha *et* al. Salujha *et* al. 1991: 65, pl 1, fig 1, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Cyathidites garoensis (Baksi) Salujha *et* al. Salujha *et* al. 1991: 65, pl 1, fig 2, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Cyathidites giganticus Saxena & Misra 1990: 265-266, pl 1, fig 17, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Cyathidites major in Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Kumar *et* al. 2001: 244, 245, OLIGOCENE and PLEISTOCENE (Barail Group and Dhekiajuli Formation), Tinali Well-7, Upper Assam. *Nomen nudum.*

Cyathidites minor Couper. Kar 1990a: 174, pl 1, figs 2-4, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 234, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Saxena & Misra 1990: 264, pl 1, fig 1, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Singh 1990: 218, pl 2, fig 11, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kumar & Takahashi 1991: 587, pl 2, fig 1, pl 3, figs 5, 8, EARLY-MIDDLE OLIGOCENE (Laisong and Jenam formations), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Ramanujam *et* al. 1991: 2, pl 1, fig 2, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Mandaokar 1993: 139, pl 1, fig 16, pl 2, fig 1, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Shanmukhappa & Koshal 1993: 200, 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Banerjee & Nandi 1994: 219, pl 1, fig 1, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 20, 36, 62, 73, 84, pl 2, fig 12, pl 6, fig 6, pl 7, fig 2, pl 30, fig 12, EARLY-MIDDLE OLIGOCENE and MIOCENE (Laisong, Jenam, Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Saxena *et* al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya;

Saxena & Rao 1996: 46, pl 1, fig 1, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana; Saxena 2000c: 163, pl 1, fig 1, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Trivedi & Saxena 2000: 273, pl 2, figs 1-3, 15, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Kar & Sharma 2001: 128, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Singh & Kar 2002: 214, PALAEOCENE (Deccan Intertrappean Beds), 3 km northeast of Papro village, Latitpur District, Uttar Pradesh; Gupta *et al.* 2003: 210, PALAEOCENE-EOCENE, Ganga Basin; Singh & Kar 2003: 219, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh; Singh *et al.* 2003: 203, pl 2, fig 5, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh; Kapoor *et al.* 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Cyathidites sp. Rao *et al.* 1993: 81, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Cyathidites sp. Shanmukhappa & Koshal 1993: 195, EARLY EOCENE (Cambay Shale Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Cyathidites sp. Misra & Kapoor 1994: 155, MIDDLE EOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Cyathidites sp. Rao *et al.* 1995: 372, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Cyathidites spp. Mehrotra *et al.* 2000: 153, PALAEOCENE-EOCENE (Basal Sandstone, Sylhet and Kopili formations), Upper Assam.

Cyathidites spp. Kumar *et al.* 2001: 245, EARLY-MIDDLE MIOCENE (Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam.

Cyathidites spp. Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

CYCADACEAELAGENELLA Maljavkina, **MONOPTYCHES.**

Cycadaceaelagenella minor Kumar & Takahashi 1991: 575, pl 4, fig 7, text-fig 15, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Cycadaceaelagenella psilata Kumar & Takahashi 1991: 575-576, pl 4, figs 11-12, pl 12, fig 6, text-fig 16, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Cycadaceaelagenella sp. Kumar 1994: 80, pl 44, fig 7, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam (wrongly spelt as *Cycadacealagenella* sp.).

CYCADOPITES Wodehouse *ex* Wilson & Webster**, CYCADOPHYTA.**

Cycadopites follicularis Wilson & Webster. Kumar & Takahashi 1991: 576-577, pl 8, fig 2, pl 11, fig 11, EARLY-MIDDLE MIOCENE (Lower and Middle Bhuban formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 50, 58, 80, pl 26, fig 2, pl 44, fig 6, pl 45, fig 11, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Cycadopites cf. follicularis Wilson & Webster. Kumar 1994: 91, pl 45, fig 11, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

Cycadopites gracilis Krutzsch. Kumar & Takahashi 1991: 577, pl 6, fig 12, pl 7, fig 3(cf.), pl 8, fig 14(cf.), LATE OLIGOCENE-EARLY MIOCENE (Renji and Lower Bhuban formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 44, 50, 80, pl 22, fig 9, pl 24, fig 21, pl 26, figs 3, 16, LATE OLIGOCENE-MIOCENE (Renji, Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

cf. Cycadopites sp. Kumar 1994: 68, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Cycadopites sp. Rao & Patnaik 2001: 276, pl 3, fig 12, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

CYCLOGRANISPORITES Potonié & Kremp, **APICULATI.**

Cyclogranisporites gondwanensis Bharadwaj & Salujha. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

DACTYLOPOLLIS Muller, **TRIPTYCHES.**

Dactylopollis magnificus Muller. Mandal *et* al. 2003: 102, 104, pl 1, fig 15, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

DAKSHINIPOLLENITES Navale & Misra, **TRIPTYCHES.**

Dakshinipollenites tripakshii Navale & Misra. Singh & Misra 1991b: 206, pl 2, figs 1-2, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh *et* al. 1992: 57, pl 2, fig 1, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

DANDOTIASPORA Sah *et* al., **LAEVIGATI.**

Dandotiaspora dilata (Mathur) Sah *et* al. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 218, pl 2, fig 3, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kumar & Takahashi 1991: 587-588, pl 3, fig 2, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Ambwani 1993: 157, 160, PALAEOCENE, Seam No. 1, Rekmangiri Coalfield, Garo Hills, Meghalaya; Mandaokar 1993: 139, pl 1, figs 14, 26, 29, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, pl 1, fig 28, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya: Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandal *et* al. 1996: 80, pl 1, fig 2, LATE PALAEOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Saxena *et* al. 1996: 21, pl 1, fig 1, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN

(Basal Sandstone), Upper Assam Shelf; Sharma 2000: 52, pl 1, figs 7-8, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Tripathi *et al.* 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Kar & Sharma 2001: 128, pl 1, figs 8, 10, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Singh & Kar 2002: 214, pl 1, figs 3-4, PALAEOCENE (Deccan Intertrappean Beds), 3 km northeast of Papro village, Latitpur District, Uttar Pradesh; Kapoor *et al.* 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Singh & Kar 2003: 219, pl 1, fig 3, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Chakraborty 2004: 115, pl 1, fig 12, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Dandotiaspora cf. D. dilata (Mathur) Sah *et al.* Mandal *et al.* 1994: 210, pl 1, fig 8, EARLY EOCENE, Kadamtala, Baratang Island, Andaman and Nicobar Islands.

Dandotiaspora plicata (Sah & Kar) Sah *et al.* Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 234, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Singh 1990: 218, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Saxena 1991: 370, fig 12, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar & Bhattacharya 1992: 251, pl 1, figs 3, 5, 18, 28, EARLY EOCENE, Gujra Dam Section and Akri lignite Kutch District, Gujarat; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Rekmangiri Coalfield, Garo Hills, Meghalaya; Mandaokar 1993: 139, pl 1, figs 17, 20, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et al.* 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Kumaran *et al.* 1995: 1024, fig 3k, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Saxena 1995: 99, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked); Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Saxena *et al.* 1996: 21, pl 1, fig 2, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Samant & Phadtare 1997: 8, pl 1, figs 3-6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 14, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Samant 2000: 114, pl 1, fig 2, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Tripathi *et al.* 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Kar & Sharma 2001: 128, pl 1, fig 9, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Samant & Tapaswi 2001: 126, pl 1, fig 1, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Kapoor *et al.* 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Singh & Kar 2003: 219, pl 1, fig 5, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Dandotiaspora pseudoauriculata Sah *et al.* Mandaokar 1991: 26, EARLY MIOCENE, north

of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Singh & Kar 2002: 214, pl 1, figs 1, 11, PALAEOCENE (Deccan Intertrappean Beds), 3 km northeast of Papro village, Latitpur District, Uttar Pradesh; Singh & Kar 2003: 219, pl 1, fig 2, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

Dandotiaspora telonata Sah *et* al. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 233, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam (Reworked); Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 218, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Saxena 1991: 369, fig 7, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Ambwani 1993: 157, 160, PALAEOCENE, Seam No. 1, Rekmangiri Coalfield, Garo Hills, Meghalaya; Mandaokar 1993: 139, pl 1, fig 24, pl 2, fig 28, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Rao 1995a: 327, pl 1, fig 11, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Saxena 1995: 99, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked); Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandal *et* al. 1996: 80, LATE PALAEOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Saxena *et* al. 1996: 21, pl 1, fig 3, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Samant & Phadtare 1997: 8-9, pl 1, fig 7, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Mandal *et* al. 2003: 102, pl 1, fig 13, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Rao 2004: 125, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

Dandotiaspora vimalii Samant & Phadtare 1997: 9, pl 1, figs 8-9, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Dandotiaspora sp. Singh *et* al. 1992: 56, pl 1, fig 1, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Dandotiaspora sp. Mehrotra *et* al. 2000: 153, PALAEOCENE-EARLY EOCENE (Basal Sandstone), Upper Assam.

Dandotiaspora sp. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

DANGRIPITES Mandaokar, **TUBERINI.**

Dangripites tuberculatus Mandaokar 1998: 72, pl 1, figs 1-10, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Upper Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar

2002b: 21, pl 2, fig 7, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

DELTOIDOSPORA Miner, **LAEVIGATI.**

Deltoidospora delicata Sah. Kumar & Takahashi 1991: 588, pl 16, figs 4-5, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam; Banerjee & Nandi 1994: 216, pl 1, fig 12, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Kumar 1994: 73, 85, pl 39, figs 6-7, pl 40, fig 9, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Deltoidospora diaphana Wilson & Webster. Kumar 1994: 62, pl 32, fig 2, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Deltoidospora cf. diaphana Wilson & Webster. Kumar & Takahashi 1991: 588-589, pl 9, fig 10, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam.

Deltoidospora cf. diaphana Wilson & Webster. Kumar 1994: 85, pl 39, fig 1, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Deltoidospora hallii Miner. Kumar & Takahashi 1991: 589, pl 7, fig 10, pl 9, fig 5, pl 10, fig 6, EARLY-MIDDLE MIOCENE (Lower-Middle Bhuban Formation), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Kumar 1994: 52, 85, 100, pl 25, fig 12, pl 39, fig 9, pl 47, fig 5-7, MIOCENE-PLIOCENE (Bhuban, Bokabil and Dupitila formations), Silchar-Haflong Road Section, Assam; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Deltoidospora minor Miner. Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam.

Deltoidospora plicata Singh. Mandal *et* al. 1996: 78, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Deltoidospora sp. Kar 1990a: 174, pl 1, figs 5-7, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Deltoidospora spp. Kar 1990b: 233, 234, 237, 239, EARLY OLIGOCENE-EARLY MIOCENE (Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam.

Deltoidospora sp A. Kumar & Takahashi 1991: 589-590, pl 2, fig 10, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Deltoidospora sp B. Kumar & Takahashi 1991: 590, pl 13, fig 1, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Deltoidospora sp. Salujha *et* al. 1991: 65, pl 1, fig 3, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Deltoidospora sp. Kumar 1994: 48, pl 22, fig 2, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Deltoidospora sp. A. Kumar 1994: 14, 142, pl 3, fig 3, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

?Deltoidospora sp. Kumar 1994: 62, pl 29, fig 5, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Deltoidospora sp. Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

DENSIPOLLENITES Bharadwaj, **ALETE-SACCITI.**

Densipollenites indicus Bharadwaj. Srivastava & Bhattacharyya 2000: 375, pl 3, fig 7, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked).

Densipollenites invisus Bharadwaj & Salujha. Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Densipollenites sp. Salujha *et* al. 1991: 68, NEOGENE, Adamtila Well-A, Cachar District, Assam (Reworked).

Densipollenites sp. Srivastava & Bhattacharyya 2000: 379, pl 3, fig 1, EARLY TERTIARY, Arunachal Pradesh (Reworked).

DENSIVERRUPOLLENITES Tripathi & Singh**, PTYCHOTRIPORINES.**

Densiverrupollenites eocenicus Tripathi & Singh. Mandal 1997: 100, pl 2, fig 1, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Trivedi & Saxena 2000: 275, pl 1, fig 5, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

DENSOISPORITES Weyland & Krieger**, CINGULATI.**

Densoipollenites indicus Bharadwaj. Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked).

Densoisporites mesozoicus Singh *et* al. Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked); Mandal *et* al. 1996: 80, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands.

Densoisporites velatus Weyland & Krieger. Kar 1990a: 179, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam (Reworked); Trivedi 1991: 67, pl 1, fig 12, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked); Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram (Reworked).

Densoisporites sp. Kar 1990b: 233, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam (Reworked).

Densoisporites sp. Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

DENSOSPORITES Berry, **CINGULATI.**

Densoipollenites gracilis Smith & Butterworth. Mehrotra *et* al. 2001: 241, pl 2, figs 1-2, EARLY EOCENE (Panna Formation), Bombay Offshore, Arabian Sea (Reworked).

Densoipollenites intermedius Butterworth & Williams. Mehrotra *et* al. 2001: 241, EARLY EOCENE (Panna Formation), Bombay Offshore, Arabian Sea (Reworked).

DERMATOBREVICOLPORITES Kar, **PTYCHOTRIPORINES.**

Dermatobrevicolporites alleppeyensis Rao 1996: 157, pl 1, figs 9-10, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala.

Dermatobrevicolporites dermatus (Sah & Kar) Kar. Rao 1990: 248, pl 2, fig 28, EOCENE-EARLY

MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Kumaran et al. 1995: 1024, fig 3e, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao 1995a: 327, pl 2, fig 9, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 46, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao & Nair 1998: 53, pl 1, fig 19, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000c: 38, pl 1, fig 20, pl 2, figs 6-7, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Saxena 2000c: 163, pl 2, fig 3, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Kumar et al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 128, pl 1, fig 12, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Dermatobrevicolporites exaltus Kar. Kumar 1996: 112, pl 2, fig 3, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandaokar 2000b: 183, pl 2, figs 7, 32, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Dermatobrevicolporites triangulus (Saxena) Kar. Mandal et al. 1996: 80, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands;

Meliapollis triangulus Saxena. Rao 2000: 297, pl 1, fig 4, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Dermatobrevicolporites sp. Saxena & Misra 1990: 264, pl 1, fig 19, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Dermatobrevicolporites sp. Rao 2004: 125, 132, pl 3, fig 7, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

DHARMSALACOLPITES Kapoor et al. *Nomen nudum.*

Dharmsalapollenites indicus Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh. *Nomen nudum.*

DHARMSALAPOLLENITES in Misra & Kapoor. *Nomen nudum.*

Dharmsalapollenites striatus in Misra & Kapoor 1994: 156, pl 4, figs 81-82, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

DHARMSALASPORIS Saxena & Bhattacharyya 1996**, LAEVIGATI.**

Dharmsalasporis indicus Saxena & Bhattacharyya 1996: 166, figs 1-2, text-fig 1, MIOCENE (Dharmsala Group), Mcleodganj-Dharmsala Road Section north of Dharmsala, Kangra District, Himachal Pradesh.

DIATRIOPOLLIS Weyland & Takahashi, **DIPORINES.**

Diatriopollis sp. Hait & Banerjee 1994: 117, pl 3, fig 43, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

DICOLPOPOLLIS Pflanzl, **DICOLPATES.**

Dicolpopollis calamoides Nagy. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Dicolpopollis cauveriensis Ramanujam et al. 1999: 36-37, pl 2, figs 29-30, 37, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Dicolpopollis edavensis Rao & Ramanujam. Kumar & Takahashi 1991: 543, pl 12, figs 2, 5, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 58, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Dicolpopollis elegans Muller. Ramanujam et al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam et al. 1992: 21, fig 2K, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Ramanujam et al. 1997: 131, pl 1, figs 3-4, MIOCENE, Borewell NSP-2 near Narsapur town, West Godavari District, Andhra Pradesh; Ramanujam et al. 1998c: 55, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh (wrongly spelt as *Dicolpopollis ulegans);* Ramanujam et al. 1999: 35, pl 2, figs 26-27, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Kumar et al. 2001: 244, fig 5.12, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

Dicolpopollis fragilis Salujha et al. Salujha et al. 1991: 66, pl 2, fig 39, NEOGENE, Adamtila Well-A, Cachar District, Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Dicolpopollis kalewensis Potonié. Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Shanmukhappa & Koshal 1993: 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Ramanujam et al. 1997: 131, pl 1, figs 5-8, MIOCENE, Borewell NSP-2 near Narsapur town, West Godavari District, Andhra Pradesh; Ramanujam et al. 1998c: 55, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam et al. 1999: 35, pl 2, fig 32, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Mehrotra et al. 2000: 153, MIDDLE EOCENE (Sylhet Formation), Upper Assam (wrongly spelt as *Dicolpopollenites kalewensis*); Gupta et al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Dicolpopollis kockelii Pflanzl. Hait & Banerjee 1994: 115, pl 1, fig 10, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram (wrongly spelt as *Dicolpopollis kockeii)*; Mandaokar 2000b: 183, pl 2, fig 23, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Dicolpopollis malesianus Muller. Kumar & Takahashi 1991: 543-544, pl 1, fig 12, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam; Ramanujam et al. 1991: 3, pl 2, fig 4, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Kumar 1994: 16, pl 14, figs 8, 13, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam; Ramanujam et al. 1997: 131, pl 1, figs 1-2, MIOCENE, Borewell NSP-2 near Narsapur town, West Godavari District, Andhra Pradesh; Ramanujam et al. 1998c: 55, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam et al. 1999: 35, pl 2, fig 28, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Dicolpopollis microreticulatus Rao & Ramanujam. Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, fig 5, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Ramanujam *et* al. 1997: 133, pl 1, figs 9-11, MIOCENE, Borewell NSP-2 near Narsapur town, West Godavari District, Andhra Pradesh; Ramanujam *et* al. 1998c: 55, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam *et* al. 1999: 35, pl 1, fig 25, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Dicolpopollis padappakkarensis in Rao *et* al. 1993: 82, pl 1, fig 14, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Rao *et* al. 1995: 374, fig 26, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala. *Nomen nudum.*

Dicolpopollis proprius Salujha *et* al. Kumar & Takahashi 1991: 544, pl 4, fig 8, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 26, pl 19, figs 13, 15, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Ramanujam *et* al. 1997: 133, pl 1, figs 12-13, MIOCENE, Borewell NSP-2 near Narsapur town, West Godavari District, Andhra Pradesh; Ramanujam *et* al. 1998c: 55, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Dicolpopollis psilatus Kumar & Takahashi = **Disulcipollis psilatus** (Kumar & Takahashi) Ramanujam *et* al.

Dicolpopollis reticulatus Salujha *et* al. Ramanujam *et* al. 1998c: 55, fig 12, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh.

Dicolpopollis sp. Saxena & Misra 1990: 264, pl 2, fig 2, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Dicolpopollis sp. Singh & Tripathi 1990: 329, pl 1, fig 28, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Dicolpopollis sp. Salujha *et* al. 1991: 66, pl 2, figs 40-41, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Dicolpopollis sp. Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam.

Dicolpopollis spp. Shanmukhappa & Koshal 1993: 195, 202, EARLY and LATE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Dicolpopollis sp. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Dicolpopollis sp. Mandaokar 2000b: 183, pl 2, fig 53, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Dicolpopollis sp. Mehrotra *et* al. 2000: 153, LATE EOCENE (Kopili Formation), Upper Assam.

Dicolpopollis sp. Gupta *et* al. 2003: 213, pl 1, fig 8, PALAEOCENE-EOCENE, Ganga Basin.

DICOTETRADITES Couper, **TETRADITES.**

Dicotetradites sp. Sarkar *et* al. 1994: 201, pl 2, fig 13, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Dicotetradites sp. Singh & Sarkar 1994: 52, pl 1, fig 26, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

DICTYOPHYLLIDITES Couper**, LAEVIGATI.**

Dictyophyllidites cannanorensis Rao & Rajendran 1996: 67, pl 1, figs 1-2, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala.

Dictyophyllidites cherrapunjensis Kar & Kumar. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Mandaokar 1993: 139, pl 1, figs 28, 30, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Tripathi *et al.* 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Dictyophyllidites dulcis (Kar) Kar. Kar 1990a: 175, pl 1, fig 16, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 234, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1993: 139, pl 1, fig 22, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et al.* 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandal *et al.* 1996: 78, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Sarkar & Prasad 2000b: 147, pl 2, fig 5, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana.

Dictyophyllidites granulatus Saxena. Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Kar & Sharma 2001: 128, pl 1, fig 3, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Dictyophyllidites kyrtomatus Kar & Kumar. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Singh 1990: 218, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Ambwani 1993: 157, 160, PALAEOCENE, Seam No. 1, Rekmangiri Coalfield, Garo Hills, Meghalaya; Mandaokar 1993: 139, pl 1, fig 27, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et al.* 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Saxena 2000c: 163, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Chakraborty 2004: 115, pl 1, fig 14, LATE PALAEOCENE (Lakadong Sand-

stone), around Bhalukurung, North Cachar Hills, Assam.

Dictyophyllidites laevigatus Kar. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1993: 139, pl 1, figs 21, 31, pl 2, fig 3, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Mandaokar 2002b: 21, pl 1, fig 12, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

Dictyophyllidites surangei Bharadwaj & Singh. Sarkar 1991: 3, EARLY EOCENE (Kakara Series), near Kakara-Chapla group of villages, north of Gambhar River, Shimla District, Himachal Pradesh.

Dictyophyllidites trilobiformis Sah. Mandaokar 1993: 139, pl 2, fig 12, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Banerjee & Nandi 1994: 219, pl 1, fig 2, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Mitra et al. 2000: 126, pl 1, fig 10, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

Dictyophyllidites spp. A-B. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

cf. Dictyophyllidites sp. Kar 1990a: 182, pl 1, fig 18, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Dictyophyllidites sp. Singh & Tripathi 1990: 329, pl 1, fig 13, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Dictyophyllidites sp. Sarkar 1991: 3, pl 3, fig 7, EARLY EOCENE (Kakara Series), near Kakara-Chapla group of villages, north of Gambhar River, Shimla District, Himachal Pradesh.

Dictyophyllidites sp. Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Dictyophyllidites sp. Rao 1995a: 326, pl 1, fig 3, EOCENE-EARLY MIOCENE, Nirkunnam Borehole, Alleppey District, Kerala.

Dictyophyllidites sp. Chandra & Kumar 1998: 64, pl 1, fig 1, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Dictyophyllidites sp. Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram.

Dictyophyllidites sp. Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Dictyophyllidites sp. A. Rao 2000: 297, pl 1, fig 1, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Dictyophyllidites sp. B. Rao 2000: 297, pl 2, fig 3, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Dictyophyllidites sp. Trivedi & Saxena 2000: 273, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

Dictyophyllidites sp. Gupta et al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

Dictyophyllidites sp. Mandal et al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

Dictyophyllidites sp. Rao 2004: 125, 130, pl 1, fig 1, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

DILLISPORITES Mandaokar, **INCERTAE SEDIS.**

Dillisporites karii Mandaokar 1996a: 32, pl 1, figs 1-16, pl 2, figs 1-11, LATE OLIGOCENE (Tikak Parbat Formation), Dilli Colliery, Dibrugarh District, Assam.

DIPORITES van der Hammen**, DIPORINES.**

Diporites sp. A. Singh 1990: 224, pl 1, figs 7-8, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

DIPOROPOLLIS Dutta & Sah, **DIPORINES.**

Diporopollis assamicus Dutta & Sah. Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Kapoor *et* al. 2003: 183, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

DIPTEROCARPUSPOLLENITES Kar, **DIPTEROCARPACEAE.**

Dipterocarpuspollenites retipilatus (Kar & Jain) Kar 1992c: 81-82, pl 1, figs 2-5, MIOCENE, Papanasam, Varkala, Kerala; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 1, fig 20, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Rao 2004: 125, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

Retitricolpites dipterocarpoides Rao & Ramanujam. Saxena & Misra 1990: 265, pl 3, fig 2, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Hait & Banerjee 1994: 115, pl 1, fig 15, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Tricolpites baculatus Kar & Jain 1981 (non Jain *et* al. 1973): 120, pl 3, figs 81-82, NEOGENE, around Quilon and Varkala, Kerala.

Disaccate pollen. Kumar 1994: 77, pl 36, figs 13-14, 17, 20, pl 37, fig 4, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

Disaccate pollen. Misra & Kapoor 1994: 150, 159, PALAEOCENE- EARLY EOCENE and EARLY MIOCENE (Subathu and Basal Dharmsala and Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

DISCOIDITES Muller, **TRIPTYCHES.**

Discoidites borneensis Muller. Mandal & Kumar 2000: 203, pl 2, fig 4, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam.

Discoidites subcircularis (Salujha *et* al.) Kumar 1994: 91, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

Lacrimapollis subcircularis Salujha *et* al. 1980: 674, pl 2, figs 46, 51, 53, MIOCENE (Bokabil and Tipam subgroups), Tulamura Anticline, South Tripura District, Tripura.

DISULCIPOLLIS Krutzsch, **DICOLPATES.**

Disulcipollis cuddalorense Ramanujam. Ramanujam *et* al. 1992: 21, fig 2J, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Disulcipollis psilatus (Kumar & Takahashi) Ramanujam *et* al. 1997: 134, pl 1, figs 14-16, MIOCENE, Borewell NSP-2 near Narsapur town, West Godavari District, Andhra Pradesh;

Ramanujam *et* al. 1998c: 55, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh.

Dicolpopollis psilatus Kumar & Takahashi 1991: 544-545, pl 4, fig 6, pl 12, fig 8, pl 17, fig 9, text-fig 5, MIDDLE OLIGOCENE and MIDDLE-LATE MIOCENE (Jenam, Middle Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 26-27, 58, 68, 91, pl 19, fig 14, pl 20, fig 2, MIDDLE OLIGOCENE and MIOCENE (Jenam, Bhuban and Tipam formations), Silchar-Haflong Road Section, Assam; Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

DISULCITES Erdtman, **DICOLPATES.**

Disulcites cuddalorense Ramanujam. Rao *et* al. 1993: 82, pl 1, fig 15, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Rao *et* al. 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

DIVARISACCUS Venkatachala & Kar**, DIVARISACCITI.**

Divarisaccus lelei Venkatachala & Kar. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

DORREENIPITES Biswas**, TRIPORINES.**

Dorreenipites cooksoniae (Ramanujam) Navale & Misra. Ramanujam *et* al. 1998c: 55, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam *et* al. 1999: 36, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Dorreenipites cooksoniae Ramanujam 1966: 184, pl 6, figs 100-101, MIOCENE (Neyveli Lignite), Neyveli, South Arcot District, Tamil Nadu.

Dorreenipites distinctus Navale & Misra. Misra *et* al. 1996: 338, pl 1, figs 11-13, pl 3, figs 1-6, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Dorreenipites erdtmanii (Ramanujam) Navale & Misra. Misra *et* al. 1996: 337, pl 1, figs 1-6, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Ramanujam *et* al. 1998c: 55, fig 10, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam *et* al. 1999: 36, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Trilatiporites erdtmanii Ramanujam. Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Singh *et* al. 1992: 56, pl 1, fig 9, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Rao *et* al. 1993: 81, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

Trilatiporites noremii Ramanujam. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Rao 1990: 246, pl 3, figs 2-3, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

Dorreenipites medius Navale & Misra. Misra *et* al. 1996: 339, pl 2, figs 4-7, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Ramanujam *et* al. 1999: 36, pl 2, fig 44, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Dorreenipites neyveliensis Misra *et* al. 1996: 339, pl 2, figs 2-3, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Ramanujam *et* al. 1999: 36, pl 2, fig 42,

MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Dorreenipites psilatus Misra *et* al. 1996: 343, 341, pl 2, figs 8-13, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Dorreenipites sellingii (Ramanujam) Navale & Misra. Misra *et* al. 1996: 341, pl 3, figs 1-4, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Ramanujam *et* al. 1998c: 55, fig 11, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam *et* al. 1999: 36, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Trilatiporites sellingii Ramanujam. Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Trilatiporites truncatus Sarma *et* al. 1984: 108, pl 1, fig 18, MIOCENE (Neyveli Lignite), Neyveli, South Arcot District, Tamil Nadu.

Dorreenipites undulatus Misra *et* al. 1996: 339, 341, pl 1, figs 7-10, pl 2, fig 1, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Dorreenipites sp. Ramanujam *et* al. 1999: 39, pl 2, fig 43, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

DRACAENOIPOLLIS Sah & Kar**, MONOPORINES.**

Dracaenoipollis circularis Sah & Kar. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Mandaokar 1993: 139, pl 1, fig 3, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Mandal 1997: 100, pl 1, fig 15, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 23, pl 4, figs 14-15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Ramanujam *et* al. 1999: 35, pl 2, fig 39, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Samant 2000: 114, pl 3, fig 9, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Saxena & Khare 2004: 74, pl 1, fig 13, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Dracaenoipollis crassiexinus Ramanujam *et* al. 1999: 36, pl 2, fig 31, 38, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

DROSERAPOLLIS Krutzsch, **TETRADITES.**

Droserapollis khasiensis Kumar 1995: 70, pl 1, fig 6, pl 2, figs 1-3, PALAEOCENE (Lakadong Sandstone), Laitryngew, Khasi Hills, Meghalaya.

DROSERIDITES Cookson *ex* Potonié**, TETRADITES.**

Droseridites major Krutzsch in Ambwani = **Nepenthidites laitryngewensis** Kumar.

Droseridites parvus Dutta & Sah = **Nepenthidites laitryngewensis** Kumar.

Droseridites spinosa (Cookson) Potonié. Kumaran *et* al. 1995: 1024, fig 4c, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Saxena 2000c: 163, pl 2, fig 11,

MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

Droseridites sp. Singh *et* al. 1992: 57, pl 2, fig 15, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Droseridites sp. in Kar & Kumar. Singh 1990: 224, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Droseridites sp. Ambwani 1993: 157, PALAEOCENE, Seam No. 1, Rekmangiri Coalfield, Garo Hills, Meghalaya.

Droseridites sp. Kapoor *et* al. 2003: 183, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

DULHUNTYISPORA Potonié, **TRILETES**.

Dulhuntyispora dulhuntyi Potonié. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole N o. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 233, 237, EARLY and LATE OLIGOCENE (Laisong and Renji formations), Silchar-Haflong Road Section, Assam (Reworked); Venkatachala & Kar 1990a: 177-178, figs 2a-d, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam, MIOCENE, Rokhia Borehole, Tripura (Reworked).

DUPLIBACULATEPOLLIS Kar & Sharma, **POLYPTYCHES.**

Duplibaculatepollis pentacolpites Kar & Sharma 2001: 130, 137, pl 5, fig 9, pl 7, figs 6, 8, 12, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Duplibaculatepollis septacolpites Kar & Sharma 2001: 130, 137, pl 6, figs 6-7, 9, 11, 13, pl 7, fig 10, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

DURGAIPOLLENITES Mathur & Chopra**, PTYCHOTRIPORINES.**

Durgaipollenites galsii Mathur & Chopra. Mandal & Kumar 2000: 204, pl 2, figs 5-6, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam; Kumar *et* al. 2001: 244, fig 5.8, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

ECHIDIPORITES Mandal, **DIPORINES.**

Echidiporites indicus Mandal 1997: 102, pl 2, figs 12-13, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Echidiporites sp. Mehrotra *et* al. 2000: 153, LATE EOCENE (Kopili Formation), Upper Assam.

ECHIMONOCOLPITES van der Hammen & Garcia de Mutis, **RETECTINES.**

Echimonocolpites rarispinosus (Sah & Dutta) Mathur & Jain. Kar *et* al. 1994: 186, pl 1, fig 16, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh.

Echimonocolpites wodehouseii (Biswas) Mathur & Jain. Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam.

Echimonocolpites sp. Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

ECHIMONOPOROPOLLIS Saxena *et* al., **MONOPORINES.**

Echimonoporopollis circularis Samant & Tapaswi 2001: 124, pl 2, fig 1, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Echimonoporopollis grandiporus Saxena *et* al. 1991: 48, pl 1, figs 1-5, PALAEOCENE (Neyveli

Formation), Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Echimonoporopollis neyveliensis Saxena *et* al. 1991: 48, pl 1, fig 6, PALAEOCENE (Neyveli Formation), Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

ECHINOSPORIS Krutzsch, **SCULPTATOMONOLETI.**

Echinosporis microreticulatus Krutzsch. Kumar 1994: 62, pl 30, fig 4, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Echinosporis sp. Kumar & Takahashi 1991: 590, pl 10, fig 4, Silchar-Haflong Road Section, Assam.

ECHISTEPHANOCOLPITES Wijmstra**, POLYPTYCHES.**

Echistephanocolpites boldamgiriensis Saxena & Rao 1996: 52, pl 2, figs 14-15, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao 2000: 297, pl 1, fig 7, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Echistephanocolpites meghalayaensis Rao *et* al. Saxena & Rao 1996: 48, pl 2, fig 13, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Echistephanocolpites quadrangularis Rao 2000: 299, 301, pl 1, figs 5-6, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Echistephanocolpites sp. Tripathi *et* al. 2000: 246, pl 1, fig 15, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

ECHITRICOLPITES De Silva Pares Regali *et* al., **TRIPTYCHES.**

Echitricolpites communis De Silva Pares Regali *et* al. Mandal 1997: 102, 104, pl 1, fig 22, LATE EOCENE (Barail Group), 35, 35.2, 37 km post, Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Echitricolpites sp. Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

ECHITRICOLPORITES van der Hammen *ex* Germeraad *et* al., **PTYCHOTRIPORINES.**

Echitricolporites sp. Saxena & Khare 2004: 74, 83, pl 1, fig 19, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

ECHITRILETES van der Hammen. *Nomen nudum.*

Echitriletes sp. Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road near Kherapara, West Garo Hills, Meghalaya (Reworked).

ECHITRIPORITES van der Hammen *ex* van Hoeken-Klinkenberg**, TRIPORINES**

Echitriporites irregularis Muller. Kumar 1994: 27, pl 18, fig 14, MIDDLE OLIGOCENE (Jenam Formation), Silcher-Haflong Road Section, Assam.

Echitriporites minutus Samant & Phadtare 1997: 23-24, pl 4, fig 18, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Echitriporites sp. Ramanujam *et* al. 1992: 22, figs 3N, O, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

ELILASACCITES Bose & Kar, **MONOSACCITES.**

Elilasaccites elilaensis Bose & Kar. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

ENGELHARDTIOIDITES Potonié *et* al., **TRIPORINES**

Engelhardtioidites minutiformis Ramanujam. Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Engelhardtioidites parvus Sah & Dutta. Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Mandaokar 2000b: 181, pl 2, figs 50, 52, 56, 59, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Engelhardtioidites sp. Aswal & Singh 2000: 123, MIDDLE EOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh.

EPHEDRIPITES Bolkhovitina *ex* Potonié, **COSTATI.**

Ephedripites sp. Kar 1990a: 176, pl 7, figs 109-110, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Ephedripites sp. Kumar & Takahashi 1991: 577, pl 13, fig 5, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam.

Ephedripites sp. Mitra *et* al. 2000: 126, pl 1, fig 13, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Ephedripites sp. Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

EQUISETOSPORITES Daugherty, **APPENDICIFERI.**

Equisetosporites spp. Kumar 1994: 27, 44, 68, pl 13, fig 7, pl 17, figs 2, 16, pl 19, fig 7, pl 20, fig 7, pl 21, fig 9, pl 22, fig 17, pl 37, fig 5, MIDDLE OLIGOCENE-MIDDLE MIOCENE (Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam.

ERICIPITES Wodehouse, **TETRADITES.**

Ericipites choprae Saxena 1992b: 532.

Ericipites scabratus Mathur & Chopra 1987 (non Sah 1967): 137-138, pl 6, fig 137, LATE MIOCENE-EARLY PLIOCENE, A-1 Offshore Well, Bay of Bengal.

Ericipites congoensis Sah. Kar 1990a: 178, pl 6, fig 97, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Rao 1995a: 327, pl 4, figs 6-7, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Saxena 1995: 97, 99, fig 41, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Rao 1996: 157, pl 1, fig 16, EARLY MIOCENE, Turavur

Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Ericipites laevigatus Kumar 1995: 74, 76, pl 1, figs 4-5, 7, PALAEOCENE (Lakadong Sandstone), Laitryngew, Khasi Hills, Meghalaya.

Ericipites longisulcatus Wodehouse. Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Ericipites sahnii Ramanujam. Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Ericipites scabratus Mathur & Chopra (non Sah 1967) = **Ericipites choprae** Saxena.

Ericipites sp. Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

?EUPHORBIACEAE (inaperturate-clavate pollen). Phadtare et al. 1994: 74, 75, pl 1, fig S, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

EXIMISPORA Salujha et al. **APICULATI.**

Eximispora tuberculata Salujha et al. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Salujha et al. 1991: 65, pl 1, fig 18, NEOGENE, Adamtila Well-A, Cachar District, Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, pl 1, fig 18, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Saxena & Sarkar 2000: 257, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya.

Eximispora sp. Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam.

EXTREMIPOLLIS Krutzsch in Góczán et al., **TRIPORINES**.

Extremipollis versatilis Tschudy. Gupta et al. 2003: 591, fig 3a, PALAEOGENE, Ganga Basin (wrongly spelt *as Extremipollis versatalis*)

FALCISPORITES (Leschik) Klaus, **DISACCIATRILETES**

Falcisporites stabilis Balme. Mandal et al. 1996: 80, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Srivastava & Bhattacharyya 2000: 375, pl 3, fig 4, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked); Kumar et al. 2001: 247, fig 5.18, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam (Reworked); Mandal et al. 2003: 102, 104, pl 3, fig 5, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Falcisporites sp. Trivedi 1991: 67, pl 1, fig 2, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked).

FAUNIPOLLENITES Bharadwaj, **STRIATITI.**

Faunipollenites parvus Tiwari. Gupta et al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

Faunipollenites varius Bharadwaj. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked); Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked);

Mandal *et* al. 2003: 100, pl 2, fig 2, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

FAVITRICOLPORITES Sah, **PTYCHOTRIPORINES.**

Favitricolporites delicatus Salujha *et* al. Kumar 1994: 68, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Favitricolporites eminens Sah. Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Favitricolporites grandis Venkatachala & Rawat. Tripathi *et* al. 2000: 245, pl 2, fig 4, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Favitricolporites magnus Sah. Rao 1990: 246, pl 2, fig 8, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Nirkunnam Borehole, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 48, pl 3, fig 4, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Tripathi *et* al. 2000: 245, pl 1, fig 10, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Favitricolporites microreticulatus Sah. Mitra *et* al. 2000: 126, pl 1, fig 27, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Favitricolporites ornatus Sah. Kumar & Takahashi 1991: 545-546, pl 5, fig 1, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kar *et* al. 1994: 186, pl 1, fig 6, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 27-28, pl 18, fig 1, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Favitricolporites retiformis Sah. Saxena & Misra 1990: 264, pl 3, fig 10, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

Favitricolporites retipilatus Samant & Phadtare 1997: 24, pl 4, figs 19-20, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Favitricolporites suratensis Samant & Tapaswi 2001: 123-124, pl 1, fig 9, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

cf. Favitricolporites sp. Kumar 1994: 80, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Favitricolporites sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

Favitricolporites sp. Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

FLORINITES Schopf *et* al., **ALETESACCITI**.

Florinites spp. Mehrotra et al. 2001: 241, pl 1, fig 3, EARLY EOCENE (Panna Formation), Bombay Offshore, Arabian Sea (Reworked).

FLORSCHUETZIA Germeraad et al. **TRIPORINES.**

Florschuetzia levipoli Germeraad et al. Ramanujam et al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Misra & Kapoor 1994: 150, MIDDLE MIOCENE (Lower Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Rao et al. 1995: 374, figs 20-21, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Kumar et al. 2001: 244, fig 5.5, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

?Florschuetzia meridionalis Germeraad et al. Kumar 1994: 98, LATE MIOCENE-PLIOCENE (Dupitila Formation), Silchar-Haflong Road Section, Assam.

Florschuetzia cf. meridionalis Germeraad et al. Kumar 1994: 80, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Florschuetzia rajpardiensis Samant & Phadtare 1997: 25, pl 5, fig 1, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Florschuetzia trilobata Germeraad et al. Kumar 1994: 28, pl 17, fig 8, pl 18, fig 9, pl 19, fig 5, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Aswal & Singh 2000: 126, PLEISTOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh.

cf. Florschuetzia trilobata Germeraad et al. Kumar 1994: 50, pl 24, fig 10, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Florschuetzia sp. Kumar & Takahashi 1991: 546, pl 4, fig 10, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Florschuetzia sp. Shanmukhappa & Koshal 1993: 202, LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

FORAMINISPORIS Krutzsch, **MURORNATI.**

Foraminisporis medius Dutta & Sah. Banerjee & Nandi 1994: 219, pl 1, fig 9, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

FORCIPITES in Misra & Kapoor. *Nomen nudum.*

Forcipites spp. Misra & Kapoor 1994: 154, pl 3, figs 47-50, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

FOVEOMONOLETES van der Hammen ex Mathur, **MONOLETES.**

Foveomonoletes sp. Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Foveomonoletes sp. Rao 2000: 299, pl 1, fig 4, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

FOVEOSPORITES Balme, **MURORNATI.**

Foveosporites canalis Balme. Sarkar et al. 1994: 201, pl 2, fig 1, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Foveosporites miocenicus Ramanujam. Ramanujam et al. 1991: 3, pl 1, figs 6, 8, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Foveosporites pseudoreticulatus Dutta & Sah. Kumar & Takahashi 1991: 590-591, pl 16, fig 8,

LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 85, pl 39, fig 14, pl 41, fig 1, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Foveosporites retiformis Salujha *et* al. Singh & Sarkar 1994: 50, pl 1, fig 9, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Foveosporites spectabilis Salujha *et* al. Salujha *et* al. 1991: 65, pl 1, fig 6, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Foveosporites splendus Kar & Saxena. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar *et* al. 1994: 185, pl 2, fig 21, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh.

Foveosporites triangulus Dutta & Sah. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Kumar 1994: 36, pl 6, fig 8, pl 7, fig 9, pl 8, figs 1, 9, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Saxena *et* al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

?Foveosporites sp. Kumar & Takahashi 1991: 591, pl 18, fig 15, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 85, pl 46, fig 18, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Foveosporites sp. Saxena *et* al. 1996: 21, pl 1, fig 12, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Foveosporites sp. Rao 2000: 297, pl 1, fig 19, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Foveosporites sp. Singh & Kar 2003: 219, pl 1, figs 10-11, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

FOVEOTRICOLPITES Pierce, **TRIPTYCHES.**

Foveotricolpites alveolatus Mandal & Rao 2001: 353, pl 2, figs 4, 14, PALAEOCENE (Therria Formation), Meghalaya.

Foveotricolpites iniquus (Salujha *et* al.) Mandal & Rao 2001: 353, MIDDLE OLIGOCENE (Jenam Formation), Assam.

Tricolpites iniquus Salujha *et* al. Salujha *et* al. 1991: 66, pl 2, fig 43, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Foveotricolpites prolatus Rao & Ramanujam. Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Ramanujam *et* al. 1992: 21, fig 2M, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Foveotricolpites sijuensis (Baksi) Mandal & Rao 2001: 353.

Tricolpopites sijuensis Baksi 1962: 16, pl 1, fig 6, EARLY MIDDLE EOCENE, Simsang River Section, Shillong Plateau, Meghalaya.

Foveotricolpites simplex (Rao & Ramanujam) Mandal & Rao 2001: 353.

Retibrevitricolpites simplex Rao & Ramanujam 1982: 71, pl 1, fig 9, MIOCENE (Quilon Formation), Kerala.

Foveotricolpites tamilensis Saxena & Khare 2004: 74, 80, pl 1, fig 17, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

FOVEOTRICOLPORITES Pierce, **PTYCHOTRIPORINES.**

Foveotricolporites foveolatus Nandi. Hait & Banerjee 1994: 116, pl 1, fig 16, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Foveotricolporites reticuloidus Kar. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi 1997: 170, EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan.

FOVEOTRILETES Potonié, **MURORNATI.**

Foveotriletes garoensis Saxena & Rao 1996: 50, pl 1, figs 9, 11, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Foveotriletes pachyexinous Dutta & Sah. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Foveotriletes triangulus Krutzsch. Kumar & Takahashi 1991: 591, pl 16, figs 9, 12, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 85, 94, pl 46, fig 18, LATE MIOCENE-PLIOCENE (Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

Foveotriletes sp. Rao 1990: 248, pl 1, fig 27, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Foveotriletes sp. Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked).

Foveotriletes sp. Ramanujam et al. 1991: 53, pl 1, fig 3, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Foveotriletes spp. Kumar 1994: 36, 73, 85, pl 10, fig 10, pl 35, fig 3, pl 36, fig 3(cf.), MIDDLE OLIGOCENE and MIOCENE (Jenam, Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Foveotriletes sp. Saxena & Rao 1996: 50, pl 1, fig 12, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

FRAXINOIPOLLENITES Potonié ex Potonié, **TRIPTYCHES.**

Fraxinoipollenites sp. Kumar 1994: 91, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

GANGAPOLLENITES Mathur & Chopra = **PSEUDONOTHOFAGIDITES** Venkatachala & Kar, **POLYPORINES.**

Gangapollenites bengalensis Mathur & Chopra = **Pseudonothofagidites bengalensis** (Mathur & Chopra) Samant & Phadtare.

GAROTRILETES Singh & Singh, **MURORNATI.**

Garotriletes assamicus Singh & Singh. Saxena et al. 1996: 21, pl 1, figs 4-5, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Garotriletes kheraparaensis Rao 2000: 297-298, pl 1, figs 17-18, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY

MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

GEMINOSPORA Balme, **ZONOTRILETES.**

Geminospora lemurata Balme. Misra & Kapoor 1994: 158, pl 6, figs 96-97, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

Geminospora sp. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

GEMMAMONOCOLPITES van der Hammen & Garcia de Mutis, **MONOPTYCHES.**

Gemmamonocolpites dimorphous Singh 1990: 224, pl 1, figs 1-2, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Gemmamonocolpites hyphaeneoides Ramanujam et al. 1999: 36, pl 1, figs 1-3, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

GEMMASTEPHANOCOLPITES van der Hammen & Garcia de Mutis, **POLYPTYCHES.**

Gemmastephanocolpites sp. Rao & Rajendran 1996: 72, pl 3, fig 6, MIOCENE (Quilon Formation), Meenkunnu Phase II, Cannanore District, Kerala.

