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PO Box 3300, South Brisbane 4101, Australia

Phone 06 7 3840 7555

Fax 06 7 3846 1226

Email qmlib@qm.qld.gov.au

Website www.qm.qld.gov.au

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Two new genera of myrmecomorph longicorn beetles from Australia and New Caledonia (Insecta: Coleoptera, Cerambycidae)

Eduard VIVES

Museu de Zoologia de Barcelona, PO Box 593, Barcelona, Spain. Email: eduard_vives@hotmail.com

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ABSTRACT

Two new genera and species of myrmecomorph Cerambycidae are described. *Myrmeciocephalus monteithi* gen. et sp. nov. (Cerambycinae: Ametrocephalini) comes from mountains of north Queensland, where it apparently associates with the ant, *Myrmecia flavicoma minuscula* Forel, 1915. All members of this tribe are ant mimics. *Myrmeparmena sudrei* gen. et sp. nov., (Lamiinae: Parmenini) is from the Isle of Pines, New Caledonia, and is provisionally placed in the tribe Parmenini. For this species we lack any information relative to the formicids with which it may coexist. □ *Coleoptera, Cerambycidae, Cerambycinae, Myrmeciocephalus gen. nov., monteithi sp. nov., Australia, Myrmeparmena gen. nov. sudrei sp. nov., New Caledonia.*

Ant mimicry (myrmecomorphy) in Australian and New Caledonian cerambycids is not rare. Indeed, this is a characteristic trait of Cerambycidae in the austral fauna, and it is absent in other biogeographical regions or represented in only very few genera. These are *Pseudomyrmecion* Bedel, 1885 in the Palaearctic region, *Myrmecoclytus* Fairmaire, 1895 in the Ethiopian region, *Tinkhamia* Gressitt, 1937, *Iphra* Pascoe, 1866 and *Clytellus* Westwood, 1853 in the Oriental region, *Eudermes* LeConte, 1850 in the Nearctic region, and *Arawakia* Villiers, 1981, *Pseudocephalus* Newman, 1842 and *Tillomorpha* Blanchard, 1851 in the Neotropical region.

In this work, two new myrmecomorph genera of Cerambycidae are described. The first comes from the mountainous Carbine Tableland of north Queensland, where it apparently lives together with the large, aggressive ant, *Myrmecia flavicoma minuscula* Forel, 1915. This new genus falls within the subfamily Cerambycinae, among the genera of Ametrocephalini, all of them myrmecophilous. The second new genus is based on

a new species found on the Isle of Pines, in New Caledonia, belonging to the Lamiinae and provisionally to the tribe Parmenini; for this species we lack any information relative to the ants with which it may coexist.

MATERIAL AND METHODS

In 2000 we started to review the Cerambycidae of New Caledonia and some of the most important collections which include Australian and New Caledonian fauna have been studied so far. These include the Australian Museum (Sydney, AMS), the Natural History Museum (London, NHM), the Museum National d'Histoire Naturelle (Paris, MNHN), the Bishop B. Museum (Honolulu, BMH), the Museum of Natural History (Osaka, MNH), the Institute Royal d'Histoire Naturelle (Bruxelles, IRHNB) and the collection at the Centre de Biologie et de Gestion des Populations (Montpellier, CBGP).

We also studied much material loaned by our colleagues Dr Geoff B. Monteith, from the

Queensland Museum, Brisbane (QM), and M. Jérôme Sudre (Faramaz, France), and it is from these sources we identified the two new myrmecomorphic genera and species described below.

SYSTEMATICS

Family Cerambycidae

Subfamily Cerambycinae

Tribe Ametrocephalini Lacordaire, 1869

Ametrocephalides Lacordaire, 1869: 420

Pseudocephalini Aurivillius, 1912: 154

Myrmeciocephalus gen. nov.

Type species. *Myrmeciocephalus monteithi* sp. nov.

