

Revision of the genus *Macroscytus* (Heteroptera: Cydnidae) in Madagascar and adjacent islands, with description of four new species

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Key words. Hemiptera, Heteroptera, Cydnidae, *Macroscytus*, revision, new species, Madagascar

Abstract. A revision of species of the genus *Macroscytus* Fieber distributed in Madagascar and adjacent islands is presented. Four previously known species [*M. fryeri* Distant, *M. lobatus* Signoret, *M. madagascariensis* (Signoret), *M. privignus* Horváth] are redescribed, and lectotypes are designated for three of them. Four new species (*M. mayottensis* sp. n., *M. simulans* sp. n., *M. tamatavei* sp. n., and *M. viettei* sp. n.) are described and compared with their congeners. A key to all species of the genus known from Madagascar and adjacent islands is also provided.

INTRODUCTION

Macroscytus Fieber, 1860 is the most speciose genus of the tribe Geotomini (Cydnidae: Cydninae), and the second (after *Chilocoris* Mayr) within the entire family; it was redescribed recently (Lis, 1994), and at present it includes 54 species (Lis, 1999a, b, c).

To date, the genus has been revised from west, central, and northeast Africa (Linnavuori, 1993), the Oriental Region (Lis, 1994), East Palaearctic (Lis, 1995), and Australia (Lis, 1999a). Only four species of the genus have been recorded from Madagascar and adjacent islands so far, but they have never been revised or redescribed.

The present paper includes a revision of all species of the genus known from this area, together with descriptions of four species new to the science.

The sources of material for this study were the following institutional collections (with acronyms used in the text): BMNH – Natural History Museum, London, Great Britain; HNHM – Hungarian Natural History Museum, Budapest, Hungary; MNHN – Museum National d’Histoire Naturelle, Paris, France; NHMW – Naturhistorisches Museum Wien, Vienna, Austria; USMB – Upper Silesian Museum, Bytom, Poland; ZMAS – Zoological Institute Russian Academy of Sciences, St. Petersburg, Russia; MZLU – Zoological Museum, Lund University, Lund, Sweden; JL – author’s collection.

GENUS *MACROSCYTUS* FIEBER, 1860

Type species: *Cydnus brunneus* Fabricius, 1803.

Diagnostic characters. Head broadly rounded, clypeus free, with or without a pair of subapical hairlike setae; each paraclypeus submarginally with hairlike setae; eyes rounded, large, protruding; ocelli distinctly developed; antennae 5-segmented, slender, long. Pronotum broader than long, narrowed apically; anterior margin angularly insinuated; lateral margins with submarginal setigerous punctures; umbones strongly swollen, protruding caudolateral, concealing posterolateral margins. Scutellum longer than broad; basal and lateral rows of punctures distinctly developed; apex elongated, its tip rounded. Corium divided into clavus, meso- and exocorium; mesocorium

with two distinct rows of punctures paralleling clavo-mesocorial suture; costa with or without setigerous punctures; membrane normally developed, not reduced. Propleuron with deep, usually punctured depression; meso- and metapleuron with large evaporative areas, that of mesopleuron posteriorly with polished band; peritreme differentiated, its apex posteriorly with more or less blunt lobe. Anterior tibiae expanded apically, margins armed in spines; male posterior femora usually with teeth and spines on dorsal margin; posterior tibiae slender, basally more or less reflected and usually with more or less distinct tubercles in male specimens.

