

A TAXONOMIC REVISION OF THE GENUS *DERETAPHRUS* NEWMAN, 1842 (COLEOPTERA: CUCUJOIDEA: BOTHRIDERIDAE)

NATHAN P. LORD^a AND JOSEPH V. MCHUGH
Department of Entomology, University of Georgia
Athens, GA 30602, U.S.A.

ABSTRACT

A revision of the genus *Deretaphrus* Newman, 1842 (Coleoptera: Bothrideridae) is presented. *Deretaphrus* is a predominantly Australian genus (22 species), although single species are also present in New Caledonia, Bolivia, and the Pacific Northwest USA. Members of the genus are large (5–13 mm) and commonly collected. *Deretaphrus* larvae are ectoparasitic on wood-boring insects and may pose some utility as biological control agents. Approximately 1,900 specimens were borrowed from 44 collections and museums, representing the majority of the world's total holdings. A taxonomic treatment of the genus was conducted and all known species are herein described and figured. A key is provided to the world species, and information about the natural history and ecology of the group is presented.

Twenty-five species are recognized, including seven new species described herein: *Deretaphrus antennatus* Lord and McHugh, **new species**, *Deretaphrus boliviensis* Lord and McHugh, **new species**, *Deretaphrus carinatus* Lord and McHugh, **new species**, *Deretaphrus hoplites* Lord and McHugh, **new species**, *Deretaphrus lateropunctatus* Lord and McHugh, **new species**, *Deretaphrus ocellaris* Lord and McHugh, **new species**, and *Deretaphrus rodmani* Lord and McHugh, **new species**. Two new junior synonyms are reported: *Deretaphrus cribriceps* Blackburn and *Deretaphrus popularis* Blackburn are placed under *Deretaphrus viduatus* Pascoe, **new synonymies**. Two former junior synonyms, *Deretaphrus bucculentus* Elston, **new status** (from *Deretaphrus puncticollis* Lea) and *Deretaphrus iridescens* Blackburn, **new status** (from *Deretaphrus gracilis* Blackburn), are removed from synonymy. Neotypes are designated for two species: *Deretaphrus fossus* Newman and *Deretaphrus wollastoni* Newman. Lectotypes are designated for 23 nominal species: *Deretaphrus aequaliceps* Blackburn, *Deretaphrus analis* Lea, *Deretaphrus bakewellii* Pascoe, *Deretaphrus cordicollis* Blackburn, *Deretaphrus colydioides* Pascoe, *Deretaphrus cribriceps* Blackburn, *Deretaphrus erichsoni* Newman, *D. gracilis*, *Deretaphrus granulipennis* Reitter, *Deretaphrus ignarus* Pascoe, *Deretaphrus incultus* Carter and Zeck, *Deretaphrus interruptus* Grouvelle, *Deretaphrus iridescens* Blackburn, *Deretaphrus oregonensis* Horn, *Deretaphrus parviceps* Lea, *Deretaphrus pascoei* Macleay, *Deretaphrus piceus* (Germar), *Deretaphrus popularis* Blackburn, *D. puncticollis*, *Deretaphrus sparsiceps* Blackburn, *Deretaphrus thoracicus* Blackburn, *D. viduatus*, and *Deretaphrus xanthorrhoeae* Lea. Paralectotypes are designated for *D. analis* (2), *D. incultus* (3), *D. interruptus* (2), *D. oregonensis* (7), *D. pascoei* (2), *D. piceus* (1), *D. sparsiceps* (1), and *D. xanthorrhoeae* (1).

Key Words: taxonomy, morphology, new species, cocoon-forming beetles, ectoparasite

INTRODUCTION

Bothrideridae is a small family of poorly known beetles comprising four subfamilies and more than 400 species. Members of the family are found in all major zoogeographical regions of the world. Although little is known about their biology, most bothriderids are closely associated with the galleries of wood-boring insects, either as fungus feeders (Teredinae, Xylariophilinae) or ectoparasites and predators (Bothriderinae) as both larvae and adults. Members of the bothriderid subfamily Anommatinae are regarded as generalist fungivores. Of the few larvae that have been observed, some are free-living (Teredinae), but most are strongly modified ectoparasites that attack wood-inhabiting insect larvae, exhibit hypermetamorphic development, and spin cocoons for pupation (Lawrence

1991). These developmental and behavioral features are rare among beetles. Due to their host preferences, bothriderids may have potential utility as biological control agents against destructive wood-boring insect pests. As adults, bothriderids are quite morphologically diverse, possessing a surprising number of body plans and innovations for such a small family (Ślipiński *et al.* 2010).

Members of Bothrideridae were historically placed into various tribes or subfamilies within the tenebrionoid family Colydiidae (= Zopheridae). Within the Colydiidae, Erichson (1845) erected the tribe Bothriderini to include several genera. Horn (1878) later erected the tribe Deretaphrini (= Teredini, in part) based on the contiguous anterior coxae of its members. Ganglbauer (1899) circumscribed the subfamily Anommatinae (containing the enigmatic genus *Anommatus* Wesmael) and also erected the subfamily Ceryloninae (= Cerylonidae), including the tribes Deretaphrini and Bothriderini along with several others.

^a Current address: Department of Biology, 401 WIDB, Brigham Young University, Provo, UT 84602, U.S.A.

Craighead (1920) did not recognize Deretaphrini, since he included *Deretaphrus* Newman within Bothriderini. Based on larval and adult morphology, Craighead found several major differences between the Colydiidae and Bothriderini, leading him to place the latter in a separate family, Bothrideridae. Subsequent workers failed to adopt Craighead's new familial classification; therefore Bothriderini and Deretaphrini (including Teredini) remained within the Colydiidae (e.g., Hetschko 1930; Hatch 1961). Craighead continued to publish works utilizing the family status for Bothrideridae and even went so far as to give the taxon a common name, "The Cocoon-Forming Beetles" (Craighead 1950). Crowson (1955) did not recognize the group as a separate family and instead recognized the Bothriderinae as a distinct subfamily within Colydiidae. Lawrence (1980) also found strong evidence for the group to constitute a separate family, but refrained from taking action. Familial status for Bothrideridae was formally adopted by Lawrence (1985, 1991), who recognized three subfamilies: Bothriderinae, Teredinae, and Anommatinae. Pal and Lawrence (1986) further solidified this status by describing a new bothriderid subfamily (Xylariophilinae) and redefining the four subfamilies within Bothrideridae. For a comprehensive overview of the family, see Ślipiński *et al.* (2010).

Currently, Bothrideridae is widely recognized as part of the Cerylonid Series of the superfamily Cucujoidea. The monophyly of the family has been questioned (e.g., Lawrence 1991; Ślipiński *et al.* 2010) and recent phylogenetic analyses confirm these suspicions, recovering Bothrideridae as paraphyletic with respect to Cerylonidae (Hunt *et al.* 2007) or Cerylonidae and Discolomatidae (J. A. Robertson, personal communication). To date, little taxonomic work has been conducted within the family. Although Bothrideridae currently contains approximately 400 species, this number is expected to increase considerably as the genera are revised.

Deretaphrus Newman is a moderately speciose genus within the subfamily Bothriderinae. It is the type genus of the tribe Deretaphrini Horn (1878). *Deretaphrus* species are large (5–13 mm) and commonly collected at lights or under bark. Members of the genus are widespread, with 22 species in Australia, one species in New Caledonia, one species occurring in the Pacific Northwest of the United States, and one species in Bolivia. While this odd distribution may call into question the monophyly of the group, there are a number of strong potential morphological synapomorphies for the genus, including the closed radial cell in the hind wing, the unique type of male genitalia, and the antero-

ventrally expanded submentum. In the absence of a larger, robust analysis, however, these synapomorphies are only hypothetically proposed. DNA-grade specimens across the family Bothrideridae have been gathered, and a combined morphological/molecular analysis of the Cerylonidae-Discolomatidae-Bothrideridae cluster of the Cerylonid Series is in the preliminary stages by NPL and J. A. Robertson. The project presented herein represents the first in a number of revisionary works being conducted by the first author in an effort to resolve the taxonomic instability and describe previously unknown diversity within the family.

MATERIAL AND METHODS

Material Examined. Most of the world's holdings of *Deretaphrus* were acquired in order to conduct a thorough revision of the genus. Approximately 1,900 specimens were examined or borrowed from the following 44 collections around the world, including all major Australian and North American museums. The majority of the museum codons used follows the system proposed by Arnett *et al.* (1993).

AAIC	Albert Allen Personal Insect Collection, Boise, ID, USA
AMNH	American Museum of Natural History, New York, NY, USA
AMSA	Australian Museum, Sydney, Australia
ANIC	Australian National Insect Collection, CSIRO, Canberra, Australia
BMNH	British Museum of Natural History, London, UK
BPBM	Bishop Museum, Honolulu, HI, USA
BYUC	Brigham Young University Insect Collection, Provo, UT, USA
CASC	California Academy of Sciences, San Francisco, CA, USA
CDFA	California Department of Food and Agriculture, Plant Pests Diagnostic Center, Sacramento, CA, USA
CUIC	Cornell University Insect Collection, Ithaca, NY, USA
EMEC	Essig Museum, University of California, Berkeley, CA, USA
FMNH	Field Museum of Natural History, Chicago, IL, USA
FSCA	Florida State Collection of Arthropods, Gainesville, FL, USA
HNHM	Természettudományi Múzeum, Allatár, Budapest, Hungary
INHS	Illinois Natural History Survey, Champaign, IL, USA
ISNB	Institut royal des Sciences naturelles de Belgique, Brussels, Belgium

KSUC	Kansas State University Insect Collection, Manhattan, KS, USA
LACM	Natural History Museum of Los Angeles County, Los Angeles, CA, USA
MAIC	Michael A. Ivie Insect Collection, Bozeman, MT, USA
MAMU	Macleay Museum, University of Sydney, New South Wales, Australia
MCZ	Museum of Comparative Zoology, Cambridge, MA, USA
MNHN	Muséum National d'Histoire Naturelle, Paris, France
MNHUB	Museum für Naturkunde, Humboldt-Universität zu Berlin, Berlin, Germany
MTEC	Montana State University Entomology Collection, Bozeman, MT, USA
MVMA	Museum Victoria, Melbourne, Australia
NPLC	Nathan P. Lord Collection, Albuquerque, NM, USA
NZAC	New Zealand Arthropod Collection, Auckland, New Zealand
OUMNH	Oxford University Museum of Natural History, Oxford, UK
QDPI	Queensland Department of Primary Industries, Brisbane, Australia
QMBA	Queensland Museum, Brisbane, Australia
QPIM	Queensland Department of Primary Industries, Mareeba, Australia
SAMA	South Australian Museum, Adelaide, Australia
SBMNH	Santa Barbara Museum of Natural History, Santa Barbara, CA, USA
SDMC	San Diego Natural History Museum, San Diego, CA, USA
SRFP	Station de Recherches Fruitières de Pocquereux, Institut Agronomique Néo-Calédonien (IAC), La Foa, New Caledonia
TAMU	Texas A&M University Insect Collection, College Station, TX, USA
UCDC	Bohart Museum, University of California, Davis, CA, USA
UCRC	University of California, Riverside Insect Collection, Riverside, CA, USA
UGCA	University of Georgia Collection of Arthropods, Athens, GA, USA
UQIC	University of Queensland Insect Collection, Brisbane, Australia
USNM	Smithsonian Institution, US National Museum, Washington, DC, USA
WAMP	Western Australian Museum, Perth, Australia
WSUC	Washington State University Insect Collection, Pullman, WA, USA
ZMPA	Polish Academy of Sciences, Museum of the Institute of Zoology, Warszawa, Poland

Specimen Preparation. Dried specimens were heated and relaxed in warm water or placed in a Branson 1210 ultrasonic cleaner in soapy water for several minutes if dirty or greasy. Specimens were disarticulated and cleared in 10% KOH solution. Dissected parts were then rinsed with a dilute acetic acid solution and water and stored in glycerin. In some cases, only parts of specimens (notably the abdomen and genitalia) were dissected (including for some type specimens). The abdomen was then glued to a card and the genitalia were placed in glycerin in a genitalia vial. The vial and card were then pinned beneath the specimen. Examination of material was done using a Wild M5, Leica MZ8, and Leica WILD M10 microscope.

Imaging and Illustrations. Color habitus images and label images were captured using a Microptics ML-1000 Digital Imaging system (Microptics, Inc., Ashland, VA, USA), Visionary Digital™ Passport, and BK Plus imaging systems, equipped with a Canon 40D and 7D DSLR camera. Genitalia were imaged with a Leica M205A microscope equipped with a Nikon DS-U3-Ri1 camera. Image stacks were montaged in Zerene Stacker v.1.04 (Zerene Systems LLC, Richland, WA, USA), Helicon Focus v.3.20.3 (Helicon Soft Ltd., Kharkov, Ukraine), and/or CombineZ v.5.3 (Alan Hadley, U.K.). SEM images were captured using a Leica 1450 EP Environmental Scanning Electron Microscope. Images were edited in Adobe Photoshop CS5 v.12.0.4. Line drawings were digitally rendered in Adobe Illustrator CS5, v.15.0.2 (Adobe Systems, Inc., San Jose, CA, USA).

Measurements. Specimen images were captured with a Sony DKC-5000 camera attached to a Leica WILD M10. Following calibration with a stage micrometer, morphometric data were generated in Auto-Montage Pro, v. 5.01 (Synoptics, Ltd., Frederick, MD, USA).

Unique Specimen Identification Numbers. For each specimen examined (including types), a unique specimen identification number was assigned. This number is composed of the museum codon, specimen number, and the first author's initials (*e.g.*, "SAMA 214NL" indicates South Australian Museum, specimen number 214, NL = Nathan Lord). This number is written on the underside of the author's determination label and is listed in the text following the type label data (in brackets), as well as in the "Additional Material Examined" section of each species treatment (in parentheses).

Label Data. Complete label data for all specimens examined has been parsed and recapitulated (fully geo-referenced when possible) into a document provided in an on-line database maintained by the first author and available at www.coleopterasystematics.com.

Label data for all type specimens are recorded under the following conventions: double quotes (“ ”) enclose label data quoted verbatim; double forward slashes (//) separate labels; brackets [] enclose our comments or notes. Labels are typed, unless noted in brackets.

Type Specimens. Primary types for all previously described species were examined. In order to stabilize the nomenclature of the species-group names, lectotypes and paralectotypes are designated herein from syntypic series. In the case of species described by Lea, specimens usually bear a “TY” in Lea’s hand below the specimen on the card-mount, indicating his concept of the type specimen. Lea’s determination labels for these specimens usually bear a “type” designation. In the case of species described by Blackburn, card-mounted specimens usually bear a number (in red ink) and “T.” (in black ink) in Blackburn’s hand. Carter and Zeck also tended to list “Type” or “Cotype” on their determination labels attached to syntypes. These conventions were noted and used in determining members of syntypic species of previously described species. All type specimens studied were affixed with appropriate labels in a standard format (e.g., “LECTOTYPE *Deretaphrus analis* Lea 1898”). Red labels were affixed to holotypes, neotypes, and lectotypes. Yellow labels were affixed to paratypes and paralectotypes. All primary types (including card-mounts, if informative) and type labels were imaged (Figs. 183–251). Images of type labels affixed by the authors were only included for new species described herein.

Species Concept. This revision applies the phylogenetic species concept *sensu* Wheeler and Platnick (2000), defining species “as the smallest aggregation of (sexual) populations or (asexual) lineages diagnosable by a unique combination of character states”. We herein assume species of *Deretaphrus* are sexually reproducing, and “character states” are morphological attributes that are heritable and fixed across the population of specimens observed.

Geo-Referencing and Mapping. All collection localities that could be reliably identified were geo-referenced with either the Global Gazetteer v. 2.2 (Falling Rain Genomics, Inc., www.fallingrain.com/world/index.html) or Google Earth/Google Maps (www.maps.google.com). The latitude/longitude coordinates for localities using a distance offset (e.g., 10 km S Canberra) were estimated via GoogleEarth. The mapping of localities and generation of maps were performed using ESRI® ArcMap™ 9.2 (Redlands, CA, USA) using shape files provided by the University of Georgia Department of Geography (Athens, GA, USA).

MAJOR MORPHOLOGICAL CHARACTERS AND TERMINOLOGY

The majority of the general anatomical terms correspond to the definitions given in The Torre-Bueno Glossary of Entomology (Nichols and Schuh 1989). Sharp and Muir (1912), McHugh *et al.* (1997) and Lawrence *et al.* (2010, 2011) were referenced for morphological structures and descriptions.

Variation. Adults are highly variable in size, coloration, and sculpturing, possibly due to their ectoparasitic lifestyle. In particular, the ornamentation of the pronotal disc and the carination of the elytral interstitial intervals can vary intraspecifically. The elytral punctures often vary in size and/or depth. The coloration and general appearance also may vary within a species, ranging from pitchy orange/red to black. The luster of various body surfaces varies in appearance from matte to glossy. Smaller specimens become nondescript, their distinguishing characters being much less pronounced than in larger specimens of the same species. This intraspecific variation undoubtedly caused many misidentifications, synonyms, and other nomenclatorial issues that are so pervasive within the genus.

Body Shape. Most species are fairly elongate and dorsoventrally flattened. Some species (*Deretaphrus antennatus* new species, *Deretaphrus oregonensis* Horn) are nearly cylindrical in shape and are much less flattened. Due to the extreme variation in sizes of members (e.g., Fig. 6), the lengths and widths of various body segments are highly variable. Thus, morphometric data were not utilized for diagnosis.

Head. The setation and sculpturing of the dorsal surface of the head provide few useful characters. The clypeus and anterior portion of the frons may be slightly depressed medially, but this condition may be too variable intra-specifically to be taxonomically informative. The shape of the head is a diagnostic character for several species, ranging from simple (in most species) to possessing large, thickened ridges above and posterior to the eyes. These supra-ocular ridges are sometimes laterally expanded over the eyes, ranging from evenly rounded (*Deretaphrus rodmani* new species, Fig. 39) to angulate (*Deretaphrus bucculentus* Elston, Fig. 35), often partially or completely concealing the eyes from above (when viewed dorsally). The head is typically narrowed anteriorly; the distance between the antennal insertions varies between species. The frontoclypeal suture is generally arcuate; however, in some species the posterior margin of the clypeus is weakly incised medially. The anterior margin of the clypeus may be straight to evenly curved

(Fig. 43) to sharply incised medially (*Deretaphrus interruptus* Grouvelle, Fig. 42). The mandibles in *Deretaphrus* are broad, curved, and bidentate (Fig. 23), often rotated ventrally so that the external face is the dorsal surface (most easily seen in anterior or ventral view, see Figs. 42–43).

Eyes. In most species, the eyes are evenly convex and appressed to slightly protuberant, but in a few species (*Deretaphrus parviceps* Lea, *Deretaphrus carinatus* new species) the eyes are strongly protuberant, approaching acutely angular (Figs. 36, 38). In *Deretaphrus ocularis* new species, the eye is reniform, excavated posteriorly by a sharp postocular expansion of the head capsule (Figs. 40–41).

Antennae. The antennal club is asymmetrical, sometimes greatly so. The anterior margin of the club segments is hereafter referred to as the “leading edge” (when antennae held laterally, perpendicular to midline of body). Note that the leading edge may appear as the inner edge if the antennae are held straight in front of the head. The leading edge of the club segments are subtly to strongly curved, often much more inflated than the trailing edge (posterior margin when antennae held laterally, outer edge when held straight forward). The antennal setation, especially on the club segments, is variable across the genus. The antennal segments bear minute, small, or long setae. Minute setae are defined as being extremely short, much shorter than (less than one-eighth) the length of the segment from which it arises (e.g., Fig. 44). Antennae bearing minute setae appear glabrous under lower magnification, the setae becoming visible only under high magnification. Short setae are defined as being just slightly shorter than the segment from which they arise, and they are visible under lower magnification (e.g., Fig. 46). Long setae are defined as being as long as or longer than the segment from which they arise (e.g., Figs. 45, 47). The density of the setae on the antennae is more or less variable, arranged in one or more transverse rows.

Submentum. The submentum is often strongly expanded anteroventrally over the oral cavity and variously shaped. The submentum may partially or completely conceal the mentum and palpi from view. The submentum may be widely separated from the subgenal braces, narrowly separated from them, or fused to them (see Figs. 48–53). A group of paired pits bearing long, erect setae occurs on the base of the submentum (Figs. 49, 50, 53) in some species.

Mandibles. All species have short, broad, bidentate mandibles. In some species, the dorsal, exterior face of the mandible bears several large punctures (sometimes appearing as a groove) from which long, thick setae arise (Figs. 42–43).

When present, the groove is clearly visible. It may be difficult to recognize setal sockets in punctures not forming a distinct groove, however, as the long setae arising from the sockets tend to break off.

Prothorax. Most *Deretaphrus* species exhibit a characteristic sculpturing of the pronotal disc (see Figs. 57–81). The median portion of the pronotal disc frequently bears a median longitudinal depression, groove, or canal. It may be very shallow and wide, hereafter referred to as a pronotal median longitudinal depression, or narrow and abruptly impressed, hereafter referred to as a pronotal median longitudinal groove or canal. The canal can be shallow to deep, weakly to strongly pronounced, variably narrowed and expanded, and open or closed at the base and apex. The internal area of the canal can be flat to weakly raised, simple or grooved at the lateral internal borders. In the majority of species, the canal is interrupted anteriorly, forming a distinct, long posterior portion and a short, anterior portion. The anterior portion of the canal can be deeply foveate, a minute slit, or a mere depression. The punctuation of the pronotal disc is highly variable, ranging in size from minute (*Deretaphrus analis* Lea, *Deretaphrus piceus* (Germar), *Deretaphrus lateropunctatus* new species) to large (*Deretaphrus alveolatus* Carter and Zeck, *D. bucculentus*, *D. parviceps*, *Deretaphrus puncticollis* Lea). The puncture size of the pronotal disc may be uniform (in most species) or variable (*D. oregonensis*, *D. lateropunctatus*). The hypomera are variously angled, from weakly deflexed (nearly perpendicular to dorsal plane) to strongly deflexed. The prosternum appears to have few useful characters that are reliable within the genus.

Metaventricle. The metaventricle bears few useful characters. The punctuation of the metaventricle is slightly variable, with a few species having much larger punctures at the anterior angles (*D. lateropunctatus*).

Elytral Interstitial Intervals. The elytra have several useful characters. The most important is the carination of the elytral interstitial intervals (interstriae), here defined as the areas between the puncture rows (striae). The sutural interval (immediately lateral to the elytral suture) is numbered as 1. In *Deretaphrus*, the elytral interstitial intervals can be flat, slightly raised, or strongly elevated to carinate (interstitial/interstitial carinae) and may be dull or shiny in luster. Generally, elytral interstitial intervals 3, 5, and 7 are raised to carinate for some portion or entire length of the elytron, with the base and apex of these intervals nearly always at least subtly raised. In some species, the raised or carinate elytral interstitial intervals merge with one or more intervals near the elytral apex.

Abdominal Ventrite V. In most species, abdominal ventrite V is simple. In some, (*D. piceus*, *D. analis*), ventrite V bears two depressions, one on each side of the midline, resulting in a raised, median, V-shaped area near the posterior margin (Figs. 132–133) which is present in both sexes. Other species (*Deretaphrus erichsoni* Newman, *Deretaphrus hoplites* new species, *Deretaphrus xanthorrhoeae* Lea) have sexual dimorphisms on abdominal ventrite V involving variable punctation, depressions, excised notches, or swellings at the apex in one or both sexes (Figs. 134–136, 138–139).

Male Genitalia. The male genitalia are diagnostic for several species (see Figs. 140–172). The parameres may be individually articulated to the phallobase or broadly fused to one another. If fused, the parameres are generally short and broadly rounded, often with distinct areas of varying thickness, appearing as lighter or darker patches that are diagnostic at the species level. Setation occurs near or at the apex of the parameres. If individually articulated, the parameres are generally elongate and narrow, with setation varying from short and sparse (majority) to long and dense (*D. oregonensis*, *Deretaphrus boliviensis* new species). In *Deretaphrus hoplites*, the parameres are greatly enlarged. In most species, each paramere bears a dorsal hook-like process (hereafter referred to as a “parameral process”). The process is a useful character, varying in size and shape from thickened and nearly touching the opposing process to thinner and distinctly separated, and with the shape ranging from straight to strongly curved. The phallobase is reduced, and the shape of the tegmen and basal piece is variable, ranging from simple (in most species) to complex, with anterior extensions and paired lateral struts (*D. piceus*, *D. analis*, *Deretaphrus iridescens* Blackburn, *Deretaphrus gracilis* Blackburn). The penis may be unicolored or bicolored and ranges from extremely long and thin and bearing long, paired anterior struts (*D. piceus*, *D. analis*, *D. iridescens*, *D. gracilis*), to shorter and thicker and bearing shorter, paired anterior struts (in most species), to greatly thickened and variously swollen (*D. bucculentus*). While the curvature of the penis initially seemed diagnostic for several species, the degree of curvature was found to vary within a species depending on conditions of specimen clearing (e.g., duration, hot vs. cold KOH) and amount of musculature surrounding the penis. Thus, we did not rely on this character for reliable identification and differentiation.

Female Genitalia. The female genitalia varied little between species and thus are not discussed in the individual species treatments.

TAXONOMY

Deretaphrus Newman, 1842

Deretaphrus Newman, 1842: 403–404. Type species: *Deretaphrus fossus* Newman, 1842: 404.
Sigerpes Germar, 1848: 222–223. Type species: *Sigerpes piceus* Germar, 1848: 223. Synonymized by Lacordaire 1854: 377–378.
Deretaphrus: Lacordaire 1854: 377–378, Lacordaire 1876: 8, pl. 20. Misspelling, no status.

Adult Diagnosis. Within the Bothriideridae, *Deretaphrus* is characterized by the loose, 3-segmented antennal club, strongly enlarged submentum which partially or completely conceals the palpi from view, externally closed coxal cavities, strongly heteromeroid trochanters, the intercoxal process of abdominal ventrite I acute, and the hind wing with a closed radial cell. Keys to separating New World bothriiderid genera can be found in Stephan (1989) and Philips and Ivie (2002), and a key to the genera of *Deretaphrini sensu* Heinze can be found in Heinze (1943).

Adult Description. Body: Length 4.9–12.9 mm. Width 1.15–3.6 mm. Elongate, parallel, slightly flattened to subcylindrical, reddish orange to black; surface luster matte to moderately shiny; glabrous except for minute setae that arise from the punctures. In general, adult *Deretaphrus* are heavily sclerotized. **Head** (Figs. 18–20): Slightly to moderately declined (Fig. 3), evenly convex to flattened, a little narrower than prothorax, elongate; with a weak lateral postocular (transverse) occipital impression that continues laterad and meets the submental suture ventrally, completely separating the vertex from the occiput. Occiput swollen, forming a bulbous posterior portion of the head capsule. Head not abruptly constricted posteriorly to form a neck. Occipital foramen small to moderate in size. Temples very short and shelf-like. Frons and vertex simple; stridulatory files absent. Frons sometimes with an evenly rounded to angulate expansion of the head capsule above and posterior to the eye (hereafter called supra-ocular ridges), often partially or completely concealing eyes from above. Frons anterolaterally emarginate (at fronto-clypeal suture) to receive antennal scape. Frontoclypeal suture indistinct to distinct, arcuate to sharply incised medially. Clypeus with lateral and anterolateral emarginations forming 4 acute, dentate projections on anterior margin, antennal scape received in lateral emarginations at level of frontoclypeal suture. Anterior edge of clypeus straight to convex to sharply incised medially. Antennal insertions dorsolateral, moderately to widely separated and completely exposed from above. Subantennal groove well-developed, deep; present on

ventrolateral surface, extending posteriad from the antennal base to posterior edge of the eye. Submentum forms anteroventral edge of head capsule. Submentum strongly produced and highly variable, slightly to strongly projecting anteroventrally, delimited posteriorly from the submental suture which lies at the bottom of a broad furrow. Laterally, submentum is margined by strongly expanded subgenal braces. Submentum and subgenal braces widely separated (Figs. 50–51, 53), narrowly separated (Fig. 48), touching (Fig. 49), or partially fused (Fig. 52). Submentum sometimes with paired setose pits anterior to submental suture, near connection of submentum and subgenal braces (Figs. 49, 51, 53). Gena bearing a distinct pit near mandibular articulation (visible in Fig. 48), most likely the external manifestation of an apodeme for the attachment of the anterior arms of the corporotentorium. Gular sutures widely separated, narrowing anteriorly. Cervical sclerites absent. Corporotentorium narrow; with anterior arms and narrow tentorial bridge; lacking dorsal arms. Bulbous posterior portion of head capsule usually retracted into anterior region of the prothorax (as ball-and-socket joint). Cervical membrane with 2 short, transverse, dorsolateral rows of anteriorly projecting setae (Fig. 18). **Eyes:** Moderately large, coarsely faceted, lacking interfacetal setae. Eyes evenly convex (most) to nearly angulate (*D. carinatus* and *D. parviceps*, Figs. 36, 38), slightly to strongly protuberant. Posterior margin of eye straight to convex and bordered by a thickened strip of cuticle (most) to distinctly emarginate posteriorly by a cuticular triangular projection of the head capsule (*D. ocellaris*, Figs. 40–41). **Antennae:** Eleven-segmented with weak, loose, slightly flattened, 3-segmented apical club. Antennal scape moderately large, asymmetrical, more strongly inflated anteriorly, round, punctate, articulation with pedicel subapical; pedicel narrower and slightly elongate; segments 3–8 short, subcylindrical and subequal. Antennal club asymmetrical, inflated at leading edge (when antennae held out laterally), segments 9–11 subtriangular, segment 10 larger than 9 and 11. Apex of segments 9–11 with 1 or more sensilla-bearing depressions or cupules (Figs. 46–47). Antennal club with minute setae (Fig. 44), sparsely setose with short setae (Fig. 46), or densely setose with long, erect setae (Figs. 45, 47). **Mouthparts:** Labrum (Fig. 21) partially concealed beneath clypeus, strongly transverse, apex subtruncate and slightly sclerotized, with a row of long, stiff setae projecting anteriorly; ventral surface with median, raised triangular portion (referred to as an epipharyngeal impression by Pal and Lawrence 1986), lateral margins of raised portion densely setose; mesal arms of tormae small, separate,

oblique, projecting anteromedially; lacking brush-like epipharyngeal process (as is found in most Bothrideridae). Maxilla (Fig. 22) with distinct galea and lacinia. Galea subtriangular with apex broad and densely setose, lacking hooks or teeth. Lacinia long and narrow, with a bifid apex. Lacinia densely setose, setae stouter and thicker distally near the apex. Maxillary palp 4-segmented. Labial palp 3-segmented. Apical maxillary and labial palpomeres weakly fusiform. Ligula undivided. Mandible (Fig. 23) short and broad; incisor edge simple; mola and prostheca absent. Mandibular base punctate; apex smooth, bidentate apically, some species with a subapical tooth on inner mesal margin. External (dorsal) face of mandible with short setae, few long setae arising from punctures medially, or with median setose groove bearing long setae. **Prothorax:** Pronotum quadrate to elongate, widest at middle or anterior half, narrowing posteriorly; dorsal surface convex (e.g., Fig. 64), flattened (e.g., Fig. 58), or slightly depressed at middle (e.g., Figs. 62, 75, 77–78, 80). Pronotal disc punctate, punctures variable in size and density. Anterior margin of pronotum straight or arcuate; anterior angles rounded and indistinct (e.g., Fig. 73) to distinct and obtuse (e.g., Fig. 65). Base of pronotum slightly to moderately narrower than elytral bases, weakly sinuate to arcuate between posterior angles; posterior angles distinct, often with single small denticle (e.g., Fig. 67). Pronotal disc usually with median longitudinal depression, groove, or canal; canal sometimes interrupted, forming an anterior fovea and a posterior canal, both separated by an elevated, usually impunctate portion of the pronotal disc (e.g., Figs. 59, 70, 76). Sides of prothorax more or less straight (e.g., Figs. 58, 77), slightly arcuate to subtly sinuate (e.g., Figs. 69, 73), or narrowing towards base (e.g., Figs. 59, 70, 74). Pronotum margined laterally by an incomplete carina with a raised margin or bead; when viewed laterally, carina gradually to abruptly curved anteroventrally, ending before anterior margin of prothorax (Fig. 3). Pronotum strongly deflexed laterally, forming the hypomeron. Hypomeron sparsely punctate, with long, narrow postcoxal projections that meet under the prosternal process. Tergosternal suture straight to slightly sinuate, originating at anterolateral margin of procoxa, extending anteriorly, parallel to the posterolateral margin of the prothorax, terminating before anterior margin. Prosternum with a transverse, sinuate groove anterior to the procoxae (Fig. 54); groove incised for entire length anterior to coxae or on either side of midline and smooth medially, groove extends laterally and ends at tergosternal suture lateral to procoxae, separating prothoracic basisternum from prosternal process. Prothoracic basisternum quadrate to elongate, flat

to moderately convex, always longer than prosternal process. Prosternal process complete, narrowed then strongly and abruptly expanded behind coxae, expansion meeting postcoxal projections. Prosternal process (Fig. 54) slightly elevated posterior to the coxae, broadly rounded, slightly overlapping mesoventrite. Prosternum bearing row of short, golden setae at anterior margin that project anteriorly opposite the base of the head; margination continues laterally and dissipates near anterior pronotal angles. Posteriorly, entire basal margin of prothorax bears row of short, golden setae that project posteriorly. Procoxae narrowly separated. Procoxal cavities round, narrowly separated at middle, internally open, externally broadly closed by postcoxal projections. Prothoracic trochantin concealed. **Pterothorax:** Mesoscutellum visible, abruptly elevated, shield-shaped. Mesoscutum shield-shaped, with fine, crenulate microsculpturing. Mesoscutum with anterolaterally projecting arms and postnotal elytral process. Lateral margin of mesoscutum bearing sharp angulate projection, locking into grooves on elytral shelf. Mesoscutum with weakly visible longitudinal mesothoracic suture, represented internally by the longitudinal mesothoracic ridge. The internally projecting yolk plates of the mesoscutum are pointed and sclerotized. Anterior edge of mesoventrite at midline on different plane than mesosternal process and metaventrite. Mesothorax usually retracted into posterior region of the prothorax. Mesocoxae (Fig. 27) round, countersunk, narrowly separated, closed laterally by meso- and metaventrite. Mesoventral process extending to middle of mesocoxae. Meso-metaventral junction between mesocoxae a notched fitting, apex of metaventrite overlapping mesoventrite (Fig. 27). Mesepisterna distinctly separated, variously punctured. Mesoventrite variously punctured. Metaventral discrimen deeply impressed, tapering and becoming weaker anteriorly, terminating near midpoint of metaventrite. Metaventrite longer than first abdominal ventrite, variously punctured. Metepisternum long, narrow. Metepimeron highly reduced, represented only weakly anteriorly in the arm of the notal wing process, obsolete posteriorly. Metacoxae ovoid, transverse, countersunk, narrowly separated. Lateral furcal arms of metendosternite moderately long, apices swollen. Metendosternite (Figs. 26–27) with anterior process absent; apical edge not emarginated; laminae well-developed, narrowed, projecting slightly posteriorly from beneath bases of furcal arms; ventrolateral processes absent; metafurcal ventral flange well-developed; anterior tendons widely separated, arising from short, pointed, anteriorly projecting arms. **Elytra** (Figs. 82–131): Elongate, completely concealing abdomen. Elytron with 9 distinct puncture rows.

Scutellary striole absent. Elytral punctures range from inconspicuous (*e.g.*, *D. analis*) to deep and strongly marked (*e.g.*, *D. ignarus*). Interstitial intervals (interstriae) flat (*e.g.*, Figs. 100–101), to feebly raised (*e.g.*, Figs. 86–87), to strongly carinate (*e.g.*, Figs. 122–123). In some species, apex of interstitial intervals with micropunctures, each bearing a minute seta (*e.g.*, *D. puncticollis*). In most species, interstitial intervals 3, 5, and 7 elevated at base and apex of elytron. In some, elytral interstitial carinae join near apex (*e.g.*, *D. puncticollis*, Fig. 122). Carina of interstitial interval 9 begins at humeral angle, extends posteriorly and merges with elytral apex. Inner margin of elytra forms tongue and groove locking apparatus. True basal margin of elytron strongly depressed, forming large elytral shelf. Grooves on inner margin of shelf articulate with and lock into corresponding notches on lateral margin of mesoscutum. Apex of humeral angles with knob-like or finger-like callosities or protuberances, sometimes merging with elytral interstitial carina. Callosities sometimes extend anterolaterally at the basal margin of elytron to epipleuron. Epipleuron gradually set off from lateral margin of elytron, narrowing posteriorly until dissipating near the elytral apex. Mesal edge of epipleuron delimited by a sharply impressed longitudinal groove; groove confluent with the sutural and apical elytral carinae. Lateral edge of elytron straight. Basal edge of elytron (when viewed laterally), weakly sinuate. **Hind wing** (Fig. 25): With well-developed, elongate radial cell. Inner posterior angle formed at base of radial cell 90°. Median area of hind wing with 4 free veins. Medial fleck present, weakly developed, partially bisected by a free vein. Wing veins in medial area variable inter- and intra-specifically. Wedge cell present in some species, minute or absent in others. Anal lobe present. **Legs** (Figs. 27, 54–56): Trochanterofemoral attachment of the heteromeroid type; trochanter partially concealed within excavations in proximal end of femur, femur nearly touching coxa. Trochanter and coxa sometimes bearing sparse setae. Femur glabrous, swollen near middle; at apex, anterior and posterior walls with expanded, downward-projecting semicircular plates, concealing the femorotibial articulation from the sides (Figs. 27, 55). Tibia slightly expanded apically, outer edge with row of small denticles, inner edge sparsely to moderately setose; outer apical angle produced into large, outwardly facing tooth (mucro) and crown of smaller teeth; with 2 subequal, glabrous tibial spurs, 1 spur much larger and thicker; curved (Figs. 55–56). Tarsal formula 4-4-4 in both sexes; tarsomere I distinctly longer than II. Tarsomeres sparsely setose, some with pockets of stout,

bristle-like setae on ventral surface arising from transverse slits near anterior margin of tarsomeres (Fig. 55). Tarsal claws simple and subequal. Empodium reduced. Procoxa cylindrical, counter-sunk, not or slightly projecting below prosternum. **Abdomen** (Figs. 28, 132–139): Abdominal tergites completely concealed by elytra. With 5 subequal ventrites. Intercoxal process of ventrite I narrowed, slightly pointed anteriorly, apex notched to interlock with metathorax. Lateral edges of abdominal ventrites I–V (= sternites III–VII) upturned (laterosternites). A parasternite is also present between the pleural membrane and laterosternite of ventrite I (= sternite III). Ventrites variously punctate. In most species, abdominal ventrite V simple. In some, abdominal ventrite V bears 2 depressions, 1 on each side of midline, resulting in raised, median, V-shaped area near posterior margin (Figs. 132–133), present in both sexes. In others, ventrite V is sexually dimorphic, with a bulbous swelling near posterior margin (females of *D. erichsoni*, Figs. 134–135), or a notched posterior face (females of *D. xanthorrhoeae*, Figs. 138–139). Tergite VII with functional spiracle in pleural membrane; lateral and apical margin slightly more sclerotized and darkly pigmented than remainder of tergite; apical margin fringed with setae. **Male terminalia** (Fig. 29): Tergite VIII concealed dorsally by tergite VII. Tergite VIII and sternite VIII fused at base, forming a ring; sternite VIII narrowly divided at middle, connected by membrane; apical margin of tergite VIII slightly emarginate; apical margins of tergite and sternite VIII fringed with setae. Tergite IX concealed dorsally by tergite VIII and tergite VII. Anterior edge of tergite IX not developed into spiculum gastrale. Tergite IX divided into two separated laterotergites, attached to sternite IX (ventrolaterally) and tergite X (dorsolaterally); sternite IX divided into two separate, well-sclerotized subtriangular plates, each produced anteriorly into narrow struts; both plates connected by a membrane medially. Tergite X (= proctiger) well-developed, free, lightly sclerotized, with weakly indicated paired longitudinal baculi; apical margin shallowly emarginate. Laterotergites IX (positioned laterally), sternite IX (positioned ventrally), and tergite X (positioned dorsally) form a ring around the aedeagus. **Male genitalia** (Figs. 30–31, 140–172): A brief description and illustrations of the aedeagus of *D. ignarus* were presented by Sharp and Muir (1912). Phallobase of cucujiform type, forming a ring that completely surrounds median lobe (= penis). Parameres attached by a membrane to distal edge of phallobase, free from one another at base. Tegmen (dorsal) and basal piece (ventral) reduced, mostly membranous, with slightly more sclerotized areas medially. Tegmen

and basal piece normally connected laterally by membrane, although may be connected by slightly more sclerotized portions in some species. Tegmen with well-developed, elongate, heavily sclerotized, rod-like anterior strut that sits dorsal to the penis, loosely attached medially by a membrane. Tegmen consisting of 2 sclerotized plates, often meeting at midline; anterior margin of tegmen usually evenly curved, but may be produced into anteriorly-projecting sclerotized lobes (*D. analis*, *D. gracilis*, *D. iridescens*, *D. piceus*; Figs. 142, 149, 154, 159). In most species, the basal piece is emarginate anteromedially, resulting in an evenly curved anterior margin and the lateral margins produced into two short, anterolateral struts; struts straight (e.g., Figs. 153, 156), to slightly curved laterad (e.g., Figs. 151, 163) to strongly recurved (e.g., Figs. 149, 159). In *D. oregonensis*, the basal piece is projecting and pointed apically (lacking lateral struts; Fig. 157). Parameres separate (in most species) to broadly fused to one another at base (e.g., Figs. 142, 149, 154, 159); degree of separation variable; shape variable, with apices narrowly rounded to truncate; size varying from small to large (in relation to phallobase). Parameres evenly sclerotized (in most species) to possessing areas of greater sclerotization (e.g., Figs. 142, 150, 160); apical and/or margins usually bearing setae. Parameres with paired, hook-like lobes (in most species, hereafter referred to as “parameral processes”) attached to dorsal surface of parameres basomedially, serving as a penis guide. Parameral processes well-separated to nearly touching medially; orientation variable, transverse to vertical; shape variable, straight to strongly curved; size variable, reduced to nearly as large as parameres. Apices of processes evenly rounded to slightly swollen to curved and pointed. Penis (= median lobe; Figs. 165–172) elongate, tubular to slightly flattened, straight in dorsal/ventral view, evenly curved to subtly sinuate in lateral view; apex narrows gradually to a point (most) to swollen and pointed (*D. bucculentus*, *D. parviceps*); apex open dorsally, opening (= median orifice of Sharp and Muir (1912)) of variable size, closed basally by fusion of margins of penis, suture of variable length, but completely obsolete in basal half. Base of penis open, slightly to greatly swollen, usually trumpet-shaped, bearing paired anterior struts; struts positioned dorsally (in most species) to dorsolaterally; length short to long; shape truncate to narrow, straight to curved mesally to nearly touching at apices. Penis dark red to brown, unicolored to lighter near base (in most species) and appearing bicolored. Penis slides through ring-shaped phallobase and ventrad to parameral processes. Internal sac undifferentiated. **Female terminalia** (Fig. 32–33): Sternite VIII and tergite VIII

separate, connected by a thin portion of membrane, forming a ring; sternite VIII entire, not divided at middle, apical margin truncate medially, fringed with setae; basal margin thickened (as weakly indicated transverse baculi), evenly curved, with well-developed, elongate, heavily sclerotized, rod-like spiculum ventrale, loosely attached medially by a membrane. Tergite VIII with sparse setae in medial area, apical margin fringed with setae and with slight medial emargination. **Ovipositor** (Fig. 32): Elongate, with well-defined but weakly sclerotized segments. Tergite IX completely divided into 2 lateral paraprocts. Paraproct with long baculus, about 2X as long as gonocoxite. Tergite X (= proctiger, epiproct) weakly sclerotized, situated between paraprocts; apical margin of tergite X rounded, extending slightly past junction of paraproct+gonocoxite. Gonocoxite divided into proximal (= valvifer) and distal (= coxite) lobes; proximal lobe with weakly indicated transverse basal baculi; distal lobe not more heavily sclerotized than proximal lobe; apex of distal lobe with few setae, with well-developed, palpiform gonostylus attached sub-apically; gonostylus with few setae at apex. **Female reproductive tract** (Fig. 34): Vagina membranous; common oviduct flattened, fan-shaped and connecting to vagina apically; spermatheca membranous, sacular, annulate, with spermathecal gland attaching near the base; spermathecal gland tubular, elongate and narrow, with minute, dense, microtubules covering surface, base of gland with sclerotized ring.

Larvae. No larvae were examined, as they are rarely collected. For description of a larva (*D. oregonensis*), see Craighead (1920) and Böving and Craighead (1930).

Etymology. The genus-group name *Deretaphrus* (*Dere*: Greek “neck,” *-taphrus*: Greek “a trench”) refers to the transverse, postocular constriction of the head capsule forming a bulbous posterior portion (Borror 1961).

Taxonomic History. *Deretaphrus* was first described by Newman (1842) from insects collected at Port Phillip in Victoria, Australia. A limited genus-group description and short descriptions of four species (*D. fossus*, *D. puteus*, *D. illusus*, and *D. vittatus*) were provided. Erichson (1845) later placed the genus in Bothriderini within Colydiidae. He also moved two species (*D. illusus* and *D. vittatus*) into the genus *Bothrideres* Dejean.

Germar (1848) described *Sigerpes*, containing one species, *S. piceus*. Lacordaire (1854) synonymized *Sigerpes* Germar with *Deretaphrus* and provided a more detailed description of the genus.

Wollaston and Newman (1855) supported Erichson's placement of the genus within Colydiidae, but also stated that *Deretaphrus* has several characters potentially allying it with other taxa. Wollaston

recognized its close relationship with *Bothrideres* and presented a fairly detailed description of the genus, mentioning several previously undescribed characters to support his hypothesis (Wollaston and Newman 1855). In the same paper, Newman conceded Erichson's move of two of his original species into *Bothrideres*. He also described two new species, *Deretaphrus wollastoni* and *Deretaphrus erichsoni*. Newman closed the paper with an updated list of the species, noted the Australian distribution, and stated that they are found “...feeding under the bark of trees, principally *Eucalyptus*.”

Based on his observation of the type specimen at the BMNH, Pascoe (1862) moved *Deretaphrus puteus* (one of Newman's originally described *Deretaphrus* species) into the genus *Bothrideres*. Contrary to Wollaston, Pascoe stated “The affinity of the two genera, *Deretaphrus* and *Bothrideres*, seems to be by no means close...” Pascoe described four new species (*D. ignarus*, *D. viduatus*, *D. bakewellii*, and *D. colydioides*) but was unable to study *D. wollastoni* and could not locate the type specimen. Pascoe provided the first key to the species of the genus. Macleay (1871) described *Deretaphrus pascoei*.

In the Catalogue of the Coleoptera of Australia, Masters (1872) listed 10 species of Australian *Deretaphrus* and their localities, apparently unaware of Pascoe's placement of *D. puteus* within *Bothrideres* some 10 years prior.

Horn (1873) described *D. oregonensis* from the western United States, noting the odd distribution of the genus. Reitter (1877) described *D. granulipennis* from New South Wales. Horn (1878) treated the North American Colydiidae and erected the tribe Deretaphrini on the basis of a deflexed head and the contiguous (or nearly so) anterior coxae. Within the tribe, he included *Oxylaemus* Erichson, *Deretaphrus*, and *Sosylus* Erichson and provided a brief generic description and species description for *D. oregonensis*, comparing and contrasting this sole North American representative with the type species, *D. fossus*.

Lea (1898) described four new species: *D. analis*, *D. xanthorrhoeae*, *D. parviceps*, and *D. puncticollis*. Grouvelle (1903) described *D. interruptus* from New Caledonia, only the second non-Australian species in the genus at that time. Fauvel (1903) noted *D. interruptus* in New Caledonia, and tallied 16 species in the genus.

One of the major works on *Deretaphrus* was by Blackburn (1903), who discussed the ambiguity of several species descriptions preventing confident identifications. He synonymized *Deretaphrus granulipennis* Reitter with *Deretaphrus erichsoni* Newman and indicated that *D. wollastoni* probably did not belong in the genus. Blackburn also mentioned that it was difficult to identify the type

species, *D. fossus*, because the original description was inadequate to differentiate it from several congeners. He discussed some variation in taxonomic characters (color, size, elytral punctuation) and provided several characters that he believed were better at diagnosing *Deretaphrus* species. He described eight new species (*D. thoracicus*, *D. gracilis*, *D. iridescens*, *D. cordicollis*, *D. popularis*, *D. aequaliceps*, *D. sparsiceps*, and *D. cribriceps*) and provided an identification key. Blackburn relied on locality in his delimitation of species, which later resulted in the synonymization of most of his species.

Craighead (1920) addressed the taxonomic position of the Colydiidae based on his study of larval morphology, noting dissimilarities between bothriderine taxa and the rest of the family. He employed the familial name Bothrideridae but formally retained the group within Colydiidae as a “specialized development” of the colydiids due to their parasitic nature. Craighead also described and illustrated the larva, pupa, and cocoon of *D. oregonensis*.