GEMMATRICOLPITES Pierce, **TRIPTYCHES.**

Gemmatricolpites saxenae Rao & Rajendran 1996: 70, pl 2, figs 10-12, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala.

Gemmatricolpites sp. Rao 1990: 248, pl 2, fig 17, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

GEMMATRILETES Pierce, **APICULATI.**

Gemmatriletes sp. Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

GEMMATRIPOROPOLLIS Saxena & Khare, **TRIPORINES.**

Gemmatriporopollis triangulus Saxena & Khare 1996: 130, figs 1-3, text-fig 1, PALAEOCENE-EOCENE, Jayamkondacholapuram Well-12, Tiruchirapalli District and Neyveli lignite mines, South Arcot District, Tamil Nadu; Saxena & Khare 2004: 74, 85, pl 2, figs 6-7, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

GHOSHIACOLPITES Sah & Kar, **POLYPTYCHES.**

Ghoshiacolpites globatus Sah & Kar. Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

GHOSHIASPORA Srivastava, **TRILETES.**

Ghoshiaspora sp. Gupta et al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

GINKGOCYCADOPHYTUS Samoilovich, **INTORTES.**

Ginkgocycadophytus sp. Gupta et al. 2003: 212, pl 2, fig 7, PALAEOCENE-EOCENE, Ganga Basin.

Ginkgocycadophytus sp. Mandal et al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

GINKGORETECTINA Maljavkina, **RETECTINES.**

Ginkgoretectina sp. Kumar & Takahashi 1991: 577-578, pl 15, fig 2, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 68, pl 37, fig 13,

EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

GLEICHENIIDITES Ross, **LAEVIGATI.**

Gleicheniidites concavus Saxena & Khare 2004: 73, 75, pl 1, figs 1-2, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Gleicheniidites indicus Mathur & Chopra (non Singh *et* al. 1964) = **Gleicheniidites mathurii** Saxena.

Gleicheniidites mathurii Saxena 1992b: 532.

Gleicheniidites indicus Mathur & Chopra 1982 (non Singh *et* al. 1964): 56, pl 1, fig 12, LATE MIOCENE, Galsi Well no. 3, Bengal Basin, West Bengal.

Gleicheniidites senonicus Ross. Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Mandal *et* al. 1996: 78, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mitra *et* al. 2000: 126, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

Gleicheniidites sp. Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam.

cf. Gleicheniidites sp. Kumar 1994: 77, EARLY-MIDEDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Gleicheniidites sp. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Gleicheniidites sp. Misra *et* al. 1996: 96, EARLY MIOCENE (Baghmara Formation), Tura-Dalu Road Section along Bugi River and in the vicinity of Baghmara, Garo Hills, Meghalaya.

GNEUDNASPORA Balme, **INCERTAE SEDIS.**

Gneudnaspora kernickii Balme. Misra & Kapoor 1994: 158, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

Gneudnaspora sp. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

GONDISPORITES Bharadwaj, **CINGULATI.**

Gondisporites sp. Gupta *et* al. 2003: 212, pl 2, fig 6, PALAEOCENE-EOCENE, Ganga Basin.

Gondisporites Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked).

GOTHANIPOLLIS Krutzsch, **TRIPTYCHES.**

Gothanipollis indicus Rao & Ramanujam. Ramanujam *et* al. 1991: 57, pl 1, fig 20, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 3, fig 6, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Gothanipollis sp. Misra & Kapoor 1994: 154, 159, pl 3, fig 45, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

GOUBINISPORA Tiwari & Rana, **STRIASACCITI.**

Goubinispora indica Tiwari & Rana. Mandal *et* al. 2003: 102, pl 3, fig 4, EOCENE (Baratang

Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

GRAMINIDITES Cookson ex Potonié, **MONOPORINES.**

Graminidites assamicus Sah & Dutta. Salujha et al. 1991: 67, pl 2, fig 50, NEOGENE, Adamtila Well-A, Cachar District, Assam; Hait & Banerjee 1994: 117, pl 2, fig 37, EARLY and LATE MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram.

Graminidites granulatus Kar. Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Graminidites media Cookson. Hait & Banerjee 1994: 117, pl 2, fig 36, EARLY and LATE MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram; Kar et al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Misra & Kapoor 1994: 150, 152, pl 1, fig 20, PALAEOCENE-EARLY EOCENE and MIDDLE MIOCENE (Subathu and Basal Dharmsala and Lower Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mitra et al. 2000: 126, pl 1, fig 14, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Saxena & Sarkar 2000: 257, pl 2, fig 1, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Gupta et al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin..

cf. Graminidites media Cookson. Kumar 1994: 28, pl 20, fig 14, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Graminidites pliocenicus Singh & Saxena. Singh & Sarkar 1994: 50, pl 1, fig 23, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

Graminidites protrudes Mathur & Mathur. Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Graminidites siwalikus Rao & Patnaik 2001: 278, pl 1, figs 18-20, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Graminidites sp. Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam.

Graminidites sp. Hait & Banerjee 1994: 117, pl 2, fig 35, EARLY and LATE MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram.

Graminidites sp. Kar et al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam.

Graminidites spp. Kumar 1994: 68, 91, pl 38, fig 15, MIOCENE-PLIOCENE (Bhuban and Tipam formations), Silchar-Haflong Road Section, Assam.

Graminidites sp. Misra & Kapoor 1994: 155, MIDDLE EOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Graminidites sp. Mehrotra et al. 2000: 153, MIDDLE EOCENE (Sylhet Formation), Upper Assam.

GRANUSTEPHANOCOLPITES Saxena, **POLYPTYCHES.**

Granustephanocolpites cooksoniae (Sah & Dutta) Saxena. Saxena et al. 1996: 21, pl 3, figs 5-6, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Granustephanocolpites sahii Saxena. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan (wrongly spelt as *Granustephanocolpites sahnii*); Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan.

Granustephanocolpites sp. Saxena & Bhattacharyya 1990: 112, pl 2, figs 6-7, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Granustephanocolpites sp. Sarkar et al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

GREVILLOIDEAEPITES Biswas, **TRIPORINES.**

Grevilloideaepites eocenicus Biswas. Singh & Misra 1991b: 209, pl 2, figs 3-4, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh et al. 1992: 57, pl 2, fig 4, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Triangulorites bellus (Sah & Kar) Kar. Rao 1990: 248, pl 2, figs 24-25, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Singh 1990: 220, pl 1, fig 17, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Saxena 1991: 369, fig 8, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Rao 1995a: 328, pl 2, fig 10, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Saxena 1995: 99, fig 26, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked); Tripathi 1995: 47, pl 1, figs 15-16, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Saxena et al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Saxena & Sarkar 2000: 257, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Kar & Sharma 2001: 129, pl 4, fig 6, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Gupta et al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin; Chakraborty 2004: 116, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Triorites bellus Sah & Kar. Kapoor et al. 2003: 183, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Grevilloideaepites inferius (Dutta & Sah) Singh & Misra 1991b: 209.

Triangulorites inferius (Dutta & Sah) Kar & Kumar. Chakraborty 2004: 116, pl 1, fig 8, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Triorites inferius Dutta & Sah 1970: 49-50, pl 9, figs 29-32, PALAEOCENE (Cherra Formation), Umstew, Shillong Plateau, Meghalaya.

Grevilloideaepites pachyexinus (Kar & Kumar) Singh & Misra 1991b: 209.

Triangulorites pachyexinus Kar & Kumar. Singh 1990: 220, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi 1997: 170, LATE PALAEOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan.

GRIMSDALEA Germeraad et al., **ALETES.**

Grimsdalea sp. Ramanujam et al. 1989: 28, pl 1, figs 5-7, MIOCENE, subsurface sediments of eastern coast of southern India.

Grimsdalea sp. Ramanujam et al. 1991: 54, pl 1, fig 31, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Grimsdalea sp. Rao et al. 1993: 82, pl 1, fig 27, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Grimsdalea sp. Rao et al. 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Grimsdalea sp. Rao & Rajendran 1996: 67-68, pl 3, fig 8, MIOCENE (Quilon Formation), Meenkunnu Phase II, Cannanore District, Kerala.

HALORAGACIDITES Couper, **TRIPORINES.**

Haloragacidites myriophylloides Cookson & Pike. Ramanujam et al. 1991: 54, pl 1, fig 15, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam et al. 1992: 22, fig 3Q, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Haloragacidites neyvelii Ramanujam. Samant & Phadtare 1997: 25, pl 5, fig 2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 2, fig 11, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Haloragacidites sp. Ramanujam et al. 1991: 57, pl 1, fig 17, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

HAMIAPOLLENITES Wilson, **RECTISTRIATI.**

Hamiapollenites sp. Kar 1990b: 232, EOCENE (Disang Group), Silchar-Haflong Road Section, Assam (Reworked).

HAMULATISPORIS (wrongly spelt as *Hammulatisporites*) Krutzsch, **MURORNATI.**

Hamulatisporis sp. Chandra & Kumar 1998: 65, pl 1, fig 2, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean (wrongly spelt as *Hammulatisporites* sp.).

HETEROCOLPITES van der Hammen, **TRIPTYCHES.**

Heterocolpites combretoides Rao & Ramanujam. Ramanujam et al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam et al. 1991: 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Heterocolpites granulatus Rao & Ramanujam. Ramanujam et al. 1992: 22, fig 3H, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao

et al. 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

HIBISCEAEPOLLENITES Kar, **PERIPORITI.**

Hibisceaepollenites robustispinosus Kar 1990a: 194, pl 6, figs 90-91, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Chandra & Kumar 1998: 66, pl 2, fig 3, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Mandaokar 2000b: 181, pl 1, fig 2, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Hibisceaepollenites splendus Kar. Kar 1990a: 192, 198, pl 6, figs 94-95, pl 9, fig 129, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Ramanujam *et* al. 1992: 22, fig 3X, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Kar *et* al. 1994: 186, pl 2, fig 38, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Hibisceaepollenites spp. A-B. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Hibisceaepollenites sp. Kar 1990a: 192, pl 6, fig 92, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Hibisceaepollenites sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin.

HIMALAYAPOLLIS in Misra & Kapoor. *Nomen nudum.*

Himalayapollis pilatus in Misra & Kapoor 1994: 156, pl 4, figs 75-76, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

HINDIPOLLENITES Bharadwaj, **STRIATITI.**

Hindipollenites indicus Bharadwaj. Kar 1990a: 181, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram (Reworked).

Hindipollenites sp. Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

HIPPOCRATEACEAEDITES Ramanujam, **OBLATI.**

Hippocrateaceaedites quilonensis Rao & Ramanujam. Ramanujam *et* al. 1991: 3, pl 2, fig 9, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Hippocrateaceaedites vancampoae Ramanujam. Ramanujam *et* al. 1992: 22, fig 3I, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

HORNIELLA Traverse, **PTYCHOPOLYPORINES.**

Horniella clavaticosta Traverse. Misra & Kapoor 1994: 155, EARLY MIOCENE (Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

HORRIDITRILETES Bharadwaj & Salujha, **APICULATI.**

Horriditriletes bulbosus Tiwari. Gupta *et* al. 2003: 212, pl 2, fig 4, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

Horriditriletes novus Tiwari. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

Horriditriletes sp. Salujha *et* al. 1991: 68, NEOGENE, Adamtila Well-A, Cachar District, Assam (Reworked).

Horriditriletes sp. Trivedi 1991: 67, pl 1, fig 8, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked).

HYMENOZONOTRILETES Naumova, **ZONATI.**

Hymenozonotriletes sp. Salujha *et* al. 1991: 65, pl 1, fig 20, NEOGENE, Adamtila Well-A, Cachar District, Assam.

ICACINOIPOLLENITES Navale & Misra, **TRIPTYCHES.**

Icacinoipollenites Singh *et* al. 1992: 58, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

ILEXPOLLENITES Thiergart *ex* Potonié, **PROLATI.**

Ilexpollenites artificiosus Salujha *et* al. Salujha *et* al. 1991: 67, pl 2, figs 58-59, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Ilexpollenites deliciosus Sah. Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Ilexpollenites rarus Sah. Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Ilexpollenites sp. Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam.

IMPATIENSIDITES Sah, **POLYPTYCHES.**

Impatiensidites brevicolpus Sah. Sarkar *et* al. 1994: 201, pl 2, fig 22, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Inaperturate-verrucate pollen. Phadtare *et* al. 1994: 75, pl 1, fig P, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

INAPERTUROPOLLENITES Pflug & Thomson in Thomson & Pflug**, PSILONAPITI.**

Inaperturopollenites dubius (Potonié & Venitz) Thomson & Pflug. Kumar 1994: 12, 28, 68, 81, 91, 98, pl 1, figs 14a, b, pl 7, fig 11, pl 14, fig 3, pl 35, fig 2, pl 48, fig 3, LATE CRETACEOUS-EOCENE, MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Disang, Jenam, Bhuban, Bokabil, Tipam and Dupitila formations), Silchar-Haflong Road Section, Assam.

Inaperturopollenites hiatus (Potonié) Thomson & Pflug. Saxena & Bhattacharyya 1990: 111, pl 2, fig 1, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Inaperturopollenites laevigatus Takahashi. Kumar 1994: 28, 68, 81, 91, pl 10, fig 7, pl 19, fig 21, pl 36, fig 18, MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Jenam, Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

Inaperturopollenites minimus Takahashi & Jux. Kumar 1994: 12, 28, 50, 58, 68-69, 91, pl 1, figs 11a, b, pl 13, fig 8, pl 16, fig 7, pl 20, fig 3, pl 24,

fig 14, pl 27, fig 18, pl 31, fig 7(cf.), LATE CRETACEOUS-EOCENE, MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Disang, Jenam, Bhuban and Tipam formations), Silchar-Haflong Road Section, Assam.

Inaperturopollenites mirabilis Salujha *et* al. Salujha *et* al. 1991: 66, pl 1, fig 28, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Inaperturopollenites parvus Takahashi. Kumar 1994: 81, 91, pl 43, fig 6, pl 46, fig 8, LATE MIOCENE-PLIOCENE (Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

Inaperturopollenites punctatus (Saxena) Saxena & Bhattacharyya. Saxena & Bhattacharyya 1990: 112, pl 1, fig 13, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad and Manjhi Khad sections near Dharmsala, Kangra District, Himachal Pradesh; Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 245, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Rao & Patnaik 2001: 279, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Inaperturopollenites sp. cf. I. punctatus (Saxena) Saxena & Bhattacharyya. Rao 1990: 248, pl 1, fig 14, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Inaperturopollenites rugosus Takahashi & Jux. Kumar 1994: 12, pl 1, figs 13a, b, LATE CRETACEOUS-EOCENE (Disang Formation), Silchar-Haflong Road Section, Assam.

Inaperturopollenites ruptus Potonié & Sah. Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Inaperturopollenites sp. Kumar & Takahashi 1991: 578, pl 17, fig 11, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Inaperturopollenites spp. Kumar 1994: 16-17, 58, 69, 81, pl 3, fig 9, pl 30, figs 1-2, 10, 17, pl 36, fig 4, pl 37, figs 8-9, EARLY OLIGOCENE and MIOCENE (Laisong, Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

cf. Inaperturopollenites sp. Kumar 1994: 58, pl 24, fig 20, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Inaperturopollenites sp. Rao 2000: 301, pl 2, fig 9, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Inaperturopollenites sp. Srivastava & Bhattacharyya 2000: 377, pl 2, fig 7, EARLY TERTIARY, Arunachal Pradesh (Reworked).

Inaperturopollenites sp. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh..

Inaperturopollenites sp. Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

INAPERTUROTETRADITES van Hoeken-Klinkenberg, **TETRADITES.**

Inaperturotetradites psilatus Rao & Ramanujam (non Ramanujam 1966) = **Inaperturotetradites udarii** (Rao & Ramanujam) Gupta.

Inaperturotetradites udarii (Rao & Ramanujam) Gupta 1985: 113.

Inaperturotetradites psilatus Rao & Ramanujam. Ramanujam *et* al. 1991: 3, pl 3, fig 20, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Inaperturotetradites sp. 1. Saxena & Misra 1990: 265, pl 2, fig 7, NEOGENE (Ratnagiri Beds),

Amberiwadi Section, Sindhudurg District, Maharashtra.

Inaperturotetradites sp. 2. Saxena & Misra 1990: 265, pl 2, fig 3, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

INCROTONIPOLLIS Jansonius & Hills, **ALETES.**

Incrotonipollis burdwanensis (Baksi *et* al.) Jansonius & Hills. Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Incrotonipollis neyvelii (Baksi *et* al.) Jansonius & Hills. Samant & Phadtare 1997: 25-26, pl 5, figs 3-5, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Incrotonipollis sp. Mandaokar 2002b: 21, pl 1, fig 8, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

INDOTRIRADITES Tiwari, **ZONATI.**

Indotriradites korbaensis Tiwari. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 239, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked); Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Srivastava & Bhattacharyya 2000: 379, pl 3, fig 2, EARLY TERTIARY, Arunachal Pradesh (Reworked); Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Indotriradites mercenierii Kar & Bose. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked).

Indotriradites sparsus Tiwari. Kar 1990b: 239, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

Indotriradites surangei Tiwari. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked).

Indotriradites sp. Kar 1990b: 239, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

Indotriradites sp. Singh *et* al. 1991: 41, pl 1, fig 10, pl 2, fig 7, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Indotriradites sp. Trivedi 1991: 67, pl 1, figs 3, 7, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked).

Indotriradites sp. Trivedi & Saxena 2000: 275, pl 1, fig 11, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam (Reworked).

INTERPOROPOLLENITES Weyland & Krieger, **TRIPORINES**.

Interporopollenites sp. Gupta *et* al. 2003: 591, fig 3b, PALAEOGENE, Ganga Basin.

INTERTRILETES Anderson, **MURORNATI.**

Intertriletes reticulatus Kumar & Takahashi 1991: 591-592, pl 3, fig 3, text-fig 19, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 37, pl 9, fig 3, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

INTRABACULISPORIS Kedves & Rakosy, **LAEVIGATI.**

Intrabaculisporis quilonensis Rao & Ramanujam. Ramanujam *et* al. 1992: 21, EARLY

MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

INTRAPUNCTISPORIS Krutzsch, **LAEVIGATI.**

Intrapunctisporis apunctis Krutzsch. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 233, 234, 239, EARLY-MIDDLE OLIGOCENE and EARLY MIOCENE (Laisong, Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, pl 1, fig 1, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 2, fig 3, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Saxena 2000c: 163, pl 1, fig 2, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Intrapunctisporis gigantica Kar & Kumar. Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Intrapunctisporis harudiensis Kar. Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 1, fig 5, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 46, pl 1, fig 4, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Intrapunctisporis intrapunctis Krutzsch. Kar 1990b: 232, 233, 237, EOCENE, EARLY and LATE OLIGOCENE (Disang, Laisong and Renji formations), Silchar-Haflong Road Section, Assam; Rao 1990: 248, pl 1, fig 22, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1993: 139, pl 1, fig 25, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, pl 1, fig 19, TERTIARY, subsurface sediments in Upper Assam; Sarkar *et* al. 1994: 201, pl 2, fig 21, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao & Rajendran 1996: 65, MIOCENE, Cannanore District, Kerala; Saxena *et* al. 1996: 21, pl 1, fig 15, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 2, fig 12, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, pl 2, fig 5, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 187,

EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Intrapunctisporis plicatus Saxena & Rao 1996: 48-50, pl 1, figs 5-6, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Intrapunctisporis subtriangularis Kar & Singh. Singh & Tripathi 1990: 329, pl 1, fig 22, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Intrapunctisporis sp. Kar & Bhattacharya 1992: 256, pl 1, fig 31, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

INTRAPUNCTOSPORIS Krutzsch, **LAEVIGATOMONOLETI.**

Intrapunctosporis cacharensis Kumar & Takahashi 1991: 592-593, pl 3, fig 6, pl 4, fig 3, text-fig 20, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 37, 52, pl 11, fig 3, pl 13, fig 10, pl 26, fig 13, MIDDLE OLIGOCENE and EARLY-MIDDLE MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam (wrongly spelt as *Intrapunctatosporis cacharensis*).

Intrapunctosporis cf. cacharensis Kumar 1994: 85, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam (wrongly spelt as *Intrapunctatosporis* cf. *cacharensis*).

Intrapunctosporis sp. Kumar & Takahashi 1991: 593-594, pl 17, fig 2, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

INTRARETICULITES Kar, **TRIPTYCHES.**

Intrareticulites brevis (Sah & Kar) Kar. Kar & Bhattacharya 1992: 251, pl 2, fig 1, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Kar et al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Samant & Phadtare 1997: 26, pl 5, fig 6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 2, fig 7, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Samant & Tapaswi 2001: 128, pl 1, fig 9, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Gupta et al. 2003: 211, pl 1, fig 10, PALAEOCENE-EOCENE, Ganga Basin.

Intrareticulites scabratus Samant & Tapaswi 2001: 126, pl 2, fig 11, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

IRIDACIDITES Ramanujam, **MONOPTYCHES.**

Iridacidites warkalliensis Ramanujam. Rao 1995a: 327, pl 4, fig 11, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Rao & Patnaik 2001: 270, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Iridacidites sp. Singh et al. 1991: 42, OLIGOCENE (Barail Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

IUGOPOLLIS Venkatachala & Rawat, **POLYPORINES.**

Iugopollis tetraporites Venkatachala & Rawat. Samant & Phadtare 1997: 26, pl 5, figs 7-8, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 2, fig 12, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY

EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Iugopollis sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

JACOBIPOLLENITES Ramanujam, **MONOPORINES.**

Jacobipollenites arthungalensis Rao 1990: 251, pl 3, figs 11, 24, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala.

Jacobipollenites crassimurus Singh & Misra 1991b: 214, pl 4, figs 3-4, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Jacobipollenites distinctus Singh & Misra 1991b: 213-214, pl 4, figs 1-2, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh *et* al. 1992: 56, pl 1, fig 10, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Ramanujam *et* al. 1999: 35, pl 2, figs 33, 40, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

Jacobipollenites magnificus Ramanujam. Sarkar *et* al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Jacobipollenites magniporus Singh & Misra 1991b: 213, pl 4, figs 5-6, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Jacobipollenites ramanujamii Samant 2000: 104, pl 3, fig 1, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Jacobipollenites sp. Rao & Patnaik 2001: 277, pl 2, fig 6, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

JANDUFOURIA Germeraad *et* al., **PTYCHOPOLYPORINES.**

Jandufouria seamrogiformis Germeraad *et* al. Saxena 1991: 369, fig 2, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kumaran *et* al. 1995: 1024-1025, fig 3j, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Saxena 1995: 98, figs 13, 28, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

JUGLANSPOLLENITES Raatz, **PERIPORITI.**

Juglanspollenites horniana Raatz. Hait & Banerjee 1994: 118, pl 3, figs 56-57, LATE MIOCENE, around Champhai, Mizoram; Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

JWALAMUKHIPOLLIS in Misra & Kapoor. *Nomen nudum.*

Jwalamukhipollis indicus in Misra & Kapoor 1994: 157, pl 5, figs 83, 90-91, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Jwalamukhipollis raivermanii in Misra & Kapoor 1994: 159, pl 5, figs 84-85, 93-94, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

KAPURDIPOLLENITES Tripathi, **SPHAEROZONISULCATES.**

Kapurdipollenites baculatus Tripathi 1994: 62, pl 2, figs 5-7, EARLY PALAEOGENE, Well MK-332 (Depth 420 m from ground level), Kapurdi, Barmer District, Rajasthan; Tripathi 1995: 47, pl 1, fig 13, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Kapurdipollenites gemmatus Tripathi 1994: 61-62, pl 1, figs 1-4, EARLY PALAEOGENE, Well MJ-4 (Depth 100 m from ground level), Jalipa, Barmer District, Rajasthan; Tripathi 1995: 47, pl 1, fig 11, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

KATROLITES Venkatachala & Kar, **HILATES.**

Katrolites kutchensis Venkatachala & Kar. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked).

KERALAEAPOLLIS Kar, **ANGIOSPERMAE.**

Keralaeapollis oculis Kar 1993b: 35, pl 1, figs 1-5, BURDIGALIAN (Ambalapuzha Formation), Papanasam, Varkala, Kerala.

KHARIASPORITES Kar, **APICULATI.**

Khariasporites sp. Gupta et al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

KIELMEYERAPOLLENITES Sah & Kar, **TETRADITES.**

Kielmeyerapollenites eocenicus Sah & Kar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 220, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Rekmangiri Coalfield, Garo Hills, Meghalaya; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Kar & Sharma 2001: 130, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Chakraborty 2004: 115, pl 1, fig 20, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Kielmeyerapollenites syncolporatus Kar & Kumar. Singh 1990: 220, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 1, 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Kumar 1995: 69, pl 1, figs 8-10, PALAEOCENE (Lakadong Sandstone), Laitryngew, Khasi Hills, Meghalaya.

KINDOPOLLIS Mathur & Jain, **PTYCHOPOLYPORINES.**

Kindopollis cf. decoris Mathur & Chopra. Kumar & Takahashi 1991: 546-547, pl 18, fig 4, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 81, pl 44, fig 4, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

KLAUSIPOLLENITES Jansonius, **DISACCITES.**

Klausipollenites decipiens Jansonius. Kar 1990b: 236, 240, MIDDLE OLIGOCENE and EARLY MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam (Reworked);

Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Mandal *et* al. 1996: 80, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland (Reworked).

Klausipollenites schaubergeri (Potonié & Klaus) Jansonius. Mandal *et* al. 2003: 100, 102, pl 3, fig 3, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Klausipollenites sulcatus Kar *et* al. Kar 1990b: 232, 233, 236, 237, 240, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam (Reworked); Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked); Trivedi & Saxena 2000: 275, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

Klausipollenites vestitus Jansonius. Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked).

Klausipollenites sp. Singh *et* al. 1991: 41, pl 2, fig 3, OLIGOCENE (Barail Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

KLUKISPORITES Couper, **MURORNATI.**

Klukisporites pseudoreticulatus Couper. Kar 1990a: 179, pl 3, fig 52, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram (Reworked).

Klukisporites variegatus Couper. Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road Section near Lumshnong, Jaintia Hills District, Meghalaya (Reworked).

Klukisporites sp. Singh *et* al. 1991: 42, pl 2, fig 6, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Klukisporites sp. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

Klukisporites sp. Mandal *et* al. 2003: 104, pl 3, fig 6, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked)..

Klukisporites sp. Singh & Kar 2003: 219, pl 1, fig 4, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

LACRIMAPOLLIS Venkatachala & Rawat, **TRIPTYCHES.**

Lacrimapollis pilosus Venkatachala & Rawat. Ramanujam *et* al. 1991: 54, pl 1, figs 23-24, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Lacrimapollis subcircularis Salujha *et* al. = **Discoidites subcircularis** (Salujha *et* al.) Kumar.

Lacrimapollis sp. Ramanujam *et* al. 1991: 3, pl 2, fig 14, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Lacrimapollis sp. Ramanujam *et* al. 1992: 22, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Lacrimapollis sp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE (Lower Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Lacrimapollis sp. Aswal & Singh 2000: 125, PLIOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh.

LADAKHIPOLLENITES Mathur & Jain, **TRIPTYCHES.**

Ladakhipollenites constatus (Dutta & Sah) Mandal & Rao 2001: 355.

Trifossapollenites constatus Dutta & Sah 1970: 27, pl 6, figs 21-23, PALAEOCENE (Cherra Formation), Meghalaya.

Ladakhipollenites prolatus (Baksi) Mandal & Rao 2001: 356.

Tricolpopites prolatus Baksi 1962: 19, pl 4, fig 44, OLIGOCENE (Barail Group), Meghalaya.

Ladakhipollenites shortii (Baksi) Mandal & Rao 2001: 356.

Tricolpopites shortii Baksi 1962: 19, pl 4, fig 45, MIOCENE (Surma Group), Meghalaya.

LAEVIGATOPOLYCOLPITES Kar & Bhattacharya = **PSILASTEPHANOCOLPITES** Leidelmeyer, **POLYPTYCHES.**

Laevigatopolycolpites rotatus Kar & Bhattacharya = **Psilastephanocolpites rotatus** (Kar & Bhattacharya) Samant & Phadtare.

LAEVIGATOSPORITES Ibrahim, **LAEVIGATOMONOLETI.**

Laevigatosporites cognatus Sah & Kar. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandal *et al.* 1996: 78, pl 1, fig 6, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Samant & Phadtare 1997: 9, pl 1, fig 10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat (wrongly spelt as *Laevigatisporites cognatus*); Saxena 2000c: 163, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Samant & Tapaswi 2001: 126, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Laevigatosporites copiosus Salujha *et al.* Kumar & Takahashi 1991: 594, pl 4, fig 2, pl 8, fig 1, pl 13, fig 6, MIDDLE OLIGOCENE, EARLY and LATE MIOCENE (Jenam, Lower Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Salujha *et al.* 1991: 66, pl 1, fig 24, NEOGENE, Adamtila Well-A, Cachar District, Assam; Kumar 1994: 20, 38, 52, 85, 95, pl 2, fig 6, pl 6, fig 4, pl 12, fig 1, pl 24, fig 22, pl 25, fig 3, EARLY-MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Laisong, Jenam, Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

Laevigatosporites discordatus Pflug in Thomson & Pflug. Hait & Banerjee 1994: 115, pl 1, fig 1, EARLY and LATE MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram; Kumar 1994: 63, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Laevigatosporites gracilis Wilson & Webster. Kumar & Takahashi 1991: 594, pl 2, fig 6, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 20-21, 38, 48, 85, 95, 100, pl 2, fig 2, pl 11, fig 1, pl 22, fig 8, pl 47, fig 6, OLIGOCENE and LATE MIOCENE-PLIOCENE (Laisong, Jenam, Renji, Bokabil, Tipam and Dupitila formations), Silchar-Haflong Road Section, Assam; Mitra *et al.* 2000: 126, pl 1, fig 12, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Samant 2000: 114, pl 1, fig 4, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Laevigatosporites lakiensis Sah & Kar. Kar 1990a: 176, pl 1, figs 12-14, pl 9, fig 130, MIOCENE (Surma and Tipam groups), Rokhia

Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 237, 239, LATE OLIGOCENE-EARLY MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Misra & Kapoor 1994: 152, pl 1, fig 1, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Samant & Phadtare 1997: 9-10, pl 1, fig 11, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat (wrongly spelt as *Laevigatisporites lakiensis*); Samant 2000: 114, pl 1, fig 3, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Saxena 2000c: 163, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Laevigatosporites ovatus Wilson & Webster. Rao 1990: 246, pl 1, fig 8, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 1, fig 10, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala (wrongly spelt as *Laevigatisporites ovalis*); Rao *et* al. 1993: 81, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Shanmukhappa & Koshal 1993: 202, LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Hait & Banerjee 1994: 115, pl 1, fig 2, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Kumar 1994: 38, pl 11, fig 6, pl 13, figs 3, 5, pl 18, fig 10, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Rao & Rajendran 1996: 66, pl 1, fig 13, MIOCENE, Cannanore District, Kerala; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Laevigatosporites ovoideus Takahashi. Misra & Kapoor 1994: 150, MIDDLE MIOCENE-EARLY PLIOCENE (Middle Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Laevigatosporites potoniei Samant & Phadtare 1997: 10-11, pl 1, fig 12, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat (wrongly spelt as *Laevigatisporites potoniei*).

Laevigatosporites robustus Kumar & Takahashi 1991: 594-595, pl 14, fig 1, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 53, 73, pl 34, fig 9, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Laevigatosporites tertiarus (Sah & Dutta) Saxena & Khare 2004: 73, 75, 77, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Polypodiaceaesporites tertiarus Sah & Dutta. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 236, 237, EOCENE-LATE OLIGOCENE (Disang, Laisong, Jenam and Renji formations), Silchar-Haflong Road Section, Assam; Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1993: 139, pl 2, fig 4, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et al.* 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1995: 17, 19, pl 1, figs 1, 38, 48, pl 2, figs 2-3, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 11, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Trivedi & Saxena 2000: 273, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Gupta *et al.* 2003: 210, PALAEOCENE-EOCENE, Ganga Basin; Kapoor *et al.* 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Laevigatosporites variabilis Saxena & Khare 2004: 73, 77, pl 1, fig 7, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Laevigatosporites spp. Shanmukhappa & Koshal 1993: 195, 201, EARLY-MIDDLE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Laevigatosporites spp. Kumar 1994: 38, 74, 95, 100, 206, pl 11, fig 9, pl 12, fig 6, pl 13, fig 1, pl 35, fig 5, MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Jenam, Bhuban, Tipam and Dupitila formations), Silchar-Haflong Road Section, Assam.

Laevigatosporites spp. Mehrotra *et al.* 2000: 153, LATE EOCENE (Kopili Formation), Upper Assam.

Laevigatosporites sp. Samant 2000: 114, pl 1, fig 5, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Laevigatosporites sp. Gupta *et al.* 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

LAHIRITES Bharadwaj, **STRIATITI.**

Lahirites raniganjensis Bharadwaj. Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam (Reworked).

Lahirites sp. Singh *et al.* 1991: 41, pl 2, fig 16, OLIGOCENE-EARLY MIOCENE (Barail and Surma Groups), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

LAKIAPOLLIS Venkatachala & Kar, **PTYCHOTRIPORINES.**

Lakiapollis assamicus Tripathi & Singh. Singh & Tripathi 1990: 330, pl 1, figs 18, 31, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Lakiapollis ovatus Venkatachala & Kar. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Rao 1990: 246, pl 2, fig 29, pl 3, fig 16, EOCENE-EARLY

MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Saxena 1991: 369, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar & Bhattacharya 1992: 252, pl 1, fig 9, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Ramanujam *et* al. 1992: 22, fig 3L, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Ambwani 1993: 157, 161, PALAEOCENE-EARLY EOCENE, Seam Nos. 1 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Rao *et* al. 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Kar *et* al. 1994: 187, pl 2, fig 20, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Kumaran *et* al. 1995: 1025, fig 3l, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao *et* al. 1995: 374, fig 17, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Saxena 1995: 99, fig 48, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked); Kumar 1996: 112, pl 1, fig 24, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandal *et* al. 1996: 80, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Rao 1996: 157, pl 1, fig 14, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 1, fig 19, pl 3, fig 10, MIOCENE, Cannanore District, Kerala; Saxena *et* al. 1996: 21, pl 3, figs 7, 11, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandal 1997: 99, pl 2, fig 4, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 27, pl 5, figs 9-11, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 181, pl 2, fig 20, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 297, pl 2, fig 5, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Samant 2000: 114, pl 3, fig 12, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Saxena 2000c: 163, pl 2, fig 9, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Srivastava & Bhattacharyya 2000: 375, pl 1, fig 3, EARLY TERTIARY, Kimin-Ziro Road Section, Lower Subansiri District, near Rilu village, West Siang District and Pasighat to Rengging Section, East Siang District, Arunachal Pradesh; Tripathi *et* al. 2000: 245, pl 2, fig 12, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Singh & Kar 2002: 214, pl 1, figs 8, 10, PALAEOCENE (Deccan Intertrappean Beds), 3 km northeast of Papro village, Latitpur District, Uttar Pradesh; Gupta *et* al. 2003: 211, pl 1, fig 4, PALAEOCENE-EOCENE, Ganga Basin; Mandal *et* al. 2003: 104, pl 1, fig 2, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Singh & Kar 2003: 219, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh;

Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Rao 2004: 125, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Lakiapollis ratnagiriensis Rao 2004: 125, 132, pl 1, figs 2-4, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

Lakiapollis sp. Saxena & Misra 1990: 265, pl 1, fig 13, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Lakiapollis sp. Ramanujam *et* al. 1991: 3, pl 3, fig 15, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Lakiapollis sp. Singh *et* al. 1992: 56, pl 1, fig 12, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Lakiapollis sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

LANAGIOPOLLIS Morley, **PTYCHOTRIPORINES.**

Lanagiopollis arcotense in Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu. *Nomen nudum.*

Lanagiopollis cambayensis Kumar 1996: 114, pl 1, figs 21-22, pl 2, figs 11-12, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Lanagiopollis emarginatus Morley. Phadtare & Thakur 1990: 287, pl 2, figs 5-6, EARLY-MIDDLE EOCENE (Rajpardi lignite), Gujarat; Tripathi *et* al. 2000: 245, pl 1, fig 1, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Lanagiopollis eocenicus Mandal & Kumar 2000: 203, pl 2, figs 7-8, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam.

Lanagiopollis meghalayaensis Tripathi *et* al. 2000: 245, pl 1, figs 2-3, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Lanagiopollis microrugulatus Morley. Phadtare & Thakur 1990: 287, pl 2, figs 1-4, EARLY-MIDDLE EOCENE (Rajpardi lignite), Gujarat; Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Lanagiopollis nanggulaensis Morley. Tripathi *et* al. 2000: 245, pl 1, fig 8, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Lanagiopollis regularis Morley. Kumar 1996: 112, pl 1, figs 13-14, 27, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandal 1997: 99, pl 1, fig 18, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Kumar *et* al. 2001: 245, fig 6.12, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Upper Assam; Mandal *et* al. 2003: 102, 104, pl 1, fig 6, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Mandal & Vijaya 2004: 497, fig 4G, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

cf. Lanagiopollis regularis Morley. Kumar 1996: 114, pl 2, fig 15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Lanagiopollis reitsmae Phadtare & Thakur 1990: 289, pl 3, figs 6-8, EARLY-MIDDLE EOCENE (Rajpardi lignite), Gujarat; Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Tripathi *et* al. 2000: 245, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Lanagiopollis rugulatus Phadtare & Thakur 1990: 289-290, pl 4, figs 1-5. EARLY-MIDDLE EOCENE (Rajpardi lignite), Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Lanagiopollis ruguloreticulatus Phadtare & Thakur 1990: 287, 289, pl 3, figs 1-5. EARLY-MIDDLE EOCENE (Rajpardi lignite), Gujarat.

Lanagiopollis ruguloverrucatus Morley. Kumar 1996: 112, pl 1, figs 25-26, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Lanagiopollis subglobosus Tripathi *et* al. 2000: 246, pl 1, figs 4-5, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Lanagiopollis tetracolporatus Kumar 1996: 114, 116, pl 1, fig 12, pl 2, fig 16, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Lanagiopollis Singh *et* al. 1992: 58, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Lanagiopollis sp. Kumar 1996: 116, pl 2, fig 13, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

LARICOIDITES Potonié *et* al. *ex* Potonié, **PSILONAPITI.**

Laricoidites indicus Singh *et* al. = **Araucariacites singhii** Saxena.

Laricoidites magnus (Potonié) Potonié *et* al. *ex* Potonié. Saxena & Bhattacharyya 1990: 111, pl 1, fig 14, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad and Manjhi Khad sections near Dharmsala, Kangra District, Himachal Pradesh; Ambwani 1993: 160, 161, EARLY EOCENE, Seam No. 3, Rekmangiri Coalfield, Garo Hills, Meghalaya;. Kumar 1994: 92, pl 46, fig 9, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam; Rao & Patnaik 2001: 270, pl 3, fig 3, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Laricoidites robustus Ambwani 1993: 158, fig 5G, PALAEOCENE-EARLY EOCENE, Rekmangiri Coalfield, Garo Hills, Meghalaya;

Laricoidites spp. Misra & Kapoor 1994: 150, LATE EOCENE-OLIGOCENE and MIDDLE MIOCENE-EARLY PLIOCENE (Lower Dharmsala and Middle Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Laricoidites sp. Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Laricoidites sp. Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

LEIOTRILETES Naumova *ex* Ishchenko, **LAEVIGATI.**

Leiotriletes brevis Sinha. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin.

Leiotriletes eocenicus (Dutta & Sah) Kumar & Takahashi 1991: 595-596, pl 3, fig 7, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Lygodiumsporites eocenicus Dutta & Sah. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh & Tripathi 1990: 329, pl 1, fig 4, MIOCENE (Siwalik sediments), Arunachal Pradesh; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 21, pl 2, figs 1, 4, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam; Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Sarkar *et* al. 1994: 201, pl

2, fig 16, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Rao 1995a: 327, pl 1, fig 12, EOCENE-EARLY MIOCENE, Nirkunnam Borehole, Alleppey District, Kerala; Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Rao & Rajendran 1996: 65, pl 1, fig 6, MIOCENE, Cannanore District, Kerala; Saxena *et* al. 1996: 21, pl 1, fig 14, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandaokar 2000b: 180, pl 2, fig 35, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Tripathi *et* al. 2003: 90, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Leiotriletes tiwarii Saxena 1993: 195.

Leiotriletes virkkii Tiwari 1965: 170, pl 1, figs 2-3, PERMIAN (Barakar Stage), Borehole G 214, Korba Coalfield, Madhya Pradesh.

Leiotriletes virkkii Tiwari (non Biswas 1962) = **Leiotriletes tiwarii** Saxena.

Leiotriletes. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh.

LEPTOLEPIDITES Couper, **APICULATI.**

Leptolepidites couperi in Banerjee & Nandi 1994: 219, pl 1, fig 10, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram. *Nomen nudum.*

Leptolepidites rariverrucatus Nandi. Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

Leptolepidites verrucatus Couper. Sarkar *et* al. 1994: 201, pl 2, fig 2, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandal 1997: 99, pl 1, fig 6, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Leptolepidites sp. Saxena & Misra 1990: 264, pl 1, fig 3, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Leptolepidites sp. Kumar 1994: 77, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Leptolepidites sp. Sarkar *et* al. 1994: 201, pl 2, fig 3, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Leptolepidites sp. Rao & Patnaik 2001: 276, pl 2, fig 3, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Leptolepidites sp. Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

LIGULIFLORAEDITES Kar, **PTYCHOTRIPORINES.**

Ligulifloraedites pilatus Kar. Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam.

LILIACIDITES Couper, **RETECTINES.**

Liliacidites baculatus Venkatachala & Kar. Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Liliacidites clubensis Samant & Phadtare 1997: 27-28, pl 5, fig 14, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Liliacidites crassireticulatus Venkatachala & Rawat. Samant & Phadtare 1997: 27, pl 5, figs 12-13, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Mitra et al. 2000: 126, pl 1, fig 21, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Liliacidites ellipticus Venkatachala & Kar. Kumar 1994: 69, pl 37, fig 11, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Liliacidites cf. ellipticus Venkatachala & Kar. Kumar & Takahashi 1991: 547, pl 15, fig 6, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam.

Liliacidites giganticus Singh. Saxena & Bhattacharyya 1990: 112, pl 2, figs 2-3, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Manjhi Khad Section near Dharmsala, Kangra District, Himachal Pradesh; Saxena et al. 1996: 21, pl 2, fig 8, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Tripathi et al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Liliacidites keralaensis Rao 1990: 248-251, pl 1, figs 1-2, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Liliacidites kutchensis Saxena = **Matanomadhiasulcites kutchensis** (Saxena) Kar.

Liliacidites magnus Jain et al. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan.

Liliacidites magnus Ramanujam (non Jain et al. 1973) = **Liliacidites ramanujamii** Saxena.

Liliacidites major Singh = **Matanomadhiasulcites major** (Singh) Saxena & Khare.

cf. Liliacidites major Singh. Kumar & Takahashi 1991: 547, pl 4, fig 14, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam.

Liliacidites microreticulatus Dutta & Sah. Kumar & Takahashi 1991: 547-548, pl 9, fig 9(cf.), pl 15, fig 4, MIDDLE-LATE MIOCENE (Middle and Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 69, pl 38, fig 8, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Saxena 2000c: 163, pl 2, fig 10, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Liliacidites cf. microreticulatus Dutta & Sah. Kumar 1994: 58, pl 29, fig 1, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Liliacidites minireticulatus Mathur & Mathur. Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Liliacidites perforatus Pocknall. Sarkar et al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Liliacidites pilosus Venkatachala & Rawat. Kumar & Takahashi 1991: 548, pl 1, fig 18, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 17,

pl 4, fig 11, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Liliacidites ramanujamii Saxena 1992b: 532.

Liliacidites magnus Ramanujam 1987 (non Jain et al. 1973): 29, pl 1, fig 19, MIOCENE (Warkalli Beds), Kerala.

Liliacidites reticulatus Sah & Kar. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan.

Liliacidites variabilis Mathur & Chopra. Kumar 1994: 81, 92, pl 46, fig 7, LATE MIOCENE-PLIOCENE (Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam; Gupta et al. 2003: 213, pl 1, fig 11, PALAEOCENE-EOCENE, Ganga Basin.

Liliacidites cf. variabilis Mathur & Chopra. Kumar & Takahashi 1991: 548-549, pl 18, figs 17-18, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Liliacidites variegatus Couper. Kumar & Takahashi 1991: 549, pl 6, fig 4, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 44, pl 22, fig 11, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Liliacidites sp. Saxena & Bhattacharyya 1990: 112, pl 2, fig 8, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Manjhi Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Liliacidites sp. in Kar & Kumar. Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Liliacidites sp. Singh & Tripathi 1990: 330, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Liliacidites sp. 1. Singh & Tripathi 1990: 326, pl 1, fig 19, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Liliacidites sp. 2. Singh & Tripathi 1990: 326, pl 1, fig 20, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Liliacidites sp. Kumar & Takahashi 1991: 549-550, pl 11, fig 5, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Liliacidites sp. Kar & Bhattacharya 1992: 257, pl 2, fig 18, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Liliacidites sp. Shanmukhappa & Koshal 1993: 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Liliacidites sp. A. Kumar 1994: 44, 58, pl 22, fig 10, pl 32, fig 17, LATE OLIGOCENE and EARLY-MIDDLE MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam.

Liliacidites spp. Kumar 1994: 29, 50, 59, 81, 92, 98, pl 15, fig 3, pl 16, figs 3, 6, 9, pl 24, fig 2, pl 33, fig 21, MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Jenam, Bhuban, Bokabil Tipam and Dupitila formations), Silchar-Haflong Road Section, Assam.

?Liliacidites sp. Kumar 1994: 29, pl 16, figs 9, 14, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Liliacidites sp. Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Liliacidites spp. Misra & Kapoor 1994: 150, 159, MIDDLE EOCENE and MIDDLE MIOCENE (Lower Dharmsala and Lower Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Liliacidites sp. Sarkar et al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Liliacidites sp. Singh & Sarkar 1994: 50, pl 1, fig 16, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

Liliacidites sp. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Liliacidites sp. Chandra & Kumar 1998: 53, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Liliacidites sp. Srivastava & Bhattacharyya 2000: 375, pl 1, fig 2, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh.