DESCRIPTION OF NEW SPECIES

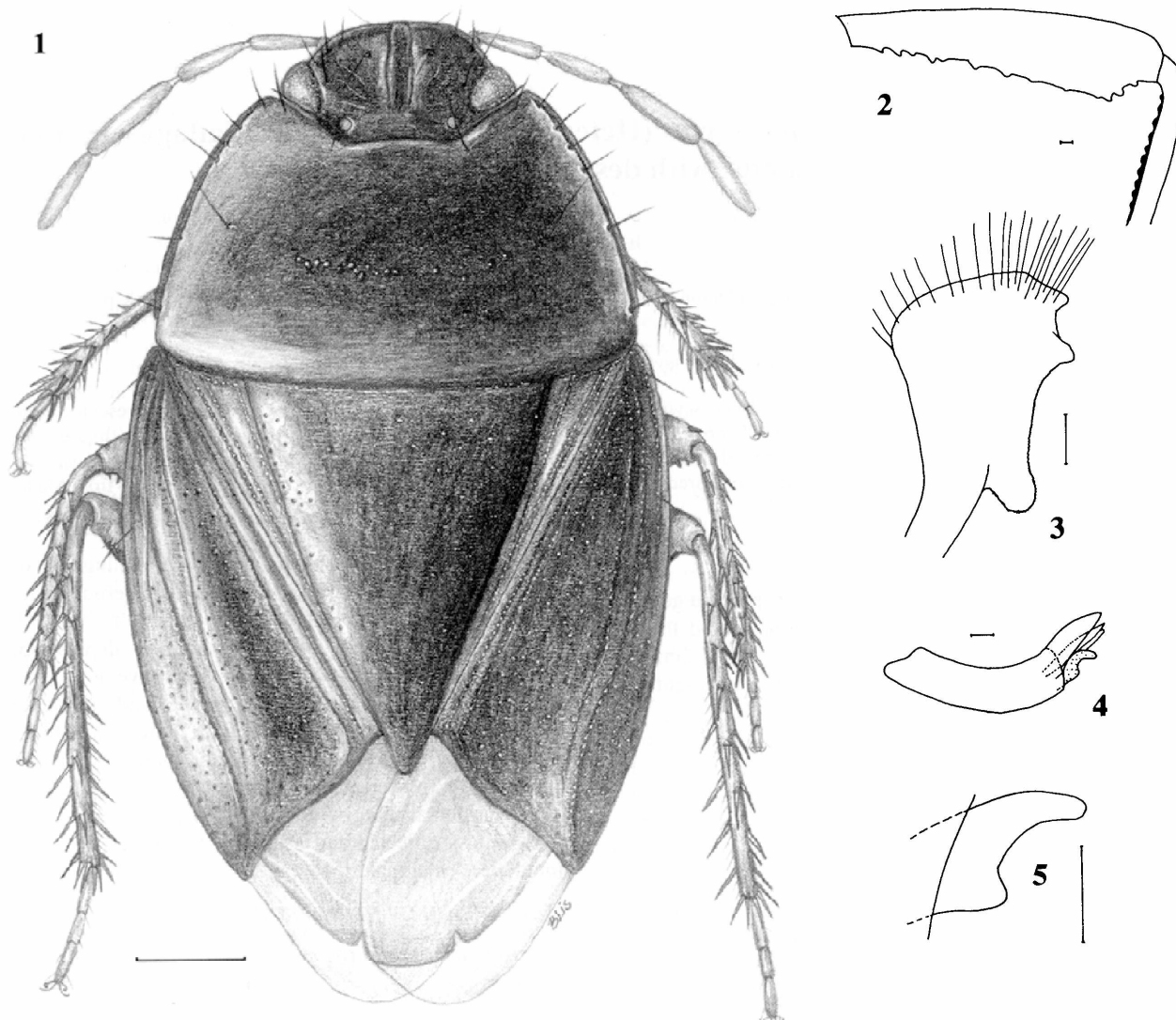
Macroscytus mayottensis sp. n.

(Figs 1–5)

Diagnosis. The new species (Fig. 1) is similar to *M. fryeri*, but can easily be distinguished from the latter by the body length (about 7.5 mm in *M. fryeri*, about 8.8–9.4 mm in *M. mayottensis*), and the presence of setigerous punctures on lateral margins of pronotum (8–9 in *M. fryeri*, 6 in *M. mayottensis*). For other characters separating both species, see the key.

Description

Head. From dark castaneous to almost black; dorsal surface alutaceous, at first sight looking impunctate, but bearing few small punctures laterally; ventral surface punctured only in the posterior third, bucculae entirely coarsely punctured; clypeus free, as long as paraclypei, parallel-sided, subapically without a pair of setigerous punctures; each paraclypeus submarginally with 2–3 setigerous punctures bearing hairlike setae; eyes reddish brown or dark brown, ocular index 2.17–2.40; ocelli reddish brown, distance between ocelli about 6.0–6.3 times longer than distance between ocellus and eye, ocellar index 5.0–5.8; antennae pale brown or brown; rostrum yellowish brown or brown, its apex reaching or slightly surpassing middle coxae.



