

NEW STEREOMERINI AND RHYPARINI FROM AUSTRALIA, BORNEO AND FIJI
(COLEOPTERA: SCARABAEIDAE: APHODIINAE)

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Daintreeola grovei gen. nov., sp. nov. (Stereomerini) from Queensland, Australia, *Bruneixenus reidi* sp. nov. (Stereomerini) from Borneo and *Monteitheolus fijiensis* gen. nov., sp. nov. (Rhyparini) from Vanua Levu, Fiji, are described and illustrated. New Australian locality records for *Australoxenella concinna* Storey & Howden are also given. □ *Taxonomy, Australia, Fiji, Borneo, Daintreeola, Bruneixenus, Monteitheolus, Scarabaeidae, Aphodiinae.*

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Since our paper establishing separate tribes for the Rhyparini and Stereomerini (Howden & Storey, 1992), 4 new genera and 14 new species in both tribes have been described (Bordat & Howden, 1995; Howden, 1995; Storey & Howden, 1996). In this paper we describe a new genus and species of Stereomerini from Australia, a new species of *Bruneixenus* Howden & Storey (Stereomerini) from Borneo, and a new genus and species of Rhyparini from Fiji. New Australian locality records for *Australoxenella concinna* Storey & Howden (Stereomerini) are also given.

Abbreviations used for collection names are: ANIC, Australian National Insect Collection, CSIRO, Canberra, Australia; HAHC, Collection of H.F. & A. Howden, Ottawa, Canada; QM, Queensland Museum, Brisbane, Australia; QPIM, Queensland Department of Primary Industries, Mareeba, Australia.

Family SCARABAEIDAE
Subfamily APHODIINAE
Tribe STEREOMERINI

Six genera placed in the tribe Stereomerini have been described from the Indo-Pacific region: *Adebrattia* Bordat & Howden, *Australoxenella* Howden & Storey, *Bruneixenus* Howden & Storey, *Danielssonia* Bordat & Howden, *Pseudostereomera* Bordat & Howden, and *Stereomera* Arrow. These genera are endemic to Australia (*Australoxenella*), Borneo (*Adebrattia*, *Bruneixenus*, *Danielssonia* and *Pseudostereomera*) and Singapore (*Stereomera*). A second Australian genus with one included new species is described below.

Daintreeola gen. nov.
(Fig. 1A-D)

TYPE SPECIES: *Daintreeola grovei* sp. nov.

ETYMOLOGY: Named after the Daintree area where specimens were collected.

DESCRIPTION. *Head* (Fig. 1A,B): Dorsally broad, flattened, feebly convex, about 1.6 × as wide as long. Clypeus anteriorly with very slightly inflexed edge, edge obtusely angulate medially and nitid. Head dorsally with distinct longitudinal median and lateral grooves, length of median groove about 1/2 dorsal length of head, groove deeper and broader in basal half, lateral grooves slightly deeper, about 2/5 of distance to outer edge of gena, lateral grooves not quite reaching base of head, lateral grooves distinctly sinuate; surface of head dorsally, except for grooves, with close, scale-like setae. Genae not obviously delimited, inner edge indicated by small, non-granulate markings near summit of convex area. Disc with short stria-like markings on lateral margins just in front of genal angles. Antenna 9-segmented, club 3-segmented, club equal in length to basal 6 segments of antenna combined; area surrounding antenna deeply concave. Eyes not visible dorsally, small, approximately 10 facets long by 14 wide, covered by pronotum when head retracted. Maxillary palpus 4-segmented, apical segment cylindrical.

Pronotum (Fig. 1B). Strongly, irregularly convex with moderately deep transverse sulcus, middle of sulcus positioned in centre of disc, the apices more anterior (about half distance to anterior pronotal margin) reaching lateral thirds of disc;