Elston (1923) described *D. bucculentus*. Perhaps the most significant work on the genus *Deretaphrus* was Carter and Zeck’s (1937) revision of the Australian Colydiidae. Carter and Zeck mentioned the unfortunate loss of the type specimen for the type species, *D. fossus*, and again discussed the many synonyms that had been created due to ambiguous species descriptions. They synonymized several species: *D. bakewellii* Pascoe and *D. thoracicus* Blackburn with *D. piceus* (Germar), *D. pascoei* Macleay with *D. ignarus* Pascoe, *D. cordicollis* Blackburn with *D. fossus* Newman, and *D. bucculentus* Elston with *D. puncticollis* Lea. Carter and Zeck also stated that *D. colydioides* Pascoe is probably a small *D. viduatus* Pascoe, and *D. sparsiceps* is most likely a junior synonym of *D. viduatus*. Carter and Zeck (1937) also described two new species, *D. alveolatus* and *D. incultus*.

Heinze (1943) revised the tribe Deretaphrini, stating that he considered the species accounts of Blackburn (1903) and Carter and Zeck (1937) to be inadequate for correct identifications.

In The Natural Classification of the Families of Coleoptera (Crowson 1955), *Deretaphrus* was classified within Colydiidae. Crowson considered *Deretaphrus* as “possibly the most primitive genus” in the group and allied it with other current bothriderid genera. He also illustrated the mesothorax and metendosternite, representing the first and only morphological study of the genus in any detail.

Since the redefinition of Bothrideridae (Lawrence 1985, 1991; Pal and Lawrence 1986), *Deretaphrus* has been considered a member of the tribe

Deretaphrini within the Bothriderinae in all major works on the family (Stephan 1989; Lawrence and Britton 1991; Lawrence and Newton 1995; Philips and Ivie 2002; Ślipiński *et al.* 2010).

Natural History. Although *Deretaphrus* is the most commonly encountered genus of Australian Bothrideridae (Lawrence and Britton 1991), the biology of most species is poorly known. The larvae are ectoparasitic on a variety of hosts, predominantly wood-boring beetles in the families Cerambycidae and Buprestidae (Burke 1919; Craighead 1920, 1950; Böving and Craighead 1931; Balduf 1935; Clausen 1940; Furniss and Carolin 1977; Stephan 1989). Larvae have also been collected inside the nests of solitary bees (S. A. Ślipiński, personal communication). Members of *Deretaphrus* have hypermetamorphic development, existing as a triungulin form during the first instar (S. A. Ślipiński, personal communication) and a grub-like form in the later instars (Böving and Craighead 1931; Lawrence 1991). This hypermetamorphic lifestyle is consistent with an ectoparasitic life history. During the last instar, *Deretaphrus* larvae migrate away from the host and spin elongate-oval silken cocoons (Figs. 8–17). The cocoon is composed of a thread-like, fibrous material that may be loose or tightly layered. It is not known whether the secretions are emitted from the buccal cavity or the anal glands of the larvae (Balduf 1935). The cocoons are attached near or directly onto the host, and the larvae pupate within their last larval skin inside the cocoon (Fig. 8). The construction of a silken cocoon is uncommon among Coleoptera, having been reported in some species of only five other families (Brachypsectridae, Tenebrionidae, Curculionidae, aleocharine Staphylinidae, and Cerylonidae) (Ashe 1981; Lawrence and Britton 1991; Leschen 1991; S. A. Ślipiński, personal communication). The duration of the immature stage of *Deretaphrus* is not known, however, label data from reared specimens suggest pupation lasts for a minimum of two months (*e.g.*, *D. rodmani*, WAMP 43NL – larva 21.x.80, adult 23.xii.80).

Adults have coarsely faceted eyes and are commonly collected at mercury-vapor and/or UV lights or are found crawling on the surface of logs at night (M. Caterino, personal communication), suggesting a nocturnal lifestyle. Most adult *Deretaphrus*, however, are collected under the bark of fallen trees. Although little is known about the adult feeding habits, it is assumed adults feed within the galleries of wood-boring insects. In The Biology of the Coleoptera, Crowson (1981) suggested that the ectoparasitic nature of the colydiid subfamilies Deretaphrinae and Bothriderinae (in part) developed from close associations between wood-boring beetle larvae

and bothriderids inside the fungus-filled galleries where they lived.

The North American *D. oregonensis* is most often collected under the loose, dry bark of trees. The literature and specimen label data indicate that larvae of *D. oregonensis* are associated with a variety of hosts and are found under bark of a number of different tree species. It has been collected from under the bark of ponderosa pine (*Pinus ponderosa* Douglas ex C. Lawson, Pinaceae), Jeffrey pine (*Pinus jeffreyi* Balfour), sugar pine (*Pinus lambertiana* Douglas), lodgepole pine (*Pinus contorta* subsp. *murrayana* (Balfour) Engelman), Douglas fir (*Pseudotsuga menziesii* (Mirbel) Franco, Pinaceae), red fir (*Abies magnifica* Murray), white fir (*Abies concolor* (Gordon and Glendinning) Hildebrand, Pinaceae), western larch (*Larix occidentalis* Nuttall, Pinaceae), and canyon oak (*Quercus chrysolepis* Liebm., Fagaceae). Burke (1919) reported that cocoons had been collected "from the wood of an old fire scar on the side of a living incense cedar [*Calocedrus decurrens* (Torrey) Florin, Cupressaceae]." Label data also indicate that *D. oregonensis* has been recovered from under the bark of burned pines. It has been associated with the following presumed beetle hosts: Curculionidae: *Dendroctonus jeffreyi* Hopkins, *Dendroctonus ponderosae* Hopkins; Buprestidae: *Buprestis laeviventris* (LeConte), *Buprestis aurulenta* L., *Trachykele opulenta* Fall, *Trachykele nimbose* Fall; and Cerambycidae: *Asemum striatum* (L.) (Burke 1919; Essig 1926; Balduf 1935; Clausen 1940; Philips and Ivie 2002). It is hypothesized (Burke 1919; Balduf 1935) that *Deretaphrus* parallel the life cycles of their hosts, potentially persisting in the larval stage for over a year. Amusingly, *D. oregonensis* was given the nickname "The Buprestid Destroyer" by Essig (1926), who stated that the adult "lives in the burrows and destroys the larvae and pupae..." of a number of wood-boring beetles in California and Oregon.

The Australian *Deretaphrus* species have been collected in association with the larvae of several cerambycids, including *Paroplites australis* Erichson, *Penthea saundersii* Pascoe, and *Phoracantha* sp. Adults and pupal cocoon masses have also been discovered inside the pupal cells of a cetoniine scarab, *Trichaulax philipsii* (Schreibers) (previously unpublished). Specimens of *D. viduatus* have been collected from within *Sarcocornia* stems (Amaranthaceae) containing *Belus* sp. (Coleoptera: Belidae) (previously unpublished). *Deretaphrus* have historically been found under the bark of *Eucalyptus* (e.g., *Eucalyptus amplifolia* Naudin, *E. diversicolor* F. von Mueller, *E. mannifera* Mudie, *E. tereticornis* Smith, *E. viminalis* Labill., Myrtaceae), *Acacia* (e.g., *Acacia anceps* DC., *A. mearnsii* De Wild., Fabaceae), *Vachellia*

bidwillii (Benth.) Kodala (Mimosaceae), *Ficus macrophylla* Desfontaines ex. Persoon (Moraceae), red cedar (*Toona ciliata* M. Roem., Meliaceae), dogwood (*Jacksonia scoparia* (Bonpl.) DC., Fabaceae), and Australian saltbrush (*Atriplex semibaccata* R. Brown, Amaranthaceae). Adults have also been collected from various sclerophyll plants and on the dead crowns of *Kingia australis* R. Brown (Dasygongonaceae) and *Xanthorrhoea* sp. (Xanthorrhoeaceae).

The New Caledonian species, *D. interruptus*, has been collected in association with the larvae of *Agrianome fairmairei* Montrouzier (Cerambycidae: Prioninae) under the bark of *Aleurites moluccana* (L.) Willdenow (Euphorbiaceae) (C. Mille, personal communication).

There is one record of *Deretaphrus* adults sheltering inside the galls of rust fungi (*Uromycladium* sp., Pucciniomycetes) on *Acacia* in Australia (*D. viduatus*, specimen UGCA INL). There is another record of an adult *Deretaphrus* being collected as an inquiline with ants. The tendency of specimens to occur under the bark of dead trees and logs may be a possible explanation for this association. Several *Deretaphrus* species were found to have small mites beneath their elytra, sometimes by the hundreds (previously unpublished). These mites are probably phoretic, a common occurrence in many wood-inhabiting beetles (Lawrence and Britton 1991).

In a study of adult *Deretaphrus* mandibles by utilizing Environmental Scanning Electron Microscopy (ESEM) equipped with backscatter detectors on uncoated specimens, elemental analysis via energy-dispersive spectroscopy identified the presence of zinc and chlorine in the apex of the mandibles of multiple *Deretaphrus* species (Figs. 42–43, NPL unpublished data). This discovery, along with the general shape of the mandibles, suggests that adult *Deretaphrus* are incorporating elements for strengthening or wear resistance. Furthermore, examination of the gut contents of dissected specimens did not reveal any traces of insect cuticle but contained fibrous material, implying that members are feeding on wood or other plant tissues as opposed to preying on soft-bodied insects as previously suspected.

Distribution. *Deretaphrus* has a disjunct distribution (Figs. 173–182). The majority (22/25) of species are Australian, occurring in all states. Most specimens seem to occur with relative abundance in the dry sclerophyll regions, although a number have been collected in more subtropical habitats of Queensland. One species, *D. interruptus*, occurs in New Caledonia. One species, *D. oregonensis*, is the only described New World species and is moderately common in the western United States (California, Oregon, Washington, Idaho, Montana,

Utah, Nevada) and British Columbia, Canada. The distribution of *D. oregonensis* appears to be limited to the western side of the Rocky Mountains. It is possible that *D. oregonensis* may occur in other western states (Wyoming, Colorado, Arizona, perhaps New Mexico), but there are currently no records from these localities. There is also a single specimen (*D. boliviensis* new species) collected from the interior of Bolivia. The distribution of the genus is perhaps an old amphipolar distribution, with representatives occurring in both Northern and Southern Hemispheres (discussion of amphipolar distributions in Crowson 1980). However, the Australasian, Nearctic, and Neotropical distribution is very odd. It is possible that *D. boliviensis* occurs in other countries in South America and perhaps Central America. The distributions of the Australian *Deretaphrus* species are by no means concrete. Over- and under-collecting in various regions of the continent have undoubtedly led to skewed distributions. It is highly probable that several species of *Deretaphrus* are much more widespread than current collection records indicate.

KEY TO THE SPECIES OF *DERETAPHRUS* NEWMAN

1. Eyes reniform, strongly excavated posteriorly by a large angular cuticular expansion of the head capsule; in dorsal view, eye and cuticular expansion appearing subtriangular and strongly projecting (Figs. 40–41) (southern Australia).....*Deretaphrus ocellaris*
Lord and McHugh, new species
- 1'. Eyes not reniform, not strongly excavated posteriorly, at most with a thickened strip of cuticle at posterior margin; in dorsal view, eyes subtly to distinctly projecting, but not as above.....2
- 2(1'). Pronotal disc with a weakly developed, shallow median longitudinal depression, or lacking depression; depression usually wide and lacking any defined lateral margins in central portion of disc (e.g., Figs. 62, 64, 69, 75, 77–78, 80). Note some *D. carinatus* (Fig. 63) and *D. xanthorrhoeae* (Fig. 81) may key here, but should go to 2'.....3
- 2'. Pronotal disc with a well-developed, impressed median longitudinal groove or canal; groove usually narrow, with defined lateral margins in at least part of central portion of disc (only basocentrally in some); groove often interrupted near anterior 1/3 to form smaller anterior depression, slit, or fovea (e.g., Figs. 57, 59, 65, 71, 74).....11
- 3(2). Antennae minutely setose, setae extremely short and nearly indiscernible, appearing glabrous unless at high magnification (Fig. 44).....4
- 3'. Antennae with clearly visible setae (Figs. 45–47).....10
- 4(3). Elytron with only odd intervals (some or all) distinctly raised, carinate or tuberculate (5 or less intervals raised, not including sutural interval).....5
- 4'. Elytron with even and odd intervals (some or all) distinctly raised, carinate or tuberculate (6 or more intervals raised, not including sutural interval).....6
- 5(4). Pronotum evenly convex, without median longitudinal depression/groove (if with slight depression at posterior margin, not distinctly visible in central portion of disc) (Fig. 69); punctures on pronotal disc more or less uniform in size; supra-ocular ridges of head well-developed, laterally expanded over eyes, angulate, mostly concealing eyes from dorsal view; eyes slightly protuberant, evenly arcuate; raised elytral interstitial intervals separate and straight for entire length (Figs. 106–107) (western Australia).....*Deretaphrus incultus*
Carter and Zeck
- 5'. Pronotum with shallow median longitudinal depression, visible in central portion of disc; punctures on pronotal disc deeper and slightly larger within median longitudinal depression; supra-ocular ridges of head weakly-developed, not or only slightly concealing eyes from dorsal view; eyes strongly protuberant, approaching pointed (Fig. 38); elytral interstitial intervals 3 and 5 curved towards midline at apex, merging or nearly merging (western Australia)*Deretaphrus parviceps* **Lea**
- 6(4'). Raised elytral interstitial intervals not continuous for entire length, repeatedly interrupted to form intermittent raised portions or tubercles (especially near apex) (Figs. 96–97, 128–129).....7
- 6'. Raised elytral interstitial intervals continuous for entire length, not frequently interrupted.....8
- 7(6). Interrupted portions of elytral interstitial intervals forming numerous den-
ticles near elytral apex (Figs. 96–97);

- pronotal median longitudinal depression extremely weak, only distinct at base; pronotal width at mid-length nearly equal to pronotal length (Fig. 64); orange to light red in color (eastern Australia).....
*Deretaphrus erichsoni* Newman
- 7'. Interrupted portions of elytral interstitial intervals not forming numerous denticles near elytral apex, instead forming raised or elevated segments (short carinae, Figs. 128–129); pronotal median longitudinal depression extending onto anterior 1/3 of pronotum; pronotal width at mid-length distinctly less than pronotal length (Fig. 80); dark red to brown in color (eastern Australia)
*Deretaphrus wollastoni* Newman
- 8(6'). Pronotal median longitudinal depression shallow and wide (sometimes very faint), visible at least in posterior half, not distinctly tapering towards anterior margin; punctures within pronotal median longitudinal depression randomly spaced along midline and distinctly larger than on rest of disc (Fig. 78) (western Australia).....
*Deretaphrus rodmani* Lord and McHugh, new species
- 8'. Pronotal median longitudinal depression narrower (sometimes very faint), parallel-sided or distinctly tapering towards anterior margin; punctures within median longitudinal depression present or absent, if present evenly spaced and not larger than on rest of disc..... 9
- 9(8'). Punctures on pronotal disc round, very shallow, closely set, giving pronotal disc an alveolate, or netlike appearance (Fig. 58); dorsal surface of the head extremely flat, supra-ocular ridges not laterally expanded, eyes entirely visible from above; distal margins of antennal club segments straight, leading edge of club segments inflated, but rounded proximally; abdominal ventrite V simple (western Australia)
*Deretaphrus alveolatus* Carter and Zeck
- 9'. Punctures on pronotal disc oval, deeply impressed; punctures around apex of median pronotal longitudinal depression slightly angled outwards, punctures on rest of disc arranged longitudinally (Fig. 60); dorsal surface of the head convex, supra-ocular ridges slightly expanded laterally, evenly curved, at least partially concealing eyes from above (see Figs. 37, 39); distal margins of antennal club segments slightly concave, leading edge of club segments inflated, angulate proximally and forming a distinct point; abdominal ventrite V with apex and posterior face impressed, slightly upturned (western Australia)....
*Deretaphrus antennatus* Lord and McHugh, new species
- 10(3'). At elytral apex, interstitial intervals 3 and 5 curved inwardly, merging or nearly merging (Figs. 122–123); elytral apex sinuate; with weak supra-ocular ridges, eye mostly visible from above (eastern Australia)
*Deretaphrus puncticollis* Lea
- 10'. Elytral interstitial intervals 3 and 5 separate for entire length; elytral apex evenly rounded, not sinuate; with well-developed, angulate supra-ocular ridges, partially or completely concealing the eye from above (Fig. 35) (eastern Australia)
*Deretaphrus bucculentus* Elston
- 11(2'). Pronotal median longitudinal canal appearing as an oval depression at base and extending as a narrow groove to about middle of pronotum (Fig. 72); canal never interrupted to form distinct anterior portion; central portion of disc evenly convex; oval depression at base of pronotum bordered on either side by a smaller dimple sub-medially; most of disc with evenly-sized, small punctures except at lateral margin, where punctures are distinctly larger and sparser; body orange.....
*Deretaphrus lateropunctatus* Lord and McHugh, new species
- 11'. Pronotal median longitudinal canal lacking oval depression as above; canal generally narrow, clearly interrupted in anterior portion forming distinctly separate anterior and posterior portions, anterior portion always much smaller than posterior portion; central portion of disc impressed; punctures near lateral margin not distinctly larger and sparser than on remainder of pronotal disc; body red to black..... 12
- 12(11'). Anterior portion of pronotal median longitudinal canal distinct, usually round or oval, forming a deep fovea,

- area around fovea depressed (Figs. 59, 61, 67, 70, 74, 76) 13
- 12'. Anterior portion of pronotal median longitudinal canal weakly developed, represented at most by a small slit or shallowly depressed area, never a deep fovea 18
- 13(12). Submentum more strongly produced anteriorly, entirely concealing mentum and base of palpi in ventral view (see Figs. 48–49, 52–53) 14
- 13'. Submentum less strongly produced anteriorly, at least part of mentum and base of palpi visible in ventral view (see Figs. 50–51) 15
- 14(13). Posterior portion of pronotal median longitudinal canal gradually narrowing and diminishing posteriorly, closed at base (Fig. 70); base of pronotum without distinct admedian depressions, lateral margin of canal at base not appearing raised and thickened; anterior portion of pronotal median longitudinal canal small, round to oval; denticles at basolateral angles of pronotal disc small; anterior margin of submentum sinuate (Fig. 49); submentum with 2 pairs of setose pits, each pit bearing a long seta; abdominal ventrite V with numerous small punctures, each bearing a small, indistinct seta (New Caledonia)
..... *Deretaphrus interruptus* **Grouvelle**
- 14'. Posterior portion of pronotal median longitudinal canal not narrowing or diminishing posteriorly, open at base; base of pronotum with a pair of admedian depressions, causing lateral margin of canal at base to appear raised and thickened; anterior portion of pronotal median longitudinal canal deep, elongate-oval; denticles at basolateral angles of pronotal disc large (Fig. 67); anterior margin of submentum arcuate to subtly sinuate (see Fig. 53); submentum lacking paired setose pits; abdominal ventrite V with few large punctures, each bearing a distinct seta (Fig. 136) (eastern Australia)
..... *Deretaphrus hoplites* **Lord and McHugh, new species**
- 15(13'). Abdominal ventrite V with two depressions, one on each side of midline, resulting in a median V-shaped area near posterior margin (see Figs. 132–133), present in both sexes 16
- 15'. Abdominal ventrite V simple, without a depressions on each side of midline, not forming a median V-shaped area near posterior margin 17
- 16(15). Pronotum nearly smooth, with minute, scarcely impressed punctures; posterior portion of pronotal median longitudinal canal rounded (Fig. 59); elytra appearing smooth, punctures scarcely impressed (although striae may be visible beneath surface of cuticle) (eastern Australia)
..... *Deretaphrus analis* **Lea**
- 16'. Pronotum with small, impressed punctures; posterior portion of pronotal median longitudinal canal narrowing posteriorly (Fig. 76); elytra with 9 rows of small, clearly impressed punctures (eastern Australia)
..... *Deretaphrus picus* (**Germar**)
- 17(15'). Posterior portion of pronotal median longitudinal canal very deep, narrowing posteriorly; elytral punctures deep, very large; diameter of pronotal punctures variable; elytral interstitial intervals 3+5 merge and 7+9 merge before meeting apical margin (Figs. 116–117) (western USA)
..... *Deretaphrus oregonensis* **Horn**
- 17'. Posterior portion of pronotal median longitudinal canal not very deep, narrowed in middle, swollen and rounded at each end; elytral punctures shallow, small; diameter of pronotal punctures uniform; elytral interstitial interval 3 ends before apex and 5+7+9 merge before meeting apical margin (Figs. 90–91) (Bolivia)
..... *Deretaphrus boliviensis* **Lord and McHugh, new species**
- 18(12'). Antennal club segments prominent, fairly dense setation (see Figs. 45, 47); pronotal disc with small, shallowly impressed punctures; (Figs. 66, 71); medial portion of elytra nearly smooth, with intervals flat to very subtly raised, (weakly raised only near base and apex); submentum as in Fig. 51 19
- 18'. Antennal club segments with or without prominent setae, but setation never dense; pronotal disc with medium to large, moderately to deeply impressed punctures; medial portion of elytra with distinctly raised interstitial intervals; submentum not as in Fig. 51 20
- 19(18). Posterior portion of pronotal median longitudinal canal sharply impressed;

- anterior portion of canal distinct, surrounding area depressed; lateral margins of pronotal disc strongly deflexed; dorsal surface of pronotal disc medially impressed (Fig. 66) (western Australia)
.....*Deretaphrus gracilis* Blackburn
- 19'. Posterior portion of pronotal median longitudinal canal shallow, not strongly impressed; anterior portion of canal feebly marked, surrounding area weakly depressed; lateral margins of pronotal disc not strongly deflexed; dorsal surface of pronotal disc very flat (Fig. 71) (eastern Australia).....
....*Deretaphrus iridescens* Blackburn
- 20(18'). Head with well-developed supra-ocular ridges, eyes at least partially concealed from above (see Figs. 35–37, 39–40)..... 21
- 20'. Head without well-developed supra-ocular ridges; eyes entirely visible from above 22
- 21(20). At elytral midlength, elytral interstitial intervals 3–9 distinctly carinate, degree of carination subequal; eyes strongly protuberant, distinctly convex (Fig. 36)
.....*Deretaphrus carinatus* Lord and McHugh, new species
- 21'. At elytral midlength, elytral interstitial intervals 3–9 carinate, but intervals 4, 6, and 8 less prominent than 3, 5, 7, 9 (sometimes only subtly so); interval 8 nearly flat; eyes weakly protuberant, only slightly convex (eastern Australia)
.....*Deretaphrus ignarus* Pascoe
- 22(20'). Anterior angles of pronotum rounded, not well-developed; elytral interstitial interval 6 not raised, or raised for nearly entire length 23
- 22'. Anterior angles of pronotum well-developed, with a distinct angle (Fig. 65); elytral interstitial interval 6 distinctly raised for only a short distance in posterior half of elytra (Figs. 98–99) (eastern Australia).....
.....*Deretaphrus fossus* Newman
- 23(22). At elytral midlength, intervals 3, 4, and 6 not distinctly raised; setae on antennal club segments moderate and longer, reaching middle of following segment; abdominal ventrite V with posterior margin entire, simple; usually black in color (eastern Australia)..... 24
- 23'. At elytral midlength, intervals 3, 4, and 6 distinctly raised; setae on antennal club segments very sparse and short, not reaching middle of following segment; ventrite V with posterior margin excised in females (Figs. 138–139); dark red in color (western Australia)...
.....*Deretaphrus xanthorrhoeae* Lea
- 24(23). Head with anterior portion bearing a median longitudinal impression, most prominent near frontoclypeal suture. Posterior portion of pronotal median longitudinal canal deeply impressed, nearly parallel-sided for entire length. Pronotum with anterior angles broadly rounded (Fig. 79); disc depressed medially. Elytral interstitial interval 3 only feebly raised at base and apex (eastern Australia)
.....*Deretaphrus viduatus* Pascoe
- 24'. Head with anterior portion evenly convex. Posterior portion of pronotal median longitudinal canal distinctly wider at base and tapering anteriorly, (appearing as an isosceles triangle), shallow. Pronotum with anterior angles pronounced, nearly forming right angles (Fig. 57); disc evenly convex. Elytral interstitial interval 3 distinctly raised for entire length, carinate (eastern Australia).....
...*Deretaphrus aequaliceps* Blackburn

Species Treatments

Deretaphrus aequaliceps Blackburn, 1903

(Figs. 57, 82–83, 140, 177, 183–184)

Deretaphrus aequaliceps Blackburn, 1903: 127.
Carter and Zeck 1937: 200–201; Heinze 1943: 119.

Diagnosis. This species can be readily distinguished from congeners by the impressed anterior portion of the head, the distinctly anteriorly narrowed pronotal median longitudinal canal, the well-defined anterior pronotal angles, the strongly transverse submentum, and generally smaller size. It most closely resembles *D. viduatus*. Due to the extreme size variation within members of the genus, small specimens may be very difficult to identify correctly.

Redescription. Length 4.84–10.36 mm. Width 1.15–2.48 mm. Body elongate, parallel, red to black; dorsal surface glabrous, slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; with supra-ocular ridges, slightly expanded laterally, dorsolateral margin sinuate; eyes visible from

above; punctures small and dense, except sparse along posterior margin. Frontoclypeal suture distinct. Clypeus distinctly narrower than head; posterior margin of clypeus slightly incised medially, anterior margin of clypeus broadly arcuate. Submentum shape similar to Fig. 53; short and transverse, distinctly separated from subgenal braces, with paired setose pits; anterior margin straight to slightly convex, moderately expanded anteroventrally over oral cavity, apices of palpi visible, part of mentum often visible. Antennal groove well-developed, impunctate. Antenna sparsely setose; segments 2–8 with single transverse row of moderately long setae, setae extending at least to distal margin of antennal segment from which they arise; antennal club segments with sparse setae, setae long and located at or near distal margin of the segment. Antennal club subsymmetrical. Dorsal surface (external face) of mandible with median setose groove. **Thorax** (Fig. 57): Pronotum elongate, widest near anterior $\frac{1}{4}$, distinctly wider than head; dorsal surface flattened to slightly impressed at middle, convex laterally; anterior margin arcuate; anterior angles produced, nearly right angles, slightly rounded; posterior margin slightly sinuate, distinctly narrower than elytral bases; posterior angles pronounced, with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with small, dense, oval punctures. Pronotal median longitudinal canal well-developed, interrupted to form a weakly impressed, anterior portion and a posterior canal; interruption of the canal impunctate; anterior fovea a small slit or merely a depression; posterior canal elongate, narrow and triangular (isosceles) widest at base and narrowing to a sharp point anteriorly; internal lateral margins of canal grooved. Hypomeron minutely punctate; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture slightly sinuate; located on lateral wall of prothorax. **Elytra** (Figs. 82–83): Elytron flattened dorsally, convex laterally; interstitial intervals 5 and 7 carinate for entire length, more pronounced near apex. Interval 3 raised near apex only. Intervals 3, 5, and 7 with micropunctures at crest. Basal elytral margin with intervals 3 and 5 ending in a weak, knob-like protuberance. Elytral shoulder with weakly developed finger-like callosity. **Legs**: Setation sparse; inner face of tibia with a double fringe of moderately long setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface near apex of tarsomeres 1–3 and a few erect setae at apices of tarsomeres. **Abdomen**: Ventrite V more densely punctured than preceding segments. **Aedeagus**: Phallobase as in Fig. 140. Tegmen consisting of paired, subtriangular plates at middle;

plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, distinctly separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with short subtriangular process; process thickest at base, narrowing apically, slightly shorter than half the length of the paramere, apex slightly swollen; processes narrowly separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis slightly lighter in color near base.

Variation. Size and color vary strongly within the species. The width of the median longitudinal pronotal canal is also somewhat variable, ranging from narrower in smaller specimens to wider in larger specimens.

Distribution. Australia: New South Wales, Queensland, and Victoria (Fig. 177).

Biology. Not known.

Remarks. Blackburn (1903) did not mention the number of specimens examined. In order to stabilize this name, a lectotype is **here designated** from the syntype series of *D. aequaliceps*.

Type Locality. Victoria (Dividing Range).

Type Material Examined. LECTOTYPE (Figs. 183–184) (BMNH, pinned; right elytron broken, glued on card beneath specimen): “Type H.T. [round label with orange border] // 7204 Healesville T. [“7204” and “Healesville” written in red ink, “T.” written in black ink, in Blackburn’s hand] // Australia. [red underline] Blackburn Coll. B.M.1910-236. // *Deretaphrus aequaliceps* Blackb [in Blackburn’s hand]” [BMNH 95NL, examined]. Sex not determined.

Additional Material Examined (32).

AUSTRALIA: NEW SOUTH WALES: Kyogle (ANIC 171NL); Mongarlowe River (ANIC 166NL); Nimmitable, 6 km. N (ANIC 240NL); Tumut River (BPBM 38NL). **QUEENSLAND:** North Queensland (ANIC 35NL). **SOUTH AUSTRALIA:** Yorketown (FMNH 22NL); no locality (BMNH 3NL). **VICTORIA:** Broadford (BPBM 24NL); Carrum (MVMA 110NL); Edenhope (SAMA 116NL); Eltham (MVMA 56NL, MVMA 64NL); Fern Tree Gully (MVMA 4NL); Hamilton (MVMA 6NL, MVMA 52NL); Healesville, Coranderrk Res. (ANIC 247–248NL); Melbourne (OUMNH 14NL, SAMA 144NL, UQIC 26NL); Mordialloc (BMNH 16NL); Ringwood (MVMA 49NL); no locality (ANIC 207NL, MVMA 57NL). **STATE UNKNOWN:** Kangaroo (MVMA 44NL). **NO LOCALITY:** ANIC 39NL, ANIC 44NL, BMNH 2NL, BMNH 93NL, MCZ 30NL, MCZ 38NL, MVMA 54NL.

***Deretaphrus alveolatus* Carter and Zeck, 1937**
(Figs. 58, 84–85, 141, 173, 185–186)

Deretaphrus alveolatus Carter and Zeck, 1937:
201. Heinze 1943: 119.

Diagnosis. This species can be readily distinguished from congeners by the large, shallow, closely set punctures of the pronotal disc, giving a net-like appearance. It most closely resembles *D. antennatus* new species. Both species have small setae that arise from punctures on the head and pronotum as well as a similar pronotal sculpturing. In *D. alveolatus*, the dorsal surface of the head is flat, the punctures on the pronotal disc are round and much more shallow, and the antennal club segments are more rounded and less angulate. The carination of the elytral interstitial intervals is similar to that of other Western Australian *Deretaphrus* species, but this species is easily separated by the sculpture of the pronotum.

Redescription. Length 7.6 mm. Width 2.0 mm. Body elongate, parallel, dark red; dorsal surface glabrous, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly, apex flat; without laterally expanded supra-ocular ridges; eyes completely visible from above; punctures small and dense except sparse along posterior margin; each puncture with 1 small seta arising from center. Frontoclypeal suture distinct, arcuate, slightly sinuate medially. Anterior margin of clypeus broadly arcuate. Submentum shape similar to Fig. 48; narrowly separated from subgenal braces, without paired setose pits; anterior margin sinuate, strongly produced anteroventrally over oral cavity, mentum completely concealed. Antennal groove well-developed, impunctate internally. Antenna appearing glabrous except under high magnification, segments 3–8 with a single transverse row of minute setae, antennal club segments with minute, sparse setae. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 58): Pronotum elongate, tapering only slightly towards base, widest near anterior margin, distinctly wider than head; dorsal surface convex, slightly depressed along midline, more strongly deflexed near anterior angles; anterior margin arcuate; anterior angles rounded; base slightly narrower than elytral bases; posterior margin weakly sinuate; posterior angles without small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with very large, shallow, round punctures, each with a small seta arising from center; punctures very dense, closely set, nearly confluent, giving

an alveolate pattern. Pronotal median longitudinal depression present, extremely weak and shallow, ending in anterior 1/3; depression slightly more impressed near base. Hypomeron more sparsely punctate than pronotal disc, punctures large and shallow; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture slightly sinuate, located on lateral wall of prothorax. **Elytra** (Figs. 84–85): Elytron slightly flattened dorsally; interstitial intervals 3–9 raised for entire length, shiny; raised even intervals not as long as odd, ending before apex; odd raised intervals nearly extending to apical margin; interval 3 raised towards apex; interval 4 raised for apical half. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance on elytral interval 5 merges with finger-like callosity on elytral shoulder. **Legs:** Tibia with short, sparse setae; inner face of tibia with 2 fringes of short, thick setae. Tarsus sparsely setose except for two pockets of dense setae on the ventral surface near apex of tarsomeres 1–3. **Abdomen:** Ventrite V simple, punctures becoming smaller and denser near apex. **Aedeagus:** Phallobase as in Fig. 141. Tegmen consisting of paired, subtriangular plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, elongate, distinctly separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with short subtriangular process; process thickest at base, narrowing apically, slightly shorter than half the length of the paramere, apex slightly swollen; processes narrowly separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, slightly curved; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis bicolored, lighter in basal 1/3.

Distribution. Australia: Cue, Western Australia. Known only from the type locality (Fig. 173).

Biology. Not known.

Remarks. Carter and Zeck (1937) described this species from a single specimen.

Type Locality. Cue, Western Australia.

Type Material Examined. HOLOTYPE (Figs. 185–186) (♂, SAMA, point-mounted) label data: “Cue, W.A. H.W. Brown // Holotype [red label] // *Deretaphrus alveolatus* Cart: [in Carter’s hand] // S. Aust. Museum specimen [orange label]” [SAMA 282NL, examined]. This type was removed from the original card-mount and was point-mounted. The original card-mount, abdomen [glued to a card, bearing a ♂ symbol], and genitalia [in glycerin in genitalia vial] are pinned beneath the specimen.

***Deretaphrus analis* Lea, 1898**

(Figs. 59, 86–87, 132, 142, 179, 187–188)

Deretaphrus analis Lea, 1898: 547. Blackburn 1903: 120; Carter and Zeck 1937: 200.

Diagnosis. This species can be readily distinguished from congeners by the nearly smooth body surface, the clearly interrupted pronotal median longitudinal canal with the posterior canal rounded and closed at the base, the densely setose antennae and tarsomeres, bearing setae that are longer than the segment from which they arise, the distinct shape of the submentum, the presence of two depressions on either side of the midline at the apex of abdominal ventrite V resulting in a median V-shaped area near the posterior margin, and genitalic characters. This species is most similar to *D. piceus* but can be distinguished by the nearly impunctate pronotum and the elytra and pronotal median longitudinal canal distinctly rounded and closed at both ends.

Redescription. Length 5.4–11.2 mm. Width 1.4–3.0 mm. Body elongate, parallel, dark brown to black; dorsal surface glabrous, matte to moderately shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures minute and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate anteromedially. Anterior margin of clypeus broadly arcuate. Submentum shape as in Fig. 51; distinctly separated from subgenal braces, with paired setose pits; anterior margin slightly expanded anteroventrally over oral cavity, at least part of mentum visible. Antennal groove well-developed, impunctate. Antenna densely setose; segment 1 with few setae on ventral surface; segments 2–4 with short setae; segments 5–11 with long, golden setae that are longer than and extend beyond distal margin of antennal segment from which they arise. Antennal club segments with multiple transverse rows of setae. Antennal club subsymmetrical. Dorsal surface (external face) of mandible with median setose groove. **Thorax** (Fig. 59): Pronotum elongate, widest near anterior $\frac{1}{4}$; dorsal surface flattened along longitudinal midline, convex laterally; anterior margin arcuate, slightly wider than head; anterior angles rounded; base narrower than elytral bases; posterior margin moderately sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc smooth, with minute, sparse punctures. Pronotal median longitudinal canal well-developed, interrupted to form a deep, anterior fovea and a posterior canal;

raised interruption of the canal impunctate; posterior canal wide, deeply impressed, rounded and closed at the base. Hypomeron minutely punctate; strongly deflexed medially. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture slightly sinuate. **Elytra** (Figs. 86–87): Elytron convex. Elytral surface smooth, punctures weakly impressed, nearly indiscernible; interstitial intervals 3, 5, 7, and 9 feebly raised, more pronounced near apex. Interval 5 meets or nearly meets interval 9 near apex. Intervals 3, 5, and 7 with micropunctures at crest. Apical elytral margin with small, dense punctures. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interstitial interval 5 merges with finger-like callosity on the elytral shoulder. **Legs:** Base of femur and trochanter with long, sparse setae; inner face of tibia with fringe of long, dense setae. Tarsus densely setose with long setae that extend beyond the segment from which they arise. **Abdomen:** Abdominal ventrite V more heavily punctured, bearing two depressions on either side of midline, resulting in a raised, median V-shaped area near posterior margin (Fig. 132), present in both sexes. **Aedeagus:** Phallobase as in Fig. 142. Tegmen consisting of paired, elongate, anteriorly-projecting subtriangular plates at middle; plates narrowly touching medially. Basal piece with long anterolateral struts; struts recurved anteriorly. Parameres broadly rounded, broadly fused to one another near base, collectively articulated to phallobase; each paramere with a pair of oblique, elongate-oval patches near base and a pair of suboval patches near apex; patches lighter in color than remainder of paramere; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere lacking process; Penis similar to Fig. 167; elongate, slender, variously curved; apex narrowed and pointed; base slightly expanded, bearing long, slender, paired anterior struts. Penis slightly lighter in color near base.

Variation. *Deretaphrus analis* varies in coloration from light reddish orange to pitchy black. The shape of the anterior portion of the pronotal median longitudinal canal ranges from elongate to teardrop-shaped to oval. The pronota range from slightly to moderately narrowed near the base. In some specimens, the elytral punctures can be seen, but in most the punctures appear absent.

Distribution. Australia: New South Wales and Queensland (Fig. 179).

Biology. One specimen was collected under the bark of *Acacia* sp. Another specimen was collected by fogging vine scrub with pyrethrum.

Remarks. Lea (1898) did not mention the number of specimens examined. No specimens from Tweed [River?] were examined; however,

three specimens from Richmond River were card-mounted together. In order to stabilize this name, a lectotype and two paralectotypes are **here designated** from the syntype series of *Deretaphrus analis*. The lectotype and paralectotypes are mounted on the same card mount and pin. The specimen on the left is the lectotype [SAMA 279NL]. The middle specimen [SAMA 280NL] and right specimen [SAMA 281NL] are paralectotypes.

Type Locality. Tweed and Richmond Rivers, New South Wales.

Type Material Examined. LECTOTYPE (Figs. 187–188) (SAMA, left-most specimen, card-mounted with two paralectotypes) label data: “TY [handwritten on card-mount beneath left-most specimen] // analis Lea TYPE Richmond R [in Lea’s hand] // 9562 *Deretaphrus analis* Lea N.S. Wales TYPE [handwritten in black ink, “TYPE” written in red ink on right side of label]// S. Aust. Museum specimen [orange label]” [SAMA 279NL]. Sex not determined. PARALECTOTYPE (SAMA, center specimen, card-mounted with lectotype and paralectotype) label data: same as above [SAMA 280NL]. Sex not determined. PARALECTOTYPE (SAMA, right-most specimen card-mounted with lectotype and paralectotype) label data: same as above [SAMA 281NL]. Sex not determined.

Additional Material Examined (25). AUSTRALIA: NEW SOUTH WALES: Acacia Plat. (ANIC 283NL); Booyong (BPBM 22–23NL); Comboyne (ANIC 195NL); Dorrigo (ANIC 72–73NL, ANIC 75NL, ANIC 204NL); Dorrigo National Park (UQIC 11–12NL); Pilliga (ANIC 149NL); Ulong (AMSA 52–53NL). QUEENSLAND: Bunya Mountains (UQIC 2NL, UQIC 6NL, UQIC 8NL); Lamington National Park (QMBA 40NL, SAMA 70–71NL, UQIC 31NL); Lamington National Park, MacPherson Range (AMSA 5NL); Mount Deongwar (QMBA 5NL); Mount Glorious (BMNH 94NL, UQIC 16NL); Tambourine (QMBA 39NL).

***Deretaphrus antennatus* Lord and McHugh,
new species**

(Figs. 4–5, 60, 88–89, 143, 173, 189–190)

Diagnosis. This species can be readily distinguished from congeners by the strongly asymmetrical antennal club consisting of very angular segments and the apical margin of antennomere 11 concave and distinctly pointed along leading margin. It most closely resembles *D. carinatus* new species. In *D. antennatus*, the pronotal median longitudinal groove is more weakly developed and not interrupted, the interstitial intervals of the elytra are less strongly carinate, the antennal club segments bear intermittent setae, the anterior apical angle of antennomere 11 bears a patch of minute, erect setae, the antennal club segments

are strongly asymmetrical (with medial apices strongly angulate), the head lacks laterally expanded supra-ocular ridges, the eyes are evenly convex, and the apex of abdominal ventrite V is truncate (flattened) and not excised dorso-medially to produce a small point.

Description. Length 8.9–9.8 mm. Width 2.5–3 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, narrowed anteriorly, dorsal surface subtriangular; without laterally expanded supra-ocular ridges; eyes visible from above; eye evenly convex; punctures fairly dense. Frontoclypeal suture distinct, slightly sinuate medially. Clypeus distinctly narrower than head. Anterior margin of clypeus subtly arcuate, nearly straight. Submentum shape similar to Fig. 48; narrowly separated from subgenal braces, anterior corners produced into rounded lobes, without paired setose pits; anterior margin straight, strongly produced anteroventrally over oral cavity, mentum completely concealed, only apices of palpi visible, if at all. Antennal groove well-developed, impunctate internally. Antenna appearing glabrous except under high magnification, segments 3–8 with a single transverse row of minute setae, setae much smaller than the segment from which they arise. Antennal club segments with intermittent setae, apical angle of antennomere 11 with patch of minute, erect setae. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge, trailing edge of club segments straight. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 60): Pronotum large, slightly impressed medially, distinctly tapering to base, widest near anterior margin; dorsal surface convex, deflexed near anterior and posterior angles; anterior margin straight; anterior angles rounded; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin arcuate, slightly to moderately sinuate, with incomplete carina, forming a distinct raised margin in dorsal view. Pronotal disc with large, deep, round to oval punctures. Pronotal median longitudinal canal present, weakly developed, not interrupted. Hypomeron sparsely punctate, punctures large, round, and deeper than punctures of pronotal disc. Lateral walls strongly deflexed, subparallel. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture more or less straight. **Elytra** (Figs. 88–89): Elytron slightly flattened dorsally. Elytral interstitial intervals with row of micropunctures near apex; intervals 3–7, 9 raised for entire length, shiny, interval 8 raised only near apex; even raised intervals not as long

as odd, ending before apex; odd raised intervals nearly extending to apical margin; interval 3 more strongly raised near apex; interval 4 more strongly raised in apical half. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance on elytral interval 5 merges with finger-like callosity on elytral shoulder. **Legs:** Femur and tibia with short, sparse setae; inner face of tibia with 2 small rows of short, stout setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface near the apex of tarsomeres 1–3. **Abdomen:** Apex of ventrite V slightly to moderately truncate or flattened. **Aedeagus:** Phallobase as in Fig. 143. Tegmen consisting of paired, transverse plates at midline; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, widely separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with long, curved process; process thickest at base, narrowing apically, slightly longer than half the length of the paramere, apex curved, pointed; base of process with small swelling bearing a few stout setae; processes moderately separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, slightly curved; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis bicolored, lighter in basal 1/3.

Variation. The general sculpture of the pronotal disc is slightly variable. In some specimens, the pronotal disc bears only a hint of a median longitudinal depression. In others, the median longitudinal depression is distinct posteriorly. The punctures of the pronotal disc are also somewhat variable in depth. The apex of abdominal ventrite V slightly to strongly truncate (flattened).

Distribution. Known only from Western Australia (Fig. 173).

Biology. One specimen was collected “in nests of Tuterus.” It is unknown what “Tuterus” refers to.

Etymology. The epithet *antennatus* (L.) refers to the characteristic shape of the strongly asymmetrical antennal club.

Remarks. A holotype and three paratypes are here designated.

Type Locality. 25 miles north of Carnarvon, Western Australia.

Type Material Examined. HOLOTYPE (Figs. 189–190) (WAMP, pinned) label data: “W.H. Butler 22.10.1965 25 Miles Nth Carnarvon W. Australia. [handwritten] // Western Australian Museum Entomology Reg. no. 65227 [yellow label]” [WAMP 45NL, examined]. Sex not deter-

mined. PARATYPE (WAMP, pinned) label data: “W.H. Butler 22.10.1965 25 Miles Nth Carnarvon W. Australia. [handwritten] // Western Australian Museum Entomology Reg. no. 65228 [yellow label]” [WAMP 46NL, examined]. The abdomen of this specimen was dissected [glued to a card] and pinned beneath the specimen. Sex not determined. PARATYPE (WAMP, pinned) label data: “W.H. Butler 30.V.1964 Barrow Is. W. Australia. [handwritten] // Western Australian Museum Entomology Reg. no. 65229 [yellow label]” [WAMP 47NL, examined]. Female, abdomen and genitalia dissected and in glycerine in vial below specimen. PARATYPE (WAMP, pinned) label data: “Tambrey in nest of tuterus 3.8.58 [handwritten] R.P. McMillan. // Western Australian Museum Entomology Reg. no. 65231 [yellow label]” [WAMP 49NL, examined]. Male, abdomen and genitalia dissected and in glycerine in vial below specimen.

Deretaphrus boliviensis Lord and McHugh,
new species

(Figs. 61, 90–91, 144, 165, 181, 191–192)

Diagnosis. This species can be readily distinguished from congeners by the Bolivian distribution, distinct male genitalia, rugosely punctate pronotal disc, sinuate pronotal median longitudinal canal, distinct submentum shape, and eye with a slight cuticular expansion of the head capsule posteriorly. This species is most similar to the North American *D. oregonensis* but is separated by the shape of the posterior portion of the longitudinal canal, the distinctly smaller elytral punctures, and the form of the aedeagus.

Description. Length 9.8 mm. Width 2.8 mm. Body elongate, parallel, dark red; dorsal surface glabrous, rugose, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate anteromedially. Anterior margin of clypeus broadly arcuate. Eyes evenly convex; eye slightly emarginate posteriorly by a swollen strip of cuticle. Submentum shape as in Fig. 50; distinctly separated from subgenal braces, without paired setose pits; anterior margin biangulate, distinctly emarginated medially, slightly expanded anteroventrally over oral cavity, a portion of the mentum visible. Antennal groove well-developed, impunctate. Antenna sparsely setose; segments 3–8 with a single transverse row of short setae. Antennal club segments 9 and 10 with 2 transverse rows of short setae, 1 row at midline, the second row arising near apex of the segment.

Penultimate segment with a single median transverse row of minute setae. Antennal club slightly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 61): Pronotum elongate, widest near anterior $\frac{1}{4}$; dorsal surface evenly convex; anterior margin weakly sinuate, slightly wider than head; anterior angles rounded; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; base with an obtuse groove that extends from the lateral margins and terminates on either side before the midline; midline raised, raised portion continues laterad of the posterior pronotal longitudinal canal; portion on either side of posterior longitudinal canal is depressed anterior to the obtuse groove; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with moderately small, dense punctures. Pronotal median longitudinal canal well-developed, interrupted to form a deep, anterior fovea and a posterior canal; raised interruption of the canal impunctate; anterior fovea oval, not punctured internally; posterior canal deeply impressed, expanded and rounded anteriorly, narrowed medially then expanded and narrowed posteriorly; posterior canal closed at base. Hypomeron sparsely punctate, punctures slightly larger than found on pronotal disc; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture weakly sinuate. **Elytra** (Figs. 90–91): Elytron convex. Interstitial intervals 3, 5, 7, and 9 carinate, intervals 3, 5, and 7 shiny; intervals 3, 5, and 7 carinate for entire length, intervals 5 and 7 merge and continue toward apex, merging with interval 9 at raised apical margin of the elytra; intervals 3, 5, 7, and 9 with micropunctures at crest. Apical elytral margin with small, dense punctures. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interstitial interval 5 merges with finger-like callosity on the elytral shoulder. **Legs**: Base of femur with short, sparse setae; inner face of tibia with fringe of long, dense setae. Tarsus densely setose with long setae that extend beyond the segment from which they arise. **Abdomen**: Ventrite V with a slightly raised, thickened apical margin. **Aedeagus**: Phallobase as in Fig. 144. Tegmen consisting of paired, slender subtriangular plates at middle; plates narrowly touching medially. Basal piece with longer anterolateral struts; struts curved anteriorly. Parameres reduced, extremely short, transverse, distinctly separated and individually articulated to phallobase; paramere densely setose with long, thin setae at apical margin; dorsal surface of paramere without process. Penis as in Fig. 165; elongate, slender,

straight; apex narrowed and pointed; base slightly expanded, bearing long, slender, paired anterior struts. Penis unicolored.

Distribution. Known only from one locality in Bolivia (Fig. 181).

Biology. Not known.

Etymology. The epithet *boliviensis* (Latin) refers to the country in which it was collected, representing the only species of South American *Deretaphrus*.

Remarks. A holotype is here designated.

Type Locality. "Boyuibe to Charagua via. Cueva," Santa Cruz Province, Bolivia.

Type Material Examined. HOLOTYPE (Figs. 191–192) (σ , USNM, pinned) label data: "Bolivia S. Ana. G L Harrington Jul. 15-Sept. 1 '20 // Boyuibe to Charagua via. Cueva Ingri, etc. // USNM [handwritten]" [USNM 68NL, examined]. The abdomen [glued to a card, bearing a σ symbol] and genitalia [in glycerin in genitalia vial] are pinned beneath the specimen.

***Deretaphrus bucculentus* Elston, 1923,
new status**

(Figs. 35, 62, 92–93, 145, 166, 179, 193–194)

Deretaphrus bucculentus Elston, 1923: 212. Carter and Zeck 1937: 200–201.

