CHECKLIST OF LEAF BEETLES (COLEOPTERA: CHRYSOMELIDAE) OF BHILAI-DURG

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ABSTRACT

A survey of the chrysomelid fauna of Bhilai-Durg (Central India) revealed a total of 95 species, belonging to the subfamilies Criocerinae (10 spp.), Clytrinae (6 spp.), Cryptocephalinae (8 spp.), Chlamisinae (1 sp.), Eumolpinae (6 spp.), Chrysomelinae (4 spp.), Galerucinae (15 spp.), Alticinae (23 spp.), Hispinae (4 spp.), and Cassidinae (18 spp.). None of the species is new to science, but some recent synonymisations have been indicated. Host plants and seasonal occurrence have been mentioned.

KEYWORDS

Leaf beetles fauna, chrysomelidae, coleoptera, host plants

Leaf beetles or Chrysomelidae are one of the largest insect families. They include more than 37,000 to 40,000 described species (Jolivet & Verma, 2002). Numerous species, specially those living on tropical forest canopies, are still awaiting discovery. They present a lot of diversity, and are placed under 19 subfamilies. Being phytophagous, the group includes many established and potential agricultural pests. Besides their agricultural significance, the biodiversity of leaf beetles is a direct indicator of diversity in ambient flora. In some cases seasonal changes in leaf beetle fauna point to forthcoming weather changes (see Kalaichelvan (2000)).

Though the family is economically important, in India they have not been studied adequately from standpoints of taxonomy, biology and ecology. The Fauna of British India volumes on Chrysomelidae, Jacoby (1908), and Maulik (1919, 1926, 1935) are still the main source of information on classification of Indian Chrysomelidae. In addition there have been taxonomic studies on Oriental Leaf Beetle, including Indian Chrysomelidae by Kimoto (1970, 1982), Kimoto *et al*. (1983), Takizawa (1980a,b, 1983, 1984, 1985a,b,c, 1986, 1987a,b 1988a,b, 1989, 1990a,b), Takizawa *et al*. (1987, 1990) Borowiec (1985, 1990, 1996, 1999, 2001), Borowiec *et al*. (1991), Silfverberg (1990), Lopatin (1995) and Swietojanska (2001). Among Indian workers Basu (1985) Basu *et al*. (1978, 1980, 1981, 1987) have contributed to the classification of Indian leaf beetles. Some sporadic studies by some other Indian workers may also be cited, e.g. Pajni *et al*. (1977, 1981), Verma, (1988) and Prathapan *et al*. (2003).

During the past a few decades importance of host plant association of chrysomelids in visualizing origin and evolution of leaf beetles has been studied. Mann and Crowson (1981), Jolivet and Hawkeswood (1995), Farrell (1998), Farrell *et al*. (1992) have helped understanding speciation and coevolution of chrysomelids with host plants. However, studies on host plants and ecology of Indian chrysomelids are highly insufficient. Perhaps the only ecological studies from central India are by Verma (1992), and Verma and Shrivastava (1985, 1986).

We surveyed in and around Bhilai-Durg in central India during the period 1997 until date for chrysomelid beetles. A brief report of this survey of leaf beetle fauna is presented below (Table 1). Subfamilies have been sequenced following Seeno and Wilcox (1982).

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Table 1. Checklist of leaf beetles of Bhilai-Durg