Liliacidites sp. Rao & Patnaik 2001: 277, pl 3, fig 2, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Liliacidites sp. Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Liliacidites sp. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

LIMITISPORITES Leschik, **DISACCIMONOLETI.**

Limitisporites diversus Lele & Karim. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked).

Limitisporites plicatus Bose & Kar. Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

LIRIODENDROIPOLLIS Krutzsch, **MONOPTYCHES**.

Liriodendroipollis verrucatus Krutzsch. Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

LOBATISPORITES Tiwari & Moiz, **APICULATI.**

Lobatisporites gondwanensis Tiwari & Moiz. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

LONGAPERTITES van Hoeken-Klinkenberg, **RETECTINES.**

Longapertites hammenii Rao & Ramanujam. Rao 1990: 246, pl 1, fig 4, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Ramanujam *et* al. 1998c: 55, fig 6, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam *et* al. 1999: 35, pl 1, fig 24, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Samant 2000: 114, pl 3, fig 5, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Longapertites indicus Mathur & Chopra. Misra & Kapoor 1994: 153, pl 2, fig 29, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Longapertites klinkenbergii Rao & Ramanujam. Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh; Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 81, pl 1, fig 12, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Rao *et* al. 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Ramanujam *et* al. 1999: 35, pl 1, fig 23, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Longapertites marginatus van Hoeken-Klinkenberg. Misra & Kapoor 1994: 153, pl 2, fig

25, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Longapertites muratus in Misra & Kapoor 1994: 153, pl 2, fig 43, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Longapertites ornatus Phadtare & Kulkarni. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Longapertites ovalis Mathur & Jain. Saxena et al. 1996: 21, pl 3, fig 8, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Longapertites proxapertoides van der Hammen & Garcia de Mutis. Misra & Kapoor 1994: 153, pl 2, fig 26, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Samant 2000: 114, pl 3, fig 3, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Longapertites retipilatus Kar. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Mandal et al. 1996: 80, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Samant 2000: 114, pl 3, fig 7, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Kumar et al. 2001: 244, 245, fig 6.8, OLIGOCENE and EARLY-MIDDLE MIOCENE (Barail Group and Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam.

Longapertites triangularis in Misra & Kapoor 1994: 153, pl 2, fig 42, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Longapertites triangulatus Samant & Phadtare 1997: 28, 30, pl 5, figs 18-19, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 3, fig 6, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Longapertites vaneedenburgii Germeraad et al. Misra & Kapoor 1994: 153, 159, pl 2, fig 27, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Samant & Phadtare 1997: 28, pl 5, figs 20-21, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf; Samant 2000: 114, pl 3, fig 4, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Longapertites spp. Shanmukhappa & Koshal 1993: 195, 201, EARLY-MIDDLE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Longapertites sp. Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Longapertites sp. Misra & Kapoor 1994: 153, pl 2, fig 41, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Longapertites sp. Kumaran et al. 1995: 1025, fig 4r, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Longapertites sp. Samant & Phadtare 1997: 30, pl 5, figs 15-16, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Longapertites spp. Aswal & Singh 2000: 122, 123, DANIAN and THANETIAN, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh.

Longapertites spp. Mehrotra et al. 2000: 153, PALAEOCENE-EOCENE (Basal Sandstone, Sylhet and Kopili formations), Upper Assam.

LOPHOTRILETES Naumova ex Ishchenko**, APICULATI.**

Lophotriletes sp. Salujha et al. 1991: 68, NEOGENE, Adamtila Well-A, Cachar District, Assam (Reworked).

Lophotriletes. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh.

LORANTHIPITES Rao & Ramanujam, **TRIPTYCHES.**

Loranthipites sp. Singh & Tripathi 1990: 330, pl 1, fig 11, MIOCENE (Siwalik sediments), Arunachal Pradesh.

LUECKISPORITES Potonié & Klaus, **STRIATITI.**

Lueckisporites virkkii Potonié & Klaus. Kar 1990a: 181, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

LUNATISPORITES Leschik**, STRIATITI.**

Lunatisporites pellucidus (Gaubin) Maheshwari & Banerjee. Singh et al. 1991: 41, pl 1, fig 11, pl 2, fig 2, OLIGOCENE (Barail Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Lunatisporites sp. Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

Lunatisporites sp. Trivedi 1991: 67, pl 1, fig 5, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road, Jaintia Hills District, Meghalaya (Reworked).

LUNDBLADISPORA Balme, **CINGULATI.**

Lundbladispora sp. Trivedi 1991: 67, pl 1, fig 4, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road, Jaintia Hills District, Meghalaya (Reworked).

Lundbladispora sp. Mandal et al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

LYCOPODIACIDITES Couper, **MURORNATI.**

Lycopodiacidites asperatus Dettmann. Kumar et al. 2004: 158, 160, pl 1, fig 1, NEOGENE and PLEISTOCENE, Site 218, Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean (Reworked).

Lycopodiacidites cerebrus Kar & Kumar. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Lycopodiacidites dextrus Kar & Kumar. Singh & Tripathi 1990: 329, pl 1, fig 3, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Lycopodiacidites sp. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Lycopodiacidites spp. Kar 1990b: 236, 237, 239, MIDDLE-LATE OLIGOCENE and EARLY MIOCENE (Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam.

Lycopodiacidites sp. Singh & Tripathi 1990: 329, pl 1, fig 2, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Lycopodiacidites sp. Singh *et* al. 1991: 42, pl 2, fig 10, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Lycopodiacidites sp. Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

LYCOPODIUM (spore). Phadtare *et* al. 1994: 74, 75, pl 1, figs B, E, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

LYCOPODIUMSPORITES Thiergart *ex* Delcourt & Sprumont, **MURORNATI.**

Lycopodiumsporites abundans Salujha *et* al. Salujha *et* al. 1991: 65, pl 1, fig 10, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Lycopodiumsporites bellus Sah & Kar. Saxena & Rao 1996: 46, pl 1, fig 2, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Lycopodiumsporites compartmentus Kar & Kumar. Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Lycopodiumsporites concavus Kar & Kumar. Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Lycopodiumsporites duttae Kar & Kumar. Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Lycopodiumsporites elegans Salujha *et* al. Salujha *et* al. 1991: 65, pl 1, fig 9, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Lycopodiumsporites eocenicus Venkatachala & Rawat. Kumar 1994: 38, pl 9, fig 7, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Lycopodiumsporites globatus Kar. Kar 1990a: 175, pl 3, figs 53-54, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 233, 236, 237, 239, EARLY OLIGOCENE-EARLY MIOCENE (Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1993: 139, pl 1, figs 9, 10, pl 2, fig 7, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Singh & Sarkar 1994: 50, pl 1, fig 15, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002b: 21, pl 2, fig 8, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 187, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Lycopodiumsporites nadahensis Rao & Patnaik 2001: 274, pl 1, figs 1-2, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Lycopodiumsporites palaeocenicus Dutta & Sah. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar

1990b: 233, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 218, pl 1, fig 9, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 1, 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kumar 1994: 38, pl 7, fig 7, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Saxena *et* al. 1996: 21, pl 1, figs 10-11, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Kar & Sharma 2001: 128, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Lycopodiumsporites parvireticulatus Sah & Dutta. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Ambwani 1993: 157, 159, PALAEOCENE, Seam Nos. 1 and 2, Rekmangiri Coalfield, Garo Hills, Meghalaya; Sarkar *et* al. 1994: 201, pl 1, fig 11, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Saxena *et* al. 1996: 21, pl 1, figs 9, 13, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandaokar 2000b: 183, pl 1, fig 3, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Kar & Sharma 2001: 128, pl 1, fig 7, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Lycopodiumsporites pattamorensis Khanna & Singh. Singh *et* al. 2003: 204, pl 2, fig 13, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Lycopodiumsporites speciosus Dutta & Sah. Kar 1990a: 175, pl 3, figs 47-48, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Ambwani 1993: 160, PALAEOCENE, Seam No. 1, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Mandal *et* al. 1996: 80, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Saxena *et* al. 1996: 21, pl 1, figs 6, 8, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Sharma 2000: 52, pl 1, fig 6, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Kar & Sharma 2001: 128, pl 1, fig 5, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Singh *et* al. 2003: 204, pl 2, fig 14, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh; Chakraborty 2004: 115, pl 1, figs 5-6, LATE PALAEOCENE (Lakadong Sand-

stone), around Bhalukurung, North Cachar Hills, Assam.

Lycopodiumsporites tulamurensis Salujha et al. Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Lycopodiumsporites umstewensis Dutta & Sah. Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Ambwani 1993: 160, EARLY EOCENE, Seam No. 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Lycopodiumsporites sp. Kar 1990a: 198, pl 9, fig 134, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Lycopodiumsporites sp. Kar 1990b: 233, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Lycopodiumsporites sp. Singh & Tripathi 1990: 329, pl 1, fig 1, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Lycopodiumsporites sp. Ramanujam et al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Lycopodiumsporites sp. Rao et al. 1993: 81, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Lycopodiumsporites sp. Shanmukhappa & Koshal 1993: 202, LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin.

Lycopodiumsporites sp. Hait & Banerjee 1994: 115, pl 1, fig 3, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Lycopodiumsporites sp. Kar et al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam.

Lycopodiumsporites spp. Misra & Kapoor 1994: 150, 155, LATE EOCENE-OLIGOCENE, EARLY MIOCENE and MIDDLE MIOCENE-EARLY PLIOCENE (Lower and Upper Dharmsala and Middle Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Lycopodiumsporites sp. Sarkar et al. 1994: 201, pl 1, fig 4, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Lycopodiumsporites sp. Rao et al. 1995: 372, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Lycopodiumsporites sp. Rao 1995a: 326, pl 1, figs 5-6, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala.

Lycopodiumsporites sp. Rao et al. 1995: 372, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Lycopodiumsporites sp. Rao & Rajendran 1996: 76, MIOCENE, Cannanore District, Kerala.

Lycopodiumsporites sp. A. Rao & Patnaik 2001: 274, pl 2, figs 1-2, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Lycopodiumsporites sp. B. Rao & Patnaik 2001: 274, pl 3, fig 1, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Lycopodiumsporites sp. C. Rao & Patnaik 2001: 274, pl 3, fig 4, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Lycopodiumsporites sp. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

LYGODIUMSPORITES Potonié *et* al. *ex* Potonié, **LAEVIGATI.**

Lygodiumsporites adriennis (Potonié & Gelletich) Potonié *et* al. *ex* Potonié. Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Lygodiumsporites barogensis Khanna & Singh. Singh *et* al. 2003: 204, pl 2, fig 12, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Lygodiumsporites donaensis Rao & Singh. Kumar 1994: 38, pl 10, fig 9, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Lygodiumsporites enigmatus Sarkar & Singh. Singh *et* al. 2003: 204, pl 2, figs 10-11, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Lygodiumsporites eocenicus Dutta & Sah = **Leiotriletes eocenicus** (Dutta & Sah) Kumar & Takahashi.

Lygodiumsporites lakiensis Sah & Kar. Kar 1990a: 175, pl 1, figs 8-11, pl 9, fig 124, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 234, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Saxena & Misra 1990: 264, pl 3, fig 1, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Singh 1990: 218, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, pl 1, figs 2, 4, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Mandaokar 1993: 139, pl 2, fig 27, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 38, pl 7, fig 10, pl 8, fig 4, pl 10, fig 12, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Rao 1995a: 327, pl 1, fig 1, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Kumar 1996: 112, pl 1, fig 1, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Rao 1996: 156, pl 1, fig 1, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 65, MIOCENE, Cannanore District, Kerala; Saxena *et* al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Saxena & Rao 1996: 46, pl 1, fig 7, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 11, pl 1, fig 13, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Sarkar 1997: 109, EOCENE (Subathu Formation), 20 km southeast of Bilaspur on Shimla-Bilaspur Highway, Bilaspur District, Himachal Pradesh; Tripathi 1997: 170, EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Mandaokar 2000b: 180, pl 1, fig 6, LATE OLIGOCENE (Tikak Parbat Forma-

tion), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 295, pl 2, fig 2, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Samant 2000: 114, pl 1, fig 7, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Sarkar & Prasad 2000a: 171, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), Koshalia Nala Section near Koti, Shimla Hills, Solan District, Himachal Pradesh; Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana; Saxena 2000c: 163, pl 2, fig 1, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Saxena & Sarkar 2000: 257, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, pl 2, fig 6, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 126, pl 1, fig 2, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin; Mandaokar 2003: 187, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Tripathi *et* al. 2003: 90, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Rao 2004: 125, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Lygodiumsporites pachyexinus Saxena. Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Saxena & Rao 1996: 46, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Saxena 2000c: 163, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Kar & Sharma 2001: 128, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Lygodiumsporites padappakkarensis Rao & Ramanujam. Rao 1990: 246, pl 1, figs 20-21, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 2, pl 1, fig 1, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 21, fig 2A, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 81, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Rao *et* al. 1995: 372, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey

District, Kerala; Rao 1996: 156, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 65, pl 1, fig 7, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Lygodiumsporites psilatus Tripathi & Singh. Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

Lygodiumsporites sp. Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Lygodiumsporites sp. Kumaran *et* al. 1995: 1024, fig 4n, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Lygodiumsporites sp. Mandal *et* al. 1996: 78, pl 1, fig 9, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

Lygodiumsporites sp. Sarkar & Prasad 2000a: 171, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), Koshalia Nala Section near Koti, Shimla Hills, Solan District, Himachal Pradesh.

MACULOSPORITES Venkatachala & Rawat, **TRIPORINES.**

Maculosporites quilonensis Rao & Ramanujam. Hait & Banerjee 1994: 118, pl 3, fig 49, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

MAGNAMONOCOLPITES Kar, **MONOPTYCHES.**

Magnamonocolpites miocenicus Kar. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

Magnamonocolpites plicatus Kar. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1993: 139, pl 1, fig 13, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam.

MAGNASTRIATITES Germeraad *et* al., **MURORNATI.**

Magnastriatites venustus (Salujha *et* al.) Salujha *et* al. Salujha *et* al. 1991: 65, pl 1, fig 13, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Magnastriatites sp. Misra & Kapoor 1994: 150, EARLY MIOCENE (Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

MALAYAEASPORA Trivedi *et* al., **MURORNATI.**

Malayaeaspora costata Trivedi *et* al. Kar 1990a: 175, pl 3, fig 55, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 233, 239, EARLY OLIGOCENE and EARLY MIOCENE (Laisong and Bhuban formations), Silchar-Haflong Road Section, Assam.

Malayaeaspora sp. Mandal 1997: 99, pl 1, fig 5, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

MALVACEAE (pollen). Phadtare *et* al. 1994: 74, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

MALVACEARUMPOLLIS Nagy, **POLYPORINES.**

Malvacearumpollis bakonyensis Nagy. Rao 1990: 248, pl 3, figs 22-23, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 3, figs 13-15, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 48, pl 3, figs 1-2, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Rao 2000: 297, pl 2, fig 16, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Rao & Patnaik 2001: 270, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandal & Vijaya 2004: 497, fig 4E, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram; Rao 2004: 125, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

Malvacearumpollis estelae (Germeraad *et* al.) Hakel. Kumaran *et* al. 1995: 1025, fig 4a, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Malvacearumpollis grandis Sah. Sarkar *et* al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Rao 1995a: 327, pl 3, fig 13, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Rao & Patnaik 2001: 270, pl 2, fig 17, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Malvacearumpollis paucibaculatus Venkatachala & Rawat. Singh & Tripathi 1990: 330, MIOCENE (Siwalik sediments), Arunachal Pradesh; Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 181, pl 2, fig 34, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Malvacearumpollis rudis Kar = **Palaeomalvaceaepollis rudis** (Kar) Kar.

Malvacearumpollis sp. Saxena & Bhattacharyya 1990: 112, pl 2, fig 5, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Malvacearumpollis sp. Saxena & Misra 1990: 265, pl 2, fig 5, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Malvacearumpollis sp. Hait & Banerjee 1994: 117, pl 3, fig 50, EARLY and LATE MIOCENE, near Suangpuilawn village about 20 km north-east of Aizawl and around Champhai, Mizoram.

Malvacearumpollis spp. Kumar 1994: 95, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

Malvacearumpollis sp. A. Sarkar *et* al. 1994: 201, pl 2, fig 18, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Malvacearumpollis sp. B. Sarkar *et* al. 1994: 202, pl 2, fig 12, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Malvacearumpollis sp. Saxena & Rao 1996: 53, pl 2, fig 10, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Malvacearumpollis sp. Rao & Patnaik 2001: 278, pl 2, figs 15-16, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Malvacearumpollis sp. Kapoor *et* al. 2003: 183, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Malvacearumpollis sp. Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

cf. Malvacearumpollis. Kumar 1994: 81, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

MALVACIPOLLIS Harris, **POLYPORINES.**

Malvacipollis problematicus Khan. Ramanujam *et* al. 1989: 28-29, pl 1, fig 9, MIOCENE, subsurface sediments of eastern coast of southern India.

Malvacipollis sp. Rao & Rajendran 1996: 74, pl 3, fig 16, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala.

MANSARPOLLENITES in Misra & Kapoor. *Nomen nudum.*

Mansarpollenites ranai in Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE and EARLY MIOCENE (Lower and Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

MARGINIPOLLIS Clarke & Frederiksen, **PTYCHOTRIPORINES.**

Marginipollis grandis Salujha *et* al. = **Marginipollis kutchensis** (Venkatachala & Kar) Rawat *et* al.

Marginipollis kutchensis (Venkatachala & Kar) Rawat *et* al. Kumar & Takahashi 1991: 550, pl 6, figs 8-9, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, fig 8, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 21, fig 2L, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Shanmukhappa & Koshal 1993: 195, EARLY EOCENE (Cambay Shale Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Banerjee & Nandi 1994: 219, pl 1, fig 20, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Kumar 1994: 29, 44, pl 17, fig 15, pl 23, figs 5, 8, MIDDLE-LATE OLIGOCENE (Jenam and Renji formations), Silchar-Haflong Road Section, Assam; Mandal 1997: 100, pl 2, fig 7, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 30, pl 5, fig 17, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Rao & Nair 1998: 53, pl 1, figs 3-4, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Mandaokar 2000b: 183, pl 2, figs 9, 16, 22, 57, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Samant 2000: 114, pl 3, fig 11, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Kumar *et* al. 2001: 244, 245, fig 5.11, OLIGOCENE and MIO-PLIOCENE (Barail Group and Namsang Formation), Tinali Well-7, Upper Assam.

Marginipollis grandis Salujha *et* al. 1972: 281, pl 3, figs 66-67, PALAEOGENE, Garo Hills, Meghalaya.

Marginipollis sp. B. Koshal & Uniyal 1986: 225, pl 7, figs 296-297, Cambay Basin, Gujarat.

cf. Marginipollis kutchensis (Venkatachala & Kar) Rawat *et* al. Kumar 1994: 59, pl 24, fig 2, pl 33, fig 21, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

?Marginipollis sp. Kumar 1994: 45, pl 23, fig 16, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam;

Marginipollis spp. Mehrotra *et* al. 2000: 153, PALAEOCENE-EOCENE (Basal Sandstone, Sylhet and Kopili formations), Upper Assam.

MARGOCOLPORITES Ramanujam *ex* Srivastava, **PROLATI.**

Margocolporites complexum Ramanujam. Saxena 1995: 99, fig 36, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Saxena 2000c: 163, pl 1, figs 7, 21, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

Margocolporites dubius Ramanujam. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Saxena 1995: 99, fig 16, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Margocolporites eocenicus Samant & Phadtare 1997: 31, pl 6, figs 1-5, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Margocolporites ghoshii (Ramanujam) Saxena & Khare 2004: 74, 83, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Retitricolporites ghoshii Ramanujam. Ramanujam *et* al. 1991: 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Margocolporites granimuratus Saxena & Khare 2004: 74, 83, pl 1, fig 22, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Margocolporites oligobrochatus Ramanujam. Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, fig 19, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Margocolporites planocolporatus Ambwani 1993: 155, fig 5A, PALAEOCENE, Seam Nos. 1 and 2, Rekmangiri Coalfield, Garo Hills, Meghalaya.

Margocolporites sahnii Ramanujam. Rao 1990: 246, pl 2, figs 5-6, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Tripathi 1995: 47, pl 1, figs 1-2, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam..

Margocolporites sitholeyi Ramanujam. Kumar & Takahashi 1991: 551, pl 6, fig 1, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 45, pl 23, fig 11, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kumaran *et* al. 1995: 1025, fig 4p, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines,

Kerala; Rao 1995a: 327, pl 3, fig 7, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Samant & Phadtare 1997: 31, pl 6, figs 6-10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Samant 2000: 110, pl 4, fig 2, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Margocolporites tsukadae Ramanujam. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, EOCENE (Disang Formation), Silchar-Haflong Road Section, Assam; Rao 1990: 246, pl 2, fig 27, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et* al. 1991: 54, pl 1, figs 11-12, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, figs 20-21, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Saxena 1991: 369, fig 10, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Ramanujam *et* al. 1992: 22, fig 3A, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 82, pl 1, fig 18, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Shanmukhappa & Koshal 1993: 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Misra & Kapoor 1994: 152, pl 1, figs 8-10, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Kumaran *et* al. 1995: 1025, fig 3a, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao 1995a: 327, pl 3, fig 8, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao *et* al. 1995: 374, fig 24, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Saxena 1995: 99, fig 14, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Rao 1996: 157, pl 1, fig 3, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 2, fig 5, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Aswal & Singh 2000: 124, MIDDLE EOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh; Tripathi *et* al. 2000: 245, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Margocolporites venkatachalae Samant & Phadtare 1997: 31, pl 6, figs 11-12, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 4, fig 1, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Margocolporites sp. Singh *et* al. 1992: 57, pl 2, fig 3, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Margocolporites sp. Hait & Banerjee 1994: 117, pl 2, fig 31, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Margocolporites sp. Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Margocolporites spp. Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat.

Margocolporites spp. Mehrotra *et al.* 2000: 153, MIDDLE-LATE EOCENE (Sylhet and Kopili formations), Upper Assam.

Margocolporites sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

Margocolporites sp. Trivedi & Saxena 2000: 275, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

MATANOMADHIASULCITES Kar, **MONOPTYCHES.**

Matanomadhiasulcites baculatus (Venkatachala & Kar) Kar. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan.

Matanomadhiasulcites kutchensis (Saxena) Kar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Singh *et al.* 1992: 56, pl 1, fig 6, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 1, 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Samant & Phadtare 1997: 33, pl 6, fig 14, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Sharma 2000: 52, pl 1, figs 9-10, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Liliacidites kutchensis Saxena. Misra & Kapoor 1994: 153, pl 2, fig 38-40, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Kapoor *et al.* 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Matanomadhiasulcites major (Singh) Saxena & Khare 2004: 74, 78, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Liliacidites major Singh. Saxena & Bhattacharyya 1990: 112, pl 1, fig 15, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Manjhi Khad Section near Dharmsala, Kangra District, Himachal Pradesh; Kumar 1994: 28, 29, pl 14, fig 7, pl 15, fig 13, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Kapoor *et al.* 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Matanomadhiasulcites maximus (Saxena) Kar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, pl 2, fig 35, EARLY

EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 1, 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Misra & Kapoor 1994: 153, 159, pl 2, fig 36, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Kumar 1996: 112, pl 2, fig 22, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandal *et al.* 1996: 80, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Samant & Phadtare 1997: 32, pl 6, figs 13, 15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Tripathi 1997: 170, LATE PALAEOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Matanomadhiasulcites microreticulatus (Dutta & Sah) Kar & Kumar. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Matanomadhiasulcites rekmangiriensis Ambwani 1993: 156, fig 5C, PALAEOCENE-EARLY EOCENE, Rekmangiri Coalfield, Garo Hills, Meghalaya.

Matanomadhiasulcites sp. Gupta *et al.* 2003: 211, pl 1, fig 1, PALAEOCENE-EOCENE, Ganga Basin.

Matanomadhiasulcites sp. Singh & Kar 2003: 219, pl 2, figs 8-9, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

MEGAPOROITES Krutzsch, **MONOPORINES.**

Megaporoites sp. Kumar & Takahashi 1991: 551-552, pl 8, fig 12, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam.

Megaporoites sp. Kumar 1994: 59, pl 24, fig 9, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

MEGARETIORITES Kar & Sharma, **TRIPORINES.**

Megaretiorites splendus Kar & Sharma 2001: 129, 138, pl 4, figs 3, 10, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

MELIAPOLLIS Sah & Kar, **PTYCHOPOLYPORINES.**

Meliapollis iratus (Sah & Kar) Navale & Misra. Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Meliapollis melioides (Ramanujam) Sah & Kar. Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Meliapollis minutus Singh. Singh 1990: 220, pl 2, fig 12, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Meliapollis navalei Sah & Kar. Kar 1990a: 177, pl 5, figs 76-78, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura;

Singh 1990: 220, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Saxena 1995: 99, fig 30, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked); Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Kumar et al. 2001: 245, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Upper Assam; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Meliapollis pachydermis Navale & Misra. Tripathi 1997: 170, EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan.

Meliapollis quadrangularis (Ramanujam) Sah & Kar. Kar 1990a: 177, pl 5, fig 84, pl 6, fig 96, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Rao 1990: 246, pl 2, fig 3, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Hait & Banerjee 1994: 116, pl 2, fig 22, EARLY and LATE MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram; Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Kumaran et al. 1995: 1025, fig 4k, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Meliapollis quilonensis Rao & Ramanujam. Ramanujam et al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Meliapollis ramanujamii Sah & Kar. Rao 1990: 246, pl 2, fig 28, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena 1991: 370, fig 9, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar & Bhattacharya 1992: 252, pl 2, fig 19, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Kar et al. 1994: 187, pl 2, fig 19, TERTIARY, subsurface sediments in Upper Assam; Misra & Kapoor 1994: 156, pl 4, fig 74, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Saxena 1995: 99, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked); Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena et al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Kumar et al. 2001: 245, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Meliapollis raoi Sah & Kar. Hait & Banerjee 1994: 116, pl 2, fig 21, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Rao 2000: 297, pl 1, fig 13, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Saxena & Sarkar 2000: 257, MID-

DLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Meliapollis simplex Navale & Misra. Tripathi 1997: 170, EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan.

Meliapollis tamilii Navale & Misra. Kumaran *et* al. 1995: 1025, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao & Nair 1998: 53, pl 1, fig 27, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Meliapollis sp. cf. T. tamilii Navale & Misra. Kumaran *et* al. 1995: 1025, fig 3n, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Meliapollis triangulus Saxena. Rao 2000: 297, pl 1, fig 4, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Meliapollis sp. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Meliapollis sp. Singh & Tripathi 1990: 330, pl 1, figs 15, 24, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Meliapollis sp. Singh *et* al. 1992: 56, pl 1, fig 15, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

cf. Meliapollis sp. Kumar 1994: 92, LATE MIOCENE PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

Meliapollis sp. Misra & Kapoor 1994: 159, MIDDLE EOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Meliapollis sp. Kumaran *et* al. 1995: 1025, fig 3i, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Meliapollis sp. Rao 1995a: 331, pl 2, fig 14, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala.

Meliapollis sp. Saxena & Khare 2004: 74, 84, pl 1, fig 16, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Mesozoic reworked pollen. Mandal 1997: 100, pl 1, fig 31, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

MEYERIPOLLIS Baksi & Venkatachala, **PTYCHOTRIPORINES.**

Meyeripollis laudabilis Salujha *et* al. Salujha *et* al. 1991: 67, pl 2, figs 47-48, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Meyeripollis naharkotensis Baksi & Venkatachala. Mandaokar 1993: 139, pl 1, figs 7, 11, 23, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 17, 29, 42, 46, 77, 81, 98, pl 4, figs 1, 4, pl 18, fig 15, pl 23, figs 2, 4, pl 44, figs 1-2, pl 50, fig 2, OLIGOCENE-PLIOCENE (Laisong, Jenam, Renji, Bhuban, Bokabil and Dupitila formations), Silchar-Haflong Road Section, Assam; Mandal *et* al. 1996: 81, pl 1, fig 13, OLIGOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Saxena & Rao 1996: 48, pl 2, fig 11, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandaokar 2000b: 181, pl 1, fig 13, LATE OLIGOCENE (Tikak Parbat Formation),

Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Kumar et al. 2001: 244, fig 5.6, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Venkatachala et al. 2004: 170, pl 1, figs 1-13, LATE OLIGOCENE (Tikak Parbat Formation), Assam.

Meyeripollis triradiatus Kumar & Takahashi 1991: 552, pl 6, fig 7, text-fig 6, LATE OLIGOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 45, 98, pl 23, fig 1, LATE OLIGOCENE and LATE MIOCENE-PLIOCENE (Renji and Dupitila formations), Silchar-Haflong Road Section, Assam.

Meyeripollis sp. Kumar 1994: 59, pl 33, fig 2, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Meyeripollis sp. Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

MICROBACULISPORA Bharadwaj, **APICULATI.**

Microbaculispora gondwanensis Bharadwaj. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Microbaculispora sp. Singh et al. 1991: 41-42, pl 1, fig 1, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Microbaculispora sp. Mandal et al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

MICROFOVEOLATISPORA Bharadwaj, **MURORNATI.**

Microfoveolatispora directa (Balme & Hennelly) Bharadwaj. Gupta et al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin.

Microfoveolatispora indica Sinha. Gupta et al. 2003: 212, pl 2, fig 11, PALAEOCENE-EOCENE, Ganga Basin.

MICROFOVEOLATOSPORIS Krutzsch, **SCULPTATOMONOLETI.**

Microfoveolatosporis sp. Kumar & Takahashi 1991: 596, pl 4, fig 1, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Microfoveolatosporis sp. Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

MIMOSAE (pollen). Phadtare et al. 1994: 74, 75, pl 1, fig T, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

MINUTITRICOLPORITES Kar, **PTYCHOTRIPORINES.**

Minutitricolporites minutus Kar. Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kar & Bhattacharya 1992: 252, pl 2, figs 4, 7, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Mandal et al. 1996: 80, pl 1, fig 21, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Kumar et al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Gupta et al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Mandal et al. 2003: 102, pl 1, fig 11, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

MOMIPITES Wodehouse, **TRIPORINES.**

Momipites inaequalis Anderson. Kumar & Takahashi 1991: 553, pl 18, fig 7, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 29, 69, 82, pl 19, fig 9, pl 38, fig 19, pl 44, fig 17, pl 46, fig 14, MIDDLE OLIGOCENE and MIOCENE (Jenam, Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Momipites sp. Kumar & Takahashi 1991: 553, pl 5, fig 14, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Momipites sp. Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Monocolpite finely reticulate pollen grains, a group of. Kumaran *et* al. 1995: 1026, fig 4g, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

MONOCOLPOPITES Biswas *ex* Baksi, **MONOPTYCHES.**

Monocolpopites spinosa Baksi. Mandal *et* al. 2003: 104, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (wrongly spelt as *Monocolpites spinosus*).

MONOCOLPOPOLLENITES Pflug & Thomson in Thomson & Pflug, **MONOPTYCHES.**

Monocolpopollenites communis (Sah & Dutta) Kumar & Takahashi 1991: 553-554, pl 15, fig 18, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 69, 82, pl 37, fig 12, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Palmaepollenites communis Sah & Dutta. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Handique *et* al. 1992: 218, 219, EOCENE-OLIGOCENE (Kopili Formation and Barail Group), Moran Oilfield, Upper Assam; Banerjee & Nandi 1994: 219, pl 1, fig 11, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Kumar 1994: 31, pl 15, fig 12, pl 16, fig 8, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Saxena *et* al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mitra *et* al. 2000: 126, pl 1, fig 19, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Monocolpopollenites subtilis (Salujha *et* al.) Kumar & Takahashi 1991: 554, pl 2, fig 3, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Palmaepollenites subtilis Salujha *et* al. Salujha *et* al. 1991: 66, pl 1, fig 35, NEOGENE, Adamtila Well-A, Cachar District, Assam; Kumar 1994: 17, pl 4, figs 10, 19, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Monocolpopollenites sp. A. Kumar & Takahashi 1991: 554, pl 12, fig 9, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam.

Monocolpopollenites sp. B. Kumar & Takahashi 1991: 555, pl 15, fig 10, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam.

Monocolpopollenites sp. C. Kumar & Takahashi 1991: 555, pl 2, fig 13, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Monocolpopollenites sp. Salujha *et* al. 1991: 66, pl 2, fig 36, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Monocolpopollenites sp. A. Kumar 1994: 59, pl 32, fig 6, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Monocolpopollenites sp. B. Kumar 1994: 69, pl 38, fig 11, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

MONOCOLPOPOLLIS in Misra & Kapoor. *Nomen nudum.*

Monocolpopollis sp. Misra & Kapoor 1994: 155, MIDDLE EOCENE, (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Monolete spores Kumar 1994: 21, 41, 208, pl 2, fig 11, pl 11, fig 7, pl 36, fig 7, EARLY-MIDDLE OLIGOCENE and EARLY-MIDDLE MIOCENE (Laisong, Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam (Reworked).

Monolete spore type A. Kumar 1994: 63, pl 29, fig 3, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

MONOLITES Cookson ex Potonié, **LAEVIGATOMONOLETI.**

Monolites amberiwadiensis Saxena & Misra 1990: 266, pl 1, fig 6, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Monolites major Cookson ex Potonié. Shanmukhappa & Koshal 1993: 202, LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Monolites mawkmaensis Sah & Dutta. Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi et al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, pl 2, figs 9, 13, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

Monolites ovatus Sah. Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Monolites sp. Sarkar et al. 1994: 201, pl 2, fig 6, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

MONOPOROPOLLENITES Meyer, **MONOPORINES.**

Monoporopollenites gramineoides Meyer. Kar et al. 1994: 186, pl 1, fig 23, TERTIARY, subsurface sediments in Upper Assam; Sarkar et al. 1994: 202, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Monoporopollenites kasauliensis Singh & Sarkar. Singh & Sarkar 1994: 50, pl 1, fig 17, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

Monoporopollenites sp. Kar 1990a: 178, pl 5, fig 79, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Monoporopollenites sp. Hait & Banerjee 1994: 117, pl 2, fig 38, EARLY and LATE MIOCENE,

near Suangpuilawn village about 20 km north-east of Aizawl and around Champhai, Mizoram.

Monoporopollenites sp. Mandaokar 2000c: 43, pl 1, fig 3, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh.

Monoporopollenites sp. Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Monosaccate pollen. Kumar 1994: 13, pl 1, fig 2, LATE CRETACEOUS-EOCENE (Disang Formation), Silchar-Haflong Road Section, Assam.

Monosaccate pollen. Kumar 1994: 41, pl 6, fig 7, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam (Reworked).

Monosaccate pollen. Kumar 1994: 208, pl 36, fig 11, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

MONOSULCITES Cookson *ex* Couper, **RETECTINES.**

Monosulcites magnus Dutta & Sah = **Spinomonosulcites magnus** (Dutta & Sah) Singh & Misra

Monosulcites neyveliense Ramanujam. Saxena 2000c: 163, pl 1, fig 3, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

Monosulcites psilatus Sah. Salujha *et* al. 1991: 66, pl 1, fig 34, NEOGENE, Adamtila Well-A, Cachar District, Assam; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Monosulcites sp. Sarkar *et* al. 1994: 202, pl 3, fig 10, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Monosulcites sp. Gupta *et* al. 2003: 211, pl 1, fig 5, PALAEOCENE-EOCENE, Ganga Basin.

Monosulcites. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh.

MULTIAREOLITES Germeraad *et* al., **DIPORINES.**

Multiareolites formosus Germeraad *et* al. Ramanujam *et* al. 1989: 28, pl 1, fig 8, MIOCENE, subsurface sediments of eastern coast of southern India.

MYRICACEOIPOLLENITES Potonié *ex* Potonié, **TRIPORINES.**

Myricaceoipollenites dubius Venkatachala & Rawat. Shanmukhappa & Koshal 1993: 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

cf. Myricaceoipollenites dubius Venkatachala & Rawat. Kumar 1994: 29, 30, pl 18, fig 13, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Myricaceoipollenites rarus Sah. Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Myricaceoipollenites sp. Kumar 1994: 92, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

Myricaceoipollenites spp. Misra & Kapoor 1994: 155, 159, PALAEOCENE-EARLY EOCENE, LATE EOCENE-OLIGOCENE and EARLY MIOCENE (Subathu and Basal Dharmsala, Lower and Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

MYRICIPITES Wodehouse, **TRIPORINES.**

Myricipites harrisii (Couper) Dutta & Sah. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Saxena *et* al.

1996: 21, pl 3, fig 4, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

cf. Myricipites harrisii (Couper) Dutta & Sah. Kumar 1994: 13, pl 1, figs 3a, b, LATE CRETACEOUS-EOCENE (Disang Formation), Silchar-Haflong Road Section, Assam.

Myricipites sp. cf. M. harrisii (Couper) Dutta & Sah. Saxena & Rao 1996: 52, pl 3, fig 13, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Myricipites singhii Rao 1995a: 331, pl 3, fig 10, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 3, fig 11, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Myricipites sp. Kar *et* al. 1994: 187, pl 2, fig 25, TERTIARY, subsurface sediments in Upper Assam.

Myricipites spp. Kumar 1994: 69, 82, pl 38, fig 11, pl 43, fig 13, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Myricipites sp. Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Myricipites sp. Saxena & Khare 2004: 74, 84, pl 2, fig 1, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

MYRTACEIDITES Cookson & Pike, **TRIPORINES.**

Myrtaceidites eugeniioides Cookson & Pike. Kumar 1994: 92, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

Myrtaceidites pretiosus Salujha *et* al. Kumar & Takahashi 1991: 555-556, pl 18, fig 12, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam; Salujha *et* al. 1991: 67, pl 2, fig 57, NEOGENE, Adamtila Well-A, Cachar District, Assam; Kumar 1994: 82, pl 44, fig 18, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

cf. Myrtaceidites pretiosus Salujha *et* al. Kumar 1994: 30, pl 18, fig 6, pl 19, fig 4, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

cf. Myrtaceidites sp. Kumar & Takahashi 1991: 556, pl 5, fig 16, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Myrtaceidites sp. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

NEOCALAMOSPORA Kar & Bose, **TRILETES.**

Neocalamospora rotunda Bose & Kar. Kar 1990b: 237, 239, LATE OLIGOCENE-EARLY MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam (Reworked).

Neocalamospora sp. Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam (Reworked).

NEOCOUPERIPOLLIS Kar & Kumar, **MONOPTYCHES.**

Neocouperipollis achinatus (Sah & Kar) Kar & Kumar = **Spinomonosulcites achinatus** (Sah & Kar) Singh & Misra.

Neocouperipollis ankleshwarensis Kar & Bhattacharya = **Spinomonosulcites**

ankleshwarensis (Kar & Bhattacharya) Samant & Phadtare.

Neocouperipollis baculatus in Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked). *Nomen nudum.*

Neocouperipollis brevispinosus (Biswas) Sarkar & Singh = **Spinomonosulcites brevispinosus** (Biswas) Kumar.

Neocouperipollis bulbospinosus in Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked). *Nomen nudum.*

Neocouperipollis cymbatus (Venkatachala & Rawat) Saxena & Khare 2004: 74, 78, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Couperipollis cymbatus Venkatachala & Rawat 1972: 296, pl 1, figs 11-12, PALAEOCENE-EOCENE, Cauvery Basin, Tamil Nadu.

Neocouperipollis donaensis (Rao et al.) Saxena & Khare 2004: 74, 78, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Couperipollis donaensis Rao et al. 1985: 10, pl 1, figs 11-13, EARLY MIOCENE (Dona Member, Bhuban Formation), Sonapur-Badarpur Road Section, Jaintia Hills, Meghalaya and Cachar District, Assam.

Neocouperipollis kutchensis (Venkatachala & Kar) Kar & Kumar = **Acanthotricolpites kutchensis** (Venkatachala & Kar) Singh & Misra.

Neocouperipollis magnus (Dutta & Sah) Kar & Kumar = **Spinomonosulcites magnus** (Dutta & Sah) Singh & Misra.

Neocouperipollis pyrispinosus Sarkar & Singh. Sarkar & Prasad 2000b: 147, pl 2, fig 1, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana; Saxena & Sarkar 2000: 257, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Singh et al. 2003: 204, pl 2, fig 17, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Neocouperipollis rarispinosus (Sah & Dutta) Singh 1990: 224, pl 2, fig 14, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, pl 2, fig 27, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, Kimin-Ziro Road Section, Lower Subansiri District, near Rilu village, West Siang District and Pasighat to Rengging Section, East Siang District, Arunachal Pradesh.

Monosulcites rarispinosus Sah & Dutta 1966: 76, pl 1, figs 26, EARLY EOCENE (Cherra Formation), Laitryngew, South Shillong Plateau, Meghalaya.

Couperipollis rarispinosus (Sah & Dutta) Venkatachala & Kar. Kumar & Takahashi 1991: 541-542, pl 6, fig 3, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Handique et al. 1992: 218, 219, EOCENE-OLIGOCENE (Kopili Formation and Barail Group), Moran Oilfield, Upper Assam; Misra & Kapoor 1994: 153, 159, pl 2, fig 37, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Neocouperipollis robustus (Saxena) Saxena & Khare 2004: 74, 78, LATE PALAEOCENE-MID-

DLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Couperipollis robustus Saxena 1979: 131-132, pl 1, fig 8, PALAEOCENE (Matanomadh Formation), Matanomadh, Kutch District, Gujarat.

Neocouperipollis spinorobustus (Kar & Kumar) Kar & Kumar = **Spinomonosulcites spinorobustus** (Kar & Kumar) Singh & Misra.

Neocouperipollis wodehousei (Venkatachala & Kar) Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya. *Invalid combination.*

Neocouperipollis wodehousei (Venkatachala & Kar) Saxena & Khare 2004: 74, 78, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Araceaepites wodehouseii Biswas 1962: 47, pl 12, fig 30, EARLY-MIDDLE EOCENE (Sylhet Limestone Formation), near Therriaghat, Meghalaya.

Neocouperipollis sp. Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Neocouperipollis sp. Mandal *et al.* 1996: 80, pl 1, fig 24, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

Neocouperipollis sp. Saxena *et al.* 1996: 22, pl 2, fig 2, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Neocouperipollis sp. Srivastava & Bhattacharyya 2000: 377, pl 2, fig 3, EARLY TERTIARY, Arunachal Pradesh.

NEOTRICHOTOMOSULCITES Samant & Phadtare, **TRICHOTOMOCOLPATES.**

Neotrichotomosulcites acrocomiae Samant & Phadtare 1997: 34, pl 6, figs 16-18, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 3, fig 8, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Neotrichotomosulcites foveolatus Samant & Phadtare 1997: 33, pl 7, figs 1-2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, pl 2, fig 2, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Neotrichotomosulcites sp. Ramanujam *et al.* 1999: 35, pl 1, figs 20-21, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

NEPENTHIDITES Kumar, **TETRADITES.**

Nepenthidites laitryngewensis Kumar 1995: 74, pl 2, fig 7, PALAEOCENE (Lakadong Sandstone), Laitryngew, Khasi Hills, Meghalaya.

Droseridites major Krutzsch. Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Rekmangiri Coalfield, Garo Hills, Meghalaya.

Droseridites parvus Dutta & Sah. Kapoor *et al.* 2003: 183, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

NETRIPOLLIS in Misra & Kapoor. *Nomen nudum.*

Netripollis multicolporatus in Misra & Kapoor 1994: 157, pl 5, fig 92, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

NEYVELIPOLLENITES Ramanujam, **PTYCHOTRIPORINES.**

Neyvelipollenites sp. Ramanujam *et al.* 1991: 54, pl 1, fig 29, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

NEYVELISPORITES Ramanujam, **MONOLETES.**

Neyvelisporites bolkhovitinae (Ramanujam) Ramanujam. Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 1, figs 18-19, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 1, fig 8, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 46, pl 1, fig 22, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Samant & Phadtare 1997: 11, pl 1, fig 14, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Neyvelisporites cooksoniae Ramanujam. Singh *et* al. 1992: 56, pl 1, fig 3, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Neyvelisporites sp. Rao & Rajendran 1996: 67, pl 1, fig 9, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala.

NIGERIPOLLIS Srivastava, **TRIPTYCHES.**

Nigeripollis scabratus (van Hoeken-Klinkenberg) Srivastava. Kumar & Takahashi 1991: 557, pl 15, fig 7, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 70, pl 38, fig 4, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

NYMPHAEA (pollen). Phadtare *et* al. 1994: 74, 75, pl 1, fig J, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

NYMPHAEACIDITES Sah, **SPHAEROZONISULCATES.**

Nymphaeacidites clarus Dutta & Sah. Hait & Banerjee 1994: 117, pl 3, fig 42, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Misra & Kapoor 1994: 153, pl 2, fig 28, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Nymphaeacidites decoratus Venkatachala & Rawat. Singh & Sarkar 1994: 52, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

Nymphaeacidites sphericus Dutta & Sah. Singh *et* al. 2003: 204, pl 2, fig 19, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Nymphaeacidites typicus Sah. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Nymphaeacidites sp. Sarkar *et* al. 1994: 202, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Nymphaeacidites sp. Samant 2000: 104, pl 4, fig 3, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Nymphaeacidites sp. Samant & Phadtare 1997: 35, pl 7, fig 4, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Nymphaeacidites sp. Rao & Patnaik 2001: 277, pl 1, fig 13, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

NYSSAPOLLENITES Thiergart *ex* Potonié, **PROLATI.**

Nyssapollenites barooahii Sah & Dutta. Handique *et* al. 1992: 219, LATE EOCENE-OLIGOCENE (Barail Group) and MIOCENE (Surma and Tipam Groups), Moran Oilfield, Upper Assam; Hait & Banerjee 1994: 116, pl 2, fig 24, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Nyssapollenites incertus Dutta & Sah. Kumar 1996: 112, pl 2, figs 4, 20, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Nyssapollenites laudabilis Salujha *et* al. Salujha *et* al. 1991: 67, pl 2, fig 56, NEOGENE, Adamtila Well-A, Cachar District, Assam; Kumar 1994: 92, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

Nyssapollenites pseudocruciatus (Potonié) Thiergart. Kumar 1994: 46, pl 23, fig 12, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Nyssapollenites thompsonianus (Traverse) Potonié. Sarkar *et* al. 1994: 202, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

NYSSOIDITES Thiergart in Potonié *et* al. *ex* Potonié, **PTYCHOTRIPORINES.**

Nyssoidites intengipollinus (Traverse) Potonié. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Nyssoidites sp. Gupta *et* al. 2003: 211, pl 1, fig 13, PALAEOCENE-EOCENE, Ganga Basin.