Diagnosis. This species can be readily distinguished from congeners by the well-developed, angulate, laterally expanded supra-ocular ridges of the head which entirely conceal the eyes from dorsal view and by the weakly-defined median longitudinal depression of the pronotum. It most closely resembles *D. puncticollis* and *D. parviceps*. *Deretaphrus bucculentus* can be distinguished from *D. puncticollis* by the carinate interstitial intervals of the elytra being straight and separate from one another near the elytral apex (not curved medially and/or merging). It can be distinguished from *D. parviceps* by the more densely and coarsely punctate pronotal disc and the median longitudinal depression of the pronotal disc being sparsely punctate near the base, bordered on either side by a small keel or carina.

Redescription. Length 5.5–9.3 mm. Width 1.5–2.8 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head** (Fig. 35): In dorsal view, slightly narrowed anteriorly, subtriangular; with laterally expanded supra-ocular ridges; eyes completely concealed from above; punctures larger (slightly smaller than on pronotal disc), dense except smaller and sparse along posterior margin. Frontoclypeal suture not distinct, subtly arcuate anteromedially. Clypeus

distinctly narrower than head. Anterior margin of clypeus nearly straight. Submentum shape as in Fig. 52; triangular, fused to subgenal braces, without paired setose pits; anterior margin arcuate and rugose, strongly produced anteroventrally over oral cavity, mentum completely concealed. Antennal groove well-developed, impunctate internally. Antenna sparsely setose; segments 3–8 with 2 transverse rows of short setae. Antennal club segments 9–11 with 2 transverse rows of short setae, 1 row at midline, the second row arising near apex of the segment. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 62): Pronotum quadrate, tapering slightly to base, widest near anterior margin; dorsal surface weakly convex; anterior margin straight; anterior angles rounded but pronounced; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with medium sized, round punctures, each bearing a minute seta. Pronotal median longitudinal depression present but weak; depression wide, gradually becoming more shallow anteriorly, sparsely punctate near base, bordered on either side by a small keel or carina, closed at base by posterior margin of pronotum. Hypomeron sparsely punctate, punctures large and shallow, each bearing a seta; lateral walls strongly deflexed. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture more or less straight. **Elytra** (Figs. 92–93): Elytron slightly flattened, not evenly convex; interstitial intervals 3, 5, 7, and 9 carinate for entire length, shiny, straight; intervals 4, 6, and 8 feebly raised. Apical elytral margin carinate; basal margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interval 5 merges with finger-like callosity on the elytral shoulder. **Legs**: Femur and tibia with short, sparse setae; inner face of tibia with small fringe of setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface near the apex of tarsomeres 1–3. **Abdomen**: Ventrite V simple. **Aedeagus**: Phallobase as in Fig. 145. Tegmen consisting of paired, slender transverse plates at middle; plates narrowly touching medially. Basal piece without well-developed anterolateral struts, at most slightly produced anteriorly. Parameres moderately short, broadly rounded, widely separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with very short curved process; process thickest

at base, narrowing apically, distinctly shorter than half the length of the paramere, apex rounded; processes narrowly separated medially. Penis as in Fig. 166; long, moderately thick, slightly curved; apex greatly swollen and bulbous, pointed apically; base narrow, bearing long, thin, paired anterior struts. Penis unicolored.

Variation. The size and color are variable within the species. The pronotal median longitudinal canal is slightly deeper and more pronounced in some, as are the punctures of the pronotal disc. In a few specimens, elytral interstitial intervals 4 and 6 are feebly raised for a short distance. The lateral margins of the pronotum are generally slightly narrowed posteriorly, but in some the lateral margins nearly subparallel. In a few specimens, the laterally expanded supra-ocular ridges are more rounded and not as distinctly angulate.

Distribution. Australia: New South Wales, Queensland, and South Australia (Fig. 179).

Biology. Not known.

Taxonomic Notes. *Deretaphrus bucculentus* was synonymized under *D. puncticollis* by Carter and Zeck (1937). After examination of material and type specimens, it is clear that *D. bucculentus* is indeed a distinct species and is thus here **removed from synonymy**.

Remarks. Elston described this species from a single specimen.

Type Locality. Murray River, South Australia.

Type Material Examined. H O L O T Y P E (Figs. 193–194) (AMSA, card-mounted) label data: “TY. [handwritten on card-mount in red ink] // Murray R. S. Australia A.H. Elston // 1167 *Deretaphrus bucculentus* [handwritten] Elston, Cotype [“Co” is crossed out] // *Deretaphrus puncticollis* Lea. [in Carter’s hand] Det. H.J. Carter [label folded] // HOLOTYPE [red label] // A.H. Elston Collection. // AUSTRALIAN MUSEUM K231594” [AMSA 1NL, examined]. Sex not determined.

Additional Material Examined (15). AUSTRALIA: NEW SOUTH WALES: Bogan River (ANIC 251NL); Narromine (ANIC 252NL); Nandewar Range, near Narrabri (AMSA 60NL). QUEENSLAND: Bundaberg (ANIC 127NL); Gayndah (SAMA 34NL); Millmerran (ANIC 250NL); Wallaroo (ANIC 12NL). SOUTH AUSTRALIA: no locality (SAMA 189NL). STATE UNKNOWN: Forest Hill (QDPI 3–6NL, QDPI 11–13NL).

***Deretaphrus carinatus* Lord and McHugh,
new species**

(Figs. 36, 63, 94–95, 146, 174, 195–196)

Diagnosis. This species can be readily distinguished from congeners by the strongly and evenly

carinate elytral interstitial intervals 3–9, with even carinate intervals ending before odd intervals, the posterior face of abdominal ventrite V with a distinct dorsal point when viewed posteriorly, the head with well-developed, laterally expanded supra-ocular ridges, and strongly protuberant eyes. It most closely resembles *D. antennatus*, but we feel this group is distinct enough to warrant a new species. In *D. carinatus*, the pronotal median longitudinal groove is more strongly developed with a slightly depressed anterior portion, the interstitial intervals of the elytra are more strongly carinate, the antennal club segments bear minute setae, the anterior apical angle of antennomere 11 lacks a patch of minute, erect setae, the club segments are asymmetrical but with expanded portions of the leading edge rounded and not distinctly angulate, the head has distinct laterally expanded supra-ocular ridges, the eye is strongly protuberant, the anterior margin of the submentum is sinuate, and the apex of abdominal ventrite V bears a distinct dorsal point.

Description. Length 8–11.5 mm. Width 2.4–3.2 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, matte to moderately shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head** (Fig. 36): In dorsal view, narrowed anteriorly, dorsal surface subtriangular; with laterally expanded supra-ocular ridges; eyes partially concealed from above; eye strongly protuberant, not uniformly convex; punctures fairly dense. Frontoclypeal suture distinct. Clypeus distinctly narrower than head. Anterior margin of clypeus incised medially. Submentum strongly produced anteroventrally over oral cavity, mentum completely concealed, only apices of palpi visible, if at all. Submentum shape similar to Fig. 52; narrowly separated from subgenal braces, without paired setose pits; anterior margin sinuate. Antennal groove well-developed, impunctate internally. Antenna minutely setose, appearing glabrous; segments 3–8 with a single transverse row of minute setae. Antennal club segments with minute setae. Antennal club asymmetrical, leading edge of club segments distinctly curved, much more inflated than trailing edge, trailing edge straight. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 63): Pronotum large, slightly impressed medially, distinctly tapering to base, widest near anterior margin; dorsal surface convex, deflexed near anterior and posterior angles; anterior margin straight; anterior angles distinctly pronounced, nearly right angles; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin arcuate, slightly to moderately sinuate, with incomplete carina, forming

a distinct raised margin in dorsal view. Pronotal disc with large, deep, round to oval punctures. Pronotal median longitudinal canal present, distinct, interrupted to form a small, narrow anterior portion and a long posterior portion; anterior portion a small slit, surrounding area slightly depressed; posterior portion wide, shallow at base, abruptly tapering anteriorly to a narrow, more distinctly impressed canal. Hypomeron sparsely punctate, punctures large, round, and deeper than punctures of pronotal disc. Lateral walls strongly deflexed, subparallel. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture more or less straight. Mesoventrite impunctate medially, punctures increase in size towards posterolateral corners. Punctures on metaventrite increase in size anterolaterally. **Elytra** (Figs. 94–95): Elytron slightly flattened dorsally; interstitial intervals 3–9 distinctly carinate for entire length, shiny; raised even intervals not as long as odd intervals, ending before apex; raised odd intervals nearly extending to apical margin; interval 3 more strongly raised near apex; interval 4 more strongly raised in apical half. Basal elytral margin with interstitial intervals 3 and 5 each ending in a knob-like protuberance; protuberance on interval 5 merges with finger-like callosity on elytral shoulder. **Legs**: Femur and tibia with short, sparse setae; inner face of tibia with small setae near apical portion. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen**: Posterior face of ventrite V with a distinct dorsal point when viewed posteriorly, present in both sexes. Punctures on abdominal ventrite I distinctly sparser anteriorly. Intercostal process impunctate. Punctures on abdominal ventrites increase in size anteriorly. **Aedeagus**: Phallobase as in Fig. 146. Tegmen consisting of paired, subtriangular plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, well-separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with moderately developed, subtriangular process; process evenly curved, narrowing anteriorly, slightly shorter than half the length of the paramere, apex slightly swollen; processes narrowly separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis bicolored, lighter in basal 1/3.

Variation. The degree of carination of the interstitial intervals of the elytra varies slightly within this species. The lateral margins of the pronotum range from more or less evenly curved

to slightly sinuate. The size of the supra-ocular ridge on the head and degree of protuberance of the eyes is also somewhat variable.

Distribution. Australia: Northern Territory, South Australia, Victoria, and Western Australia (Fig. 174). *Deretaphrus carinatus* is the most widely distributed species of the genus.

Biology. Several specimens were collected from under the bark of *Eucalyptus*.

Etymology. The epithet *carinatus* (Latin, *carina* = keel) refers to the distinct carination of elytral interstitial intervals 3–9.

Remarks. A holotype is **here designated** and deposited in the WAMP. Six paratypes are **here designated** and deposited in the ANIC, SAMA, NZAC, and QDPI.

Type Locality. Narrogin, Western Australia.

Type Material Examined. HOLOTYPE (Figs. 195–196) (WAMP, card-mounted) label data: “36-3562 Narrogin [hand-written] // Western Australian Museum Entomology Reg. no. 65194 [yellow label]” [WAMP 13NL, examined]. Sex not determined. PARATYPE (ANIC, card-mounted) label data “Pinjarra, W.A. E. Goerling” [ANIC 241NL, examined]. Sex not determined. PARATYPE (ANIC, pinned) label data “Beverley, W.A. F.H. du Boulay // *D. gracilis* Blkb [in Carter’s hand] Det. H.J. Carter” [ANIC 31NL, examined]. Sex not determined. PARATYPE (ANIC, pointed) label data “30.40S 118.55E 38km NNW of Bullfinch, WA. 20 Sep. 1981 A.A. Calder // under bark *Eucalyptus*” [ANIC 132NL, examined]. Sex not determined. PARATYPE (SAMA, card-mounted) label data “Geraldton & Mullewa W.A., Lea // *D. fossus* Newm HJC [in Carter’s hand]” [SAMA 43NL, examined]. Male. Abdomen and genitalia are dissected and in glycerine in a vial below specimen. PARATYPE (QDPI, pointed) no label data [QDPI 15NL, examined]. Female. Abdomen and genitalia are dissected and in glycerine in a vial below specimen. PARATYPE (NZAC, pointed) label data: “Mullewa Miss F. May // *D. ignarus* Pasc HJC [in Carter’s hand] // typical sp. of a common sp. [in Carter’s hand] // F.E. Wilson Collection” [NZAC 2NL, examined]. Female. Abdomen and genitalia are dissected and in glycerine in a vial below specimen.

Additional Material Examined (13). AUSTRALIA: NORTHERN TERRITORY: Henbury, Finke River Gorge (ANIC 199NL). SOUTH AUSTRALIA: Serpentine Lakes, East side (SAMA 234–235NL); Yelprawaralinna HW (SAMA 170NL); no locality (MAMU 4NL). VICTORIA: Kerang (AMSA 38NL); no locality (ANIC 41NL). WESTERN AUSTRALIA: Nedlands (Perth) (HNHM 6NL, HNHM 10NL); Roebourne (SAMA 37NL). NO LOCALITY: (HNHM 14NL, MNHUB 58NL, QDPI 19NL).

***Deretaphrus erichsoni* Newman, 1855**

(Figs. 44, 55–56, 64, 96–97, 134–135, 147, 177, 197–198)

Deretaphrus erichsoni Newman in Wollaston and Newman, 1855: 211. Pascoe 1862: 461–462; Masters 1871: 79; Blackburn 1903: 120, 129; Carter and Zeck 1937: 200–201.

Deretaphrus granulipennis Reitter, 1877: 342. Lea 1898: 550; Blackburn 1903: 120, 129. Synonymized by Blackburn 1903: 129.

Deretaphrus ericksoni: Blackburn 1903: 126, 130. Misspelling, no status.

Diagnosis. This species can be readily distinguished from congeners by the numerously interrupted elytral interstitial intervals near the apex forming multiple granulose denticles, abdominal ventrite V with a bulbous swelling near the posterior margin in females, the nearly glabrous antennae, the sub-quadrate pronotum, the pronotal disc with at most a weak median longitudinal depression, and the orange to reddish color. It most closely resembles *D. wollastoni*. For comments on similarities and differences in relation to *D. wollastoni*, see the diagnosis under that species.

Redescription. Length 6.3–8.5 mm. Width 1.7–2.4 mm. Body elongate, parallel, orange to dark red; dorsal surface moderately shiny, glabrous; ventral surface moderately shiny, with moderately long setae that arise from punctures. **Head:** In dorsal view, rounded anteriorly; with laterally expanded supra-ocular ridges; eyes partially concealed from above; posterior margin of eye meets a distinct strip of abruptly raised cuticle; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, straight medially, faintly impressed, suture darker than surrounding area. Anterior margin of clypeus slightly arcuate medially. Submentum shape similar to Fig. 50; short and transverse, distinctly separated from subgenal braces, without paired setose pits; anterior margin arcuate, inflexed medially, slightly expanded anteroventrally over oral cavity, palpi visible, mentum concealed; anterolateral angles rounded. Antennal groove well-developed, impunctate. Antenna appearing glabrous except under high magnification, segments 3–11 with a single transverse row of minute setae; setae on antennal club segments arising near the apex. Antennal club slightly asymmetrical, leading edge of club segments much more inflated than trailing edge. Sensilla on distal surface of antennal club segments not restricted to within cupules. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 64): Pronotum quadrate, widest near anterior $\frac{1}{4}$; dorsal surface strongly convex; anterior margin straight; anterior angles

distinct; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view, carina more distinct for anterior half, terminating anteriorly at anterior angles, before the true anterior margin of the pronotum. Pronotal disc with moderately large, dense punctures. Pronotal median longitudinal depression weakly developed, surface of pronotal disc only slightly depressed along midline, with no hint of anterior fovea; longitudinal depression slightly wider and deeper posteriorly, forming two small vague keels on either side of midline. Hypomeron large, less densely punctate than on pronotum, punctures slightly larger than found on pronotal disc; lateral walls nearly vertical. Prosternum convex medially, strongly deflexed laterally, before tergosternal suture. Prosternum gradually raised posteriorly, then depressed immediately anterior to procoxae. Tergosternal suture nearly straight. **Elytra** (Figs. 96–97): Elytron convex; interstitial intervals 3–9 shiny, raised from base until apical 1/3, then becoming interrupted into numerous prominent denticles or granules. Apical elytral margin rugose. Basal elytral margin with intervals 3 and 5 not ending in distinct knob-like protuberance; finger-like callosity on the elytral shoulder indistinct. **Legs**: Setation sparse; inner face of tibia glabrous. Ventral apex of tibia with 2 pockets of dense setae that arise on either side of the large, curved tibial spur. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen**: Abdomen with moderately long setae. Ventrite V simple in males, bulbous swelling near posterior margin in females (Figs. 134–135). Punctures on ventrite V smaller and denser than on ventrites I–IV. **Aedeagus**: Phallobase as in Fig. 147. Tegmen consisting of paired, subtriangular plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts strongly curved anteriorly. Parameres moderately long, broadly rounded, well-separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with moderately developed, subtriangular process; process evenly curved, narrowing anteriorly, slightly longer than 1/3 the length of the paramere, apex slightly swollen; processes widely separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis bicolored, lighter in basal 1/3.

Variation. The color varies from dark orange to dark red, and the surface luster ranges from matte

to shiny. In some, the pronotal median longitudinal canal is slightly more impressed.

Distribution. Australia: New South Wales, South Australia, Tasmania, and Victoria (Fig. 177).

Biology. Several specimens were collected under the bark of *E. mannifera*. One specimen was collected in a flight intercept window trough trap [ANIC 104NL].

Remarks. Neither Newman (1855) nor Reitter (1877) mentioned the number of specimens examined of *D. erichsoni* and *D. granulipennis*, respectively. In order to stabilize these names, lectotypes are **here designated** for *Deretaphrus erichsoni* Newman and *Deretaphrus granulipennis* Reitter from the syntype series of those species. There is a specimen in the Museum für Naturkunde, Humboldt-Universität zu Berlin [MNHUB 6NL, examined] bearing the label data: “Tasmania // 1916 26 // ♀ // PARATYPUS // *Deretaphrus erichsoni tasmanica* Hze det. Dr. E. Heinze 1942”. This specimen was probably meant to be a paratype for a subspecies (*D. erichsoni tasmanica*), but no formal description was ever published by Heinze.

Type Locality. *Deretaphrus erichsoni*: Adelaide, South Australia; *Deretaphrus granulipennis*: New South Wales.

Type Material Examined. *Deretaphrus erichsoni*. LECTOTYPE (Figs. 197–198) (BMNH, card-mounted) label data: “Type [round label with orange border] // Adelaide [handwritten on blue round label] 54 / 70 [handwritten on underside] // *Erichsoni* Newman [in Newman’s hand] // Acc. No. [18] 54.70 [handwritten] det. R.G. Booth 2011.” [BMNH 42NL, examined]. Sex not determined.

Deretaphrus granulipennis. LECTOTYPE (Figs. 199–200) (MNHN, card-mounted) label data: “*Deretaphrus* Nov. Gallia [in Reitter’s hand] // EX. COLL. REITTER // TYP. REITTER // *Deretaphrus granulipennis* m. [written in Reitter’s hand]” [MNHN 1NL, examined]. Sex not determined.

Additional Material Examined (145). AUSTRALIA: AUSTRALIAN CAPITAL TERRITORY (A.C.T.): Black Mountain (ANIC 83NL, ANIC 87NL, ANIC 104NL, ANIC 203NL, ANIC 230NL, ANIC 232NL); Canberra, Yarralumla, Stirling Park (ANIC 242NL). NEW SOUTH WALES: Armidale (ANIC 269NL); Black Bob’s Creek, 11 km. SW of Moss Vale (ANIC 126NL); Bluegate, near Yanco (AMSA 10NL); Buxton (AMSA 15NL); Coolah Creek (ANIC 287NL); Goulburn (ANIC 193NL, ANIC 286NL); Kurrajong (MVMA 8NL); Numeralla, 1 km. W (ANIC 201NL); Queanbeyan, 9 Km NE (ANIC 245NL); Sydney (BMNH 44NL); The Creel, Mount Kosciuszko (ANIC 306NL, MCZ 20NL); Tumut River (BPBM 42–46NL, CASC 133NL); Wagga

Wagga (MAMU 17NL); Warung (BPBM 47NL); Werrikimbe National Park, Mooraback Camp (ANIC 135NL); Wog Wog, 35 Km NE of Braidwood (ANIC 197–198NL); Yass (AMSA 16–17NL); no locality (MAMU 14–15NL, MAMU 19NL). SOUTH AUSTRALIA: Adelaide (SAMA 12–13NL, SAMA 30NL, SAMA 256NL, SAMA 264NL), Adelaide, Montecute Heights, NE Adelaide (CUIC 9–10NL); Aldgate (MCZ 18NL); Belair National Park (SAMA 257NL); Cape Torrens Conservation Park, 1 km. S (SAMA 266NL); Deep Creek Conservation Park (SAMA 258NL); Kangaroo Island (SAMA 265NL); Lucindale (SAMA 16–20NL, SAMA 260NL); Mount Lofty Ranges (AMSA 11–13NL, AMSA 82NL, SAMA 23–27NL, SAMA 261NL, SAMA 263NL); Mylor (SAMA 29NL); Myponga (SAMA 262NL); Nuriootpa (SAMA 215NL, SAMA 240NL); no locality (BMNH 46–47NL, MAMU 13NL). TASMANIA: Hobart (ANIC 89NL, BMNH 50NL, SAMA 31–32NL, USNM 59NL); Launceston (AMSA 20NL); Trevallyn Dam (ANIC 68NL, ANIC 138NL); no locality (AMSA 14NL, BMNH 51NL, FMNH 1NL, MNHUB 6NL, SAMA 21–22NL, SAMA 288NL). VICTORIA: Benalla (BPBM 13–14NL); Cheltenham (BMNH 52NL); Eltham (MVMA 18–20NL); Fern Tree Gully (BMNH 53NL); Gippsland (ANIC 90NL); Glenfyne (AAIC 5–6NL); Healesville (SAMA 259NL); Leopold (ANIC 42NL); Lilydale (MVMA 26NL); Melbourne (ANIC 79NL, BMNH 43NL, SAMA 283NL); Moe (ANIC 217NL, ANIC 276NL); Mordialloc (MVMA 16NL); Oakleigh (QDPI 9NL); Port Phillip (BMNH 54NL); Portland (QMBA 31–33NL); Red Hill (AAIC 7NL); Warburton (MAIC 8NL); Woori Yallock (ANIC 196NL); Yarragon (ANIC 221NL); no locality (ANIC 91NL, MNHUB 4–5NL, MVMA 21–23NL, QMBA 36NL). STATE UNKNOWN: Emerald District (MVMA 9NL); Jenolan Caves vicinity (SAMA 14NL); Mittayay (ANIC 80NL); no locality (ANIC 84NL, ANIC 86NL, ANIC 88NL, BMNH 45NL, BMNH 48NL, BMNH 49NL, FMNH 20NL, MCZ 19NL, MVMA 7NL, MVMA 10–15NL, MVMA 17NL, MVMA 24NL, OUMNH 24NL, QDPI 10NL, SAMA 28NL).

***Deretaphrus fossus* Newman, 1842**

(Figs. 1–3, 18–28, 65, 98–99, 148, 175, 201–203)

Deretaphrus fossus Newman, 1842: 403. Erichson 1845: 288; Wollaston and Newman 1855: ccvii–ccxii; Pascoe 1862: 460–464; Masters 1871: 79; Horn 1878: 581; Lea 1898: 549–550; Blackburn 1903: 120–123, 125–128, 130; Carter and Zeck 1937: 199–201; Heinze 1943: 119.

Deretaphrus fossus: Lacordaire 1854: 377–378. Misspelling, no status.

Deretaphrus cordicollis Blackburn, 1903: 125. Carter and Zeck 1937: 199–201. Synonymized by Carter and Zeck 1937: 200.

Diagnosis. This species can be readily distinguished from congeners by the strongly produced anterior pronotal angles, the sinuate lateral pronotal margin (when viewed from above), the distinctly interrupted pronotal median longitudinal canal, and elytral interstitial intervals 3, 5, and 7 carinate, with a portion of the sixth carinate for a short distance on apical half. It most closely resembles *D. aequaliceps* and *D. ignarus*. *Deretaphrus fossus* can be distinguished from *D. aequaliceps* by the sixth elytral interstitial interval being slightly raised to carinate for a short distance, the posterior portion of the median longitudinal canal being bordered on either side posteriorly by a slightly raised area of the pronotal disc, the pronotum with distinctly sinuate lateral margins and more strongly pronounced and angulate anterior pronotal angles, and by the generally larger size. For comments on similarities and differences in relation to *D. ignarus*, see the diagnosis under that species.

Redescription. Length 6.5–11.7 mm. Width 1.8–3.3 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, nearly straight. Anterior margin of clypeus broadly arcuate. Submentum shape as in Fig. 153; narrowly separated from subgenal braces, with large punctures, with paired, setose pits; anterior margin evenly arcuate, slightly inflexed, strongly produced anteroventrally over oral cavity, mentum concealed. Antennal groove well-developed, impunctate. Antenna sparsely setose, segments 3–7 with a single transverse row of short setae, setae about half as long as the segment from which they arise; setae on antennal club segments sparse, short, arising near apex of segments. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible with median setose groove. **Thorax** (Fig. 65): Pronotum elongate, tapering to base, widest near anterior; dorsal surface evenly convex; anterior margin straight; anterior angles strongly produced, nearly right angles; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles depressed, with small denticle; lateral margin sinuate, with incomplete carina, forming a distinct raised margin in dorsal view, terminating anteriorly before the true anterior

margin of the pronotum. Pronotal disc with large, dense, punctures. Pronotal median longitudinal canal well-developed; interrupted; anterior portion of canal a round depression, heavily punctate internally; posterior portion of canal narrow, parallel-sided, deeply impressed, impunctate internally, slightly expanding right at base; internal lateral margins of posterior canal grooved. Pronotal disc on either side of posterior canal with slightly raised portion. Hypomeron more sparsely punctate than pronotal disc; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Prosternum depressed immediately anterior to procoxae. Tergosternal suture more or less straight. **Elytra** (Figs. 98–99): Elytron evenly convex; interstitial intervals 3, 5, and 7 raised and shiny for entire length, becoming carinate near the apex; interval 6 raised for a short time near apical third, not reaching apex. Crest of raised intervals with punctures bearing minute setae. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; finger-like callosity on the elytral shoulder short and thick. **Legs**: Setation sparse; inner face of tibia with a prominent fringe of relatively short setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface near apex of tarsomeres 1–3. **Abdomen**: Ventrite V simple. **Aedeagus**: Phallobase as in Fig. 148. Tegmen consisting of paired, subtriangular plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, distinctly separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with short subtriangular process; process thickest at base, narrowing apically, slightly shorter than half the length of the paramere, apex slightly swollen; processes moderately separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis unicolored.

Variation. The size and color vary strongly within the species. The amount of sinuation of the lateral margins of the pronotum, the convexity of the pronotal disc, and the degree of carination of the elytral interstitial intervals (especially the sixth) is slightly variable. In some, the anterior portion of the median longitudinal canal is more weakly developed.

Distribution. Australia: Australian Capital Territory, New South Wales, Queensland, South Australia, Tasmania, and Victoria (Fig. 175).

Biology. One specimen was taken at an outside light [ANIC 66NL]. Another specimen was taken at a mercury vapor light in an open forest [QMBA

4NL]. Several specimens were taken under the bark of *Eucalyptus* [ANIC 112NL, ANIC 249NL].

Taxonomic Notes. *Deretaphrus cordicollis* was synonymized under *D. fossus* by Carter and Zeck (1937). Although the type specimen of *D. fossus* is apparently lost, there is little doubt as to the identity of this species. Therefore, we continue to recognize *D. cordicollis* as a junior synonym of *D. fossus*.

Remarks. Neither Newman (1842) nor Blackburn (1903) mentioned the number of specimens examined of *D. fossus* and *D. cordicollis*, respectively. The type of *D. fossus* was not located. The suspected original pin and labels (Fig. 201) were found among Newman's material in the BMNH, but no specimen was associated. The label data of the suspected original type is as follows: "Deretaphrus fossus Newm 1842 Sigerpes piceus Germ 1848 3.223 [in Newman's hand] // Label in E. Newman's handwriting, but no specimen found [handwritten] det. R.G. Booth 2006". In order to stabilize these names, a neotype is **here designated** from the material of *D. fossus* and a lectotype is **here designated** from the syntype series of *D. cordicollis*. There is a specimen of *D. cordicollis* [SAMA, point-mounted, damaged] that bears the following label data: "Bous. [handwritten in red ink] // described as ? cordicollis. [in Blackburn's hand] // co-type. [in Blackburn's hand] // Dividing Rge., V. Blackb's Coll. // I.8722 Deretaphrus cordicollis Bl Victoria Cotype [handwritten in black ink, "Cotype" written in red ink on right side of label] // S. Aust. Museum specimen [orange label]" [SAMA 272NL, examined]. Sex is not determined. Given the locality of the specimen and Blackburn labels, this is possibly the "much smaller specimen..." Blackburn "took near the summit of one of the higher Victorian mountains..." As Blackburn (1903) stated in his description of *D. cordicollis*, "It is probably a valid species, but more specimens of both forms ought to be examined before this Victorian insect is described as distinct." Because this specimen does not bear the markings on the card-mount typical of Blackburn syntypes, we do not consider this a syntypic specimen.

Type Locality. *Deretaphrus fossus*: Port Philip, South Australia; *Deretaphrus cordicollis*: Tasmania.

Type Material Examined. *Deretaphrus fossus*. NEOTYPE (Figs. 202–203) (SAMA, point-mounted) label data: "2619 [handwritten on blue label] // Tasmania A. Simson // S.A. Museum specimen [red label]" [SAMA 285NL, examined]. Sex not determined. This type was removed from the original card-mount and point-mounted. The original card-mount is pinned beneath the specimen.

Deretaphrus cordicollis. LECTOTYPE (Figs. 204–205) (♂, BMNH, point-mounted) label data: “7202 T. Tas [in Blackburn’s hand at base of card-mount; “7202” and “Tas” written in red ink, “T.” written in black ink] // Type H.T. [round label with red border] // Australia. [red underline] Blackburn Coll. B.M.1910-236. // *Deretaphrus cordicollis*, Blackb [in Blackburn’s hand]” [BMNH 97NL, examined]. This type was removed from the original card-mount and point-mounted. The original card-mount, abdomen [glued to a card, bearing a ♂ symbol], and genitalia [in glycerin in genitalia vial] are pinned beneath the specimen.

Additional Material Examined (171).

AUSTRALIA: AUSTRALIAN CAPITAL TERRITORY (A.C.T.): Canberra (ANIC 96NL, ANIC 295NL); Canberra, Black Mountain (ANIC 238NL). NEW SOUTH WALES: 30 mi. SW of Canberra (SAMA 184–186NL); Armidale (ANIC 119NL); Black Bobs Creek, 11 km. SW of Moss Vale (ANIC 112NL, ANIC 249NL); Blue Mountains (ANIC 15NL, ANIC 154NL); Bogolong (AMSA 46NL, MAMU 23NL, MAMU 35NL); Copertree Valley (AMSA 71NL); Dorrigo (ANIC 100NL); Forest Reefs (SAMA 38–39NL); Goulburn (ANIC 288NL, SAMA 244NL); Greta (ANIC 296NL); Hornsby (AMSA 18NL, ANIC 94NL); Jenolan (HNHM 9NL); Jindabyne (AMSA 76–77NL); Lane Cove (AMSA 73NL); Matheson (UQIC 20NL); Mount Kosciuzko (MCZ 37NL); Mount Lofty Range (BMNH 89NL); Mount Tomah (AMSA 24NL); Orange (ANIC 284NL); Pipers Flat (MAMU 24–25NL); Ryde (AMSA 7–8NL, ANIC 109NL, ANIC 225NL); Sydney (ANIC 101NL, ANIC 160NL, BMNH 85, BMNH 91NL, USNM 63–64NL); Sydney, Sandy Point (ANIC 271–272NL); Tumut Pond (BPBM 27NL); Tumut River (AMNH 22NL, BPBM 25–26NL, BPBM 28–29NL, CASC 130NL); Wauchope (QMBA 45NL); Wingello (Manor Park) (HNHM 5NL); Yass, 16 km. NW (ANIC 237NL); no locality (MAMU 3NL, MAMU 36NL). QUEENSLAND: Cape York (MNHUB 41NL, MNHUB 49NL); Goomburra, Upper Dalrymple Creek (QMBA 1NL); Middle Ridge (UQIC 21NL); Mount Nebo Road (QMBA 4NL); Stanthorpe (QMBA 18–19NL, QMBA 23–24NL, UQIC 47NL); Warwick, 1.6 km. W of Wildash (SAMA 169NL); Wyberba (ANIC 48NL). SOUTH AUSTRALIA: Adelaide (BMNH 1NL); Kangaroo Island, Rocky River (SAMA 202NL); Enfield suburb (AMSA 45NL); Mount Lofty Ranges (AMSA 21–23NL, SAMA 63NL, SAMA 82–84NL, SAMA 255NL). TASMANIA: Grantow (HNHM12NL); Hobart (BMNH 5–6NL, BMNH 8NL, BMNH 71–72NL, BMNH 74NL, SAMA 40–41NL, SAMA 183NL, SAMA 221NL); Hobart, Sandy Bay (ANIC 66NL); Latrobe (SAMA 196NL); Launceston (AMSA 26NL); Mount

Wellington (ANIC 92–93NL, SAMA 1NL); New Norfolk (BMNH 70NL); no locality (AMSA 80–81NL, BMNH 7NL, SAMA 44NL, SAMA 200NL, SAMA 213NL, SAMA 287NL). VICTORIA: Dadenong Ranges (HNHM 13NL); Diamond Creek (SAMA 223NL); Eltham (MVMA 33–35NL); Gippsland (MVMA 27–28NL); Glenfyne (AAIC 1–2NL); Heywood, 18 km. NWN (MVMA 39NL); Killara (MVMA 29NL, MVMA 36–37NL); Lakes Entrance (ANIC 303NL); Lilydale (MVMA 25NL); Melbourne (AMSA 70NL, HNHM 2NL, SAMA 284 NL); North Melbourne (MVMA 38NL); Port Phillip (MNHUB 2NL); Stawell (ANIC 175NL); Tyres River (ANIC 226NL); Wallan (MVMA 41–42NL); Warragul (ANIC 214NL, ANIC 228–229NL); Warrandyte (ANIC 36NL); Yarragon (ANIC 121–123NL, ANIC 222–224NL); no locality (ANIC 151–152NL, BMNH 10NL, MAMU 1–2NL, MNHUB 7NL, MNHUB 9NL, MNHUB 10–12NL, MNHUB 48NL, UQIC 23NL). STATE UNKNOWN: Broadwater (QDPI 16NL); Inverell, 30 km. E (QDPI 18NL); Portland (MVMA 30–32NL); no locality (AMSA 27NL, ANIC 14NL, CASC 125–126NL, MCZ 31–32NL, MNHUB 47NL, MVMA 40NL, OUMNH 10–13NL, OUMNH 22NL, SAMA 42NL, BMNH 99NL).

***Deretaphrus gracilis* Blackburn, 1903**

(Figs. 66, 100–101, 149, 167, 174, 206–207)

Deretaphrus gracilis Blackburn, 1903: 124. Carter and Zeck 1937: 200–201.

Diagnosis. This species can be readily distinguished from congeners by the slightly convex pronotal disc with moderately sparse, small punctures and a sharply impressed pronotal median longitudinal canal, the simple abdominal ventrite V, the shape of the submentum, a distribution restricted to Western Australia, and genitalic characters. This species is most similar to *D. piceus* and *D. iridescens*. *Deretaphrus gracilis* can be distinguished from *D. piceus* by the simple abdominal ventrite V (without two depressions on either side of midline), the larger and denser punctures on the pronotal disc, the less foveate anterior portion of the pronotal median longitudinal canal, and the less dense setation of the antennal club. It can be distinguished from *D. iridescens* by having more strongly impressed anterior and posterior portions of the median longitudinal canal, a pronotum that is slightly depressed medially and deflexed laterally, and a distribution restricted to Western Australia.

Redescription. Length 5.2–9.9 mm. Width 1.5–2.7 mm. Body elongate, parallel, red; dorsal surface glabrous, matte to weakly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In

dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate anteromedially. Anterior margin of clypeus broadly arcuate. Submentum shape as in Fig. 51; distinctly separated from subgenal braces, with paired setose pits; anterior margin moderately expanded anteroventrally over oral cavity; palpi and a portion of the mentum visible. Antennal groove well-developed, impunctate. Antenna densely setose; segment 1 with few setae on ventral surface; segments 2–8 with a single transverse row of moderately long setae, setae greater than half the length of the segment from which they arise; antennal club segments with 2 transverse rows of setae, 1 row located medially, with short setae, second row at apical margin of segments, with long setae. Antennal club subsymmetrical. Dorsal surface (external face) of mandible with median setose groove. **Thorax** (Fig. 66): Pronotum elongate, widest near anterior $\frac{1}{4}$; dorsal surface flat, slightly impressed along midline; anterior angles rounded, not distinctly pronounced; anterior margin arcuate medially, slightly wider than head; base narrower than elytral bases; posterior margin slightly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a subtle raised border in dorsal view. Pronotal disc with small, sparse punctures. Pronotal median longitudinal canal present, strongly developed, interrupted anteriorly; anterior portion a weak slit, the surrounding area slightly depressed, more densely punctate; raised interruption of the canal impunctate; posterior canal narrow, strongly impressed, internal lateral margins of canal grooved, slightly tapering posteriorly, open at the base. Hypomeron minutely punctate; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture slightly sinuate. **Elytra** (Figs. 100–101): Elytron flattened dorsally; interstitial intervals 3, 5, and 7 feebly raised near apex. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interval 5 narrowly separated from or narrowly joining finger-like callosity on the elytral shoulder. **Legs**: Setation sparse; inner face of tibia with double fringe of long, dense setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen**: Ventrite V simple. **Aedeagus**: Phallobase as in Fig. 149. Tegmen consisting of paired, elongate, anteriorly projecting, subtriangular plates at middle; plates narrowly touching medially. Basal piece with long anterolateral struts; struts recurved anteriorly. Parameres rounded, broadly fused to one another near base, collectively slightly transverse and articu-

lated to phallobase; each paramere with a pair of oblique, elongate-oval patches near middle and a pair of subcircular patches near apicolateral margin, patches lighter in color than remainder of paramere; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere lacking process; Penis as in Fig. 167; elongate, slender, variously curved; apex narrowed and pointed; base slightly expanded, bearing long, slender, paired anterior struts. Penis slightly lighter in color near base.

Variation. The color is variable within the species, ranging from light reddish brown to nearly black. The depth of the posterior portion of the pronotal longitudinal canal is shallower in smaller individuals and deeper in larger individuals.

Distribution. Known only from Western Australia (Fig. 174).

Biology. Not known.

Remarks. Blackburn (1903) did not mention the number of specimens examined. In order to stabilize this name, a lectotype is **here designated** from the syntype series of *D. gracilis*.

Type Locality. Western Australia.

Type Material Examined. LECTOTYPE (Figs. 206–207) (BMNH, point-mounted) label data: “T. 7200 W.A. [in Blackburn’s hand at base of card-mount, “7200” and “W.A.” are written in red ink, “T.” is written in black ink] // Type H.T. [round label with orange border] // Australia. [red underline] Blackburn Coll. B.M.1910-236. // *Deretaphrus gracilis*, Blackb [in Blackburn’s hand]” [BMNH 100NL, examined]. Sex not determined. This type was removed from the original card-mount and point-mounted. The original card-mount and abdomen (glued to a card) are pinned beneath the specimen. Upon dissection, the genitalia were not found. It is possible a previous worker dissected the genitalia and did not place with the specimen.

Additional Material Examined (12). AUSTRALIA: WESTERN AUSTRALIA: 7 mi. E by N of Balladonia HS (ANIC 170NL); Boorabbin (MNHUB 3NL); Coolgardie (BMNH 92NL); Eradu (ANIC 32NL); Mundaring (BMNH 82NL); Porongurup National Park (WAMP 63NL); Swan River (ANIC 307–308NL, OUMNH 9NL, SAMA 72NL); Wurarga, Marloo Station (ANIC 159NL); STATE UNKNOWN: no locality (OUMNH 20NL).

Deretaphrus hoplites Lord and McHugh,
new species

(Frontispiece, Figs. 67, 102–103, 136,
150, 168, 179, 208–209)

Diagnosis. This species can be readily distinguished from congeners by the posterior pronotal angles bearing a large, excised denticle (larger than any other *Deretaphrus*), abdominal ventrite V bearing deep, setose punctures, the distinct sculpturing

of the pronotal disc, and genitalic characters. It most closely resembles *D. interruptus* but can be distinguished from it by the parallel-sided posterior portion of the pronotal median longitudinal canal, the larger denticles on the posterior angles of the pronotum, the fully carinate (for entire length) elytral interstitial interval 3, the arcuate anterior margin of the submentum, the dark red color, and Australian distribution.

Description. Length 7.4–10.4 mm. Width 2.1–3.0 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, moderately shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture not distinct, arcuate anteromedially. Clypeus distinctly narrower than head; with a medial depression; anterior margin of clypeus incised medially. Submentum shape similar to Fig. 52; narrowly separated from subgenal braces, without paired setose pits; anterior margin strongly produced anteroventrally over oral cavity, mentum completely concealed. Antennal groove well-developed, impunctate. Antenna densely setose; segments 2–8 with a single transverse row of long setae that extend beyond distal margin of antennal segment from which they arise. Antennal club segments with multiple transverse rows of long setae. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 67): Pronotum elongate, widest near anterior $\frac{1}{4}$; dorsal surface impressed along longitudinal midline, convex laterally; anterior margin straight, slightly wider than head; anterior angles rounded; base slightly narrower than elytral bases; posterior margin sinuate; posterior angles with very prominent, large, excised denticle, bearing a single, small seta; lateral margin with incomplete sublateral carina, carina deeply grooved forming a distinct raised border in dorsal view. Pronotal disc with small to large oval punctures, punctures increasing in size laterally. Pronotal median longitudinal canal well-developed, interrupted to form a deeply impressed, anterior fovea and a posterior canal; raised interruption of the canal impunctate; anterior fovea narrows to a point anteriorly; posterior canal wide, deeply impressed, impunctate, broadly open at base; internal lateral margins of canal simple; base bordered by strongly raised portion of pronotal disc, raised portion delimited laterally by deep impressions, base of impression with a small tuberculate swelling (Fig. 67). Hypomeron minutely punctate; strongly deflexed medially, walls subparallel. Prosternum flat medi-

ally, strongly deflexed at lateral margin. Tergosternal suture slightly sinuate. Metaventricle with small punctures, punctures significantly larger anteriorly and at anterolateral corners. **Elytra** (Figs. 102–103): Elytron convex; interstitial interval 3 feebly raised basally, strongly raised near apex; intervals 5, 7, and 9 strongly raised for entire length; intervals 3, 5, and 7 with micropunctures at crest. Basal elytral margin with intervals 3 and 5 ending in a knob-like protuberance; protuberance of interval 5 merges with finger-like callosity on the elytral shoulder; callosity strongly pronounced, distinctly forked. **Legs:** Base of femur and trochanter with long, sparse setae; inner face of tibia with a double fringe of long, dense setae. Tarsus densely setose with long setae that extend beyond the segment from which they arise. **Abdomen:** Ventrites with large punctures, ventrite V with deep punctures, each bearing a long seta. In females, ventrite V with a large depression on either side of midline (Fig. 136), creating a median raised area (generally impunctate) that narrows apically. Males with ventrite V slightly depressed at apical margin. **Aedeagus:** Phallobase as in Fig. 150. Tegmen consisting of small, paired, curved plates at base; plates narrowly touching medially. Basal piece without anterolateral struts; Parameres very large, broad, truncate apically, distinctly separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical and lateral margin; paramere with external margin more heavily sclerotized, interior with a lighter and less-sclerotized, reniform area; dorsal surface of paramere with very small, short subtriangular process; process thickest at base, curved, less than $\frac{1}{5}$ the length of the paramere, apex slightly swollen; processes moderately separated, parallel medially. Penis as in Fig. 168; short, moderately thick, more or less straight; slightly expanded apically, apex narrowed and pointed; base slightly expanded, bearing long, slender, paired anterior struts. Penis slightly lighter in color near basal end.

Variation. The color is variable within the species, ranging from light reddish brown to nearly black.

Distribution. Australia: New South Wales and Queensland (Fig. 179).

Biology. One specimen was taken from dry sclerophyll [SAMA 193NL]. Three specimens were taken from *Acacia* sp. [ANIC 273–275NL]. Three specimens were taken by fogging trees with pyrethrum [QMBA 2NL, QMBA 9NL, and QMBA 12NL].

Etymology. The epithet *hoplites* (Greek, = armed, or a man in armor) refers to the heavily armored nature of *Deretaphrus*.

Remarks. A holotype is **here designated** and deposited in the SAMA. Twenty paratypes are

here designated and deposited in the AMSA, BMNH, MVMA, QMBA, SAMA, and UQIC.

Type Locality. McArthur's Clearing, near Kempsey, New South Wales.

Type Material Examined. H O L O T Y P E (Figs. 208–209) (SAMA, minuten-pinned into foam block) label data: "NSW McArthurs clearing nr. Kempsey. Dry sclerophyll. 4 Jan 1963 P. Aitken // S.A. Museum Specimen [red label]" [SAMA 193NL, examined]. Sex not determined. PARATYPE (AMSA, card-mounted) label data: "Brooklana, E. Dorrigo, N.S.W. W. Heron May 1929 // K59342 [handwritten] // *Deretaphrus piceus* Germ Det. H.J. Carter = *bakewelli* Pasc [handwritten] // Australian Museum K231642" [AMSA 55NL, examined]. Sex not determined. PARATYPE (BMNH, card-mounted) label data: "NEW S. WALES [red underline] Dorrigo. W. Heron. B.M. 1935–46" [BMNH 84NL, examined]. Sex not determined. PARATYPE (QMBA, pinned) label data: "SEQ: 26°08'Sx151°58'E Nangur State For., 24Nov1995 G.Monteith Pyrethrum, trees, 320m" [QMBA 2NL, examined]. Sex not determined. PARATYPE (SAMA, card-mounted) label data: "Dorrigo N.S. Wales W. Heron // S.A. Museum Specimen [red label]" [SAMA 208NL, examined]. Sex not determined. PARATYPE (UQIC, minuten-pinned) label data: "Bunya Mts, S.E.Qld. 17–18.ix.1966. G. Monteith // UQIC Reg. #91682" [UQIC 1NL, examined]. Sex not determined. PARATYPE (UQIC, minuten-pinned) label data same as above, except label 2 reads "UQIC Reg. #91684" [UQIC 3NL, examined]. Sex not determined. PARATYPE (UQIC, minuten-pinned) label data same as above, except label 2 reads "UQIC Reg. #91685" [UQIC 4NL, examined]. Sex not determined. PARATYPE (UQIC, minuten-pinned) label data same as above, except label 2 reads "UQIC Reg. #91686" [UQIC 5NL, examined]. Sex not determined. PARATYPE (UQIC, minuten-pinned) label data same as above, except label 2 reads "UQIC Reg. #91688" [UQIC 7NL, examined]. Sex not determined. PARATYPE (UQIC, minuten-pinned) label data same as above, except label 2 reads "UQIC Reg. #91690" [UQIC 9NL, examined]. Sex not determined. PARATYPE (UQIC, minuten-pinned) label data same as above, except label 2 reads "UQIC Reg. #91691" [UQIC 10NL, examined]. Sex not determined. PARATYPE (BMNH, card-mounted) label data: "NEW S. WALES: [red underline] Dorrigo. W. Heron. B.M. 1935–46." [BMNH 83NL, examined]. Sex not determined. PARATYPE (SAMA, card-mounted) label data: "Dorrigo [handwritten] // From Carter [handwritten] // *piceus* Germ HJC [in Carter's hand] (SAMA 114NL, examined). Sex not determined. PARATYPE (QMBA, pointed) label data: "SEQ: 27°14'Sx152°15'E MtDeongwar, 3km S, RF 27Dec1998. Monteith pyr.trees.450m. 7554"

[QMBA 9NL, examined]. Sex not determined. PARATYPE (QMBA, pointed) label data same as above [QMBA 12NL, examined]. Sex not determined. PARATYPE (MVMA, card-mounted) label data: "Bunya Mts. Queensland H.J. Carder // H.J. Carter Coll. P. 20.4.22 // *D. piceus* Germ Id. by A.M. Lea very large [in Lea's hand] // *D. ignarus* Pasc HJC [in Carter's hand] // COL-71831" [MVMA 111NL, examined]. Sex not determined. PARATYPE (ANIC, minuten-pinned) label data: "Armidale N.S.W. Sept. 1946 R. Millington [handwritten]" [ANIC 110NL, examined]. Sex not determined. PARATYPE (ANIC, pointed) label data: "Acacia Mtns. N.S.W. J. Armstrong" [ANIC 273NL, examined]. Male, genitalia dissected and in glycerine in vial below specimen. PARATYPE (ANIC, pointed) label data: "Acacia Mtns. N.S.W. J. Armstrong" [ANIC 274NL, examined]. Male, genitalia dissected and in glycerine in vial below specimen. PARATYPE (ANIC, pinned) label data: "N.S. Wales // Armidale [handwritten] // On permanent loan from MALEAY MUSEUM University of Sydney" [ANIC 78NL, examined]. Sex not determined.

Additional Material Examined (2). AUSTRALIA: NEW SOUTH WALES: Acacia Mountains (ANIC 275NL). QUEENSLAND: Brisbane (NZAC 1NL). Note: These two specimens are not regarded as members of the type series due to their morphological variability that departs significantly from the remaining types. Therefore, these two specimens are tentatively listed under this species.

***Deretaphrus ignarus* Pascoe, 1862**

(Figs. 48, 68, 104–105, 151, 169, 175, 210–211)

Deretaphrus ignarus Pascoe, 1862: 462. Masters 1871: 79; Blackburn 1903: 120–122, 128, 130; Carter and Zeck 1937: 199–201.

Deretaphrus ignarius: Lea 1898: 548, 550. Misspelling, no status.

Deretaphrus pascoei Macleay, 1871: 165. Masters 1871: 79; Lea 1898: 549–550; Blackburn 1903: 120; Carter and Zeck 1937: 200–201. Synonymized by Carter and Zeck 1937: 200.