Sl.No.	Subfamily/Species	Host collection details	Remarks
Subfamily Criocerinae			
1.	*Lema coromandeliana** Fabricius	*Commelina bengalensis* and *C. nudiflora* more common in theformer	Active in rainy season, summer; diapause in severe winter
2.	*Lema* (*Oulema*) *downesi* Baly	*Sporobolus diander* and *S. indica*	Active in rainy season, and late summer; diapause in severe winter and in mid – summer
3.	*Lema histrio* Clark	*Dioscorea alata*	Active in rainy season; diapause in severe winter and again summer
4.	*Lema maheensis** Jacoby	Same as for *L. coromandeliana*	Same as for *L. coromandelian*
5	*Lema praeusta** Fabricius	Same as for *L. coromandeliana*	Same as for *L. coromandeliana*
6.	*Lema rufotestacea* Clark	*Commelina bengalensis* and *C. nudiflora,* more frequently on the latter	Active in rainy season, summer; diapause in severe winter
7.	*Lema semifulva*** Jacoby	*Commelina bengalensis* and *C. nudiflora* more common on the latter	Active in rainy season, summer; diapause in severe winter. First record in India. (Jacoby, 1908 recorded in Burma only.)
8.	*Lema singularis* Jacoby	*Dioscorea alata*	Active in rainy season; diapause in severe winter and continuous in summer.
9.	*Lema terminata**Lacordaire	Same as for *L. coromandeliana*	Same as for *L. coromandeliana*
10.	*Lema tibiella*** Weise	Same as for *L. semifulva*	Same as for *L. semifulva*
Subfamily Clytrinae			
1.	*Gynandrophthalma longicornis* Jacoby	*Zizyphus mauritiana*	Active in rainy season
2.	*Gynandrophthalma divisa* Jacoby		Active in rainy season
3.	*Gynandrophthalma duvivieri* Jacoby	*Zizyphus mauritiana*	Active in rainy season
4.	*Aetheomorpha maduraensis* Jacoby	*Zizyphus mauritiana*	Active in rainy season
5.	*Aetheomorpha fallax* Lacordaire	*Zizyphus mauritiana* and *Ipomoea fistulosa.*	Active in rainy season
6.	*Aspidolopha* sp.		Active in rainy season
Subfamily Cryptocephalinae			
1.	*Cryptocephalus bissexsignatus* Suffrian		Active in rainy season
2.	*Cryptocephalus ovulum* Suffrian	*Zizyphus mauritiana*	Active in rainy season
3	*Cryptocephalus pallidipennis* Jacoby		Active in rainy season
4.	*Cryptocephalus sehestedti* Fabricius	*Zizyphus mauritiana*	Active in rainy season
5.	*Cryptocephalus sexsignatus* Fabricius	*Zizyphus mauritiana*	Active in rainy season
6.	*Cryptocephalus uniformis* Jacoby		Active in rainy season
7.	*Cryptocephalus vahli* Fabricius	*Zizyphus mauritiana*	Active in rainy season
8.	*Cryptocephalus* sp.	*Zizyphus mauritiana*	Active in rainy season
Subfamily Chlamisinae			
1.	*Chlamys stercoralis* Gressitt	*Zizyphus mauritiana*	Active in rainy season
Subfamily Eumolpinae			
1.	*Abirus* sp.		
2.	*Basilepta? latefaciata* Jacoby		
3.	*Colasposoma auripenne* Motschulsky	*Ipomoea aquatica, I. batatas*, *I. fistulosa, I. hispida, I. indica, I. palmata, I. pestigridis* and *I. pilosa.* Collected at light at night also	Active in rainy season and summer; diapause in severe winter
4.	*Pachnephorus impressus* Rosenh	*Alysicarpus monilifer.*Collected at light at night also	Active in rainy season; diapause in severe winter and continues into summer
5.	*Pagria signata* Motschulsky	Collected at light at night	Active in rainy season; diapause in severe winter and continues into summer
6.	*Platycorynus peregrinus* Fuessly	*Calotropis procera* and *C. gigiantica*	Active in only rainy season. Seems to be in diapause in winter to summer. First instar larva with two ocelli on each side of head; in culture the larva scratched epidermis of leaves, and died without further development
Subfamily Chrysomelinae			
1.	*Chrysomela exanthematica* Weidemann	*Medicago sativa*	Active in March and rainy season
2.	*Chrysolina* sp1.		Active in March and rainy season
3.	*Chrysolina* sp2.		Active in March and rainy season.
4.	*Zygogramma disrupta* auth?	*Medicago sativa*	Active in March
Subfamily Galerucinae			
1.	*Aulacophora foveicollis* Lucas	*Cucumis melo*, and other Cucurbitaceae. Collected at light at night also	Active all the year round, except in severe winter
2.	*Aulacophora intermedia* Jacoby	Same as for *A. foveicollis*	Same as for *A. foveicollis*
3.	*Oides bipunctata* Fabricius	*Vitis trifolia*	Active in rainy season. Diapause in winter, and continues into summer
4.	*Madurasia obscurella* Jacoby	*Phaseolus sublobatus*	Active in rainy season and early summer
5.	*Medythia suturalis* Motschulsky	Collected at light at night	Active in rainy season
6.	*Monolepta bifasciata* Hornstedt	*Mangifera indica.* Collected at light at night	Active in early summer
7.	*Monolepta brunnea* Maulik	*Polygonum pulcherium*	Active in early summer
8.	*Monolepta conformis* Weise	Collected at light at night	Active in rainy season
9.	*Monolepta lineata* Weise	*Commelina bengalensis* and *C. nudiflora*	Active period: rainy season, summer; diapause in severe winter