OCIMUMPOLLENITES Kar, **POLYPTYCHES.**

Ocimumpollenites indicus Kar 1996: 46, pl 1, figs 1-6, 8, EARLY EOCENE (Palana Formation), Borehole core no. K 12 (Depth 80 m), Kuchaur-Benia area, Bikaner District, Rajasthan; Sharma 2000: 52, pl 1, fig 13, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Kar & Sharma 2001: 130, pl 5, fig 3, pl 6, figs 8, 10, pl 7, fig 3, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Sarkar & Prasad 2002: 165, pl 1, figs1-2, LATE YPRESIAN (Subathu Formation), Koshalaya Nala Section near Koti, Solan District, Himachal Pradesh; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

OCULOPOLLIS Pflug, **TRIPORINES**.

Oculopollis lapillus Pflug. Gupta *et* al. 2003: 591, fig 3f, PALAEOGENE, Ganga Basin.

OPERCULOSCULPTITES Kar, **INCERTAE SEDIS.**

Operculosculptites baculatus in Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura. *Nomen nudum.*

Operculosculptites baculatus Kar 1991: 3, pl 1, figs 20-24, MIOCENE, Rokhia Borehole core no. 1 (Depth 220-225 m), Tripura; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam.

Operculosculptites globatus in Kar 1990a: 178, pl 2, figs 21-26, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura. *Nomen nudum.*

Operculosculptites globatus Kar 1991: 3, pl 1, figs 7-11, MIOCENE, Rokhia Borehole core no. 1 (Depth 2095-2100 m), Tripura; Mandal *et* al. 1996: 81, OLIGOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Kumar *et* al. 2001: 245, fig 6.11, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Upper Assam.

Operculosculptites rokhiaensis in Kar 1990a: 178, pl 2, figs 27-33, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura. *Nomen nudum.*

Operculosculptites rokhiaensis Kar 1991: 3, pl 1, figs 12-19, MIOCENE, Rokhia Borehole core no. 1 (Depth 205-210 m), Tripura; Kumar *et* al. 2001: 245, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Upper Assam.

Operculosculptites sp. Kar 1990a: 178, pl 2, figs 34-36, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Operculosculptites sp. Chandra & Kumar 1998: 64, pl 2, fig 15, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Operculosculptites sp. Srivastava & Bhattacharyya 2000: 375, pl 2, figs12-13, EARLY TERTIARY, Kimin-Ziro Road Section, Lower Subansiri District, near Rilu village, West Siang District and Pasighat to Rengging Section, East Siang District, Arunachal Pradesh.

Operculosculptites sp. Kumar *et* al. 2004: 158, NEOGENE and PLEISTOCENE, Site 218, Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean.

OPHIOGLOSSISPORITES Nagy, **APICULATI.**

Ophioglossisporites sp. Kumar & Takahashi 1991: 597, pl 2, fig 5, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

ORNATETRADITES Rao & Ramanujam, **TETRADITES.**

Ornatetradites chandae Rao & Ramanujam. Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala.

Ornatetradites droseroides Rao & Ramanujam. Rao 1990: 248, pl 3, fig 27, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et* al. 1991: 54, pl 1, fig 34, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 3, fig 21, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 22, fig 3W, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Ornatetradites keralaensis Rao 1995a: 333, pl 4, figs 4-5, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Kumar *et* al. 2001: 244, fig 5.15, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam (wrongly spelt as *Ornatetradites keralayensis)*.

OSMUNDACIDITES Couper, **APICULATI.**

Osmundacidites cephalus Saxena. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Saxena & Misra 1990: 264, pl 3, fig 7, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Kumaran *et* al. 1995: 1024, fig 4q, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandal 1997: 99, pl 1, fig 28, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Kar & Sharma 2001: 128, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Osmundacidites inequalis Sah. Salujha *et* al. 1991: 65, pl 1, fig 7, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Osmundacidites kutchensis Sah & Kar. Rao 1990: 246, pl 1, fig 23, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields,

Dibrugarh District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Kumar et al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 126, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Saxena & Khare 2004: 73, pl 1, fig 3, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Osmundacidites microgranifer Sah & Jain. Saxena & Misra 1990: 264, pl 1, fig 2, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Osmundacidites pseudoreticulatus in Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh. *Nomen nudum.*

Osmundacidites wellmanii Couper. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 236, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandaokar 1993: 139, pl 2, fig 29, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar et al. 1994: 185, pl 2, fig 14, TERTIARY, subsurface sediments in Upper Assam; Singh & Sarkar 1994: 50, pl 1, fig 6, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Mandal et al. 1996: 81, pl 1, fig 3, MIDDLE-LATE EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 187, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Osmundacidites cf. O. wellmanii Couper. Kapoor et al. 1997: 32, fig 2c, PALAEOCENE-EOCENE (Subathu Formation), Kalka-Kasauli Road, Solan District, Himachal Pradesh.

Osmundacidites sp. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya.

Osmundacidites sp. Salujha et al. 1991: 65, pl 1, fig 8, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Osmundacidites sp. Kar & Bhattacharya 1992: 257, pl 1, fig 15, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Osmundacidites sp. Kar et al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam.

Osmundacidites sp. Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

Osmundacidites sp. Sarkar et al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Osmundacidites sp. Rao 1995a: 326, pl 1, fig 13, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala.

Osmundacidites sp. Saxena & Rao 1996: 50, pl 1, fig 8, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Osmundacidites sp. Gupta *et* al. 2003: 212, pl 2, fig 12, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

Osmundacidites sp. Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Osmundacidites sp. Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Osmundacidites. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh.

OVALIPOLLIS Krutzsch, **DISACCIATRILETI**.

Ovalipollis sp. Mandal *et* al. 2003: 102, pl 3, fig 13, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

OVOIDITES Krutzsch, **INCERTAE SEDIS**.

Ovoidites rarus Salujha *et* al. 1991: 67, pl 2, fig 63, NEOGENE, Adamtila Well-A, Cachar District, Assam.

PACHYDERMITES Germeraad *et* al., **STEPHANOPORITI**.

Pachydermites diederixi Germeraad *et* al. Hait & Banerjee 1994: 118, pl 3, figs 54-55, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Pachydermites sp. Ramanujam *et* al. 1991: 54, pl 1, fig 32, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Pachydermites sp. Ramanujam *et* al. 1991: 3, pl 3, fig 14, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

PACHYMONOLETASPORITES Kar, **MONOLETES.**

Pachymonoletasporites superbus Kar 1995a: 165, pl 1, figs 1-2, EARLY EOCENE, Borehole core no. K-12 at Kuchaur-Benia area, Bikaner District, Rajasthan; Kar & Sharma 2001: 129, pl 1, fig 2, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

PADMASPORITES Mathur & Chopra, **SCULPTATOMONOLETI.**

?Padmasporites sp. Kumar 1994: 95, pl 45, fig 8, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

PALAEOCOPROSMADITES Ramanujam, **OBLATI.**

Palaeocoprosmadites arcotense Ramanujam. Hait & Banerjee 1994: 117, pl 2, fig 32, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Kar *et* al. 1994: 187, pl 2, fig 1, TERTIARY, subsurface sediments in Upper Assam; Saxena *et* al. 1996: 21, pl 3, fig 16, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Palaeocoprosmadites keralensis Rao & Ramanujam. Ramanujam *et* al. 1991: 54, pl 1, fig 14, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Palaeocoprosmadites sindhudurgensis Saxena 2000c: 162, pl 2, figs 5-6, 14, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

Palaeocoprosmadites sp. Ramanujam *et* al. 1991: 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

PALAEOMALVACEAEPOLLIS PERIPORITI. Kar,

Palaeomalvaceaepollis mammilatus Kar. Kar 1990a: 178, pl 6, fig 93, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 236, 237, 240, EOCENE, MIDDLE OLIGOCENE-EARLY MIOCENE (Disang, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Kumar *et* al. 2001: 245, LATE MIOCENE (Girujan Clay Formation), Tinali Well-7, Upper Assam; Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin; Mandal & Vijaya 2004: 497, fig 5C, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Palaeomalvaceaepollis paucicostatus Kar. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Palaeomalvaceaepollis rudis (Kar) Kar. Ramanujam *et* al. 1989: 29, pl 1, figs 10-12, MIOCENE, subsurface sediments of eastern coast of southern India; Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 238, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Rao *et* al. 1995: 374, fig 25, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Kumar *et* al. 2001: 245, fig 5.14, LATE MIOCENE, MIO-PLIOCENE and PLEISTOCENE (Girujan Clay, Namsang and Dhekiajuli formations), Tinali Well-7, Upper Assam; Mandal & Vijaya 2004: 497, fig 4D, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Malvacearumpollis rudis Kar. Rao *et* al. 1993: 82, pl 1, figs 24-25, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

Palaeomalvaceaepollis spp. A-B. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Palaeomalvaceaepollis sp. Srivastava & Bhattacharyya 2000: 375, pl 1, fig 7, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (wrongly spelt as *Palaeomalvacearumpollis* sp.).

Palaeozoic reworked pollen. Mandal 1997: 100, pl 1, figs 30, 34, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

PALEOARALIACEAEPITES PTYCHOTRIPORINES. Biswas,

Paleoaraliaceaepites distinctus Samant & Phadtare 1997: 35, pl 7, figs 5-8, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Paleoaraliaceaepites indica Biswas. Mandal 1997: 104-105, pl 2, figs 14-16, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

Paleoaraliaceaepites indistinctus Samant & Phadtare 1997: 35, pl 7, figs 9-11, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 3, fig 10, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

PALEOCAESALPINIACEAEPITES TRIPTYCHES. Biswas,

Paleocaesalpiniaceaepites eocenica (Biswas) Venkatachala & Rawat. Ambwani 1993: 160,

PALAEOCENE-EARLY EOCENE, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kar *et* al. 1994: 187, TERTIARY, subsurface sediments in Upper Assam; Misra & Kapoor 1994: 159, MIDDLE EOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Tripathi 1995: 47, pl 1, fig 5, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 245, pl 1, fig 11, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Paleocaesalpiniaceaepites sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

PALEORUBIACEAEPITES Biswas, **POLYPTYCHES.**

Paleorubiaceaepites psychotria Biswas. Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

PALEOSANTALACEAEPITES Biswas, **PTYCHOTRIPORINES.**

Paleosantalaceaepites dinoflagellatus Biswas. Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Kumar & Takahashi 1991: 557-558, pl 5, fig 3, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 30, pl 17, fig 1, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Paleosantalaceaepites ellipticus Sah & Kar. Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Saxena *et* al. 1996: 21, pl 3, fig 12, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

Paleosantalaceaepites minutus Sah & Kar. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Singh & Sarkar 1994: 50, pl 1, fig 1, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 48, pl 2, fig 17, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Paleosantalaceaepites ovatus Sah & Kar. Rao & Nair 1998: 53: MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Paleosantalaceaepites primitiva Biswas. Misra & Kapoor 1994: 152, pl 1, fig 16, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Mitra *et* al. 2000: 126, pl 1, fig 30, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Paleosantalaceaepites reticulatus Samant & Phadtare 1997: 36, pl 7, figs 12-13, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, pl 2, fig 5, EARLY EOCENE (Surat lignite,

Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Paleosantalaceaepites sp. Kumar 1994: 46, pl 22, fig 16, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Paleosantalaceaepites sp. (Group of pollen grains). Kumaran *et* al. 1995: 1026, fig 4d, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

PALMAEPOLLENITES Potonié *ex* Potonié, **MONOPTYCHES.**

Palmaepollenites communis Sah & Dutta = **Monocolpopollenites communis** (Sah & Dutta) Kumar & Takahashi.

Palmaepollenites elongatus Samant & Phadtare 1997: 38, pl 7, fig 19, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 4, fig 5, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Palmaepollenites eocenicus Sah & Dutta. Rao 1990: 246, pl 1, fig 6, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et* al. 1991: 53, pl 1, fig 10, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, fig 1, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Handique *et* al. 1992: 218, EOCENE (Kopili Formation), Moran Oilfield, Upper Assam; Ramanujam *et* al. 1992: 21, fig 2D, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 81, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Shanmukhappa & Koshal 1993: 200, 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Kumar 1994: 31, pl 15, figs 7, 11, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Rao *et* al. 1995: 374, fig 15, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Kapoor *et* al. 1997: 33, fig 2*e*, PALAEOCENE-EOCENE (Subathu Formation), Kalka-Kasauli Road, Solan District, Himachal Pradesh; Samant & Phadtare 1997: 38, pl 7, fig 14, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Ramanujam *et* al. 1998c: 55, fig 3, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam *et* al. 1999: 35, pl 1, figs 5-7, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf; Samant 2000: 114, pl 4, fig 6, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Gupta *et* al. 2003: 211, pl 1, fig 3, PALAEOCENE-EOCENE, Ganga Basin; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Palmaepollenites indicus Ramanujam. Kumar 1996: 112, pl 2, fig 6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Palmaepollenites karii Saxena 1993: 195.

Palmaepollenites longicolpus Kar & Singh 1986 (non Mathur & Mathur 1969): 114, pl 10, figs 5, 26, LATE CRETACEOUS (Jadukata Formation), Ranikor-Barsaura Road Section, Nongnah, Meghalaya.

Palmaepollenites keralensis Rao & Ramanujam. Rao 1990: 246, pl 1, fig 15, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et* al. 1992: 21, fig 2E, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 81, pl 1, figs 10-11, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra

Sector, Burdwan District, West Bengal; Rao *et* al. 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Rao 1995a: 327, pl 4, fig 13, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao & Nair 1998: 52: MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mitra *et* al. 2000: 126, pl 1, fig 17, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Palmaepollenites kutchensis Venkatachala & Kar. Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Rao 1990: 246, pl 1, fig 5, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Kar & Bhattacharya 1992: 251, pl 2, fig 13, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District and Rajpardi lignite mine, Cambay Basin, Gujarat; Mandaokar 1993: 139, pl 1, figs 4, 8, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Shanmukhappa & Koshal 1993: 195, 201, 202, EARLY-LATE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Misra & Kapoor 1994: 155, PALAEOCENE-EARLY EOCENE and MIDDLE EOCENE (Subathu and Basal and Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 38, pl 7, fig 15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Ramanujam *et* al. 1998c: 55, fig 9, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Ramanujam *et* al. 1999: 35, pl 1, fig 16, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Aswal & Singh 2000: 122, 123, DANIAN and THANETIAN, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mitra *et* al. 2000: 126, pl 1, fig 15, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Palmaepollenites longicolpus Kar & Singh (non Mathur & Mathur 1969) = **Palmaepollenites karii** Saxena.

Palmaepollenites magnus Sah & Kar. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat.

Palmaepollenites nadhamunii Venkatachala & Kar. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch Dis-

trict, Gujarat; Kar *et* al. 1994: 186, pl 2, fig 11, TERTIARY, subsurface sediments in Upper Assam; Misra & Kapoor 1994: 153, pl 2, fig 23, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Singh & Sarkar 1994: 50, pl 1, fig 18, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Samant & Phadtare 1997: 38, pl 7, figs 16-17, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Mandaokar 2000b: 181, pl 2, fig 17, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Trivedi & Saxena 2000: 275, pl 1, fig 14, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Kumar *et* al. 2001: 244, 245, OLIGOCENE and MIOCENE (Barail, Surma and Tipam groups), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin (Reworked); Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Palmaepollenites neyvelii Ramanujam. Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala (wrongly spelt as *Palmaepollenites neyveliensis*); Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala (wrongly spelt as *Palmaepollenites neyveliensis*); Hait & Banerjee 1994: 115, pl 1, fig 7, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram (wrongly spelt as *Palmaepollenites neyveliensis*); Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Samant & Phadtare 1997: 37, pl 7, fig 18, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Ramanujam *et* al. 1998c: 55, fig 1, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh (wrongly spelt as *Palmaepollenites neyveliensis*); Ramanujam *et* al. 1999: 35, pl 1, figs 11, 15, 17, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu (wrongly spelt as *Palmaepollenites neyveliensis*).

Palmaepollenites ovatus Sah & Kar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Mandaokar 1993: 139, pl 1, fig 1, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Shanmukhappa & Koshal 1993: 200, 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Hait & Banerjee 1994: 115, pl 1, fig 8, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Misra & Kapoor 1994: 153, pl 2, fig 24, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Aswal & Singh 2000: 124, MIDDLE EOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh; Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mitra *et* al. 2000: 126, pl 1, fig 18, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch Dis-

trict, Gujarat; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Chakraborty 2004: 115, pl 1, fig 1, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Palmaepollenites plicatus Sah & Kar. Mandaokar 1993: 139, pl 2, fig 24, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Mitra *et* al. 2000: 126, pl 1, fig 16, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Saxena 2000c: 163, pl 2, fig 17, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Saxena & Sarkar 2000: 257, pl 2, fig 2, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Palmaepollenites subtilis Salujha *et* al. = **Monocolpopollenites subtilis (**Salujha *et* al.) Kumar.

Palmaepollenites spp. Shanmukhappa & Koshal 1993: 195, 200, 201, EARLY-MIDDLE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Palmaepollenites spp. Kumar 1994: 17, 82, pl 5, fig 3, EARLY OLIGOCENE and LATE MIOCENE (Laisong and Bokabil formations), Silchar-Haflong Road Section, Assam.

cf. Palmaepollenites sp. Kumar 1994: 31, pl 16, fig 10, pl 17, fig 20, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Palmaepollenites sp. Misra & Kapoor 1994: 150, LATE EOCENE-OLIGOCENE and MIDDLE MIOCENE (Lower Dharmsala and Lower Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Palmaepollenites sp. Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

Palmaepollenites sp. Misra & Saxena 1995: 18, fig 2.4, PALAEOGENE?, Bombay Offshore (Reworked).

Palmaepollenites sp. Saxena 1995: 99, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked).

Palmaepollenites spp. Mehrotra *et* al. 2000: 153, PALAEOCENE-EARLY EOCENE and LATE EOCENE (Basal Sandstone and Kopili formations), Upper Assam.

Palmaepollenites. Sharma 2000: 54, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan.

PALMIDITES Couper, **MONOPTYCHES.**

Palmidites aplicatus Kar & Kumar. Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Singh & Tripathi 1990: 329, pl 1, fig 12, MIOCENE (Siwalik sediments), Arunachal Pradesh; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Palmidites assamicus Singh. Saxena *et* al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Saxena & Sarkar 2000: 257, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 243, pl 1, fig 14, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Palmidites excellensus Kar & Kumar. Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan (wrongly spelt as *Palmidites excellens*).

Palmidites granulatus Mehrotra. Tripathi *et* al. 2000: 243, pl 2, fig 7, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Palmidites intrafoveolatus Sarkar & Singh. Singh *et* al. 2003: 204, pl 2, fig 18, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Palmidites maximus Couper. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Rao 1990: 246, pl 1, fig 10, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 17-18, 31, 46, 51, 59, 70, 82, 98, pl 4, fig 20, pl 14, figs 1, 2, 4, 8, pl 15, fig 9, pl 16, fig 15, pl 20, fig 11, pl 22, figs 7, 15, pl 24, fig 11, pl 25, fig 6, pl 26, fig 9, pl 27, fig 1, pl 38, figs 1, 6, OLIGOCENE-PLIOCENE (Laisong, Jenam, Renji, Bhuban, Bokabil and Dupitila formations), Silchar-Haflong Road Section, Assam; Singh & Sarkar 1994: 50, pl 1, fig 19, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Kapoor *et* al. 1997: 33, fig 2g, PALAEOCENE-EOCENE (Subathu Formation), Kalka-Kasauli Road, Solan District, Himachal Pradesh; Mandal 1997: 100, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Srivastava & Bhattacharyya 2000: 375, pl 2, fig 8, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh; Kar & Sharma 2001: 129, pl 2, figs 2, 5, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandaokar 2002b: 21, pl 1, fig 3, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Gupta *et* al. 2003: 211, pl 1, fig 6, PALAEOCENE-EOCENE, Ganga Basin; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Palmidites cf. maximus Couper. Kumar & Takahashi 1991: 558, pl 7, fig 13, pl 15, fig 1, EARLY and EARLY LATE MIOCENE (Lower and Upper Bhuban Formation), Silchar-Haflong Road Section, Assam;

Palmidites minor Kumar 1994: 30, 92, pl 15, fig 4, pl 45, fig 10, MIDDLE OLIGOCENE and LATE MIOCENE-PLIOCENE (Jenam and Tipam formations), Silchar-Haflong Road Section, Assam.

Palmidites naviculus Kar & Saxena. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi 1997: 170, LATE PALAEOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Palmidites noviculatus Sarkar & Singh. Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana.

Palmidites obtusus Tripathi & Singh. Singh & Tripathi 1990: 326, pl 1, fig 23, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Palmidites plicatus Singh in Sah & Singh. Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 1 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Saxena *et* al. 1996: 21, pl 2, fig 3, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Kapoor *et* al. 1997: 33, fig 2f, PALAEOCENE-EOCENE (Subathu Formation), Kalka-Kasauli Road, Solan District, Himachal Pradesh; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Dutta *et* al. 1998: 64, pl 1, fig 2, EARLY CRETACEOUS-LATE EOCENE-OLIGOCENE (Upper Disang-Lower Barail groups), Kohima District, Nagaland; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Tripathi *et* al. 2000: 243, pl 2, fig 3, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Palmidites psilatus Kumar 1994: 14, 31, 46, 60, 82, 92, pl 4, fig 3, pl 15, figs 1-2, 5-6, pl 22, fig 6, pl 26, fig 1, OLIGOCENE-PLIOCENE (Laisong, Jenam, Renji, Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

Palmidites punctatus Mehrotra. Saxena *et* al. 1996: 21, pl 2, fig 4, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 243, pl 2, fig 8, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Palmidites sp. Saxena & Misra 1990: 265, pl 1, fig 8, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Palmidites sp. Singh & Tripathi 1990: 329, pl 1, fig 26, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Palmidites sp. A. Kar & Bhattacharya 1992: 257, pl 1, fig 20, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Palmidites sp. B. Kar & Bhattacharya 1992: 257, pl 1, fig 30, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Palmidites sp. B. Kumar 1994: 60, pl 32, fig 4, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Palmidites sp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE (Lower Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Palmidites sp. Saxena *et* al. 1996: 22, pl 2, fig 7, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Palmidites sp. Chandra & Kumar 1998: 53, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Palmidites sp. Kumar *et* al. 2000: 323, NEOGENE, Mahuadanr Valley, Palamu District, Jharkhand.

Palmidites sp. Rao & Patnaik 2001: 277, pl 3, fig 10, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Palynomorph type 1. Saxena & Bhattacharyya 1990: 113-114, pl 2, fig 11, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Manjhi Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Palynomorph type 1. Mandal *et* al. 2003: 106, pl 1, fig 17, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

PANDANIIDITES Elsik, **MONOPORINES.**

Pandaniidites texus Elsik. Kumar & Takahashi 1991: 558-559, pl 1, fig 6, EARLY OLIGOCENE, (Laisong Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 18, 82, pl 4, fig 16, EARLY OLIGOCENE and LATE MIOCENE (Laisong and Bokabil formations), Silchar-Haflong Road Section, Assam.

Pandaniidites sp. Saxena & Misra 1990: 265, pl 1, fig 14, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

PANDANUS Linn., **PANDANACEAE.**

Pandanus sp. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

PARAAQUILAPOLLENITES in Misra & Kapoor. *Nomen nudum.*

Paraaquilapollenites asymmetricus in Misra & Kapoor 1994: 154, pl 3, fig 65, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

PARASACCITES Bharadwaj & Tiwari, **PARASACCITI.**

Parasaccites distinctus Tiwari. Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road, Jaintia Hills District, Meghalaya (Reworked).

Parasaccites korbaensis Bharadwaj & Tiwari. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked); Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram (Reworked).

Parasaccites obscurus Tiwari. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked).

Parasaccites sp. Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked).

Parasaccites sp. 1. Singh *et* al. 1991: 42, pl 2, fig 9, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Parasaccites sp. 2. Singh *et* al. 1991: 42, pl 1, fig 7, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Parasaccites sp. Saxena & Rao 1996: 48, pl 3, fig 15, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya (Reworked).

Parasaccites sp. Rao 2000: 297, pl 2, fig 18, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya (Reworked).

Parasaccites sp. Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland (Reworked).

Parasaccites sp. Gupta *et* al. 2003: 212, pl 2, fig 1, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

PARAVURIPOLLIS Rao & Ramanujam, **MONOPTYCHES.**

Paravuripollis mulleri Rao & Ramanujam. Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1992: 21, figs 2H, I, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 81, pl 1, fig 13, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Rao *et* al. 1995: 374, fig 16, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Ramanujam *et* al. 1999: 35, pl 1, figs 12-13, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Paravuripollis sp. Ramanujam *et* al. 1991: 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

PARIPOLLIS Partridge in Stover & Partridge, **TETRADITES.**

Paripollis broachensis Samant & Phadtare 1997: 39, pl 7, fig 20, pl 8, figs 1-5, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Paripollis reticulatus Samant & Phadtare 1997: 39, pl 8, figs 6-7, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

PELLICIEROIPOLLIS Sah & Kar, **PROLATI.**

Pellicieroipollis langenheimii Sah & Kar. Kar 1990a: 177, pl 5, fig 73, pl 9, fig 133, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura. Kar 1990b: 232, 236, 237, EOCENE, MIDDLE-LATE OLIGOCENE (Disang, Jenam and Renji formations), Silchar-Haflong Road Section, Assam; Phadtare & Thakur 1990: 284, pl 1, figs 1-6, EARLY-MIDDLE MIOCENE (Rajpardi lignite), Gujarat; Kar & Bhattacharya 1992: 251, 252, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin and Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Mandaokar 1993: 139, pl 2, figs 2, 19, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Shanmukhappa & Koshal 1993: 195, EARLY EOCENE (Cambay Shale Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Kar *et* al. 1994: 186, pl 2, figs 33-34, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Mandal 1997: 99, pl 1, figs 24-26, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Mandaokar 2000b: 181, pl 1, fig 25, pl 2, figs 6, 10, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 18, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 297, pl 1, fig 16, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Samant 2000: 114, pl 4, fig 3, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Saxena & Sarkar 2000: 257, pl 2, fig 6, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 275, pl 1, fig 3, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7,

Upper Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

cf. Pellicieroipollis langenheimii Sah & Kar. Mandal *et* al. 1996: 80, pl 1, fig 15, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

Pellicieroipollis minutus in Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 181, pl 2, figs 27, 29, 45, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam. *Nomen nudum.*

Pellicieroipollis sp. Kar 1990a: 177, pl 5, fig 81, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Pellicieroipollis sp. Mandal 1997: 100, pl 1, fig 27, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Pellicieroipollis sp. Mandaokar 2000b: 183, pl 2, figs 11, 19, 43, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Pellicieroipollis sp. Mandal *et* al. 2003: 104, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

PENTACHOTOMOSULCITES in Misra & Kapoor. *Nomen nudum.*

Pentachotomosulcites echinatus in Misra & Kapoor 1994: 156, pl 4, fig 73, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

PENTACOLPITES in Rao & Vimal, *Nomen nudum.*

Pentacolpites sp. Mehrotra *et* al. 2000: 153, PALAEOCENE-EARLY EOCENE (Basal Sandstone), Upper Assam.

PENTADESMAPITES Ramanujam *et* al., **PTYCHOPOLYPORINES.**

Pentadesmapites neyveliense Ramanujam *et* al. Ramanujam *et* al. 1991: 3, pl 3, fig 13, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 21, figs 3S, T, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

PERFOTRICOLPITES González Guzmán, **TRIPTYCHES.**

Perfotricolpites digitatus González Guzmán. Chandra & Kumar 1998: 66-67, pl 2, fig 4, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Perfotricolpites neyvelii (Navale & Misra) Mandal & Kumar 2000: 201-203, pl 1, figs 13-15, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam; Rao 2004: 125, 130, pl 1, figs 6-8, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra..

Plumbaginacipites neyvelii Navale & Misra. Ramanujam *et* al. 1989: 29, pl 1, figs 14-15, MIOCENE, subsurface sediments of eastern coast of southern India; Singh *et* al. 1992: 57, pl 2, fig 5, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Rao 1996: 157, pl 1, fig 4, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 48, pl 2, figs 8-9, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo

Hills District, Meghalaya; Rao 2000: 297, pl 2, fig 7, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Kumar et al. 2001: 245, EARLY-MIDDLE MIOCENE (Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Perfotricolpites rajpardiensis Samant & Phadtare 1997: 40, pl 8, figs 8-10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

PERINOFOVEOMONOCOLPITES Kar & Sharma, **MONOPTYCHES.**

Perinofoveomonocolpites excellensus Kar & Sharma 2001: 129, 131, pl 2, figs 1, 3, 6, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

PERIRETITRICOLPITES Jan du Chene et al., **TRIPTYCHES.**

Periretitricolpites anambraensis Jan du Chene et al. Rao 1995a: 327, pl 3, fig 9, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Periretitricolpites indicus Saxena & Khare 2004: 74, 80, pl 1, figs 24-25, 1, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

PICEAEPOLLENITES Potonié, **PINOSACCITI**.

Piceaepollenites excellensus Kar. Kar 1990a: 188, pl 4, fig 69, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 236, 237, EOCENE, MIDDLE-LATE OLIGOCENE (Disang, Jenam and Renji formations), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Piceaepollenites naeraensis Mathur & Mathur. Kar 1990a: 176, pl 4, fig 64, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Piceaepollenites sp. Banerjee & Nandi 1994: 219, pl 1, fig 19, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Piceaepollenites sp. Chandra & Kumar 1998: 66, pl 2, fig 16, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Piceaepollenites sp. Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram.

Piceaepollenites sp. Rao & Patnaik 2001: 276-277, pl 3, fig 5, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Piceaepollenites sp. Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

PILADIPOROCOLPITES Kar, **DIPORINES.**

Piladiporocolpites caratinii Kar 1995b: 383, pl 1, figs 1-6, EARLY EOCENE (Palana Formation), Borehole core no. K 12 (Depth 134 m), around Kuchaur-Benia area, Bikaner District, Rajasthan; Acharya 2000: 22, EARLY EOCENE, Borehole

No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Kar & Sharma 2001: 129, pl 3, fig 4, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Piladiporocolpites. Sharma 2000: 54, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan.

PILAMONOLETES Kar, **SCULPTATO-MONOLETI.**

Pilamonoletes excellensus in Kar 1990a: 176, pl 2, fig 43, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam. *Nomen nudum.*

Pilamonoletes excellensus Kar 1991: 2, pl 1, figs 1-4, MIOCENE, Rokhia Borehole core no. 1 (Depth 195-200 m), Tripura; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1993: 139, pl 2, figs 5, 9, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar et al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1995: 26, pl 1, figs 15, 39, 51, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Saxena & Rao 1996: 46, pl 1, fig 23, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandal 1997: 99, pl 1, fig 3, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Rao & Nair 1998: 52: MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 295, pl 1, fig 11, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Kumar et al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

Pilamonoletes moderatus in Kar 1990a: 176, pl 2, fig 37, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 237, 240, LATE OLIGOCENE-EARLY MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam. *Nomen nudum.*

Pilamonoletes moderatus Kar 1991: 2, pl 1, figs 5-6, MIOCENE, Rokhia Borehole core no. 1 (Depth 1450-1455 m), Tripura; Mandaokar 1993: 139, pl 2, fig 6, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar et al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1995: 27, pl 1, figs 6, 23, 26, 29, 31-32, 34-35, 37, pl 2, fig 8, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh.

PILAPOLYCOLPORITES Kar & Sharma, **PTYCHOPOLYPORINES.**

Pilapolycolporites verrucatus Kar & Sharma 2001: 130, 139, pl 8, figs 2, 7-8, 10-11, LATE PALAEOENE-EARLY EOCENE (Palana Forma-

tion), Bikaner-Nagaur area, Bikaner District, Rajasthan.

PILATETRADITES Kumar, **TETRADITES.**

Pilatetradites meghalayaensis Kumar 1995: 78, pl 2, figs 8, 11, PALAEOCENE (Lakadong Sandstone), Laitryngew, Khasi Hills, Meghalaya; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

PILATRICOLPORITES Kar, **PTYCHOTRIPORINES.**

Pilatricolporites sp. Saxena & Sarkar 2000: 259, pl 2, fig 3, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya.

PILATRISYNCOLPITES Kar *et* al. **TRIPTYCHES.**

Pilatrisyncolpites triangulatus Kar *et* al. 1994: 287, figs 1-2, text-fig 2, OLIGOCENE (Barail Group), Nahorkatiya Well no. 268 (Depth 2270 m), Upper Assam; Kar *et* al. 1994: 187, pl 1, fig 7, TERTIARY, subsurface sediments in Upper Assam; Mandal 2000: 70, fig 3, EARLY EOCENE (Naredi Formation), Waghopadar, Kutch District, Gujarat.

PINJORIAPOLLIS Saxena & Singh, **MONOPTYCHES.**

Pinjoriapollis lanceolatus Saxena & Singh. Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Saxena & Rao 1996: 48, pl 2, fig 12, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Rao & Patnaik 2001: 270, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Pinjoriapollis spp. Kumar 1994: 93, 98, LATE MIOCENE-PLIOCENE (Tipam and Dupitila formations), Silchar-Haflong Road Section, Assam.

PINUS (pollen). Phadtare *et* al. 1994: 74, 75, pl 1, fig I, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

PINUSPOLLENITES Raatz *ex* Potonié, **PINOSACCITI.**

Pinuspollenites banksiana in Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh. *Invalid combination.*

Pinuspollenites chandigarhensis Rao & Patnaik 2001: 276, pl 2, figs 12-14, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Pinuspollenites crestus Kar. Kar 1990a: 176, pl 4, figs 61-63, pl 9, figs 125-128, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 236, 237, 240, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Kar *et* al. 1994: 186, pl 2, fig 31, TERTIARY, subsurface sediments in Upper Assam; Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Sarkar *et* al. 1994: 201, pl 2, fig 11, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Chandra & Kumar 1998: 65-66, pl 3, figs 8-9, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 177-178, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Trivedi & Saxena 2000: 275, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near

Umrongso, North Cachar Hills District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, pl 2, fig 5, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandal & Vijaya 2004: 497, fig 4C, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Pinuspollenites foveolatus Rao = **Pityosporites foveolatus** (Rao) Kumar & Takahashi.

Pinuspollenites cf. foveolatus Rao. Misra *et* al. 1996: 95, 96, EARLY MIOCENE (Baghmara Formation), Tura-Dalu Road Section along Bugi River and in the vicinity of Baghmara, Garo Hills, Meghalaya.

Pinuspollenites nadahensis Rao & Patnaik 2001: 276, pl 2, figs 7-8, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Pinuspollenites tenuicorpus Singh & Sarkar. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Singh & Sarkar 1994: 50, pl 1, figs 11-12, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Mitra *et* al. 2000: 126, pl 2, fig 4, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Pinuspollenites sp. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Pinuspollenites sp. Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Pinuspollenites sp. Banerjee & Nandi 1994: 219, pl 1, fig 23, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Pinuspollenites spp. Misra *et* al. 1996: 96, EARLY MIOCENE (Baghmara Formation), Tura-Dalu Road Section along Bugi River and in the vicinity of Baghmara, Garo Hills, Meghalaya.

Pinuspollenites sp. Kapoor *et* al. 1997: 33, fig 2d, PALAEOCENE-EOCENE (Subathu Formation), Kalka-Kasauli Road, Solan District, Himachal Pradesh.

Pinuspollenites sp. Kumar *et* al. 2001: 245, LATE MIOCENE (Girujan Clay Formation), Tinali Well-7, Upper Assam.

Pinuspollenites sp. Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

Pinuspollenites sp. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

PISTILIPOLLENITES Rouse, **TRIPORINES.**

Pistilipollenites sp. Kumar 1994: 93, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

PITYOSPORITES Seward, **DISACCIATRILETI.**

Pityosporites cf. alatus (Potonié) Thomson & Pflug. Kumar & Takahashi 1991: 578, pl 17, fig 16, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Pityosporites classicus (Salujha *et* al.) Kumar & Takahashi 1991: 579, pl 8, fig 6, EARLY MIOCENE (Lower Bhuban Formation), Silchar-

Haflong Road Section, Assam; Kumar 1994: 51, pl 25, fig 11, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Podocarpidites classicus Salujha et al. Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Salujha et al. 1991: 66, pl 1, fig 26, NEOGENE (Surma and Tipam groups), Adamtila Well A, Cachar District, Assam (Reworked); Shanmukhappa & Koshal 1993: 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Kumar 1994: 32, 82, pl 20, fig 9, MIDDLE OLIGOCENE and LATE MIOCENE (Jenam and Bokabil formations), Silchar-Haflong Road Section, Assam.

Pityosporites foveolatus (Rao) Kumar & Takahashi 1991: 579, pl 10, figs 2-3, 5, pl 14, figs 2, 11, pl 15, fig 17, MIDDLE MIOCENE and EARLY LATE MIOCENE (Middle and Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 60, 70, 82, 93, pl 25, fig 16, pl 31, figs 16, 18, pl 36, fig 5, pl 37, figs 1, 6, MIOCENE-PLIOCENE (Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

Pinuspollenites foveolatus Rao. Saxena & Rao 1996: 46, pl 2, figs 1-3, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao 2000: 295, pl 1, fig 12, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Rao & Patnaik 2001: 270, pl 2, fig 11, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Pityosporites sp A. Kumar & Takahashi 1991: 579-580, pl 7, fig 4, EARLY MIOCENE (Lower Bhuban Formation), Silchar-Haflong Road Section, Assam.

Pityosporites sp B. Kumar & Takahashi 1991: 580, pl 17, fig 13, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam

Pityosporites spp. Kumar 1994: 46, 51, pl 25, figs 13, 17, LATE OLIGOCENE-MIDDLE MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam.

cf. Pityosporites sp. Kumar 1994: 32, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

PLATONIAPOLLENITES Sah & Kar, **PTYCHOPOLYPORINES.**

Platoniapollenites iratus Sah & Kar. Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Mandal 1997: 100, pl 1, fig 33, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Kar & Sharma 2001: 130, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

PLATYSACCUS Naumova ex Ishchenko, **PODOCARPOIDITI.**

Platysaccus densus Kar. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked).

Platysaccus densus (Venkatachala) Kumar (non Kar 1968) = **Platysaccus kutchensis** Saxena.

Platysaccus kutchensis Saxena 1993: 196.

Platysaccus densus (Venkatachala) Kumar 1973: 118, pl 6, fig 121, LATE JURASSIC (Jabalpur Formation), Sehora, Narsinghpur District, Madhya Pradesh.

Podocarpidites densus Venkatachala 1969: 215, pl 5, figs 16-17, 21, EARLY CRETACEOUS (Bhuj Series), Pat River near Bhuj, Kutch District, Gujarat.

Platysaccus ovatus Maithy. Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road, Jaintia Hills District, Meghalaya (Reworked).

Platysaccus papilionis Potonié & Klaus. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 237, 240, LATE OLIGOCENE-EARLY MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam (Reworked).

Platysaccus queenslandii de Jersey. Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

Platysaccus sp. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked).

Platysaccus sp. Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam (Reworked).

Platysaccus sp. Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram (Reworked).

Platysaccus sp. Mandaokar 2002b: 21, pl 2, fig 13, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland (Reworked).

PLAYFORDIASPORA Maheshwari & Banerji, **SACCIZONATI.**

Playfordiaspora cancellosa (Playford & Dettmann) Maheshwari & Banerji. Mandal *et* al. 2003: 102, 104, pl 3, fig 14, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Playfordiaspora sp. Singh *et* al. 1991: 42, pl 2, fig 5, OLIGOCENE (Barail Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

PLICATIAPERTURITES Kar, **PTYCHOTRIPORINES.**

Plicatiaperturites retipilatus Kar. Samant & Phadtare 1997: 40, pl 8, figs 11-12, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

PLICATIPOLLENITES Lele, **APERTACORPITI.**

Plicatipollenites gondwanensis Lele. Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked); Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked).

Plicatipollenites ovatus Kar. Singh *et* al. 1991: 42, pl 1, fig 9, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked); Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya (Reworked).

Plicatipollenites sp. Salujha *et* al. 1991: 68, NEOGENE (Surma and Tipam groups), Adamtila Well A, Cachar District, Assam (Reworked).

Plicatipollenites sp. Singh *et* al. 1991: 42, pl 1, fig 13, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Plicatipollenites sp. Saxena & Rao 1996: 48, pl 3, fig 18, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya (Reworked).

Plicatipollenites sp. Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram (Reworked).

Plicatipollenites sp. Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland (Reworked).

Plicatipollenites sp. Gupta *et* al. 2003: 212, pl 2, fig 2, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

PLUMBAGINACIPITES Navale & Misra, **TRIPTYCHES.**

Plumbaginacipites navalei Rao & Nair 1998: 52: pl 1, figs 20-21, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala;

Plumbaginacipites neyvelii Navale & Misra = **Perfotricolpites neyvelii** (Navale & Misra) Mandal & Kumar.

PLURICOLUMELLATIPOLLIS Kar, **PTYCHOPOLYPORINES.**

Pluricolumellatipollis pachyexinus Kar 1995a: 165, 166, pl 1, figs 3-7, EARLY EOCENE, Borehole core no. K-12 at Kuchaur-Benia area, Bikaner District, Rajasthan; Sharma 2000: 52, pl 1, fig 11, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Kar & Sharma 2001: 130, pl 5, figs 11, 13, pl 7, fig 1, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

PODOCARPIDITES Cookson ex Couper, **PODOCARPOIDITI.**

Podocarpidites clarus Sah. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Podocarpidites classicus Salujha et al. = **Pityosporites classicus** (Salujha et al.) Kumar & Takahashi.

Podocarpidites cognatus Kar. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 2000b: 180, pl 1, fig 14, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002b: 21, pl 2, figs 6, 9, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

Podocarpidites congoensis Sah. Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Podocarpidites couperi Sarkar & Singh. Sarkar 1991: 3, EARLY EOCENE (Kakara Series), near Kakara-Chapla group of villages, north of Gambhar River, Shimla District, Himachal Pradesh; Sarkar & Prasad 2000a: 171, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), Koshalia Nala Section near Koti, Shimla Hills, Solan District, Himachal Pradesh; Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana; Singh et al. 2003: 197, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Podocarpidites decorus Sarkar & Singh. Sarkar 1997: 109, EOCENE (Subathu Formation), 20 km southeast of Bilaspur on Shimla-Bilaspur Highway, Bilaspur District, Himachal Pradesh; Singh et al. 2003: 197, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Podocarpidites densicorpus Kar. Kar 1990a: 176, pl 4, figs 66-68, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Kar et al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Chandra & Kumar 1998: 65, pl 3, figs 11, 14, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Podocarpidites densus Venkatachala = **Platysaccus kutchensis** Saxena.

Podocarpidites ellipticus Cookson. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Podocarpidites granulatus in Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh. *Nomen nudum.*

Podocarpidites khasiensis Dutta & Sah. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 236, 240, EOCENE-MIDDLE OLIGOCENE and EARLY MIOCENE (Disang, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandal 1990: 326, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Sarkar 1991: 3, EARLY EOCENE (Kakara Series), near Kakara-Chapla group of villages, north of Gambhar River, Shimla District, Himachal Pradesh; Sarkar et al. 1994: 201, pl 2, fig 7, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandal et al. 1996: 80, LATE CRETACEOUS, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 177-178, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, pl 2, fig 12, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandal et al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked); Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Podocarpidites meghalayaensis Rao. Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh; Kumar & Takahashi 1991: 580, pl 15, fig 16, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 70, 82, 93, pl 36, fig 16, MIOCENE-PLIOCENE (Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Rao & Patnaik 2001: 270, pl 2, fig 10, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Podocarpidites microreticulatus Cookson. Singh & Sarkar 1994: 50, pl 1, fig 14, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh;

Podocarpidites rajpardiensis Samant & Phadtare 1997: 14, pl 2, fig 11, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Podocarpidites sp. Jeyasingh *et* al. 1989: 310-311, figs 1-4, EOCENE, Mine I area, Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Podocarpidites sp. Singh & Tripathi 1990: 329, pl 1, fig 27, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Podocarpidites sp. Kumar & Takahashi 1991: 581, pl 14, fig 14, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam.

Podocarpidites sp. Shanmukhappa & Koshal 1993: 200, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Podocarpidites spp. Kumar 1994: 60, 70, 98, pl 31, fig 15, pl 32, fig 5, pl 36, fig 9, MIOCENE-PLIOCENE (Bhuban and Tipam formations), Silchar-Haflong Road Section, Assam.

Podocarpidites spp. Mehrotra *et* al. 2000: 153, PALAEOCENE-EARLY EOCENE and LATE EOCENE (Basal Sandstone and Kopili formations), Upper Assam.

Podocarpidites sp. Samant 2000: 114, pl 1, fig 15, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Podocarpidites sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin.

PODOSPORITES Rao, **POLYSACCITES.**

Podosporites tripakshi Rao. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road, Jaintia Hills District, Meghalaya (Reworked); Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland (Reworked).

Podosporites cf. P. tripakshi Rao. Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Pollen grains cf. Matanomadhiasulcites. Bonde & Kumaran 1993: 776, fig 1c-j, Deccan Intertrappean Beds), Umaria near Shahpura, Mandla District, Madhya Pradesh.

Pollen tetrad type A. Kumar 1996: 116, pl 1, fig 20, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Pollen tetrad type B. Kumar 1996: 116, pl 2, fig 8, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Pollen tetrad type A. Chandra & Kumar 1998: 67, pl 2, fig 2, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Pollen tetrad type. Rao 2000: 301, pl 1, fig 8, OLIGOCENE (Kherapara Formation), Tura-Dalu Road near Kherapara, West Garo Hills District, Meghalaya.

Pollen tetrad type A. Rao & Patnaik 2001: 280, pl 1, fig 12, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Pollen tetrad type B. Rao & Patnaik 2001: 280, pl 1, fig 17, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Pollen tetrad. Singh & Kar 2003: 221, pl 2, fig 6, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

Pollen type A. Singh 1990: 226, pl 2, fig 15, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Pollen type B. Singh 1990: 226, pl 2, fig 9, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Pollen type A. Kumar 1996: 112, pl 1, fig 16, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Pollen type A. Chandra & Kumar = **Varisculptinaperturites sphericus** Saxena *et* al.