Diagnosis. This species can be readily distinguished from congeners by the nearly glabrous antennae, the anterior margin of the submentum being evenly arcuate, elytral interstitial intervals 3, 5, and 7 being strongly carinate and raised near apex, and genitalic characters. *Deretaphrus ignarus* most closely resembles *D. fossus*, *D. viduatus*, and *D. xanthorrhoeae*. It can be distinguished from *D. fossus* by the nearly glabrous antennae, the rounded and downturned anterior angles of the pronotum, the non-sinuate lateral pronotal margins, the less-depressed area surrounding the

pronotal median longitudinal canal, and the distinctly more carinate elytral intervals, with interval 6 raised for a much longer portion. It can be distinguished from *D. viduatus* by the nearly glabrous antennae and the more strongly raised elytral intervals, with some of both even and odd intervals carinate. It can be distinguished from *D. xanthorrhoeae* by the slight, rounded to sinuate laterally expanded supra-ocular ridges, the larger and deeper pronotal punctures, a narrower, parallel-sided and more deeply impressed pronotal median longitudinal canal, elytral intervals 3, 5, and 7 being much more distinctly carinate, a lack of sexual dimorphism of abdominal ventrite V in females, and a generally darker color (dark reddish brown to black, as opposed to lighter reddish orange in *D. xanthorrhoeae*).

Redescription. Length 6–10.5 mm. Width 1.7–2.8 mm. Body elongate, parallel, dark orange to dark red; dorsal surface glabrous, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; with slight, sinuate to rounded supra-ocular ridge, eyes partially concealed from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate anteromedially. Anterior margin of clypeus broadly arcuate. Submentum shape similar to Fig. 48; narrowly separated from subgenal braces, without paired setose pits; anterior margin evenly arcuate, slightly inflexed, with large punctures, strongly produced anteroventrally over oral cavity, mentum concealed. Antennal groove well-developed, impunctate. Antenna sparsely setose, appearing glabrous except under high magnification, segments 3–8 with a single transverse row of short setae; setae on antennal club segments extremely sparse. Antennal club slightly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 68): Pronotum elongate, tapering to base widest near anterior $\frac{1}{4}$; dorsal surface evenly convex; anterior margin straight; anterior angles rounded but prominent; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles depressed, with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view, terminating anteriorly before the true anterior margin of the pronotum. Pronotal disc with medium, dense, shallow punctures. Pronotal median longitudinal canal well-developed, interrupted; anterior portion of canal a narrow slit, surrounding area slightly depressed; posterior portion of canal narrow, deeply impressed, impunctate internally, abruptly expanding at base, posterior

margin of canal appearing rounded, bordered on either side by a raised portion of the pronotal disk; posterolateral margin of the raised portion bears a distinct impression (Fig. 68). Hypomeron densely punctate, punctures shallow and larger than found on pronotal disc; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Prosternum depressed immediately anterior to procoxae. Tergosternal suture more or less straight. **Elytra** (Figs. 104–105): Elytron evenly convex; interstitial intervals 3, 5, 7, and 9 raised and shiny for entire length; intervals 3, 5, and 7 becoming very prominent, carinate near the apex; intervals 4 and 6 weakly raised at mid-length, interval 6 more prominent than 4. In some, interval 4 minutely raised, if at all. Crest of raised intervals with punctures bearing minute setae. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interval 5 merges with finger-like callosity on the elytral shoulder. **Legs:** Setation sparse; inner face of tibia with 2 prominent fringes of relatively short setae. Ventral apex of tibia with 2 pockets of dense setae that arise on either side of the large, curved tibial spur. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen:** Ventrite V simple. Punctures on ventrite V smaller and denser than ventrites I–IV. **Aedeagus:** Phallobase as in Fig. 151. Tegmen consisting of paired, subtriangular plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, distinctly separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with short subtriangular process; process thickest at base, narrowing apically, slightly shorter than half the length of the paramere, apex slightly swollen; processes moderately separated, parallel medially. Penis as in Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis bicolored, lighter for basal $\frac{1}{4}$.

Variation. The size and color are variable within the species. In some, the anterior angles of the pronotum are slightly more pronounced and the posterior portion of the pronotal median longitudinal canal may be slightly wider and less tapered. The degree of carination of elytral interstitial intervals 4, 6, and 7 is variable, with those intervals slightly more pronounced in some specimens.

Distribution. Australia: Australian Capital Territory, New South Wales, Northern Territory, Queensland, South Australia, and Victoria (Fig. 175).

Biology. One specimen was taken under the bark of *Eucalyptus* sp. [ANIC 246NL]. Two specimens were taken at a mercury vapor light [ANIC 17NL, ANIC 21NL]. Nine specimens were found near the pupa of *Paroplites australis* (Coleoptera: Cerambycidae) [SAMA 73–81NL].

Remarks. Neither Pascoe (1862) nor Macleay (1871) mentioned the number of specimens examined of *D. ignarus* and *D. pascoei*, respectively. In order to stabilize these names, a lectotype is **here designated** from the syntype series of *Deretaphrus ignarus* Pascoe and a lectotype and two paralectotypes are **here designated** from the syntype series of *Deretaphrus pascoei* Macleay.

Type Locality. *Deretaphrus ignarus*: Sydney, New South Wales; *Deretaphrus pascoei*: Gayndah, Queensland.

Type Material Examined. *Deretaphrus ignarus*. LECTOTYPE (Figs. 210–211) (BMNH, card-mounted) label data: “Type [round label with orange border] // N.S.W. [in Pascoe’s hand on green oval label] // *Deretaphrus ignarus* Type Pasc [in Pascoe’s hand] // Pascoe Coll. 93–60” [BMNH 104NL, examined]. Sex not determined.

Deretaphrus pascoei. LECTOTYPE (Figs. 212–213) (ANIC, pinned) label data: “Gayndah // *Deretaphrus Pascoei*, MacL. Gayndah [in Macleay’s hand] // On permanent loan from MACLEAY MUSEUM University of Sydney // SYNTYPE [red label] //” [ANIC 2NL, examined]. Sex not determined. PARALECTOTYPE: (AMSA, card-mounted with one other paralectotype) label data: “[round orange label] // *Deretaphrus Pascoei* McL.W. Gayndah [in Macleay’s hand, label folded] // HOLOTYPE [red label] // K27386 [handwritten] // Australian Museum K 231598” [AMSA 3NL, examined]. Sex not determined. PARALECTOTYPE: (AMSA, card-mounted with one other paralectotype) label data: same as above [AMSA 4NL, examined]. Sex not determined. Unfortunately, the two paralectotypes from the AMSA (card-mounted together) are not conspecific, nor are they *D. pascoei*. The specimen on the left is *D. viduatus* and the specimen on the right is *D. puncticollis*. The specimens bear a determination label in Macleay’s hand that matches the type locality. Therefore, we assume these are part of Macleay’s syntypic series.

Additional Material Examined (120). AUSTRALIA: AUSTRALIAN CAPITAL TERRITORY (A.C.T.): Canberra, 5 km. NE (UGCA 1NL). NEW SOUTH WALES: 1260 Rd. Bagawa State Forest (ANIC 114NL); Armidale (ANIC 117–118NL, ANIC 137NL); Bangaroo (ANIC 309NL); Bogan River (ANIC 177–183NL); Cambridge Plateau, Richmond Range State Forest, WNW of Casino (ANIC 21NL); Forest Reefs (SAMA 35–36NL, SAMA 54NL); Greta (ANIC

294NL); Hornsby (AMSA 36NL); Illawarra (AMSA 34–35NL, ANIC 40NL, BMNH 17NL); Katoomba (ANIC 185NL); Monaro (AMSA 47NL); Narrabri (ANIC 290NL); Nimbin Rocks, near Nimbin (ANIC 113NL); Pyrocarpa Reserve, Doubleduke State Forest, WSW of New Italy (ANIC 17NL); Ryde (ANIC 108NL); Sydney (ANIC 33NL, SAMA 53NL, SAMA 209–210NL, SAMA 228NL); North Sydney (BMNH 18NL); Tamworth (AMSA 66NL); Taralga (BMNH 15NL); Wagga Wagga (MAMU 20–21NL); no locality (MAMU 18NL, MAMU 28NL, SAMA 92NL, USNM 62NL). NORTHERN TERRITORY: Roper River (SAMA 204–205NL); no locality: SAMA 194NL). QUEENSLAND: Brisbane (UQIC 22NL); Foleyvale Aboriginal Reserve (HNHM 8NL); Gayndah (SAMA 55NL, UQIC 19NL); Millmerran (AMSA 43NL); Stanthorpe (QMBA 20NL, QMBA 26–30NL); Stanwell (UQIC 46NL); Tambourine Mountain (ANIC 158NL); Warwick (ANIC 291NL); no locality (ANIC 3NL). SOUTH AUSTRALIA: Lucindale (ANIC 37NL, SAMA 46NL, SAMA 64NL, SAMA 73–81NL); no locality (ANIC 34NL, MAMU 38NL, SAMA 93NL). VICTORIA: Birchip (MVMA 46–47NL, SAMA 89–90NL); Broadford (BPBM 21NL); Fern Tree Gully (UQIC 36NL); Healesville, Coranderrk Reserve (ANIC 246NL); Melbourne (BMNH 14NL, OUMNH 1NL); Moe (ANIC 99NL); Mount Rosea, the Grampians (SAMA 212NL); no locality (ANIC 85NL, BMNH 12–13NL, MAMU 22NL, MAMU 37NL, MNHUB 14–17NL, MNHUB 57NL). STATE UNKNOWN: Victorian Alps (SAMA 56–61NL, SAMA 65–66NL); no locality (BMNH 4NL, BMNH 11NL, FMNH 24NL, MCZ 25–28NL, MCZ 33NL, MNHUB 13NL, MNHUB 18NL, MVMA 48NL, MVMA 50–51NL, OUMNH 19NL, SAMA 233NL).

***Deretaphrus incultus* Carter and Zeck, 1937**

(Figs. 37, 69, 106–107, 152, 174, 214–215)

Deretaphrus incultus Carter and Zeck, 1937: 201. Heinze 1943: 119.

Diagnosis. This species can be readily distinguished from congeners by the pronotal disc lacking a median longitudinal depression or groove (represented at most by a weak depression at the base), the nearly glabrous antennae, elytral interstitial intervals 3, 5, and 7 being weakly carinate, not meeting near apex, and a distribution restricted to Western Australia. It most closely resembles *D. parviceps* but can be distinguished by the well-developed, laterally expanded, angulate supra-ocular ridges of head (eyes mostly concealed from dorsal view), the evenly arcuate, slightly protuberant eyes, and the raised elytral

interstitial intervals being straight and separate from one another for their entire length.

Redescription. Length 6.5–8.6 mm. Width 2–2.8 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, moderately shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head** (Fig. 37): In dorsal view, slightly narrowed anteriorly, subtriangular; with laterally expanded supra-ocular ridges; eyes partially concealed from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture not distinct, arcuate anteromedially, with a weak median impression. Clypeus distinctly narrower than head. Anterior margin of clypeus slightly arcuate medially. Submentum shape as in Fig. 52; triangular, fused to subgenal braces, without paired setose pits; anterior margin arcuate, strongly produced anteroventrally over oral cavity, mentum completely concealed. Antennal groove well-developed, punctate internally. Antenna minutely setose, appearing glabrous except under high magnification, segments 3–8 with a single transverse row of minute setae. Antennal club segments with minute setae. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 69): Pronotum quadrate, tapering to base and slightly flattened basally, widest near anterior margin; dorsal surface weakly convex, more strongly deflexed near anterior angles; anterior margin straight; anterior angles rounded but pronounced; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with medium sized, ovoid punctures, each bearing a minute seta. Pronotal median longitudinal depression absent. Hypomeron sparsely punctate, punctures large and shallow, each bearing a seta; lateral walls strongly deflexed. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture more or less straight. **Elytra** (Figs. 106–107): Elytron flat, not evenly convex; interstitial intervals 3, 5, 7, and 9 weakly raised, more pronounced near apex. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; callosity on elytral shoulder long and projecting dorsolaterally. **Legs:** Femur and tibia with short, sparse setae; inner face of tibia with small fringe of setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen:** Ventrite V simple in males, apex slightly depressed (appearing subtly truncate) in females. **Aedeagus:** Phallobase as in Fig. 152. Tegmen consisting of paired, slender transverse plates at

middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, widely separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with well-developed, transverse, curved process; process thickest at base, narrowing apically, shorter than half the length of the paramere, apex pointed; processes narrowly separated medially. Penis similar to Fig. 169; short, moderately thick, slightly curved; apex narrowed and pointed; base slightly expanded, bearing moderately long, paired anterior struts. Penis unicolored.

Variation. The color and size are variable within the species. In one specimen, a small area in the center of the pronotal disc is impunctate.

Distribution. Australia: South Australia and Western Australia (Fig. 174).

Biology. One specimen was taken at a light [SAMA 231NL], and one specimen was taken under the bark of *Eucalyptus* sp. [WAMP 66NL].

Remarks. Carter and Zeck (1937) mentioned “four examples” from Coolgardie and Beverley (in the collections of du Boulay and H.J. Carter) and Kellerberrin (in S. Australia Museum). Three specimens were located that matched these localities/collections. A fourth specimen from Kalgoorlie was located in the ANIC. Since the specimen labels were consistent with syntype material, and due to the close proximity of Kalgoorlie to Coolgardie, we also consider this part of the syntypic series. In order to stabilize this name, a lectotype and three paralectotypes are **here designated** from the syntype series of *D. incultus*.

Type Locality. Coolgardie, Kalgoorlie, Beverley, and Kellerberrin, Western Australia.

Type Material Examined. LECTOTYPE (Figs. 214–215) (AMSA, point-mounted above card) label data: “Coolgardie W.A [in Carter’s hand] // Holotype [red label] // *Deretaphrus incultus* C & Z. [in Carter’s hand] Det. H.J. Carter // HOLOTYPE [red label] // Australian Museum K231597” [AMSA 2NL, examined]. Sex not determined. PARALECTOTYPE (ANIC, card-mounted) label data: “Kalgoorlie W.A. H.J.C. [in Carter’s hand] // Lea [red label] // PARATYPE [blue label] // *Deretaphrus incultus* Cart [in Carter’s hand] // PARATYPE [blue label]” [ANIC 1NL, examined]. Sex not determined. PARALECTOTYPE (SAMA, card-mounted) label data: “Kellerberrin WA [handwritten] // Paratype [blue label] // *Deretaphrus incultus* Cart. [in Carter’s hand] // S. Aust. Museum specimen [orange label]” [SAMA 273NL, examined]. Sex not determined. PARALECTOTYPE (BMNH) label data: “Beverley, W.A. F. H. du Boulay // PARATYPE [blue label] // *Deretaphrus*

incultus Cart [in Carter's hand] // 1936 389 [hand-written]" [BMNH 87NL].

Additional Material Examined (5).

AUSTRALIA: SOUTH AUSTRALIA: Kimba (SAMA 231NL). WESTERN AUSTRALIA: Hamel (UQIC 30NL); Mundrabilla (WAMP 66NL); Norseman, 15 mi. NW by W (ANIC 216NL); Officer Basin, NE of Streich Mount, Great Victorian Desert (WAMP 56NL).

***Deretaphrus interruptus* Grouvelle, 1903**

(Figs. 42, 45, 47, 49, 70, 108–109, 153, 180, 216–217)

Deretaphrus interruptus Grouvelle, 1903: 184. Fauvel 1903: 341; Heinze 1943: 119.

Diagnosis. This species can be readily distinguished from congeners by the New Caledonian distribution, the shape of the submentum, and the posterior portion of the pronotal median longitudinal canal tapering posteriorly. It most closely resembles *D. hoplites* and can be distinguished by the characters given in the diagnosis for that species.

Redescription. Length 6.0–11.9 mm. Width 2.5–3.3 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, moderately shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture not distinct, arcuate anteromedially. Anterior margin of clypeus slightly arcuate medially. Clypeus with a row of long erect setae. Submentum shape as in Fig. 49; narrowly separated from subgenal braces, with paired setose pits; anterior margin sinuate, strongly produced anteroventrally over oral cavity, mentum completely concealed. Antennal groove well-developed, impunctate. Antenna moderately setose; segments 2–4 with a single transverse row of short setae; segments 5–11 with long, golden setae that extend beyond distal margin of antennal segment from which they arise. Antennal club segments 9–10 with 2 transverse rows of setae, penultimate segment with a single transverse row of setae arising near the distal margin of the segment. Antennal club subsymmetrical. Dorsal surface (external face) of mandible with median setose groove. **Thorax** (Fig. 70): Pronotum elongate, widest near anterior ¼; dorsal surface flattened along longitudinal midline, convex laterally; anterior margin slightly sinuate, slightly wider than head; anterior angles rounded; base narrower than elytral bases; posterior margin slightly sinuate; posterior angles with small denticle; lateral margin with

incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with small, relatively dense punctures. Pronotal median longitudinal canal well-developed, interrupted to form a small, anterior fovea and a posterior canal; raised interruption of the canal impunctate; anterior fovea ovoid, deepest posteriorly; posterior canal wide, deeply impressed, smooth; internal lateral margins not grooved; posterior canal rounded and closed anteriorly, open posteriorly. Hypomeron with large, shallow, dense punctures in middle, margins smooth; strongly deflexed medially. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture more or less straight. **Elytra** (Figs. 108–109): Elytron convex; punctures of elytral puncture rows 2, 3, and 4 abruptly increasing in size towards the apex; interstitial intervals 3 and 5 feebly raised, more pronounced near apex; intervals 7 and 9 raised for entire length, interval 7 more prominent. Raised intervals with micropunctures at crest. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interval 5 merges with finger-like callosity on the elytral shoulder. **Legs:** Base of femur and trochanter with long, sparse setae; inner face of tibia with fringe of long, dense setae. Tarsus densely setose with long setae that extend beyond the segment from which they arise. **Abdomen:** Ventricle V simple. **Aedeagus:** Phallobase as in Fig. 153. Tegmen consisting of paired, subtriangular plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, narrowly separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with short subtriangular process; process thickest at base, narrowing apically, about as long as 1/3 the length of the paramere, apex slightly swollen; processes narrowly separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis bicolored, lighter in basal 1/3.

Variation. Other than the expected variation in size, the sculpture of this species varies little. More material may reveal additional variation.

Distribution. New Caledonia (Fig. 180).

Biology. Eleven specimens were collected in association with the larvae of *Agrianome fairmairei* (Coleoptera: Cerambycidae) under the bark of dead *Aleurites moluccana* (Euphorbiaceae).

Remarks. Grouvelle (1903) did not mention the number of specimens examined. In order to stabilize this name, a lectotype and two paralectotypes are **here designated** from the syntype series of *D. interruptus*.

Type Locality. Kanala and Ourail, New Caledonia.

Type Material Examined. LECTOTYPE (Figs. 216–217) (MNHUB, card-mounted) label data: “Coll. R.I.Sc.N.B. [underline] Nouvelle Calédonie Ourail [“Ourail” is a label in Grouvelle’s hand glued onto larger label] rec Lécard [handwritten] ex. coll. Fauvel [pink label] // Coll. A. Fauvel *Deretaphrus interruptus* Grouv. [“*Deretaphrus interruptus* Grouv. is a label in Grouvelle’s hand glued onto larger label] // LECTOTYPE *Deretaphrus interruptus* Gr S.A. Ślipiński 1989 [red border]” [ISNB 1NL, examined]. Sex not determined. PARALECTOTYPE (MNHUB, card-mounted) label data: “Coll. R.I.Sc.N.B. [underline] Nouvelle Calédonie Kanala [“Kanala” is in Grouvelle’s hand glued onto larger label] rec Bougier [handwritten] ex. coll. Fauvel [pink label] // Coll. A. Fauvel *Deretaphrus interruptus* Grouv. [handwritten] R.I. Sc.N.B. 17.673 // PARALECTOTYPE *Deretaphrus interruptus* Gr S.A. Ślipiński 1989 [red border]” [ISNB 2NL, examined]. Sex not determined. PARALECTOTYPE (MNH, card-mounted) label data: “N^{le} Caledon [in Grouvelle’s hand on red label] // Type // *interruptus* 5. Grouv [in Grouvelle’s hand] // PARALECTOTYPE [red label] // *Deretaphrus interruptus* Gr [handwritten] det. S.A. Slipinski ‘89” [MNH 2NL, examined].

Additional Material Examined (14). N E W CALEDONIA: PROVINCE SOUTH: La Foa (ANIC 302NL, FSCA 23–25NL); Mount Ouenarou (ANIC 301NL); Pocquereux (SRFP 1–8NL); Sarramea (AAIC 4NL).

Deretaphrus iridescens Blackburn, 1903,
new status

(Figs. 71, 110–111, 154, 177, 218–219)

Deretaphrus iridescens Blackburn, 1903: 126.
Carter and Zeck 1937: 200–201.

Diagnosis. This species can be readily distinguished from congeners by the strongly flattened dorsal surface of the pronotal disc, the disc with a weakly interrupted, shallow median longitudinal canal, the nearly smooth elytral interstitial intervals, a simple abdominal ventrite V, and the shape of the submentum. This species is most similar to *D. piceus* and *D. gracilis*. *Deretaphrus iridescens* can be distinguished from *D. piceus* by the simple abdominal ventrite V, the larger and denser punctures on the pronotal disc, the less foveate anterior portion of the pronotal median longitudinal canal, and the less dense setation of the antennal club. It can be distinguished from *D. gracilis* by the more weakly developed anterior and posterior portions of the median longitudinal canal, the pronotum being more or less flat medially and less distinctly

deflexed laterally, and a distribution restricted to eastern Australia.

Redescription. Length 6.3–9.1 mm. Width 1.5–2.5 mm. Body elongate, parallel, dark brown to black; dorsal surface glabrous, matte to weakly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture not distinct, arcuate anteromedially. Anterior margin of clypeus broadly arcuate. Submentum shape as in Fig. 51; distinctly separated from subgenal braces, with paired setose pits; anterior margin moderately expanded anteroventrally over oral cavity; a portion of the mentum visible. Antennal groove well-developed, impunctate. Antenna densely setose; segment 1 with few setae on ventral surface; segments 2–4 with short setae; segments 5–11 with long, golden setae that extend beyond distal margin of antennal segment from which they arise. Antennal club segments with multiple transverse rows of setae. Antennal club subsymmetrical. Dorsal surface (external face) of mandible with median setose groove. **Thorax** (Fig. 71): Pronotum elongate, pronotum widest near anterior ¼; dorsal surface flattened; anterior margin arcuate, slightly wider than head; anterior angles rounded; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with small, sparse punctures. Pronotal median longitudinal canal present, weakly developed, interrupted anteriorly; anterior portion a weak slit, surrounding area slightly depressed; raised interruption of the canal impunctate; posterior canal narrow, weakly impressed, gradually tapering posteriorly, open at the base, internal lateral margins of canal grooved. Hypomeron minutely punctate; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture slightly sinuate. **Elytra** (Figs. 110–111): Elytron flattened dorsally; interstitial intervals 3, 5, and 7 feebly raised near apex; interval 5 meets or nearly meets interval 9 near apex. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; finger-like callosity on the elytral shoulder weakly developed. **Legs:** Setation sparse; inner face of tibia with fringe of long, dense setae. Tarsus densely setose with long setae that extend beyond the segment from which they arise. **Abdomen:** Ventrite V simple. **Aedeagus:** Phallobase as in Fig. 154. Tegmen consisting of paired, elongate, anteriorly-projecting subtriangular plates at middle; plates narrowly touching medially. Basal piece with long

anterolateral struts; struts recurved anteriorly. Parameres rounded, broadly fused to one another near base, collectively slightly transverse and articulated to phallobase; each paramere with a single elongate-oval patch, extending from near base to apex, apical portion slightly narrowed, patch lighter in color than remainder of paramere; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere lacking process; Penis similar to Fig. 167; elongate, slender, variously curved; apex narrowed and pointed; base slightly expanded, bearing long, slender, paired anterior struts. Penis slightly lighter in color near base.

Variation. The size and coloration are variable within the species. In some, the anterior portion of the pronotal median longitudinal depression is more well-developed. In a few specimens, the posterior portion of the pronotal median longitudinal depression is slightly more impressed, in others the canal gradually narrows towards the base.

Distribution. Australia: New South Wales, South Australia, and Victoria (Fig. 177).

Biology. Not known.

Taxonomic Notes. *D. iridescens* Blackburn was synonymized under *D. gracilis* Blackburn by Carter and Zeck (1937). After examination of material and type specimens, it is clear that *D. iridescens* is a distinct species and is thus here **removed from synonymy**.

Remarks. Blackburn (1903) did not mention the number of specimens examined. A specimen from Blackburn's collection in the BMNH bears handwriting on the card-mount and labels consistent with Blackburn syntypes, although it lacked locality information. We assume this specimen is a syntype. In order to stabilize this name, a lectotype is **here designated** from the syntype series of *D. iridescens*.

Type Locality. Adelaide District, South Australia.

Type Material Examined. LECTOTYPE (Figs. 218–219) (♀, BMNH, point-mounted) label data: "T. 7201 [in Blackburn's hand at base of card-mount; "T." is written in black ink, "7201" is written in red ink, is written in red ink with a black strikethrough] // Type H.T." [round label with orange border] // Australia. [red underline] Blackburn Coll. B.M.1910-236. // *Deretaphrus iridescens*, Blackb [in Blackburn's hand"]. [BMNH 101NL, examined]. This type was removed from the original card-mount and point-mounted. The original card-mount, abdomen (glued to a card, bearing a ♀ symbol), and genitalia (in glycerin in genitalia vial) are pinned beneath the specimen.

Additional Material Examined (30). AUSTRALIA: NEW SOUTH WALES: Baan Baa (BMNH 31NL); Bogan River (ANIC 29NL, ANIC 74NL, ANIC 184NL, ANIC 186–187NL, ANIC

191NL, ANIC 194NL, ANIC 285NL, ANIC 289NL); Caldwell (MVMA 61NL); Dubbo (ANIC 190NL, ANIC 192NL); Mullaley (ANIC 188NL); Wagga Wagga (BPBM 16–19NL, MAMU 44NL); no locality (MAMU 30NL). SOUTH AUSTRALIA: Lucindale (SAMA 8–9NL); Wirrabara (SAMA 237NL). VICTORIA: Black Rock (MVMA 62NL); Mildura (MVMA 90NL); Sea Lake (MVMA 60NL). STATE UNKNOWN: no locality (AMSA 54NL, HNHM 7NL, MVMA 63NL, MVMA 91NL).

***Deretaphrus lateropunctatus* Lord and McHugh,
new species**

(Figs. 72, 112–113, 155, 179, 220–221)

Diagnosis. This species can be readily distinguished from congeners by the larger punctures along the dorsolateral margin of the pronotal disc (distinctly larger than on the remaining portion of the disc), the base of the pronotum with an oval depression and the disc with the median longitudinal canal consisting of a weakly impressed line not extending past the middle of the pronotum, the metaventrite bearing large punctures at the anterolateral corners, the elytra being nearly smooth and reddish in color. It most closely resembles *D. analis* in the nearly impunctate surface of the pronotal disc but is easily distinguished by the uninterrupted median longitudinal canal and the larger punctures at the lateral margin.

Description. Length 7.6–11.5 mm. Width 2.1–3.3 mm. Body elongate, parallel, dark orange to dark red; dorsal surface glabrous, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; with laterally expanded supra-ocular ridges; eyes partially concealed from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate anteromedially. Anterior margin of clypeus incised medially. Submentum shape similar to Fig. 53; narrowly separated from subgenal braces, with large punctures, without paired setose pits; anterior margin sinuate, inflexed anteromedially, strongly produced anteroventrally over oral cavity; mentum concealed. Antennal groove well-developed, impunctate. Antenna moderately to densely setose, segments 3–8 with a single transverse row of medium-length setae, setae slightly longer than half the length of the segment from which they arise; antennal club segments with two transverse rows of moderately long setae. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 72): Pronotum

quadrate, tapering slightly towards base, widest near anterior $\frac{1}{4}$, distinctly wider than head; dorsal surface evenly convex; anterior margin straight; anterior angles rounded; base slightly narrower than elytral bases; posterior margin weakly sinuate; posterior angles depressed, with small denticle at posterolateral corner; lateral margin with incomplete carina, forming a distinct raised border in dorsal view, terminating anteriorly before the true anterior margin of the pronotum. Pronotal disc with minute, dense punctures. Pronotal disc with large punctures along dorsolateral margin. Pronotal median longitudinal canal present, weakly developed, not interrupted; canal terminating anteriorly at midline, widening into a large, oval depression posteriorly; pronotal disc with two prominent round depressions on either side of posterior portion of median canal. Hypomerone sparsely punctate, punctures much larger than those found on pronotal disc; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Prosternum depressed immediately anterior to procoxae. Tergosternal suture more or less straight. Metaventricle with small punctures, punctures significantly larger at anterolateral corners. **Elytra** (Figs. 112–113): Elytron evenly convex; interstitial intervals smooth; intervals 3, 5, and 7 minutely raised near apex. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interval 5 narrowly merges with finger-like callosity on the elytral shoulder; callosity large and globular. **Legs**: Setation sparse; inner face of tibia with 2 prominent fringes of relatively long setae. Tibial crown moderately setose. Ventral apex of tibia with 2 pockets of dense setae that arise on either side of the large, curved tibial spur. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen**: Ventrite V simple. Punctures on ventrite V smaller and denser than ventrites I–IV. **Aedeagus**: Phallobase as in Fig. 155. Tegmen consisting of small, paired plates anteromedially; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, distinctly separated and individually articulated to phallobase, internal lateral margins sinuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with large subtriangular process; process thickest at base, narrowing apically, about as long as half the length of the paramere, apex slightly swollen; processes narrowly separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis bicolored, lighter in basal $\frac{1}{3}$.

Variation. The size is variable within the species. The color ranges from orange to dark red. The depth of the prominent round depressions at the posterior margin of the pronotum on either side of the pronotal median longitudinal groove varies, as well as the depth of the groove itself. In some, the larger lateral punctures of the pronotal disc are much more apparent.

Distribution. Australia: New South Wales and Queensland (Fig. 179).

Biology. Not known.

Etymology. The epithet *lateropunctatus* (Latin) refers to the enlarged punctures located along the lateral margin of the pronotal disc.

Remarks. A holotype is **here designated** and deposited in the BMNH. Nine paratypes are **here designated** and deposited in the ANIC, MVMA, QDPI, QMBA, and UQIC.

Type Locality. Dorrigo, New South Wales.

Type Material Examined. HOLOTYPE (Fig. 220–221) (BMNH, card-mounted) label data: “Dorrigo N.S. Wales // Deretaphrus analis Lea [in Carter’s hand] Det. H.J. Carter // 1936-389 [handwritten]” [BMNH 60NL]. Sex not determined. PARATYPE (QMBA, card-mounted) label data: “Rivertree, NSW 10.VIII.1924 [handwritten]” [QMBA 42NL, examined]. Sex not determined. PARATYPE (ANIC, card-mounted) label data: “Tamb Mt Q. Davidson [handwritten]” [ANIC 153NL, examined]. Sex not determined. PARATYPE (QMBA, card-mounted) label data: “Rivertree, NSW 10.viii.1924 [handwritten]” [QMBA 43NL, examined]. Sex not determined. PARATYPE (ANIC, pinned) label data: “Queensland // National Pk. Jan. 1928 Nicholson // D. analis HJC c.w. cotype [in Carter’s hand]” [ANIC 71NL, examined]. Sex not determined. PARATYPE (QDPI, pinned) label data: “Imbil 22.11.37 ARB [handwritten]” [QDPI 23NL, examined]. Sex not determined. PARATYPE (QDPI, pointed) label data: Liston N.S.W. 9.8.27 [handwritten] // Deretaphrus [in Lea’s hand] Id. by A.M. Lea” [QDPI 22NL, examined]. Male, genitalia dissected and in glycerine in vial beneath specimen. PARATYPE (UQIC, minuten-pinned) label data: National Pk. Queensland R. Illidge // UQIC Reg. #91707” [UQIC 27NL, examined]. Sex not determined. PARATYPE (UQIC, minuten-pinned) label data: “UQIC Reg. #91696 // Wrattens Camp, via Widgee, S.E. Qld. 28.iii.1975 G.B. Monteith” [UQIC 15NL, examined]. Sex not determined. PARATYPE (MVMA, pinned) label data: “Dorrigo [handwritten] // H.J. Carter Coll. P. 20.4.22 // D. analis Lea [in Carter’s hand] Det. H.J. Carter // D. analis [handwritten] // COL-69143” [MVMA 112NL, examined]. Sex not determined.

Additional Material Examined (3). AUSTRALIA: NEW SOUTH WALES: Byron Bay (BPBM 8NL); Blue Mountains, Dorrigo

(MAMU 40NL). QUEENSLAND: Lamington National Park (UQIC 35NL).

Deretaphrus ocellaris Lord and McHugh,
new species

(Figs. 40–41, 73, 114–115, 156, 177, 222–223)

Diagnosis. This species can be readily distinguished from congeners by the distinctly reniform eyes, excavated posteriorly by a large, subtriangular cuticular expansion of the head capsule. It most closely resembles *D. wollastoni* and *D. xanthorrhoeae* but is easily distinguished by the structure of the eye.

Description. Length 7.2–8.5 mm. Width 2.3–2.8 mm. Body elongate, parallel, dark red; dorsal surface glabrous, moderately shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head** (Figs. 40–41): In dorsal view, slightly narrowed anteriorly, subtriangular; with sinuate, laterally expanded supra-ocular ridges; eyes partially concealed from above. Eye reniform, excavated posteriorly by a large, subtriangular cuticular expansion of the head capsule; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate anteromedially. Clypeus distinctly narrower than head, anterior margin nearly straight. Submentum shape similar to Fig. 52; meeting subgenal braces, with large punctures, without paired setose pits; anterior margin arcuate, inflexed anteromedially, strongly produced anteroventrally over oral cavity, mentum concealed. Antennal groove well-developed, impunctate. Antenna appearing glabrous except under high magnification, segments 3–8 with a single transverse row of minute setae. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 73): Pronotum elongate, tapering only slightly towards base, widest near anterior $\frac{1}{4}$; dorsal surface evenly convex; anterior margin arcuate, wider than head; anterior angles rounded; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view, terminating anteriorly before the true anterior margin of the pronotum. Pronotal disc with medium, shallow, oval punctures. Pronotal median longitudinal canal present, weakly developed, not interrupted; canal terminating anteriorly near anterior $\frac{1}{3}$, very narrow, weakly impressed, widening into a depression posteriorly. Hypomeron sparsely punctate, punctures larger than those found on pronotal disc; lateral walls strongly deflexed. Prosternum flat medially, strongly deflexed at lat-

eral margin. Prosternum depressed immediately anterior to procoxae. Tergosternal suture more or less straight. **Elytra** (Figs. 114–115): Elytron evenly convex; interstitial intervals 5 and 7 weakly raised for entire length, more pronounced near apex; interval 9 merges with apical elytral margin; interval 3 raised near apex. Raised intervals with micropunctures at crest. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interval 5 joining finger-like callosity on the elytral shoulder; callosity distinctly forked. **Legs:** Setation sparse; inner face of tibia with 2 prominent fringes of relatively long setae. Tibial crown moderately setose. Ventral apex of tibia with 2 pockets of dense setae that arise on either side of the large, curved tibial spur. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen:** Ventrite V simple. Punctures on ventrite V smaller and denser than ventrites I–IV. **Aedeagus:** Phallobase as in Fig. 156. Tegmen consisting of paired, subtriangular plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, somewhat elongate, rounded at apices, distinctly separated and individually articulated to phallobase, internal lateral margins approaching straight; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with short subtriangular process; process thickest at base, narrowing apically, about as long as $\frac{1}{3}$ the length of the paramere, apex slightly swollen; processes moderately separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis bicolored, lighter for short portion near base.

Variation. Other than the expected variation in size, this species varies little. In one specimen [SAMA 188NL], the pronotal median longitudinal groove appears to be weakly interrupted near the apex.

Distribution. Known only from South Australia (Fig. 177).

Biology. One specimen was collected on a sand dune in “open low Mallee.”

Etymology. The epithet *ocellaris* (Latin) refers to the reniform shape of the eyes, excavated posteriorly by a large, subtriangular cuticular expansion of the head capsule.

Remarks. A holotype and three paratypes are here designated and are deposited in SAMA.

Type Locality. 33°02'93"S, 135°49'63"E, Pinkawillinie Conservation Park, 16 km NNW of Koongawa, South Australia.

Type Material Examined. HOLOTYPE (Figs. 222–223) (SAMA, pinned) label data:

S. AUST. Pinkawillinie CP 16km NNW Koongawa 33°02'93" S 135°49'63"E 24 Nov. 1995 J.A. Forrest // S. Aust. Museum specimen [orange label]" [SAMA 171NL]. Sex not determined. PARATYPE (♂, SAMA, pinned) label data: "S. AUST. Danggali CP 3km N Tomahawk Dam pitfalls 33°19'39"S 140°42'50"E 24–26 Nov. 96 JA Forrest // S. Aust. Museum specimen [orange label]" [SAMA 172NL, examined]. The abdomen of this specimen was dissected [glued to a card, bearing a handwritten "P.T." and "♀" symbol]. The abdomen and the genitalia [in glycerin in a genitalia vial] are pinned beneath the specimen. PARATYPE (SAMA, minuten-pinned to foam block) label data: "S.AUST. dead on Sinclair Gap salt lake 7 Sept. 1996 33.1250°S 137.0522°E P. Hudson // S. Aust. Museum specimen [orange label]" [SAMA 173NL, examined]. Sex not determined. PARATYPE (SAMA, minuten-pinned into foam block) label data: "S. AUST Munnyaroo CP, 9.5km SSW Murninnie 33°23'38"S 137°20'33"E 23–30 September 2002 beat MUN002 SEG Munnyaroo Survey // Low sand dune, open low Mallee // S. Aust. Museum specimen [orange label]" [SAMA 188NL, examined]. Sex not determined.

***Deretaphrus oregonensis* Horn, 1873**

(Figs. 50, 74, 116–117, 157, 170, 182, 224–225)

Deretaphrus oregonensis Horn, 1873: 146. Horn 1878: 579–581; Burke 1919: 123–124; Craighead 1920: 6–9, 13, pl. 2; Essig 1926: 398–399, 450, 514; Böving and Craighead 1931: 40, 174, pl. 44; Balduf 1935: 166; Clausen 1940: 572; Heinze 1943: 119; Craighead 1950: 208; Hatch 1961: 241, 247, 460, pl. 51; Furniss and Carolin 1977: 285; Stephan 1989: 11–13; Lawrence 1991: 478; Philipps and Ivie 2002: 358–361.

Diagnosis. This species can be readily distinguished from congeners by the distribution being restricted to the western United States, the rugose punctation of the pronotal disc, the shape of the submentum, and the unique aedeagus. It most closely resembles *D. boliviensis* but is easily distinguished by the deeper elytral punctures, the punctures on pronotal disc varying in size, the posterior portion of the median longitudinal canal not being variously narrowed and expanded, and the distribution.

Redescription. Length 6.4–12.9 mm. Width 1.8–3.6 mm. Body elongate, parallel, dark brown to black; dorsal surface glabrous, rugose, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small

and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate with a weak median impression. Anterior margin of clypeus nearly straight. Submentum shape as in Fig. 50; distinctly separated from subgenal braces, without paired setose pits; anterior margin slightly emarginated medially, anterolateral angles pointed; submentum moderately expanded anteroventrally over oral cavity; a portion of the mentum visible. Antennal groove well-developed, impunctate. Antenna sparsely setose; segments 6–8 with a single transverse row of moderately long setae, setae nearly as long as segment from which they arise. Antennal club segments with a single transverse row of setae, arising near apex of each segment. Antennal club slightly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible with median setose groove. **Thorax** (Fig. 74): Pronotum elongate, widest near anterior ¼; dorsal surface evenly convex; anterior margin straight, slightly wider than head; anterior angles not developed; base narrower than elytral bases; posterior margin slightly sinuate; posterior angles with minute denticle, if any; lateral margin with incomplete carina, forming a distinct raised border in dorsal view; in lateral view, carina is slightly curved near base, extends anterodorsally and ends only slightly past midline. Pronotal disc with well-pronounced, deep punctures of varying sizes. Pronotal median longitudinal canal well-developed, interrupted to form a deep, anterior fovea and a posterior canal; raised interruption of the canal impunctate; anterior fovea oval, punctured heavily internally; posterior canal narrow, deeply impressed, internal lateral margins grooved, gradually narrowed to an open point at the base. Hypomeron strongly punctate with shallow punctures, larger than found on pronotal disc; lateral walls nearly vertical. Prosternum evenly convex. Tergosternal suture more or less straight. **Elytra** (Figs. 116–117): Elytron convex; interstitial intervals 3, 5, 7, and 9 carinate; intervals 3 and 5 carinate for entire length, merging to a point near elytral apex; intervals 7 and 9 weaker at base, more pronounced near apex; intervals 3, 5, 7, and 9 with micropunctures at crest. Apical elytral margin with small, dense punctures. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interval 5 merges with finger-like callosity on the elytral shoulder. **Legs:** Base of femur and trochanter without long, sparse setae; inner face of tibia with fringe of sparse setae. Tarsus densely setose with long setae that extend beyond the segment from which they arise. **Abdomen:** Ventrite V with a slightly raised, thickened margin. **Aedeagus:** Phallobase as in Fig. 157. Tegmen reduced,

membranous. Basal piece produced anteriorly, narrowed and pointed. Parameres very long and narrow, rounded at apices, distinctly separated and individually articulated to phallobase, internal lateral margins approaching straight; paramere densely setose with long, thick setae at apical and apicolateral margin; dorsal surface of paramere with elongate process; process narrowing apically, as long as 2/3 the length of the paramere; processes moderately separated, diverging medially. Penis as in Fig. 170; short, moderately thick, slightly curved; apex narrowed and pointed; base slightly expanded, bearing very short, transverse, paired anterior struts. Penis unicolored.

Variation. The size and coloration is variable within the species. The degree of carination of the elytral interstitial intervals ranges from strongly raised to carinate. The sculpturing of the pronotal disc is also slightly variable, the punctures are variously sized and the lateral margins of the posterior portion of the pronotal median longitudinal canal range from slightly narrowed to subparallel.

Distribution. Western United States: WA, OR, CA, ID, NV, UT, MT; Canada: BC (Fig. 182).

Biology. *Deretaphrus oregonensis* has been collected from under the bark of ponderosa pine, Jeffrey pine, sugar pine, lodgepole pine, Douglas fir, red fir, white fir, western larch, and canyon oak. It has been associated with the following beetles, as a presumed ectoparasite: Curculionidae: *Dendroctonus jeffreyi*, *Dendroctonus monticolae*, Buprestidae: *Buprestis laeviventris*, *Buprestis aurulenta*, *Trachykele opulenta*, *Trachykele nimboza*, and Cerambycidae: *Asemum atrum*.

Remarks. Horn (1873) did not mention the number of specimens he examined. In order to stabilize this name, a lectotype and seven paralectotypes are **here designated** from the syntype series of *D. oregonensis* in the Horn and LeConte collections (MCZ).

Type Locality. Oregon and California.

Type Material Examined. LECTOTYPE (Figs. 224–225) (MCZ, Horn Collection, pinned) label data: “Or. // LectoTYPE 3198 [red label, “3198” handwritten] // Horn Coll 3281 [“3281” handwritten] // *Deretaphrus oregonensis* Horn [in Horn’s hand]” [MCZ 44NL, examined]. Sex not determined. PARALECTOTYPE (MCZ, Horn Collection, pinned) label data: “Or. // Para-Type 3198 [blue label, “3198” handwritten] // HornColl H3281 [“H3281” handwritten]” [MCZ 45NL, examined]. Sex not determined. PARALECTOTYPE (MCZ, Horn Collection, pinned) label data: “Or. // HornColl H3281 [“3281” handwritten]” [MCZ 46NL, examined]. Sex not determined. PARALECTOTYPE (MCZ, Horn Collection, pinned) label data: “Or. // HornColl H3281 [“3281”

handwritten]” [MCZ 47NL, examined]. Sex not determined. PARALECTOTYPE (MCZ, LeConte Collection) label data: “Or. // Type 8042 [red label, “8042” handwritten] // *Deretaphrus oregonensis* Horn [in Horn’s hand]// Aug.–Dec. 2004 MCZ Image Database” [MCZ 40NL, examined]. Sex not determined. PARALECTOTYPE (MCZ, LeConte Collection) label data: “Cal // 42. [handwritten]” [MCZ 41NL]. PARALECTOTYPE (MCZ, LeConte Collection) label data: “Or” [MCZ 42NL, examined]. Sex not determined. PARALECTOTYPE (MCZ, LeConte Collection) label data: “Or” [MCZ 43NL, examined]. Sex not determined.

Additional Material Examined (500).