Sl.No.	Subfamily/Species	Host collection details	Remarks
10.	*Monolepta marginipennis* Jacoby	*Mangifera indica.* Collected at light at night	Active in early summer
11.	*Monolepta nigrobilineata* Motschulsky	Collected at light at night	Active in rainy season
12.	*Monolepta severini* Jacoby	Collected at light at night	Active in rainy season
13.	*Monolepta signata* Olivier	*Commelina bengalensis* and *C. nudiflora*	Active in rainy season and in summer; diapause in severe winter
14.	*Monolepta sodalis* Weise	Collected at light at night	Active in rainy season
15.	*Sphenoraia bicolor* Hope	*Impatiens balsamia*	Active in only rainy season. Diapause in winter and continues into summer
Subfamily Alticinae			
1.	*Aphthona hugely* Weise		Active period?
2.	*Aphthona kanaraensis* Jacoby	*Euphorbia hirta* (?) *Medicago sativa*	Active in rainy season
3.	*Aphthona nigrilabris* Duvivier	*Euphorbia hirta*	Active in rainy season
4.	*Chaetocnema basalis* Baly	*Brassica compestris*	Active all the year round except severe winter and summer
5.	*Chaetocnema bretinghami* Baly	Collected at light at night	Active in rainy season
6.	*Chaetocnema concinnipennis* Baly	*Alternanthera sessils* and *Vigna trilobata*	Active all the year round except severe winter and summer
7.	*Chaetocnema confines* Crotch	*Ipomoea aquatica, I. batatas, I. fistulosa, I. palmata, and I. violacea.* Collected at light also	Active in all the year round except in severe winter and summer. First record in India (see Kalaichelvan *et al*., 2001)
8.	*Chaetocnema harita* Maulik	*Brassica compestris.* Collected at light at night.	Active in rainy season
9.	*Crepidodera minuta* Jacoby	Collected at light at night	Active in rainy season
10.	*Crepidodera nigripennis* Motschulsky		Active in rainy season
11.	*Haltica cyanea* Weber	*Ludwigia parviflora*	Active in early summer and rainy season
12.	*Hermacophaga ruficollis* Lucas	Collected at light at night	Active in rainy season
13.	*Hyphasis* sp.	Collected at light at night	Active in rainy season
14.	*Longitarsus lohita* Maulik	Collected at light at night	Active in rainy season
15.	*Longitarsus pandura* Maulik	*Euphorbia hirta*	Active in rainy season
16.	*Longitarsus recticolis* Maulik	*Euphorbia hirta.* Collected at light at night also	Active in rainy season
17.	*Philopona signata* Duvivier	*Commelina bengalensis* and *C. nudiflora*	Active in rainy season
18.	*Phygasia hookeri* Baly	*Calotropis gigiantica, C. procera,* and *Daemia extensa.* Collected at light at night also	Active in rainy season
19.	*Phygasia unicolor* Olivier	*Calotropis gigiantica, C. procera,* and *Daemia extensa.* Collected at light at night also	Active in rainy season. Adults are seen in groups. *Phygasia hookeri* and *P. unicolor* are found in a same locality
20.	*Phygasia violaceipennis* Jacoby	*Calotropis gigiantica, C. procera,* and *Daemia extensa*	Active in rainy season
21.	*Phyllotreta birmanica* Harold	Collected at light at night	Active in rainy season
22.	*Phyllotreta chotanica* Duvivier	*Brassica campestris*	Active in rainy season and in March – April
23.	*Podagrica nigripennis* Jacoby	*Abutilen cripum, Urena lobata* and *Melachra* sp.	Active in rainy season
Subfamily Hispinae			
1	*Choeridina picea* Baly	*Commelina bengalensis* and *C. nudiflora*	Active in rainy season
2	*Dactylispa pusilal* Weise	*Sporobolus diander* and *S. indica*	Active in rainy season
3	*Oncocephala quadrilobata* Guerin	*Ipomoea batatas*, *I. fistulosa, I. palmata* and *I. violacea*	Active in rainy season
4	*Platypria andrewesi* Weise	*Zizyphus mauritiana*	Active in rainy season
Subfamily Cassidinae			
1	*Aspidimorpha furcata* Thunberg	Ref. Kalaichelvan, 2004.	Active in rainy season, mild summer and in mild winter. Diapause in severe winter and summer. A polymorphic species; three morphs could be made out (i) with four spots on the explanate margins of elytra, two at the anterior angles and two at posterior; (ii) with only the anterior spots, posterior spots missing, (iii) as (i) but with darker pigmentation (see Swietojanska, 2001).
2.	*Aspidimorpha lobata* Boheman	Same as for *A. sanctaecrucis*	Same as for *A. sanctaecrucis.*(see Kalaichelvan & Verma, in press)
3.	*Aspidimorpha miliaris* Fabricius	Ref. Kalaichelvan, 2004.	Active in rainy season, mild summer, mild winter, and diapause in severe winter and summer. Spots on elytra show considerable variations; they may even be fused together to form completely black elytral disc (for polymorphism in *A. miliaris* see Maulik, 1919; Verma, 1988; Verma *et al.,* 1985)
4.	*Aspidimorpha sanctaecrucis* Fabricius	Ref. Kalaichelvan, 2004.	Active in rainy season; diapause in winter and summer. In our collection two morphs were made out, (i) with golden shine in the discs of elytra and prothroax and (ii) with coffee colour in the disc of elytra and prothorax and anterior and posterior spots in the elytra explanate margin better marked than in (i). For niche of the species, see Verma *et al.*,1985.)
5.	*Conchyloctenia nigrovittata* Boheman	Ref. Kalaichelvan, 2004.	Active in rainy season, diapause in winter and summer
6.	*Cassida circumdata* Herbst	Ref. Kalaichelvan, 2004.	Active in rainy season, in mild summer and mild winter, and diapause in severe winter and severe summer. It has been inferred that this species is polymorphic, and shows 3 morphs: (i) showing typical elytral pattern (see George & Venkataraman, 1980); (ii) the same as (i) but dark pigmentation is very dilute; (iii) with discs of pronotum and elytra uniformed black (see Verma & Kalaichelvan, 2004)
7.	*Cassida exilis* Boheman	Ref. Kalaichelvan, 2004.	Breeding seson monsoon. Adult with immature stages are available in rainy season. From March to early April only adult could be collected on *Melingtonia hartensis* and larval