Pollen type. Saxena 2000c: 163, pl 1, figs 18-19, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

Pollen type 1. Tripathi *et* al. 2000: 248, pl 1, fig 12, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Pollen type 1 (cf. Sapotaceoidaepollenites). Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

Pollen type 1. Kumar *et* al. 2001: 245, EARLY-MIDDLE MIOCENE (Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam.

Pollen type 1. Rao 2004: 125, 132, pl 1, fig 16, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

POLYADOPOLLENITES Pflug & Thomson in Thomson & Pflug, **POLYADITES.**

Polyadopollenites granulatus Sah. Kar *et* al. 1994: 187, TERTIARY, subsurface sediments in Upper Assam.

Polyadopollenites levis Sah. Mandal 1997: 99, pl 1, fig 7, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Polyadopollenites miocenicus Ramanujam. Ramanujam *et* al. 1989: 29, 30, pl 1, fig 16, MIOCENE, subsurface sediments of eastern coast of southern India; Mandaokar 1993: 139, pl 2, fig 21, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 186, pl 2, fig 36, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandal 1997: 100, pl 2, fig 9, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Chandra & Kumar 1998: 66, pl 3, fig 4, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Kumar *et* al. 2001: 245, fig 5.13, EARLY-MIDDLE MIOCENE (Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Polyadopollenites sahii Rao *et* al. Rao 2000: 297, pl 2, fig 10, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Polyadopollenites siwalikus Saxena & Singh. Saxena & Rao 1996: 48, pl 3, figs 5-6, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 245, pl 2, fig 5, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Polyadopollenites sp. Kar 1990a: 190, 198, pl 5, fig 86, pl 9, fig 131, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Polyadopollenites spp. Kar 1990b: 236, 238, 240, MIDDLE OLIGOCENE-EARLY MIOCENE

(Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam.

Polyadopollenites sp. Saxena & Misra 1990: 265, pl 1, fig 16, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Polyadopollenites sp. Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Polyadopollenites sp. Mitra *et* al. 2000: 126, pl 2, fig 1, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

POLYBREVICOLPITES Deb, **POLYPTYCHES.**

Polybrevicolpites neyvelii Deb. Shanmukhappa & Koshal 1993: 200, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

POLYBREVICOLPORITES Venkatachala & Kar, **PTYCHOPOLYPORINES.**

Polybrevicolporites cephalus Venkatachala & Kar. Kar & Bhattacharya 1992: 252, pl 2, figs 5, 8, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Mandaokar 1993: 139, pl 1, fig 6, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Shanmukhappa & Koshal 1993: 195, EARLY EOCENE (Cambay Shale Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Kar *et* al. 1994: 187, TERTIARY, subsurface sediments in Upper Assam; Misra & Kapoor 1994: 154, pl 3, fig 55, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Mandaokar 2000b: 183, pl 2, figs 12, 42, 44, 48, 58, 61, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mitra *et* al. 2000: 126, pl 1, fig 24, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Kar & Sharma 2001: 130, pl 5, fig 4, pl 6, fig 4, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Saxena & Khare 2004: 74, pl 1, fig 14, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Polybrevicolporites indistinctus Samant & Phadtare 1997: 41, pl 8, figs 13-18, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 4, fig 11, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat (wrongly spelt as *Polybrevicolpites indistinctus*); Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Polybrevicolporites karii Rao & Ramanujam. Rao 1990: 246, pl 2, fig 8, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Polybrevicolporites reticulata Samant 2000: 104, 106, pl 4, figs 7-8, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Polybrevicolporites sp. Singh *et* al. 1992: 56, pl 1, fig 17, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Polybrevicolporites sp. Rao & Rajendran 1996: 74, 76, pl 3, fig 9, MIOCENE (Quilon Formation), Meenkunnu Phase II, Cannanore District, Kerala.

POLYCINGULATISPORITES Simoncsics & Kedves, **CINGULATI.**

Polycingulatisporites reduncus (Bolkhovitina) Venkatachala. Mandal *et* al. 2003: 102, pl 2, fig

8, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Polycingulatisporites sp. Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road, Jaintia Hills District, Meghalaya (Reworked).

Polycingulatisporites sp. Kumar *et* al. 2001: 247, fig 5.19, EARLY-MIDDLE MIOCENE (Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam (Reworked).

POLYCOLPITES Couper, **POLYPTYCHES.**

Polycolpites crassimarginatus Samant & Phadtare 1997: 42, pl 9, figs 5-6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Polycolpites flavatus Sah & Kar. Shanmukhappa & Koshal 1993: 195, 200, 202, EARLY-LATE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Misra & Kapoor 1994: 154, pl 3, figs 56-57, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Samant & Phadtare 1997: 41, pl 9, figs 1-2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 4, fig 10, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Polycolpites ornatus Dutta & Sah. Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Samant & Phadtare 1997: 42, pl 9, figs 3-4, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 4, fig 9, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Polycolpites pedaliaceoides Sah. Shanmukhappa & Koshal 1993: 195, 200, EARLY-MIDDLE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Sarkar *et* al. 1994: 202, pl 2, fig 8, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Polycolpites tertiarus (Singh in Sah & Singh) Saxena. Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Polycolpites sp. Rao 1990: 248, pl 2, fig 10, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Polycolpites sp. Salujha *et* al. 1991: 67, pl 2, figs 60-61, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Polycolpites sp. Singh *et* al. 1992: 57, pl 2, fig 7, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Polycolpites spp. Shanmukhappa & Koshal 1993: 195, 201, EARLY-MIDDLE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Polycolpites sp. Misra & Kapoor 1994: 152, pl 1, fig 18, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Polycolporate pollen type 1. Rao & Nair 1998: 53, pl 1, fig 18, MIOCENE, Kundra Clay Mine Section, Quilon District, Kerala.

Polycolporate pollen type Rao 2000: 301, pl 1, fig 3, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

POLYCOLPORITES Mehrotra, **PTYCHOPOLYPORINES.**

Polycolporites indicus Mehrotra. Kar & Sharma 2001: 130, pl 8, fig 5, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

POLYGALACEAE (pollen). Phadtare *et* al. 1994: 74, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

POLYGALACIDITES Sah & Dutta, **PTYCHOPOLYPORINES.**

Polygalacidites clarus Sah & Dutta. Mehrotra *et* al. 2000: 153, MIDDLE EOCENE (Sylhet Formation), Upper Assam; Kumar *et* al. 2001: 244, 245, 250, fig 6.2, OLIGOCENE, LATE MIOCENE and MIO-PLIOCENE (Barail Group, Girujan Clay and Namsang formations), Tinali Well-7, Upper Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Polygalacidites magnus Samant & Phadtare 1997: 42, pl 9, figs 7-10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Polygalacidites minutus Samant & Phadtare 1997: 43, pl 9, figs 11-13, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 5, fig 12, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Polygalacidites rhomboidus Kar & Bhattacharya 1992: 256, pl 2, figs 25-26, 28, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat.

Polygalacidites sp. Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Polygalacidites sp. Ramanujam *et* al. 1991: 3, pl 3, fig 7, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Polygalacidites sp. Ramanujam *et* al. 1992: 22, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Polygalacidites sp. Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Polygalacidites sp. Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Polygalacidites sp. Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Polygalacidites sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

Polygalacidites sp. Mandal & Vijaya 2004: 497, fig 5L, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

POLYGONACIDITES Sah & Dutta, **PERIPORITI.**

Polygonacidites frequens Sah & Dutta. Hait & Banerjee 1994: 118, pl 3, figs 44-45, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram; Mandal & Kumar 2000: 199, pl 1, figs 1-3, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam; Kumar *et* al. 2001: 245, figs 5.3-4, EARLY-MIDDLE MIOCENE, MIO-PLIOCENE and PLEISTOCENE (Surma and Tipam groups excluding Girujan Clay

Formation and Namsang and Dhekiajuli formations), Tinali Well-7, Upper Assam; Rao 2004: 125, pl 1, fig 15, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

Polygonacidites zonoides Baksi. Hait & Banerjee 1994: 118, pl 3, figs 46-47, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram.

Polygonacidites sp. Ramanujam et al. 1991: 57, pl 1, fig 35, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Polygonacidites sp. Ramanujam et al. 1991: 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

POLYLONGICOLPORITES Kar & Sharma, **PTYCHOPOLYPORINES.**

Polylongicolporites retipilatus Kar & Sharma 2001: 130, 139-140, pl 7, fig 5, pl 8, figs 4, 6, 9, 12, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

POLYMARGOCOLPORITES Kar & Kumar**, PTYCHOPOLYPORINES.**

Polymargocolporites mawlensis Kar & Kumar. Singh 1990: 220, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

POLYPODIACEAESPORITES Thiergart ex Potonié, **LAEVIGATOMONOLETI.**

Polypodiaceaesporites chatterjii Kar. Kar 1990a: 184, pl 2, fig 42, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 236, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar et al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 46, pl 1, fig 21, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 10, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 187, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Polypodiaceaesporites haardtii (Potonié & Venitz) Potonié. Kar 1990b: 236, 240, MIDDLE OLIGOCENE and EARLY MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam; Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Polypodiaceaesporites intrapunctatus Kar & Jain. Rao 1990: 246, pl 1, fig 7, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Mandaokar 1993: 139, pl 2, fig 10, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar et al. 1994: 185, pl 1, fig 2, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1995:

19, pl 1, figs 36, 50, pl 2, fig 11, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Kumar *et al.* 2001: 245, MIOCENE (Surma and Tipam groups), Tinali Well-7, Upper Assam.

Polypodiaceaesporites levis Sah. Kar 1990b: 232, 236, 237, 239, EOCENE, MIDDLE OLIGOCENE-EARLY MIOCENE (Disang, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Salujha *et al.* 1991: 66, pl 1, fig 25, NEOGENE, Adamtila Well-A, Cachar District, Assam ; Mandaokar 1993: 139, pl 2, fig 25, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et al.* 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1995: 21, pl 1, figs 24, 28, pl 2, figs 1, 6, OLIGOCENE, Ledo C olliery, Makum Coalfield, Tinsukia District, Assam; Mandal *et al.* 1996: 80, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandal 1997: 99, pl 1, fig 7, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Kumar *et al.* 2001: 245, PLEISTOCENE (Dhekiajuli Formation), Tinali Well-7, Upper Assam; Mandaokar 2002b: 21, pl 1, fig 4, pl 2, fig 3, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 187, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Polypodiaceaesporites major Saxena. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Kar *et al.* 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Kar & Sharma 2001: 129, pl 1, fig 1, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Polypodiaceaesporites major Singh *et al.* (non Saxena 1978) = **Polypodiaceaesporites meghalayaensis** Saxena.

Polypodiaceaesporites meghalayaensis Saxena 1992b: 532.

Polypodiaceaesporites major Singh *et al.* 1985 (non Saxena 1978): 47, pl 2, figs 30, 33, OLIGOCENE (Barail Group), Assam and Meghalaya.

Polypodiaceaesporites oligocenicus Salujha *et al.* Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Polypodiaceaesporites strictus Kar & Saxena. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Mandal 1997: 99, pl 1, fig 8, LATE

EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

Polypodiaceaesporites tertiarus Sah & Dutta = **Laevigatosporites tertiarus** (Sah & Dutta) Saxena & Khare.

Polypodiaceaesporites sp. A. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Polypodiaceaesporites sp. Kar 1990b: 232, EOCENE (Disang Formation), Silchar-Haflong Road Section, Assam.

Polypodiaceaesporites sp. Kar & Bhattacharya 1992: 257, pl 2, fig 31, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Polypodiaceaesporites spp. Kumar 1994: 53, 74, 86, 95, 100, pl 35, fig 13, pl 45, fig 2, MIOCENE-PLIOCENE (Bhuban, Bokabil, Tipam and Dupitila formations), Silchar-Haflong Road Section, Assam.

Polypodiaceaesporites sp. Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Polypodiaceaesporites sp. Sarkar *et* al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Polypodiaceaesporites sp. Kumaran *et* al. 1995: 1024, fig 4s, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Polypodiaceaesporites sp. Chandra & Kumar 1998: 53, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Polypodiaceaesporites sp. Dutta *et* al. 1998: 64, pl 1, fig 4, EARLY CRETACEOUS-LATE EOCENE-OLIGOCENE (Upper Disang-Lower Barail groups), Kohima District, Nagaland.

Polypodiaceaesporites sp. Kumar *et* al. 2000: 323, pl 1, fig 1, NEOGENE, Mahuadanr Valley, Palamu District, Jharkhand.

Polypodiaceaesporites sp. Mandal *et* al. 2003: 102, pl 1, fig 10, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

Polypodiaceaesporites. Handique *et* al. 1992: 222, PLIOCENE (Dhekiajuli Formation), Moran Oilfield, Upper Assam.

POLYPODIACEOISPORITES Potonié *ex* Potonié, **CINGULATI.**

Polypodiaceoisporites idoneus Salujha *et* al. Kumar & Takahashi 1991: 597-598, pl 13, fig 3, pl 14, fig 6, pl 16, figs 1, 3, 7(cf.), LATE MIOCENE (Upper Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Salujha *et* al. 1991: 65, pl 1, figs 15-16, NEOGENE, Adamtila Well-A, Cachar District, Assam; Kumar 1994: 74, 86, 95, pl 34, fig 1, pl 35, fig 1, pl 39, figs 4, 16, pl 45, fig 13, MIOCENE-PLIOCENE (Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

Polypodiaceoisporites pauciornatus Nagy. Kumar 1994: 63, pl 29, figs 7, 11, 15, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Polypodiaceoisporites pseudoreticulatus Nandi. Banerjee & Nandi 1994: 216, pl 1, fig 5, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Polypodiaceoisporites simplex Sah. Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Rao *et* al. 1995: 372, figs 5, 8, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Polypodiaceoisporites turpitus Sah. Rao *et* al. 1995: 372, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Polypodiaceoisporites sp. Kumar & Takahashi 1991: 598, pl 9, fig 6, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam.

Polypodiaceoisporites sp. Rao *et* al. 1993: 81, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Polypodiaceoisporites spp. Shanmukhappa & Koshal 1993: 200, 202, MIDDLE-LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin.

Polypodiaceoisporites sp. Banerjee & Nandi 1994: 216, pl 1, fig 7, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Polypodiaceoisporites spp. Kumar 1994: 39, 53, pl 9, fig 8, pl 25, fig 1, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

POLYPODIIDITES Ross, **SCULPTATOMONOLETI.**

Polypodiidites perverrucatus Couper = **Polypodiisporites perverrucatus** (Couper) Khan & Martin.

Polypodiidites sp. Kumar & Takahashi 1991: 599, pl 7, fig 2, EARLY MIOCENE (Lower Bhuban Formation), Silchar-Haflong Road Section, Assam.

POLYPODIISPORITES Potonié in Potonié & Gelletich *ex* Potonié, **SCULPTATOMONOLETI.**

Polypodiisporites connus Samant 2000: 103-104, pl 1, fig 10, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Polypodiisporites constrictus Kar. Mandaokar 1993: 139, pl 2, fig 16, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1995: 21, pl 1, figs 4, 11, pl 2, fig 10, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Mandaokar 2000c: 45, pl 2, fig 2, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Samant 2000: 114, pl 1, fig 9, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

Polypodiisporites favus (Potonié) *ex* Potonié. Kumar 1994: 63, 74, 86, 100, pl 40, fig 1, MIOCENE-PLIOCENE (Bhuban, Bokabil and Dupitila formations), Silchar-Haflong Road Section, Assam; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram.

Polypodiisporites formosus Salujha *et* al. Salujha *et* al. 1991: 66, pl 1, figs 21-22, NEOGENE, Adamtila Well-A, Cachar District, Assam; Shanmukhappa & Koshal 1993: 202, LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin; Mandaokar 1995: 19, pl 1, figs 4, 11, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Polypodiisporites gemmatus Nagy. Kumar 1994: 86, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Polypodiisporites grandis Sah. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 1995: 21, 23, Pl 2, fig 7, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam.

Polypodiisporites impariter (Potonié & Sah) Dutta & Sah. Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 81, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Kumar *et* al. 2001: 245, MIOCENE (Surma and Tipam groups), Tinali Well-7, Upper Assam; Mandal *et* al. 2003: 102, pl 1, fig 12, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

Polypodiisporites inangahuensis (Couper) Nagy. Kumar 1994: 86, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Polypodiisporites mawkmaensis Dutta & Sah = **Polypodiisporonites mawkmaensis** (Dutta & Sah) Mathur & Chopra.

Polypodiisporites megafavus (Krutzsch) Nagy. Kumar 1994: 63, 74, pl 29, figs 4, 8, pl 34, fig 10, pl 38, fig 3, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Polypodiisporites minor Sah. Mandaokar 1995: 23, pl 1, figs 2, 10, 22, pl 2, fig 9, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Samant & Phadtare 1997: 11, pl 1, fig 15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Polypodiisporites minutiverrucus Saxena & Misra 1990: 266, pl 1, fig 5, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Polypodiisporites miocenicus Rao & Ramanujam. Rao 1990: 246, pl 1, fig 18, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Mandaokar 1995: 23, pl 1, figs 3, 14, 20, 49, pl 2, fig 4, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Saxena 2000c: 163, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Kumar *et* al. 2001: 245, MIOCENE (Surma and Tipam groups), Tinali Well-7, Upper Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Polypodiisporites oligocenicus Sah & Dutta. Kumar & Takahashi 1991: 598, pl 3, fig 4, pl 7, fig 11, MIDDLE OLIGOCENE and EARLY MIOCENE (Jenam and Lower Bhuban formations), Silchar-Haflong Road Section, Assam; Salujha *et* al. 1991: 66, pl 1, fig 23, NEOGENE, Adamtila Well-A, Cachar District, Assam; Handique *et* al. 1992: 219, OLIGOCENE (Barail Group), Moran Oilfield, Upper Assam; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kumar 1994: 39, 53, pl 13, fig 4, pl 25, fig 4, MIDDLE OLIGOCENE and EARLY-MIDDLE MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandaokar 1995: 24, pl 1, figs 18, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, pl 1, fig 12, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Kumar *et* al. 2001: 244, fig 6.3, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Polypodiisporites ornatus Sah. Kar 1990a: 176, pl 2, figs 38-40, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 236, 240, MIDDLE OLIGOCENE and EARLY MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam; Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Ramanujam *et* al. 1991: 53, pl 1, fig 4, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 1, figs 15-16, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Rao *et* al. 1993: 81, pl 1, figs 6-7, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Banerjee & Nandi 1994: 219, pl 1, fig 17, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Kar *et* al. 1994: 185, pl 1, fig 3, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 21, 39, 63, 101, pl 2, fig 10, pl 11, fig 5, pl 12, fig 9, pl 20, figs 5, 11, pl 29, fig 2, EARLY-MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Laisong, Jenam, Bhuban and Dupitila formations), Silchar-Haflong Road Section, Assam; Sarkar *et* al. 1994: 201, pl 1, fig 3, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandaokar 1995: 24, pl 1, figs 27, 42-43, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Rao *et* al. 1995: 372, fig 13, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao & Rajendran 1996: 66, pl 1, fig 12, MIOCENE, Cannanore District, Kerala; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, pl 1, fig 8, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Polypodiisporites perverrucatus (Couper) Khan & Martin. Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 1, figs 13-14, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Kumar 1994: 21, 39, 48, 74, 86, pl 2, figs 7-8, 13, pl 11, fig 8, pl 12, figs 3, 8, pl 13, fig 2, pl 22, figs 4-5, pl 35, fig 12, OLIGOCENE-MIOCENE (Laisong, Jenam, Renji, Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Rao *et* al. 1995: 372, fig 14, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Polypodiidites perverrucatus Couper. Kumar & Takahashi 1991: 598-599, pl 2, fig 2, pl 3, fig 9, pl 6, fig 2, OLIGOCENE (Laisong, Jenam and Renji formations), Silchar-Haflong Road Section, Assam.

Polypodiisporites rarus in Rao & Rajendran 1996: 76, MIOCENE, Cannanore District, Kerala. *Nomen nudum.*

Polypodiisporites ratnamii (Ramanujam) Rao & Ramanujam. Rao 1990: 246, pl 1, fig 17, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1992: 21, figs 2B, C, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 81, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Kumar 1994: 39, 86, 95, pl 12, fig 4, pl 13, figs 6, 9, 11, pl 45, fig 15, MIDDLE OLIGOCENE and LATE MIOCENE-

PLIOCENE (Jenam, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam; Rao *et al.* 1995: 372, fig 12, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Samant & Phadtare 1997: 12, pl 2, figs 1-2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 1, fig 8, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 126, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Polypodiisporites repandus Takahashi = **Polypodiisporonites repandus** (Takahashi) Saxena & Khare

Polypodiisporites speciosus Sah & Dutta = **Polypodiisporites speciosus** (Sah & Dutta) Kumar & Takahashi.

Polypodiisporites splendidus Salujha *et al.* Trivedi & Saxena 2000: 273, pl 1, fig 7, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

Polypodiisporites tertiarus in Singh & Sarkar 1994: 50, pl 1, fig 5, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Mandal 1997: 100, pl 1, fig 9, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland. *Nomen nudum.*

Polypodiisporites tuberculensis (Baksi) Rao & Singh. Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Misra *et al.* 1996: 95, 96, OLIGOCENE (Simsang Formation), Tura-Dalu Road near Kherapara, Garo Hills, Meghalaya; Rao & Rajendran 1996: 66, pl 1, fig 11, MIOCENE, Cannanore District, Kerala; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Tripathi *et al.* 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Polypodiisporites turbinatus Sah. Ramanujam *et al.* 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Mandaokar 1995: 25, pl 1, figs 8, 21, pl 3, fig 3, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Mandal 1997: 99, pl 1, fig 4, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Polypodiisporites umstewensis Kar & Kumar. Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Polypodiisporites usmensis (Germeraad *et al.*) Khan & Martin. Ramanujam *et al.* 1991: 3, pl 1, figs 11-12, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Kumar 1994: 39, 63, 74, 86, 95, 101, pl 11, fig 2, pl 45, fig 15, MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Jenam, Bhuban, Bokabil, Tipam and Dupitila formations), Silchar-Haflong Road Section, Assam.

Polypodiisporites sp. Saxena & Misra 1990: 264, pl 1, fig 4, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Polypodiisporites sp. Singh *et al.* 1992: 56, pl 1, fig 4, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Polypodiisporites spp. Shanmukhappa & Koshal 1993: 195, 200, 201, EARLY-MIDDLE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Polypodiisporites spp. Kumar 1994: 21, 39, 53, 63, 95, pl 2, fig 14, pl 6, fig 2, pl 12, fig 7, pl 25, figs 5, 15, pl 28, fig 7, pl 30, fig 3, pl 31, fig 12, pl 45, fig 3, EARLY-MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Laisong, Jenam, Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Polypodiisporites sp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE-EARLY PLIOCENE (Middle

Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Polypodiisporites sp. Kumaran et al. 1995: 1024, fig 4t, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Polypodiisporites sp. Mandaokar 1995: 25, pl 1, figs 7, 41, 45, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam.

Polypodiisporites sp. Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Polypodiisporites sp. Misra et al. 1996: 96, OLIGOCENE and EARLY MIOCENE (Simsang and Baghmara formations), Tura-Dalu Road Section near Kherapara and along Bugi River and in the vicinity of Baghmara, Garo Hills, Meghalaya.

Polypodiisporites sp. Mandal 1997: 100, pl 1, fig 13, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Polypodiisporites sp. Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Polypodiisporites sp. Mehrotra et al. 2000: 153, LATE EOCENE (Kopili Formation), Upper Assam.

Polypodiisporites sp. Rao 2000: 299, pl 1, fig 2, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Polypodiisporites Handique et al. 1992: 222, PLIOCENE (Dhekiajuli Formation), Moran Oilfield, Upper Assam.

Polypodiisporites sp. Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

POLYPODIISPORONITES SCULPTATOMONOLETI. Potonié,

Polypodiisporonites mawkmaensis (Dutta & Sah) Mathur & Chopra. Kar et al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandal et al. 1996: 80, pl 1, fig 8, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Polypodiisporites mawkmaensis Dutta & Sah. Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Shanmukhappa & Koshal 1993: 202, LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Mandaokar 1995: 23-24, pl 1, figs 5, 16, 19, 23, 25, 40, pl 3, fig 6, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, pl 1, fig 9, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Kumar et al. 2001: 245, MIOCENE (Surma and Tipam groups), Tinali Well-7, Upper Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Polypodiisporites multiverrucatus Nagy. Kumar *et* al. 2004: 158, pl 1, fig 4, NEOGENE and PLEISTOCENE, Site 218, Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean.

Polypodiisporonites repandus (Takahashi) Saxena & Khare 2004: 73, 77, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Polypodiisporites repandus Takahashi. Kar 1990b: 232, 233, 236, 237, 240, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1995: 24, pl 1, figs 12, 14, pl 2, fig 5, pl 3, figs 4-5, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Kumar 1996: 112, pl 2, fig 1, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandal *et* al. 1996: 80, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandal 1997: 99, pl 1, fig 29, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Chandra & Kumar 1998: 65, pl 3, fig 2, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000b: 180, pl 1, fig 22, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 6, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Polypodiisporonites sp. Saxena & Khare 2004: 73, 77, pl 1, fig 10, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

POLYPORINA Naumova *ex* Potonié, **PERIPORITI.**

Polyporina globosa Sah. Salujha *et* al. 1991: 67, pl 2, fig 55, NEOGENE, Adamtila Well-A, Cachar District, Assam; Banerjee & Nandi 1994: 219, pl 1, fig 28, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Hait & Banerjee 1994: 118, pl 3, fig 58, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Singh & Sarkar 1994: 50, pl 1, fig 2, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Rao & Nair 1998: 53, pl 1, fig 14, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mehrotra *et* al. 2000: 153, LATE EOCENE (Sylhet Formation), Upper Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Polyporina magna Sah. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Polyporina microreticulata Salujha & Kindra (non Salujha et al. 1979) = **Polyporina salujhae** Saxena.

Polyporina multiporosa Kar. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Rao 1990: 248, pl 3, fig 1, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Kar et al. 1994: 187, pl 1, fig 12, TERTIARY, subsurface sediments in Upper Assam; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000c: 38, pl 1, fig 4, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 297, pl 2, fig 14, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Gupta et al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Polyporina salujhae Saxena 1992b: 533.

Polyporina microreticulata Salujha & Kindra 1981 (non Salujha et al. 1979): 50, pl 1, figs 39-40, PALAEOCENE (Langpar Formation), Umsohryngkew and Umiew River Sections, Khasi Hills, Meghalaya.

Polyporina sp. Kumar 1994: 32, pl 20, fig 1, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

POLYVESTIBULOPOLLENITES Pflug in Thomson & Pflug, **POLYPORINES.**

Polyvestibulopollenites assamicus Kumar & Takahashi 1991: 559-560, pl 5, fig 10, pl 8, fig 4, pl 12, fig 3, pl 15, figs 14-15, text-fig 7, MIDDLE OLIGOCENE and EARLY, MIDDLE and EARLY LATE MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 51, 60, 70, 82, 93, pl 24, fig 3, pl 33, figs 17, 19, pl 38, figs 9, 12, pl 46, figs 12, 16, MIOCENE-PLIOCENE (Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

Polyvestibulopollenites verus (Potonié) Thomson & Pflug. Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Polyvestibulopollenites sp. Misra & Kapoor 1994: 154, 155, pl 3, fig 52, PALAEOCENE-EARLY EOCENE and EARLY MIOCENE (Subathu and Basal Dharmsala and Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Polyvestibulopollenites sp. Misra & Saxena 1995: 18, fig 2.5, PALAEOGENE?, Bombay Offshore (Reworked).

POMETIAPOLLENITES Samant, **PTYCHOTRIPORINES.**

Pometiapollenites reticulatus Samant 2000: 106, pl 5, fig 4, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

POTAMOGETONACEAEPITES Biswas, **POTAMOGETONACEAE.**

Potamogetonaceaepites spp. Kumar 1994: 32, 51, pl 20, fig 12, pl 24, fig 15, pl 26, fig 7, MIDDLE OLIGOCENE and MIDDLE MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam.

POTAMOGETONACIDITES Sah, **POTAMOGETONACEAE**.

Potamogetonacidites cenozoicus Sah. Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Potamogetonacidites sp. Kumar & Takahashi 1991: 560, pl 4, fig 9, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Potamogetonacidites sp. Kumar 1994: 46, pl 23, figs 10, 21, LATE OLIGOCENE (Renji Formations), Silchar-Haflong Road Section, Assam.

POTONIEISPORITES Bharadwaj, **VESICULOMONORADITI.**

Potonieisporites granulatus Bose & Kar. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked).

Potonieisporites sp. Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

PRECTENOLOPHONIDITES Samant & Phadtare, **PTYCHOPOLYPORINES.**

Prectenolophonidites distinctus in Phadtare & Samant 1996: 673, pl 1, figs 10-12, pl 2, figs 1-7, EARLY EOCENE (Rajpardi lignite), Rajpardi, Bharuch District, Gujarat. *Nomen nudum.*

Prectenolophonidites distinctus Samant & Phadtare 1997: 45, pl 9, figs 18-19, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Prectenolophonidites primitiva in Phadtare & Samant 1996: 673, pl 1, figs 3-9, EARLY EOCENE (Rajpardi lignite), Rajpardi, Bharuch District, Gujarat. *Nomen nudum.*

Prectenolophonidites primitiva Samant & Phadtare 1997: 44, pl 9, figs 14-17, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

PRETRICOLPIPOLLENITES Danze-Corsin & Laveine, **MONOPTYCHES**

Pretricolpipollenites sp. Srivastava & Bhattacharyya 2000: 375, pl 3, fig 11, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh.

PRIMUSPOLLENITES Tiwari, **STRIARETICULOIDITI.**

Primuspollenites sp. Gupta et al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

PROTEACIDITES Cookson ex Couper, **TRIPORINES.**

Proteacidites sp. cf. P. bellus Samoilovich. Samant & Phadtare 1997: 46, pl 9, figs 20-21, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Proteacidites excertus Dutta & Sah. Mandal 1990: 326, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya.

Proteacidites protrudus Sah & Kar. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Saxena 1991: 369, fig 6, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar & Bhattacharya 1992: 252, pl 1, fig 8, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Saxena 1995: 99, fig 27, MIOCENE (Mayyanad Formation), Kundra Clay Mines,

Quilon District, Kerala (Reworked); Tripathi 1995: 47, pl 1, fig 17, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Chakraborty 2004: 115, pl 1, fig 7, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Proteacidites rectomarginus Cookson. Misra & Kapoor 1994: 156, pl 4, figs 78-79, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Proteacidites retusus Anderson. Samant & Phadtare 1997: 46, pl 10, figs 1-2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Proteacidites triangulus Kar & Jain. Rao 1990: 248, pl 3, figs 17-18, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena 1991: 370, fig 3, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala (wrongly spelt as *Proteacidites triangulatus)*; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 2, fig 15, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 48, pl 2, fig 18, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Samant 2000: 114, pl 4, fig 12, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat (wrongly spelt as *Proteacidites triangulatus)*.

Proteacidites truncatus Cookson. Rao 1990: 248, pl 3, fig 7, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et al.* 1991: 3, pl 3, fig 10, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Rao & Rajendran 1996: 66, pl 2, fig 16, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Saxena 2000c: 163, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

Proteacidites sp. Misra & Saxena 1995: 18, fig 2.6, PALAEOGENE?, Bombay Offshore (Reworked).

PROXAPERTITES van der Hammen, **SPHAEROZONISULCATES.**

Proxapertites assamicus (Sah & Dutta) Singh. Singh 1990: 219, pl 1, fig 10, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Singh & Tripathi 1990: 329, pl 1, fig 25, MIOCENE (Siwalik sediments), Arunachal Pradesh; Mandaokar 1993: 139, pl 1, fig 33, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Misra & Kapoor 1994: 153, 155, 159, PALAEOCENE-EARLY EOCENE, MIDDLE EOCENE and LATE EOCENE-OLIGOCENE (Subathu and Basal Dharmsala and Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Kumar 1996: 112, pl 1, fig 28, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandal *et al.* 1996: 80, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Saxena *et al.* 1996: 21, pl 3, fig 3, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Kapoor *et al.* 1997: 33, fig 2h, PALAEOCENE-EOCENE (Subathu Formation), Kalka-Kasauli Road, Solan District, Himachal Pradesh; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer Dis-

trict, Rajasthan; Aswal & Singh 2000: 123, EARLY EOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Kumar et al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Mandaokar 2002b: 21, pl 1, fig 13, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Saxena & Khare 2004: 74, pl 1, fig 9, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Proxapertites crassimurus (Sah & Dutta) Singh. Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 1, 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Mandal et al. 1996: 80, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Saxena et al. 1996: 21, pl 2, figs 10, 12, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Proxapertites cursus van Hoeken-Klinkenberg. Shanmukhappa & Koshal 1993: 195, 200, 201, 202, EARLY-MIDDLE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Banerjee & Nandi 1994: 219, pl 1, fig 16, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Misra & Kapoor 1994: 155, 159, PALAEOCENE-EARLY EOCENE and MIDDLE EOCENE (Subathu and Basal Dharmsala and Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandal 1997: 99, pl 2, fig 5, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 47, pl 10, figs 5-6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Ramanujam et al. 1999: 35, pl 2, fig 34, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Aswal & Singh 2000: 122, DANIAN, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh; Mehrotra et al. 2000: 153, PALAEOCENE-MIDDLE EOCENE (Basal Sandstone and Sylhet formations), Upper Assam; Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf; Samant 2000: 114, pl 5, fig 1, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Sharma 2000: 52, pl 1, fig 1, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Samant & Tapaswi 2001: 128, pl 2, fig 9, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Gupta et al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Chakraborty 2004: 115, pl 1, fig 2, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Proxapertites emendatus (Sah & Dutta) Kar & Kumar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 219, pl 1, fig 13, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Ambwani 1993: 160, PALAEOCENE-

EARLY EOCENE, Seam Nos. 1, 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Chakraborty 2004: 115, pl 1, fig 15, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Proxapertites granulatus Singh. Kapoor et al. 1997: 33, fig 2i, PALAEOCENE-EOCENE (Subathu Formation), Kalka-Kasauli Road, Solan District, Himachal Pradesh. Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Proxapertites marginatus (Venkatachala & Kar) Singh. Samant & Phadtare 1997: 47, pl 10, figs 7-9, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 5, fig 2, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Proxapertites microreticulatus Jain et al. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra (Reworked); Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Kar et al. 1994: 187, pl 2, fig 29, TERTIARY, subsurface sediments in Upper Assam; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Kumar et al. 2001: 244, 245, fig 6.4, OLIGOCENE and EARLY-MIDDLE MIOCENE (Barail Group and Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam; Gupta et al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Proxapertites operculatus (van der Hammen) van der Hammen. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Shanmukhappa & Koshal 1993: 195, 200, EARLY-MIDDLE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin; Misra & Kapoor 1994: 153, 159, pl 2, fig 33, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Saxena et al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Samant & Phadtare 1997: 46, pl 10, figs 3-4, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Aswal & Singh 2000: 123, THANETIAN and MIDDLE EOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh; Mehrotra et al. 2000: 153, PALAEOCENE-MIDDLE EOCENE (Basal Sandstone and Sylhet formations), Upper Assam; Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf; Srivastava & Bhattacharyya 2000: 375, pl 1, fig 8, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandal et al. 2003: 102, 104, pl 1, fig 16, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Proxapertites reticulatus (Kar & Saxena) Kar. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch Dis-

trict, Gujarat; Saxena *et* al. 1996: 21, pl 2, figs 11, 13, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Gupta *et* al. 2003: 211, pl 1, fig 2, PALAEOCENE-EOCENE, Ganga Basin.

Proxapertites rugulatus Samant & Phadtare 1997: 47, pl 10, fig 10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Proxapertites sp. Saxena & Misra 1990: 265, pl 1, fig 12, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Proxapertites sp. Kumar 1994: 77, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Proxapertites spp. Mehrotra *et* al. 2000: 153, LATE EOCENE (Kopili Formation), Upper Assam.

Proxapertites sp. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

PSEUDONOTHOFAGIDITES Venkatachala & Kar = *GANGAPOLLENITES* Mathur & Chopra, **STEPHANOPORITI.**

Pseudonothofagidites bengalensis (Mathur & Chopra) Samant & Phadtare 1997: 48, pl 10, figs 11-14, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 6, fig 1, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 129, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Gangapollenites bengalensis Mathur & Chopra 1987: 127, pl 5, fig 93, EARLY EOCENE, K-1 Well, Bengal Basin, West Bengal.

Pseudonothofagidites cerebrus Venkatachala & Kar. Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Kar *et* al. 1994: 186, pl 2, fig 18, TERTIARY, subsurface sediments in Upper Assam.

Pseudonothofagidites kutchensis Venkatachala & Kar. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Saxena 1991: 369, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar & Bhattacharya 1992: 252, pl 2, figs 14-15, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Shanmukhappa & Koshal 1993: 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin; Misra & Kapoor 1994: 159, pl 3, fig 53, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Saxena 1995: 99, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Pseudonothofagidites microreticulatus Samant & Tapaswi 2001: 126, pl 2, fig 8, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Pseudonothofagidites salujhaii in Misra & Kapoor 1994: 154, pl 3, fig 54, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Pseudonothofagidites septaporatus Saxena & Khare 2004: 75, 86, pl 2, figs 21-22, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Pseudonothofagidites spp. Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat.

Pseudonothofagidites sp. Aswal & Singh 2000: 124, MIDDLE EOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh.

Pseudonothofagidites sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

PSEUDONYSSAPOLLENITES Kar**, PTYCHOTRIPORINES.**

Pseudonyssapollenites kutchensis (Venkatachala & Kar) Kar. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Saxena 1991: 369, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar & Bhattacharya 1992: 252, pl 2, fig 9, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Saxena 1995: 99, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked); Mandal et al. 1996: 80, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

PSEUDOTRUDOPOLLIS Krutzsch in Góczán et al., **PTYCHOPOLYPORINES.**

Pseudotrudopollis sp. Misra & Kapoor 1994: 154, pl 3, fig 46, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

PSILADIPOROCOLPITES Kar, **DIPORINES.**

Psiladiporocolpites pachyexinus Kar 1995b: 383, pl 1, figs 7-10, 16-17, EARLY EOCENE (Palana Formation), Borehole core no. K 12 (Depth 134 m), around Kuchaur-Benia area, Bikaner District, Rajasthan; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Psiladiporocolpites. Sharma 2000: 54, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan.

PSILALACINITES Kar, **LAEVIGATI.**

Psilalacinites. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked).

PSILAPLICATES Kar & Bose, **LAEVIGATI.**

Psilaplicatus triangulus Bose & Kar. Kar 1990b: 239, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

PSILASTEPHANOCOLPITES Leidelmeyer**, POLYPTYCHES.**

Psilastephanocolpites elongatus Kumar & Takahashi 1991: 560-561, pl 1, fig 13, pl 2, fig 8, pl 17, fig 12, text-fig 8, EARLY OLIGOCENE and LATE LATE MIOCENE (Laisong and Bokabil formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 18-19, 32, pl 4, figs 17-18, pl 5, fig 5, pl 18, fig 8, EARLY-MIDDLE OLIGOCENE (Laisong and Jenam formations), Silchar-Haflong Road Section, Assam.

Psilastephanocolpites minutus Kumar & Takahashi 1991: 561, pl 18, fig 2, text-fig 9, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 32, 46, 83, 98, pl 17, figs 7, 12, pl 19, figs 6, 11, 16, pl 23, fig 17, pl 44, fig 21, pl 50, fig 5, MIDDLE-LATE OLIGOCENE and LATE MIOCENE-PLIOCENE (Jenam, Renji, Bokabil and Dupitila formations), Silchar-Haflong Road Section, Assam [Junior homonym of *Psilastephanocolpites minutus* (Salujha et al.) Saxena 1982].

Psilastephanocolpites pedaliaceoides in Misra & Kapoor 1994: 154, pl 3, fig 58, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Psilastephanocolpites psilatus Kar & Kumar. Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Psilastephanocolpites quadrangularis Saxena & Khare 2004: 75, 82, pl 1, fig 21, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Psilastephanocolpites rotatus (Kar & Bhattacharya) Samant & Phadtare 1997: 49, pl 10, figs 15-17, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Laevigatopolycolpites rotatus Kar & Bhattacharya 1992: 256, pl 1, figs 7, 16-17, 22, 27, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Kumar 1996: 112, pl 2, figs 5, 7, 21, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Psilastephanocolpites terminaliaformis (Biswas) Saxena. Kumar & Takahashi 1991: 561-562, pl 5, fig 6, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 33, pl 19, fig 19, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

cf. Psilastephanocolpites terminaliaformis (Biswas) Saxena. Kumar 1994: 83, pl 44, fig 26, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Psilastephanocolpites sp A. Kumar & Takahashi 1991: 562, pl 2, fig 12, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Psilastephanocolpites sp B. Kumar & Takahashi 1991: 562-563, pl 5, fig 7, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Psilastephanocolpites sp. Kar & Bhattacharya 1992: 257-258, pl 1, fig 13, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Psilastephanocolpites spp. Kumar 1994: 19, 33, 60, 93, pl 4, fig 15, pl 5, fig 8, pl 19, figs 1, 8, 18, EARLY-MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Laisong, Jenam, Bhuban and Tipam formations), Silchar-Haflong Road Section, Assam.

cf. Psilastephanocolpites spp. Kumar 1994: 19, 98, pl 5, fig 7, pl 50, fig 3, EARLY OLIGOCENE and LATE MIOCENE-PLIOCENE (Laisong and Dupitila formations), Silchar-Haflong Road Section, Assam.

Psilastephanocolpites sp. Saxena 2000c: 163, pl 1, fig 16, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

PSILASTEPHANOCOLPORITES Leidelmeyer, **PTYCHOPOLYPORINES.**

Psilastephanocolporites psilatus Kar & Kumar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 220, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Tripathi 1995: 47, pl 1, fig 10, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan.

PSILATRICOLPORITES van der Hammen ex Pierce**, PTYCHOTRIPORINES.**

Psilatricolporites cassioides Ramanujam. Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Psilatricolporites minor Ramanujam. Hait & Banerjee 1994: 116, pl 2, fig 27, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Psilatricolporites operculatus van der Hammen & Wijmstra. Ramanujam et al. 1991: 54, EARLY

MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Psilatricolporites sagittatus Samant & Phadtare 1997: 49, pl 10, fig 18, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 5, fig 7, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Psilatricolporites sahii Saxena & Khare 2004: 75, 82, pl 2, fig 5, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Psilatricolporites sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

PSILODIPORITES Varma & Rawat, **DIPORINES.**

Psilodiporites erdtmanii (Varma & Rawat) Venkatachala & Rawat. Kumar *et* al. 2001: 244, fig 6.10, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Psilodiporites hammenii Varma & Rawat. Rao 1990: 246, pl 3, fig 5, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Shanmukhappa & Koshal 1993: 200, 202, MIDDLE-LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin; Misra & Kapoor 1994: 154, 159, pl 3, figs 63-64, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Samant & Phadtare 1997: 50, pl 10, fig 19, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Aswal & Singh 2000: 122, 123, DANIAN, THANETIAN and MIDDLE EOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh; Mehrotra *et* al. 2000: 153, PALAEOCENE-EOCENE (Basal Sandstone, Sylhet and Kopili formations), Upper Assam; Mitra *et* al. 2000: 126, pl 2, fig 7, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Psilodiporites magnus in Samant 2000: 110, pl 5, fig 11, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat. *Nomen nudum.*

Psilodiporites sp. Rao & Rajendran 1996: 73, pl 2, fig 9, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala.

Psilodiporites sp. A. Samant 2000: 106, 108, pl 5, fig 10, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Psilodiporites sp. B. Samant 2000: 108, pl 5, fig 9, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Psilodiporites sp. Rao & Patnaik 2001: 277, pl 3, fig 11, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

PSILOSCHIZOSPORIS Jain**, MONOPTYCHES.**

Psiloschizosporis psilata Kar & Saxena. Kar 1990a: 176, pl 7, figs 106-108, pl 9, fig 135, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 236, 237, 240, EOCENE, MIDDLE OLIGOCENE-EARLY MIOCENE (Disang, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member,

Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Mandal *et* al. 1996: 80, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Kumar *et* al. 2001: 244, 245, OLIGOCENE and EARLY-MIDDLE MIOCENE (Barail Group and Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam.

Psiloschizosporis punctata Kar & Saxena. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Gupta *et* al. 2003: 211, pl 1, fig 7, PALAEOCENE-EOCENE, Ganga Basin.

Psiloschizosporis scabratus Kar. Kar 1990a: 181, pl 7, figs 101-105, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Psiloschizosporis sp. Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Psiloschizosporis sp. Dutta *et* al. 1998: 64, pl 1, fig 3, EARLY CRETACEOUS-LATE EOCENE-OLIGOCENE (Upper Disang-Lower Barail groups), Kohima District, Nagaland.

Pteridaceae spores. Kumar *et* al. 2000: 323, NEOGENE, Mahuadanr Valley, Palamu District, Jharkhand.

PTERIDACIDITES Sah, **CINGULATI.**

Pteridacidites africanus Sah. Ramanujam *et* al. 1991: 53, pl 1, figs 1-2, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Kar *et* al. 1994: 185, pl 1, fig 9, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Pteridacidites chandigarhensis Rao & Patnaik 2001: 274, 276, pl 1, figs 3-4, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Pteridacidites congoensis Sah. Rao *et* al. 1995: 372, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Pteridacidites fistulosus Sah. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 239, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam; Saxena & Misra 1990: 264, pl 3, fig 6, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Kumar *et* al. 2001: 245, LATE MIOCENE and MIO-PLIOCENE (Girujan Clay and Namsang formations), Tinali Well-7, Upper Assam.