Head large, rounded, slightly projecting anteriorly, with arched epistome and trapezoidal labrum with long setae at sides. Mandibles short and thick, with inner margin almost straight and bent apex; external margin arched, with broad flattened and pubescent margin. Maxillary palpi short; fourth segment securiform. Eyes small, globose, finely-faceted, without lateral notch for antennal insertion. Antennal tubercles almost flat, with small inner tooth. Small furrow between base of mandibles and eye margin able to receive antennal scape. Head posteriorly broadly rounded and very convex; temples pubescent, convex and regularly arched; neck narrow, cylindrical, weakly transversely striated. Head above furrowed longitudinally. Antennae long and slender with segments cylindrical, long and parallel-sided, except for scape, slightly arched and broadened apically.

Pronotum narrower than head, clearly longer than wide (8/6.6), with anterior margin forming narrowed pronotal neck articulating with cephalic neck; posterior margin narrowed, transversely furrowed; surface entirely finely rugose with some sparse long brownish setae. Prosternum flattened, decliving towards coxae; prosternal process very narrow and short, slightly widened at margined apex; procoxal cavities open behind.

Procoxae large, conical, strongly protruding. Prothoracic longitudinal axis strongly sinuate as in all *Ametrocephalini*. Mesonotum smooth and shiny, with scutellum short, rounded. Metasternum short, granulose, with coxal cavities open at both sides.

Elytra long, subparallel in anterior half, and strongly widened in apical half as a rounded, globulose apical area; humeri rounded, weakly protruding; disc flattened, strongly punctured, with broad oblique, rather smooth, stripe on basal third; hind globose part smooth, shiny, with short yellowish spot at sides on postmedian region, and apex rounded, dehiscent, covered by dense golden pilosity. Hindwings present, but strongly reduced.

First visible segment of abdomen twice as long as wide, waist-narrowed; remaining segments short and wide, covered by short grey tomentum. Legs long and slender, with anterior femora enlarged medially; median and hind femora broad and straight; tibiae long, narrow, straight, covered by sparse long golden setae; tarsi long and thin, with first segment much longer than remaining together.

Myrmeciocephalus monteithi sp. nov. (Figs.1 B-D)

MATERIAL. HOLOTYPE ♀ : Australia: Pauls Luck, Platypus Creek, 13 km W Mossman, NQ, 1-2 Jan 1990, 1100 m, ANZSES Expedition. In QM, Reg. No. QMT169566.

Size: 16mm long, 2.3 mm wide at posterior half of elytra. Ground colour brownish testaceous, with scape, labrum and mandibles ivory white; anterior half of elytra reddish brown, with glossy oblique stripe on anterior third; posterior half of elytra brown, with yellowish spot at each side behind middle, and a dull triangular area narrowing from suture to epipleura; apex of elytra less shiny, entirely covered by dense golden pubescence with velvety iridescence, as in apical segments of some ants.