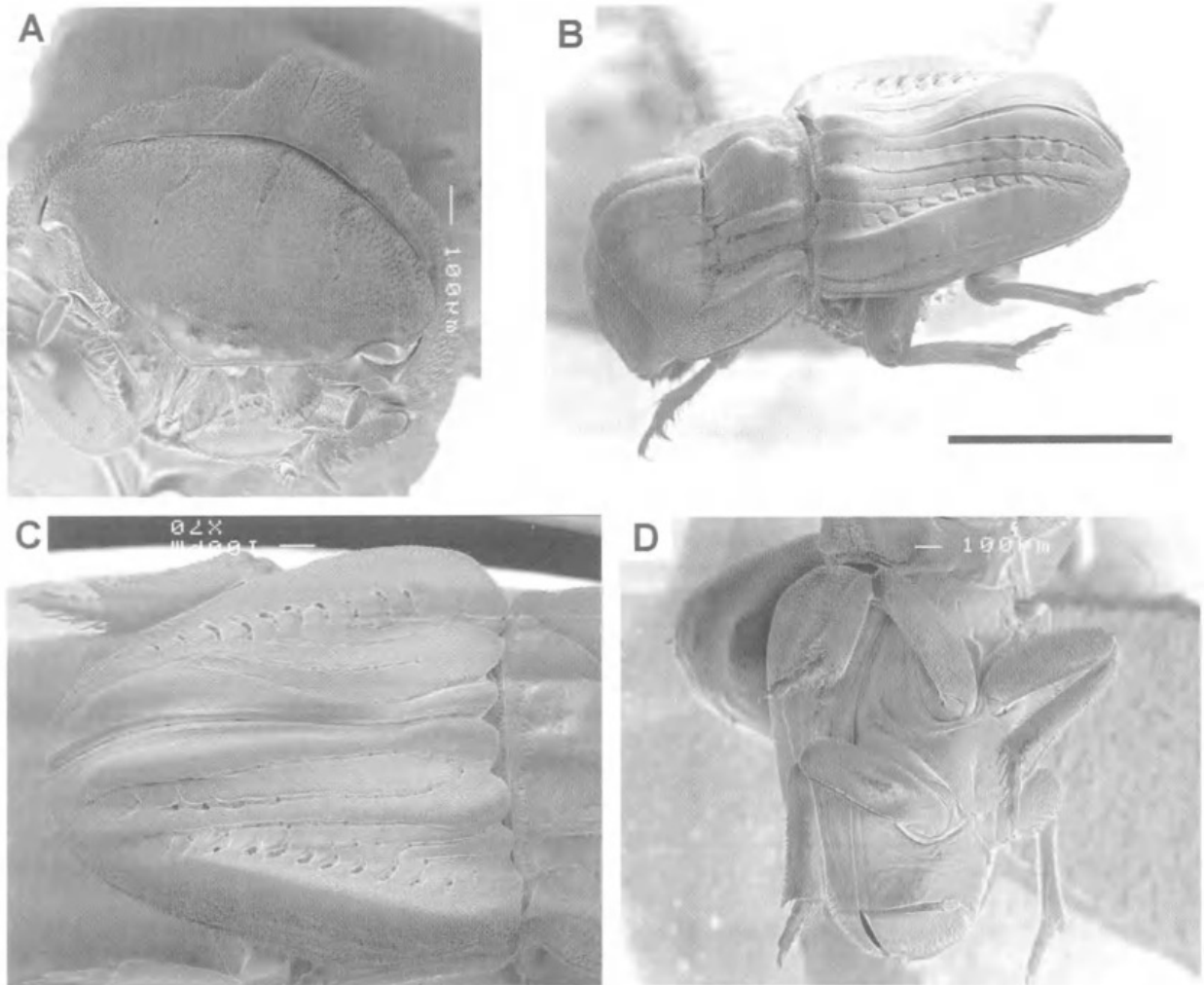


FIG. 1. *Daintreeola grovei* gen. et sp. nov. A, head, dorsal view; B, dorsolateral view; C, elytra, dorsal view; D, ventral view.

area anterior to sulcus with seven longitudinal grooves, all but central groove deepest posteriorly near sulcus; distinct groove running laterally along anterior pronotal margin from apex of outermost longitudinal groove to anterior angle then posteriorly along lateral margin to about 3/4 distance to posterior margin; rounded ridges (costae) between longitudinal grooves variable, inner two ridges strongly elevated and forming rounded prominence just anterior to transverse sulcus, outer 4 ridges slightly convex; equivalent median surface posterior to sulcus also with seven longitudinal grooves, median groove and associated ridges strongly convex and more strongly elevated than any other part of dorsum; three lateral posterior grooves on each side extending from pronotal base to sulcus, inner pair widest, especially in posterior half, outer two pairs deepest; ridges between grooves 2 and 3 and

between 3 and 4 distinctly convex, ridge between grooves 3 and 4 flattened, ridge 4 located outside of groove 4 running from pronotal base to sulcus; lateral margins of pronotum slightly convex; anterior angles quadrate, posterior angles slightly obtuse, abruptly rounded; pronotal surfaces with close, appressed, scale-like setae, except grooves and sulcus, somewhat obscured in centre of disc. Scutellum not visible.