Sl.No.	Subfamily/Species	Host collection details	Remarks
			stages not seen on this plant
8.	*Cassida nilgiriensis* Borowiec and	Same as for *C. circumdata* Takizawa	Same as for *C. circumdata.* (see Kalaichelvan & Verma, in press)
9.	*Cassida obtusata* Boheman	Ref. Kalaichelvan, 2004.	Active iin rainy season, in mild summer and in mild winter, and diapause in severe winter and in in severe summer
10.	*Cassida pulvinata* Boheman	*Medicago sativa*	Active in rainy season
11.	*Cassida residua* Weise	Ref. Kalaichelvan, 2004.	Active in rainy season, in mild summer and mild winter, and diapause in severe winter and also in and late summer. Two morphs: (i) with metallic irridiscens in the discs of elytra and pronotum; (ii) with discs of elytra and pronotum rough and without shine
12.	*Chiridopsis bipunctata* Linnaeus (=*C. promiscua* Boheman)	Ref. Kalaichelvan, 2004.	Active in rainy season; diapause in winter and summer
13.	*Chiridopsis* sp.1	*Ipomoea fistulosa*	Active in rainy season
14.	*Chiridopsis nigropunctata* Borowiec and Ghate	Ref. Kalaichelvan, 2004.	Active in rainy season; diapause in winter and summer
15.	*Chiridopsis* sp 2.	*Ipomoea fistulosa*	Active in rainy season
16.	*Glyphocasis trilineata* Hope	Ref. Kalaichelvan, 2004.	Active in rainy season; diapause in winter and continues into summer. (In culture jar, however feeding was renewed in April.)
17.	*Oocassida pudibunda* Boheman	Ref. Kalaichelvan, 2004.	Active in rainy season; diapause in winter and continues into summer
18.	*Rhytidocassis* (Cassida Borowiec) *indicola* Duvivier	Ref. Kalaichelvan, 2004.	Active in rainy season; diapause in severe winter and again in severe summer. Two morphs could be made out: (i) with abdominal venter and terga dark (ii) with abdominal venter and terga green. In the former morph the apical part of the scutellum may be dark only in the middle, or dark colour may extend through the greater part of width of the sterna, leaving only small lateral parts green. The two morphs noted in progeny of the same female