CANADA: BRITISH COLUMBIA: Princeton (INHS 2–3NL, MCZ 7NL); Creston (CASC 52NL, CASC 54NL, CASC 56NL, CASC 63NL, CASC 87NL, FSCA 10NL); Salmon Arm (CASC 55NL); Vernon (UCRC 3NL); Victoria (CASC 115NL). **USA:** CALIFORNIA: Alameda County: Oakland (CASC 57NL); Alpine County: no locality (CASC 1–2NL, CASC 10–12NL, CASC 15NL, CASC 35NL); Calaveras County: Big Meadow (UCDC 5NL, UCRC 5NL); Black Springs Road (SBMNH 1NL); Camp Wolfboro (EMEC 40–42NL); Wolfboro (CASC 46NL); El Dorado County: Blodgett Forest, 13 mi. E of Georgetown (EMEC 66NL); Fallen Leaf Lake, 3 mi. N (EMEC 62NL); Fallen Leaf Lake, El Dorado National Forest (BYUC 3–5NL); Fallen Leaf Lake, Lake Tahoe (CASC 13NL, CASC 17NL); Meyers (USNM 6NL, USNM 29NL); Riverton (USNM 18–22NL, USNM 24–26NL, USNM 30–31NL); State line (TAMU 1NL); Tallac (CASC 3NL, CASC 5NL, CASC 9NL); Fresno County: Dalton Creek (CUIC 3NL); Florence Lake, 2 mi. N (SBMNH 2–3NL); Huckleberry Meadow (CASC 66NL, CASC 69NL, CASC 84NL, CASC 138NL); Kings Canyon (EMEC 23NL); Kings River, South Fork (CASC 20NL, CASC 135NL, CASC 137NL); Onion Valley (EMEC 31NL, USNM 2NL); Vade (EMEC 24NL); no locality (CASC 68NL, CASC 86NL); Inyo County: Bishop (CASC 36NL); Kern County: Cannel Meadow (CASC 74NL); Frazier Park (LACM 37–40NL); Glennville (UCDC 13NL); Horse Meadow, Cannel Meadows District, Sequoia (AMNH 17NL); Mill Potrero (LACM 20NL, UCDC 26NL, UCDC 32NL); Mount Pinos (CASC 14NL); no locality (EMEC 32NL); Lassen County: Blacks Mountain Experimental Forest (EMEC 58–59NL); Butte Creek (CASC 73NL); Crater Mountain, Lassen National Forest (CASC 77NL); Grassy Lake, Lassen National Forest (EMEC 25NL); Goumaz (USNM 43–45NL); Harvey Mountain (CDFA 3–4NL); Harvey Valley (CUIC 7NL, USNM 33NL); Hills Flat (UCDC 15NL); Norvell Flats (CASC 93–95NL, CASC 114NL, CASC 122NL); Pine Creek (CASC

43NL); no locality (CASC 60NL, CASC 92NL, CASC 96–113NL, CASC 121NL, USNM 46–47NL); Los Angeles County: Angeles Crest Highway (FSCA 20–21NL, TAMU 6–7NL); Angeles Crest Highway, Grassy Hollow (FSCA 13–16NL); Big Pines (CASC 119NL); Big Pines Recreation Area (LACM 36NL); Buckhorn Flats, San Gabriel Mountains (FSCA 18NL, LACM 43NL, UCDC 17–18NL); Crystal Lake (EMEC 5NL, UCDC 12NL, UCRC 4NL); Crystal Lake, San Gabriel Mountains (LACM 45NL); Cucamongacyn (MAIC 3NL); Kratka Ridge, San Gabriel Mountains (LACM 21NL, TAMU 3NL, UCDC 19NL, UCDC 31NL); Madera County: Bass Lake (FMNH 6NL); Cascadal (CASC 72NL); Chiquito Creek (CUIC 4–6NL); Miami Ranger Station (LACM 2NL); Placer Station (CASC 67NL); no locality (CASC 53NL); Mariposa County: Big Tree Grove (USNM 5NL); Carl Inn, Yosemite National Park (CASC 48–49NL); Fish Camp (EMEC 44NL); Giant Forest (USNM 3NL); Hazel Green (CASC 71NL, CASC 78NL); Summerdale (USNM 11NL, USNM 14NL, USNM 32NL, USNM 34–35NL, USNM 40NL); Yosemite Valley (CASC 140NL, USNM 4NL); no locality (USNM 9NL); Mendocino County: Ham Pass, 4 air miles NE El R. Ranger Station (EMEC 64NL); Howard Lake, Mendocino National Forest (EMEC 69NL); Modoc County: Cedar Pass (LACM 22–23NL); Hackamore (AMNH 18NL, AMNH 20NL, CASC 65NL, CASC 90NL, CASC 116NL, EMEC 4NL, EMEC 8–11NL, EMEC 18–22NL, EMEC 28NL, EMEC 39NL, EMEC 47NL, EMEC 54–55NL, LACM 1NL, UCDC 14NL); Lily Lake, Warner Mountains, 12 mi. NNW of Fort Bidwell (CASC 120NL); no locality (AMNH 21NL); Mono County: Mammoth (CASC 80NL, CASC 82NL); June Lake (FSCA 1NL, FSCA 8NL, LACM 24–35NL); Nevada County: Truckee (USNM 37–38NL); Placer County: Kings Beach (UCDC 24NL); Placerville (UCDC 35NL); Tahoe City (CASC 19NL, UCDC 16NL); Tahoe City, Angora Lake (CASC 76NL); Plumas County: Chester (USNM 17NL); Chester, 8 mi. NW (EMEC 61NL); Lassen National Forest (CASC 75NL); Portola (CASC 16NL, CASC 18NL); Quincy, 4 mi. W (FSCA 17NL; UCDC 36NL, USNM 58NL); no locality (FMNH 3NL, USNM 50NL, USNM 53–57NL); Riverside County: Dark Canyon, San Jacinto Mountains (LACM 9NL); Idyllwild (CASC 7NL, SBMNH 4NL, SDMC 1–2NL); Idyllwild, San Jacinto Mountains (EMEC 36NL, EMEC 50NL, UCDC 10–11NL); Marion Mountain Camp, San Jacinto Mountains (UCDC 21NL); Santa Rosa Mountains (CASC 131NL); San Bernardino County: Arrowbear [Lake], 2 mi. NE (EMEC 63NL); Baldwin Lake (KSUC 1NL); Barton Flats (CDFA 1–2NL); West of Barton Flats (SBMNH 8–9NL); Barton Flats, 15 mi. N of Redlands (FSCA 2–3NL); Barton Flat, San Bernardino National Forest (EMEC 56–57NL); Big Bear (EMEC 49NL); Big Bear Lake (FSCA 19NL); Big Bear Lake, 18 mi. W (AMNH 14NL); Big Pine Flat Campground (LACM 10NL); Camp Cedar Falls (SBMNH 5–6NL); Deep Creek, near Running Springs (LACM 47NL); Fallsvale (ANIC 4–10NL, LACM 3–8NL); Fawnskin Valley (UCDC 25NL); near Fawn Skin Valley (LACM 11–12NL, LACM 15–16NL); Forsee Trailhead (SBMNH 7NL); Hanna Flats (LACM 14NL); Herkey Creek, San Jacinto Mountains (EMEC 33NL, EMEC 45NL, EMEC 51NL, TAMU 5NL); Holcomb Creek (LACM 19NL); Mount Baldy (FSCA 12NL, LACM 41NL); Round Cienga (LACM 17–18NL, UCDC 27–30); San Antonio Falls (LACM 42NL); San Bernardino Mountains, 20 mi. NE Redlands (FSCA 4NL); Snow Valley (LACM 13NL); no locality (FSCA 22NL); San Diego County: 4 mi. N of Julian, near Volcan Mountain (EMEC 67NL); Shasta County: Big Spring (CASC 40–41NL); Burney, 10 mi. W (MAIC 6NL, UCDC 33–34NL); Burney Falls (TAMU 2NL); Castle Crag (CASC 4NL, CASC 139NL); Hat Creek (CASC 44NL, CASC 58–59NL, EMEC 13–17NL, EMEC 29–30NL, EMEC 38NL, EMEC 43NL, EMEC 46NL); Hat Creek Ranger Station (EMEC 27NL); Hat Creek, San Jacinto Mountains (EMEC 35NL); Manzanita Lake, Lassen National Park (EMEC 65NL, WSUC 2NL); Old Station (CDFA 5NL, EMEC 7NL, EMEC 37NL, EMEC 48NL, LACM 44NL, WSUC 3NL); Pot Spring, 2 mi. SW (EMEC 60NL); Siskiyou County: Ash Creek Ranger Station, 9 mi. E of McCloud (EMEC 65NL); McCloud (CASC 21–34NL); Elk Creek (CASC 136NL); no locality (CASC 117–118NL); Trinity County: Carrville (CASC 8NL, CASC 64NL); Tulare County: G. Grant National Park (USNM 49NL); Grey Meadow (CASC 81NL, CASC 83NL); Kaweah (CASC 64NL); Needlerock Rd. (SBMNH 10NL); Scaffold Meadow (CASC 79NL); Wells Mill (CASC 70NL); no locality (CDFA 9NL, USNM 52NL); Tuolumne County: Browns Meadow (EMEC 26NL, UCDC 22–23NL); Dardanelle (CASC 37NL); Dardanelle, 3 mi. E (EMEC 1–3NL); Leland Meadow (UCDC 6NL); Mather (TAMU 4NL); Pinecrest (CASC 89NL); Strawberry, 10 mi. E (UCDC 7–9NL); Strawberry, 16 mi. E (EMEC 52–53NL); no locality (CASC 132NL, CASC 134NL, FMNH 5NL); Ventura County: Mount Pinos (CASC 91NL, MAIC 7NL, UCDC 1–3NL); Ozena Grade (SBMNH 11NL); Yuba County: 6 mi. W of Yuba Pass (LACM 46NL); no locality (FMNH 4NL); County Unknown: Bray (EMEC 12 NL); Dark Valley (CASC 45NL); Lassen National Forest (CUIC 2NL); Norfolk (CASC 61–62NL); North Fork (CUIC 8NL); Sequoia National Park (UCDC 4NL, UCDC

20NL); Whitakers Forest, Sequoia National Park (EMEC 68NL); Yosemite National Park (CASC 50–51NL, EMEC 6NL); no locality (ANIC 305NL, CASC 142NL, INHS 5–6NL). IDAHO: Bannock County: Lava Hot Springs (BYUC 2NL); Idaho County: Stites (USNM 36NL); Kootenai County: Tubbs Hill, Burn, Cour d' Alene (FSCA 5–7NL). MONTANA: Flathead County: Columbia Falls (USNM 10NL, USNM 16NL); Hungry Horse Reservoir at Betty Creek (MAIC 4–5NL, MTEC 6–9NL); Missoula County: Missoula (BMNH 66–69NL); Ravalli County: Bitterroot River (MTEC 1–5NL). NEVADA: Washoe County: Reno (INHS 1NL, INHS 4NL, CASC 39NL, CASC 42NL). OREGON: Baker County: Dooley Mountain (AMNH 15NL); Sumpter (USNM 42NL); Crook County: Ochoco Ranger Station (AMNH 6NL, AMNH 11NL, FSCA 11NL); Grant County: Silvies Valley (AMNH 8NL, AMNH 13NL); no locality (CUIC 1NL); Jackson County: Ashland (CASC 47NL, USNM 27–28NL); Talent (USNM 12–13NL, USNM 15NL); Klamath County: Bly, 5 mi. NE (AMNH 3NL); Bly Mountain (AMNH 16NL); LaPine, 13 mi. S (USNM 51NL); Klamath Falls (AMNH 4NL, AMNH 7NL, AMNH 10NL); Round Lake (CDFA 7–8NL); Upper Klamath Lake (AMNH 1NL); Upper Klamath Lake, Dennie Creek (AMNH 9NL); Upper Klamath Marsh, Military Crossing (AMNH 2NL); Lake County: Quartz Mountain (AMNH 5NL); Umatilla County: Hidaway (USNM 7NL); Union County: Lagrande (BYUC 1NL); Unknown County: Red Hill Look Out, Wallowa National Forest (AMNH 12NL); Whitman National Forest (KSUC 2NL); no locality (AMNH 19NL, MCZ 9–12NL, USNM 1NL); UTAH: Summit County: Kamas (USNM 41NL). WASHINGTON: Asotin County: Fields Spring State Park (WSUC 1NL); Fields Spring State Park, 4 mi. S of Anatone (KSUC 3NL); King County: Seattle (USNM 8NL); Walla Walla County: Kooskooskie (CASC 88NL, FSCA 9NL); Whitman County: Palouse (MCZ 6NL, MCZ 8NL, MCZ 13–14NL, MCZ 16NL); Yakima County: Satus Creek Canyon, Toppenish (WSUC 4NL). STATE UNKNOWN: Barkhouse, Klamath River (CASC 85NL); June Lake (UCRC 1–2NL); Lloyd Meadow (CASC 6NL). NO LOCALITY (BMNH 61–65NL, CASC 38NL, CDFA 6NL, FMNH 2NL, MCZ 1–5NL, MCZ 15NL, MCZ 17NL, USNM 23NL, USNM 39NL, USNM 48NL).

***Deretaphrus parviceps* Lea, 1898**

(Figs. 38, 75, 118–119, 158, 171, 173, 226–227)

Deretaphrus parviceps Lea, 1898: 548. Blackburn 1903: 120; Carter and Zeck 1937: 200; Heinze 1943: 119.

Diagnosis. This species can be readily distinguished from congeners by the nearly glabrous

antennae, the extremely convex eyes (nearing angulate), the weak pronotal median longitudinal depression, elytral interstitial intervals 3, 5, and 7 being moderately carinate, the carina on intervals 3 and 5 merging near apex, and a distribution restricted to Western Australia. It most closely resembles *D. bucculentus*, *D. puncticollis*, and *D. incultus*. *Deretaphrus parviceps* can be distinguished from *D. bucculentus* by the elytral interstitial interval 5 curving inward, merging or narrowly merging with interstitial interval 3 near the apex and the head lacking laterally expanded supra-ocular ridges. It can be distinguished from *D. puncticollis* by the less densely and coarsely punctate pronotal disc and the median longitudinal depression being more strongly punctate near the base, not bordered on either side by a small keel or carina. It can be distinguished from *D. incultus* by the more weakly developed (but present) pronotal median longitudinal depression and elytral interstitial interval 5 curving inward and merging or narrowly merging with interstitial interval 3 near the apex.

Redescription. Length 8.5–9.3 mm. Width 2.5–2.7 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, moderately shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head** (Fig. 38): In dorsal view, narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes strongly protuberant (nearing angulate), visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture not distinct, arcuate anteromedially. Clypeus distinctly narrower than head. Anterior margin of clypeus slightly arcuate medially. Submentum shape as in Fig. 52; triangular, fused to subgenal braces, without paired setose pits; anterior margin arcuate, strongly produced anteroventrally over oral cavity, mentum completely concealed. Antennal groove well-developed, impunctate internally. Antenna sparsely setose, appearing glabrous except under high magnification. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 75): Pronotum quadrate, slightly tapering to base, widest near anterior margin; dorsal surface nearly flat, deflexed near anterior and posterior angles; anterior margin straight; anterior angles broadly rounded; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct, large raised border in dorsal view. Pronotal disc with large, deep, round to oval punctures. Pronotal median longitudinal depression present but very faint; punctures largest within depression, oval anteriorly, round posteriorly. Hypomeron

sparingly punctate, punctures large and shallow, each bearing a seta; lateral walls strongly deflexed. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture more or less straight. **Elytra** (Figs. 118–119): Elytron flat, not evenly convex; interstitial intervals 3, 5, 7, and 9 weakly raised, more pronounced near apex; interval 5 curves inward and merges with interval 3 near the apex. Crest of interstitial intervals with micropunctures bearing minute setae. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interval 5 merges with finger-like callosity on the elytral shoulder. **Legs**: Femur and tibia with short, sparse setae; inner face of tibia with small fringe of setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen**: Ventrite V simple. **Aedeagus**: Phallobase as in Fig. 158. Tegmen consisting of paired, transverse plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, somewhat elongate, rounded at apices, widely separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with short subtriangular process; process thickest at base, narrowing apically, about as long as 1/3 the length of the paramere, apex slightly swollen; processes widely separated. Penis as in Fig. 171; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis unicolorous.

Variation. The punctures in the center of the pronotal disc are sometimes less dense, and the puncture shape on the elytra varies from round to slightly irregular.

Distribution. Australia: Western Australia (Fig. 173).

Biology. Not known.

Remarks. Lea (1898) did not mention the number of specimens he examined. In order to stabilize this name, a lectotype is **here designated** from the only known type material of *D. parviceps*.

Type Locality. Swan River, Western Australia.

Type Material Examined. LECTOTYPE (Figs. 226–227) (♂, SAMA, point-mounted) label data: “parviceps Lea TYPE Swan R [in Lea’s hand] // 9560 *Deretaphrus parviceps* Lea W. Australia TYPE [handwritten in black ink, “TYPE” written in red ink on right side of label] // S. Aust. Museum specimen [orange label]” [SAMA 278NL, examined]. The abdomen of this specimen was dissected [glued to point-mount] and the genitalia is in glycerin in a genitalia vial pinned beneath the specimen.

Additional Material Examined. Known only from the lectotype and one other specimen. Label

data: “R.P. McMillan DATE 16.6.51 Culham // Western Australian Museum Entomology Reg. no. 65202” [WAMP 21NL]. This specimen was removed from the original card-mount and point-mounted. The original card-mount, abdomen (glued to a card, bearing a ♀ symbol), and genitalia (in glycerin in genitalia vial) are pinned beneath the specimen.

***Deretaphrus piceus* (Germar, 1848)**

(Figs. 43, 51, 76, 120–121, 133, 159, 176, 228–229)

Sigerpes piceus Germar, 1848: 223. Synonymized by Lacordaire 1854: 377–378.

Deretaphrus piceus: Pascoe 1862: 462–463. Masters 1871: 79; Lacordaire 1876: 8, pl. 20; Lea 1898: 550; Blackburn 1903: 121–123, 125, 129; Carter and Zeck 1937: 200–201.

Derataphrus piceus: Lacordaire 1876: 8; pl. 20 fig. 3. Misspelling, no status.

Deretaphrus bakewellii Pascoe, 1862: 463. Synonymized by Carter and Zeck 1937: 200.

Deretaphrus bakewelli: Masters 1871: 78; Lea 1898: 547, 550; Blackburn 1903: 123, 129; Carter and Zeck 1937: 200–201. Misspelling, no status.

Deretaphrus thoracicus Blackburn, 1903: 122. Synonymized by Carter and Zeck 1937: 200–201.

Diagnosis. This species can be readily distinguished from congeners by the sparsely punctate surface of the pronotal disc, the clearly interrupted pronotal median longitudinal canal, the (relatively) dense setation of the antennal club, the shape of the submentum, and abdominal ventrite V bearing two depressions on either side of the midline, resulting in a median V-shaped area near the posterior margin. It most closely resembles *D. analis*, from which it can be differentiated by the much more prominently punctate pronotal disc, the posterior portion of the pronotal median longitudinal canal being open and narrowed posteriorly, the more prominent elytral punctures, and the form of the aedeagus.

Redescription. Length 5.6–12.1. Width 1.6–2.9 mm. Body elongate, parallel, dark brown to black; dorsal surface glabrous, moderately shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head**: In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture not distinct, arcuate anteromedially. Anterior margin of clypeus broadly arcuate. Submentum shape as in Fig. 51; distinctly separated from subgenal braces, with paired setose pits; anterior margin moderately expanded anteroventrally over

oral cavity; a portion of the mentum visible. Antennal groove well-developed, impunctate. Antenna densely setose; segment 1 with few setae on ventral surface; segments 2–4 with short setae; segments 5–11 with long, golden setae that extend beyond distal margin of antennal segment from which they arise. Antennal club segments with multiple transverse rows of setae. Antennal club subsymmetrical. Dorsal surface (external face) of mandible with median setose groove. **Thorax** (Fig. 76): Pronotum elongate, widest near anterior $\frac{1}{4}$; dorsal surface flattened along longitudinal midline, convex laterally; anterior margin slightly arcuate, slightly wider than head; anterior angles rounded; base narrower than elytral bases; posterior margin slightly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with small, sparse punctures. Pronotal median longitudinal canal well-developed, interrupted to form a deep, anterior fovea and a posterior canal; raised interruption of the canal impunctate; anterior fovea narrows to a point anteriorly; posterior canal wide, deeply impressed, abruptly narrowed and open at the base, internal lateral margins of canal grooved. Hypomeron minutely punctate; strongly deflexed medially. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture slightly sinuate. **Elytra** (Figs. 120–121): Elytron convex; interstitial intervals 3, 5, 7, and 9 feebly raised, more pronounced near apex; interval 5 meets or nearly meets interval 9 near elytral apex; intervals 3, 5, and 7 with micropunctures at crest. Apical elytral margin with small, dense punctures. Basal elytral margin with intervals 3 and 5 ending in a knob-like protuberance; protuberance of interval 5 narrowly separated or slightly touching finger-like callosity on the elytral shoulder. **Legs**: Base of femur and trochanter with long, sparse setae; inner face of tibia with fringe of long, dense setae. Tarsus densely setose with long setae that extend beyond the segment from which they arise. **Abdomen**: Ventricle V more heavily punctured, bearing two depressions on either side of midline, resulting in a median V-shaped area near posterior margin (Fig. 133), present in both sexes. **Aedeagus**: Phallobase as in Fig. 159. Tegmen consisting of paired, elongate, anteriorly-projecting subtriangular plates at middle; plates narrowly touching medially. Basal piece with long antero-lateral struts; struts recurved anteriorly. Parameres broadly rounded, broadly fused to one another near base, collectively articulated to phallobase; each paramere with a pair of oblique, elongate-oval patches near base and a pair of subcircular patches near apex; patches lighter in color than remainder of paramere; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere

lacking process; Penis similar to Fig. 167; elongate, slender, variously curved; apex narrowed and pointed; base slightly expanded, bearing long, slender, paired anterior struts. Penis slightly lighter in color near base.

Variation. Size and color are variable within the species. The degree of carination of the raised interstitial intervals is variable, ranging from only slightly raised to distinctly raised. The lateral margins of the pronotum may be slightly to strongly narrowed. The base of the pronotal median longitudinal canal is generally narrowed posteriorly but may be more or less parallel-sided. The anterior portion of the pronotal canal ranges from narrowed anteriorly (in most specimens) to oval.

Distribution. Australia: Australian Capital Territory, New South Wales, Queensland, South Australia, Tasmania, and Victoria (Fig. 176).

Biology. One specimen was found in the galleries of *Phoracantha* (Coleoptera: Cerambycidae) in *Eucalyptus viminalis* [ANIC 65NL]. Several specimens were collected under bark [ANIC 253NL, SAMA 239NL]. Several specimens were taken at lights [ANIC 125NL, ANIC 133NL, ANIC 169NL]. One specimen was taken at a mercury vapor light in an open forest [QMBA 3NL].

Remarks. Neither Germar (1848), Pascoe (1862), nor Blackburn (1903) mentioned the number of specimens examined of *D. piceus*, *D. bakewellii*, and *D. thoracicus*, respectively. In order to stabilize these names, lectotypes are **here designated** for *Deretaphrus piceus* Germar, *Deretaphrus bakewellii* Pascoe, and *Deretaphrus thoracicus* Blackburn, and a paralectotype is **here designated** for *Deretaphrus piceus* Germar from the syntype series of those species. There is a specimen in MNHUB (MNHUB 21NL, examined) that is labeled as a syntype of *D. bakewellii*, however, we do not regard this specimen as a syntype, as the label data do not correspond with the lectotype in the BMNH.

Type Locality. *Deretaphrus piceus*: Adelaide, South Australia; *Deretaphrus bakewellii*: Melbourne, Victoria and Sydney, New South Wales; *Deretaphrus thoracicus*: Glenelg River District, Victoria.

Type Material Examined. *Deretaphrus piceus*. LECTOTYPE (Figs. 228–229) (MNHUB, pinned) label data: “43683 // Adelaide [handwritten on purple label] // *piceus* Germ. [handwritten on purple label, label folded] // Hist. –Coll. (Coleoptera) Nr. 43683 *Deretaphrus piceus* Germ. typ Adelaide, Coll. Schaum Zool. Mus. Berlin [purple label with black border] // *piceus* [in Heinze’s hand] Germ. vid. Dr. E. Heinze 1942 // SYNTYPUS *Sigerpes piceus* Germar, 1848 labeled by MNHUB 2007 [red label]” [MNHUB 19NL, examined]. Sex not determined. PARALECTOTYPE (MNHUB, pinned) label data: “Adelaide [handwritten] // Hist. –Coll. (Coleoptera) Nr. 43683 *Deretaphrus piceus*

Germ. typ Adelaide, Coll. Schaum Zool. Mus. Berlin [purple label with black border] // piceus Germ. [in Heinze's hand] vid. Dr. E. Heinze 1942 // SYNTYPUS *Sigerpes piceus* Germar, 1848 labeled by MNHUB 2007 [red label] [MNHUB 20NL, examined]. Sex not determined.

Deretaphrus bakewellii. LECTOTYPE (Figs. 230–231) (BMNH, pinned) label data: "Type [round label with orange border] // Melbourne [in Pascoe's hand on green oval label] // Deretaphrus Bakewellii Pascoe type [in Pascoe's hand] // Pascoe Coll. 93–60". [BMNH 108NL, examined]. Sex not determined.

Deretaphrus thoracicus. LECTOTYPE (Figs. 232–233) (♂, BMNH, point-mounted) label data: "T. 5346 Nelg. V. [in Blackburn's hand at base of card-mount; "T." is written in black ink, "5346" and Nels V." is written in red ink] // Type H.T. [round label with orange border] // Australia. [red underline] Blackburn Coll. B.M.1910-236 // Deretaphrus thoracicus, Blackb. [in Blackburn's hand]" [BMNH 102NL, examined]. This type was removed from the original card-mount and point-mounted. The original card-mount, abdomen (glued to a card, bearing a ♂ symbol), and genitalia (in glycerin in genitalia vial) are pinned beneath the specimen.

Additional Material Examined (259).

AUSTRALIA: AUSTRALIAN CAPITAL TERRITORY (A.C.T.): Black Mountain (ANIC 65NL, ANIC 202NL, ANIC 210–211NL, ANIC 231NL); Canberra (ANIC 111NL, ANIC 142NL); Mount Ainslie (ANIC 105NL); Weetangera (ANIC 253NL); no locality (ANIC 169NL). NEW SOUTH WALES: Armidale (ANIC 77NL, ANIC 115–116NL, ANIC 120NL); Bathurst (BPBM 1NL, BPBM 5–7NL); Blue Mountains (ANIC 98NL, MAMU 41NL); Bombala (AMSA 56–57NL); Cooma (MCZ 21NL); Culcairn (ANIC 53NL); Forest Reefs (ANIC 49NL, SAMA 7NL, SAMA 98NL, USNM 65NL); Glenreagh (SAMA 254NL); Goulburn (ANIC 189NL, SAMA 168NL); Greta (BPBM 32NL, BPBM 36–37NL); Howlong (ANIC 227NL, ANIC 234NL); Lane Cove (MAMU 26–27NL); Murrumbateman (ANIC 103NL); Nowra (ANIC 215NL); Pipers Flat (MAMU 39NL); Sydney (BMNH 81NL, BPBM 4NL, CASC 128NL, SAMA 99–100NL); Tumut River (ANIC 293NL, BPBM 31NL, BPBM 33–35NL); Wagga Wagga (MAMU 31NL); Werris Creek (SAMA 103NL); no locality (ANIC 161–163NL). QUEENSLAND: Dawson River (SAMA 227NL); Gayndah (SAMA 33NL); Kuranda (QMBA 41NL); Mount Nebo Road (QMBA 3NL); River Crossing, 1 mi. W of Uralla (UQIC 13–14NL); Stanthorpe (UQIC 43NL); Wyberba (ANIC 146NL). SOUTH AUSTRALIA: Adelaide (AMSA 50NL, BMNH 29NL, BMNH 32NL,

BMNH 38–39NL, MNHUB 22NL, OUMNH 8NL, OUMNH 17–18NL, SAMA 101NL, SAMA 177–178NL); Enfield suburb (AMSA 48NL); Glenunga (SAMA 206–207NL); Greenock (FMNH 12NL, SAMA 195NL); Hamelfirth (SAMA 232NL); Kangaroo Island (SAMA 192NL, SAMA 201NL, SAMA 214NL, SAMA 217–219NL, SAMA 248NL); Kangaroo Island, Ravine des Casoars Wilderness Protection Area (SAMA 239NL); Lucindale (SAMA 104–110NL, SAMA 113NL); Mount Lofty (SAMA 216NL, SAMA 245–246NL); Mount Lofty Ranges (AMSA 49NL, AMSA 51NL, SAMA 117–125NL, SAMA 131–136NL); Murray River (SAMA 180NL, SAMA 250NL); Mylor (SAMA 179NL); Quorn (SAMA 191NL); Saddleworth (SAMA 182NL); Torrens Gorge (SAMA 181NL); Yorketown (FMNH 21NL); no locality (ANIC 95NL, BMNH 30NL, BMNH 41NL, FMNH 18–19NL, MAMU 43NL, MCZ 22NL, SAMA 111NL, SAMA 137NL). TASMANIA: Hobart (ANIC 133NL, BMNH 73NL); Huon River (SAMA 128NL); Launceston (BMNH 35–36NL, BMNH 40NL, BMNH 75–77NL, SAMA 175–176NL, SAMA 243NL); Mount Nelson, Hobart (ANIC 125NL); New Norfolk (BMNH 78NL, BMNH 80NL); no locality (BMNH 34NL, SAMA 3NL, SAMA 199NL). VICTORIA: Alexandra (FMNH 10NL); Edenhope (SAMA 115NL); Eltham (QMBA 44NL); Fern Tree Gully (UQIC 37NL); Fitzroy River (BMNH 9NL); Gippsland (ANIC 52NL, ANIC 56–57NL, MVMA 104–105NL); Greensborough (MVMA 100–101NL); Heyfield (USNM 66–67NL); Kewell (SAMA 126NL); Kiata (MAIC 1–2NL); Mallee District (MVMA 98NL, MVMA 109NL); Melbourne (MVMA 89NL, OUMNH 3–4NL, OUMNH 6NL); Mildura (MVMA 99NL, MVMA 103NL); Moe (ANIC 97NL, ANIC 213NL, ANIC 218–220NL); Narracan (ANIC 304NL, MVMA 88NL); Port Phillip (BMNH 33NL); Seaford (MVMA 92NL; MVMA 106–107NL); Warburton district (MVMA 94NL); Yarra Glen (ANIC 281–282NL); no locality (ANIC 157NL, FMNH 17NL, MNHUB 24–40NL, MVMA 87NL, MVMA 108NL, SAMA 94–95NL). STATE UNKNOWN: Paret Reefs (SAMA 96–97NL); Parkside (SAMA 198NL); Victorian Alps (SAMA 2NL, SAMA 112NL); no locality (AMSA 32–33NL; ANIC 206NL, ANIC 209NL, ANIC 233NL; BMNH 28NL, BMNH 37NL, FMNH 7–9NL, FMNH 13–16NL, MAMU 29NL, MAMU 32–34NL, MCZ 23NL, MNHUB 21NL, MNHUB 23NL, MVMA 93NL, MVMA 95–97NL, MVMA 102NL, OUMNH 2NL, OUMNH 7NL, OUMNH 15–16NL, QDPI 20NL, SAMA 4–6NL, SAMA 62NL, SAMA 102NL, SAMA 129–130NL, SAMA 203NL, USNM 60NL).

***Deretaphrus puncticollis* Lea, 1898**
(Figs. 8–9, 14, 46, 52, 54, 77, 122–123,
160, 172, 178, 234–235)

Deretaphrus puncticollis Lea, 1898: 549. Carter and Zeck 1937: 200–201.

Diagnosis. This species can be readily distinguished from congeners by the nearly glabrous antennae, the shape of the submentum, the densely punctate pronotal disc with large, deep punctures, the pronotum with a weak median longitudinal depression, and elytral interstitial intervals 3, 5, and 7 moderately carinate, with the carina on intervals 3 and 5 meeting near apex. It most closely resembles *D. bucculentus* but can be distinguished by the elytral interstitial intervals 3 and 5 curving inwardly and merging near the apex (or nearly so), and the lack of prominent, angulate supra-ocular ridges that conceal the eyes from above.

Redescription. Length 5.5–8.8 mm. Width 1.6–2.6 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, moderately shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate anteromedially, with a weak median impression. Clypeus distinctly narrower than head. Anterior margin of clypeus broadly arcuate. Submentum shape as in Fig. 52; triangular, fused to subgenal braces, without paired setose pits; anterior margin arcuate, strongly produced anteroventrally over oral cavity, mentum completely concealed. Antennal groove well-developed, punctate internally. Antenna sparsely setose, setae shorter than half the length of the segment from which it arises; segments 3–8 with a single transverse row of short setae. Antennal club segments 9 and 10 with 2 transverse rows of short setae, 1 row at midline with sparse setation, the second row arising near apex of the segment. Penultimate segment with a single median transverse row of short setae. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible with median setose groove. **Thorax** (Fig. 77): Pronotum elongate, tapering to base, widest near anterior margin; dorsal surface rugose; anterior margin straight; anterior angles pronounced; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with large, dense punctures, each bearing a minute

seta. Pronotal median longitudinal depression well-developed; depression wide, gradually becoming more shallow anteriorly; sparsely punctate near base; bordered on either side basally by a small keel; base closed by posterior margin of pronotum. Hypomeron sparsely punctate, punctures larger than found on pronotal disc; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture more or less straight. **Elytra** (Figs. 122–123): Elytron convex; interstitial intervals 3, 5, 7, and 9 carinate for entire length, shiny; intervals 3 and 5 merge to a point near elytral apex; intervals 3, 5, 7, and 9 with micropunctures at crest bearing minute setae. Apical elytral margin of elytra slightly flanged, flange sinuate. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; protuberance of interval 5 merges with finger-like callosity on the elytral shoulder; callosity distinctly forked. **Legs:** Femur and tibia with short, sparse setae; inner face of tibia without distinct fringe of setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen:** Ventrite V simple. **Aedeagus:** Phallobase as in Fig. 160. Tegmen consisting of paired, subtriangular plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately elongate, slender, rounded apically, distinctly separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical and lateral margin; paramere with external margin more heavily sclerotized, interior with a lighter and less-sclerotized reniform area; dorsal surface of paramere with very small, short subtriangular process; process thickest at base, curved, less than 1/4 the length of the paramere, apex slightly swollen; processes narrowly separated, diverging. Penis as in Fig. 172; elongate, thin, more or less straight; apex narrowed and pointed; base slightly expanded, bearing long, slender, paired anterior struts. Penis unicolored.

Variation. Size and coloration vary within the species. In some, interstitial intervals 3 and 5 do not quite merge with one another near the apex of the elytra, but nearly so.

Distribution. Australia: New South Wales and Queensland (Fig. 178).

Biology. Fifty-four of the 58 specimens [Q MBA 46–80, ANIC 254–267, SAMA 138–143] of *D. puncticollis* were collected from within the earthen pupal chambers of several rose chafer scarab larvae, *Trichaulax philipsii* (Coleoptera: Scarabaeidae: Cetoniinae). The larvae of *D. puncticollis* parasitized the scarab larvae. After feeding, the *Deretaphrus* larvae spun and attached dozens of silken cocoons to the host (Figs. 7–9).

This is the largest series of a single *Deretaphrus* species ever collected.

Remarks. Lea (1898) did not mention the number of specimens examined. In order to stabilize this name, a lectotype is **here designated** from the syntype series of *Deretaphrus puncticollis*.

Type Locality. Queanbeyan, New South Wales.

Type Material Examined. LECTOTYPE (Figs. 234–235) (SAMA, card-mounted) label data: “puncticollis Lea TYPE Queanbeyan [in Lea’s hand] // 9561 *Deretaphrus puncticollis* Lea N.S. Wales TYPE [handwritten in black ink, “TYPE” written in red ink on right side of label] // S. Aust. Museum specimen [red label]” [SAMA 277NL, examined]. Sex not determined.

Additional Material Examined (58). AUSTRALIA: NEW SOUTH WALES: Muswellbrook (ANIC 268NL); Urbenville, 25 km. S (QMBA 46–80NL, ANIC 254–267NL, SAMA 138–143NL). QUEENSLAND: Clermont (AMSA 25NL, AMSA 61NL).

Deretaphrus rodmani Lord and McHugh,
new species

(Figs. 39, 78, 124–125, 161, 173, 236–237)

Diagnosis. This species can be readily distinguished from congeners by the much larger and angled punctures found within the pronotal median longitudinal depression, the sparsely punctate antennae, the head with laterally expanded and rounded supra-ocular ridges that partially conceal the eyes from above, and a distribution restricted to Western Australia.

Description. Length 6.1–9.9 mm. Width 1.9–3.1 mm. Body elongate, parallel, light to dark red; dorsal surface glabrous, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head** (Fig. 39): In dorsal view, slightly narrowed anteriorly, subtriangular; with broadly rounded, laterally expanded supra-ocular ridges; eyes nearly entirely concealed from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate, nearly straight. Anterior margin of clypeus broadly arcuate. Submentum shape similar to Fig. 52; fused to subgenal braces, without paired setose pits; anterior margin arcuate, strongly produced antero-ventrally, mentum completely concealed. Antennal groove well-developed, impunctate internally. Antenna sparsely setose, appearing glabrous except under high magnification; segments 3–8 with a single transverse row of minute setae. Antennal club segments with minute setae. Antennal club slightly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible with

median setose groove. **Thorax** (Fig. 78): Pronotum elongate, tapering to base, widest near anterior margin; dorsal surface convex, depressed along midline, more strongly deflexed near anterior angles; anterior margin arcuate; anterior angles rounded; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with large, round to oval punctures. Pronotal median longitudinal depression present, shallow, wide; punctures larger and denser in median depression, at times confluent. Hypomeron sparsely punctate, punctures large and shallow, each bearing a seta; lateral walls strongly deflexed. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture more or less straight. **Elytra** (Figs. 124–125): Elytron evenly convex; interstitial intervals 5, 6, 7, and 9 raised for entire length; interval 9 feebly raised; interval 3 raised towards apex; interval 4 raised for apical half. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; callosity on elytral shoulder thick and projecting dorsolaterally. **Legs:** Femur and tibia with short, sparse setae; inner face of tibia with 2 fringes of long setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen:** Ventrite V comes to a slight point. **Aedeagus:** Phallobase as in Fig. 161. Tegmen consisting of large, paired subtriangular plates; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, distinctly separated and individually articulated to phallobase, internal lateral margins sinuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with large subtriangular process; process thickest at base, narrowing apically, nearly as long as the paramere, apex pointed; processes moderately separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis bicolored, lighter in basal 1/3.

Variation. Size and color are variable within the species. The punctation along the midline of the pronotal disc is somewhat variable, ranging from sparsely (in most specimens) to moderately punctate, the punctures often being confluent.

Distribution. Known only from Western Australia (Fig. 173).

Biology. Several specimens emerged from the tunnels of *Penthea saundersii* (Coleoptera: Cerambycidae) in *Acacia* sp. The remains of dead *Penthea* larvae were found in the tunnels, strongly suggesting the possibility of *P. saundersii* as a

host of *D. rodmani*. Four specimens were also taken from *Casuarina* sp. (Casuarinaceae) [AMSA 65NL, AMSA 67–69NL].

Etymology. The epithet *rodmani* (noun) honors James E. (Jim) Rodman, founder of the National Science Foundation Partnerships for Enhancing Expertise in Taxonomy (PEET) program.

Remarks. A holotype is **here designated** and deposited in WAMP. Forty paratypes are **here designated** and deposited in AMSA, ANIC, NPLC, SAMA, and WAMP.

Type Locality. 31°13'S, 119°20'E, Southern Cross, Western Australia.

Type Material Examined. H O L O T Y P E (Figs. 236–237) (WAMP, point-mounted; cocoon point-mounted beneath specimen) label data: “Southern Cross (31°13'S 119°20'E) W. Australia 21.X.80 PTO R.P. McMillan // [underside of label 1] Emerged from tunnel of *Penthea* sp. 14.iii.80 remains of *Penthea* larva in tunnel [hand-written] // Western Australian Museum Entomology Reg. no. 65199 [yellow label] // *Deretaphrus xanthorrhoeae* Lea ? [handwritten] Det. J.F. Lawrence” [WAMP 18NL, examined]. Sex not determined. PARATYPE (WAMP, pinned) label data: “Miling Western Australia 20 Nov. 1974 A. Page // in bored section of branch [hand-written] // Western Australian Museum Entomology Reg. no. 65263 [yellow label]” [WAMP 61NL, examined]. Sex not determined. PARATYPE (WAMP, pinned) label data as above, except: Label 3: “Western Australian Museum Entomology Reg. no. 65264 [yellow label]” [WAMP 62NL, examined]. Sex not determined. PARATYPE (SAMA, card-mounted) label data: “Mullewa W.A. Miss F. May // *Deretaphrus ignarus* Pasc. HJC [in Carter’s hand] // S. Aust. Museum specimen [orange label]” [SAMA 91NL, examined]. Sex not determined. PARATYPE (ANIC, on same pin but point-mounted separately from other paratype) label data: “Emerged from tunnel of *Penthea* sp. 19.iii.81 [handwritten] Southern Cross (31°13'S 119°20'E) W. Australia 21.x.80 Larva? [“21.x.80 Larva?” is handwritten] R.P. McMillan” [ANIC 62NL, examined]. Sex not determined. PARATYPE (ANIC, on same pin but point-mounted separately from other paratype) label data as above [ANIC 63NL, examined]. Sex not determined. PARATYPE (AMSA, pinned) label data: “Mt. Magnet, W.A. Aug 1981 2 x *Casuarina* sp. G.A. Holloway [handwritten] // Australian Museum K 231649” [AMSA 67NL, examined]. Sex not determined. PARATYPE (AMSA, pinned) label data as above, except: Label 2: “Australian Museum K 231650” [AMSA 68NL, examined]. Sex not determined. PARATYPE (AMSA, pinned) label data as above, except: Label 2: “Australian Museum K 231647”

[AMSA 65NL, examined]. Sex not determined. PARATYPE (AMSA, pinned) label data as above, except: Label 2: “Australian Museum K 231651” [AMSA 69NL, examined]. Sex not determined.

PARATYPE (ANIC, pointed) label data: “Southern Cross (31°13'S 119°20'E) W. Australia 21.X.80 PTO R.P. McMillan” // “Emerged from tunnel of *Penthea* sp. 19.iii.81 Remains of *Penthea* larva in tunnel [handwritten on underside of label]” [ANIC 64NL, examined]. Sex not determined. PARATYPE (WAMP, pointed) label data same as above [WAMP 19NL, examined]. Sex not determined. PARATYPE (WAMP, pointed) label data same as above [WAMP 20NL, examined]. Sex not determined. PARATYPES (WAMP, card-mounted) 4, card-mounted together, label data: “Southern Cross (31°13'S 119°20'E) W. Australia 21.X.80 R.P. McMillan” // “predators in larval stage on *Penthea saundersii* [handwritten]” [WAMP 14–17NL, examined]. Sexes not determined. PARATYPES (WAMP, card-mounted) 4, card-mounted together, label data: “Southern Cross (31°13'S 119°20'E) W. Australia 21.X.80 R.P. McMillan” // in *Penthea saundersii* tunnel [handwritten on underside of label]” [WAMP 30–33NL, examined]. Sexes not determined. PARATYPES (WAMP, card-mounted) 4, card-mounted together, label data same as above [WAMP 34–37NL, examined]. PARATYPES (WAMP, card-mounted) 4, card-mounted together, label data same as above [WAMP 26–29NL, examined]. Sexes not determined. PARATYPES (WAMP, card-mounted) 3, card-mounted together, label data same as above [WAMP 38–40NL, examined]. Sexes not determined. PARATYPE (NPLC, disarticulated) label data same as above [WAMP 41NL – with NPL, disarticulated and in glycerine]. Male. PARATYPE (WAMP, pointed) label data: “Southern Cross (31°13'S 119°20'E) W. Australia OCT. 1977 R.P. McMillan // FROM TUNNEL OF PENTHEA SAUNDERSII [handwritten]” [WAMP 53NL, examined]. Sex not determined. PARATYPE (WAMP, pointed) label data same as above [WAMP 54NL, examined]. Sex not determined. PARATYPE (WAMP, pointed) label data same as above [WAMP 55NL, examined]. Sex not determined. PARATYPE (WAMP, card-mounted) label data: “Southern Cross (31°13'S 119°20'E) W. Australia 21.X.80 R.P. McMillan // as predator larva on *Penthea* sp.” [WAMP 51NL, examined]. Sex not determined. PARATYPE (WAMP, card-mounted) label data: “Southern Cross (31°13'S 119°20'E) W. Australia 21 OCT. 1980 R.P. McMillan” [WAMP 42NL, examined]. Sex not determined. PARATYPE (WAMP, card-mounted) label data: “Larva 21.X.80 Adult 23.XII.80 in *Acacia* tunnel [handwritten] Southern Cross (31°13'S 119°20'E) W. Australia

21 OCT. 1980 R.P. McMillan" [WAMP 43NL, examined]. Sex not determined. PARATYPE (WAMP, card-mounted) label data: "R. P. McMILLAN DATE OCT.11.50 BEJOORDING" [WAMP 22NL, examined]. Sex not determined. PARATYPE (WAMP, pinned) label data: "M. de Graaf 26.iii.1965 BINNU W. AUSTRALIA" [WAMP 24NL, examined]. Sex not determined.

Additional Material Examined (1).

AUSTRALIA: NORTHERN TERRITORY: Alice Springs, 11 mi. N (CASC 123NL). Note: This specimen is not regarded as a member of the type series due to the rarity of specimens from this locality and far proximity of the collection locality (Northern Territory) to that of other type specimens (Western Australia).

***Deretaphrus viduatus* Pascoe, 1862**

(Figs. 6, 11, 15, 53, 79, 126–127, 162, 176, 238–239)

Deretaphrus viduatus Pascoe, 1862: 463. Masters 1871: 79; Blackburn 1903: 126–130; Grouvelle 1903: 184; Carter and Zeck 1937: 200–201.

Deretaphrus colydioides Pascoe, 1862: 463. Lea 1898: 550. Synonymized by Carter and Zeck 1937: 200–201.

Deretaphrus colydioides: Masters 1871: 79. Blackburn 1903: 121, 127–128. Misspelling, no status.

Deretaphrus cribriceps Blackburn, 1903: 128. Carter and Zeck 1937: 200–201; Heinze 1943: 119. **New synonymy.**

Deretaphrus popularis Blackburn, 1903: 126. Carter and Zeck 1937: 200–201. **New synonymy.**

Deretaphrus sparsiceps Blackburn, 1903: 127. Synonymized by Carter and Zeck 1937: 200–201.

Diagnosis. This species can be readily distinguished from congeners by the darker color (nearly black), the sculpture of the pronotal disc, the anterior portion of the head bearing a median longitudinal impression, elytral interstitial interval 3 being only raised near the apex, intervals 5 and 7 not being carinate, and the shape of the submentum. *Deretaphrus viduatus* most closely resembles *D. aequaliceps* and *D. ignarus*. It may be distinguished from *D. aequaliceps* by the more rounded anterior angles of the pronotum, the posterior portion of the pronotal median longitudinal canal being narrow and parallel-sided, and the generally larger size. For comments on similarities and differences in relation to *D. ignarus*, see the diagnosis under that species.

Redescription. Length 4.9–10.3 mm. Width 1.4–2.7 mm. Body elongate, parallel, black; dorsal surface glabrous, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In

dorsal view, slightly narrowed anteriorly; with slight supra-ocular ridges, lateral margin sinuate; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture distinct, arcuate anteromedially, with median depression. Anterior margin of clypeus broadly arcuate. Submentum shape as in Fig. 53; distinctly separated from subgenal braces, without paired setose pits; anterior margin truncate, strongly produced anteroventrally over oral cavity, mentum completely concealed. Antennal groove well-developed, impunctate. Antenna sparsely setose, setae shorter than half the length of the segment from which they arise; segments 2–8 with single transverse row of short setae; antennal club segments with 2 transverse rows of setae; 1 row located medially and with short setae, second row with medium length setae found at the apex of club segments. Antennal club asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove, but with few punctures bearing stout setae (often difficult to see due to broken setae).

Thorax (Fig. 79): Pronotum elongate, widest near anterior $\frac{1}{4}$; dorsal surface flattened along longitudinal midline, convex laterally; anterior margin arcuate, slightly wider than head; anterior angles rounded; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles pronounced, with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view. Pronotal disc with medium sized, dense, oval punctures. Pronotal median longitudinal canal well-developed, interrupted to form a small, impressed, anterior fovea and a posterior canal; raised interruption of the canal impunctate; anterior fovea a small slit, narrowing to a point anteriorly (arrowhead shaped); posterior canal narrow, parallel-sided, deeply impressed, slightly expanded and open at the base, internal lateral margins of canal grooved. Hypomeron minutely punctate; strongly deflexed medially. Prosternum flat medially, strongly deflexed at lateral margin. Tergosternal suture slightly sinuate.

Elytra (Figs. 126–127): Elytron flattened dorsally, convex laterally; interstitial intervals 5 and 7 weakly raised for entire length, more pronounced near apex; interval 3 raised near apex; intervals 3, 5, and 7 with micropunctures at crest. Basal elytral margin with interstitial intervals 3 and 5 each ending in a knob-like protuberance; finger-like callosity on the elytral shoulder weakly developed. **Legs:** Setation sparse; inner face of tibia with fringe of short setae. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3.

Abdomen: Ventrite V more densely punctured

than preceding segments. **Aedeagus:** Phallobase as in Fig. 162. Tegmen consisting of paired, subtriangular plates at middle; plates narrowly touching medially. Basal piece with short anterolateral struts; struts slightly curved anteriorly. Parameres moderately short, broadly rounded, distinctly separated and individually articulated to phallobase, internal lateral margins arcuate; paramere sparsely setose with short setae at apical margin; dorsal surface of paramere with short subtriangular process; process thickest at base, narrowing apically, slightly shorter than half the length of the paramere, apex slightly swollen; processes narrowly separated, parallel medially. Penis similar to Fig. 169; short, moderately thick, more or less straight; apex narrowed and pointed; base slightly expanded, bearing short, paired anterior struts. Penis slightly lighter in color near basal end.

Variation. *Deretaphrus viduatus* is the most intraspecifically variable member of the genus. This species ranges strongly in color and size, and smaller individuals tend to be less well-sculptured than larger individuals. The sculpture of the pronotal disc is highly variable. The lateral margins of the pronotal disc range from slightly to strongly curved, the punctuation varies from small and sparse to larger and dense. The pronotal median longitudinal canal is also quite variable. The anterior portion ranges from a mere slit (in most specimens) to small and slightly elongate to slightly narrowed anteriorly. In general, the posterior portion of the pronotal canal is narrow and parallel-sided with the internal lateral margins grooved, but this also varies. The posterior canal is sometimes slightly expanded at the base and the internal lateral grooves may be lacking. The raised elytral interstitial intervals are also variously pronounced, ranging from slightly raised (in most specimens) to carinate.

Distribution. Australia: Australian Capital Territory, New South Wales, Queensland, South Australia, Tasmania, and Victoria (Fig. 176).

Biology. One specimen was taken from under the bark of *Eucalyptus viminalis* [ANIC 67NL], and one specimen was taken from under the bark of *Eucalyptus* sp. [ANIC 200NL]. Two specimens were taken from the stems of salt brush [SAMA 67–68NL]. Three specimens were taken by fogging hoop pine scrub with pyrethrum [QMBA 14–16NL], and one specimen was taken by fogging python vine scrub with pyrethrum [QMBA 7NL]. One specimen was taken at night in an open forest [QMBA 6NL]. One specimen was taken from within rotten branches [QDPI 17NL], and one specimen was reared from bipinnate wattle [ANIC 27NL].

Taxonomic Notes. Due to the extreme size variation and lack of satisfactory characters, we

feel it necessary to synonymize several species under *D. viduatus* for the purposes of nomenclatural stability and practicality of identification. These junior synonyms may later be regarded as distinct species, but at this point, we believe these conservative actions will provide some clarity within this group.

Remarks. Neither Pascoe (1862) nor Blackburn (1903) mentioned the number of specimens examined of these species. In order to stabilize these names, lectotypes are **here designated** for *Deretaphrus viduatus* Pascoe, *Deretaphrus colydioides* Pascoe, *Deretaphrus cribriceps* Blackburn, *Deretaphrus popularis* Blackburn, and *Deretaphrus sparsiceps* Blackburn, and a paralectotype is **here designated** for *Deretaphrus sparsiceps* Blackburn from the syntype series of those species. There is a specimen of *D. sparsiceps* (♀, SAMA, point-mounted) with label data: “Ad [Adelaide – written in red ink in Blackburn’s hand on the original card-mount] // Adelaide Blackburn // sparsiceps, Blackb. [in Blackburn’s hand] // I.8723 Deretaphrus sparsiceps Bl S. Australia Cotype [“Cotype” written in red ink on right side of label]” [SAMA 274NL]. This specimen was removed from the original card-mount and point-mounted. The original card-mount and abdomen (glued to a card, bearing a ♀ symbol) are pinned beneath the specimen. We do not consider this a syntype, as the lectotype and paralectotype are from Eyre Peninsula (the type locality) and the card mount of this specimen does not bear the markings typical of Blackburn’s types.

Type Locality. *Deretaphrus viduatus*: Adelaide, South Australia; *Deretaphrus colydioides*: Sydney, New South Wales; *Deretaphrus cribriceps*: near Ballarat, Victoria; *Deretaphrus popularis*: Australia, Victorian Mountains; *Deretaphrus sparsiceps*: Eyre Peninsula, South Australia.

Type Material Examined. *Deretaphrus viduatus*. LECTOTYPE (Figs. 238–239) (BMNH, pinned) label data: “Type [round label with orange border] // Adelaide [in Pascoe’s hand on green oval label] // Deretaphrus viduatus type Pasc [in Pascoe’s hand] // Pascoe Coll. 93–60” [BMNH 105NL, examined]. Sex not determined.