Elytron (Figs 1B-C). Disc with 8 distinct striae, these variable in length and impression, innermost stria feeble, partially effaced, almost impunctate; striae 2, 3 and 4 moderately to strongly impressed, about 4/5 length of elytron (can vary between left and right elytron in same individual), each with 1-6 deep punctures plus additional shallow ones; striae 5 and 6 short about 1/5 length of elytron, with a few indistinct punctures; row of about 12 large deep crescent-

shaped punctures outside stria 6; striae 7 and 8 about 3/4 length of elytron, 7 more pronounced with distinct punctures, 8 feeble with no distinct punctures. Basal margin strongly incised, innermost incision between elytra deepest, incision 2 near base of stria 2 slightly smaller, incisions 3 and 4 at bases of striae 5 and 6 smallest; outer anterior angles rounded, subquadrate. Sections of disc strongly elevated, namely: interval 1 from basal quarter rising to maximal height about 2/3 distance to apex, height reduced just before apex; basal 1/5 of intervals 1, 3 and 5; outside crescent-shaped punctures from base to 4/5 distance to apex. Epipleura not inflexed, subvertical, narrowing to point at elytral apex, anterior 1/3 with groove on outer edge, widest anteriorly, ridge on inner edge, most prominent posteriorly, concave near middle, posterior 2/3 with lateral and central grooves running 4/5 distance to apex. Elytral apices conjointly broadly rounded. Surface covered by close, appressed, circular scales, density variable, largely effaced on intervals 2, 4, 5 and 6; surface dull, alutaceous.

Pygidium (Fig. 1D). Surface almost vertical, wider than long, with broadly rounded apex; numerous distinct medium-sized punctures.

Ventral surface (Fig. 1D). Prosteronum laterally with surface alutaceous; median prosternal process anteriorly strongly elevated, narrow, process posteriorly lanceolate, medially carinate, with obtusely angled sides. Mesosternum moderate in size, subtriangular, narrowed laterally. Metasternum between mesocoxae narrow, blade-like, posterior to mesocoxae abruptly widened, flat, concave in posterior median 1/2 with shallow groove to posterior margin, anteriorly behind mesocoxae with transverse marginal groove which almost reaches lateral margin; metacoxae contiguous. Abdomen with 5 segments visible medially, 6 visible laterally, apical segment slightly shorter in midline than other segments combined, surface alutaceous to subnitid.

Legs (Fig. 1D). Femora about 3 to 4 times as long as wide. Protibia with 2 teeth on outer edge, one apical, 1 subapical. Meso- and metatibiae not flattened, approximately four times as long as wide; outer narrow edge of each tibia with irregular longitudinal rows of punctures, each puncture with a minute yellowish seta; each tibia with 2 small apical spurs, may be large setae; a few apical setae also present. Protarsus 5-segmented. Meso- and metatarsi 4-segmented, basal segment slightly shorter than second segment. Tarsal claws reduced in thickness.

REMARKS. *Daintreeola* can easily be separated from the only other Australian stereomerine genus *Australoxenella* by: lateral grooves on vertex of head distinctly 'S' shaped, acute anterior edge of clypeus not vertical, in same plane as clypeal disc; elytra distinctly laterally compressed, not dorsoventrally flattened; vertical sides of elytra wide, narrowed posteriorly; elytra bulbous anterior to apex, not flattened; meso- and metatibia oval in cross section, not flattened. Other differentiating characters are given in Table 1.

***Daintreeola grovei* sp. nov.**
(Figs 1A-D)

ETYMOLOGY. For the collector, Simon Grove.

MATERIAL. Holotype, QMT93012: Australia: NE Qld, 16°06'31"S 145°26'25"E, Thompson Ck, 9.xi.-19.xii.1998, S. Grove, 140m, trunk FIT #4 (in QM). Paratypes (2): same locality and collector, 19.xii.1998-26.i.1999, trunk FIT #18 and #21 (In HAHC and QPIM).

DESCRIPTION (sex not determined). Length 2.3-2.6mm, greatest width 1.1-1.2mm. Colour light brown to brown. Morphology as in generic description and in Fig. 1A-D.

REMARKS. The three known specimens were taken by Simon Grove, of James Cook University in Cairns, in a long-term study of saproxylic insects in tropical rainforests in the Daintree lowlands of northeast Queensland. They were taken using trunk window traps, a relatively new sampling technique in Australia (Grove, 2000). Ground-based flight-intercept traps set nearby failed to collect this species, though several of another stereomerine, *Australoxenella concinna* Storey & Howden, were taken (see below).