Figs 1–5: *Macroscyrtus mayottensis* sp. n. 1 – habitus, dorsal view; 2 – male hind femur and tibia in dorsal view; 3 – paramere; 4 – penis; 5 – second conjunctival appendage. Scale: 0.1 mm.

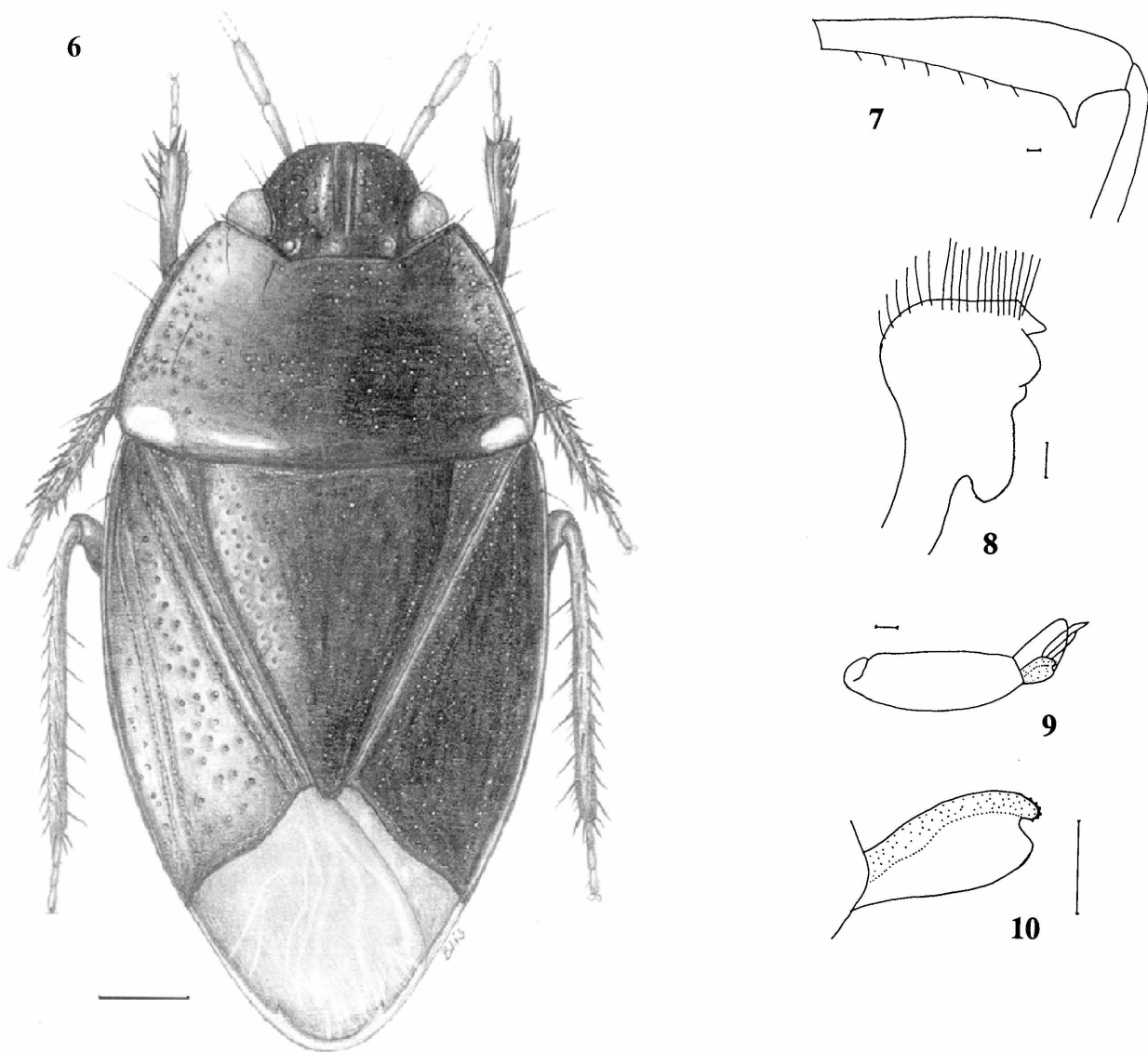
Prothorax. Pronotum from dark castaneous to blackish brown, posteriorly somewhat lighter in shade; puncturation of pronotal disc weak, punctures irregularly scattered, more visible behind head and in shallow transverse impression behind calli; lateral margins of pronotum with 6 submarginal setigerous punctures bearing long hairlike setae. Prosternal carinae low, coarsely punctured; anterior convexity of propleuron alutaceous, punctured laterally and apically, the posterior convexity distinctly coarsely punctured with large punctures, propleural depression coarsely punctured.