Pteridacidites frequens in Kumar *et* al. 2001: 245, PLEISTOCENE (Dhekiajuli Formation), Tinali Well-7, Upper Assam. *Nomen nudum.*

Pteridacidites meghalayaensis Kar & Kumar. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Chakraborty 2004: 115, pl 1, fig 16, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Pteridacidites minor Kumar 1994: 74, pl 35, fig 11, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Pteridacidites robustus Kar & Kumar. Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin

Coalfield, Khasi Hills, Meghalaya; Hait & Banerjee 1994: 115, pl 1, fig 5, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Pteridacidites rotundus Sah. Kumar 1994: 101, pl 48, figs 1, 4, LATE MIOCENE -PLIOCENE (Dupitila Formation), Silchar-Haflong Road Section, Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Pteridacidites sahii Rao & Ramanujam. Saxena 2000c: 163, pl 1, figs 4-5, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

Pteridacidites triangulatus Sah. Ramanujam et al. 1991: 2, pl 1, figs 4-5, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Rao et al. 1993: 81, pl 1, fig 4, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Banerjee & Nandi 1994: 219, pl 1, fig 3, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Rao et al. 1995: 372, figs 6-7, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Samant & Phadtare 1997: 12, pl 2, fig 3, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Samant 2000: 114, pl 1, fig 6, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Pteridacidites tripuraensis Kar 1990a: 181, pl 3, figs 44-46, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Pteridacidites vermiverrucatus Sah. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Kar et al. 1994: 185, pl 2, fig 8, TERTIARY, subsurface sediments in Upper Assam; Rao 1995a: 327, pl 1, fig 8, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 12, pl 2, fig 10, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Mandaokar 2002b: 21, pl 1, fig 10, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Pteridacidites verrucatus Salujha et al. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (wrongly spelt as *Pteridacidites verrucus*); Salujha et al. 1991: 65, pl 1, fig 17, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Pteridacidites sp. Singh & Tripathi 1990: 329, pl 1, fig 5, MIOCENE (Siwalik sediments), Arunachal Pradesh.

?Pteridacidites sp. Kumar & Takahashi 1991: 599-600, pl 14, fig 9, EARLY LATE MIOCENE

(Upper Bhuban Formation), Silchar-Haflong Road Section, Assam.

Pteridacidites sp. Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Pteridacidites sp. Rao *et* al. 1993: 81, pl 1, figs 3, 5, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Pteridacidites sp. Kar *et* al. 1994: 185, pl 1, fig 17, TERTIARY, subsurface sediments in Upper Assam.

Pteridacidites spp. Kumar 1994: 64, 86, pl 29, fig 6, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Pteridacidites spp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE-EARLY PLIOCENE (Middle Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Pteridacidites sp. Sarkar *et* al. 1994: 201, pl 2, fig 4, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Pteridacidites sp. Mandal *et* al. 1996: 78, pl 1, fig 27, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

Pteridacidites sp. Saxena & Rao 1996: 50, pl 1, fig 13, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Pteridacidites sp. Chandra & Kumar 1998: 64, pl 2, fig 1, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Pteridacidites sp. Mandaokar 2000c: 43, pl 2, fig 11, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh.

Pteridacidites sp. Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

Pteridacidites. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh.

Pteridophytic spore 1. Rao & Rajendran 1996: 67, pl 1, fig 3, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala.

PTERIS (spore). Phadtare *et* al. 1994: 74, 75, pl 1, fig G, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

PUNCTATISPORITES Ibrahim, **LAEVIGATI.**

Punctatisporites sp. Trivedi & Saxena 2000: 273, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

QUERCOIPOLLENITES Potonié, **TRIPTYCHES**.

Quercoipollenites sp. Hait & Banerjee 1994: 115, pl 1, fig 12, EARLY MIOCENE, around Champhai, Mizoram.

QUILONIPOLLENITES Rao & Ramanujam, **MONOPTYCHES.**

Quilonipollenites minutus Samant & Phadtare 1997: 51-52, pl 10, figs 20-21, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Quilonipollenites ornatus Rao & Ramanujam. Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, fig 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Saxena 1991: 369, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Ramanujam *et* al. 1992: 21, fig 2F, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 81, EARLY MIOCENE, Thakkazhi

Borewell, Alleppey District, Kerala; Kar *et al.* 1994: 186, pl 2, figs 12-13, TERTIARY, subsurface sediments in Upper Assam; Rao *et al.* 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Saxena 1995: 99, fig 7, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Ramanujam *et al.* 1998c: 55, fig 7, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam *et al.* 1999: 35, pl 1, fig 4, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Saxena 2000c: 163, pl 1, fig 6, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Rao 2004: 125, pl 3, fig 5, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

Quilonipollenites reticulatus Samant & Phadtare 1997: 50, pl 11, figs 1-2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Quilonipollenites sahnii Rao & Ramanujam. Rao 1990: 246, pl 1, fig 16, pl 2, fig 22, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et al.* 1991: 53, pl 1, figs 7-9, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et al.* 1991: 3, pl 2, fig 2, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et al.* 1992: 21, fig 2G, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao 1995a: 327, pl 2, fig 3, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao 1996: 157, pl 1, fig 2, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 1, fig 15, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 52, pl 1, fig 11, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Ramanujam *et al.* 1998c: 55, fig 2, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh.

Quilonipollenites sp. cf Q. sahnii Rao & Ramanujam. Kumaran *et al.* 1995: 1025, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Quilonipollenites sp. Saxena & Misra 1990: 265, pl 1, fig 9, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Quilonipollenites sp. Kumaran *et al.* 1995: 1026, fig 4h, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Quilonipollenites sp. Ramanujam *et al.* 1999: 35, pl 1, figs 9-10, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Quilonipollenites sp. Saxena 2000c: 163, pl 1, fig 15, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

RACEMONOCOLPITES González Guzmán, **MONOPTYCHES.**

Racemonocolpites bhavnagarensis Samant 2000: 108, pl 5, fig 13, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Racemonocolpites romanus González Guzmán. Kar & Sharma 2001: 129, pl 4, fig 9, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Racemonocolpites thanjinathensis Mandal 1990: 326, pl 1, figs 5-10, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Chakraborty 2004: 115, pl 1, fig 10, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Racemonocolpites trichotomosulcatus Mandal 1990: 326, pl 1, figs 1-4, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya.

Racemonocolpites sp. Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam.

Racemonocolpites sp. Mandal 1997: 100, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

RADIIZONATES Staplin & Jansonius, **ZONATI.**

Radiizonates aligerens (Knox) Staplin & Jansonius. Misra & Kapoor 1994: 158, 159, pl 6, figs 101-102, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

Radiizonates concentricus in Misra & Kapoor 1994: 158, 160, pl 6, figs 110, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked). *Nomen nudum.*

Radiizonates faunus Smith & Butterworth. Misra & Kapoor 1994: 158, 160, pl 6, figs 109, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

Radiizonates genuinus (Jushko) Loboziak & Alpern. Misra & Kapoor 1994: 158, 160, pl 6, figs 100, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

RAISTRICKIA Schopf et al., **APICULATI.**

Raistrickia sp. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

RATARIACOLPORITES Kar, **PTYCHOTRIPORINES.**

Ratariacolporites plicatus Kar. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat.

RETIALETES Sah & Dutta (non Staplin 1960) = **ASSAMIALETES** Singh, **SUBPILONAPITI.**

Retialetes emendatus Sah & Dutta. Ramanujam et al. 1998c: 55, fig 1, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh.

RETIBACULIPOLYCOLPITES Kar & Sharma, **POLYPTYCHES.**

Retibaculipolycolpites baculatus Kar & Sharma 2001: 130, 135, pl 5, figs 6, 12, pl 6, fig 5, pl 7, figs 7, 9, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

RETIBREVITRICOLPITES van Hoeken-Klinkenberg, **TRIPTYCHES.**

Retibrevitricolpites macroreticulatus Kumar & Takahashi 1991: 563, pl 14, fig 8, text-fig 10, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 70, pl 38, fig 13, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Retibrevitricolpites simplex Rao & Ramanujam = **Foveotricolpites simplex** (Rao & Ramanujam) Mandal & Rao.

Retibrevitricolpites triangulatus van Hoeken-Klinkenberg. Kumar 1994: 33, pl 7, fig 6, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

RETICULOSPORIS Krutzsch, **MONOLETES.**

Reticulosporis spp. Kumar 1994: 40, 48, pl 12, figs 2, 5, pl 22, figs 1, 13, MIDDLE-LATE OLIGOCENE (Jenam and Renji formations), Silchar-Haflong Road Section, Assam.

?Reticulosporis sp. Kumar 1994: 64, pl 30, fig 15, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

RETIDIPOROCOLPITES Kar, **DIPORINES.**

Retidiporocolpites excellensus Kar 1995b: 384, pl 1, figs 11-12, EARLY EOCENE (Palana Formation), Borehole core no. K 12 (Depth 134 m), around Kuchaur-Benia area, Bikaner District, Rajasthan; Sharma 2000: 52, pl 1, figs 2-3, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Kar & Sharma 2001: 129, pl 3, figs 1, 3, 12, pl 5, fig 2, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Retidiporocolpites sp. Kar 1995b: 384, pl 1, figs 13-15, EARLY EOCENE (Palana Formation), Borehole core no. K 12 (Depth 134 m), around Kuchaur-Benia area, Bikaner District, Rajasthan.

RETIHEXACOLPITES Mathur, **POLYPTYCHES.**

Retihexacolpites medicolpatus Mathur. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

RETIINAPERTURITES Mathur, **SUBPILONAPITI.**

Retiinaperturites sp. Kumar et al. 2004: 158, pl 1, fig 2, NEOGENE and PLEISTOCENE, Site 218, Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean.

RETIMONOCOLPITES Pierce, **MONOPTYCHES.**

Retimonocolpites thanikaimonii Samant & Phadtare 1997: 52, pl 11, figs 3-6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 129, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

RETIMONOSULCITES Kar, **MONOPTYCHES.**

Retimonosulcites ellipticus (Venkatachala & Kar) Kar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Mandal et al. 1996: 80, pl 1, fig 22, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Retimonosulcites longus Kar & Bhattacharya 1992: 254, pl 1, figs 23, 33, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat.

Retimonosulcites ovatus (Sah & Kar) Kar. Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, pl 2, figs 36, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Retimonosulcites ramanujamii Rao & Rajendran 1996: 70, pl 3, figs 18-19, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

RETIOVOIPOLLIS Krutzsch, **MONOPORINES.**

Retiovoipollis sp. Kumar & Takahashi 1991: 563-564, pl 18, fig 16, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Retiovoipollis sp. Kumar 1994: 83, pl 44, fig 20, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

RETIPILONAPITES Ramanujam ex Potonié, **SUBPILONAPITI.**

Retipilonapites arcotense Ramanujam. Rao 1990: 246, pl 1, fig 3, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena 1995: 99, fig 20, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Chandra & Kumar 1998: 66, pl 2, figs 14, 17, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Tripathi et al. 2000: 245, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Retipilonapites barakensis Kumar & Takahashi 1991: 564, pl 6, figs 6, 10, text-fig 11, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 46, pl 23, figs 14, 15, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Retipilonapites cenozoicus Sah. Saxena & Rao 1996: 48, pl 2, fig 21, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Retipilonapites conspicua Rao & Ramanujam. Hait & Banerjee 1994: 115, pl 1, fig 11, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Retipilonapites delicatissimus Ramanujam. Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Retipilonapites tertiaris Rao & Ramanujam. Ramanujam et al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Retipilonapites sp. Saxena & Misra 1990: 265, pl 3, fig 9, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Retipilonapites sp. Ramanujam et al. 1992: 22, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Retipilonapites sp. Rao et al. 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

RETIPOLLENITES González Guzmán**, RETICULONAPITI.**

Retipollenites borassodendrii Samant & Phadtare 1997: 53-54, pl 11, figs 9-10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Retipollenites confusus González Guzmán. Kumar 1996: 112, pl 2, fig 9, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Samant & Phadtare 1997: 53, pl 11, figs 7-8, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 6, fig 2, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Saxena 2000c: 163, pl

2, fig 7, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Retipollenites echinulatus Samant & Phadtare 1997: 54, pl 11, figs 12-13, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Retipollenites laevigatus Saxena & Khare 2004: 75, 77, pl 1, fig 8, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Retipollenites monosulcites Samant & Phadtare 1997: 55, pl 11, figs 14-15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Retipollenites ramanujamii Saxena & Khare 2004: 75, 82, pl 1, fig 12, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Retipollenites sp. Rao 1995a: 328, pl 2, fig 4, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala.

RETISTEPHANOCOLPITES Leidelmeyer, **POLYPTYCHES.**

Retistephanocolpites arcotense (Ramanujam) Saxena 1982: 301

Stephanocolpites arcotense Ramanujam. Ramanujam *et* al. 1992: 22, fig 2P, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Retistephanocolpites assamicus Kumar 1994: 33, 99, pl 16, fig 5, pl 17, fig 11, pl 18, fig 4, pl 50, fig 7, MIDDLE OLIGOCENE and LATE MIOCENE-PLIOCENE (Jenam and Dupitila formations), Silchar-Haflong Road Section, Assam.

Retistephanocolpites brevicolpus Samant & Phadtare 1997: 56, pl 12, figs 6-10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 129, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Retistephanocolpites coromandeliensis Venkatachala & Rawat. Mandal & Vijaya 2004: 497, fig 5E, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Retistephanocolpites flavatus (Sah & Kar) Saxena. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Kar & Sharma 2001: 130, pl 6, fig 2, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Chakraborty 2004: 115, pl 1, fig 3, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Retistephanocolpites granulatus (Sah & Kar) Kar. Mandal 1997: 100, pl 1, figs 14, 23, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Kar & Sharma 2001: 130, pl 5, fig 1, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Chakraborty 2004: 116, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam (wrongly spelt as *Retistephanocolporites granulatus*)

Retistephanocolpites kutchensis Saxena. Kar & Bhattacharya 1992: 251, pl 2, fig 6, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Kar *et* al. 1994: 187, TERTIARY, subsurface sediments in Upper Assam; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Samant

& Phadtare 1997: 55-56, pl 12, figs 4-5, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Kar & Sharma 2001: 130, pl 6, fig 1, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Samant & Tapaswi 2001: 129, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Retistephanocolpites multirimatus (Dutta & Sah) Saxena. Singh 1990: 219-220, pl 1, fig 18, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Retistephanocolpites neogenicus Ramanujam. Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, fig 7, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 21, fig 2Q, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Retistephanocolpites psilatus in Misra & Kapoor 1994: 154, pl 3, fig 60, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

Retistephanocolpites williamsii Germeraad *et* al. Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat; Tripathi 1995: 47, pl 1, fig 14, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Phadtare & Samant 1996: 673, pl 1, figs 1-2, EARLY EOCENE (Rajpardi lignite), Rajpardi, Bharuch District, Gujarat; Samant & Phadtare 1997: 55, pl 12, figs 1-3, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 129, pl 2, fig 7, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Retistephanocolpites sp. Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Retistephanocolpites sp. Rao 1990: 248, pl 2, fig 11, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Retistephanocolpites sp. A. Kumar & Takahashi 1991: 565, pl 12, fig 15, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam.

Retistephanocolpites sp. B. Kumar & Takahashi 1991: 565, pl 5, fig 8, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Retistephanocolpites sp. C. Kumar & Takahashi 1991: 565-566, pl 6, fig 11, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Retistephanocolpites sp. Singh *et* al. 1992: 57, pl 2, fig 13, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Retistephanocolpites sp. A. Kumar 1994: 60, pl 33, fig 7, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Retistephanocolpites sp. B. Kumar 1994: 60, pl 33, fig 6, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Retistephanocolpites spp. Kumar 1994: 47, 71, pl 23, fig 7, LATE OLIGOCENE-MIDDLE MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam.

Retistephanocolpites sp. Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Retistephanocolpites sp. Misra *et* al. 1996: 95, 96, OLIGOCENE (Simsang Formation), Tura-Dalu Road near Kherapara, Garo Hills, Meghalaya.

Retistephanocolpites sp. Chandra & Kumar 1998: 67, pl 2, fig 5, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Retistephanocolpites sp. Tripathi *et* al. 2000: 246, pl 1, fig 13, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

RETISTEPHANOCOLPORITES van der Hammen & Wijmstra, **PTYCHOPOLYPORINES.**

Retistephanocolporites sp. Kumar 1996: 112, pl 1, fig 3, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Retistephanocolporites sp. Rao 1996: 157, pl 1, figs 17-18, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala.

RETITETRABREVICOLPORITES Kar, **PTYCHOPOLYPORINES.**

Retitetrabrevicolporites globatus (Venkatachala & Kar) Kar. Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Mandal 1997: 99, pl 1, fig 16, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Kar & Sharma 2001: 130, pl 5, fig 8, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

RETITETRACOLPITES Mathur, **POLYPTYCHES.**

Retitetracolpites medicolpus Mathur & Jain. Samant & Phadtare 1997: 56, pl 12, figs 11-12, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 5, fig 3, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 129, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

RETITETRADITES Kar, **TETRADITES.**

Retitetradites nairii Kar 1995a: 168, pl 1, figs 8-9, EARLY EOCENE, Borehole core no. K-12 at Kuchaur-Benia area, Bikaner District, Rajasthan.

RETITRESCOLPITES Sah, **PROLATI.**

Retitrescolpites africanus Sah. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kumar *et* al. 2001: 245, fig 6.9, PLEISTOCENE (Dhekiajuli Formation), Tinali Well-7, Upper Assam.

Retitrescolpites bellus Sah. Kar *et* al. 1994: 186, pl 2, fig 9, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 181, pl 2, fig 26, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

Retitrescolpites crassimurus Sah. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Hait & Banerjee 1994: 116, pl 2, fig 30, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Saxena 1995: 98, figs 12, 23, 40, 49, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Mandaokar 2000b: 181, pl 2, figs 2, 8, 25, OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Tripathi *et* al. 2000: 245, pl 1, fig 9, EARLY EOCENE (Tura Forma-

tion), Tura-Dalu Road, West Garo Hills District, Meghalaya; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Retitrescolpites decipiens Sah. Kar et al. 1994: 186, pl 1, figs 15, 24, TERTIARY, subsurface sediments in Upper Assam; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Retitrescolpites horridus (Salujha et al.) Mandal & Rao 2001: 357.

Tricolpites horridus Salujha et al. Salujha et al. 1991: 66, pl 2, fig 44, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Retitrescolpites indicus Rao & Ramanujam = **Retitrescolpites megareticulatus** (Mathur) Mandal & Rao.

Retitrescolpites megareticulatus (Mathur) Mandal & Rao 2001: 357.

Retitricolpites megareticulatus Mathur 1966: 41, pl 1, fig 19, PALAEOCENE (Supratrappeans), Kutch District, Gujarat.

Retitrescolpites indicus Rao & Ramanujam. Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, pl 2, fig 19, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Retitrescolpites oblongus Sah. Kar et al. 1994: 186, pl 2, fig 32, TERTIARY, subsurface sediments in Upper Assam; Saxena 2000c: 163, pl 1, figs 12, 17, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Retitrescolpites ornatus Sah. Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh.

Retitrescolpites singularis Rao & Ramanujam. Rao 1990: 246, pl 2, fig 13, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Retitrescolpites splendens Sah. Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Retitrescolpites typicus Sah. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Mandaokar 1993: 139, pl 2, fig 17, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 183, pl 2, fig 41, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper

Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Retitrescolpites sp. Kar 1990a: 190, 192, pl 5, figs 74-75, pl 6, fig 98, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Retitrescolpites spp. A-B. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Retitrescolpites spp. Kar 1990b: 236, 237, MIDDLE-LATE OLIGOCENE (Jenam and Renji formations), Silchar-Haflong Road Section, Assam.

Retitrescolpites sp. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya.

Retitrescolpites sp. Singh *et* al. 1992: 56, pl 1, fig 14, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Retitrescolpites sp. Rao *et* al. 1993: 82, pl 1, fig 17, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Retitrescolpites sp. 1. Saxena 1995: 102, fig 47, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

Retitrescolpites sp. Rao & Nair 1998: 53, pl 1, fig 10, MIOCENE, Kundra Clay Mine Section, Quilon District, Kerala.

Retitrescolpites sp. Mandaokar 2000b: 183, pl 2, fig 24, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Retitrescolpites sp. Rao & Patnaik 2001: 277, pl 2, fig 9, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

RETITRIBREVICOLPORITES Kar = **TRICOLPOROPOLLIS** Dutta & Sah, **PTYCHOTRIPORINES.**

Retitribrevicolporites decorus (Dutta & Sah) Kar & Kumar = **Tricolporopollis decorus** Dutta & Sah.

Retitribrevicolporites foveolatus Samant 2000: 108, pl 6, fig 3, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Retitribrevicolporites matanomadhensis (Venkatachala & Kar) Kar = **Tricolporopollis matanomadhensis** (Venkatachala & Kar) Tripathi & Singh.

Retitribrevicolporites ruber (Dutta & Sah) Kar & Kumar = **Tricolporopollis ruber** Dutta & Sah.

RETITRICOLPITES (van der Hammen) Pierce, **TRIPTYCHES.**

Retitricolpites crassireticulatus (Dutta & Sah) Samant & Phadtare 1997: 57, pl 12, figs 16-18, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 5, fig 8, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 129, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Retitricolpites delicatus Kar = **Tricolpites delicatus** (Kar) Mandal & Rao.

Retitricolpites dipterocarpoides Rao & Ramanujam = **Dipterocarpuspollenites retipilatus** Kar.

Retitricolpites medireticulatus Mathur = **Albertipollenites medireticulatus** (Mathur) Mandal & Rao.

Retitricolpites megareticulatus Mathur = **Retitrescolpites megareticulatus** (Mathur) Mandal & Rao.

Reticolpites ramanujamii Saxena & Khare 2004: 75, 82, pl 1, fig 12, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Retitricolpites robustus Sah & Kar = **Albertipollenites robustus** (Sah & Kar) Mandal & Rao.

Retitricolpites singhii Tripathi *et* al. 2000: 245, pl 1, figs 6-7, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Retitricolpites singhii Saxena & Khare 2004: 75, 82, pl 1, fig 5, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu. (Junior homonym of *Retitricolpites singhii* Tripathi *et* al. 2000)

Retitricolpites sitholeyi Ramanujam = **Rousea sitholeyi** (Ramanujam) Mandal & Rao.

Retitricolpites sp. Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Rekmangiri Coalfield, Garo Hills, Meghalaya.

RETITRICOLPORITES (van der Hammen) van der Hammen & Wijmstra, **PROLATI.**

Retitricolporites crassioratus Rao & Ramanujam. Rao 1990: 246, pl 2, fig 7, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Kumaran *et* al. 1995: 1025, fig 3d, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Retitricolporites ghoshii Ramanujam = **Margocolporites ghoshii** (Ramanujam) Saxena & Khare.

Retitricolporites guianensis van der Hammen & Wijmstra. Hait & Banerjee 1994: 116, pl 2, fig 23, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Mitra *et* al. 2000: 126, pl 1, fig 25, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Retitricolporites cf. guianensis van der Hammen & Wijmstra. Mandal & Kumar 2000: 204, pl 2, fig 3, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam.

Retitricolporites minor Saxena & Khare 2004: 75, pl 1, fig 18, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Retitricolporites sitholeyi (Ramanujam) Varma *et* al. Ramanujam *et* al. 1991: 54, pl 1, fig 13, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1992: 22, fig 2T, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 82, pl 1, fig 19, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Rao *et* al. 1995: 374, fig 23, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Retitricolporites subcircularis Saxena & Misra 1990: 266, pl 1, fig 11, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Retitricolporites sp. Rao 1990: 248, pl 3, fig 29, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Retitricolporites sp. Kumar 1994: 93, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

cf. Retitricolporites spp. Kumar 1994: 19, 60, pl 4, fig 2, pl 33, fig 8, EARLY OLIGOCENE and EARLY-MIDDLE MIOCENE (Laisong and Bhuban formations), Silchar-Haflong Road Section, Assam.

Retitricolporites sp. Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Retitricolporites spp. Misra & Kapoor 1994: 150, MIDDLE MIOCENE-EARLY PLIOCENE (Middle Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Retitricolporites sp. Rao 1995a: 328, pl 2, figs 6-7, EOCENE-EARLY MIOCENE, Nirkunnam Borehole, Alleppey District, Kerala.

Retitricolporites sp. Rao 1996: 157, pl 1, fig 5, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala.

Retitricolporites sp. Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram.

Retitricolporites sp. 1. Trivedi & Saxena 2000: 275, pl 1, fig 6, pl 2, fig 10, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

Retitricolporites sp. 2. Trivedi & Saxena 2000: 275, pl 1, fig 10, pl 2, fig 11, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

Retitricolporites sp. Saxena & Khare 2004: 75, 83, pl 1, fig 15, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

RETITRICOLPOROIDITES Mathur, **PTYCHOTRIPORINES.**

Retitricolporoidites ovalis Mathur & Chopra. Mandal & Vijaya 2004: 497, fig 5D, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

RETITRILATIPORITES Misra *et* al., **TRIPORINES.**

Retitrilatiporites kutchensis (Venkatachala & Kar) Misra *et* al. 1996: 343, 345, pl 4, figs 3-4, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Trilatiporites kutchensis Venkatachala & Kar. Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Retitrilatiporites matanomadhensis Misra *et* al. 1996: 347, pl 4, figs 5-11, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Retitrilatiporites minutus (Sah & Kar) Misra *et* al. 1996: 345, 347, pl 3, figs 11-14, pl 4, figs 1-2, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Trilatiporites minutus Sah & Kar 1970: 138, pl 2, fig 40, EARLY EOCENE (Laki Series), Kutch District, Gujarat.

RETITRILETES Pierce, **MURORNATI.**

Retitriletes sp. Kumar & Takahashi 1991: 600, pl 17, fig 8, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Retitriletes spp. Kumar 1994: 86, 101, pl 40, fig 10, pl 50, fig 9, LATE MIOCENE-PLIOCENE (Bokabil and Dupitila formations), Silchar-Haflong Road Section, Assam.

RETITRIPORITES (van der Hammen) Pierce, **TRIPORINES.**

Retitriporites quilonensis Ramanujam. Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1992: 22, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao 1995a: 328, EOCENE-EARLY MIOCENE, Nirkunnam Borehole, Alleppey District, Kerala.

Retitriporites sp. Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

RETITRISYNCOLPITES Mandal *et* al., **TRIPTYCHES.**

Retitrisyncolpites reimannii Mandal *et* al. 1994: 211, pl 1, figs 1-2, 15, EARLY EOCENE, Kadamtala, Andaman and Nicobar Islands; Mandal *et* al. 1996: 80, pl 1, fig 4, MIDDLE-LATE EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandal *et* al. 2003: 102, 104, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

Retitrisyncolpites thaungii Mandal *et* al. 1994: 211, pl 1, figs 3, 9, 13, EARLY EOCENE, Kadamtala, Andaman and Nicobar Islands; Mandal *et* al. 1996: 80, pl 1, fig 11, MIDDLE-LATE EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandal *et* al. 2003: 102, pl 1, fig 4, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

Retitrisyncolpites sp. Mandal *et* al. 1994: 211, pl 1, fig 10, EARLY EOCENE Kadamtala, Andaman and Nicobar Islands.

Retitrisyncolpites sp. Mandal *et* al. 1996: 80, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

RETIVERRUMONOSULCITES Tripathi, **MONOPTYCHES.**

Retiverrumonosulcites barmerensis Tripathi 1994: 63, pl 2, figs 1-4, EARLY PALAEOGENE, Well MJ-4 (Depth 160 m from ground level), Jalipa, Barmer District, Rajasthan; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

RHIZOMASPORA Wilson, **STRIARETICULOIDITI.**

Rhizomaspora costa Venkatachala & Kar. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked); Trivedi 1991: 67, LATE EOCENE (Kopili Formation), 136 km post from Shillong, Jowai-Badarpur Road, Jaintia Hills District, Meghalaya (Reworked).

Rhizomaspora radiata Wilson. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam (Reworked).

Rhizomaspora sp. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked).

Rhizomaspora sp. Singh *et* al. 1991: 42, pl 1, figs 4-5, OLIGOCENE-EARLY MIOCENE (Barail and Surma Groups), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Rhizophoraceae (Zonocostites) type pollen grains. Kumaran *et* al. 1995: 1025, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

RHOIPITES Wodehouse, **PROLATI.**

Rhoipites anacardioides Ramanujam. Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1992: 22, fig 2V, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Hait & Banerjee 1994: 116, pl 2, fig 17, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Rao *et* al. 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Rao & Nair 1998: 53, pl 1, fig 6, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Rhoipites bradleyi Wodehouse. Hait & Banerjee 1994: 116, pl 2, fig 18, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Rhoipites cauveriensis Venkatachala & Rawat. Rao *et* al. 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Rhoipites communis Sah. Banerjee & Nandi 1994: 219, pl 1, fig 26, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

Rhoipites conatus Venkatachala & Rawat. Shanmukhappa & Koshal 1993: 201, 202, MIDDLE-LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Rhoipites dubius Sah. Kumar & Takahashi 1991: 566, pl 6, fig 15, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 47, pl 23, fig 20, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Rhoipites kutchensis Venkatachala & Kar. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Mandaokar 1993: 139, pl 1, fig 2, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Hait & Banerjee 1994: 116, pl 2, fig 20, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Kar *et* al. 1994: 187, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandal 1997: 99, pl 1, fig 12, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Mandaokar 2000b: 181, pl 1, fig 36, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

Rhoipites nitidus Sah & Dutta. Mitra *et* al. 2000: 126, pl 1, fig 33, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Rhoipites psilatus Sah. Mandaokar 1993: 139, pl 1, fig 5, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Hait & Banerjee 1994: 116, pl 2, fig 19, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Rhoipites sp. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Rhoipites sp. A. Kumar & Takahashi 1991: 566, pl 5, fig 13, MIDDLE OLIGOCENE (Jenam, Formation), Silchar-Haflong Road Section, Assam.

Rhoipites sp. B. Kumar & Takahashi 1991: 566-567, pl 5, fig 15, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

?Rhoipites sp. Kumar & Takahashi 1991: 567, pl 6, fig 16, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Rhoipites sp. Kar & Bhattacharya 1992: 252, pl 2, figs 23, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Rhoipites sp. Kumar 1994: 13, pl 1, fig 13, LATE CRETACEOUS-EOCENE (Disang Formation), Silchar-Haflong Road Section, Assam.

Rhoipites sp. A. Kumar 1994: 34, pl 18, fig 3, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

cf. Rhoipites sp. Kumar 1994: 61, pl 33, fig 20, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Rhoipites sp. Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Rhoipites sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

Rhoipites sp. Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

ROUSEA Srivastava, **TRIPTYCHES.**

Rousea globus (Dutta & Sah) Mandal & Rao 2001: 360.

Tricolpites globus Dutta & Sah. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya.

Rousea matanomadhensis (Saxena) Mandal & Rao 2001: 360-361, pl 1, figs 10-11.

Tricolpites matanomadhensis Saxena. Rao 1990: 248, pl 3, fig 26, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Rao 1995a: 328, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena *et* al. 1996: 21, pl 2, fig 9, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandaokar 2000c: 43, pl 1, fig 19, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 295, pl 1, fig 15, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 245, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Rousea meghalayaensis Mandal & Rao 2001: 361, pl 5, fig 1, LATE PALAEOCENE (Lakadong Sandstone), Upper Cherrapunji, Meghalaya.

Rousea saxenae Mandal & Rao 2001: 361, pl 5, figs 12-14, LATE PALAEOCENE (Matanomadh Formation), Matanomadh, Kutch District, Gujarat.

Rousea sitholeyi (Ramanujam) Mandal & Rao 2001: 361.

Retitricolpites sitholeyi Ramanujam 1966: 163, pl 2, fig 30, MIOCENE (Neyveli Lignite), South Arcot District, Tamil Nadu.

ROUSEISPORITES Pocock, **HILATES.**

Rouseisporites reticulates Pocock. Kumar *et* al. 2004: 160, pl 1, fig 14, NEOGENE and PLEISTOCENE, Site 218, Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean (Reworked).

Rouseisporites sp. Saxena & Rao 1996: 48, pl 3, fig 9, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya (Reworked).

Rouseisporites sp. Chandra & Kumar 1998: 62, pl 1, figs 3, 6, pl 2, fig 7, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean (Reworked).

Rouseisporites sp. Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya (Reworked).

RUBIACEAE (pollen). Phadtare *et* al. 1994: 74, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

RUSIZIA Sah, **ALETES.**

Rusizia kivuensis Sah. Salujha *et* al. 1991: 66, pl 1, fig 29, NEOGENE, Adamtila Well-A, Cachar District, Assam.

SAHNITES Pant, **VESICULOMONORADITI.**

Sahnites sp. Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

SANTALACIDITES Stelmak in Pokrovskaya & Stelmak**, TRIPORINES.**

Santalacidites santaloides Stelmak in Pokrovskaya & Stelmak. Kumar 1994: 93, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

SAPOTACEOIDAEPOLLENITES Potonié *et* al. *ex* Potonié, **PTYCHOPOLYPORINES.**

Sapotaceoidaepollenites africanus Sah. Ramanujam *et* al. 1991: 54, pl 1, fig 18, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, fig 12, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 22, fig 3G, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Sapotaceoidaepollenites cauveriensis Saxena 1993: 196.

Sapotaceoidaepollenites obscurus (Pflug & Thomson in Thomson & Pflug) Venkatachala & Rawat 1973: 246, pl 4, figs 23-24, OLIGOCENE-MIOCENE, Cauvery Basin, Tamil Nadu.

Tetracolporopollenites obscurus Pflug & Thomson in Thomson & Pflug 1953, pl 14, fig 86-99, 102-108.

Sapotaceoidaepollenites communis Sah. Mitra *et* al. 2000: 126, pl 1, fig 29, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Sapotaceoidaepollenites keralaensis Rao & Ramanujam. Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, pl 2, fig 11, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam *et* al. 1992: 22, fig 3F, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao *et* al. 1993: 82, pl 1, fig 23, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Rao *et* al. 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Sapotaceoidaepollenites neyvelii Ramanujam. Ramanujam *et* al. 1991: 54, pl 1, fig 16, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala (wrongly spelt as *Sapotaceoidaepollenites neyveliensis*); Ramanujam *et* al. 1992: 22, figs 3D, E, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala (wrongly spelt as *Sapotaceoidaepollenites neyveliensis*); Rao *et* al. 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala (wrongly spelt as *Sapotaceoidaepollenites neyveliensis*); Rao *et* al. 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam,

Kottayam District, Kerala (wrongly spelt as *Sapotaceoidaepollenites neyveliensis*).

Sapotaceoidaepollenites oblongatus Venkatachala & Rawat. Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

Sapotaceoidaepollenites oblongus Venkatachala & Rawat. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Sapotaceoidaepollenites obscurus Sah. Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Sapotaceoidaepollenites obscurus (Pflug & Thomson in Thomson & Pflug) Venkatachala & Rawat (non Sah 1967) = **Sapotaceoidaepollenites cauveriensis** Saxena.

Sapotaceoidaepollenites sp. Kumar 1994: 93, LATE MIOCENE-PLIOCENE (Tipam Formation), Silchar-Haflong Road Section, Assam.

Sapotaceoidaepollenites sp. Misra & Kapoor 1994: 155, EARLY MIOCENE (Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Sapotaceoidaepollenites sp. Kumar *et* al. 2001: 250, fig 6.5, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

SASTRIIPOLLENITES Venkatachala & Kar**, PROLATI.**

Sastriipollenites trilobatus Venkatachala & Kar. Rao 1990: 248, pl 2, figs 1-2, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Rao 1995a: 328, pl 2, fig 11, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Kumar 1996: 112, pl 1, fig 15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandal *et* al. 1996: 80, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

SAXONIPOLLIS Krutzsch, **TETRADITES.**

Saxonipollis saxonicus Krutzsch. Samant & Phadtare 1997: 58, pl 13, figs 1-2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

SCABRASTEPHANOCOLPITES van der Hammen & Garcia de Mutis, **POLYPTYCHES.**

Scabrastephanocolpites ornatus Kumar 1994: 71, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Scabrastephanocolpites ovatus Kumar & Takahashi 1991: 567-568, pl 5, figs 2, 4, text-fig 12, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 34, 61, pl 17, figs 3, 13, pl 19, figs 10, 20, pl 33, fig 18, MIDDLE OLIGOCENE and EARLY-MIDDLE MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam.

SCANTIGRANULITES Kar, **APICULATI.**

Scantigranulites sparsus Kar. Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Scantigranulites sp. Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam.

SCHEURINGIPOLLENITES Tiwari, **DISACCITES.**

Scheuringipollenites maximus (Hart) Tiwari. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Singh *et* al. 1991: 42, pl 2, figs 11-12, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked); Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya (Reworked); Mandal *et* al. 2003: 100, 102, pl 3, fig 10, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Scheuringipollenites tentulus Tiwari. Kar 1990a: 180, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

SCHIZAEACEAESPORITES Baksi, **MURORNATI.**

Schizaeaceaesporites knoxii Baksi. Misra *et* al. 1996: 95, OLIGOCENE (Simsang Formation), Tura-Dalu Road near Kherapara, Garo Hills, Meghalaya.

Schizaeaceaesporites spp. Misra & Kapoor 1994: 150, EARLY and MIDDLE MIOCENE (Upper Dharmsala and Lower Siwalik)), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

SCHIZAEOISPORITES Potonié *ex* Delcourt & Sprumont, **ORNATI.**

Schizaeoisporites crassimurus Dutta & Sah. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Mandaokar 1993: 139, pl 2, fig 8, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 45, pl 2, fig 13, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

Schizaeoisporites digitatoides (Cookson) Potonié. Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Schizaeoisporites eocenicus (Selling) Potonié. Misra & Kapoor 1994: 152, 155, 159, pl 1, figs 2-3, PALAEOCENE-EARLY EOCENE and MIDDLE EOCENE (Subathu and Basal Dharmsala and Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

Schizaeoisporites grandiformis Ramanujam. Singh *et* al. 1992: 56, pl 1, fig 5, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Schizaeoisporites minimus Ramanujam. Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Schizaeoisporites multistriatus Rao & Ramanujam. Ramanujam *et* al. 1991: 53, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala;

Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Rao *et al.* 1995: 372, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala; Samant & Phadtare 1997: 12, pl 2, fig 4, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 104, pl 1, fig 14, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Schizaeoisporites palanaensis Sah & Kar. Kar & Sharma 2001: 129, pl 1, figs 11-12, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Schizaeoisporites perforatus Naskar & Baksi. Ramanujam *et al.* 1991: 3, pl 1, fig 17, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Schizaeoisporites phaseolus Delcourt & Sprumont. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Mandal *et al.* 1996: 80, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram.

Schizaeoisporites sahii Samant & Phadtare 1997: 12-13, pl 2, fig 5, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Schizaeoisporites sinuata Ramanujam. Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Schizaeoisporites suratensis Samant & Tapaswi 2001: 123, pl 1, fig 3, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Schizaeoisporites sp. Kar 1990a: 182, pl 1, fig 20, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Schizaeoisporites spp. A-B. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Schizaeoisporites sp. Saxena & Bhattacharyya 1990: 110, pl 1, fig 9, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad and Manjhi Khad sections near Dharmsala, Kangra District, Himachal Pradesh.

Schizaeoisporites sp. A. Kar & Bhattacharya 1992: 257, pl 1, fig 26, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Schizaeoisporites sp. B. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Schizaeoisporites sp. Rao *et al.* 1993: 81, pl 1, fig 22, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Schizaeoisporites spp. Kumar 1994: 40, 101, pl 7, fig 8, pl 47, fig 8, pl 48, figs 6, 8, pl 49, fig 3, MIDDLE OLIGOCENE and LATE MIOCENE-PLIOCENE (Jenam and Dupitila formations), Silchar-Haflong Road Section, Assam.

Schizaeoisporites sp. Chandra & Kumar 1998: 64-65, pl 2, fig 6, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Schizaeoisporites sp. Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi

area, Thanjavur District, Cauvery Basin, Tamil Nadu.

Schizaeoisporites. Sharma 2000: 54, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan.

SCHIZOSPORIS Cookson & Dettmann, **INCERTAE SEDIS.**

Schizosporis crassimurus Sah & Dutta = **Assamialetes crassimurus** (Sah & Dutta) Singh & Tripathi.

SCROBICULATRICOLPORITES Singh & Misra, **PTYCHOTRIPORINES.**

Scrobiculatricolporites undulatus Singh & Misra 1991a: 63, pl 1, figs 14-20, text-fig 1, MIOCENE (Cuddalore Formation), Borehole No. NLE-35, Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh et al. 1992: 56, pl 1, fig 16, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Kumar 1996: 112, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

SEMIOCULOPOLLIS Góczán et al., **TRIPORINES.**

Semioculopollis verrucosa Christopher. Gupta et al. 2003: 591, fig 3d, PALAEOGENE, Ganga Basin.

SENIASPORITES Sah & Kar, **SCULPTATO-MONOLETI.**

Seniasporites eocenicus Sah & Kar. Kar et al. 1994: 185, pl 1, fig 4, TERTIARY, subsurface sediments in Upper Assam.

Seniasporites minutus Sah & Kar. Kar et al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1995: 26, pl 1, figs 9, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Seniasporites verrucosus Sah & Kar. Kar 1990a: 182, 184, pl 1, fig 15, pl 2, fig 41, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Mandaokar 1995: 25-26, pl 1, figs 30, 46, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam; Chakraborty 2004: 115, pl 1, fig 18, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Seniasporites sp. Kar 1990a: 176, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Seniasporites sp. Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Seniasporites sp. Mandaokar 1995: 26, pl 1, fig 13, OLIGOCENE, Ledo Colliery, Makum Coalfield, Tinsukia District, Assam.

SESTROSPORITES Dettmann, **TRICRASSATI.**

Sestrosporites dettmanniae Dutta & Sah. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

SIMPLIBACULATEPOLLIS Kar & Sharma, **POLYPTYCHES.**

Simplibaculatepollis aerolatus Kar & Sharma 2001: 130, 136, pl 7, figs 2, 13, 14, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Simplibaculatepollis bithnokensis Kar & Sharma 2001: 130, 136, pl 7, figs 4, 11, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

SONNERATIOIPOLLIS Venkatachala & Kar**, TRIPORINES.**

Sonneratioipollis bellus Venkatachala & Kar. Kumar *et al.* 2001: 244, fig 6.6, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

SPARGANIACEAEPOLLENITES Thiergart, **MONOPORINES.**

Sparganiaceaepollenites polygonalis Thiergart. Hait & Banerjee 1994: 117, pl 3, fig 42, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl and around Champhai, Mizoram; Kumar 1994: 34, pl 20, fig 15, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Sparganiaceaepollenites sp. Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram.

SPHAGNUMSPORITES Raatz ex Potonié**, LAEVIGATI.**

Sphagnumsporites sp. Kumar 1994: 40, pl 17, fig 10, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

SPHEROCOLPITES in Misra & Kapoor. *Nomen nudum.*

Spherocolpites indicus in Misra & Kapoor 1994: 157, pl 5, fig 95, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

SPINAINAPERTURITES Pierce, **RETICULONAPITI.**

Spinainaperturites conatus Venkatachala & Rawat. Tripathi *et al.* 2000: 245, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Spinainaperturites densispinus Venkatachala & Rawat. Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Spinainaperturites horridus Venkatachala & Rawat. Saxena & Khare 2004: 75, pl 1, fig 18, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Spinainaperturites longispinosus Salujha *et al.* Salujha *et al.* 1991: 66, pl 1, figs 32-33, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Spinainaperturites minutus Venkatachala & Rawat. Salujha *et al.* 1991: 66, pl 1, figs 30-31, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Spinainaperturites spp. Kumar 1994: 52, 61, 71, pl 24, figs 13, 18, pl 26, fig 6, pl 27, fig 10, pl 31, fig 5, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

?Spinainaperturites sp. Kumar 1994: 83, pl 43, fig 15, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

SPINITETRADOCOLPORITES Kar & Sharma, **PTYCHOPOLYPORINES.**

Spinitetradocolporites spinosus Kar & Sharma 2001: 130, 140, pl 5, figs 5, 10, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

SPINIZONOCOLPITES Muller, **MONOPTYCHES.**

Spinizonocolpites adamanteus Fredriksen. Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Spinizonocolpites baculatus Muller. Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Banerjee & Nandi 1994: 219, pl 1, fig 22, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Mandal *et* al. 1996: 80, pl 1, fig 14, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandal 1997: 100, pl 1, fig 21, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandal *et* al. 2003: 104, pl 1, fig 9, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Tripathi *et* al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Spinizonocolpites brevispinosus in Mitra *et* al. 2000: 126, pl 1, fig 20, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya. *Nomen nudum.*

Spinizonocolpites bulbospinosus Singh 1990: 226, pl 1, figs 3, 6, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Saxena & Rao 1996: 48, pl 2, fig 6, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Spinizonocolpites duplispinosus Ambwani 1993: 158, fig 5D, PALAEOCENE-EARLY EOCENE, Rekmangiri Coalfield, Garo Hills, Meghalaya.

Spinizonocolpites echinatus Muller. Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 219, pl 2, fig 16, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked); Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 1, 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Mandaokar 1993: 139, pl 1, fig 36, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 186, pl 2, fig 10, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandal *et* al. 1996: 80, pl 1, fig 17, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 42, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Samant & Phadtare 1997: 58, pl 13, figs 3-4, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Ramanujam *et* al. 1998c: 55, fig 4, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh; Ramanujam *et* al. 1999: 35, pl 2, fig 36, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 181, pl 2, fig 13, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 15, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Pundeer & Mehrotra 2000: 141,

THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf; Rao 2000: 295, pl 1, fig 10, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Sharma 2000: 52, pl 1, fig 5, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Trivedi & Saxena 2000: 275, pl 1, fig 1, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Samant & Tapaswi 2001: 129, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, pl 1, fig 15, pl 2, fig 2, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Singh & Kar 2002: 214, pl 1, fig 2, PALAEOCENE (Deccan Intertrappean Beds), 3 km northeast of Papro village, Latitpur District, Uttar Pradesh; Kapoor *et al.* 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Singh & Kar 2003: 219, pl 2, fig 1, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Chakraborty 2004: 116, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Spinizonocolpites indicus Singh 1990: 226, pl 2, figs 1-2, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Spinizonocolpites intrarugulatus Muller *et al.* Singh 1990: 219, pl 2, fig 4, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Spinizonocolpites prominatus (McIntyre) Stover & Evans. Samant 2000: 114, pl 6, fig 5, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Spinizonocolpites quilonensis Rao & Ramanujam. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Ramanujam *et al.* 1998c: 55, fig 5, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh.

Spinizonocolpites thanikaimonii Samant & Phadtare 1997: 58-59, pl 13, fig 5, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Spinizonocolpites venkatachalae Saxena & Khare 2004: 75, 78, pl 1, figs 4, 23, pl 2, fig 9, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Spinizonocolpites wodehousei Singh 1990: 225, pl 1, figs 14-15, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Spinizonocolpites sp. A. Singh 1990: 226, pl 2, fig 5, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya.