RELATIONSHIPS. Howden & Storey (1992) described the genera *Australoxenella* and *Bruneixenus* and proposed the tribe Stereomerini within the Aphodiinae to contain them plus the previously described genera *Stereomera* and *Termitaxis* Krikken. Bordat & Howden (1995) added the genera *Adebrattia*, *Danielssonia* and *Pseudostereomera* to Stereomerini, removing the Neotropical genus *Termitaxis* until its unique type specimen could be closely examined. Howden & Storey (1992) undertook a cladistic analysis of the five stereomerine genera (including *Termitaxis*) available to them, using the tribe Eupariini (primarily *Ataenius* Harold) as the outgroup. Bordat & Howden (1995) repeated the analysis, removing *Termitaxis* and adding the three new genera described in their paper. Forty-five

TABLE 1. Phylogenetic characters in which *Australoxenella* and *Daintreeola* differ. P = plesiomorphic, A = apomorphic.

Character No.	Character	<i>Australoxenella</i>	<i>Daintreeola</i>
1	apical maxillary palpomere: cylindrical (P) or lanceolate (A)	P or A	P
2	pronotal trichomes absent (P) or present (A)	P or A	P
3	elytral apex unmodified (P) or flattened (A)	A	P
4	elytral striae distinct (P) or absent (A)	A	P
5	elytral striae punctate (P) or not (A)	A	P
6	sides of elytra parallel (P) or convergent (A)	P	A
7	elytral costae low (P) or high (A)	P	A
8	elytral epipleurae narrow (P) or wide (A)	A	P
9	pygidium vertical (P) or ventral (A)	A	P
10	metasternum feebly convex each side (P) or with marginal bead (A)	A	P
11	number of abdominal segments 5 (P) or 4 (A)	P or A	P
12	meso/metatibia cross section oval (P) or flattened (A)	A	P
13	sides of metasternum not rugose (P) or rugose (A)	A	P

phylogenetically important characters were used in these two studies. In this paper, the authors have rated *Daintreeola* using the combined character table of the Howden & Storey (1992) and Bordat & Howden (1995) papers. Table 1 lists only the characters in which *Daintreeola* and *Australoxenella* differ.

Australoxenella Howden & Storey, 1992

Australoxenella concinna Storey & Howden, 1996

NEW RECORDS. 16°05'S 145°28'E, 2km SSW Cape Tribulation, CT2 10m, 4.i-1.ii.1996, L. Umback, FI Trap JCU (1); 16°01'S 145°27'E, Donovan Ck, 20m FITDO5F, 14.iii-5.v.1998, S. Grove (1); same locality, 8.i.1998, S. Grove, mushroom bait trap (1); 16°06'31"S 145.26.25E, Thompson Ck, 140m Trunk FIT#4, 9.xi-19.xii.1998, S. Grove (1). (in ANIC, QPIM, HAHC, S. Grove, Cairns).

This species was described from a single specimen from a ground based flight intercept trap at 680m on the southern Atherton Tableland. All new records are from close to sea level in the Cape Tribulation area, 170km north of the type locality. One was taken in a pitfall trap baited with mushrooms and the others from flight intercept traps set on the ground or part way up tree trunks.

Bruneixenus Howden & Storey, 1992

Bruneixenus can be separated from the other genera of Stereomerini by the following combination of characters: large conical protrusion along pronotal midline anterior to median transverse sulcus; protrusion posterior to sulcus small, smaller than anterior protrusion; elytral

disc with narrow costae or feebly raised intervals; elytra not abruptly declivous posteriorly; apex of each elytron rounded, not abruptly angulate near suture; tibiae only moderately flattened.

Bruneixenus reidi sp. nov. (Fig. 2A-B)

ETYMOLOGY. Named for Dr Chris Reid, who collected the known specimens and recognised them as an unusual scarab.

MATERIAL. Holotype, ♀ (?), INDONESIA, Nanga Sg. Belabi, Sg. Sibau, Kalbar, 1°17'N, 113°15'E, 250-350m, rainforest on ridge, 5-8.vii.1996, C. Reid, yellow pan traps 10:1-10 (Museum Zoologicum Bogoriense, Bogor, Java, Indonesia). Paratype, same data as holotype (in HAHC).

DESCRIPTION. Length 1.8mm, greatest width 0.9mm. Reddish brown dorsally and ventrally.

Head (Fig. 2A-B). Dorsally broad, about 2 × as wide as long. Clypeus inflexed, forming broad, obtuse triangle, apex sharply angulate; base delimited by feebly indicated suture; clypeal surface evenly punctate, punctures small, surface between shining. Vertex very feebly, transversely concave in median 2/3, lacking tubercles; vertex with 5 narrow, longitudinal grooves, one median and two on each side equally spaced between centre and lateral edge, grooves anteriorly divergent; surface, except for grooves, with close, but not contiguous, appressed, oval scales. Gena not distinct, feebly ridged just anterior to eye, ridge abutting prothoracic edge. Antenna 9-segmented; club 3-segmented, densely setose, length slightly longer than basal six segments. Mouthparts and eyes as described for genus (Howden & Storey, 1992).