Deretaphrus colydioides. LECTOTYPE (Figs. 240–241) (♂, BMNH, disarticulated on card-mount) label data: “Type [round label with orange border] // Sydney [in Pascoe’s hand on green oval label] // Colydioides *typ* Pasc [in Pascoe’s hand] // Pascoe Coll. 93–60” [BMNH 96NL, examined]. This type was removed from the original card and was disarticulated. Body parts were glued to a new card-mount. The original card-mount, abdomen (glued to a card, bearing a ♂ symbol), and genitalia (in glycerin in genitalia vial) are pinned beneath the specimen.

Deretaphrus cribriceps. LECTOTYPE (Figs. 242–243) (♂, BMNH, point-mounted, missing right elytron) label data: “Type H.T. [round label with orange border] // 5666 T. Vict. [in Blackburn’s hand; “5666” and “Vict.” written in red ink, “T.” written in black ink] // Australia. [red underline] Blackburn Coll. B.M.1910-236. // *Deretaphrus cribriceps*, Blackb. [in Blackburn’s hand]” [BMNH 98NL, examined]. This type was removed from the original card-mount and point-mounted. The original pin and card-mount, abdomen (glued to a card, bearing a ♂ symbol), and genitalia [in glycerin in genitalia vial] are pinned beneath the specimen.

Deretaphrus popularis. LECTOTYPE (Figs. 244–245) (BMNH, minuten-pinned into block) label data: “Type H.T. [round label with orange border] // 7203 T. [in Blackburn’s pen; “7203” written in red pen, “T.” written in black pen] // Australia. [red underline] Blackburn Coll. B.M.1910-236. // *Deretaphrus popularis*, Blackb.” [in Blackburn’s hand] [BMNH 106NL, examined]. Sex not determined.

Deretaphrus sparsiceps. LECTOTYPE (Figs. 246–247) (BMNH, card-mounted) label data: “T. 7205. [in Blackburn’s hand at base of card-mount; “T.” in black ink, “7205” written in red ink] // Type H.T. [round label with red border] // Australia. [red underline] Blackburn Coll. B. M.1910-236. // *Deretaphrus sparsiceps*, Blackb. [in Blackburn’s hand]” [BMNH 107NL, examined]. Sex not determined. PARALECTOTYPE (SAMA, card-mounted, card with thick black line at base) label data: “Port Lincoln Blackburn // *Deretaphrus sparsiceps* cotype [in Blackburn’s hand] // *Deretaphrus sparsiceps* Bl. [handwritten] // *D. viduatus* Pasc. [in Carter’s hand] Det. H.J. Carter. // S. Aust. Museum specimen [orange label]” [SAMA 156NL, examined]. Sex not determined.

Additional Material Examined (197).

AUSTRALIA: AUSTRALIAN CAPITAL TERRITORY (A.C.T.): Black Mountain (ANIC 205NL); Piccadilly Circus, Brindabella Range (ANIC 143NL). NEW SOUTH WALES: Belmore suburb (AMSA 28–31NL, AMSA 37NL); Berkshire Park (ANIC 27NL); Bulga (ANIC 243–244NL); Cabramatta (BMNH 27NL); Dorrigo (SAMA 174NL, SAMA 197NL); Fairfield Park (BMNH 90NL); Jamberoo (AMSA 42NL, AMSA 75NL); Minnamurra Falls, near Kiama (ANIC 239NL); Kioloa (ANIC 139NL, ANIC 141NL); Kioloa State Forest, 15 km. NE of Bateman’s Bay (ANIC 134NL); Kurnell (BMNH 88NL); Glen Cutte, Kurrjong (AMSA 39–41NL, AMSA 78–79NL); Lake Cowal (ANIC 176NL); Lilyvale (AMSA 83NL); Little Dromedary (CASC 129NL); Liverpool (SAMA 224NL); Lorient, approx. 1 km. NNW of Lansdowne via Taree (ANIC 102NL); Mittagong (BMNH 25NL); Nepean Gorge, near Mulgoa (ANIC

18NL); Penrith (AMSA 59NL, AMSA 64NL); Picton (AMSA 74NL, ANIC 155NL); Revith (AMSA 6NL); Richmond River (BMNH 22NL); Ryde (ANIC 128–131NL); Sydney (ANIC 54NL, BMNH 24NL, BMNH 26NL); Tuross (AMSA 44NL); Wingham (ANIC 25NL); Wingham Brush, Manning River (ANIC 22–24NL). QUEENSLAND: Bluff Range, West slope, via Biggenden (ANIC 165NL); Boomer Range (QMBA 7NL); Brisbane (QDPI 8NL, QMBA 25NL, SAMA 148NL, SAMA 153NL, UQIC 42NL); Bunya Mountains (QMBA 21NL); Dawson River (SAMA 225–226NL); Dunwich, Stadbroke Island (UQIC 17NL); Eumundi (QDPI 17NL); Expedition Range National Park (QMBA 6NL); Gayndah (ANIC 106–107NL); Indooroopilly (ANIC 38NL); Lake Clarendon (QMBA 10NL); Nangur State Forest (QMBA 13NL); Pine Mountain, summit (QMBA 14–16NL); Rockhampton (AMNH 23NL); Roma (ANIC 45NL); Rosewood (ANIC 13NL); Stanthorpe (QDPI 14NL, UQIC 45NL); Theodore (UQIC 44NL); no locality (HNHM 3–4NL). SOUTH AUSTRALIA: Adelaide (BMNH 23NL, SAMA 147NL, SAMA 155NL, SAMA 274NL); Lucindale (ANIC 30NL, ANIC 76NL, SAMA 10–11NL, SAMA 45NL, SAMA 47–52NL, SAMA 160NL); Mannum (SAMA 145NL); Mount Lofty (SAMA 242NL); Murray Bridge (ANIC 16NL); Murray River (AMSA 58NL, SAMA 249NL, SAMA 251NL); Nuriootpa (SAMA 253NL); Point Davenport (ANIC 172–174NL); Port Noarlunga (SAMA 230NL); no locality (SAMA 211NL). TASMANIA: Launceston (SAMA 238NL); Liffey Valley (ANIC 67NL); Lower Gordon River (ANIC 11NL); Mount Wellington (SAMA 69NL); no locality (SAMA 286NL). VICTORIA: Albion (BPBM 2–3NL, BPBM 15NL); Blairgowrie (ANIC 136NL); Brighton (MVMA 85NL); Broadmeadows (MVMA 77NL); Burrumbeet (ANIC 46NL); Cheltenham (MVMA 45NL); Croydon (MVMA 70–71NL, MVMA 82NL); Eltham (MVMA 58–59NL); Fern Tree Gully (MVMA 5NL); Fitzroy River (BMNH 86NL); Fulham (SAMA 229NL); Grampians (SAMA 150NL); Harcourt (SAMA 146NL, SAMA 157–159NL); Harrierville (MVMA 84NL); Healesville (MVMA 66NL); Koonung Creek (MVMA 80NL); Melbourne (BMNH 20NL); Melton (MVMA 69NL); Moe (ANIC 212NL, ANIC 279–280NL); Mount Hope (MVMA 86NL); Mount Waverly (ANIC 50–51NL); Narracan (MVMA 79NL); Noble Park (QMBA 17NL); Nunawading (MVMA 68NL); Port Phillip (MNHUB 43NL); Ringwood (MVMA 78NL, QMBA 22NL); Seaford (ANIC 69–70NL, MVMA 72–73NL, MVMA 81NL); Sorrento (ANIC 147–148NL); Warring (ANIC 47NL); West Warburton (MVMA 53NL); Werribee (SAMA 67–68NL); Wodonga, 13 km. W (ANIC

200NL); no locality (ANIC 164NL, FMNH 23NL). STATE UNKNOWN: Anulgoa (ANIC 156NL); Croydon (ANIC 55NL); Great Lake (SAMA 187NL); Sutherland (ANIC 145NL); Warburton (ANIC 277–278NL); no locality (AMSA 72NL, ANIC 43NL, ANIC 140NL, ANIC 144NL, ANIC 150NL, BMNH 21NL, BMNH 79NL, BPBM 9NL, BPBM 11NL, BPBM 48NL, CASC 127NL, FMNH 11NL, FMNH 25NL, MCZ 24NL, MCZ 29NL, MCZ 39NL, MNHUB 42NL, MVMA 55NL, MVMA 65NL, MVMA 67NL, MVMA 74–76NL, OUMNH 5NL, OUMNH 21NL, SAMA 149NL, SAMA 163NL, SAMA 222NL).

***Deretaphrus wollastoni* Newman, 1855**

(Figs. 80, 128–129, 163, 178, 248–249)

Deretaphrus wollastoni Newman in Wollaston and Newman, 1855: 210. Pascoe 1862: 461–462; Masters 1871: 79; Blackburn 1903: 120.

Diagnosis. This species can be readily distinguished from congeners by the variously interrupted carinate elytral interstitial intervals (forming numerous short, interrupted carinae). It most closely resembles *D. erichsoni*. The raised interstitial intervals of both species are numerous interrupted; however, in *D. wollastoni*, the interrupted portions of the elytral interstitial intervals do not form distinct denticles near the apex. Instead, the interruptions form raised or elevated patches throughout the entire length of the elytra. In *D. wollastoni*, the pronotum is more elongate (nearly quadrate in *D. erichsoni*), the pronotal median longitudinal depression is more apparent and extends into the anterior half of the pronotum, the pronotal punctures are much larger, denser, and coarser, and the keels on the posterior portion of the pronotum are much more strongly produced. *Deretaphrus wollastoni* exhibits no sexual dimorphism of abdominal ventrite V, as can be found in *D. erichsoni*.

Redescription. Length 6.7–10.6 mm. Width 2.1–2.9 mm. Body elongate, parallel, dark red; dorsal surface glabrous, slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; posterior margin of eye meets a distinct strip of abruptly raised cuticle; punctures small and dense except sparse along posterior margin. Frontoclypeal suture arcuate anteromedially, slightly impressed, more distinct in lighter colored specimens, suture darker than surrounding area. In darker colored specimens, frontoclypeal suture indistinct, same color as surrounding area. Anterior margin of clypeus broadly arcuate, with large punctures, anterior margin with

slightly raised border; Submentum shape similar to Fig. 50; short and transverse, distinctly separated from subgenal braces, without paired setose pits; anterior margin arcuate, inflexed medially, slightly expanded anteroventrally over oral cavity, palpi visible, mentum concealed; anterolateral angles rounded. Antennal groove well-developed, impunctate. Antenna sparsely setose, appearing glabrous except under high magnification, setae on antennal club segments sparse. Antennal club distinctly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 80): Pronotum elongate, widest near anterior $\frac{1}{4}$, tapering thereafter to base; dorsal surface convex, depressed along midline for nearly entire length; anterior margin straight, wider than head; anterior angles rounded, obtuse; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles depressed, with small denticle; lateral margin with incomplete carina, forming a raised border in dorsal view, terminating anteriorly before the true anterior margin of the pronotum. Pronotal disc with large, closely set, shallow punctures, nearly reticulate; puncture size decreases toward anterior margin. Pronotal median longitudinal depression well-developed; median depression more shallow anteriorly, ending before anterior margin, becoming slightly wider posteriorly; posterior portion of depression less punctate, rugose; internal punctures slightly larger than on rest of pronotal disc; median depression closed at the base by posterior margin of pronotum, bordered on either side by a raised portion (“rib”) of the pronotal disc. Pronotal disc with paired, short carinae that originate from posterior corners of pronotum, extend longitudinally (not following curvature of lateral margins) and terminate before midline. Hypomeron punctate; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Prosternum depressed immediately anterior to procoxae. Tergosternal suture nearly straight. Anterior procoxal groove raised, sinuate and sharply medially just anterior to the procoxae. **Elytra** (Figs. 128–129): Elytron evenly convex; interstitial intervals 3, 5–9 raised and shiny for entire length, more strongly raised (nearly carinate) towards apex; interval 4 raised, ending slightly before elytral base. All raised intervals frequently interrupted, appearing sinuate in lateral view. Crest of raised intervals with punctures bearing minute setae. Basal elytral margin with intervals 3 and 5 each ending in a knob-like protuberance; finger-like callosity on the elytral shoulder short but pronounced. **Legs:** Setation sparse; inner face of tibia with 2 fringes (1 more prominent) of relatively short setae. Tarsus sparsely setose

except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen:** Ventrite V slightly swollen medially, depressed at apex. **Aedeagus:** Phallobase simple, as in Fig. 163. Basal piece with short anterolateral struts; struts strongly curved anteriorly, nearing 90°. Parameres moderately short, broadly rounded apically, narrowed basally, distinctly separated and individually articulated to phallobase; parameres sparsely setose with short setae at apical margins; dorsal surface with short subtriangular hook-like projections; projections thickest at base, narrowing apically, narrowly separated, parallel medially, slightly shorter than half the length of the parameres, apices slightly swollen, out-turned. Penis similar to Fig. 169; short, moderately thick, slightly sinuate, apical tip narrowed and pointed, basal tip slightly expanded, bearing paired anterior struts. Penis bicolored, lighter in basal 1/3.

Variation. The size and color is variable within the species. In some specimens, the pronotal median longitudinal depression is slightly more impressed.

Distribution. Australia: New South Wales, Queensland, and South Australia (Fig. 178).

Biology. Four specimens were taken at a light [ANIC 19NL, ANIC 20NL, ANIC 26NL, SAMA 252NL], and one specimen was taken under bark [ANIC 310NL]. One specimen was reared from *Jacksonia scoparia* (Fabaceae), and one specimen was taken by fogging trees with pyrethrum [QMBA 11NL].

Taxonomic Notes. Newman's (1855) meager description of *D. wollastoni* cannot be used to satisfactorily diagnose members of this species. In the description, Newman states that there is "on each margin, a ridge or keel of corresponding length, which does not follow the curved margin of the prothorax where it widens, but is continued in a direct line towards anterior margin, ceasing, like the median depression, about half-way between anterior and posterior margins of prothorax." When interpreted strictly, this character is not present in any known species of *Deretaphrus*. It is apparent that Pascoe (1862) had not seen any specimens that corresponded to Newman's *D. wollastoni*, and Blackburn (1903) wrote: "*D. Wollastoni*, Newm., is probably not a *Deretaphrus*; at any rate it is very different from any species before me..." There is also no mention of *D. wollastoni* in Carter and Zeck (1937). Through examination of specimens and attached label data, we feel confident our concept of *D. wollastoni* is the same concept Newman had when he described this species.

Remarks. Newman (1855) did not mention the number of specimens examined. In order to stabilize this name, a neotype is **here designated** from the material of *D. wollastoni*.

Type Locality. Moreton Bay, Queensland.

Type Material Examined. No specimen could be identified as a type of *D. wollastoni*. Newman gave no indication where the type specimens were deposited, and the type could not be located in Newman's material at the BMNH (Max Barclay, personal communication). There is a single specimen identified as *D. wollastoni* in E. Heinze's material at the Berlin Museum (MNHUB). The specimen does have two small carinae on the pronotum that extend more or less anteriorly in a direct line. Although the majority of Newman's description is vague, the specimen identified as *D. wollastoni* by E. Heinze is the closest fit and the only reasonable candidate to serve as a neotype. Therefore, a neotype is here designated for *Deretaphrus wollastoni* Newman. All subsequent identifications were based on the neotype.

Type Material Examined. NEOTYPE (Figs. 248–249) (♂, MNHUB, card-mounted, with abdomen glued to card) label data: "Brisbane [handwritten on pink label] // Coll. Hacker // ♂ [on square label with black border] // *Deretaphrus erichsoni* Newm. [in Carter's hand] Det. H.J. Carter [label folded] // *wollastoni* Newm. [in Heinze's hand] det. Dr. E. Heinze 19_" [MNHUB 44NL, examined].

Additional Material Examined (35). AUSTRALIA: NEW SOUTH WALES: Blue Mountains (UQIC 29NL); Bungabee State Forest, SE Kyogle (ANIC 20NL); Enfield (AMSA 9NL); Fortis Creek National Park, South boundary, N of Grafton (ANIC 26NL); Sandy Point, Sydney (ANIC 28NL, ANIC 270NL); Sydney (ANIC 81–82NL, ANIC 310NL, SAMA 220NL); Wallis Lake (MVMA 43NL); Yarratt State Forest, West boundary (ANIC 19NL); no locality (MAMU 16NL). QUEENSLAND: Alderly (QMBA 38NL); Brisbane (BPBM 41NL, QDPI 1–2NL, QDPI 7NL, QMBA 34–35NL, QMBA 37NL, SAMA 15NL, UQIC 33–34NL, UQIC 41NL); Duaringa (CASC 124NL); Enoggera Reservoir (QMBA 11NL); Pine Mountain (AMSA 19NL); Stonehenge (UQIC 18NL); Sunnybank (UQIC 25NL). SOUTH AUSTRALIA: Mabel Creek H.S., 30 km. SW. (SAMA 252NL). STATE UNKNOWN: no locality (BPBM 39–40NL, OUMNH 23NL, QDPI 21NL).

Deretaphrus xanthorrhoeae Lea, 1898

(Figs. 10, 12–13, 16–17, 81, 130–131, 137–139, 164, 174, 250–251)

Deretaphrus xanthorrhoeae Lea, 1898: 548.
Blackburn 1903: 120; Carter and Zeck 1937: 200.

Diagnosis. This species can be readily distinguished from congeners by the nearly glabrous antennae, the shape of the submentum, the head

without distinct laterally expanded supra-ocular ridges, abdominal ventrite V with a notched posterior face in females, and a distribution restricted to Western Australia. It most closely resembles *D. ocellaris* and *D. ignarus*. *Deretaphrus xanthorrhoeae* can be distinguished from *D. ocellaris* by the non-reniform shape of the eye. For comments on similarities and differences in relation to *D. ignarus*, see the diagnosis under that species.

Redescription. Length 6.6–9.5 mm. Width 2–2.6 mm. Body elongate, parallel, dark red to black; dorsal surface glabrous, matte to slightly shiny; ventral surface moderately shiny, glabrous except for minute setae that arise from punctures. **Head:** In dorsal view, slightly narrowed anteriorly; without laterally expanded supra-ocular ridges; eyes visible from above; punctures small and dense except sparse along posterior margin. Frontoclypeal suture not distinct, arcuate antero-medially. Anterior margin of clypeus broadly arcuate. Submentum shape similar to Fig. 49; narrowly separated from subgenal braces, without paired setose pits; anterior margin sinuate, strongly produced anteroventrally over oral cavity, mentum barely visible to concealed. Antennal groove well-developed, impunctate. Antenna sparsely setose, setae small, but distinctly visible, setae less than $\frac{1}{4}$ of the length of the segment from which they arise, segments 3–8 with a single transverse row of short setae; setae on antennal club segments sparse, arising near the apex. Antennal club slightly asymmetrical, leading edge of club segments much more inflated than trailing edge. Dorsal surface (external face) of mandible without median setose groove. **Thorax** (Fig. 81): Pronotum elongate, tapering to base, widest near anterior $\frac{1}{4}$; dorsal surface strongly convex, flattened to slightly depressed medially; anterior margin straight, slightly wider than head; anterior angles rounded; base narrower than elytral bases; posterior margin weakly sinuate; posterior angles with small denticle; lateral margin with incomplete carina, forming a distinct raised border in dorsal view, terminating anteriorly before the true anterior margin of the pronotum. Pronotal disc with small, dense, ovoid punctures. Pronotal median longitudinal depression moderately well-developed, widening posteriorly; area on either side of midline slightly raised; longitudinal depression slightly interrupted anteriorly, anterior portion a small line or slit, with surrounding area strongly punctate; punctures along median longitudinal depression distinctly larger than on rest of pronotal disc; posterior portion of interruption with an anterior groove that widens towards base; groove punctate internally. Hypomeron densely punctate except for laterad of coxae

and at dorsal margin, punctures larger than found on pronotal disc; lateral walls nearly vertical. Prosternum flat medially, strongly deflexed at lateral margin. Prosternum depressed immediately anterior to procoxae. Tergosternal suture more or less straight. **Elytra** (Figs. 130–131): Elytron convex, slightly flattened dorsally; punctures small and evenly spaced; interstitial intervals 3, 5, 7, and 9 weakly raised and shiny for entire length; intervals 4 and 6 slightly raised at mid-length (not as strong as 3, 5, 7, and 9). Basal margin with intervals 3 and 5 ending in a small knob-like protuberance; finger-like callosity on the elytral shoulder small. **Legs:** Setation sparse; inner face of tibia with 2 prominent fringes of relatively long setae. Ventral apex of tibia with 2 pockets of dense setae that arise on either side of the large, curved tibial spur. Tarsus sparsely setose except for 2 pockets of dense setae on the ventral surface at the apex of tarsomeres 1–3. **Abdomen:** Punctures on ventrite V smaller and denser than on ventrites I–IV. In females, posterior face of ventrite V with a semicircular excised notch, the dorsal margin of which bears a small point (Figs. 138–139). In males, tip of ventrite V simple (Fig. 137). **Aedeagus:** Phallobase as in Fig. 164. Tegmen consisting of a single arcuate median plate; plate with small emargination anteromedially. Basal piece with short anterolateral struts; struts straight to subtly curved anteriorly. Parameres moderately short, lateral margins strongly arcuate, widely separated and individually articulated to phallobase, internal lateral margins sinuate; paramere sparsely setose with short setae at lateral and apical margins; dorsal surface of paramere with well-developed, curved process; process thickest at base, narrowing apically, about half as long as the paramere, apex pointed; processes narrowly separated medially. Penis similar to Fig. 169; short, moderately thick, slightly curved; apex narrowed and pointed; base slightly expanded, bearing moderately long, paired anterior struts. Penis lighter for short portion near basal tip.

Variation. The size and color vary within the species. In some specimens, the anterior portion of the median longitudinal canal is short and very narrow; in others, the anterior portion is not distinctly visible, but the surrounding area is impressed. The degree of carination of the elytral interstitial intervals is also somewhat variable, ranging from slightly raised to distinctly raised and shiny.

Distribution. Australia: Western Australia (Fig. 174).

Biology. In the description, Lea (1898) stated that *D. xanthorrhoeae* "... may frequently be obtained from the dead crowns of various species

of *Xanthorrhoea* and occasionally from similar situations in *Kingia australis*." One specimen was taken in *Xanthorrhoea* sp. [WAMP 12NL], one specimen was taken in log heartwood [ANIC 299NL], and two specimens were taken from "Blackboy" grass trees (= *Xanthorrhoea* spp., Xanthorrhoeaceae) [WAMP 9–10NL, WAMP 50NL, WAMP 57–58NL, WAMP 64–65NL]. One specimen was in an inquiline collection, card-mounted with an ant [WAMP 25NL].

Remarks. Lea (1898) did not mention the number of specimens he examined. Only two specimens from Swan River (card-mounted together) were located that matched the type locality and had labels consistent with Lea's syntypes. In order to stabilize this name, a lectotype and paralectotype are **here designated** from the syntype series of *D. xanthorrhoeae*.

Type Locality. Swan River, Chidlow's Well, Pinjarra, Western Australia.

Type Material Examined. LECTOTYPE (Figs. 250–251) (SAMA, left specimen, card-mounted with paralectotype) label data: "TY [handwritten on card-mount beneath left specimen] // xanthorrhoeae Lea TYPE Swan R [in Lea's hand] // 9572 *Deretaphrus xanthorrhoeae* Lea W. Australia TYPE [handwritten in black ink, "TYPE" written in red ink on right side of label] // S. Aust. Museum specimen [orange label]" [SAMA 275, examined]. Sex not determined. PARALECTOTYPE (SAMA, right-most specimen on card-mount, mounted with lectotype) label data: same as above [SAMA 276NL, examined]. Sex not determined.

Additional Material Examined (53).

AUSTRALIA: WESTERN AUSTRALIA: Augusta (ANIC 168NL); Bejoording (WAMP 8NL); Beverly (MVMA 2NL); Denmark (WAMP 48NL); Dryandra Forest, 27 km. NW. of Narrogin (WAMP 60NL); Dunsborough (ANIC 299NL); Eradu (SAMA 127NL); Julimar Forest (WAMP 64–65NL); King George Sound (AMSA 62–63NL, MAMU 11–12NL); Marivale Downs, East Esperance (MCZ 36NL); Geraldton (MVMA 3NL); Gingin (WAMP 52NL); Gnaragara (WAMP 1NL, WAMP 3–7NL); Green Head (WAMP 44NL); Karridale (ANIC 235NL); Mundaring (BMNH 55–56NL); Muresk (WAMP 9NL); Perth (MCZ 34–35NL, SAMA 85–88NL); Pinjarra (BMNH 58NL); Spencers Brook (WAMP 10NL, WAMP 12NL); Swan River (ANIC 58NL, SAMA 167NL); Walyunga National Park (WAMP 50NL, WAMP 57–58NL); Wanneroo (WAMP 25NL); no locality (ANIC 59NL, BMNH 57NL, BMNH 59NL, MVMA 1NL, UQIC 32NL). STATE UNKNOWN: Ivaneru (WAMP 11NL); no locality (ANIC 61NL, MNHUB 46NL, SAMA 161–162NL, SAMA 166NL).

Unassigned *Deretaphrus* Specimens. The following specimens could not be confidently identified, as they were either missing body parts critical to identification or fell outside the accepted boundaries of variation according to our species definitions. It is possible a greater degree of morphological variability exists within some species, and/or the natural ranges are far larger than currently recorded. In some cases, a few of the specimens below may represent distinct species (especially from W. Australia and northern Queensland), but conservative identifications were made until more material becomes available. In a few instances, specimens thought to be erroneously labeled are included here and are excluded from the distribution maps.

AUSTRALIA: NEW SOUTH WALES: Clyde River (MAMU 8NL); Smiggins Hole, Kosciusko National Park (HNHM 11NL); Wagga Wagga (BPBM 20NL); no locality (HNHM 1NL, MAMU 42NL, MNHUB 53–54NL). NORTHERN TERRITORY: Mundingbarry H.S., 9 km. E (ANIC 167NL); Mundingbarry H.S., 9 km. N by E (ANIC 236NL); Port Darwin (SAMA 154NL); Stapleton (SAMA 190NL). QUEENSLAND: Ban Ban Range, via Coalstoun Lakes (ANIC 124NL); Endeavour River (MAMU 9–10NL); Herberton (MVMA 83NL); West Claudie River, Iron Range (AAIC 3NL, QMBA 8NL). SOUTH AUSTRALIA: Adelaide (MNHUB 1NL). TASMANIA: no locality (BMNH 35NL). VICTORIA: no locality (MNHUB 8NL). WESTERN AUSTRALIA: Fremantle (BMNH 103NL); Gnaragara (WAMP 2NL); Hamel (SAMA 151–152NL); Mingenew (BPBM 30NL); Mundaring (BMNH 19NL); Rockingham (MNHUB 52NL); no locality (MNHUB 45NL). STATE UNKNOWN: no locality (BPBM 10NL, BPBM 12NL, MAMU 5–7NL, MNHUB 50–51NL, MNHUB 55–56NL).

Possible Erroneous Labels. There are a few specimens from Hamel, W.A. in the UQIC. These are *D. wollastoni* but are most likely mis-labeled. The two specimens preceding this series (UQIC 34NL, UQIC 41NL) are from Brisbane and are in a sequence with the Hamel specimens (according to the UQIC Reg. numbers affixed to the specimens). Therefore, it is likely the specimens were affixed with a Hamel, W.A. label in error (UQIC 24NL, UQIC 38–40NL). There is a single specimen in the UQIC labeled from Brisbane, Queensland (UQIC 28NL). The specimen is *D. xanthorrhoeae* and was perhaps mis-labeled.

Possible New Species. Three morphotypes were not assigned to a species due to lack of additional material. We elect to keep these specimens undetermined until more material can be collected. For ease of reference, we refer to these as *Deretaphrus* morphotypes 1–3.

Morphotype 1. AUSTRALIA: WESTERN AUSTRALIA: Bridgetown (SAMA 165NL); Denmark (ANIC 60NL); Forrestfield (WAMP 67NL); Melaleuca Park, 12 km. NE of Wanneroo (WAMP 59NL); Pinjarra (SAMA 164NL).

Morphotype 2. AUSTRALIA: SOUTH AUSTRALIA: Serpentine Lakes, East side near dune crest (SAMA 236NL).

Morphotype 3. AUSTRALIA: QUEENSLAND: Coen (ANIC 208NL); Tolga (ANIC 297NL); Tolga, 7 km. NE (ANIC 292, ANIC 298NL).

CHECKLIST OF THE SPECIES OF *DERETAPHRUS* NEWMAN

Deretaphrus Newman, 1842
aequaliceps Blackburn, 1903
alveolatus Carter and Zeck, 1937
analisis Lea, 1898
antennatus Lord and McHugh, **new species**
boliviensis Lord and McHugh, **new species**
bucculentus Elston, 1923, **new status**
carinatus Lord and McHugh, **new species**
erichsoni Newman *in* Wollaston and Newman, 1855
granulipennis Reitter, 1877
fossus Newman, 1842
cordicollis Blackburn, 1903
gracilis Blackburn, 1903
hoplites Lord and McHugh, **new species**
ignarus Pascoe, 1862
pascoei Macleay, 1871
incultus Carter and Zeck, 1937
interruptus Grouvelle, 1903
iridescens Blackburn, 1903, **new status**
lateropunctatus Lord and McHugh, **new species**
ocularis Lord and McHugh, **new species**
oregonensis Horn, 1873
parviceps Lea, 1898
piceus (Germar, 1848)
bakewellii Pascoe, 1862
thoracicus Blackburn, 1903
puncticollis Lea, 1898
rodmani Lord and McHugh, **new species**
viduatus Pascoe, 1862
colydioides Pascoe, 1862
cribriceps Blackburn, 1903, **new synonymy**
popularis Blackburn, 1903, **new synonymy**
sparsiceps Blackburn, 1903
wollastoni Newman *in* Wollaston and Newman, 1855
xanthorrhoeae Lea, 1898

ACKNOWLEDGMENTS

This study was conducted in partial fulfillment of MSc degree requirements at the University of Georgia for NPL. NPL thanks his advisory com-

mittee members, Joseph V. McHugh, Kenneth G. Ross, and Wendy B. Zomlefer, and is strongly indebted to the other students of the McHugh lab (Juanita Forrester, Adriano Giorgi, Chris Hartley, James Robertson, Floyd Shockley) for continual support and contributions.

We thank the following people for their help: C. Mille (Institut Agronomique néo-Calédonien) and M. Pereboom (Alpharetta, Georgia) for providing translations of several references; Richard Smith (Dept. of Geography, Univ. of Georgia) for providing valuable instruction in the use of ArcGIS for mapping; John Shields (Center for Ultrastructural Studies, Univ. of Georgia) for assistance with SEM imaging; Roy Larimer (Visionary Digital) for imaging assistance; Axel Becker (Ernst-Moritz-Arndt University of Greifswald) for key testing; Robert Hoare (NZAC, Auckland, New Zealand) for assistance with Latin; Ralph Holzenthal (University of Minnesota) for assistance with digital illustration; and Tom Weir (CSIRO) for help with Australian locality information. We thank Stainlaw Adam Ślipiński, John Lawrence, Rich Leschen, Kelly Miller, Gino Nearn, and Mike Thomas for useful discussions and kind assistance with various phases of the project. Tatiana Kiselyova (Monroe, Georgia, USA) rendered the frontispiece illustration. Pia Scanlon (Department of Agriculture and Food, Western Australia) is credited for the image of *D. antennatus* (Figs. 4–5).

We thank the following individuals and associated institutions for loans of specimens and/or associated data: E. Matthews, SAMA; P. Lillywhite, MVMA; S. A. Ślipiński, ANIC; D. Smith, AMSA; D. Tree, QDPI; S. Myers, BPBM; Z. Simmons, OUMNH; P. Limbourg, IRSNB; T. Houston, WAMP; A. Taghavian and T. Deuve, MNHN; G. Daniels, UQIC; M. Barclay, BMNH; J. Boone, FMNH; D. Kavanaugh, CASC; G. Monteith, QMBA; C. Barr, EMEC; E. R. Hoebeke, CUIC; L. Herman, AMNH; P. Perkins, MCZ; M. Wall, SDNHM; G. Zolnerowich, KSUIC; P. Tinerella, INHS; R. Zack, WSUIC; W. Xie, LSCM, M. Uhlig, MNHUB; R. A. B. Leschen, NZAC; E. Riley, TAMU; S. Heydon, UCDC; M. Thomas and P. Skelley, FSCA; F. Génier, CMNC; M. Ivie, MSUC, MAIC; M. Caterino, SBMNH; A. Allen, AAIC, Boise, Idaho; C. Bellamy and A. Cline, CDFA; G. Hevel, USNM; D. Yanega, UCRC; C. Mille, SRF; S. Clark, BYUC; O. Merkl, HNHM; M. Clutterbuck and E. Jefferys, MAMU. Additional material from the USNM, FMNH, and QDPI-Mareeba was viewed with the aid of S. A. Ślipiński.

This study was supported by an NSF PEET grant (DEB-0329115) to J. V. McHugh, M. F. Whiting, and K. B. Miller. Additional support was provided by the H. H. Ross Fund and

the Department of Entomology at the University of Georgia.

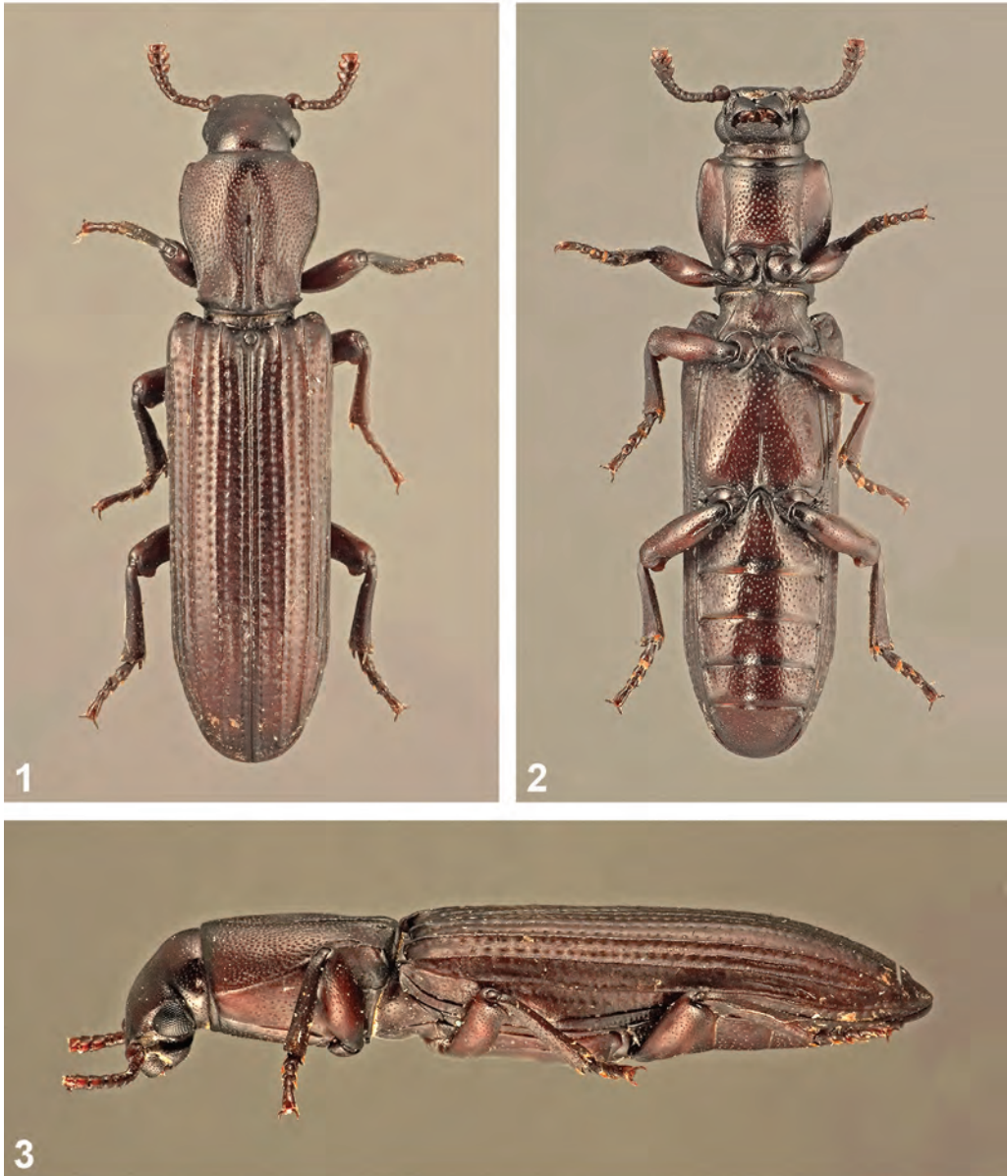
REFERENCES CITED

- Arnett, R. H., Jr., G. A. Samuelson, and G. M. Nishida. 1993.** The Insect and Spider Collections of the World, 2nd Edition. Flora and Fauna Handbook No. 11. Sandhill Crane Press, Gainesville, FL.
- Ashe, J. S. 1981.** Construction of pupal cells by larvae of Aleocharinae (Coleoptera: Staphylinidae). The Coleopterists Bulletin 35(3): 341–343.
- Balduf, W. V. 1935.** The Bionomics of Entomophagous Coleoptera. E. W. Classey Ltd., Hampton, UK.
- Blackburn, T. 1903.** Further notes on Australian Coleoptera, with descriptions of new genera and species. Transactions of the Royal Society of South Australia 27: 91–182.
- Borror, D. J. 1961.** Dictionary of Word Roots and Combining Forms. Mayfield Publishing, Mountain View, CA.
- Böving, A. G., and E. C. Craighead. 1931.** An illustrated synopsis of the principal larval forms of the order Coleoptera. Entomologica Americana (New Series) XI (1): 1–351.
- Burke, H. E. 1919.** Notes on a cocoon making colydiid (Coleopt.). Proceedings of the Entomological Society of Washington 21: 123–124.
- Carter, H. J., and E. H. Zeck. 1937.** A Monograph of the Australian Colydiidae. The Proceedings of the Linnean Society of New South Wales 62: 181–208 + pl. VIII–IX.
- Clausen, C. P. 1940.** Entomophagous Insects. McGraw-Hill Book Company, New York, NY.
- Craighead, F. C. 1920.** Biology of some Coleoptera of the families Colydiidae and Bothrideridae. Proceedings of the Entomological Society of Washington 22: 1–13.
- Craighead, F. C. 1950.** Insect Enemies of Eastern Forests. U.S. Department of Agriculture Miscellaneous Publication No. 657. United States Government Printing Office, Washington, DC.
- Crowson, R. A. 1955.** The Natural Classification of the Families of Coleoptera. Nathaniel Lloyd, London, UK (seen as 1967 reprint, E.W. Classey Ltd., Hampton, UK).
- Crowson, R. A. 1980.** On amphipolar distribution patterns in some cool climate groups of Coleoptera. Entomologia Generalia 6(2/4): 281–292.
- Crowson, R. A. 1981.** The Biology of the Coleoptera. Academic Press, London, UK.
- Elston, A. H. 1923.** Australian Coleoptera-Part IV. Transactions and Proceedings of the Royal Society of South Australia 47: 212–215 + pl. XV.
- Erichson, W. F. 1845.** Naturgeschichte der Insecten Deutschlands. Erste Abtheilung, Coleoptera, Vol. 3, pp. 1–320. Verlag der Nicolaischen Buchhandlung, Berlin.
- Essig, E. O. 1926.** Insects of Western North America. The MacMillan Company, New York, NY.
- Fauvel, A. 1903.** Faune analytique des coléoptères de la Nouvelle-Calédonie. Revue d'Entomologie 22: 203–387.
- Furniss, R. L., and V. M. Carolin. 1977.** Western Forest Insects. Miscellaneous Publication No. 1339, U.S. Department of Agriculture, Forest Service.
- Ganglbauer, L. 1899.** Die Käfer von Mitteleuropa. Die Käfer der österreichisch-ungarischen Monarchie, Deutschlands, der Schweiz, sowie des französischen und italienischen Alpengebietes. Vol. 3, Familienreihe Staphylinoidea, II. Theil: Scydmaenidae, Silphidae, ... Carl Gerold's Sohn, Vienna, Austria.
- Germar, E. F. 1848.** Insektenfauna von Adelaide. Linnaea Entomologica 3: 153–247.
- Grouvelle, A. 1903.** Descriptions de Clavicornes de Nouvelle-Calédonie. Revue d'Entomologie 22: 173–202.
- Hatch, M. H. 1961.** The Beetles of the Pacific Northwest. Part III: Pselaphidae and Diversicornia I. University of Washington Publications in Biology 16: 1–503.
- Heinze, E. 1943.** Studien zur Kenntnis der Tribus Deretaphrini und deren Stellung im System (Colydiidae). Entomologische Blätter für Biologie und Systematik der Käfer 39: 85–93, 97–124.
- Hetschko, A. 1930.** Colydiidae. In: *Coleopterorum Catalogus* Pars 107 (W. Junk and S. Schenkling, editors). Berlin, Germany.
- Horn, G. H. 1873.** Descriptions of some new North American Coleoptera. Transactions of the American Entomological Society 4: 143–152.
- Horn, G. H. 1878.** Synopsis of the Colydiidae of the United States. Proceedings of the American Philosophical Society 17: 555–592.
- Hunt, T., J. Bergsten, Z. Levkancicova, A. Papadopoulou, O. St. John, R. Wild, P. M. Hammond, D. Ahrens, M. Balke, M. S. Caterino, J. Gomez-Zurita, I. Ribera, T. G. Barraclough, M. Bocakova, L. Bocak, and A. P. Vogler. 2007.** A comprehensive phylogeny of beetles reveals the evolutionary origins of a superradiation. Science 318: 1913–1916.
- Lacordaire, J. T. 1854.** Histoire Naturelle des Insectes. Genera des Coléoptères ... Vol. 2. Librairie Encyclopédique de Roret, Paris, France.
- Lacordaire, J. T. 1876.** Histoire Naturelle des Insectes. Genera des Coléoptères ... Atlas, Vol. 1–12, 1854–1876. Librairie Encyclopédique de Roret, Paris, France.
- Lawrence, J. F. 1980.** A new genus of Indo-Australian Gempylodini with notes on the constitution of the Colydiidae (Coleoptera). Journal of the Australian Entomological Society 19: 293–310.
- Lawrence, J. F. 1985.** The genus *Teredolaemus* Sharp (Coleoptera: Bothrideridae) in Australia. Journal of the Australian Entomological Society 24: 205–206.
- Lawrence, J. F. 1991.** Bothrideridae (Cucujoidea) [pp. 477–479]. In: Immature Insects, Volume 2 (F.W. Stehr, editor). Kendall Hunt Publishing Company, Dubuque, IA.
- Lawrence, J. F., R. G. Beutel, R. A. B. Leschen, and S. A. Šlipiński. 2010.** 2. Glossary of morphological terms [pp. 9–20]. In: Handbook of Zoology. Volume IV: Arthropoda: Insecta, Part 38. Coleoptera, Beetles. Volume 2. Morphology and

- Systematics (Polyphaga partim). (R. G. Beutel, R. A. B. Leschen, and J. F. Lawrence, editors). W. DeGruyter, Berlin, Germany.
- Lawrence, J. F., and E. B. Britton. 1991.** 35. Coleoptera (Beetles) [pp. 543–683]. *In: The Insects of Australia: A Textbook for Students and Research Workers*, 2nd edition, Volume 2. Cornell University Press, Ithaca, NY.
- Lawrence, J. F., and A. F. Newton. 1995.** Families and subfamilies of Coleoptera (with selected genera, notes, references and data on family-group names) [pp. 779–1006]. *In: Biology, Phylogeny, and Classification of Coleoptera: Papers Celebrating the 80th Birthday of Roy A. Crowson.* (J. Pakaluk and S.A. Slipinski, editors), Muzeum i Instytut Zoologii PAN, Warszawa, Poland.
- Lawrence, J. F., A. S. Ślipiński, A. E. Seago, M. K. Thayer, A. F. Newton, and A. E. Marvaldi. 2011.** Phylogeny of the Coleoptera based on morphological characters of adults and larvae. *Annales Zoologici* 61(1): 1–217.
- Lea, A. M. 1898.** Descriptions of new species of Australian Coleoptera. Part V. The Proceedings of the Linnean Society of New South Wales 23: 521–645.
- Leschen, R. A. B. 1991.** Fiber formation and pupal cocoon spinning in *Platydemia* (Coleoptera: Tenebrionidae; Diaperinae). *Journal of the Kansas Entomological Society* 64(2): 237–238.
- Macleay, W. 1871.** Notes on a collection of insects from Gayndah. *The Transactions of the Entomological Society of New South Wales* 2: 79–205.
- Masters, G. 1871.** Catalogue of the described Coleoptera of Australia, Parts I–IV. P. White, machine printer, Sydney, Australia.
- McHugh, J. V., C. J. Marshall, and F. L. Fawcett. 1997.** A study of adult morphology in *Megalodacne herms* (Say) (Coleoptera: Erotylidae). *Transactions of the American Entomological Society* 123(4): 167–223.
- Newman, E. 1842.** List of insects collected at Port Philip, New South Wales, by Edmund Thomas Higgins, Esq. *The Entomologist* 1: 351–354, 361–369, 401–405.
- Nichols, S. W., and R. T. Schuh (editors). 1989.** The Torre-Bueno Glossary of Entomology. New York Entomological Society, New York, NY.
- Pal, T. K., and J. F. Lawrence. 1986.** A new genus and subfamily of mycophagous Bothrideridae (Coleoptera: Cucujoidea) from the Indo-Australian region, with notes on other related families. *Journal of the Australian Entomological Society* 25: 185–210.
- Pascoe, F. P. 1862.** On some Australian Colydiidae. *The Journal of Entomology. Descriptive and Geographical* 1: 460–468.
- Philips, T. K., and M. A. Ivie. 2002.** 90. Bothrideridae Erichson 1845 [pp. 358–362]. *In: American Beetles, Volume 2: Polyphaga: Scarabaeoidea through Curculionoidea* (R. H. Arnett, M. C. Thomas, P. E. Skelley and J. H. Frank, editors). CRC Press, Boca Raton, FL.
- Reitter, E. 1877.** Beitrag zur Kenntniss der Colydier. *Entomologische Zeitung* 38: 323–356.
- Sharp, D., and F. Muir. 1912.** The comparative anatomy of the male genital tube in Coleoptera. *Transactions of the Entomological Society of London.* 1912: 477–642.
- Ślipiński, A. S., N. P. Lord, and J. F. Lawrence. 2010.** 10.28. Bothrideridae Erichson, 1845 [pp. 411–422]. *In: Handbook of Zoology. Volume IV: Arthropoda: Insecta, Part 38. Coleoptera, Beetles. Volume 2. Morphology and Systematics (Polyphaga partim).* (R. G. Beutel, R. A. B. Leschen, and J. F. Lawrence, editors). W. DeGruyter, Berlin, Germany.
- Stephan, K. H. 1989.** The Bothrideridae and Colydiidae of America north of Mexico (Coleoptera: Clavicornia and Heteromera). *Occasional Papers of the Florida State Collection of Arthropods* 6: 1–65.
- Wheeler, Q. D., and N. I. Platnick. 2000.** The phylogenetic species concept (*sensu* Wheeler and Platnick) [pp. 55–69]. *In: Species Concepts and Phylogenetic Theory: A Debate* (Q. D. Wheeler and R. Meier, editors). Columbia University Press, New York, NY.
- Wollaston, T. V., and E. Newman. 1855.** Art. XXXI.-Revision of the characters of *Deretaphrus* and descriptions of two new species, ccvii–ccxi *In: Appendix to the Zoologist for 1855. The Zoologist: A Popular Miscellany of Natural History* 13.

(Received 6 March 2013; accepted 20 October 2013. Publication date 20 December 2013.)

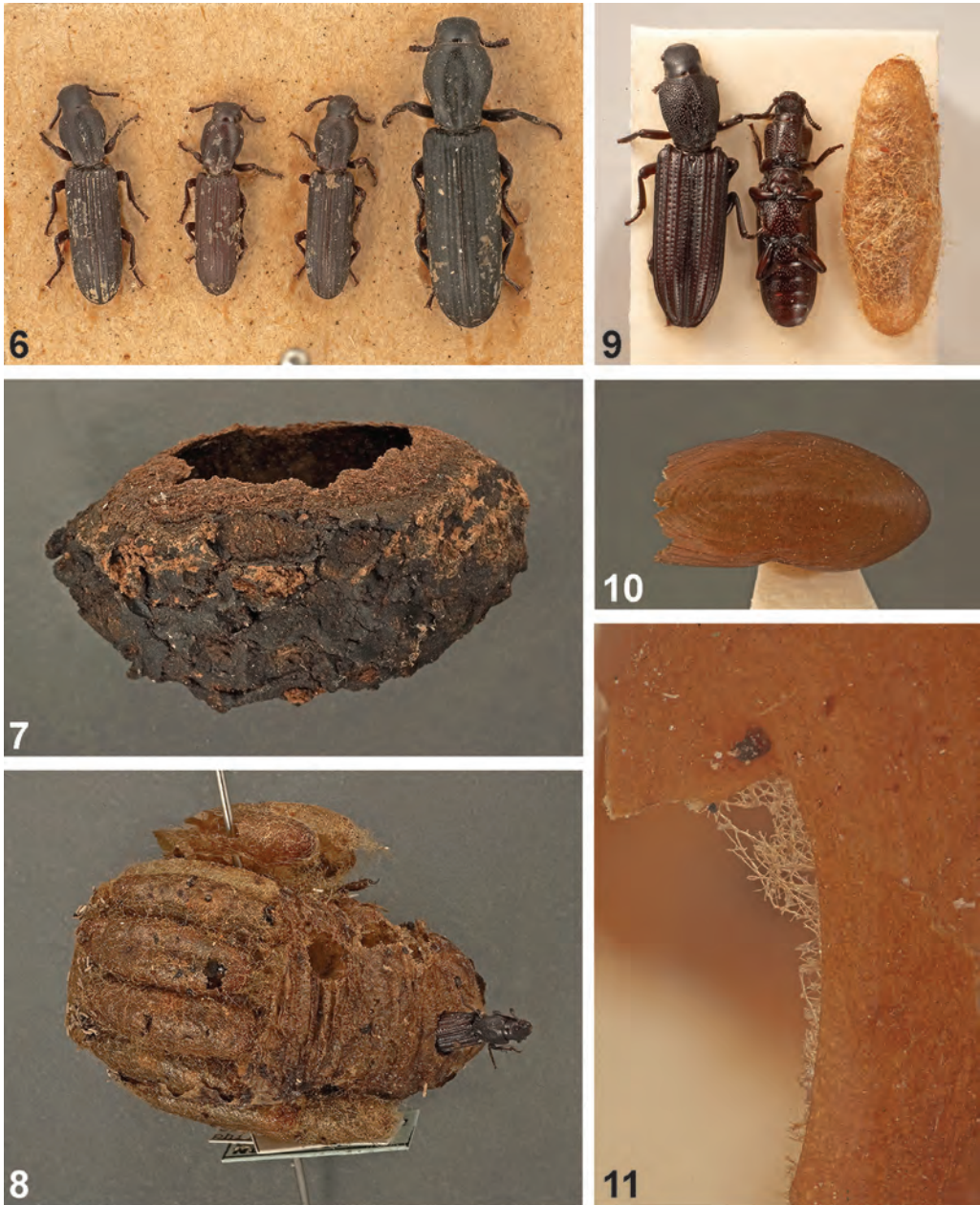
FIGURES



Figs. 1–3. *Deretaphrus fossus*, neotype. 1) Dorsal habitus; 2) Ventral habitus; 3) Lateral habitus.