Two new genera of myrmecomorph longicorn beetles

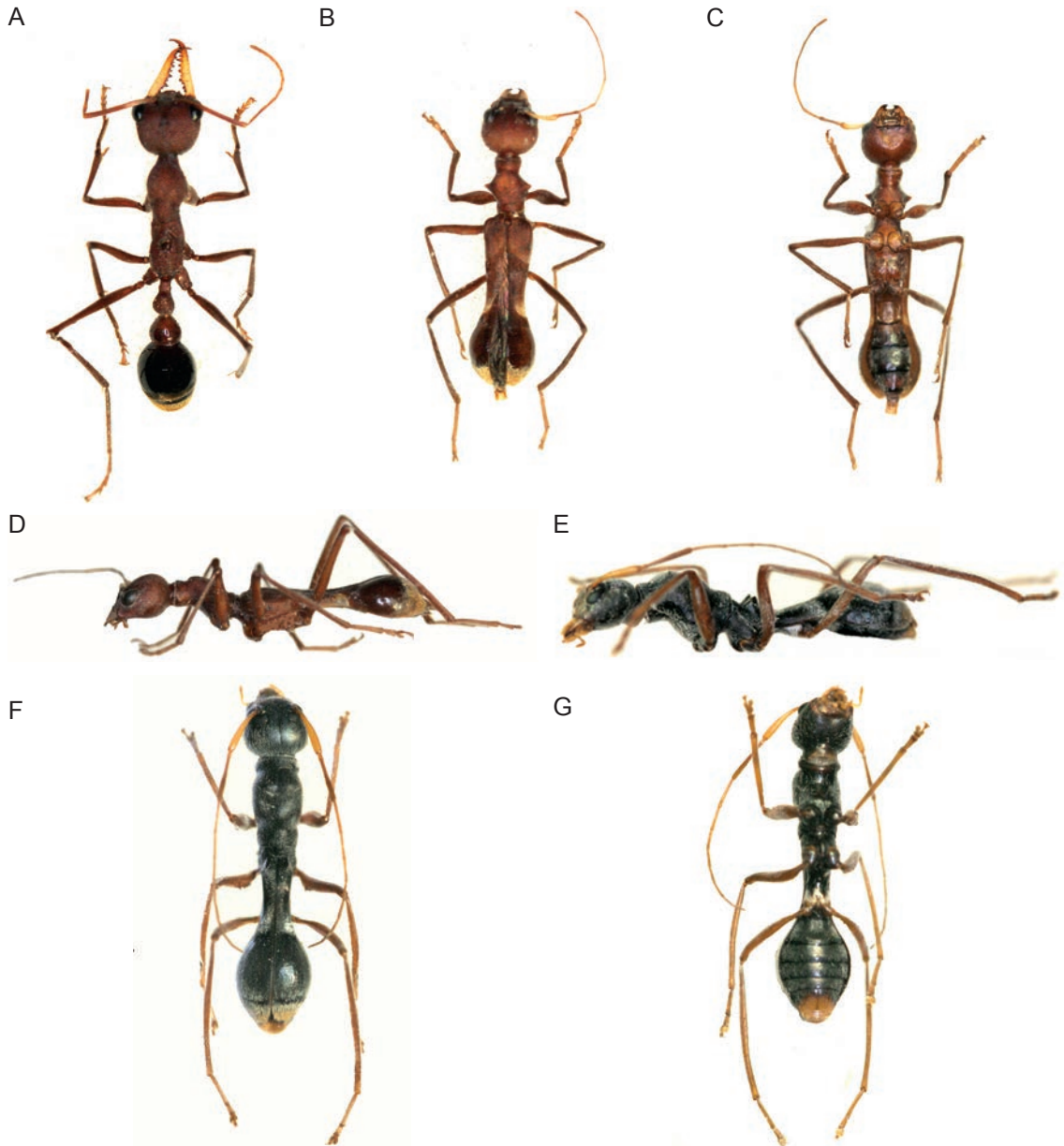


FIG. 1. **A**, *Myrmecia flavicoma minuscula* Forel (Formicidae), dorsal view, length 17 mm; **B-D**, *Myrmeciocephalus monteithi* gen. et sp. nov., holotype female, length 16 mm; **B**, dorsal view; **C**, ventral view; **D**, lateral view; **E-G**, *Myrmeparmena sudrei* gen. et sp. nov., holotype female, length 11 mm; **E**, lateral view; **F**, dorsal view; **G**, ventral view.

Head with sides covered by short silvery tomentum; posterior half with long sparse reddish setae. Antennae with short tomentum and some long setae on first three segments. Pronotum fringed anteriorly by short white setae; surface of pronotum covered by short grey setae, particularly on prosternal area; disc with long brownish setae. Elytra and legs with long sparse brownish setae. Abdominal sternites reddish brown with black posterior margin.