Spinizonocolpites sp. Rao *et al.* 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Spinizonocolpites spp. Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Spinizonocolpites sp. Rao *et al.* 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Spinizonocolpites sp. Ramanujam *et al.* 1999: 39, pl 2, fig 35, MIOCENE, South Arcot and Thanjavur districts, Tamil Nadu.

Spinizonocolpites spp. Mehrotra et al. 2000: 153, PALAEOCENE-MIDDLE EOCENE (Basal Sandstone and Sylhet formations), Upper Assam.

Spinizonocolpites sp. Kapoor et al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Spinizonocolpites sp. Singh & Kar 2003: 219, pl 2, fig 3, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

SPINOMONOSULCITES Singh & Misra, **MONOPTYCHES.**

Spinomonosulcites achinatus (Sah & Kar) Singh & Misra 1991c: 223.

Neocouperipollis achinatus (Sah & Kar) Kar & Kumar. Kar 1990b: 232, 233, 236, EOCENE-MIDDLE OLIGOCENE (Disang, Laisong and Jenam formations), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya (wrongly spelt as *Neocouperipollis echinatus*); Singh 1990: 219, pl 2, fig 7, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya (wrongly spelt as *Neocouperipollis echinatus*); Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam, Meghalaya (wrongly spelt as *Neocouperipollis echinatus*; Reworked); Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Ambwani 1993: 157, 161, PALAEOCENE-EARLY EOCENE, Seam Nos. 1 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya (wrongly spelt as *Neocouperipollis echinatus*); Mandaokar 1993: 139, pl 1, fig 15, pl 2, fig 30, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam (wrongly spelt as *Neocouperipollis echinatus*); Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 181, pl 2, fig 18, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Couperipollis achinatus Sah & Kar. Misra & Kapoor 1994: 159, pl 2, fig 37, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (wrongly spelt as *Couperipollis echinatus)*.

Spinomonosulcites ankleshwarensis (Kar & Bhattacharya) Samant & Phadtare 1997: 59-60, pl 13, fig 6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Neocouperipollis ankleshwarensis Kar & Bhattacharya 1992: 252, pl 1, fig 34, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Kumar 1996: 112, pl 2, fig 17, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Spinomonosulcites brevispinosus (Biswas) Kumar 1994: 61, 71, pl 32, figs 12, pl 33, fig 4, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Couperipollis brevispinosus (Biswas) Venkatachala & Kar. Kumar & Takahashi 1991: 541, pl 12, fig 13, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong

Road Section, Assam; Handique *et* al. 1992: 219, LATE EOCENE-OLIGOCENE (Barail Group), Moran Oilfield, Upper Assam; Mandaokar 2000c: 43, pl 1, fig 16, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Neocouperipollis brevispinosus (Biswas) Sarkar & Singh. Sarkar 1991: 3, pl 3, fig 13, EARLY EOCENE (Kakara Series), near Kakara-Chapla group of villages, north of Gambhar River, Shimla District, Himachal Pradesh; Ambwani 1993: 160, PALAEOCENE, Seam No. 2, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kar *et* al. 1994: 186, pl 2, fig 24, TERTIARY, subsurface sediments in Upper Assam; Mandal *et* al. 1996: 80, pl 1, fig 7, LATE PALAEOCENE-EARLY EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Sarkar 1997: 109, pl 2, fig 3, EOCENE (Subathu Formation), 20 km south-east of Bilaspur on Shimla-Bilaspur Highway, Bilaspur District, Himachal Pradesh; Sarkar & Prasad 2000a: 171, pl 1, fig 12, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), Koshalia Nala Section near Koti, Shimla Hills, Solan District, Himachal Pradesh; Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana; Saxena & Sarkar 2000: 257, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandal *et* al. 2003: 102, 104, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Singh *et* al. 2003: 204, pl 2, figs 15-16, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh; Saxena & Khare 2004: 74, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Spinomonosulcites echinatus Kumar 1994: 71, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Spinomonosulcites magnus (Dutta & Sah) Singh & Misra 1991c: 223.

Monosulcites magnus Dutta & Sah 1970: 28. pl 5, figs 1-2, PALAEOCENE (Cherra Formation), Umstew, Shillong Plateau, Meghalaya;

Couperipollis magnus (Dutta & Sah) Kar & Kumar. Singh & Tripathi 1990: 329, pl 1, fig 21, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Neocouperipollis magnus (Dutta & Sah) Kar & Kumar. Singh 1990: 224, pl 2, fig 6, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Chakraborty 2004: 115, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Spinomonosulcites spinorobustus (Kar & Kumar) Singh & Misra 1991c: 223.

Couperipollis spinorobustus Kar & Kumar: 1986: 195, pl 5, fig 6, PALAEOCENE (Lakadong Sandstone), Upper Cherrapunji, Khasi Hills, Meghalaya.

Neocouperipollis spinorobustus (Kar & Kumar) Kar & Kumar. Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 181, pl 2, figs 14-15, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Spinomonosulcites varispinosus Singh & Misra 1991c: 223, pl 1, fig 12, MIOCENE (Cuddalore

Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh *et al.* 1992: 56, pl 1, fig 7, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Spinomonosulcites spp. Kumar 1994: 15-16, 34, 77, 83, pl 3, fig 7, pl 14, figs 6, 9, pl 15, figs 14, 15, pl 16, fig 1, pl 40, fig 14, pl 44, figs 8, 23, EARLY-MIDDLE OLIGOCENE and MIOCENE (Laisong, Jenam, Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

?Spinomonosulcites sp. Kumar 1994: 71, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

SPINOSOPITES Baksi, **INCERTAE SEDIS.**

Spinosopites acolporata Baksi. Misra *et al.* 1996: 95, 96, OLIGOCENE (Simsang Formation), Tura-Dalu Road near Kherapara, Garo Hills, Meghalaya.

SPINULOTETRADITES Kar, **TETRADITES.**

Spinulotetradites juxtatus Kar. Kapoor *et al.* 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Spore type 1. Sarkar *et al.* 1994: 202, pl 2, fig 14, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Spore type 2. Sarkar *et al.* 1994: 202, pl 2, fig 5, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Spore type 1. Saxena *et al.* 1996: 22, pl 1, fig 7, pl 2, fig 1, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Spore type 2. Saxena *et al.* 1996: 22, pl 2, fig 5, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Spore type. Rao & Patnaik 2001: 276, pl 1, figs 5-6, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Spore type 1. Singh & Kar 2003: 220, pl 1, fig 9, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh.

STAUROSACCITES Dolby, **DISACCIATRILETI.**

Staurosaccites quadrifidus Dolby. Mandal *et al.* 2003: 102, pl 2, fig 11, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

STEPHANOCOLPITES van der Hammen, **POLYPTYCHES.**

Stephanocolpites arcotense Ramanujam = **Retistephanocolpites arcotense** (Ramanujam) Saxena.

Stephanocolpites granulatus Venkatachala & Kar. Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked).

Stephanocolpites sp. Shanmukhappa & Koshal 1993: 200, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Stephanocolpites spp. Aswal & Singh 2000: 124, 125, MIDDLE EOCENE, Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh.

Stephanocolporate type. Rao 1995a: 333, pl 3, fig 4, EOCENE-EARLY MIOCENE, Nirkunnam Borehole, Alleppey District, Kerala.

STEPHANOPOROPOLLENITES Pflug & Thomson in Thomson & Pflug, **POLYPORINES.**

Stephanoporopollenites validus Salujha *et al.* Salujha *et al.* 1991: 67, pl 2, figs 2, 54, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Stephanoporopollenites sp. Kumar & Takahashi 1991: 568, pl 12, figs 4, 7, Silchar-Haflong Road Section, Assam.

Stephanoporopollenites sp. A. Kumar 1994: 61, pl 32, fig 12, pl 33, fig 4, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Stephanoporopollenites spp. Kumar 1994: 71, 77, 83, 94, MIOCENE-PLIOCENE (Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam.

STEREISPORITES Pflug in Thomson & Pflug, **LAEVIGATI.**

Stereisporites assamensis Sah & Dutta. Mandal *et* al. 1996: 78, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

Stereisporites formosus Salujha *et* al. Salujha *et* al. 1991: 65, pl 1, fig 5, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Stereisporites sp. Kumar & Takahashi 1991: 600, pl 2, fig 9, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Stereisporites spp. Kumar 1994: 13, 87, pl 1, figs 1a, b, pl 39, fig 15, LATE CRETACEOUS-EOCENE and LATE MIOCENE (Disang and Bokabil formations), Silchar-Haflong Road Section, Assam.

Stereisporites sp. Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

STRIABREVICOLPORITES Samant & Phadtare, **PTYCHOTRIPORINES.**

Striabrevicolporites reticulatus Samant & Phadtare 1997: 60, pl 13, figs 7-9, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

STRIACOLPITES in Misra & Kapoor. *Nomen nudum.*

Striatricolpites sp. Misra & Kapoor 1994: 150, EARLY MIOCENE (Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

STRIACOLPORITES Sah & Kar, **PROLATI.**

Striacolporites cephalus Sah & Kar. Kar 1990a: 177, pl 5, fig 85, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Rao 1990: 248, pl 3, fig 10, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena 1991: 370, fig 11, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar *et* al. 1994: 187, pl 1, fig 20, TERTIARY, subsurface sediments in Upper Assam; Saxena 1995: 100, fig 31, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

Striacolporites minor Kumar 1994: 35, pl 17, fig 5, MIDDLE OLIGOCENE (Jenam Formations), Silchar-Haflong Road Section, Assam.

Striacolporites ovatus Sah & Kar. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Rao 1990: 248, pl 3, fig 28, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Striacolporites striatus Sah & Kar. Rao 1995a: 328, pl 3, fig 6, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Mandal 1997: 100, pl 1, fig 17, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 61, pl 13, fig 10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Mandaokar

1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Samant 2000: 115, pl 6, fig 6, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Chakraborty 2004: 116, pl 1, fig 19, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Striacolporites sp. Mandal *et* al. 1996: 80, pl 1, fig 16, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

STRIASULCITES Venkatachala & Kar, **MONOPTYCHES.**

Striasulcites tectus Venkatachala & Kar. Mandal & Vijaya 2004: 497, fig 4K, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Striasulcites. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked).

STRIATITES Pant, **STRIATITI.**

Striatites sewardii (Virkki) Pant. Singh *et* al. 1991: 42, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Striatites tectus Venkatachala & Kar. Srivastava & Bhattacharyya 2000: 375, pl 3, fig 9, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked).

Striatites varius Kar. Srivastava & Bhattacharyya 2000: 375, pl 3, fig 3, EARLY TERTIARY, Arunachal Pradesh (Reworked); Mandal *et* al. 2003: 102, 104, pl 2, fig 9, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Striatites sp. Kumar *et* al. 2004: 158, NEOGENE and PLEISTOCENE, Site 218, Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean (Reworked).

STRIATOCOLPORITES van der Hammen, **PTYCHOTRIPORINES.**

Striatocolporites minor Kumar & Takahashi 1991: 568-569, pl 5, fig 11, text-fig 13, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 35, pl 17, fig 5, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam (wrongly spelt as *Striacolporites minor*). (Junior homonym of *Striatocolporites minor* Mathur & Chopra 1987)

STRIATOPODOCARPITES Sedova**, STRIATITI.**

Striatopodocarpites brevis Sinha. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked); Gupta *et* al. 2003: 212, PALAEOCENE-EOCENE, Ganga Basin.

Striatopodocarpites diffusus Bharadwaj & Salujha. Kar 1990a: 181, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 237, 240, LATE OLIGOCENE-EARLY MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam (Reworked).

Striatopodocarpites plicatus (Kar) Bharadwaj & Dwivedi. Kar 1990a: 181, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked).

Striatopodocarpites venustus Bharadwaj & Salujha. Kar 1990a: 181, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 240, EARLY MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam (Reworked).

Striatopodocarpites sp. Mandaokar 1991: 27, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam (Reworked).

Striatopodocarpites sp. Singh *et* al. 1991: 42, pl 1, figs 6, 12, OLIGOCENE-EARLY MIOCENE (Barail and Surma Groups), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Striatopodocarpites sp. Saxena & Rao 1996: 48, pl 3, figs 19-20, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya (Reworked).

Striatopodocarpites sp. Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram (Reworked).

Striatopodocarpites sp. Rao 2000: 297, pl 2, fig 15, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Striatopodocarpites sp. Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland (Reworked).

Striatopodocarpites sp. Gupta *et* al. 2003: 214, pl 2, fig 5, PALAEOCENE-EOCENE, Ganga Basin (Reworked).

Striatopodocarpites sp. Kumar *et* al. 2004: 160, pl 1, fig 8, NEOGENE and PLEISTOCENE, Site 218, Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean.

STRIATOPOLLIS Krutzsch, **TRIPTYCHES.**

Striatopollis sp. Kumar & Takahashi 1991: 569, pl 6, fig 14, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Striatopollis sp. Kumar 1994: 47, pl 23, fig 6, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam.

Striatopollis sp. Mandal *et* al. 2003: 102, 106, pl 1, fig 8, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

STRIATRICOLPITES (van der Hammen) González Guzmán**, TRIPTYCHES.**

Striatricolpites semistriatus González Guzmán. Kumar 1996: 112, pl 1, fig 10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

STRIATRICOLPORITES van der Hammen *ex* Leidelmeyer, **PTYCHOTRIPORINES.**

Striatricolporites sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

STRIATRILETES van der Hammen (non Potonié 1956)**, MURORNATI.**

Striatriletes aidaensis Kar. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 237, 239, LATE OLIGOCENE-EARLY MIOCENE (Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Striatriletes attenuatus Singh & Tripathi. Singh & Tripathi 1990: 329, pl 1, figs 16, 23, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Striatriletes discontinuous Singh *et* al. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Striatriletes indicus Singh *et* al. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and

Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Striatriletes jagdevii Singh *et* al. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Striatriletes juxtacostatus Singh *et* al. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Striatriletes macrocostatus in Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin. *Invalid combination.*

Striatriletes mediostriatus (Bolkhovitina) Saxena & Bhattacharyya 1990: 110, pl 1, fig 4, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Striatriletes microverrucosus Kar & Saxena. Kar 1990a: 175, pl 9, fig 132, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 236, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Kumar *et* al. 2001: 244, fig 5.16, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Striatriletes multicostatus Kar & Saxena. Kar 1990a: 175, pl 3, fig 60, pl 9, fig 136, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 236, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1993: 139, pl 2, fig 31, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Sarkar *et* al. 1994: 201, pl 2, fig 17, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 2, fig 15, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Srivastava & Bhattacharyya 2000: 375, pl 1, fig 5, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh; Trivedi & Saxena 2000: 273, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Kumar *et* al. 2001: 244, 245, OLIGOCENE, EARLY-MIDDLE MIOCENE and MIO-PLIOCENE (Barail Group, Surma and Tipam groups excluding Girujan Clay Formation and Namsang Formation), Tinali Well-7, Upper Assam; Mandaokar 2002b: 21, pl 1, fig 2, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Striatriletes pachyexinus Rao & Singh = **Cicatricosisporites pachyexinus** (Rao & Singh) Kumar & Takahashi.

Striatriletes cf. pachyexinus Rao & Singh. Kumar 1994: 21, pl 2, fig 2, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Striatriletes paucicostatus Kar. Kar 1990a: 198, pl 9, fig 139, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 236, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Mandaokar 1993: 139, pl 1, fig 20, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam: Sarkar *et* al. 1994: 201, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandal *et* al. 1996: 81, OLIGOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandal 1997: 99, pl 1, fig 2, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Chandra & Kumar 1998: 53, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean; Mandaokar 2000c: 38, pl 2, fig 14, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Kumar *et* al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam; Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh; Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands.

Striatriletes pseudocostatus Singh & Tripathi. Saxena & Bhattacharyya 1990: 110, pl 1, fig 2, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad Section near Dharmsala, Kangra District, Himachal Pradesh; Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh; Saxena & Rao 1996: 46, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Striatriletes punctatus Saxena & Rao 1996: 50-52, pl 1, figs 16-17, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Striatriletes sahnii Singh *et* al. Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

Striatriletes shravilensis Kapoor *et* al. 2003: 182, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh. *Nomen nudum.*

Striatriletes sinuosus Rao & Singh. Rao & Patnaik 2001: 269, pl 2, fig 5, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Striatriletes susannae van der Hammen = **Cicatricosisporites susannae** (van der Hammen) Kumar & Takahashi.

Striatriletes tetradites Rao 2000: 299, pl 2, fig 17, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Striatriletes sp. Saxena & Bhattacharyya 1990: 110, pl 1, figs 3, 6, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Striatriletes sp. Misra *et* al. 1996: 96, EARLY MIOCENE (Baghmara Formation), Tura-Dalu Road Section along Bugi River and in the vicinity of Baghmara, Garo Hills, Meghalaya.

STROBILANTHIDITES Sah, **TRIPORINES.**

Strobilanthidites cf. africanus Sah. Mandal & Kumar 2000: 204-205, pl 2, fig 10, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam; Kumar *et* al. 2001: 245, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Upper Assam.

STROTERSPORITES Wilson, **STRIATITI.**

Strotersporites decorus (Bharadwaj & Salujha) Venkatachala & Kar. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked).

SUBTRIPOROPOLLIS Sah, **PROLATI.**

Subtriporopollis rotundis Sah. Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1991: 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala (wrongly spelt as *Subtriporopollis rotundus*); Rao 1995a: 328, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Subtriporopollis sp. A Rao 1996: 157, pl 1, fig 13, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala.

Subtriporopollis sp. B Rao 1996: 157, pl 1, fig 15, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala.

Subtriporopollis sp. Rao & Rajendran 1996: 74, pl 3, fig 5, MIOCENE (Quilon Formation), Meenkunnu Phase III, Cannanore District, Kerala.

SURMASPORA Singh & Rao, **APICULATI.**

Surmaspora karii Rao & Rajendran 1996: 67, pl 1, figs 24-26, MIOCENE (Quilon Formation), Meenkunnu Phase II, Cannanore District, Kerala; Ramanujam *et* al. 1998b: 48, pl 1, figs 1-5, MIOCENE (subsurface sediments), Godavari Basin (Andhra Pradesh) and Cauvery Basin (Tamil Nadu).

SYMPLOCOIPOLLENITES Potonié *ex* Potonié, **PROLATI.**

Symplocoipollenites bhavnagarensis Samant 2000: 108, 110, pl 6, fig 4, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Symplocoipollenites constrictus Sah & Kar. Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Symplocoipollenites crassioratus Rao & Ramanujam. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Symplocoipollenites paravurensis Saxena 1992b: 533.

Symplocoipollenites punctatus Rao & Ramanujam (non Venkatachala & Rawat 1972): 78-79, pl 3, fig 42, MIOCENE (Quilon Beds), Paravur, Kerala.

Symplocoipollenites punctatus Rao & Ramanujam (non Venkatachala & Rawat 1972) = **Symplocoipollenites paravurensis** Saxena.

Symplocoipollenites verrucatus Samant & Phadtare 1997: 61, pl 13, figs 11-12, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Symplocoipollenites sp. Shanmukhappa & Koshal 1993: 201, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Syncolpate pollen. Srivastava & Bhattacharyya 2000: 375, pl 2, figs 5-6, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh.

TAENIAESPORITES Leschik, **STRIATITI.**

Taeniaesporites sp. Kar 1990b: 232, EOCENE (Disang Formation), Silchar-Haflong Road Section, Assam (Reworked).

TAMILIPOLLENITES Singh & Misra, **PTYCHOPOLYPORINES.**

Tamilipollenites grandis Singh & Misra 1991a: 73, pl 4, figs 8, 11-12, MIOCENE (Cuddalore Formation), Borehole No. NLE-36, Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu.

Tamilipollenites robustus Singh & Misra 1991a: 72-73, pl 4, figs 6-7, 9-10, MIOCENE (Cuddalore Formation), Borehole No. NLE-36, Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh *et al.* 1992: 56, pl 1, fig 18, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

TAMILNADUAPOLLIS Acharya, **TRIPTYCHES.**

Tamilnaduapollis reticulatus Acharya 2000: 22, pl 1, figs 1, 4, 6, EARLY EOCENE, Borehole No. MII 128 (depth 141.2-141.25 m), Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

TAXODIACEAEPOLLENITES Kremp ex Potonié, **ALETES.**

Taxodiaceaepollenites sp Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Tetracolpate pollen. Kumar 1996: 114, pl 2, fig 2, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

TETRACOLPITES Vimal ex Srivastava, **POLYPTYCHES.**

Tetracolpites similis Salujha *et* al. Salujha *et* al. 1991: 67, pl 2, fig 49, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Tetracolporate pollen. Kar & Sharma 2001: 156, pl 6, fig 3, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

TETRACOLPORITES Couper, **PTYCHOPOLYPORINES.**

Tetracolporites brevicolpus Dutta & Sah. Saxena *et* al. 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Tetracolporites camaruensis Couper. Saxena 1995: 98, fig 17, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

Tetracolporites onagraceoides Sah & Dutta. Mitra *et* al. 2000: 126, pl 1, fig 28, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Tetracolporites sp. cf. onagraceoides Sah & Dutta. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Tetracolporites similis Salujha *et* al. Salujha *et* al. 1991: 67, pl 2, fig 62, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Tetracolporites spp. A-C. Kar 1990a: 177, pl 5, figs 82-83, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Tetracolporites spp. Kar 1990b: 233, 236, 237, EARLY-LATE OLIGOCENE (Laisong, Jenam and Renji formations), Silchar-Haflong Road Section, Assam.

TETRACOLPOROPOLLENITES Pflug & Thomson in Thomson & Pflug, **PTYCHOPOLYPORINES.**

Tetracolporopollenites brevis Samant & Phadtare 1997: 62, pl 13, figs 13-14, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 129, EARLY EOCENE (Surat lignite, Cambay Shale

Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Tetracolporopollenites obscurus Pflug & Thomson in Thomson & Pflug = **Sapotaceoidaepollenites cauveriensis** Saxena.

Tetracolporopollenites sp. Samant & Phadtare 1997: 62, pl 13, figs 15-16, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Tetrad spore type 1. Saxena & Rao 1996: 52, pl 1, fig 20, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

TETRAPOLLIS Pflug, **POLYPORINES.**

Tetrapollis rotundus Rao & Ramanujam. Ramanujam et al. 1991: 3, pl 3, fig 11, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Tetrapollis sp. Ramanujam et al. 1992: 22, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

THICKOEXINA in Misra & Kapoor. *Nomen nudum.*

Thickoexina himachalensis in Misra & Kapoor 1994: 156, pl 4, fig 80, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

THINICOLPITES in Misra & Kapoor. *Nomen nudum.*

Thinicolpites pqlarii in Misra & Kapoor 1994: 154, pl 3, fig 61, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh. *Nomen nudum.*

THOMSONIPOLLIS Elsik, **TRIPORINES.**

Thomsonipollis psilatus Saxena & Khare 2004: 75, 84, pl 2, fig 19, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Thomsonipollis submarginatus Venkatachala & Rawat. Rao et al. 1993: 82, pl 1, fig 26, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala.

Thomsonipollis sp. Saxena & Misra 1990: 265, pl 1, fig 10, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Thomsonipollis sp. Ramanujam et al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Thomsonipollis sp. Ramanujam et al. 1992: 22, fig 3U, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

THYMELAEPOLLIS Sah & Kar**, PERIPORITI.**

Thymelaepollis crotonoidis Sah & Kar. Kar & Bhattacharya 1992: 251, pl 1, figs 6, 10, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Mandaokar 2002b: 21, pl 1, figs 7, 9, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

Thymelaepollis sp. Kar & Bhattacharya 1992: 256, pl 1, figs 11, 24, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat.

Thymelaepollis sp. Singh et al. 1992: 57, pl 2, fig 12, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

TIKISPORITES Kumaran in Kumaran & Maheshwari, **ZONOTRILETES.**

Tikisporites complicates Kumaran in Kumaran & Maheshwari. Mandal et al. 2003: 102, pl 2, fig 3, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

TILIAEPOLLENITES Potonié, **PTYCHOTRIPORINES.**

Tiliaepollenites foveolatus Venkatachala & Rawat. Kumar et al. 2001: 245, EARLY-MIDDLE MIOCENE (Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam.

Tiliaepollenites rotundus Venkatachala & Rawat. Kumar et al. 2001: 244, OLIGOCENE (Barail Group), Tinali Well-7, Upper Assam.

Tiliaepollenites cf. rotundus Venkatachala & Rawat. Mandal & Kumar 2000: 204, pl 2, fig 1, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam.

Tiliaepollenites sp. A. Kumar & Takahashi 1991: 569-570, pl 18, fig 6, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Tiliaepollenites sp. B. Kumar & Takahashi 1991: 570, pl 14, fig 7, pl 18, fig 21, MIOCENE (Upper Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Tiliaepollenites sp. Kumar 1994: 83, pl 44, fig 25, pl 46, fig 20, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Tiliaepollenites sp. B. Kumar 1994: 71, pl 38, fig 7, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Tiliaepollenites sp. Mandal & Kumar 2000: 204, pl 2, fig 14, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam.

TINALIPOLLENITES Mandal & Kumar, **PTYCHOTRIPORINES.**

Tinalipollenites duttae Mandal & Kumar 2000: 205, pl 1, figs 8-10, MIO-PLIOCENE (Namsang Formation), Tinali Well-7, Tinali Oilfield, Upper Assam.

TIWARIASPORIS Maheshwari & Kar, **ORNATI.**

Tiwariasporis sp. Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam (Reworked).

TODISPORITES Couper, **LAEVIGATI.**

Todisporites additiensis Kapoor & Singh. Kapoor et al. 1997: 32, fig 2b, PALAEOCENE-EOCENE (Subathu Formation), Kalka-Kasauli Road, Solan District, Himachal Pradesh.

Todisporites dagshaiensis Khanna & Singh. Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana.

Todisporites flavatus Sah & Kar. Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Samant & Phadtare 1997: 13, pl 2, fig 6, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 1, fig 12, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Todisporites giganticus in Mandaokar 1993: 139, pl 1, fig 19, pl 2, fig 13, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram. *Nomen nudum.*

Todisporites kutchensis Sah & Kar. Kar 1990a: 175, pl 1, fig 19, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar

1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Kar *et al.* 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Saxena *et al.* 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 43, pl 1, fig 13, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Tripathi *et al.* 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Kar & Sharma 2001: 128, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Singh & Kar 2003: 219, pl 2, fig 6, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh; Tripathi *et al.* 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan; Saxena & Khare 2004: 73, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Todisporites major Couper. Kar 1990a: 175, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 232, 233, 234, 237, 239, EOCENE-EARLY MIOCENE (Disang, Laisong, Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 218, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Singh & Tripathi 1990: 329, MIOCENE (Siwalik sediments), Arunachal Pradesh; Kumar & Takahashi 1991: 601, pl 9, fig 2, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam; Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam; Sarkar 1991: 3, EARLY EOCENE (Kakara Series), near Kakara-Chapla group of villages, north of Gambhar River, Shimla District, Himachal Pradesh; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Mandaokar 1993: 139, pl 2, figs 11, 14, 18, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et al.* 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 40, 64, pl 10, fig 1, pl 28, figs 1, 3, MIDDLE OLIGOCENE and EARLY-MIDDLE MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam; Singh & Sarkar 1994: 50, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Rao 1995a: 327, pl 1, fig 2, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Tripathi 1995: 46, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Mandal *et al.* 1996: 78, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao & Rajendran 1996: 65, MIOCENE, Cannanore District, Kerala; Saxena *et al.* 1996: 21, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandal 1997: 99, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 13, pl 2, figs 7-8, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Sarkar 1997: 109, pl 2, fig 6, EOCENE (Subathu Formation), 20 km southeast of Bilaspur on Shimla-Bilaspur Highway, Bilaspur District, Himachal Pradesh; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 7, pl 2, fig 1, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal

Pradesh; Rao 2000: 295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Samant 2000: 114, pl 1, fig 11, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Sarkar & Prasad 2000a: 171, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), Koshalia Nala Section near Koti, Shimla Hills, Solan District, Himachal Pradesh; Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana; Tripathi *et* al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Singh & Kar 2002: 214, PALAEOCENE (Deccan Intertrappean Beds), 3 km northeast of Papro village, Latitpur District, Uttar Pradesh; Singh & Kar 2003: 219, PALAEOCENE (Deccan Intertrappean Beds), northeast of Papro, Lalitpur District, Uttar Pradesh; Singh *et* al. 2003: 197, 203, pl 2, fig 7, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Todisporites minor Couper. Saxena & Misra 1990: 264, pl 3, fig 3, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Singh 1990: 218, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kumar & Takahashi 1991: 601, pl 9, fig 7, pl 13, figs 9, 12, MIDDLE MIOCENE (Middle Bhuban Formation), Silchar-Haflong Road Section, Assam; Kar & Bhattacharya 1992: 251, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar *et* al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 40, 64, 75, 87, 95, pl 8, fig 7, pl 10, fig 5, pl 30, fig 11, pl 34, fig 7, pl 36, fig 7-8, MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Jenam, Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam; Singh & Sarkar 1994: 50, pl 1, fig 7, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh; Rao 2000: 295, pl 2, fig 4, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Sarkar & Prasad 2000a: 171, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), Koshalia Nala Section near Koti, Shimla Hills, Solan District, Himachal Pradesh; Sarkar & Prasad 2000b: 147, LATE YPRESIAN-MIDDLE LUTETIAN (Subathu Formation), west bank of Ghaggar river near Kharak village, Morni Hills, Haryana; Saxena 2000c: 163, pl 1, figs 4-5, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Saxena & Sarkar 2000: 257, MIDDLE EOCENE (Siju Formation), Simsang River Section near Siju, South Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Gupta *et* al. 2003: 210, PALAEOCENE-EOCENE, Ganga Basin.

Todisporites plicatus Sah & Kar. Kapoor *et* al. 1997: 32, fig 2a, PALAEOCENE-EOCENE (Subathu Formation), Kalka-Kasauli Road, Solan District, Himachal Pradesh; Kar & Sharma 2001: 128, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Singh *et* al. 2003: 203, pl 2, fig 8, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Todisporites rarus Sarkar & Singh. Sarkar 1991: 3, EARLY EOCENE (Kakara Series), near Kakara-Chapla group of villages, north of Gambhar River, Shimla District, Himachal Pradesh; Singh *et* al. 2003: 203, pl 2, fig 9, YPRESIAN-POST LUTETIAN (Subathu Formation), around Dharampur and Koti areas, Solan District, Himachal Pradesh.

Todisporites sp. Singh *et* al. 1992: 56, pl 1, fig 2, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Todisporites sp. Misra & Kapoor 1994: 150, EARLY MIOCENE (Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Todisporites sp. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Todisporites. Sharma 2000: 54, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan; Srivastava & Bhattacharyya 2000: 375, pl 1, fig 1, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Kimin-Ziro Road Section, Lower Subansiri District, near Rilu village, West Siang District and Pasighat to Rengging Section, East Siang District, Arunachal Pradesh.

TRANSDANUBIAEPOLLENITES Kedves & Pardutz, **TRIPTYCHES.**

Transdanubiaepollenites indicus Singh 1991: 702, figs 2a-h, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh *et al.* 1992: 57, pl 2, fig 18, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

TRIANGULORITES Kar, **TRIPORINES.**

Triangulorites bellus (Sah & Kar) Kar = **Grevilloideaepites eocenicus** Biswas.

Triangulorites foveolatus Ambwani 1993: 158, fig 5C, PALAEOCENE, Seam No. 2, Rekmangiri Coalfield, Garo Hills, Meghalaya.

Triangulorites inferius (Dutta & Sah) Kar & Kumar = **Grevilloideaepites inferius** (Dutta & Sah) Singh & Misra.

Triangulorites minutus (Sah & Kar) Kar. Samant 2000: 115, pl 6, fig 11, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Triangulorites pachyexinus Kar & Kumar = **Grevilloideaepites pachyexinus (**Kar & Kumar) Singh & Misra.

Triangulorites triradiatus (Saxena) Kar. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Saxena 1995: 101, fig 45, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

Triangulorites sp. Saxena & Khare 2004: 75, 84, pl 1, fig 20, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

TRIANGULOTRICOLPORITES Kar**, PTYCHOTRIPORINES.**

Triangulotricolporites triangulus Kar. Kar & Bhattacharya 1992: 251, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Chakraborty 2004: 11, pl 1, fig 11, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

TRIATRIOPOLLENITES Pflug in Thomson & Pflug, **TRIPORINES.**

Triatriopollenites sp. Hait & Banerjee 1994: 118, pl 3, figs 51-52, EARLY MIOCENE, around Champhai, Mizoram.

Triatriopollenites sp. Gupta *et al.* 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Triatriopollenites sp. Mandal & Vijaya 2004: 497, fig 5G, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

TRIBREVICOLPORITES Kar, **PTYCHOTRIPORINES.**

Tribrevicolporites alleppeyensis Rao. Rao & Nair 1998: 53, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Tribrevicolporites duttae Rao & Rajendran 1996: 72, pl 1, figs 21-22, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala.

Tribrevicolporites eocenicus Kar. Kumar 1996: 114, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandal 1997: 100, pl 1, fig 20, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland.

Tribrevicolporites sarkarii Rao & Rajendran 1996: 72, pl 3, figs 3-4, MIOCENE (Quilon Formation), Meenkunnu Phase II, Cannanore District, Kerala; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala.

Tribrevicolporites sp. Rao 1996: 157, pl 1, fig 6, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala.

Tribrevicolporites sp. Rao & Rajendran 1996: 72, pl 2, fig 23, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala.

TRICHOTOMOSULCITES Couper, **TRICHOTOMOCOLPATES.**

Trichotomosulcites granulatus Couper. Ramanujam et al. 1992: 21, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Ramanujam et al. 1998c: 55, fig 8, MIOCENE, Borewell NSP-1 and NSP-2 near Narsapur, West Godavari District, Andhra Pradesh.

Trichotomosulcites sp. Ramanujam et al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Trichotomosulcites sp. Ramanujam et al. 1991: 3, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Trichotomosulcites spp. Misra & Kapoor 1994: 153, 155, 159, pl 2, fig 34, PALAEOCENE-EARLY EOCENE and MIDDLE EOCENE (Subathu and Basal Dharmsala and Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

TRICOLLAREPORITES Venkatachala & Rawat, **TRIPORINES.**

Tricollareporites echinatus Venkatachala & Rawat. Mandal & Vijaya 2004: 497, fig 4A, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

TRICOLPITES Cookson ex Couper, **TRIPTYCHES.**

Tricolpites baculatus Jain et al. = **Albertipollenites baculatus** (Jain et al.) Mandal & Rao.

Tricolpites baculatus Kar & Jain (non Jain et al. 1973) = **Tricolpites keralaensis** Saxena.

Tricolpites baculatus Kar & Jain = **Dipterocarpuspollenites retipilatus** (Kar & Jain) Kar.

Tricolpites brevicolpus Couper. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Gupta et al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin.

Tricolpites crassireticulatus Dutta & Sah = **Retitricolpites crassireticulatus** (Dutta & Sah) Samant & Phadtare (according to Samant & Phadtare 1997).

Tricolpites crassireticulatus Dutta & Sah = **Albertipollenites crassireticulatus** (Dutta & Sah) Mandal & Rao (according to Mandal & Rao 2001).

Tricolpites crassisexinus Venkatachala & Rawat = **Albertipollenites crassireticulatus** (Dutta & Sah) Mandal & Rao.

Tricolpites delicatulus Couper. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lig-

nite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Tricolpites delicatus (Kar) Mandal & Rao 2001: 362, pl 2, figs 3, 7.

Retitricolpites delicatus Kar 1979: 28, pl 2, figs 31-32, OLIGOCENE (Maniyara Fort Formation), Kutch District, Gujarat.

Tricolpites fissilis Couper. Misra & Kapoor 1994: 152, 154, pl 1, figs 12-13, pl 3, fig 51, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Tricolpites foxii (Biswas) Ramanujam. Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal.

Tricolpites globus Dutta & Sah = **Rousea globus** (Dutta & Sah) Mandal & Rao.

Tricolpites cf. globus Dutta & Sah. Kumar & Takahashi 1991: 570-571, pl 8, fig 13, EARLY MIOCENE (Lower Bhuban Formation), Silchar-Haflong Road Section, Assam.

Tricolpites gracilis Salujha et al. = **Albertipollenites gracilis** (Salujha et al.) Mandal & Rao.

Tricolpites horridus Salujha et al. = **Retitrescolpites horridus** (Salujha et al.) Mandal & Rao.

Tricolpites iniquus Salujha et al. = **Foveotricolpites iniquus** (Salujha et al.) Mandal & Rao.

Tricolpites jainii Saxena 1992b: 533.

Tricolpites minutus Jain et al. 1973 (non Sah & Kar 1970): 155, pl 2, figs 54, 58, PALAEOCENE (Barmer Sandstone), near Barmer Hill, Barmer District, Rajasthan.

Tricolpites keralaensis Saxena 1992b: 533.

Tricolpites baculatus Kar & Jain (non Jain et al. 1973). Singh 1990: 219, pl 2, fig 8, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Tripathi et al. 2003: 91, LATE PALAEOCENE (Akli Formation), Barmer Basin, Rajasthan.

Tricolpites levis Sah & Dutta. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Kar et al. 1994: 187, pl 2, fig 7, TERTIARY, subsurface sediments in Upper Assam; Tripathi 1995: 47, pl 1, fig 4, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan.

Tricolpites longicolpus Sah & Dutta. Shanmukhappa & Koshal 1993: 200, MIDDLE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Tricolpites matanomadhensis Saxena = **Rousea matanomadhensis** (Saxena) Mandal & Rao.

Tricolpites medius Sah. Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Tricolpites microreticulatus Belesky et al. Trivedi & Saxena 2000: 275, pl 2, fig 12, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam (junior homonym of *Tricolpites microreticulatus* van der Hammen 1954).

Tricolpites minor Sah. Kumar & Takahashi 1991: 571, pl 1, fig 16, pl 15, figs 3, 8, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam; Shanmukhappa & Koshal 1993: 200, 201, 202, MIDDLE-LATE EOCENE (Ankleshwar Formation), Gandhar area, Broach Depression, Cambay Basin, Gujarat; Kumar 1994: 19, 71, 94, pl 4, fig 7, EARLY OLIGOCENE and MIOCENE-PLIOCENE

(Laisong, Bhuban and Tipam formations), Silchar-Haflong Road Section, Assam.

Tricolpites minutus Sah & Kar. Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Saxena *et* al. 1996: 21, pl 3, fig 17, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Mandaokar 2000b: 181, pl 1, fig 17, pl 2, fig 60, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Tricolpites minutus Jain *et* al. (non Sah & Kar 1970) = **Tricolpites jainii** Saxena.

Tricolpites ovatus Salujha *et* al. Salujha *et* al. 1991: 66, pl 2, fig 42, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Tricolpites perforatus van der Hammen & Garcia de Mutis. Rao 2000: 295, pl 2, fig 11, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya.

Tricolpites retibaculatus Saxena = **Albertipollenites retibaculatus** (Saxena) Mandal & Rao.

Tricolpites reticulatus Cookson *ex* Couper. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 236, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam; Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Singh 1990: 219, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Kumar & Takahashi 1991: 571, pl 5, figs 9, 18, pl 12, fig 14, pl 15, fig 12, pl 18, fig 3, MIDDLE OLIGOCENE and MIDDLE-LATE MIOCENE (Jenam, Middle-Upper Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Kar & Bhattacharya 1992: 251, pl 2, figs 12, 17, 21, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Ambwani 1993: 159, 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Hait & Banerjee 1994: 115, pl 1, fig 14, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram; Kar *et* al. 1994: 187, pl 1, fig 10, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 35, 48, 61-62, 71, 83, 94, pl 17, figs 14, 21, pl 18, figs 2, 7, pl 23, figs 18-19, pl 33, fig 22, pl 46, fig 19, MIDDLE OLIGOCENE-PLIOCENE (Jenam, Renji, Bhuban, Bokabil and Tipam formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Bera & Banerjee 1995: 150, MIDDLE-LATE EOCENE (Bengal lignite), Panagarh-Domra Sector, Burdwan District, West Bengal; Rao 1995a: 328, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Saxena 1995: 98, figs 3, 32, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Kumar 1996: 114, pl 1, fig 5, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 48, pl 3, fig 10, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000b: 181, pl 2, figs 21, 49, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, pl 1, fig 1, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mitra *et* al. 2000: 126, pl 1, fig 32, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Rao 2000:

295, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Saxena 2000c: 163, pl 1, fig 13, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Kar & Sharma 2001: 129, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, pl 1, fig 1, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Chakraborty 2004: 116, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Tricolpites microreticulatus Belesky *et* al. in Rawat *et* al. 1977: 187, pl 1, fig 25, EARLY EOCENE (Kadi Formation), Cambay Basin, Gujarat.

Tricolpites sp. A. Salujha *et* al 1980: 674-675, pl 2, figs 52, 58, pl 3, fig 64, MIOCENE (Bokabil and Tipam subgroups), Tulamura Anticline, South Tripura District, Tripura.

Tricolpites retipilatus Kar & Jain. Rao 1990: 248, pl 2, fig 14, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Rao 1995a: 328, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Kumar 1996: 114, pl 1, fig 11, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram.

Tricolpites triangulatus Venkatachala & Sharma (non Sah 1967) = **Tricolpites venkatachalae** Saxena.

Tricolpites venkatachalae Saxena 1993: 195.

Tricolpites triangulatus Venkatachala & Sharma 1974 (non Sah 1967): 162, pl 3, fig 115, LATE CRETACEOUS, Kallamedu Well, Vridhachalam area, Cauvery Basin, Tamil Nadu.

Tricolpites sp. Kar 1990a: 190, pl 5, figs 87-88, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Tricolpites sp. Rao 1990: 248, pl 3, fig 21, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Tricolpites sp. 1. Saxena & Misra 1990: 265, pl 2, fig 1, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Tricolpites sp. 2. Saxena & Misra 1990: 265, pl 1, fig 15, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Tricolpites sp. Kumar & Takahashi 1991: 572, pl 15, fig 12, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam.

Tricolpites sp. A. Salujha *et* al. 1991: 66, pl 2, fig 45, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Tricolpites sp. B. Salujha *et* al. 1991: 67, pl 2, fig 46, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Tricolpites sp. Kar *et* al. 1994: 187, pl 1, fig 5, TERTIARY, subsurface sediments in Upper Assam.

Tricolpites spp. Kumar 1994: 72, 98, pl 38, fig 2, pl 50, fig 12, MIOCENE-PLIOCENE (Bhuban and Dupitila formations), Silchar-Haflong Road Section, Assam.

Tricolpites sp. Sarkar *et* al. 1994: 202, pl 2, fig 14, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal.

Tricolpites sp. Singh & Sarkar 1994: 50, pl 1, fig 22, EARLY MIOCENE (Kasauli Formation), Kasauli, Solan District, Himachal Pradesh.

Tricolpites sp. Tripathi 1995: 47-48, pl 1, fig 12, PALAEOCENE-EOCENE, Well MK-327 near Kapurdi, Barmer District, Rajasthan.

Tricolpites sp. Kumar 1996: 114, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Tricolpites sp. Mandaokar 2000c: 45, pl 2, fig 8, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh.

Tricolpites sp. Mandaokar 2000b: 183, pl 2, figs 31, 38, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Tricolpites sp. Mehrotra *et* al. 2000: 153, LATE EOCENE (Kopili Formation), Upper Assam.

Tricolpites. Sharma 2000: 54, LATE PALAEOCENE, Borehole No. 125, Bithnok area, Bikaner District, Rajasthan.

cf. Tricolpites sp. B. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

cf. Tricolpites sp. Kar 1990a: 190, pl 5, fig 89, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

TRICOLPOPITES Biswas, **TRIPTYCHES.**

Tricolpopites aquifoliaceaeformis Biswas = **Albertipollenites aquifoliaceaeformis** (Biswas) Mandal & Rao.

Tricolpopites proboscideus Biswas = **Albertipollenites proboscideus** (Biswas) Mandal & Rao.

Tricolpopites prolatus Baksi = **Ladakhipollenites prolatus** (Baksi) Mandal & Rao.

Tricolpopites shortii Baksi = **Ladakhipollenites shortii** (Baksi) Mandal & Rao.

Tricolpopites sijuensis Baksi = **Foveotricolpites sijuensis** (Baksi) Mandal & Rao.

TRICOLPOPOLLENITES Pflug & Thomson in Thomson & Pflug, **TRIPTYCHES.**

Tricolpopollenites minutus (González Guzmán) Takahashi & Jux. Kumar 1994: 72, 94, pl 38, fig 18, MIOCENE-PLIOCENE (Bhuban and Tipam formations), Silchar-Haflong Road Section, Assam.

Tricolpopollenites cf. minutus (González Guzmán) Takahashi & Jux. Kumar & Takahashi 1991: 572, pl 15, fig 13, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam.

Tricolporate pollen Type 1. Rao & Nair 1998: 52, pl 1, fig 12, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Tricolporate pollen Type 2. Rao & Nair 1998: 53, pl 1, fig 5, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

TRICOLPORITES van der Hammen, **PROLATI.**

Tricolporites sp. Ambwani 1993: 157, PALAEOCENE, Seam No. 1, Rekmangiri Coalfield, Garo Hills, Meghalaya.

Tricolporites spp. Misra & Kapoor 1994: 152, 154, pl 1, fig 17, pl 3, fig 44, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

TRICOLPOROCOLUMELLITES Kar, **PTYCHOTRIPORINES.**

Tricolporocolumellites eocenicus Samant & Phadtare 1997: 63, pl 14, figs 1-5, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat.

Tricolporocolumellites pilatus Kar. Kar & Bhattacharya 1992: 251, pl 2, fig 20, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Kumar 1996: 114, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandal 1997: 99, pl 2, fig 3, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 63-64, pl 13, figs 17-19, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 115, pl 6, fig 10, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat (wrongly spelt as *Tricolporocolumellites psilatus*).