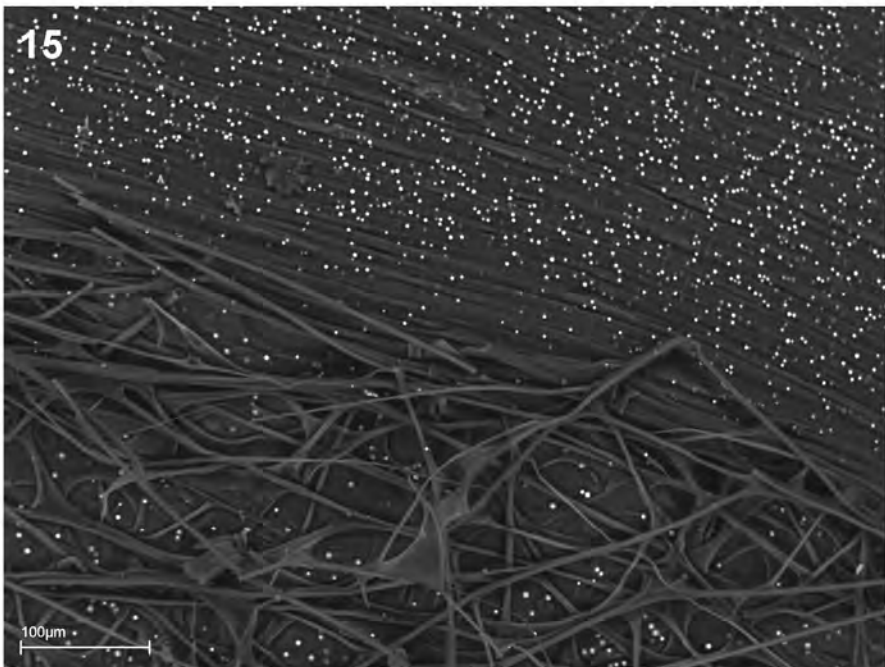
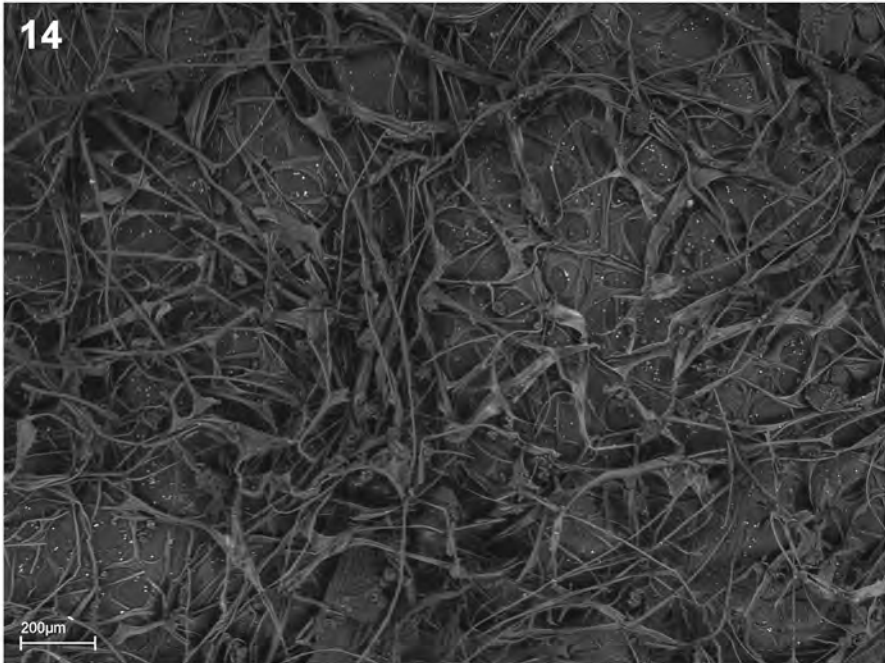
Figs. 4–5. *Deretaphrus antennatus*, live specimen from Barrow Island, Western Australia (Image credit: Pia Scanlon, Dept. of Agriculture and Food, Western Australia).



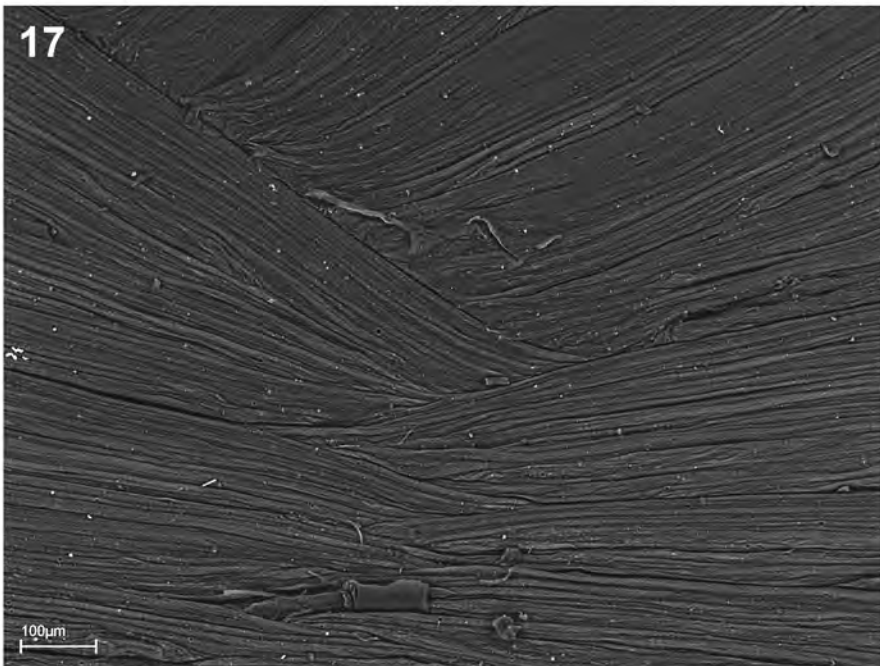
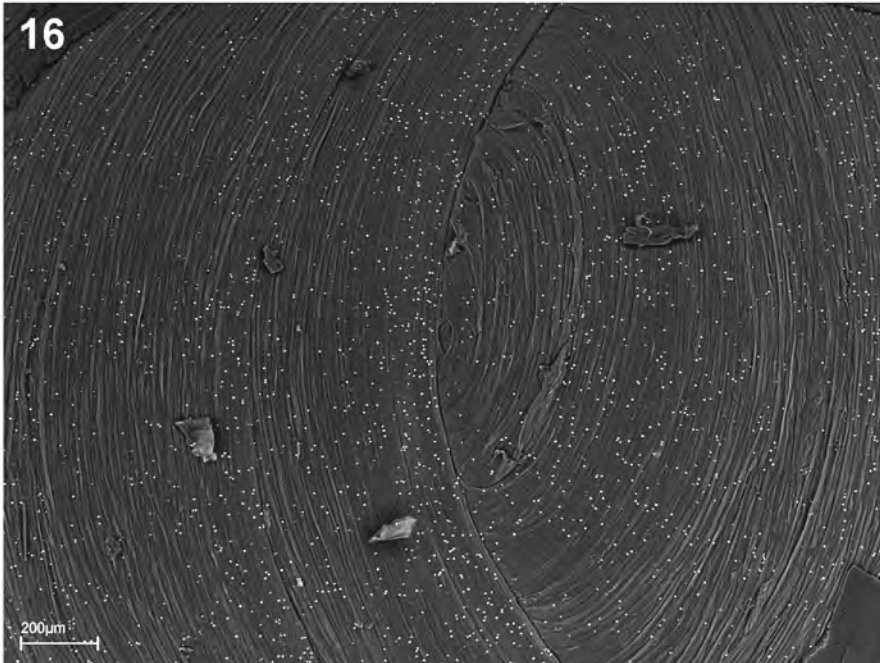
Figs. 6–11. *Deretaphrus* biology. **6)** Series of *D. viduatus* depicting size variability; **7)** Pupal cell of *Trichaulax philipsii*; **8)** *D. puncticollis*, pupal cocoon mass (with emerging adult) attached to larva of *T. philipsii*; **9)** *D. puncticollis*, with pupal cocoon; **10)** *D. xanthorrhoeae*, pupal cocoon; **11)** *D. viduatus*, pupal cocoon with silken threads and smooth external surface.



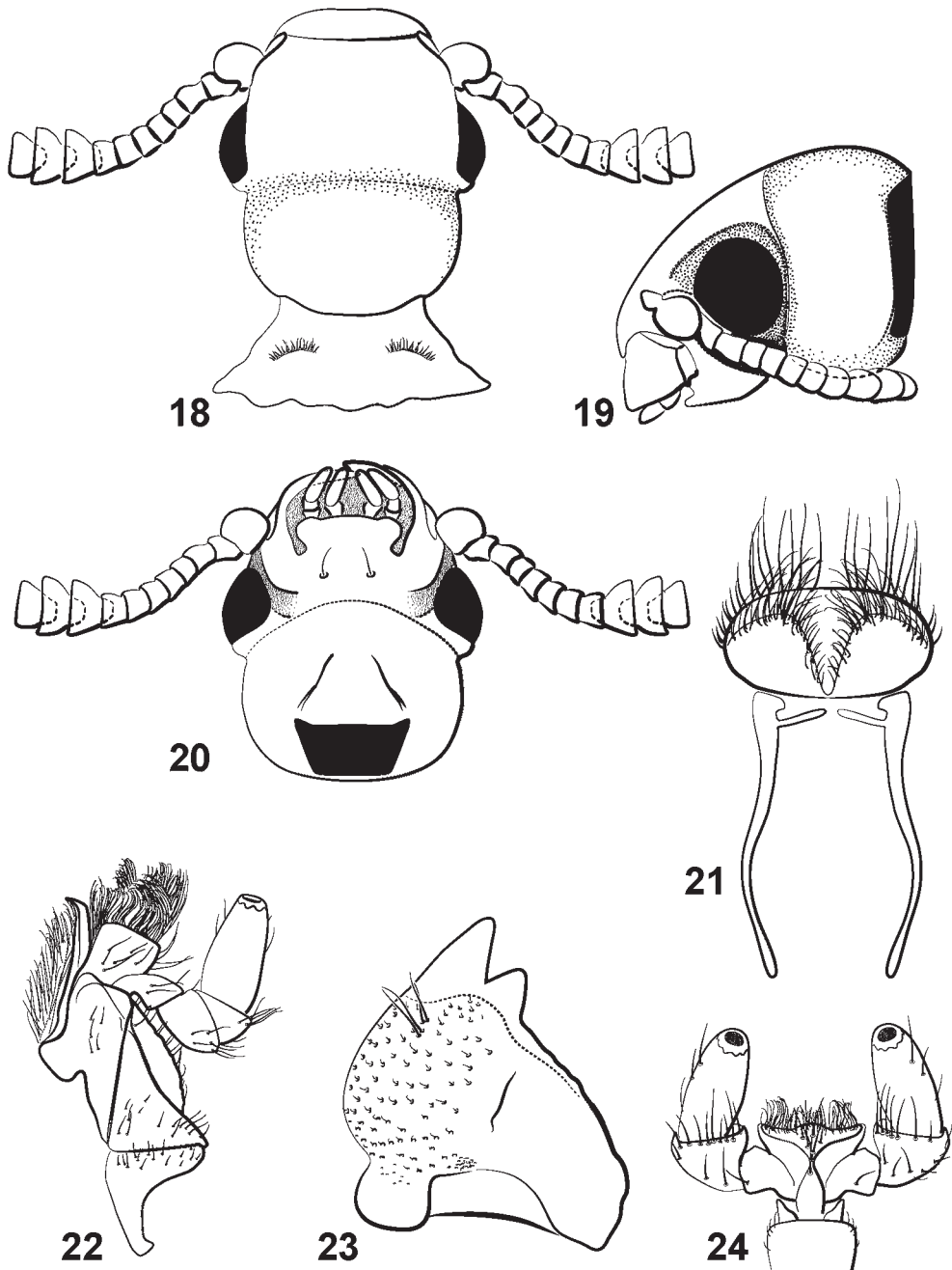
Figs. 12–13. *Deretaphrus xanthorrhoeae*, pupal cocoons. **12)** Dorsal view; **13)** Ventral view.



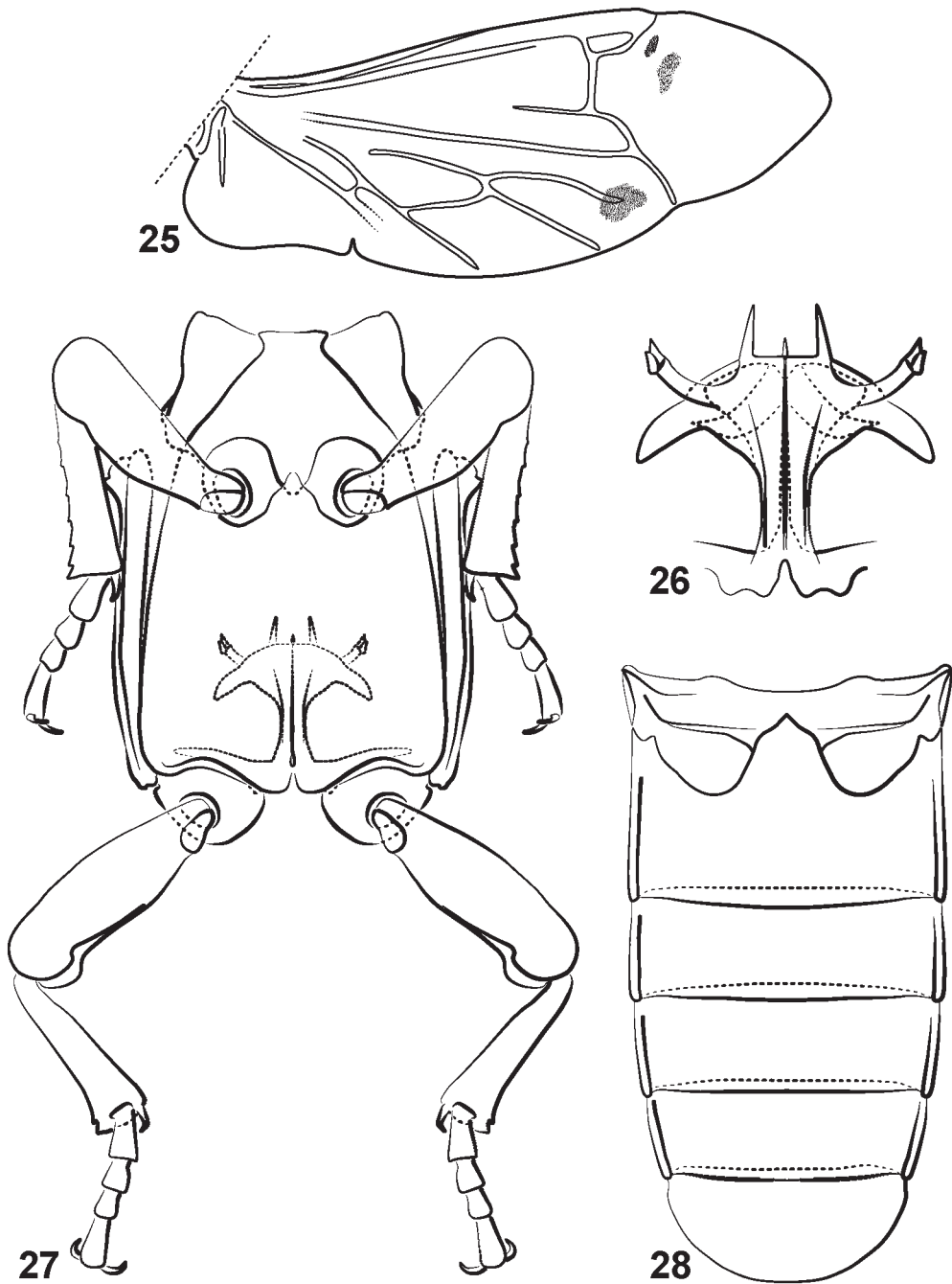
Figs. 14–15. *Deretaphrus* species pupal cocoon. **14)** *D. puncticollis*, 50X; **15)** *D. viduatus*, 70X.



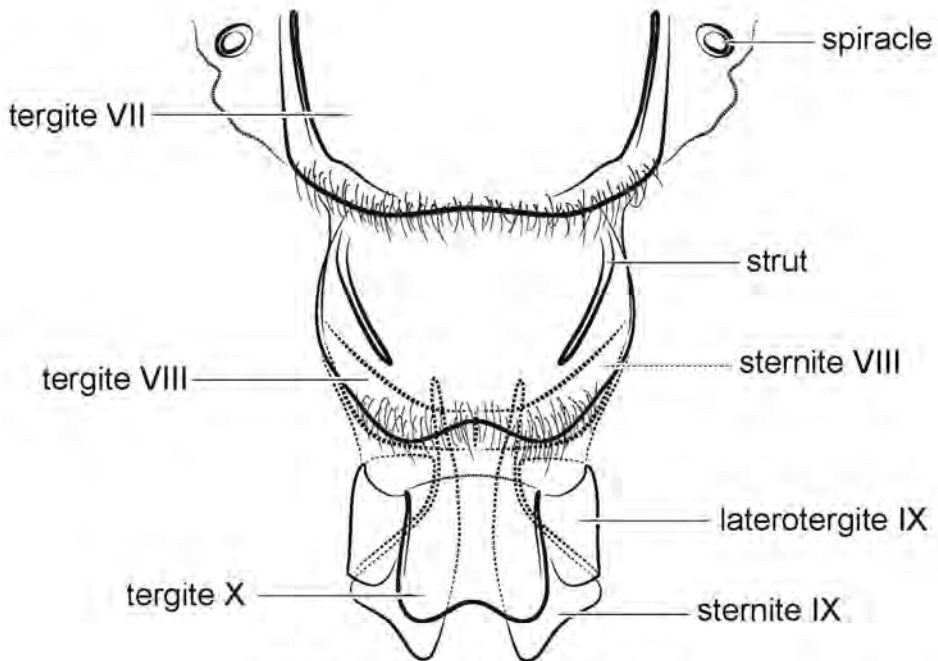
Figs. 16–17. *Deretaphrus xanthorrhoeae*, pupal cocoon. **16)** 50X; **17)** 100X.



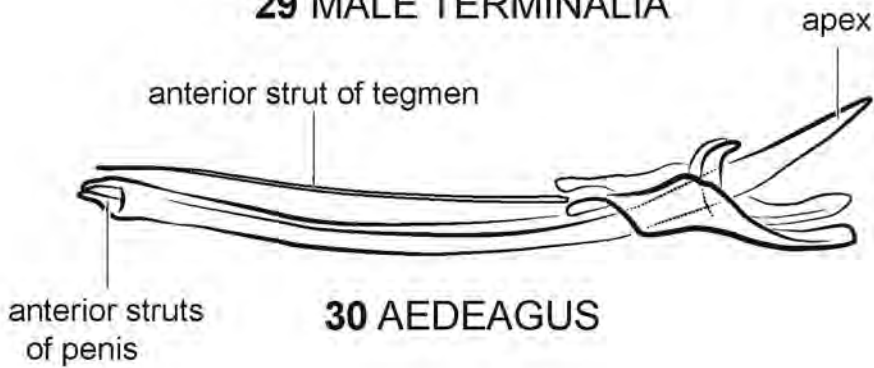
Figs. 18–24. *Deretaphrus fossus*, head morphology. **18)** Head, dorsal view; **19)** head, lateral view; **20)** Head, ventral view; **21)** Labrum, ventral view; **22)** Maxilla, ventral view; **23)** Left mandible, dorsal view; **24)** Labium, ventral view.



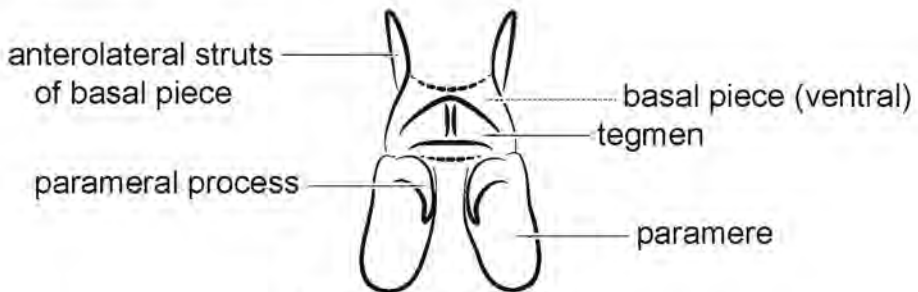
Figs. 25–28. *Deretaphrus fossus*, thorax and abdomen morphology. **25)** Metathoracic wing; **26)** Metendosternite, ventral view; **27)** Pterothorax, ventral view; **28)** Abdominal ventrites I–V, ventral view.



29 MALE TERMINALIA

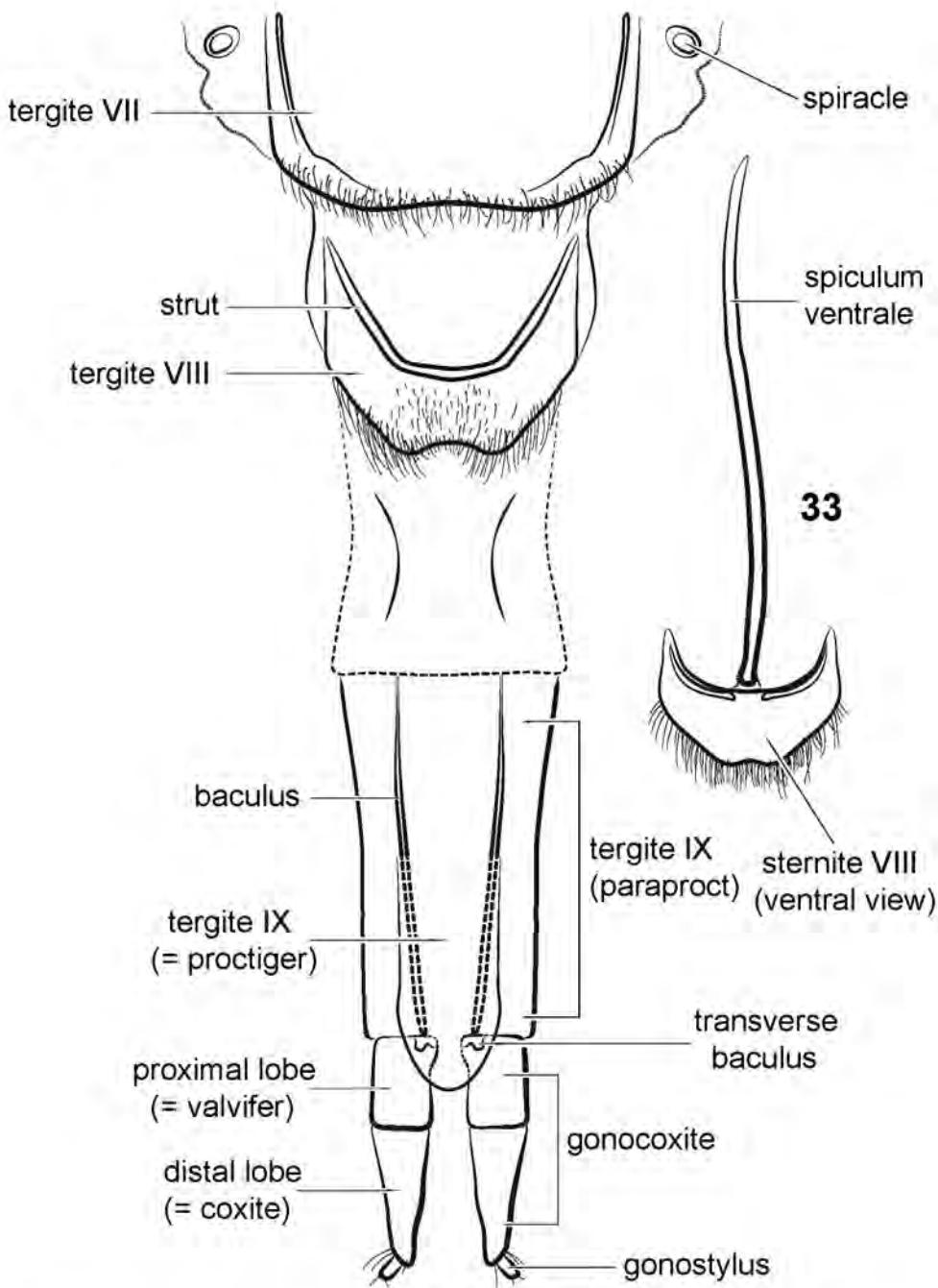


30 AEDEAGUS



31 PHALLOBASE

Figs. 29–31. Generalized male terminalia and genitalia of *Deretaphrus*. 29) Abdominal terminalia; 30) Aedeagus; 31) Phallobase.



32 FEMALE TERMINALIA and OVIPOSITOR

Figs. 32–33. Generalized female terminalia and genitalia of *Deretaphrus*. 32) Abdominal terminalia and ovipositor; 33) Sternite VIII, ventral view.

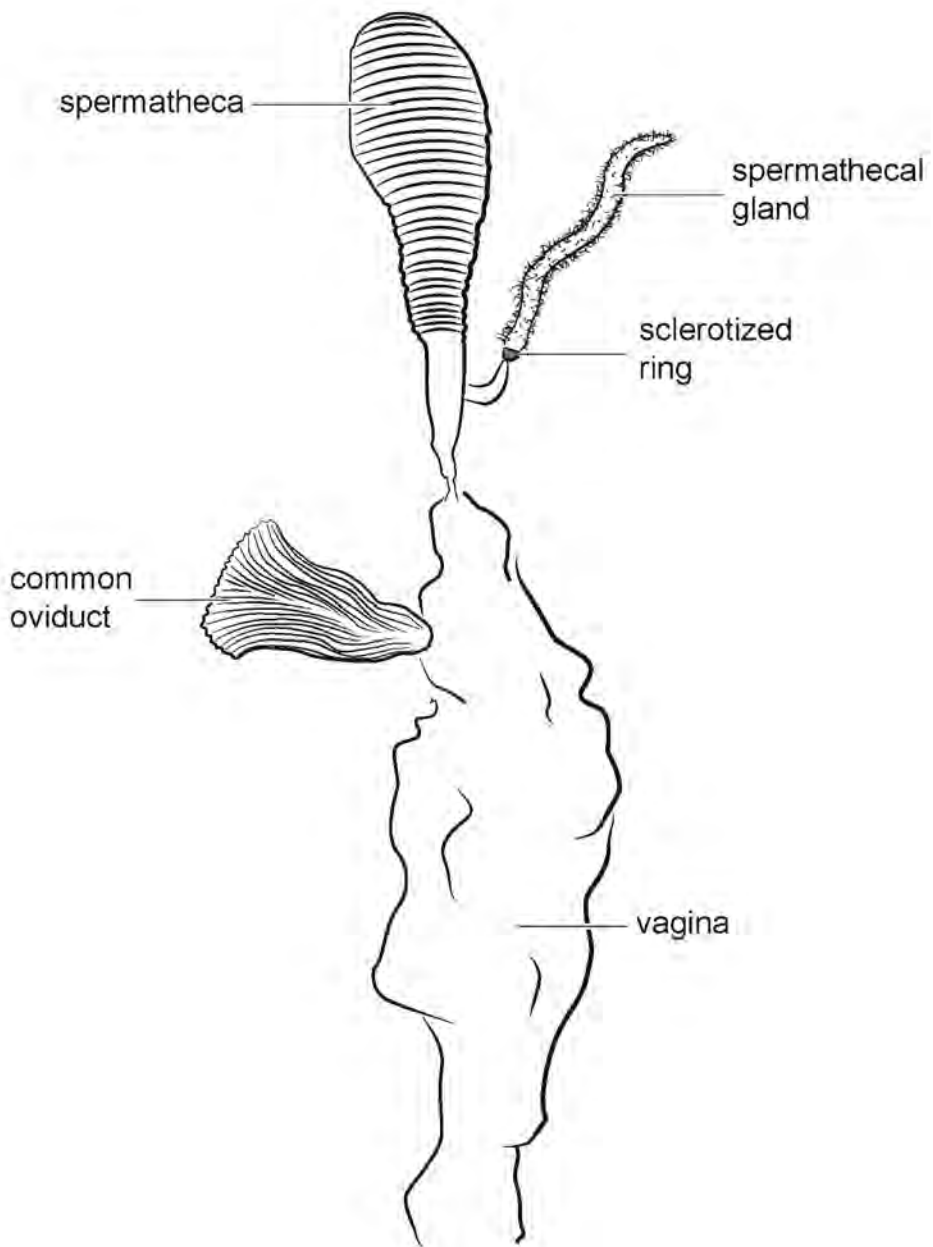
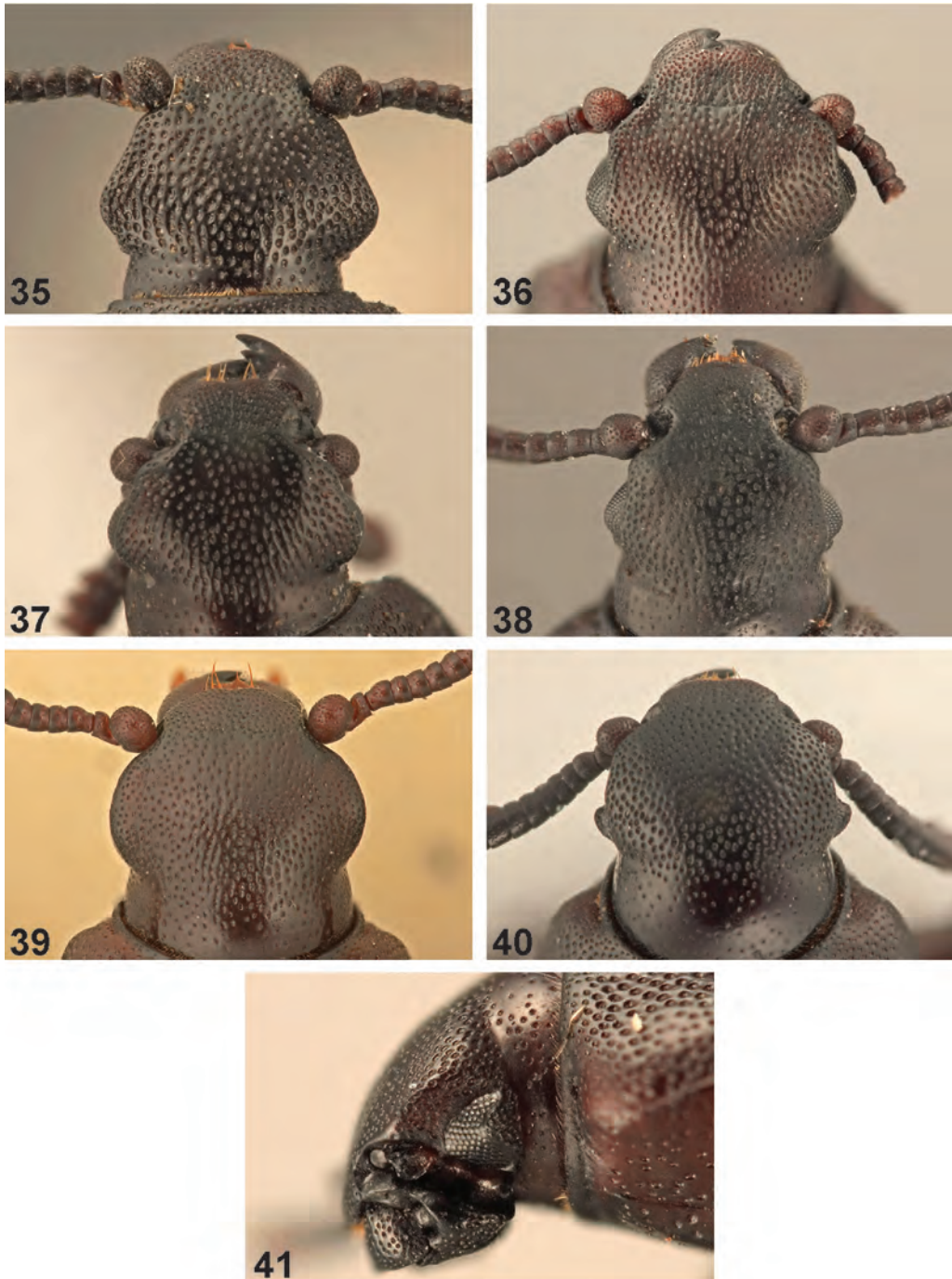
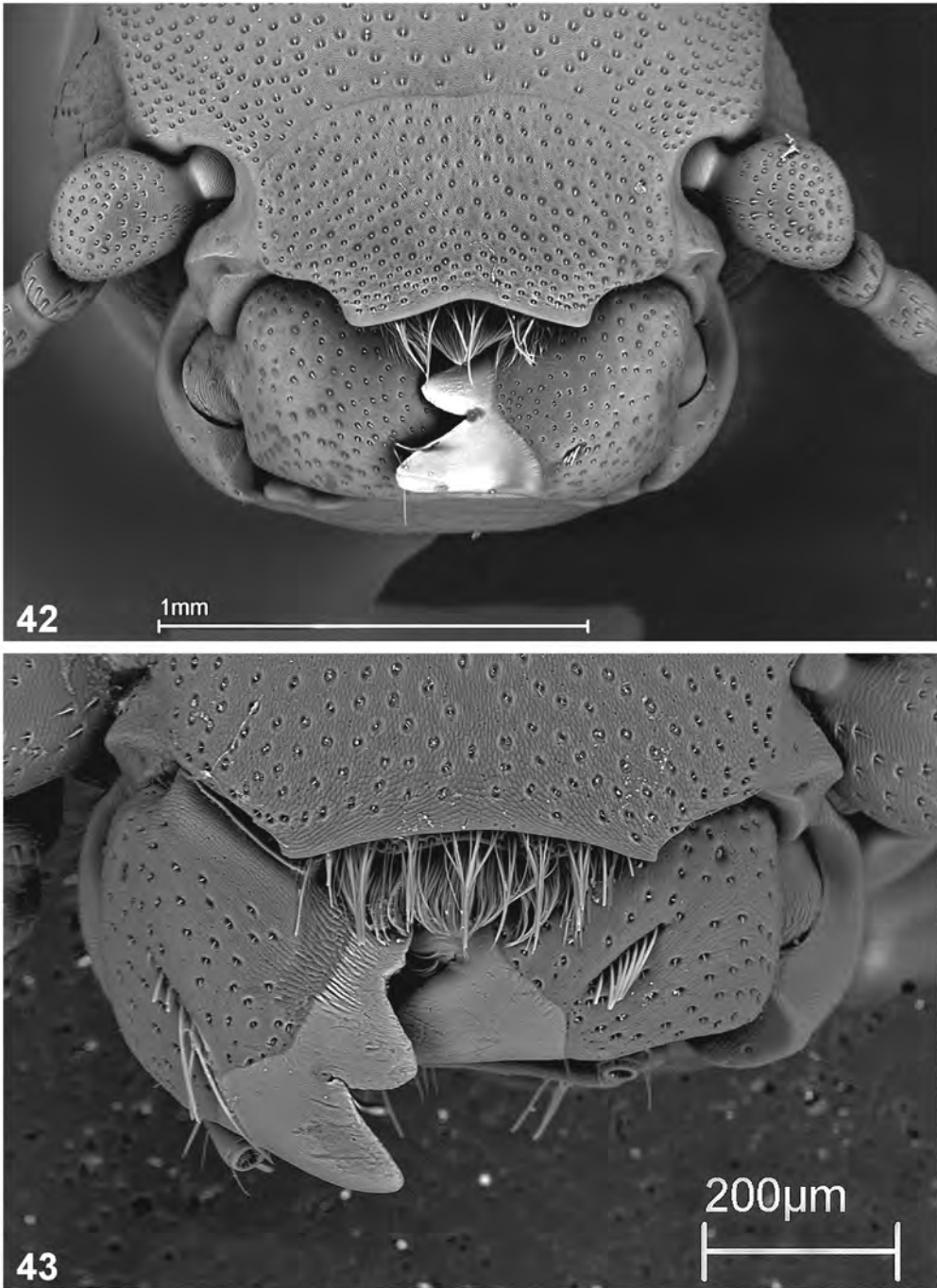


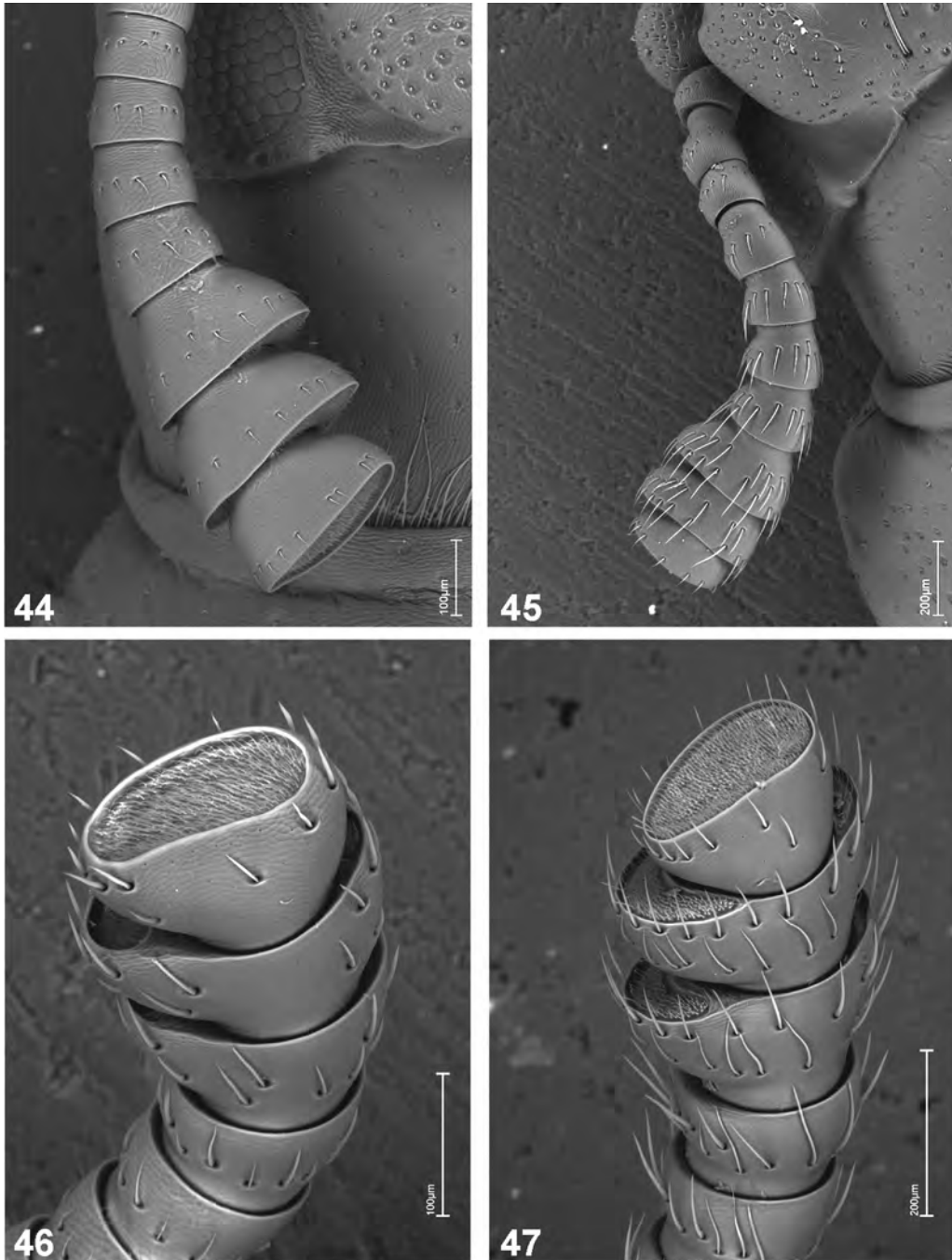
Fig. 34. Generalized female reproductive tract of *Deretaphrus*, ovaries removed.



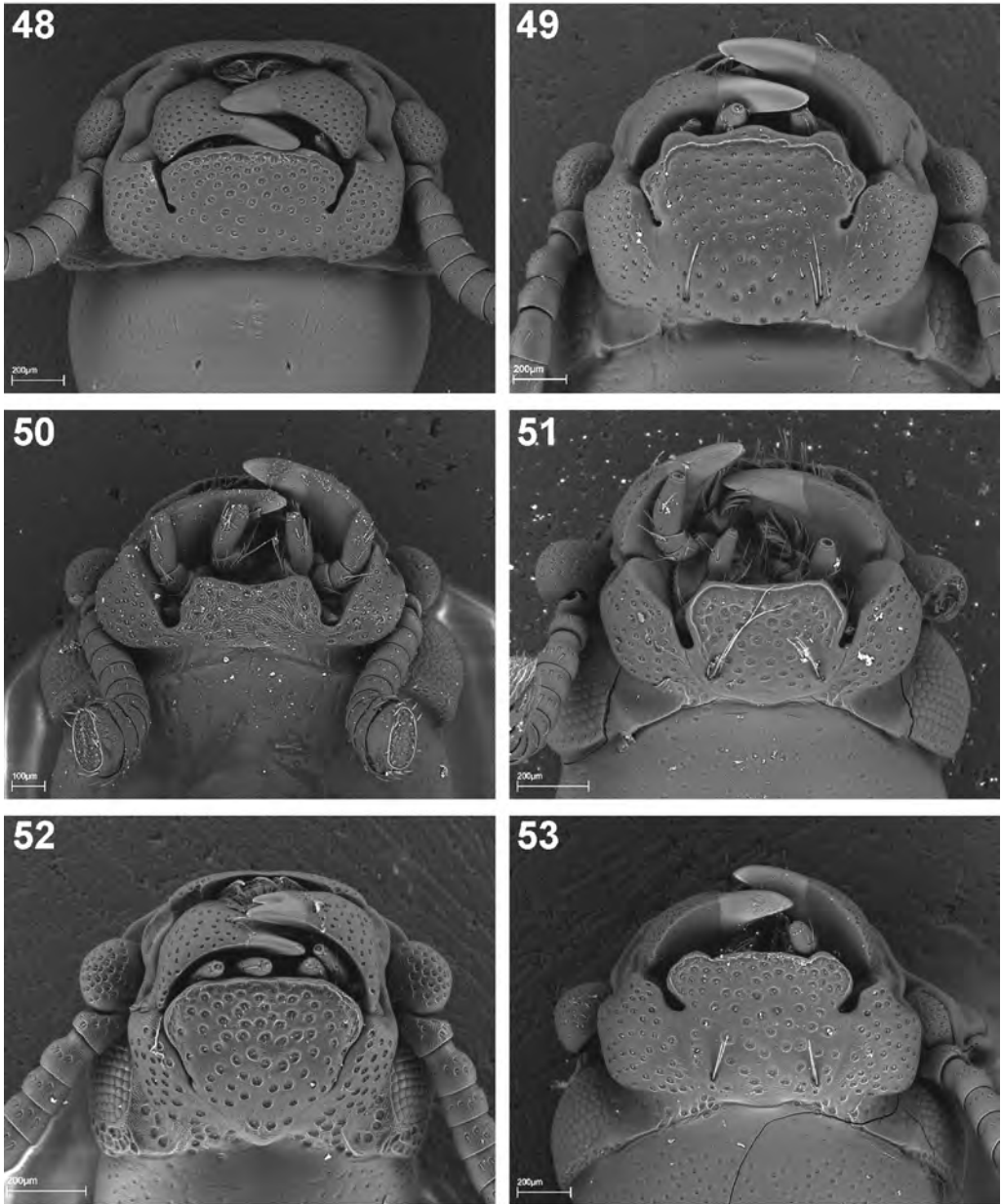
Figs. 35–41. *Deretaphrus* species, head. 35) *D. bucculentus*, dorsal view; 36) *D. carinatus*, dorsal view; 37) *D. incultus*, dorsal view; 38) *D. parviceps*, dorsal view; 39) *D. rodmani*, dorsal view; 40) *D. ocellaris*, dorsal view; 41) *D. ocellaris*, lateral view.



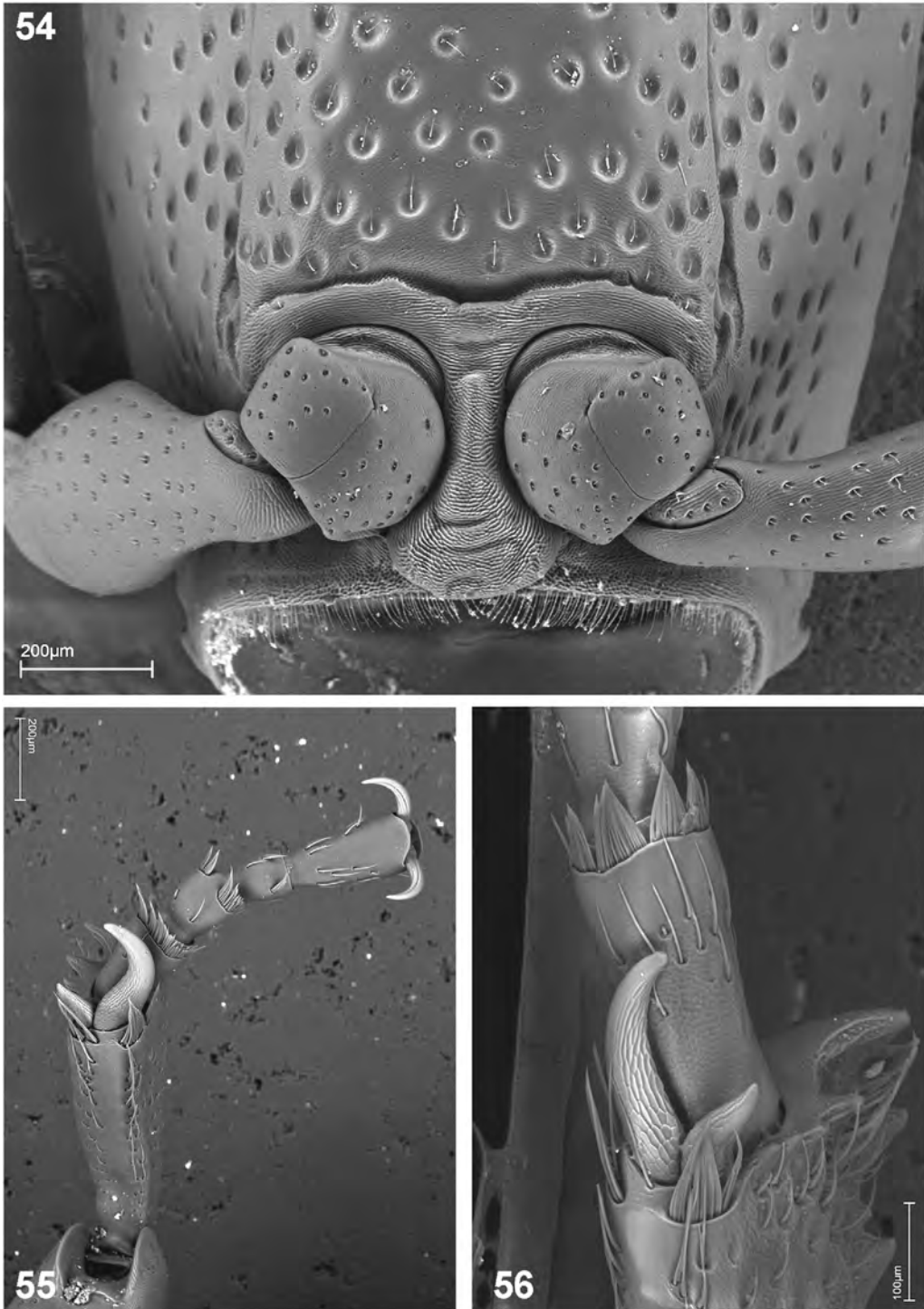
Figs. 42–43. *Deretaphrus* species, head showing clypeal emargination, mandibular setae, and areas of metal incorporation. 42) *D. interruptus*, anterior view; 43) *D. piceus*, anterior view.