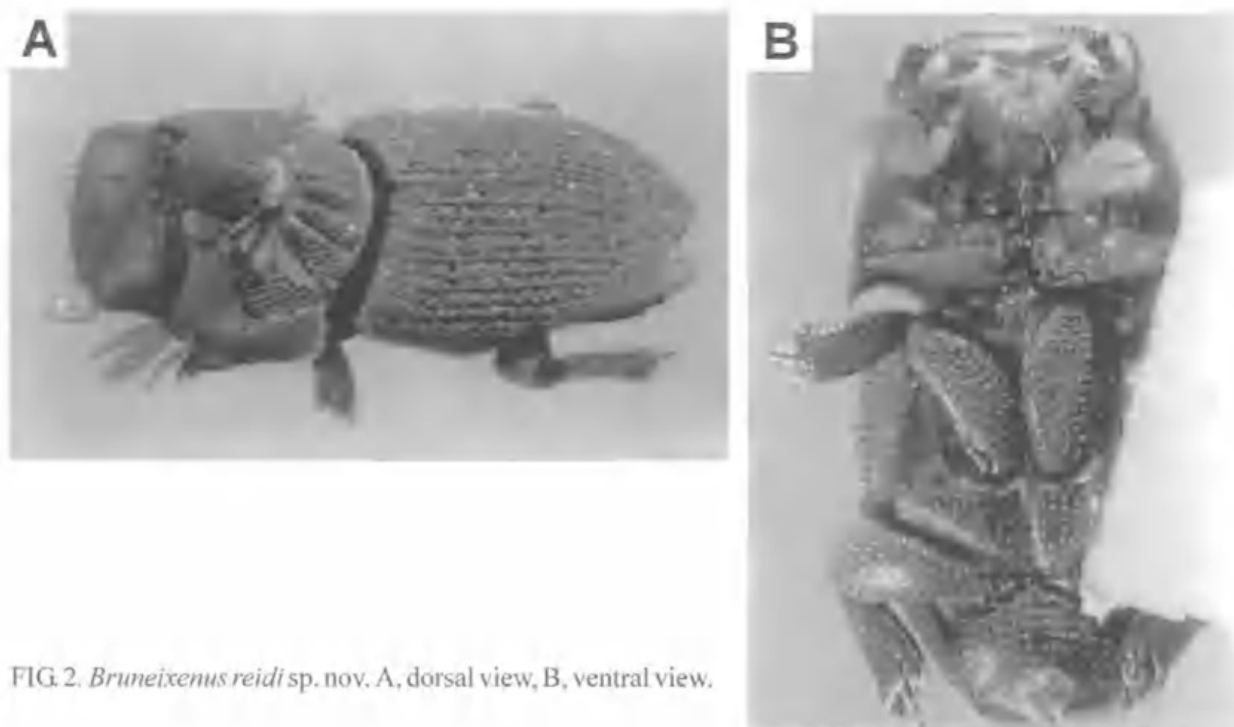


FIG. 2. *Bruneixenus reidi* sp. nov. A, dorsal view, B, ventral view.

Pronotum (Fig. 2A). Very irregularly convex with narrow transverse sulcus extending across median 1/3 near middle; median 1/5 of pronotum anterior to sulcus conical, delimited on each side by longitudinal groove; conical summit with two short spines, one on each side of midline, midline posterior to spines with groove extending to transverse sulcus. Each side of pronotum near outer 1/3 in anterior half with second groove converging posteriorly with inner groove; transverse sulcus continued laterally as deep groove curving posteriorly and ending in notch at lateral 1/3 of posterior pronotal margin; area adjacent and partly enclosed by groove depressed and almost flat; median 1/3 of pronotum posterior to transverse sulcus convex with seven longitudinal grooves, one median and three on each side, grooves on each side with scattered yellowish setae, grooves divergent posteriorly; convex ridge on each side of median groove with longitudinal row of four minute spines; most of pronotal surface with numerous stout, posteriorly directed, lanceolate setae. Scutellum minute, depressed below elytral surface.

Elytron (Fig. 2A). Nine striae present between suture and humeral angle, side of elytron abrupt; intervals of uniform height and same width as adjacent striae, crest flat, each with row of small, often indistinct, scales. Striae and intervals becoming confused in apical 1/3; side of elytron rounded, broadly inflexed, basal 1/3 with fine

transverse striae; apex of each elytron rounded, very slightly reflexed posterior to termination of intervals.