Etymology. We take great pleasure in naming this new species after our dynamic colleague, Dr Geoff B. Monteith (Queensland Museum, Brisbane), who provided us with the studied material, and in recognition of his dedicated contribution to entomological exploration in New Caledonia.

DISCUSSION

Myrmeciocephalus gen. nov. falls perfectly well within the Ametrocephalini as characterised by Lacordaire (1869), based on the globular shape of the head capsule, narrow neck, the sinuate longitudinal axis of pronotum and the very peculiar shape of elytra which are strongly modified due to myrmecomorph mimicry. This elytral shape also occurs in related Australian genera such as *Ametrocephala* Newman, 1851, *Formicomimus* Aurivillius, 1897 and *Cyclocranion* Poll, 1892. All species in the Ametrocephalini have their morphology strongly adapted to mimic some of the ants with which they occur.

The unique holotype of *Myrmeciocephalus monteithi* was collected by student collectors on a back-packing expedition by the Australian and New Zealand Schools Exploration Society to the highest parts of the rainforested Carbine Tableland in 1990. This plateau shows extremely high insect endemism and diversity within the Australian Wet Tropics biogeographic zone (Yeates & Monteith 2008). Samples from the expedition were later sorted by G. Monteith at the Queensland Museum and one vial of hand-collected specimens from Paul's Luck

(an old tin-mining area in rainforest at 16° 26'27"S × 145°15'08"E) contained the specimen of the longicorn beetle plus several specimens of the large ant, *Myrmecia flavicoma minuscula* Forel, 1915 (Fig 1A). It can be assumed that all the specimens in the vial were collected in reasonably close proximity. The ant genus *Myrmecia* belongs to the primitive Australian subfamily Myrmeciinae and its members are well known for their large size, aggressive behaviour and formidable defences in the form of large jaws and powerful sting. *Myrmecia f. minuscula* is a daytime-foraging species with dark reddish-brown body and prominent pale mandibles. Its abdominal apex is subglobular, black and furnished apically with silvery hairs. The resemblance of the longicorn (Figs 1B-D) to the ants in size and colour is almost perfect, particularly the abdominal apex which is the same shape and colour and bears the same terminal ornamentation of silvery hairs as in the ant. The long pale, curved, antennal scapes of the longicorn resemble, in size, colour and position, the defensive jaws of the ant. This ant-mimicry by the longicorn most likely benefits it by allowing it to escape the predators which avoid the aggressive ant. This is undoubtedly another case of Wasmannian mimicry, where the mimicking insect lives along with the model, as has been reported for other genera of Australian and New Caledonian longicorn beetles (Hayashi 1961; Vives *et al.* 2011).

Subfamily Lamiinae

Tribe Parmenini Mulsant, 1839

Parmenaires Mulsant, 1839: 118.

Parmenini Breuning, 1950: 29.

Myrmeparmena gen. nov.

Type species. *Myrmeparmena sudrei* sp. nov.

Head large, rounded, very convex dorsally and longitudinally furrowed from occiput to labrum; anteriorly briefly elongated as short rostrum with sides convergent; epistome trapezoidal, glabrous; temples rounded and protruding, covered by

fuzzy grey pilosity; underneath almost smooth, with sparse grey pubescence. Labrum large, with round anterior margin and transversal row of short golden setae. Mandibles very short, weakly protruding, with large golden setae at base of external margin, and inner margin smooth with apical curved and sharp tooth. Palpi rather long; third segment acuminate. Eyes small, feebly protruding, finely faceted, with inner edge strongly emarginate. Antennae short and thin, reaching apical third of elytra; scape long, club-shaped, slightly arched; third segment neatly shorter than scape, longer than fourth segment; segments 3 to 11 cylindrical, long and narrow, with long setae on internal margin of three first segments and remaining segments with very short grey tomentum.