Mesothorax. Scutellum coloured as anterior half of pronotum, its disc with almost evenly spaced punctures as large as those on pronotum, apex and basal fifth of scutellar disc impunctate. Mesopleural evaporatorium with weak longitudinal rugae, its posterior wedge-shaped polished band with few punctures.

Metathorax. Hemelytra coloured as posterior half of pronotum, punctures distinctly smaller than those on scu-

tellum; clavus with one complete and two incomplete rows of punctures; mesocorial disc densely and almost evenly punctured; exocorium densely punctured; mesocorium and exocorium separated along their entire length; costa narrow, flattened, separated from exocorium only in its basal half, costal margin bearing 2 setigerous punctures; membranal suture slightly bisinuated; membrane semihyaline, embrowned, reaching (female) or surpassing (male) the posterior extremity of abdomen. Metapleural evaporatorium with weak longitudinal rugae; lateral area of metapleuron impunctate (male) or narrowly punctured with few coarse punctures (female), posteriorly coarsely punctured.

Legs. Male and female femora and tibiae from castaneous to dark castaneous, all tarsi pale brown or brown; male hind femur with a row of tubercles on its dorsal margin (Fig. 2), and a row of denticles on the ventral margin, subapical teeth well visible; male hind tibia with a row of small denticles (Fig. 2), female hind femora with row of setae on margins, female tibiae simple.



Figs 6–10: *Macroscythus simulans* sp. n. 6 – dorsal view; 7 – male hind femur and tibia in dorsal view; 8 – paramere; 9 – penis; 10 – second conjunctival appendage. Scale: 0.1 mm.

Abdomen. Sterna alutaceous, more or less polished, punctured only around spiracles and trichobothria. Ventral surface of male pygophore almost impunctate, bearing only few punctures laterally, its dorsal surface pilose, longitudinal sclerites on infolding of its dorsal rim well developed; penis as in Fig. 4, 2nd conjunctival appendages as in Fig. 5, paramere as in Fig. 3.

Measurements (in mm). Male and female, respectively: Body length 8.78–9.37, 7.80; body width 4.90–5.15, 4.55; head length 1.34–1.46, 1.41; head width 2.15–2.32, 2.10; pronotum length 2.57–2.82, 2.28; pronotum width 4.50–4.75, 4.31; scutellum length 3.56–3.66, 3.27; scutellum width 2.97–3.07, 2.77; antennal segments: 0.42–0.47 : 0.62–0.69 : 0.65–0.67 : 0.92–0.94 : 1.03–1.08, 0.37 : 0.55 : 0.60 : 0.76 : 0.90.

Type material: Holotype ♂: [COMOROS]: “Mayotte, Mamoutzou, II-56, A.R., Institut Scientifique Madagascar, Muséum Paris” (MNHN). Paratypes: [COMOROS]: 1♂, “Gde Comore,

XI.54, J.M., Institut Scientifique Madagascar, Muséum Paris” (JL); 1♀, “Grande Comore, Niombadjou, 505 m, III-V-58, Raharizonina, Institut Scientifique Madagascar, Muséum Paris” (MNHN).

Distribution. Comoros.

***Macroscythus simulans* sp. n.**

(Figs 6–10)

Diagnosis. In general body habitus and head vestiture the new species resembles *M. madagascariensis*; nevertheless, it can easily be separated from the latter (as well as from all its Madagascan congeners) by sharply bicoloured pronotum (pronotal disc black, umbones yellowish brown – Fig. 6).