Pygidium. Wider than long, feebly convex and inflexed; surface shallowly punctate, each puncture with an oval scale, surface between punctures shining.

Venter (Fig. 2B). Prosternum shining, slightly alutaceous; marginal bead present on each side adjacent to eye; median prosternal process anteriorly blade-like, apex slightly expanded; process posteriorly bluntly lanceolate. Metasternum with midline between meso- and metacoxae narrowly indented; transverse marginal bead present just posterior to mesocoxal depression; metasternal surface on either side of depressed midline nitid, punctate, each puncture with a small seta. Fifth sternite punctate, equal in length at midline to basal four segments. Protibia with two teeth on outer edge, one apical, one at apical 1/6. All tarsi apparently 5-segmented, legs otherwise as described for genus.

Variation. The single paratype measures: 1.7mm in length, 0.9mm in greatest width. Otherwise similar to holotype.

REMARKS. *Bruneixenus reidi* can be easily distinguished from the only other species in the genus, *B. squamosus* Howden and Storey, by its non-costate elytra. *B. squamosus* has four narrow, evenly elevated costae on each elytron.

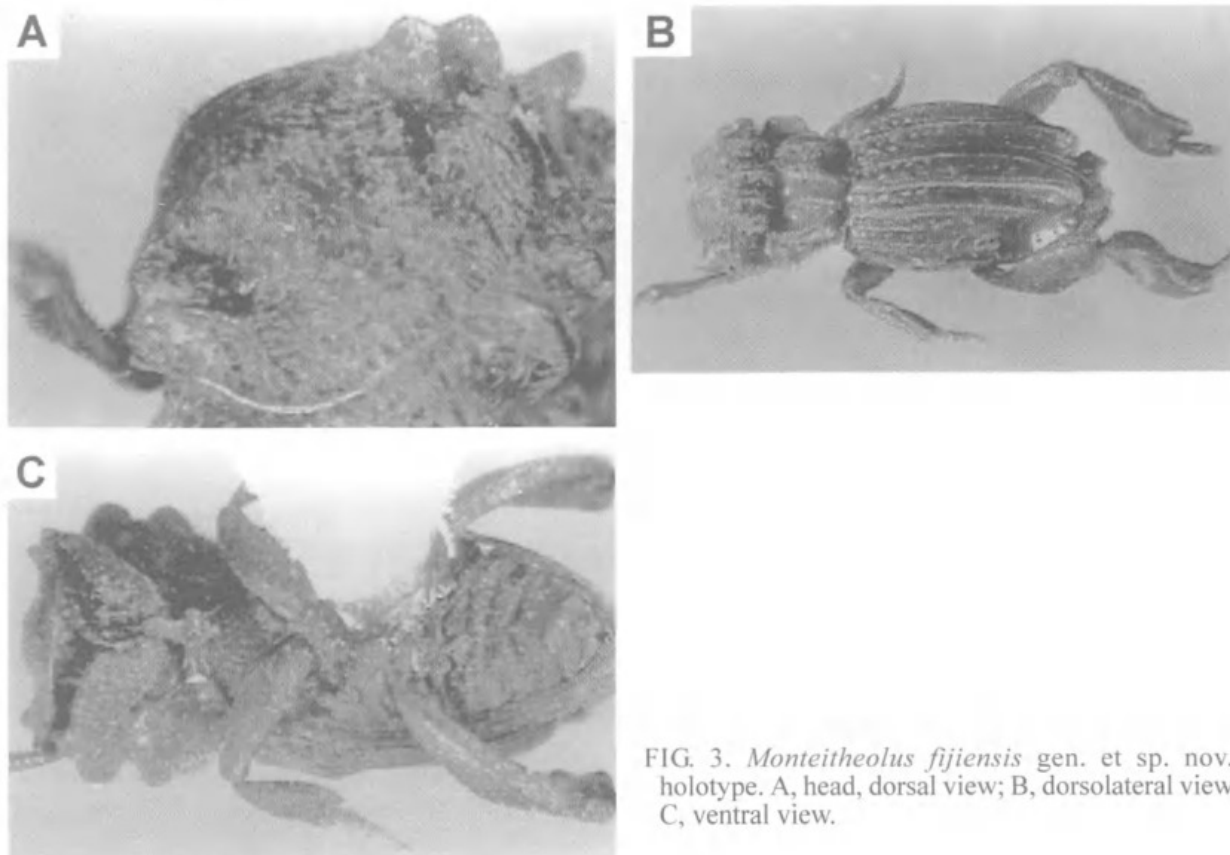


FIG. 3. *Monteitheolus fijiensis* gen. et sp. nov., holotype. A, head, dorsal view; B, dorsolateral view; C, ventral view.