Elytra very long and narrowed, almost cylindrical at anterior half, and very convex and widened at posterior half; almost glabrous with inconspicuous suture; base of each elytron with large carinate tooth, just behind scutellum; surface of elytra rugulose at anterior half, except laterally, smooth, shiny; posterior half very convex, finely punctured but rather glossy between punctures, covered by silvery grey tomentum; golden yellow pubescence on epipleural area; sutural angle strongly dehiscent, making each elytron apically rounded, revealing last abdominal tergite. Hindwings present but strongly reduced, but following shape of elytra, narrowed anteriorly and widened posteriorly. First visible abdominal ventrite trapezoidal; following three ventrites wide and short, rather convex; fifth large, yellow, slightly translucent; abdomen entirely covered by short silvery grey pubescence.

Legs long and slender; profemora strongly widened, meso- and metafemora less so; tibiae long, compressed, slightly arched; protibia feebly grooved at lower part near apex, mesotibiae externally emarginate at apex; tarsi narrow, with first segment twice as long as remaining together; claws divaricate. Tibiae and claw shape are as generally observed in Parmenini.

Myrmeparmena sudrei sp. nov.
(Figs. 1 E-G)

MATERIAL. Holotype ♀: New Caledonia, Île des Pins, 22-X-2008, Arade and Jérôme Sudre. In MNHN, Paris, France. Paratype ♀: same locality, X-2008, Laurent Soldati leg., (E. Vives collection).

Size of holotype/paratype: Length 11/10 mm, width 2.8/2.6 mm at apical third of elytra. Ground colouration black, with some areas glossy and others satin-like; epistome, labrum, mandibles, palpi and two first antennal segments creamy yellow; legs and remaining antennal segments testaceous with short grey tomentum and sparse long golden setae. Head and pronotum black, their surface finely punctured, with slight glossy shine except laterally on anterior half of pronotum, smooth, shiny, indicating a waist-like narrowing; posterior half of pronotum anteriorly with depressed area at both sides surrounded by white pubescence, and apically densely covered by grey tomentum, furrowed transversely by smooth and shiny strip, mimicking the intersection of abdominal segments in some ants.

Etymology. this species is named after our friend M. Jérôme Sudre (Faramaz, France), companion in the research of the beetle fauna of New Caledonia, great expert in the Cerambycidae subfamily Lamiinae.

DISCUSSION

The shape and colouration of this new species mimics perfectly those of some genera of ants, with which it probably coexists. Unfortunately, we were unable to study any of the potential ants serving as model.

The morphology of *Myrmeparmena sudrei* sp. nov. is highly modified to adapt it to an arboreal life-style, presumably living in association with colonies of ants which it mimics. Its derived characters make it difficult to confidently place the new genus among the Lamiinae. Some remarkable characters include the insertion of the cephalic capsule, the pro- and mesotibial furrows

and the peculiar shape of divaricate claws, all of them relating the new genus to Mulsant's (1839) '*Parmenaires*' within the Lamiinae.

Several characters of *Myrmeparmena* gen. nov. are similar to those of *Caledomicrus* Vives et al., 2011, recently described on specimens from New Caledonia. In particular, they are similar in the almost cylindrical shape of pronotum, narrower than head, with sinuate longitudinal axis. However, it can be differentiated from *Caledomicrus* because the latter lacks hindwings, and its antennae are shorter and thicker, as well as by the narrower head and the narrower apical third of elytra. None the less, both myrmecophilous New Caledonian genera share several characters with representatives of Parmenini (*sensu* Breuning, 1950), including the anterior half of elytra narrowed, depressed, with basal spines, the atrophy of hindwings, the elytral apex broadly rounded and convex, and the divaricate claws. Based on these characters we include *Myrmeparmena* gen. nov. among the myrmecomorph Parmenini characteristic of New Caledonia (*Caledomicrus* Vives et al., 2011; *Falsohomaemota* Hayashi, 1961). A deeper analysis of these three atypical myrmecophilous genera may indicate establishing a new supra-generic taxon to include them.

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