TRICOLPOROPILITES Kar, **PTYCHOTRIPORINES.**

Tricolporopilites differentialis Singh & Misra 1991a: 67-68, pl 3, figs 1-4, 7-9, 11-12 text-fig 3, MIOCENE (Cuddalore Formation), Borehole No. NLE-35, Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh et al. 1992: 57, pl 2, fig 16, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu; Mandal 1997: 100, pl 2, fig 10, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Rao & Nair 1998: 52, pl 1, fig 3, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Tricolporopilites magnus Acharya 2000: 24, pl 1, figs 11, 13, EARLY EOCENE, Borehole No. MII 128 (depth 129.2-129.5 m), Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

Tricolporopilites pseudoreticulatus Kar. Kar et al. 1994: 187, pl 1, fig 13, TERTIARY, subsurface sediments in Upper Assam; Kumaran et al. 1995: 1025, fig 4o, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala; Rao 1995a: 328, pl 2, figs 12-13, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Mandal 1997: 99, pl 2, fig 11, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Kumar et al. 2001: 245, MIOCENE (Surma and Tipam groups), Tinali Well-7, Upper Assam; Mandal et al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram; Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Tricolporopilites robustus (Kar & Saxena) Kar. Saxena 1991: 370, fig 4, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar et al. 1994: 187, pl 2, fig 37, TERTIARY, subsurface sediments in Upper Assam; Saxena 1995: 99, figs 2, 4-5, 9, 24, 37, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked); Kumar 1996: 114, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Samant 1994: 49, EARLY EOCENE (Bhavnagar lignite, Kharsalia Clay Formation), South Cambay Basin, Gujarat (wrongly spelt as *Tricolporopollenites robustus*); Mandal et al. 1996: 81, MIDDLE-LATE EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands; Mandal 1997: 99, pl 2, fig 6, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Samant & Phadtare 1997: 64, pl 14, figs 6-9, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Mandaokar 2000b: 183, pl 2, fig 5, LATE OLIGOCENE (Tikak Parbat For-

mation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Samant 2000: 115, pl 6, fig 9, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Tripathi *et* al. 2000: 245, pl 2, figs 1-2, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Mandaokar 2002b: 21, pl 1, fig 6, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland.

Retitrescolpites robustus Kar & Saxena. Saxena 1995: 98, figs 15, 44, 50, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

Tricolporopilites tectatus Singh & Misra 1991a: 69-70, pl 4, figs 1-5, MIOCENE (Cuddalore Formation), Borehole No. NLE-36, Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu; Tripathi *et* al. 2000: 245, pl 2, fig 6, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Tricolporopilites uniformis Singh & Misra 1991a: 65-67, pl 3, figs 5-6, 10, text-fig 2, MIOCENE (Cuddalore Formation), Borehole No. NLE-36, Mine III area, Neyveli Lignitefield, South Arcot District, Tamil Nadu; Samant & Phadtare 1997: 64, pl 14, figs 10-11, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Tripathi *et* al. 2000: 245, pl 2, figs 9-11, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Tricolporopilites sp A. Rao & Nair 1998: 53, pl 1, figs 7-8, MIOCENE, Kundra Clay Mine Section, Quilon District, Kerala.

Tricolporopilites sp B. Rao & Nair 1998: 53, pl 1, fig 9, MIOCENE, Kundra Clay Mine Section, Quilon District, Kerala.

Tricolporopilites sp. Rao 2004: 125, pl 1, fig 5, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

TRICOLPOROPOLLENITES Pflug & Thomson in Thomson & Pflug, **PROLATI.**

Tricolporopollenites exaltus in Mandaokar 2000c: 45, pl 2, fig 9, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh. *Nomen nudum.*

Tricolporopollenites kruschii Thomson & Pflug. Mandaokar 2000b: 181, pl 2, figs 30, 54, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Tricolporopollenites sp. Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Tricolporopollenites sp. Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram.

Tricolporopollenites sp. Mandaokar 2000c: 45, pl 2, fig 5, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh.

TRICOLPOROPOLLIS Dutta & Sah, **PTYCHOTRIPORINES.**

RETITRIBREVICOLPORITES Kar 1985.

Tricolporopollis alleppeyensis Rao & Rajendran 1996: 73, pl 3, figs 1-2, 17, MIOCENE (Quilon Formation), Meenkunnu Phase II, Cannanore District, Kerala; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Tricolporopollis cannanorensis Rao & Rajendran 1996: 72-73, pl 2, figs 6-8, MIOCENE (Quilon Formation), Meenkunnu Phase I, Cannanore District, Kerala; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala.

Tricolporopollis decorus Dutta & Sah. Rao 1990: 246, pl 2, fig 15, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Misra & Kapoor 1994: 155, LATE EOCENE-OLIGOCENE (Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena et al. 1996: 21, pl 2, fig 1, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya.

Retitribrevicolporites decorus (Dutta & Sah) Kar & Kumar. Samant & Phadtare 1997: 57, pl 12, figs 13-15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 129, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Tricolporopollis globosus Dutta & Sah. Misra & Kapoor 1994: 159, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan.

Tricolporopollis matanomadhensis (Venkatachala & Kar) Tripathi & Singh. Rao 1990: 248, pl 2, fig 16, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena & Misra 1990: 265, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Rao 1995a: 328, EOCENE-EARLY MIOCENE, Kalarakod and Nirkunnam Boreholes, Alleppey District, Kerala; Tripathi 1995: 47, pl 1, fig 7, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Rao 1996: 157, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena et al. 1996: 21, pl 3, fig 2, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Rao & Nair 1998: 52, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Saxena 2000c: 163, pl 1, fig 8, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Trivedi & Saxena 2000: 275, pl 1, fig 4, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam; Mandaokar 2002b: 21, pl 1, fig 5, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Lakiapollis matanomadhensis Venkatachala & Kar. Kumar 1996: 112, pl 1, fig 7, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Retitribrevicolporites matanomadhensis (Venkatachala & Kar) Kar. Singh 1990: 220, pl 2, fig 13, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Saxena 1991: 369, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Kar & Bhattacharya 1992: 251, pl 2, fig 34, EARLY EOCENE, Rajpardi lignite mine, Cambay Basin, Gujarat; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya; Saxena 1995: 99, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked); Kumar 1996: 112, pl 1, figs 2, 7, 19, 23, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Mandal 1997: 100, pl 2, fig 8, LATE EOCENE (Barail Group), Mariani-Mokokchung Road, Mokokchung District, Nagaland; Acharya 2000: 22, EARLY EOCENE, Borehole No. MII 128, Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu; Samant & Tapaswi 2001: 129, pl 2, fig 10, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat; Chakraborty 2004: 116, LATE PALAEOCENE

(Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Tricolporopollis ruber Dutta & Sah. Rao 1990: 248, pl 2, fig 9, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Singh & Tripathi 1990: 330, pl 1, figs 14, 29, MIOCENE (Siwalik sediments), Arunachal Pradesh; Tripathi 1995: 47, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan; Kumar 1996: 112, pl 1, figs 17-18, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat; Saxena *et* al. 1996: 21, pl 3, fig 6, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Tripathi 1997: 170, LATE PALAEOCENE-EARLY EOCENE, MK 327 and MK 332 boreholes, near Kapurdi, Barmer District, Rajasthan; Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Retitribrevicolporites ruber (Dutta & Sah) Kar & Kumar. Mandal 1990: 325, PALAEOCENE (Lakadong Sandstone Member, Sylhet Limestone Formation), Thanjinath, Khasi Hills, Meghalaya; Singh 1990: 220, PALAEOCENE (Tura Formation), Langrin Coalfield, Khasi Hills, Meghalaya; Ambwani 1993: 160, PALAEOCENE-EARLY EOCENE, Seam Nos. 1, 2 and 3, Rekmangiri Coalfield, Garo Hills, Meghalaya; Kumar 1994: 206, PALAEOCENE (Lakadong Sandstone), Jarain and Laitrymbai, Jaintia Hills District, Meghalaya.

Tricolporopollis sindhudurgensis Rao 2004: 125, pl 3, figs 1-3, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

Tricolporopollis sp. Kumaran *et* al. 1995: 1025, figs 3b, 4j, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Tricolporopollis sp. Tripathi 1995: 48, pl 1, fig 9, PALAEOCENE-EOCENE, subsurface sediments near Kapurdi, Barmer District, Rajasthan.

Tricolporopollis sp. Kumar 1996: 114, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Bharuch District, Gujarat.

Tricolporopollis sp. Trivedi & Saxena 2000: 275, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

Tricolporopollis. Kumaran *et* al. 1995: 1025, fig 3g, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

TRIFOSSAPOLLENITES Rouse, **PRAECOLPATES.**

Trifossapollenites constatus Dutta & Sah = **Ladakhipollenites constatus** (Dutta & Sah) Mandal & Rao.

?Trifossapollenites constatus Dutta & Sah. Kumar 1994: 77, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

TRILATIPORITES Ramanujam *ex* Potonié, **TRIPORINES.**

Trilatiporites cooksoniae Ramanujam = **Dorreenipites cooksoniae** (Ramanujam) Navale & Misra.

Trilatiporites erdtmanii Ramanujam = **Dorreenipites erdtmanii** (Ramanujam) Navale & Misra.

Trilatiporites kutchensis Venkatachala & Kar = **Retitrilatiporites kutchensis** (Venkatachala & Kar) Misra *et* al.

Trilatiporites minor Gupta *et* al. 2003: 211, PALAEOCENE-EOCENE, Ganga Basin. *Nomen nudum.*

Trilatiporites minutus Sah & Kar = **Retitrilatiporites minutus** (Sah & Kar) Misra *et* al.

Trilatiporites noremii Ramanujam = **Dorreenipites erdtmanii** (Ramanujam) Navale & Misra.

Trilatiporites sp. cf. T. noremii Ramanujam. Kumaran *et* al. 1995: 1026, fig 4l, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Trilatiporites sellingii Ramanujam = **Dorreenipites sellingii** (Ramanujam) Navale & Misra.

Trilatiporites truncates Sarma *et* al. = **Dorreenipites sellingii** (Ramanujam) Navale & Misra.

Trilatiporites spp. Misra & Kapoor 1994: 152, 155, 159, pl 1, fig 14, PALAEOCENE-EARLY EOCENE, MIDDLE EOCENE and LATE EOCENE-OLIGOCENE (Subathu and Basal Dharmsala and Lower Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Trilatiporites sp. Kumaran *et* al. 1995: 1026, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

Trilete-echinulate pteridophytic spore. Phadtare *et* al. 1994: 75, pl 1, fig F, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

Trilete-rugulate pteridophytic spore. Phadtare *et* al. 1994: 75, pl 1, fig H, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

Trilete spores. Kumar 1994: 22, 77, pl 3, fig 16, pl 34, figs 5-6, 8, pl 35, fig 4, EARLY OLIGOCENE and EARLY-MIDDLE MIOCENE (Laisong and Bhuban formations), Silchar-Haflong Road Section, Assam.

Trilete spores. Misra & Saxena 1995: 18, figs 2.1-2, ?PALAEOGENE, Bombay Offshore, Arabian Sea.

Trilete spore type 1. Saxena & Bhattacharyya 1990: 110, pl 1, figs 7, 11, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Manjhi Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Trilete spore type 2. Saxena & Bhattacharyya 1990: 110, pl 1, figs 12, 16-18, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Churan Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Trilete-verrucate pteridophytic spore. Phadtare *et* al. 1994: 75, pl 1, fig C, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

TRIORITES Erdtman *ex* Cookson, **TRIPORINES.**

Triorites andamanensis Saxena 1993: 195.

Triorites indicus Mathur & Mathur 1980: 58-59, pl 1, fig 16, EARLY OLIGOCENE (Upper Baratang Formation), Bakultala-Rangat Section, Middle Andaman, Andaman and Nicobar Islands.

Triorites bellus Sah & Kar = G**revilloideaepites eocenicus** Biswas.

Triorites indicus Mathur & Mathur (non Thiergart & Frantz 1963) = **Triorites andamanensis** Saxena.

Triorites inferius Dutta & Sah = **Grevilloideaepites inferius** (Dutta & Sah) Singh & Misra.

Triorites kutchensis Saxena 1992b: 533.

Triorites triangulus Sah & Kar 1970 (non Sah 1967): 139, pl 2, fig 53, EARLY EOCENE (Naredi Formation), Kutch District, Gujarat.

Triorites protrudus Samant 2000: 110, 114, pl 6, fig 12, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Triorites quilonensis Rao & Nair 1998: 53, pl 1, figs 16-17, MIOCENE, Kundra Clay Mine Section, Quilon District, Kerala.

Triorites sahii Samant 2000: 114, pl 6, fig 13, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Triorites triangulus Sah & Kar (non Sah 1967) = **Triorites kutchensis** Saxena.

Triorites sp. Ramanujam *et* al. 1991: 3, pl 3, fig 12, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Triorites sp. Ramanujam *et* al. 1992: 22, fig 3R, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Triorites sp. Aswal & Singh 2000: 122, DANIAN Saripalli Well-A, Krishna-Godavari Basin, Andhra Pradesh.

Triorites sp. Kapoor *et* al. 2003: 183, OLIGOCENE-NEOGENE (Dharmsala and Siwalik), Dharmsala and Nurpur areas, Kangra District, Himachal Pradesh.

TRIPILAORITES Kar, **TRIPORINES.**

Tripilaorites triangulus (Sah & Kar) Kar. Kar & Bhattacharya 1992: 252, pl 2, figs 11, 16, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Misra & Kapoor 1994: 156, 159, pl 4, figs 71-72, 77, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh; Samant & Tapaswi 2001: 129, pl 2, fig 12, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat (wrongly spelt as *Tripilaorites triangulatus*); Chakraborty 2004: 116, LATE PALAEOCENE (Lakadong Sandstone), around Bhalukurung, North Cachar Hills, Assam.

Tripilaorites sp. Kar 1990a: 178, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

TRIPLANOSPORITES Pflug *ex* Pflug in Thomson & Pflug**, LAEVIGATI.**

Triplanosporites sinuosus Pflug in Thomson & Pflug. Samant & Phadtare 1997: 14, pl 2, figs 9-10, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 114, pl 1, fig 13, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat; Samant & Tapaswi 2001: 128, EARLY EOCENE (Surat lignite, Cambay Shale Formation), Tarkeshwar, Surat District and Valia, Bharuch District, Gujarat.

Triporate pollen Kar *et* al. 1994: 187, pl 2, fig 2, TERTIARY, subsurface sediments in Upper Assam.

TRIPORIPITES Biswas, **TRIPORINES.**

Triporipites betulaceaeformis Biswas = **Triporopollenites betulaceaeformis** (Biswas) Kumar & Takahashi (according to Kumar & Takahashi 1991).

Triporipites betulaceaeformis Biswas = **Betulaceoipollenites betulaceaeformis** (Biswas) Kumar (according to Kumar 1994).

TRIPORITES van der Hammen, **TRIPORINES.**

Triporites sp. Misra & Kapoor 1994: 152, pl 1, fig 11, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

TRIPOROLETES Mtchedlishvili in Mtchedlishvili & Samoilovich, **TRIPORINES.**

Triporoletes reticulatus (Pocock) Playford. Singh *et* al. 1991: 42, pl 1, fig 2, pl 2, fig 15, OLIGOCENE (Barail Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked); Mandal *et* al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Triporoletes sp. Singh *et* al. 1991: 42, pl 2, fig 8, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

TRIPOROPOLLENITES Pflug & Thomson in Thomson & Pflug *ex* Potonié, **TRIPORINES.**

Triporopollenites betulaceaeformis (Biswas) Kumar & Takahashi 1991: 572-573, pl 1, figs 11,

EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Triporipites betulaceaeformis Biswas 1962: 45, pl 10, fig 11, EARLY-MIDDLE EOCENE (Sylhet Limestone Formation), Therriaghat, Shillong Plateau, Meghalaya.

Triporopollenites exactus Salujha *et* al. Salujha *et* al. 1991: 67, pl 2, fig 51, NEOGENE, Adamtila Well-A, Cachar District, Assam; Mandaokar 1993: 139, pl 1, fig 34, pl 2, fig 23, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Mandaokar 1999: 241, LATE EOCENE (Disang Group), Tirap River Section, Tinsukia District, Assam; Mandaokar 2000b: 181, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

Triporopollenites karii Saxena 1992b: 533.

Triporopollenites robustus Kar & Jain (non Pflug in Thomson & Pflug 1953). Rao 1995a: 328, EOCENE-EARLY MIOCENE, Nirkunnam Borehole, Alleppey District, Kerala; Saxena 1995: 101, fig 34, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala; Rao & Rajendran 1996: 66, MIOCENE, Cannanore District, Kerala; Saxena & Rao 1996: 48, pl 2, fig 19, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandaokar 2003: 188, EARLY MIOCENE (Middle Bhuban Formation), Lawngtlai, Chhimtuipui District, Mizoram.

Triporopollenites meenkunnuensis Rao & Rajendran 1996: 73-74, pl 2, figs 1-3, MIOCENE, Cannanore District, Kerala.

Triporopollenites minutus Rao & Ramanujam. Rao 1990: 248, pl 3, fig 4, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam *et* al. 1992: 22, fig 3K, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala.

Triporopollenites parvus Sah. Saxena & Khare 2004: 75, LATE PALAEOCENE-MIDDLE EOCENE, Jayamkondacholapuram Well 12, Tiruchirapalli District, Tamil Nadu.

Triporopollenites robustus Kar & Jain (non Pflug in Thomson & Pflug 1953) = **Triporopollenites karii** Saxena.

Triporopollenites simplex Ramanujam. Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Triporopollenites triangularis Sah. Mitra *et* al. 2000: 126, pl 1, fig 35, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya.

Triporopollenites vimalii Sah & Dutta. Saxena *et* al. 1996: 21, pl 3, fig 10, PALAEOCENE (Tura Formation), Nongwal Bibra area, East Garo Hills District, Meghalaya; Tripathi *et* al. 2000: 245, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya.

Triporopollenites sp. Kumar & Takahashi 1991: 573, pl 5, figs 5, 20-21, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Triporopollenites sp. Salujha *et* al. 1991: 67, pl 2, fig 52, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Triporopollenites sp. Kar & Bhattacharya 1992: 258, pl 2, fig 3, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat.

Triporopollenites sp. Trivedi & Saxena 2000: 275, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

Triporopollenites sp. Kumar *et* al. 2001: 245, fig 5.7, EARLY-MIDDLE MIOCENE (Surma and Tipam groups excluding Girujan Clay Formation), Tinali Well-7, Upper Assam.

Triporopollenites sp. Gupta *et* al. 2003: 211, pl 1, fig 12, PALAEOCENE-EOCENE, Ganga Basin.

TRIPOROTETRADITES van Hoeken-Klinkenberg, **TETRADITES.**

Triporotetradites sp. Saxena & Misra 1990: 265, pl 2, fig 8, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Triporotetradites sp. Rao 2004: 125, 132, pl 1, fig 20, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

TRISYNCOLPITES Kar, **TRIPTYCHES.**

Trisyncolpites ramanujamii Kar. Ramanujam *et* al. 1989: 29, pl 1, fig 13, MIOCENE, subsurface sediments of eastern coast of southern India; Rao 1990: 246, pl 2, fig 20, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Rao 1995a: 328, pl 3, fig 5, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Mandaokar 1996b: 41, LATE OLIGOCENE (Tikak Parbat Formation), Dilli-Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000b: 181, pl 2, fig 55, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002b: 21, LATE OLIGOCENE (Tikak Parbat Formation), Borjan Coalfield, Nagaland; Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

cf. Trisyncolpites sp. Kar in Saxena 1995: 97, figs 10, 46, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

Trisyncolporate pollen type 1. Mandal *et* al. 1994: 211, pl 1, fig 11, EARLY EOCENE, Kadamtala, Andaman and Nicobar Islands.

TROCHOSPORITES Wilson, **POLYSACCITES.**

Trochosporites tripus Venkatachala & Kar. Mandal *et* al. 2003: 102, pl 2, fig 5, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

Trochosporites sp. Kar 1990a: 181, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

TRUDOPOLLIS Pflug, **TRIPORINES.**

Trudopollis pertrudens (Pflug in Thomson & Pflug) Pflug. Gupta *et* al. 2003: 591, fig 3c, PALAEOGENE, Ganga Basin.

TSUGAEPOLLENITES Potonié & Venitz *ex* Potonié, **SACCIZONATI.**

Tsugaepollenites velatus Kar. Kar 1990b: 236, 237, 240, MIDDLE OLIGOCENE-EARLY MIOCENE (Jenam, Renji and Bhuban formations), Silchar-Haflong Road Section, Assam; Banerjee & Nandi 1994: 219, pl 1, fig 18, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Kar *et* al. 1994: 186, TERTIARY, subsurface sediments in Upper Assam; Sarkar *et* al. 1994: 201, pl 2, fig 15, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Mandal & Vijaya 2004: 497, fig 5B, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Tsugaepollenites sp. Singh *et* al. 1991: 42, pl 2, figs 4, 13, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Tsugaepollenites spp. Misra & Kapoor 1994: 150, 155, LATE EOCENE-OLIGOCENE and EARLY MIOCENE (Lower and Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

TUBERCULOZONISULCITES Kar & Sharma, **SPHAEROZONISULCATES.**

Tuberculozonisulcites retibaculatus Kar & Sharma 2001: 129, 132, pl 3, figs 7, 8, 11, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

Type 1 (?Tiliaepollenites) Singh *et* al. 1992: 57, pl 2, fig 8, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

UMBELLIFERAE (pollen). Phadtare *et* al. 1994: 74, Upper Siwalik, Haripur Khol, Sirmaur District, Himachal Pradesh.

UMBELLIFEROIPOLLENITES Venkatachala & Kar, **SUBPROLATI.**

Umbelliferoipollenites broachensis Samant & Phadtare 1997: 65, pl 14, figs 14-15, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 115, pl 6, fig 7, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Umbelliferoipollenites constrictus Venkatachala & Kar. Mandaokar 2002a: 116, EARLY MIOCENE (Dulte Formation), 2 km from Dulte village on Dulte-Keifang Road, Aizawl District, Mizoram; Mandaokar 2002c: 79, EARLY MIOCENE (Keifang Formation), eastern flank of Aizawl Hills, Mizoram; Mandaokar 2004: 146, LATE MIOCENE (Upper Bhuban Formation), Champhai area, Eastern Mizo Hills, Mizoram.

Umbelliferoipollenites ovatus Venkatachala & Kar. Shanmukhappa & Koshal 1993: 195, 202, EARLY and LATE EOCENE (Cambay Shale and Ankleshwar formations), Gandhar area, Broach Depression, Cambay Basin, Gujarat.

Umbelliferoipollenites typicus Samant & Phadtare 1997: 65, pl 14, figs 12-13, EARLY EOCENE (Tarkeshwar Formation), Rajpardi, Cambay Basin, Gujarat; Samant 2000: 115, pl 6, fig 8, EARLY EOCENE (Kharsalia Clay Formation), near Bhavnagar, Cambay Basin, Gujarat.

Umbelliferoipollenites sp. Misra & Kapoor 1994: 155, EARLY MIOCENE (Upper Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

UNDULATISPORITES Pflug in Thomson & Pflug, **LAEVIGATI.**

Undulatisporites benevolus Salujha & Kindra. Salujha *et* al. 1991: 65, pl 1, figs 11-12, NEOGENE, Adamtila Well-A, Cachar District, Assam.

Undulatisporites structuris Krutzsch. Kumar 1994: 75, pl 35, fig 16, pl 36, figs 1, 15, EARLY-MIDDLE MIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam.

Undulatisporites sp. Kumar & Takahashi 1991: 602, pl 14, figs 12-13, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam.

Undulatisporites sp. Kumar 1994: 87, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Unidentified forms. Mandal *et* al. 1996: 78, pl 1, figs 25-26, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

Unidentified pollen. Mandal *et* al. 1996: 78, pl 1, figs 19-20, age not mentioned, mud volcano in Baratang Island, Andaman and Nicobar Islands.

VALLATISPORITES Hacquebard, **CINGULATI.**

Vallatisporites vallatus Hacquebard. Misra & Kapoor 1994: 158, 160, pl 6, figs 98-99, 106-108, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked); Mehrotra *et* al. 2001: 241,

pl 2, figs 3-5, EARLY EOCENE (Panna Formation), Bombay Offshore, Arabian Sea (Reworked).

Vallatisporites spp. Misra & Kapoor 1994: 158, pl 6, figs 103-104, PALAEOCENE-EARLY EOCENE (Subathu and Basal Dharmsala), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh (Reworked).

Vallatisporites sp. Mehrotra *et* al. 2001: 241, pl 2, fig 6, EARLY EOCENE (Panna Formation), Bombay Offshore, Arabian Sea (Reworked).

VARISCULPTINAPERTURITES Saxena *et* al., **TUBERINI.**

Varisculptinaperturites sphericus Saxena *et* al. 1999: 135, pl 1, figs 1-3, text-fig 3, LATE MIOCENE, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

Pollen Type 1. Chandra & Kumar 1998: 67, pl 2, fig 8, LATE TERTIARY, DSDP Leg 22, Site 218, Bengal Fan, Indian Ocean.

VARISPINITRIPORITES Kar, **TRIPORINES.**

Varispinitriporites ratariaensis (Kar & Saxena) Kar. Saxena & Rao 1996: 48, pl 2, figs 4, 16, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Saxena 2000c: 163, pl 1, fig 14, pl 2, fig 15, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

VELLARIPOLLIS Singh & Misra, **POLYPTYCHES.**

Vellaripollis foveolatus Singh & Misra 1991b: 211, pl 2, figs 5-7, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, South Arcot District, Tamil Nadu; Singh *et* al. 1992: 56, pl 1, fig 11, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

VERRUALETES Singh & Saxena, **TUBERINI.**

Verrualetes assamicus Singh & Saxena. Saxena & Misra 1990: 265, pl 1, fig 20, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Singh & Tripathi 1990: 326, pl 1, fig 8, MIOCENE (Siwalik sediments), Arunachal Pradesh; Kumar 1994: 72, 77, 83, pl 39, figs 2, 12, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Rao & Rajendran 1996: 66, pl 3, fig 12, MIOCENE, Cannanore District, Kerala; Saxena 2000c: 163, MIOCENE (Sindhudurg Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra; Rao & Patnaik 2001: 270, LATE PLIOCENE (Pinjor Formation), Nadah, Panchkula, Haryana.

Verrualetes baculatus Kumar 1994: 99, pl 50, figs 1, 13-14, LATE MIOCENE-PLIOCENE (Dupitila Formation), Silchar-Haflong Road Section, Assam.

Verrualetes cannanorensis Rao & Rajendran 1996: 68, pl 3, fig 7, MIOCENE (Quilon Formation), Meenkunnu Phase II, Cannanore District, Kerala.

Verrualetes excellensus Acharya 2000: 24, pl 1, figs 2, 8, EARLY EOCENE, Borehole No. MII 128 (depth 124.9-125 m), Mannargudi area, Thanjavur District, Cauvery Basin, Tamil Nadu.

Verrualetes kalarakodensis Rao 1995a: 335, pl 2, figs 1-2, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala.

Verrualetes sp. Saxena & Bhattacharyya 1990: 112, pl 1, fig 21, OLIGOCENE-EARLY MIOCENE (Dharmsala Group), Manjhi Khad Section near Dharmsala, Kangra District, Himachal Pradesh.

Verrualetes sp. Singh & Tripathi 1990: 326, pl 1, fig 9, MIOCENE (Siwalik sediments), Arunachal Pradesh.

Verrualetes sp. Kumar & Takahashi 1991: 573-574, pl 8, fig 7, EARLY MIOCENE (Lower Bhuban

Formation), Silchar-Haflong Road Section, Assam.

Verrualetes spp. Kumar 1994: 42, 52, pl 24, fig 12, pl 25, fig 18, MIDDLE OLIGOCENE and EARLY-MIDDLE MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam.

Verrualetes spp. Kumar et al. 2004: 158, pl 1, fig 6, NEOGENE and PLEISTOCENE, Site 218, Deep Sea Drilling Project Leg 22, Bengal Fan, Indian Ocean.

Verrualetes sp. Mandal & Vijaya 2004: 497, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Verrualetes sp. Rao 2004: 125, pl 3, fig 9, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

VERRUCATOSPORITES Pflug & Thomson in Thomson & Pflug, **SCULPTATOMONOLETI.**

Verrucatosporites ornatus (Sah) Kumar & Takahashi 1991: 602, pl 2, fig 7, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Polypodiisporites ornatus Sah. Kar 1990a: 176, pl 2, figs 38-40, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura; Kar 1990b: 236, 240, MIDDLE OLIGOCENE and EARLY MIOCENE (Jenam and Bhuban formations), Silchar-Haflong Road Section, Assam; Saxena & Misra 1990: 264, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra; Ramanujam et al. 1991: 53, pl 1, fig 4, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Mandaokar 1993: 139, LATE OLIGOCENE (Tikak Parbat Formation), Dangri Kumari Colliery, Dibrugarh District, Assam; Banerjee & Nandi 1994: 219, pl 1, fig 17, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Kar et al. 1994: 185, pl 1, fig 3, TERTIARY, subsurface sediments in Upper Assam; Kumar 1994: 21, 39, 63, 101, pl 2, fig 10, pl 11, fig 5, pl 12, fig 9, pl 20, figs 5, 11, pl 29, fig 2, EARLY-MIDDLE OLIGOCENE and MIOCENE-PLIOCENE (Laisong, Jenam, Bhuban and Dupitila formations), Silchar-Haflong Road Section, Assam; Sarkar et al. 1994: 201, pl 1, fig 3, LATE MIOCENE (Middle Siwalik), Bagh Rao, Dehradun District, Uttaranchal; Rao & Rajendran 1996: 66, pl 1, fig 12, MIOCENE, Cannanore District, Kerala; Mandaokar 2000b: 180, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam; Tripathi et al. 2000: 243, EARLY EOCENE (Tura Formation), Tura-Dalu Road, West Garo Hills District, Meghalaya; Trivedi & Saxena 2000: 273, pl 1, fig 8, LATE EOCENE (Kopili Formation), Umrongso-Haflong Road near Umrongso, North Cachar Hills District, Assam.

Verrucatosporites speciosus (Sah & Dutta) Kumar & Takahashi 1991: 602-603, pl 13, fig 4, EARLY LATE MIOCENE (Upper Bhuban Formation), Silchar-Haflong Road Section, Assam.

Polypodiisporites speciosus Sah & Dutta. Handique et al. 1992: 219, LATE EOCENE-OLIGOCENE (Barail Group), Moran Oilfield, Upper Assam; Kumar 1994: 74, pl 34, fig 2, EARLY-MIDDLE MIOCENE-PLIOCENE (Bhuban Formation), Silchar-Haflong Road Section, Assam; Rao 1995a: 327, EOCENE-EARLY MIOCENE, Kalarakod Borehole, Alleppey District, Kerala; Saxena & Rao 1996: 46, pl 1, fig 15, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya; Mandaokar 2000a: 320, EARLY MIOCENE (Bhuban Formation), Ramrikawn near Chandmari, Aizawl District, Mizoram; Mandaokar 2000c: 38, LATE OLIGOCENE (Tikak Parbat Formation), Namchik River Section, Changlang District, Arunachal Pradesh; Mitra et al. 2000: 126, pl 1, fig 9, NEOGENE (Siwalik Group), Darjeeling Foothills, Eastern Himalaya; Rao 2000: 295, OLIGOCENE

(Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya (junior homonym of *Polypodiisporites speciosus* Sah 1967).

Verrucatosporites usmensis (van der Hammen) Germeraad et al. Misra & Kapoor 1994: 150, MIDDLE MIOCENE (Lower Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Verrucatosporites sp. Srivastava & Bhattacharyya 2000: 375, pl 2, fig 11, EARLY TERTIARY, southwest of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh.

VERRUCOLPORITES Sah & Kar, **PROLATI.**

Verrucolporites verrucus Sah & Kar. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (wrongly spelt as *Verrutricolporites verrucus*); Rao 1990: 248, pl 3, fig 8, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala; Saxena 1991: 369, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala (wrongly spelt as *Verrutricolporites verrucus*); Kar & Bhattacharya 1992: 252, EARLY EOCENE, Gujra Dam Section and Akri lignite, Kutch District, Gujarat; Kar et al. 1994: 187, TERTIARY, subsurface sediments in Upper Assam; Saxena 1995: 98-99, fig 1, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala (Reworked; wrongly spelt as *Verrutricolporites verrucus*); Mandaokar 2000b: 183, pl 2, figs 1, 3-4, LATE OLIGOCENE (Tikak Parbat Formation), Jeypore Colliery, Dilli-Jeypore Coalfields, Dibrugarh District, Assam.

VERRUCOSISPORITES Ibrahim, **APICULATI.**

Verrucosisporites microverrucosus Ibrahim. Mehrotra et al. 2001: 241, pl 1, fig 8, EARLY EOCENE (Panna Formation), Bombay Offshore, Arabian Sea (Reworked).

Verrucosisporites miocenicus Kumar & Takahashi 1991: 603-604, pl 13, figs 10-11, text-fig 22, EARLY LATE MIOCENE (Upper Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam; Kumar 1994: 75, 87, pl 34, fig 3, pl 35, fig 6, pl 39, fig 5, MIOCENE (Bhuban and Bokabil formations), Silchar-Haflong Road Section, Assam.

Verrucosisporites verrucus Sah & Kar. Kar et al. 1994: 185, TERTIARY, subsurface sediments in Upper Assam.

Verrucosisporites sp. Kar 1990b: 233, 236, 237, EARLY-LATE OLIGOCENE (Laisong, Jenam and Renji formations), Silchar-Haflong Road Section, Assam.

Verrucosisporites sp. Rao 1990: 248, pl 1, fig 24, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Verrucosisporites sp. Kumar & Takahashi 1991: 604, pl 2, fig 4, EARLY OLIGOCENE (Laisong Formation), Silchar-Haflong Road Section, Assam.

Verrucosisporites sp. Singh et al. 1991: 42, pl 1, fig 8, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Verrucosisporites spp. Kumar 1994: 22, 41, pl 3, fig 1, pl 7, fig 1, pl 9, figs 2, 5, EARLY-MIDDLE OLIGOCENE (Laisong and Jenam formations), Silchar-Haflong Road Section, Assam.

Verrucosisporites sp. Mandal et al. 2003: 102, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

VERRUDANDOTIASPORA Kar, **APICULATI.**

Verrudandotiaspora verrucata (Kar & Saxena) Kar. Mandal et al. 1996: 81, MIDDLE-LATE EOCENE, mud volcano in Baratang Island, Andaman and Nicobar Islands.

VERRUINAPERTURITES Pierce, **TUBERINI.**

Verruinaperturites raoi Ramanujam. Saxena 2000c: 163, pl 2, fig 4, MIOCENE (Sindhudurg

Formation), Mavli Mine at Redi, Sindhudurg District, Maharashtra.

Verruinaperturites sp. Rao 2004: 125, 130, pl 1, fig 12, MIOCENE (Sindhudurg Formation), Kalviwadi, Sindhudurg District, Maharashtra.

VERRUMONOCOLPITES Pierce, **MONOPTYCHES.**

Verrumonocolpites sp. Saxena & Misra 1990: 265, pl 1, fig 7, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

VERRUMONOSULCITES Kar & Sharma, **MONOPTYCHES.**

Verrumonosulcites foveolatus Kar & Sharma 2001: 129, 131, pl 2, figs 4, 7, 8, LATE PALAEOCENE-EARLY EOCENE (Palana Formation), Bikaner-Nagaur area, Bikaner District, Rajasthan.

VERRUTRICOLPITES Pierce, **TRIPTYCHES.**

Verrutricolpites sp. Kar 1990a: 177, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura.

Verrutricolpites sp. Rao 1990: 248, pl 2, fig 4, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

VERRUTRICOLPORITES van der Hammen & Wijmstra, **PROLATI.**

Verrutricolporites rotundiporus van der Hammen & Wijmstra. Rao et al. 1993: 82, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Misra & Kapoor 1994: 150, MIDDLE MIOCENE (Lower Siwalik), Jwalamukhi-B Well, northern part of Jwalamukhi Structure, Himachal Pradesh.

Verrutricolporites sp. Kumar 1994: 35, pl 17, fig 4, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

VERRUTRILETES van der Hammen ex Potonié, **APICULATI.**

Verrutriletes grandis Salujha et al. Mandaokar 1991: 26, EARLY MIOCENE, north of Maibong Railway Station, North Cachar Hills District, Assam.

Verrutriletes sp. Kumar & Takahashi 1991: 604, pl 18, fig 1, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Verrutriletes sp. Kumar 1994: 87, pl 39, fig 2, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Verrutriletes sp. Saxena & Rao 1996: 52, pl 1, fig 14, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

VERRUTRIPORITES Muller, **TRIPORINES.**

Verrutriporites annulatus Kar & Jain. Saxena 1991: 370, fig 5, EARLY MIOCENE, Varkala and Kundra Clay mines, Kerala; Saxena 1995: 100, fig 25, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

Verrutriporites grandioratus Saxena & Misra 1990: 268, pl 1, fig 18, NEOGENE (Ratnagiri Beds), Amberiwadi Section, Sindhudurg District, Maharashtra.

Verrutriporites gregarus Kar & Jain. Saxena 1995: 101, fig 33, MIOCENE (Mayyanad Formation), Kundra Clay Mines, Quilon District, Kerala.

Verrutriporites kundraensis Rao & Nair 1998: 53, pl 1, figs 1-2, MIOCENE, Kundra Clay Mine Section, Quilon District, Kerala.

Verrutriporites lunduensis Muller. Saxena & Rao 1996: 48, pl 2, fig 20, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Verrutriporites cf. lunduensis Muller. Kumar 1994: 100, pl 50, fig 8, LATE MIOCENE-

PLIOCENE (Dupitila Formation), Silchar-Haflong Road Section, Assam.

Verrutriporites perverrucatus Rao & Ramanujam. Ramanujam *et* al. 1991: 54, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala.

Verrutriporites sparsiverrucatus Kumar & Takahashi 1991: 574, pl 18, fig 11, text-fig 14, LATE LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam; Kumar 1994: 84, pl 39, fig 13, LATE MIOCENE (Bokabil Formation), Silchar-Haflong Road Section, Assam.

Verrutriporites vermiculatus Rao & Ramanujam. Ramanujam *et* al. 1991: 3, pl 3, figs 8-9, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala.

Verrutriporites sp. Rao 1990: 248, pl 3, fig 19, EOCENE-EARLY MIOCENE, Arthungal Borehole, Alleppey District, Kerala.

Verrutriporites sp. Rao 1996: 157, pl 1, fig 7, EARLY MIOCENE, Turavur Borehole near Panchayat L.P. School, west of N.H. 47 between 380 and 381 km, Alleppey District, Kerala.

VERTICIPOLLENITES Bharadwaj**, STRIATITI.**

Verticipollenites debilis Venkatachala & Kar. Srivastava & Bhattacharyya 2000: 375, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked).

Verticipollenites gibbosus Bharadwaj. Srivastava & Bhattacharyya 2000: 375, pl 3, fig 10, EARLY TERTIARY, south-west of the thrust in Tippi and Pinjoli Nala on Tippi-Sessa Road, West Kameng District, Arunachal Pradesh (Reworked); Kumar *et* al. 2001: 247, fig 5.17, MIDDLE MIOCENE (Tipam Group), Tinali Well-7, Upper Assam (Reworked).

Verticipollenites secretus Bharadwaj. Kar 1990a: 181, MIOCENE (Surma and Tipam groups), Rokhia Borehole No. 1, Gojalia Borehole No. 1 and Baramura Borehole No. 2, Tripura (Reworked); Kar 1990b: 237, LATE OLIGOCENE (Renji Formation), Silchar-Haflong Road Section, Assam (Reworked).

VESICASPORA Schemel, **DISACCIATRILETI.**

Vesicaspora sp. Singh *et* al. 1991: 42, pl 1, fig 14, EARLY MIOCENE (Surma Group), Sonapur-Badarpur Road Section, Jaintia Hills District, Meghalaya (Reworked).

Vesicaspora sp. Mandal *et* al. 2003: 102, pl 3, fig 1, EOCENE (Baratang Formation), Baratang Island, Andaman and Nicobar Islands (Reworked).

WARKALLIPOLLENITES Ramanujam & Rao in Thanikaimoni *et* al. **TRIPTYCHES.**

Warkallipollenites erdtmanii Ramanujam & Rao in Thanikaimoni *et* al. Rao 2000: 297, OLIGOCENE (Kherapara Formation), Tura-Dalu Road Section near Kherapara, West Garo Hills District, Meghalaya; Mandal & Vijaya 2004: 497, fig 4J, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Warkallipollenites ramanujamii Rao & Nair 1998: 52, pl 1, fig 22, MIOCENE, Kannanellur-Kundra Road area, Quilon District, Kerala; Mandal & Vijaya 2004: 497, fig 4H, LATE OLIGOCENE-EARLY MIOCENE, Borehole PGD-1A, Raniganj Coalfield, Damodar Basin, West Bengal.

Warkallipollenites sp. Saxena & Rao 1996: 52, pl 2, fig 7, EARLY MIOCENE (Boldamgiri Formation), Adugiri-Purakhasia Road near Boldamgiri, West Garo Hills District, Meghalaya.

Zonocolpate type. Kumaran *et* al. 1995: 1025, fig 3c, MIOCENE (Warkalli Formation), Bharathi and Kundra Clay Mines, Kerala.

ZONOCOSTITES Germeraad *et* al., **PTYCHOTRIPORINES.**

Zonocostites indicus Rao & Ramanujam. Kumar 1994: 94, LATE MIOCENE-PLIOCENE (Tipam

Formation), Silchar-Haflong Road Section, Assam.

Zonocostites ramonae Germeraad et al. Ramanujam et al. 1991: 54, pl 1, fig 25, EARLY MIOCENE, Pattanakad Borewell, Alleppey District, Kerala; Ramanujam et al. 1991: 3, pl 2, fig 10, NEOGENE, Mynagapalli Borewell, Quilon District, Kerala; Ramanujam et al. 1992: 22, EARLY MIOCENE (Mayyanad and Quilon formations), Kalaikode Borewell, Quilon District, Kerala; Rao et al. 1993: 82, pl 1, fig 20, EARLY MIOCENE, Thakkazhi Borewell, Alleppey District, Kerala; Banerjee & Nandi 1994: 219, EARLY-MIDDLE MIOCENE (Middle Bhuban Formation), near Kolasib, Aizawl District, Mizoram; Rao et al. 1995: 374, EARLY MIOCENE, Borewell at Kulasekharamangalam, Kottayam District, Kerala.

Zonocostites sp. Singh et al. 1992: 57, pl 2, fig 10, MIOCENE (Cuddalore Formation), Neyveli Lignitefield, Tamil Nadu.

Zonocostites sp. Hait & Banerjee 1994: 116, pl 2, fig 25, EARLY MIOCENE, near Suangpuilawn village about 20 km northeast of Aizawl, Mizoram.

Zonocostites sp. Kumar 1994: 42, MIDDLE OLIGOCENE (Jenam Formation), Silchar-Haflong Road Section, Assam.

Zonocostites sp. Mehrotra et al. 2000: 153, PALAEOCENE EOCENE (Basal Sandstone, Sylhet and Kopili formations), Upper Assam.

Zonocostites sp. Pundeer & Mehrotra 2000: 141, THANETIAN-YPRESIAN (Basal Sandstone), Upper Assam Shelf.

CONCLUDING REMARKS

Usefulness and limitations of the present catalogue are highlighted below. Future plan to update the catalogue is also suggested.

Usefulness

1. The first prerequisite in palynological research is the study and identification of palynofossils and their placement under genera and species. In most of the cases, the placement of pollen or spores into genus is not a major problem for an experienced palynologist. However, to assign them to species requires consultation of literature and comparison with the known species. In case a specimen or a group of specimens having identical characters does not match with the known species, new species is proposed. For comparing with the known species, one should first know how many species of a particular genus are known and where are they published? Here, this catalogue is expected to play an important role. Knowledge of all the species will definitely check unwarranted introduction of new species. The various records of a particular species will also help to understand intraspecific morphological variations.
2. It has been observed that a number of superfluous taxa names are in frequent usage in Indian palynological literature. Such names have been clearly marked as *nomen nudum* or invalid combination to prevent their usage in future publications.
3. Each entry in the catalogue provides name of the stratigraphic unit from where a particular species has been recorded and also its geological age. This helps in deducing the known stratigraphic range of a particular taxon. Similarly, their geographic occurrence helps in knowing basin-wise distribution of certain taxon or a group of taxa. The catalogue is therefore expected to be useful in deducing vertical and horizontal distribution of palynotaxa.
4. Recognition of synonyms (both nomenclatural and taxonomic) and basionyms (name-bringing or epithet-bringing synonym) is indispensable in palynological studies. The catalogue records synonyms and basionyms under the respective species, wherever possible. The compilation of data also brought to light a few homonyms, i.e. name of a taxon spelled exactly like a name based on a different type that was previously and validly published for a taxon of same rank. Obviously, in such cases the junior homonyn needs to be given a new replacement name.
5. The catalogue also takes care of nomenclatural inconsistencies. In several cases, terminations of the specific epithets are not as per rules, this has been corrected. For example, *cooksonii* is changed to *cooksoniae, dettmannii* to *dettmanniae, tsukadii* to *tsukadae,* etc. Authorship of the species has been checked from its original valid publication and corrected accordingly, wherever required. Typographic and orthographic errors have also been corrected. These corrections will facilitate correct usage of palynotaxa in future publications.

Limitations

1. In spite of authors' best efforts to include all records of Tertiary spores and pollen, it is possible that some of them might have escaped their attention mainly due to non-availability of literature in the library.
2. The present catalogue includes spore-pollen records only from 1989 to 2004 and therefore does not provide total number of records at one place. For getting complete records, one will have to consult earlier catalogues.

Future Plan

As the palynological data is continuously growing, it would be desirable that the catalogue be updated in every ten years. Further, the records that could not be included in the present or earlier catalogues should also be incorporated in the future editions.

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The research work on Indian Tertiary spores and pollen is widely scattered in various scientific journals and therefore need of a catalogue is always felt. This catalogue is a sequel of earlier catalogues published by Lakhanpal et al. (1976) and Saxena (1991) and includes all records of spores and pollen from the Indian Tertiary sediments published after 1988 up to 2004, including taxa that are nomina nuda or invalid combinations or where no binomials are given.

The present catalogue is expected to be useful in : (i) identifying Tertiary spores and pollen and their placement under suitable palynotaxa; (ii) checking unwarranted introduction of new genera and species; (iii) understanding intraspecific morphological variations; (iv) recognizing superfluous taxa names (nomina nuda or invalid combination); (v) deducing vertical and horizontal distribution of palynotaxa; and (vi) recognizing synonyms, basionyms and homonyms.