The configuration of the pronotal grooves also differs between the two species.

Tribe RHYPARINI

Four genera have been recognised in the Rhyparini from the Australasian region (Howden, 1995): *Rhyparus* Westwood, *Termitodius* Wasmann, *Termitodiellus* Nakane, and *Hadorrhyparus* Howden. Recently a new genus and species was discovered on the eastern island of Vanua Levu, Fiji.

Monteitheolus gen. nov. (Figs 3A-C, 4)

TYPE SPECIES. *Monteitheolus fijiensis* sp. nov.

ETYMOLOGY. Named for its energetic collector, Geoff Monteith, of the Queensland Museum.

DESCRIPTION. *Head* (Fig.3A). Approximately as wide as long; clypeal edge arcuate, narrow transverse section bordered posteriorly by raised arcuate ridge; section anterior to ridge depressed below plane of clypeo-frontal junction, not inflexed or toothed. Frontal area with broadly convex central disc; deep depression present on each side of disc; bottom of depression with what

appears to be a number of eye facets. Gena with two strongly produced angulate lobes. Vertex posterior to disc with four longitudinal ridges, one on each side adjacent to midline, one on each side posterior to deep depression. Surface of disc and vertex shallowly punctate, most punctures each with a small, recumbent seta. Mouthparts and antennae hidden by legs.

Pronotum (Figs 3B, 4). Six strongly elevated, longitudinal ridges present on disc, ridges divided by transverse groove across middle of pronotum; ridges anterior to groove more elevated; three ridges on each side of midline anterior to groove evenly spaced; posterior to groove inner two pairs of ridges in longitudinal line with anterior ones, outer pair strongly flared laterad. Each side of pronotum with two lobes, one anterior, one posterior to line of transverse groove. Summits of all ridges bare, edged on each side by a row of pale setae, lateral pronotal margins also setose; pronotal surface between ridges alutaceous, uneven or tuberculate between median ridges. Ridges ending abruptly just before posterior margin, margin edged with narrow bead. Scutellum minute.

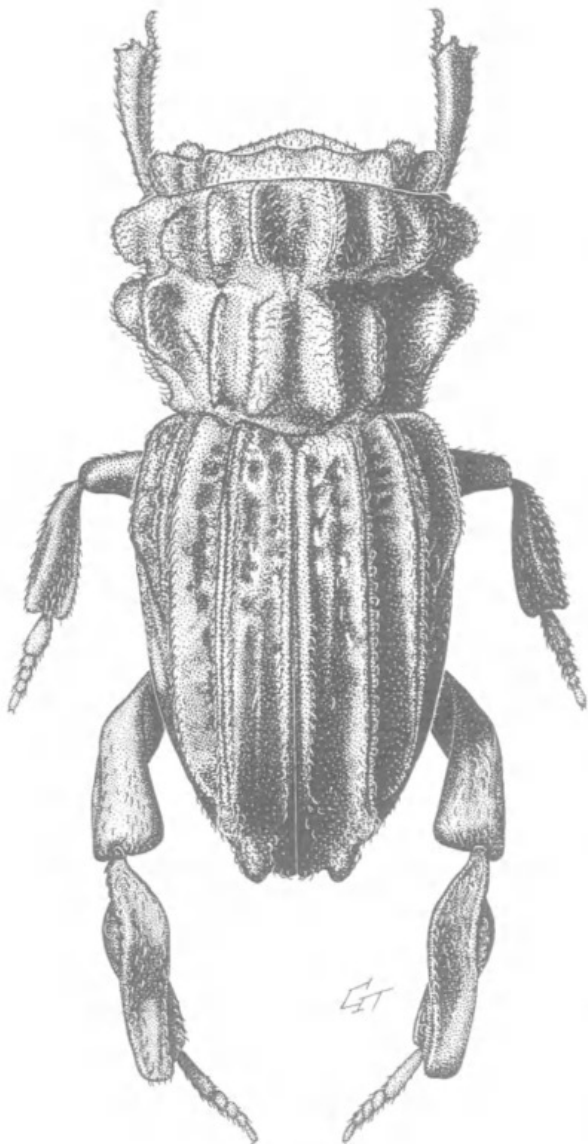


FIG. 4. *Monteitheolus fijiensis* gen. et sp. nov., holotype, dorsal view.