Figs. 44–47. *Deretaphrus* species, antenna showing setal density. **44)** *D. erichsoni*, right antenna; **45)** *D. interruptus*, right antenna; **46)** *D. puncticollis*, left antennal club; **47)** *D. interruptus*, left antennal club.



Figs. 48–53. *Deretaphrus* species, head capsule, ventral view, showing setae and shape of submentum. **48)** *D. ignarus*; **49)** *D. interruptus*; **50)** *D. oregonensis*; **51)** *D. piceus*; **52)** *D. puncticollis*; **53)** *D. viduatus*.



Figs. 54–56. *Deretaphrus* species, morphology. **54)** *D. puncticollis*, prosternum; **55)** *D. erichsoni*, right protibia and protarsus; **56)** *D. erichsoni*, right mesotibial spurs.



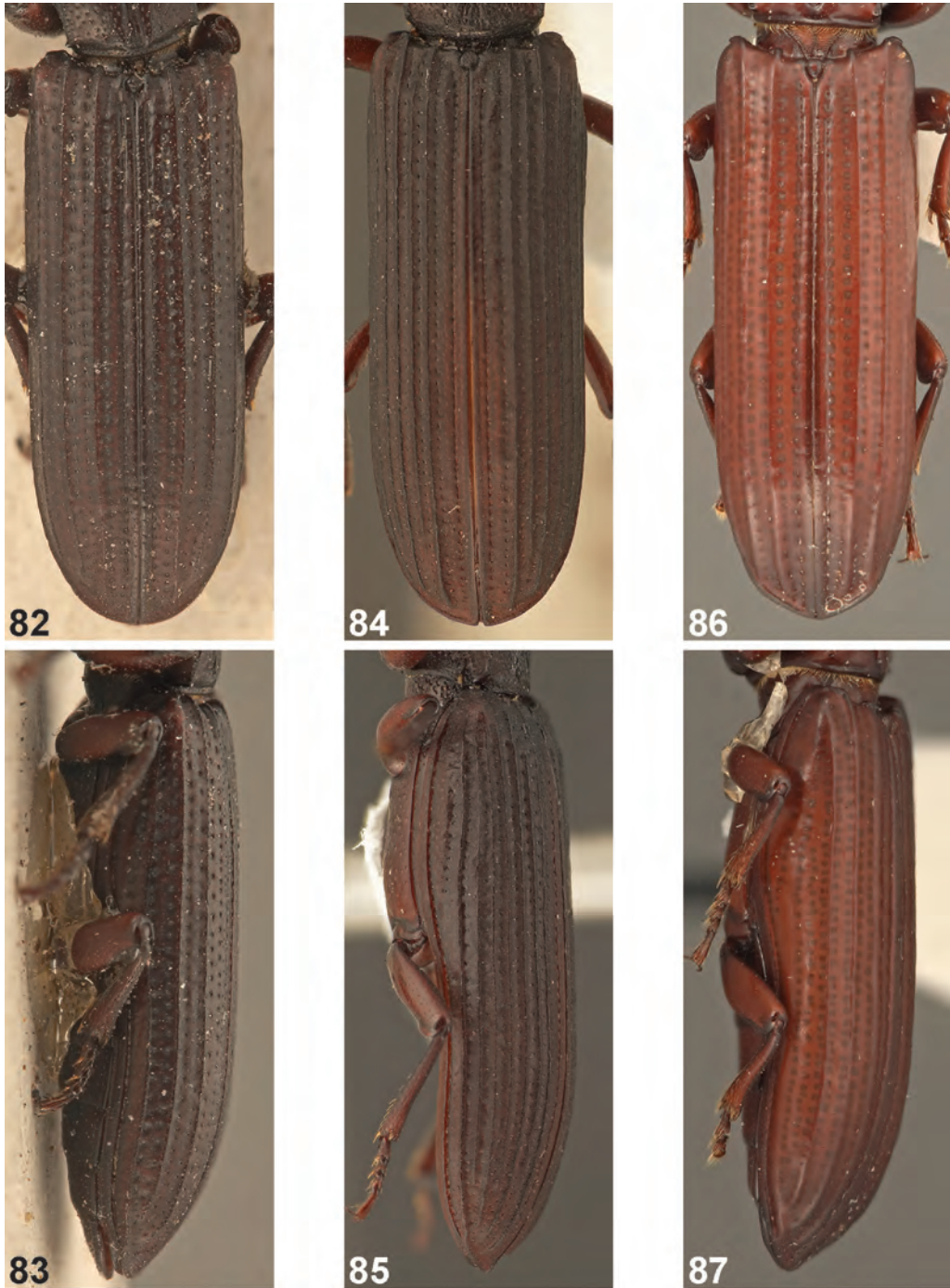
Figs. 57–65. *Deretaphrus* species, pronotum. **57)** *D. aequaliceps*; **58)** *D. alveolatus*; **59)** *D. analis*; **60)** *D. antennatus*; **61)** *D. boliviensis*; **62)** *D. bucculentus*; **63)** *D. carinatus*; **64)** *D. erichsoni*; **65)** *D. fossus*.



Figs. 66–74. *Deretaphrus* species, pronotum. 66) *D. gracilis*; 67) *D. hoplites*; 68) *D. ignarus*; 69) *D. incultus*; 70) *D. interruptus*; 71) *D. iridescens*; 72) *D. lateropunctatus*; 73) *D. ocellaris*; 74) *D. oregonensis*.



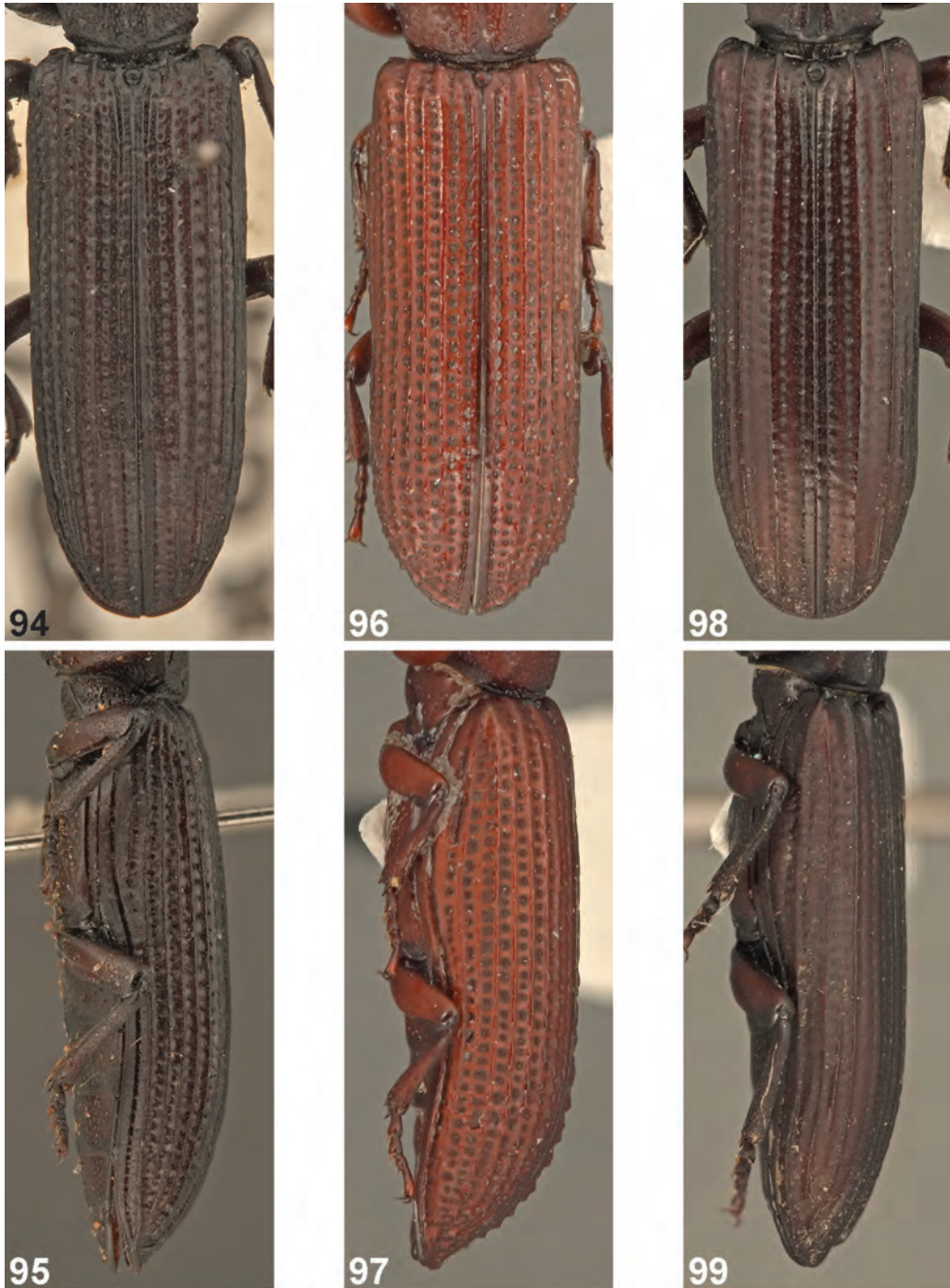
Figs. 75–81. *Deretaphrus* species, pronotum. **75)** *D. parviceps*; **76)** *D. piceus*; **77)** *D. puncticollis*; **78)** *D. rodmani*; **79)** *D. viduatus*; **80)** *D. wollastoni*; **81)** *D. xanthorrhoeae*.



Figs. 82–87. *Deretaphrus* species, elytra, dorsal and lateral views. 82–83) *D. aequaliceps*; 84–85) *D. alveolatus*; 86–87) *D. analis*.



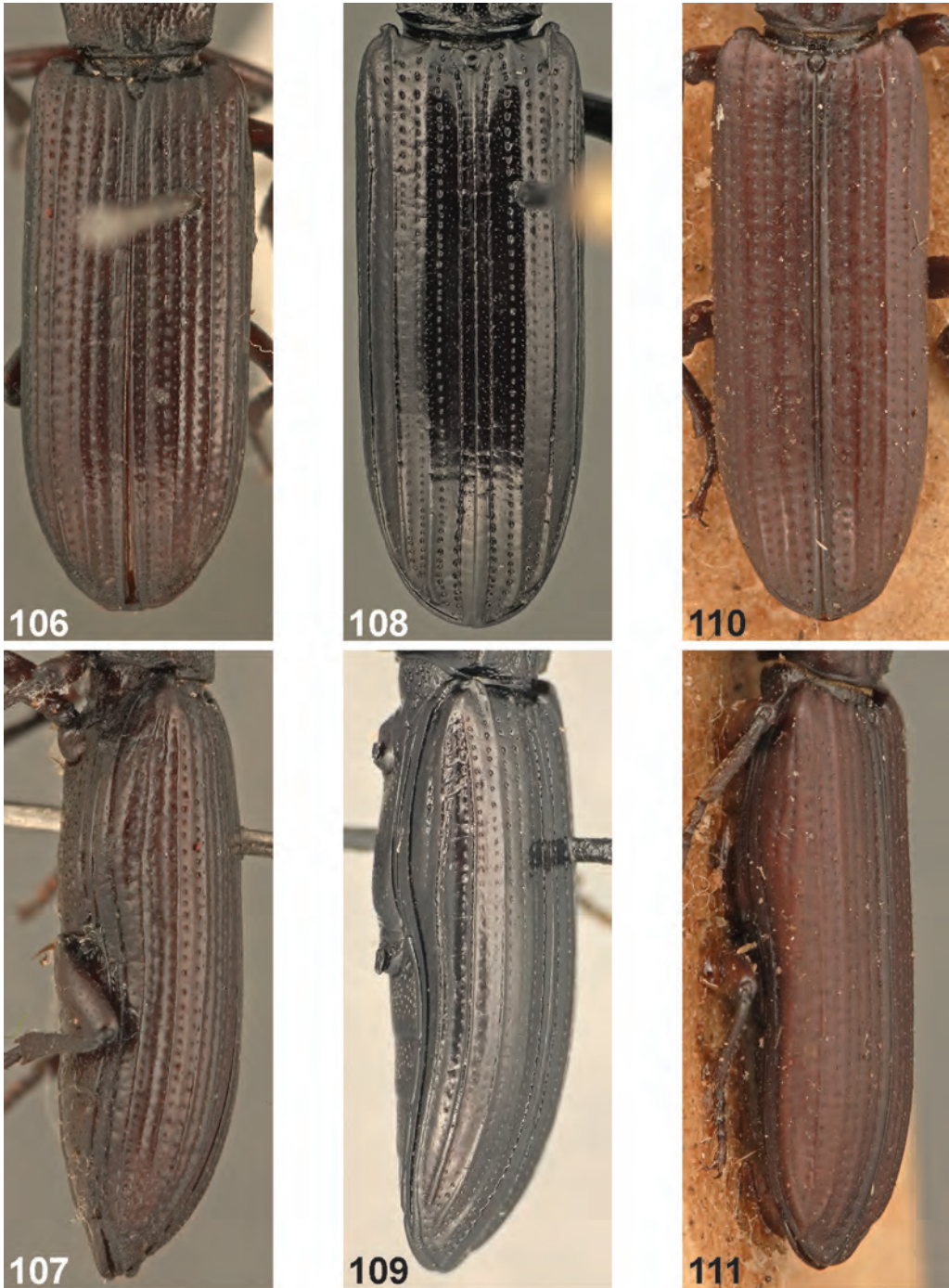
Figs. 88–93. *Deretaphrus* species, elytra, dorsal and lateral views. **88–89)** *D. antennatus*; **90–91)** *D. boliviensis*; **92–93)** *D. bucculentus*.



Figs. 94–99. *Deretaphrus* species, elytra, dorsal and lateral views. 94–95) *D. carinatus*; 96–97) *D. erichsoni*; 98–99) *D. fossus*.



Figs. 100–105. *Deretaphrus* species, elytra, dorsal and lateral views. **100–101)** *D. gracilis*; **102–103)** *D. hoplites*; **104–105)** *D. ignarus*.



Figs. 106–111. *Deretaphrus* species, elytra, dorsal and lateral views. 106–107) *D. incultus*; 108–109) *D. interruptus*; 110–111) *D. iridescens*.



Figs. 112–117. *Deretaphrus* species, elytra, dorsal and lateral views. 112–113) *D. lateropunctatus*; 114–115) *D. ocularis*; 116–117) *D. oregonensis*.



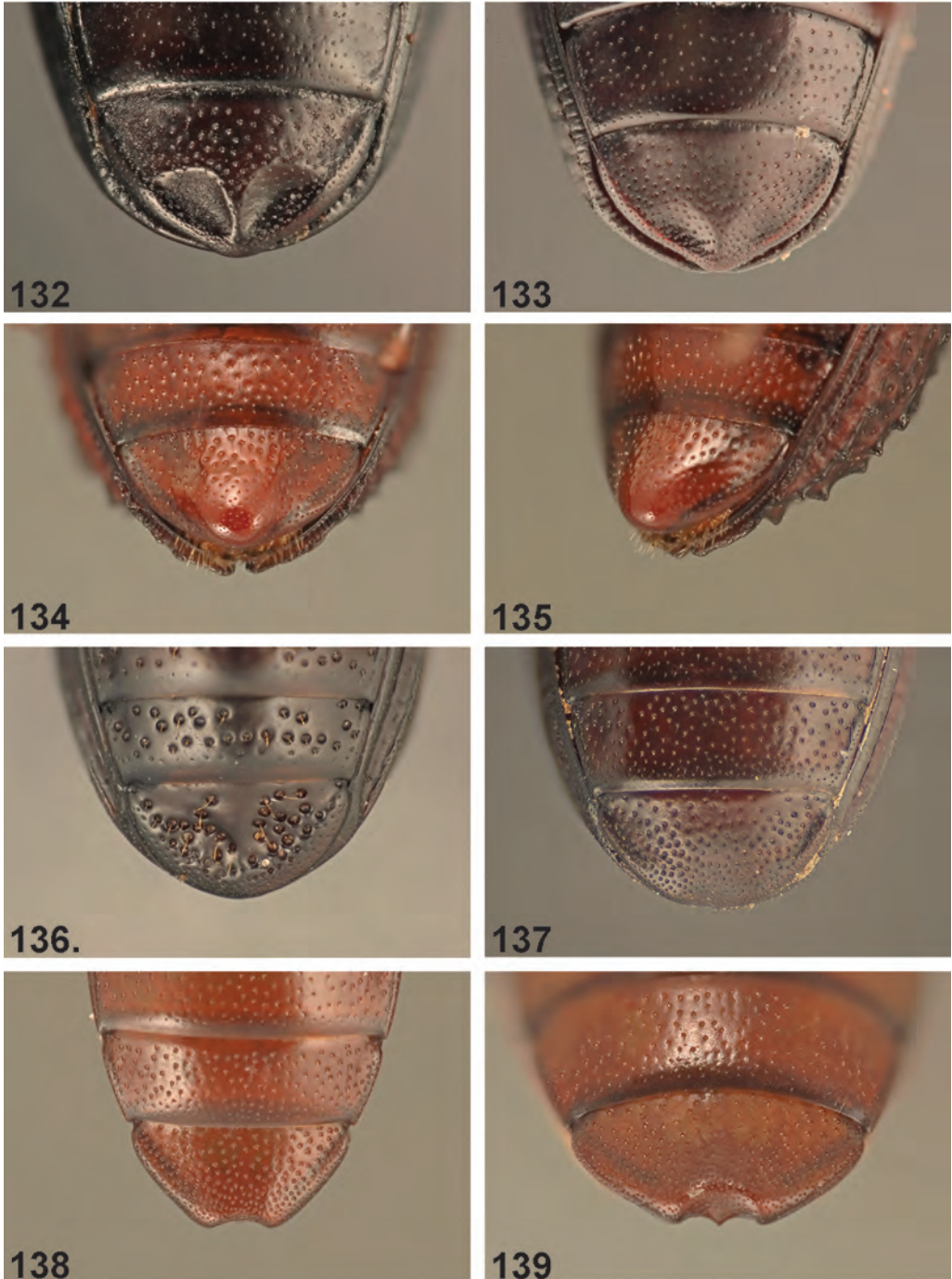
Figs. 118–123. *Deretaphrus* species, elytra, dorsal and lateral views. 118–119) *D. parviceps*; 120–121) *D. piceus*; 122–123) *D. puncticollis*.



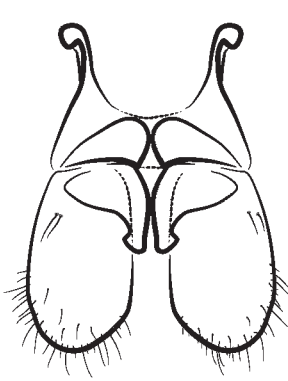
Figs. 124–129. *Deretaphrus* species, elytra, dorsal and lateral views. 124–125) *D. rodmani*; 126–127) *D. viduatus*; 128–129) *D. wollastoni*.



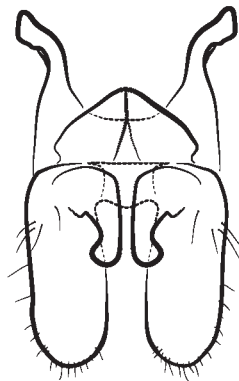
Figs. 130–131. *Deretaphrus* species, elytra. **130)** Dorsal view; **131)** Lateral view.



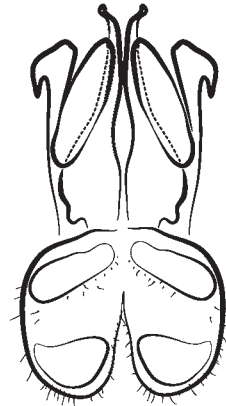
Figs. 132–139. *Deretaphrus* species, abdominal apex. **132)** *D. analis*, ventral view (either sex); **133)** *D. piceus*, ventral view (either sex); **134)** *D. erichsoni*, female, ventral view; **135)** *D. erichsoni*, female, oblique lateral view; **136)** *D. hoplites*, female, ventral view; **137)** *D. xanthorrhoeae*, male, ventral view; **138)** *D. xanthorrhoeae*, female, ventral view; **139)** *D. xanthorrhoeae*, female, posterior view.



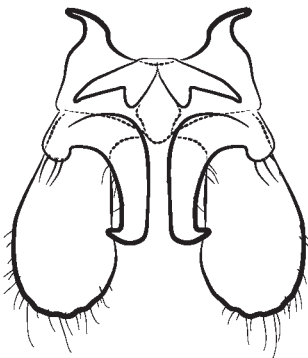
140



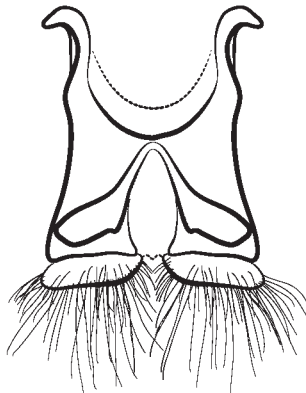
141



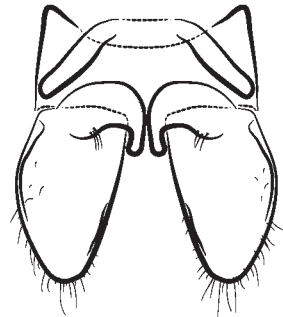
142



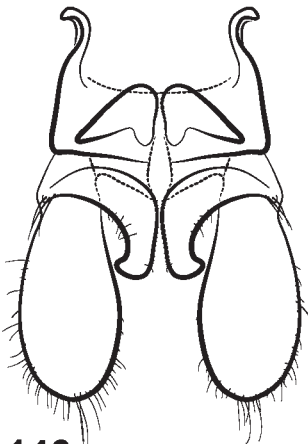
143



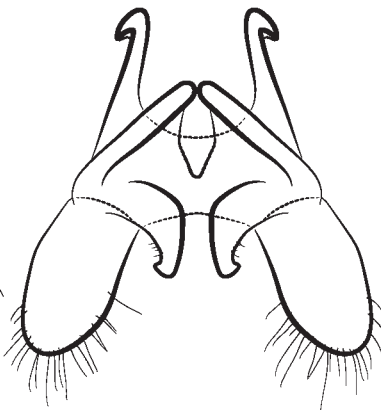
144



145



146

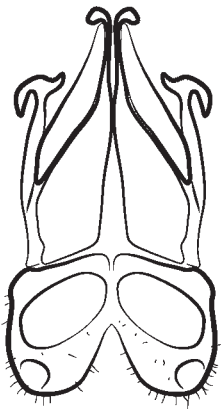


147

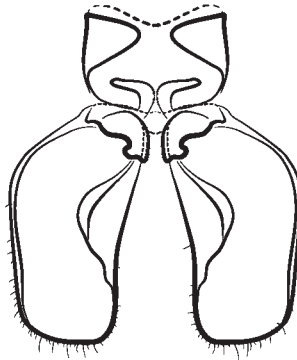


148

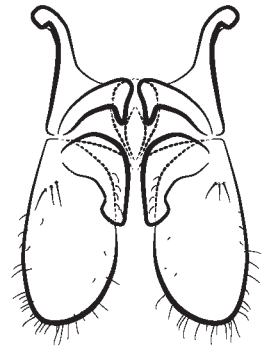
Figs. 140–148. *Deretaphrus* species, phallobase. 140) *D. aequaliceps*; 141) *D. alveolatus*; 142) *D. analis*; 143) *D. antennatus*; 144) *D. boliviensis*; 145) *D. bucculentus*; 146) *D. carinatus*; 147) *D. erichsoni*; 148) *D. fossus*.



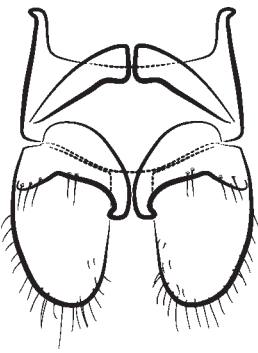
149



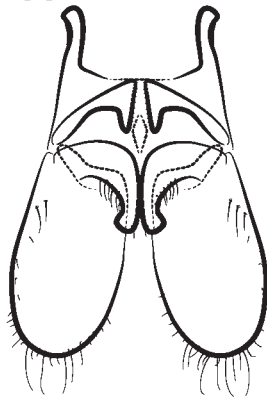
150



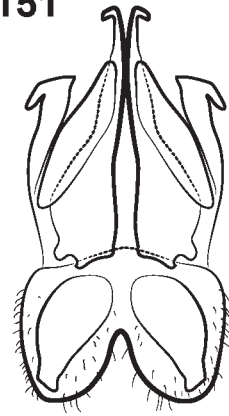
151



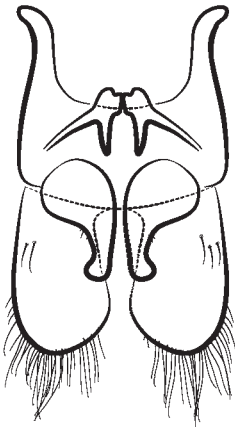
152



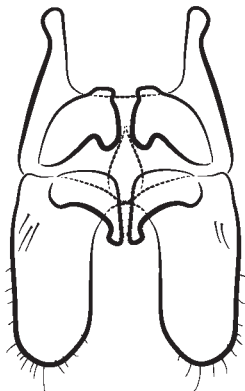
153



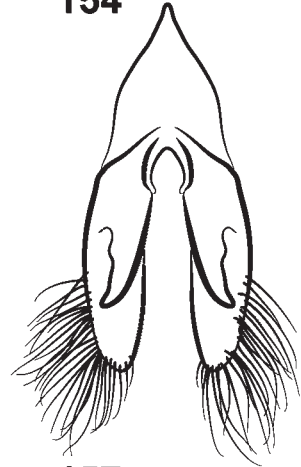
154



155

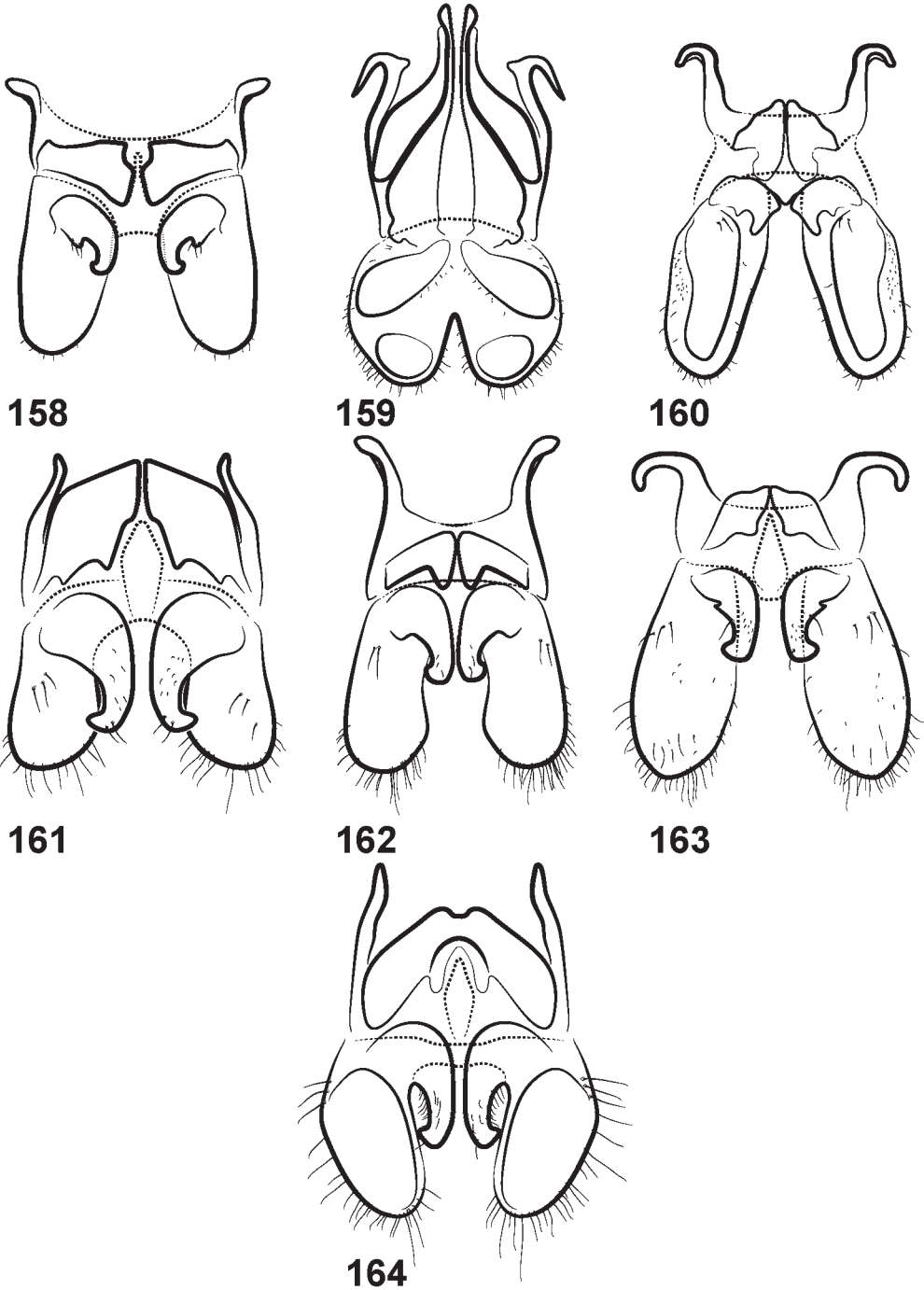


156

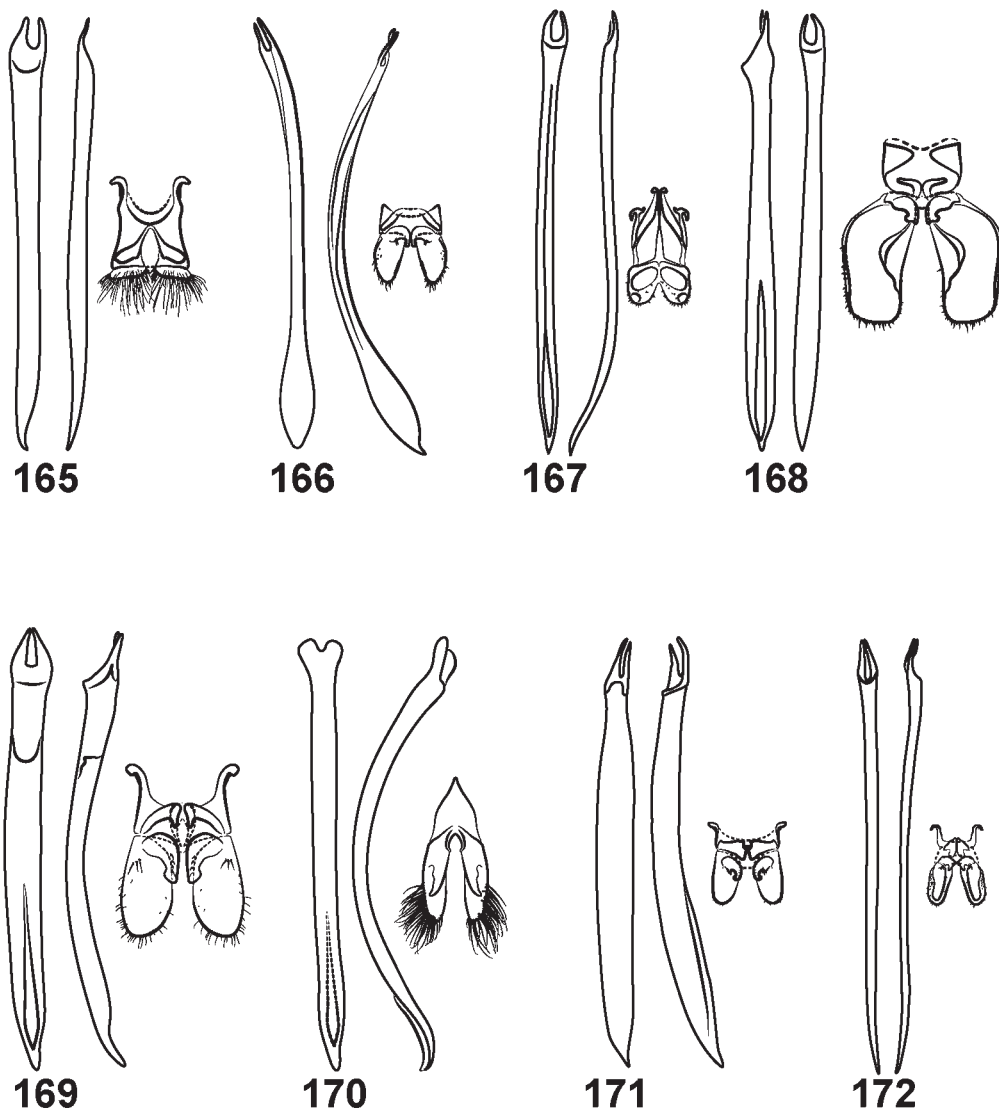


157

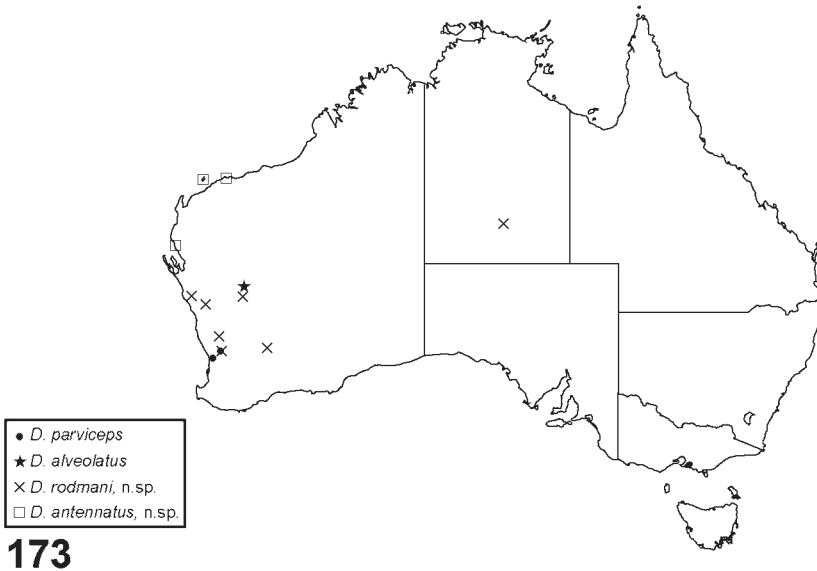
Figs. 149–157. *Deretaphrus* species, phallobase. 149) *D. gracilis*; 150) *D. hoplites*; 151) *D. ignarus*; 152) *D. incultus*; 153) *D. interruptus*; 154) *D. iridescens*; 155) *D. lateropunctatus*; 156) *D. ocularis*; 157) *D. oregonensis*.



Figs. 158–164. *Deretaphrus* species, phallobase. 158) *D. parviceps*; 159) *D. piceus*; 160) *D. puncticollis*; 161) *D. rodmani*; 162) *D. viduatus*; 163) *D. wollastoni*; 164) *D. xanthorrhoeae*.



Figs. 165–172. *Deretaphrus* species, penis (left: dorsal view; right: lateral view; phallobase, to scale with penis).
165) *D. boliviensis*; **166)** *D. bucculentus*; **167)** *D. gracilis*; **168)** *D. hoplites*; **169)** *D. ignarus*; **170)** *D. oregonensis*;
171) *D. parviceps*; **172)** *D. puncticollis*.



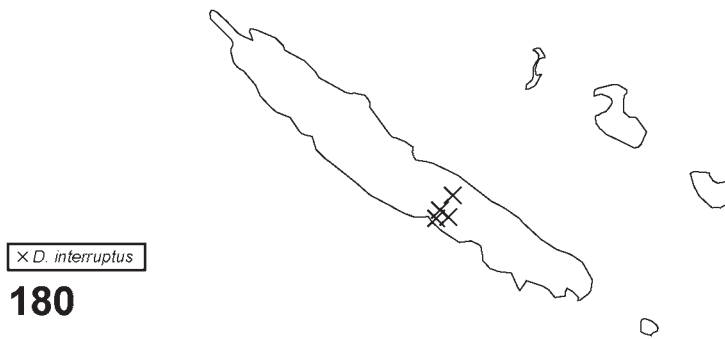
Figs. 173–174. Distribution of *Deretaphrus* species. **173)** *D. alveolatus*, *D. antennatus*, *D. parviceps*, and *D. rodmani*; **174)** *D. carinatus*, *D. gracilis*, *D. incultus*, and *D. xanthorrhoeae*.



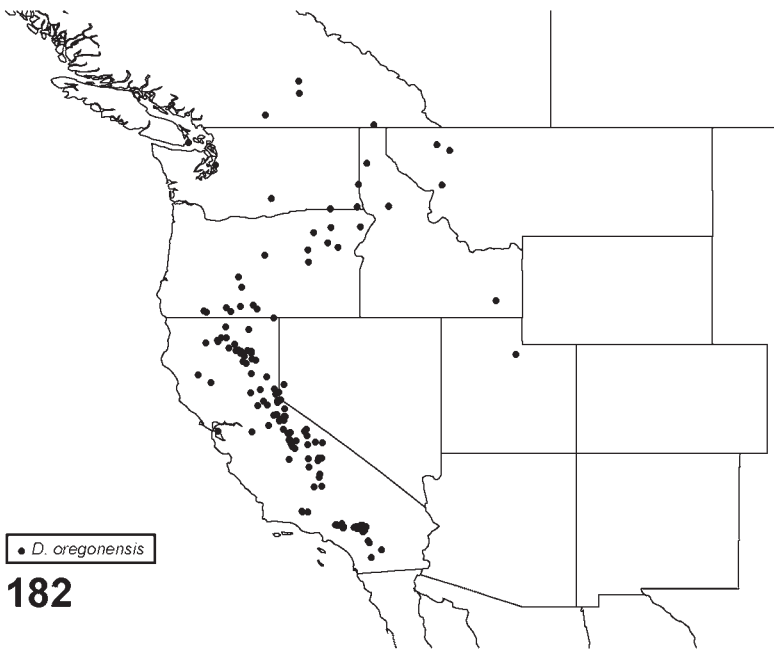
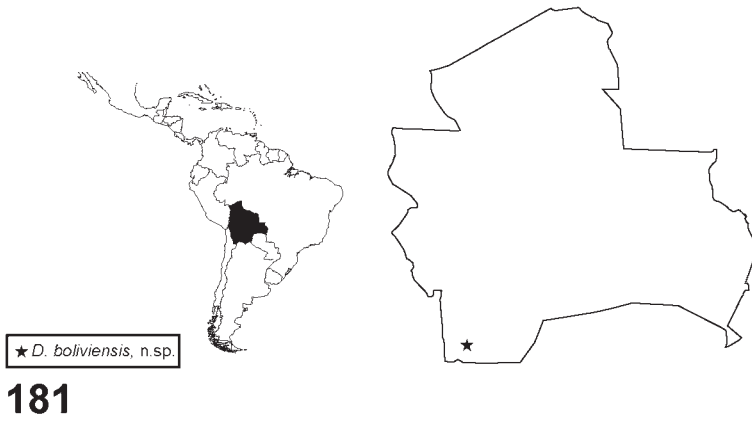
Figs. 175–176. Distribution of *Deretaphrus* species. **175)** *D. fossus* and *D. ignarus*; **176)** *D. piceus* and *D. viduatus*.



Figs. 177–178. Distribution of *Deretaphrus* species. **177)** *D. aequaliceps*, *D. erichsoni*, *D. iridescens*, and *D. ocularis*; **178)** *D. puncticollis* and *D. wollastoni*.



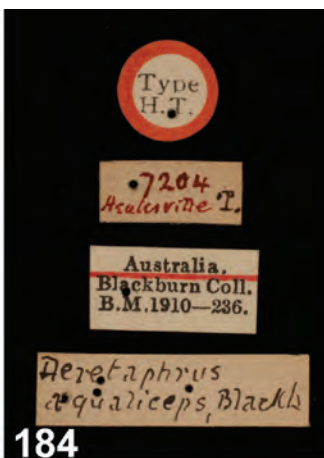
Figs. 179–180. Distribution of *Deretaphrus* species. **179)** *D. analis*, *D. bucculentus*, *D. hoplites*, and *D. lateropunctatus*; **180)** *D. interruptus*.



Figs. 181–182. Distribution of *Deretaphrus* species. **181)** *D. boliviensis*; **182)** *D. oregonensis*.



183



184



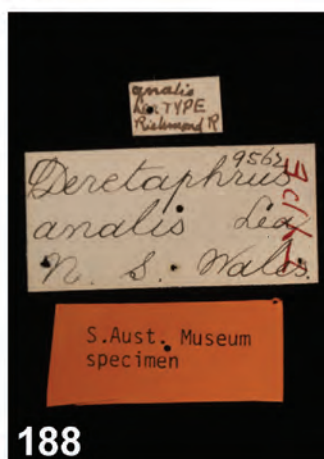
185



186



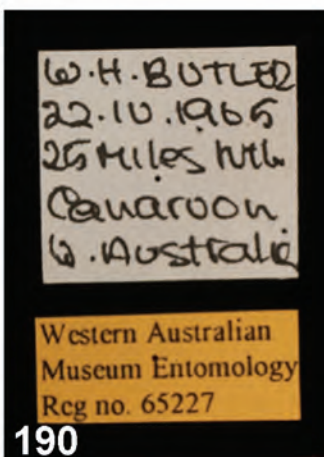
187



188



189



190



191

Figs. 183–191. Primary type specimens and specimen labels of *Deretaphrus* species. 183–184) *D. aequaliceps*, lectotype, BMNH; 185–186) *D. alveolatus*, holotype, SAMA; 187–188) *D. analis*, lectotype, SAMA; 189–190) *D. antennatus*, holotype, WAMP; 191) *D. boliviensis*, holotype, USNM.



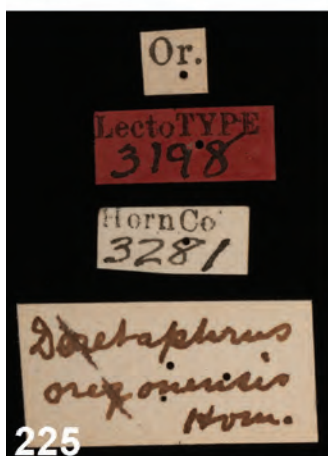
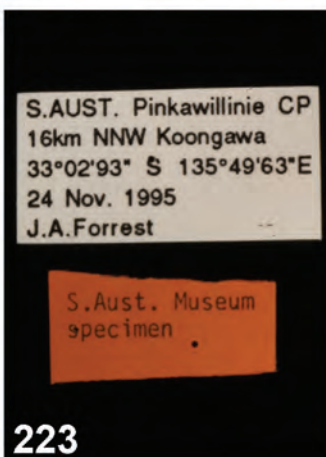
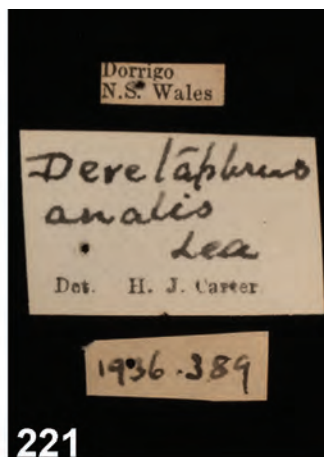
Figs. 192–200. Primary type specimens and specimen labels of *Deretaphrus* species. 192) *D. boliviensis*, holotype labels; 193–194) *D. bucculentus*, holotype, AMSA; 195–196) *D. carinatus*, holotype, WAMP; 197–198) *D. erichsoni*, lectotype, BMNH; 199–200) *D. granulipennis*, lectotype, MNHN.



Figs. 201–209. Primary type specimens and specimen labels of *Deretaphrus* species. 201) Presumed pin and label of the original type of *D. fossus*, BMNH; 202–203) *D. fossus*, neotype, SAMA; 204–205) *D. cordicollis*, lectotype, BMNH; 206–207) *D. gracilis*, lectotype, BMNH; 208–209) *D. hoplites*, holotype, SAMA.



Figs. 210–218. Primary type specimens and specimen labels of *Deretaphrus* species. 210–211) *D. ignarus*, lectotype, BMNH; 212–213) *D. pascoei*, lectotype, ANIC; 214–215) *D. incultus*, lectotype, AMSA; 216–217) *D. interruptus*, lectotype, MNHUB; 218) *D. iridescens*, lectotype, BMNH.



Figs. 219–227. Primary type specimens and specimen labels of *Deretaphrus* species. 219) *D. iridescens*, lectotype labels; 220–221) *D. lateropunctatus*, holotype, BMNH; 222–223) *D. ocellaris*, holotype, SAMA; 224–225) *D. oregonensis*, lectotype, MCZ; 226–227) *D. parviceps*, lectotype, SAMA.



Figs. 228–236. Primary type specimens and specimen labels of *Deretaphrus* species. 228–229) *D. piceus*, lectotype, MNHUB; 230–231) *D. bakewellii*, lectotype, BMNH; 232–233) *D. thoracicus*, lectotype, BMNH; 234–235) *D. puncticollis*, lectotype, SAMA; 236) *D. rodmani*, holotype, WAMP.

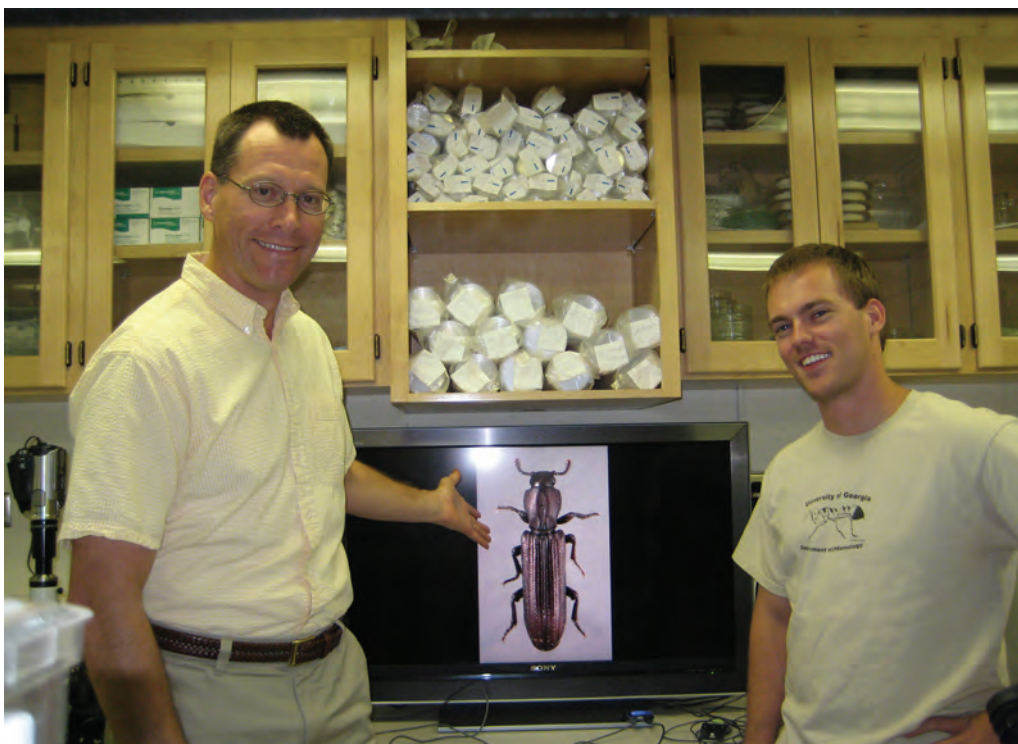


Figs. 237–245. Primary type specimens and specimen labels of *Deretaphrus* species. 237) *D. rodmani*, holotype labels; 238–239) *D. viduatus*, lectotype, BMNH; 240–241) *D. colydioides*, lectotype, BMNH; 242–243) *D. cribriceps*, lectotype, BMNH; 244–245) *D. popularis*, lectotype, BMNH.



Figs. 246–251. Primary type specimens and specimen labels of *Deretaphrus* species. 246–247) *D. sparsiceps*, lectotype, BMNH; 248–249) *D. wollastoni*, neotype, MNHUB; 250–251) *D. xanthorrhoeae*, lectotype, SAMA.

THE AUTHORS



Nathan Lord was born in Albion, MI and developed a love for insects, especially beetles, at a young age. He received his B.S.E.S. (2006) and MSc (2008) in Entomology from the University of Georgia under the direction of Joseph McHugh, where he focused his studies on the families Latridiidae and Bothriideridae. He recently completed his PhD (2013) at the University of New Mexico under the direction of Kelly Miller, where his research focused on the development of interactive electronic keys and systematics of the family Zopheridae (Tenebrionoidea). Nathan is broadly interested in all facets of Coleoptera systematics, but his research currently focuses on the construction of higher-level phylogenies, descriptive morphology and taxonomy, and biogeography of the Australo-Pacific region. Currently, he is a Post-Doctoral Fellow in the Bybee Lab at Brigham Young University, investigating the evolution of visual systems in odonates.

Joseph McHugh is Professor in the Department of Entomology at the University of Georgia and serves as the Curator of the Collection of Arthropods at the Georgia Museum of Natural History. McHugh's research focuses on the systematics of beetles traditionally classified in the superfamily Cucujoidea. He has a special fondness for neglected "little brown beetle" groups. McHugh grew up in Brooklyn and Ticonderoga, New York. He received a BSc in Entomology at Cornell University, an MSc in Evolutionary Biology at the University of Connecticut under the direction of James A. Slater, and a PhD in Insect Systematics at Cornell under the direction of Quentin D. Wheeler. He has been on the faculty at UGA since 1995.