Rainy season refers to the monsoon period of late June to middle September.
N.B.: * Synonymised as *Lema praeusta* (see Kalaichelvan *et al.,* 2003); **Synonymised as *Lema semifulva* (see Kalaichelvan *et al.,* 2003); For food plants* ** (see Kalaichelvan *et al.,* 2004).
In addition oothecae have been recorded in the species of Cassidinae (see Kalaichelvan *et al*. 2000, 2002; Verma *et al.* in press[2]). Feeding pattern of the chrysomelids have also been recorded (see Kalaichelvan *et al.,* in prep.).

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COMMENTS ON "HERPETOFAUNA OF NALLAMALAI HILLS WITH ELEVEN NEW RECORDS FROM THE REGION INCLUDING TEN NEW RECORDS FOR ANDHRA PRADESH" BY RAO *ET AL.* (2005)

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Recently, a catalogue of herpetofauna of the Nallamala Hills including 18 species of amphibians and 48 species of reptiles was published in *Zoos' Print Journal* by Rao *et al.* (2005). As many as 11 and 10 species were reported as new records from the region and the state of Andhra Pradesh, respectively. Majority of the taxa reported are based on the voucher specimens collected from 16 sites in Nagarjunasagar Srisailam Tiger Reserve, Gundla Brahmeshwaram Wildlife Sanctuary and Rollapadu Wildlife Sanctuary over a period of three years that are deposited in the Eco-Resources Labs, Sunnipenta, Kurnool district. The catalogue is first of its kind for the region and a useful document, but has major flaws. While such checklists/ catalogues provide useful information, wrong reporting would harm not only the usefulness of the paper and credibility of the authors, but also cast uncertainty regarding the region's biodiversity. It is to resolve all these issues and in the interest of the region's biodiversity, this review of the earlier paper is intended.

The inclusion of Rollapadu Wildlife Sanctuary (located in the grassland plains between the Nallamala and Erramala Hills (see Dadbadghoa & Shankarnarayan, 1973; Srinivasulu & Srinivasulu, 2004) is erroneous as it is one of the geo-administrative regions under the Project Tiger Circle of the Andhra Pradesh State Forest Department, and it has nothing to do with the geographically distinct Nallamala Hills.

1. The legend of the map of the study area (on page 1740) detailing the collection sites includes wrong depiction of the coordinates of each location. The coordinates provided are values of decimal latitude and longitude represented in minutes and degree format.

2. Of the new records claims, six records for Andhra Pradesh and five records for the region have already been cited earlier by other workers. Having included the Rollapadu Wildlife Sanctuary as a part of the Nallamala Hills, the claim of new records of *Calotes rouxii* (Duméril & Bibron, 1837) (Squamata: Agamidae) and *Lycodon striatus* (Shaw, 1802) (Squamata: Colubridae) are not correct as both these taxa have been recorded from Rollapadu Wildlife Sanctuary and its vicinity by Srinivasulu and Srinivasulu (2004). *Bufo scaber* (Schneider, 1799) (Amphibia: Bufonidae) and *Geochelone elegans* (Schoepff, 1795) (Testudines: Testudinidae) was reported from

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