Elytron (Figs 3B, 4). Disc with 9 elevated intervals, length and height differing: intervals 1, 3 and 4 extending to approximately apical 1/6 of elytron, 3rd and 4th intervals strongly elevated, more so apically and with apical end abruptly declivous, sutural interval low, these three intervals dorsally flattened, single row of setae present on laterad side of sutural interval, row on each side of intervals 3 and 4; interval 2 very low, summit rounded, uneven, with only scattered setae; intervals 5 to 7 short, extending only to basal 1/4 of elytron; summit of 6th interval flat, with row of setae on each side; intervals 5 and 7 low, summit narrow, irregular and with scattered setae; intervals 8 and 9 at side

of elytron, both intervals extending to approximately apical 1/5 of elytron, height moderate with summit narrow, double rows of very small setae present on each. Surfaces between intervals with distinctly separated, large, shallow punctures, surface between shining. Elytron gradually narrowed in apical 1/2 (Fig. 4), apex abruptly rounded; irregular, raised, almost pyramidal knob present between apex and end of interval 3, projection with numerous curved setae, similar to those on end of interval 3.

Pygidium (Fig. 3C). Almost vertical in lateral view; slightly wider than long; median basal margin briefly indented, midline below to pygidial apex not depressed, surface on each side with large, transversely oval depression occupying about 2/3 of pygidial surface; surface finely, irregularly rugose.

Venter (Fig. 3C). Prosternum ridged anteriorly along midline, hastate posterior to coxae. Mesosternum feebly ridged adjacent to anterior edges of mesocoxae. Metasternum with elevated ridge between mesocoxae, posteriorly with median depression, widened at middle; surface on each side of depression slightly convex, heavily granulate; posterior and lateral margin adjacent to each mesocoxa strongly ridged, additional lateral ridge paralleling elytral margin; longitudinal depression present between ridge and edge of elytron (depression possibly for reception of inner edge of mesotibia). Abdomen (partly obscured by dirt and glue) apparently with five sternites; at least sternites 3 and 4 transversely convex, margins of segments 3, 4 and base of 5 transversely depressed and with deep oval depression on each side near lateral margin.

Legs (Figs 3B-C, 4). All femora punctate-setose on ventral surfaces, femora not unusually modified. Protibia with two adjacent teeth on outer apical edge; outer edge basad to teeth finely serrate. Mesotibia with outer edge very slightly sinuous. Metatibia (Figs 3C, 4) enlarged from near base to apex, outer and inner surfaces sinuous and slightly twisted, tibial apex with one minute spur and numerous, short, stout setae. Tarsi 5-segmented, meso- and metatarsi each with basal segment approximately as long as remaining four segments.

REMARKS. Two genera of Rhyparini are known from Fiji, *Monteitheolus* and *Hadorrhyparus*. Both share greatly modified metatibiae. They also share some other characters, such as pronotal ridges, with the non-Fijian genera, *Termitodius*

and *Termitodiellus*. *Monteitheolus* differs from all of these genera in having noticeable eye slits on the dorsum of the head, different placement of the elytral ridges, strong sculpturing of the mesosternum and abdominal sternites, and an oddly twisted, very characteristic c.u. metatibia.

***Monteitheolus fijiensis* sp. nov.**
(Figs 3A-C, 4)

ETYMOLOGY. The species name is for its country of origin.

MATERIAL. Holotype, QMT46169, sex not determined, FIJI: 16°35'S 179°20'E, Vanua Levu: Mt Delaikoro, 21 July 1987, G. Monteith, QM. berlesate No.785, rainforest, 700m, sieved litter. (In QM).

DESCRIPTION. Length 2.6mm, greatest width of pronotum 1.25mm; length of elytra 1.6mm, greatest width 1.15mm. Dorsum light reddish brown, setae yellowish to tan. Other features as in generic description and Figs 3 and 4.

REMARKS. The small size and the sinuous, slightly twisted metatibia will separate *M. fijiensis* from any other known species in the Rhyparini.

ACKNOWLEDGEMENTS

We are greatly indebted to Simon Grove, James Cook University, Cairns, Geoff Monteith, Queensland Museum, Brisbane, and Chris Reid, Australian Museum, Sydney, for furnishing the

highly unusual species that have formed the basis of this paper. We also thank Geoff Thompson, Queensland Museum, for the habitus drawing of *Monteitheolus fijiensis*. Henri Goulet, Research Branch, Agriculture Canada, Ottawa provided the photographs of *Bruneixenus reidi* and *Monteitheolus*. Anthony O'Toole, University of Queensland, Brisbane produced the SEMs of *Daintreeola grovei*. Anne Howden made helpful suggestions that improved the manuscript.

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