Description

Head. Black, its dorsal surface distinctly punctured with large, coarse punctures; ventral surface impunctate only in anterior third, posterior two-thirds as well as en-

tire bucculae coarsely punctured; clypeus free, as long as paraclypei, almost impunctate, subapically without pair of setigerous punctures; each paraclypeus with single submarginal setigerous puncture just anterior to eye; the latter reddish brown, ocular index 2.60–2.75; ocelli large, reddish brown, ocellar index about 4.7–5.6, distance between ocelli about 4.5–5.6 times longer than distance between ocellus and eye; antennae from brown to dark brown; rostrum yellowish brown or brown, reaching anterior margin of middle coxae.

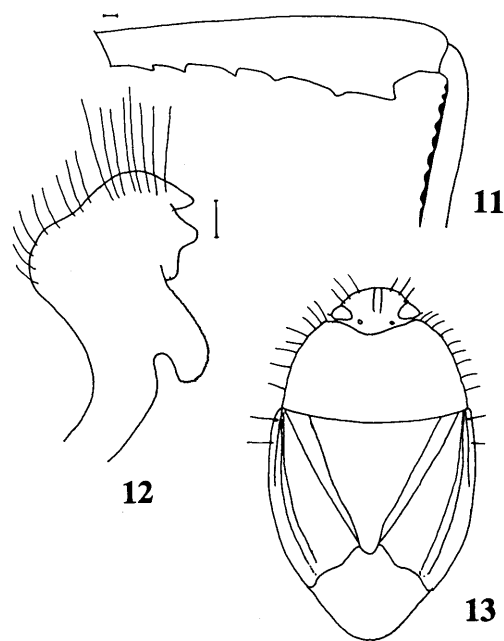
Prothorax. Pronotum black, entire umbones yellowish brown, thus making pronotal disc sharply bicoloured (Fig. 6); puncturation distinct on disc, calli and posterior margin impunctate, punctures larger than those on head; transverse discal impression absent; lateral margins of pronotum with 4–5 submarginal setigerous punctures bearing long hairlike setae. Prosternal carinae low, coarsely punctured; anterior convexity of propleuron alutaceous, coarsely punctured anteriorly and laterally with small punctures; posterior convexity alutaceous, with numerous large punctures; propleural depression with large and coarse punctures.

Mesothorax. Scutellum black, almost evenly punctured, punctures almost of same size as those on pronotum; anterolateral angles of disc impunctate. Mesopleural evaporatorium with well visible longitudinal rugae, its posterior wedge-shaped polished band almost impunctate, bearing only few very small punctures.

Metathorax. Hemelytra dark castaneous, clavus and exocorium almost black; clavus with one complete and two short rows of punctures; mesocorial disc almost evenly punctured, all punctures distinctly smaller than those on scutellum; exocorium distinctly punctured, punctures of same size as those on mesocorial disc; mesocorium and exocorium separated along their entire length; costa narrow, convex and raised, entirely separated from exocorium, costal margin with a single setigerous puncture bearing long hairlike seta; membranal suture bisinuated, membrane extending beyond posterior extremity of abdomen, semihyaline, distinctly embrowned. Metapleural evaporatorium with longitudinal rugae; lateral area of metapleuron impunctate, posterior area with row of coarse punctures.

Legs. Femora and tibiae almost black, tarsi brown; ventral margin of hind male femur with row of short setae and subapical denticle, its dorsal margin with row of short setae and large subapical tooth (Fig. 7); hind male tibia without denticles on inner margin; ventral margin of hind female femur with row of short setae and small subapical denticle, its dorsal margin with of short setae and subapical tooth; hind female tibia without denticles on inner margin;

Abdomen. Sterna black, polished, with large punctures in lateral third, around trichobothria and spiracles. Ventral surface of male pygophore distinctly punctured, its dorsal surface pilose, longitudinal sclerites on infolding of its dorsal rim dark and well developed; penis with theca almost straight (Fig. 9), 2nd conjunctival appendages elongated (Fig. 10); paramere as in Fig. 8.



Figs 11–13. 11–12: *Macroscythus tamatavei* sp. n. 11 – male hind femur and tibia in dorsal view; 12 – paramere. Scale: 0.1 mm. 13 – *Macroscythus fryeri* Distant, general body outline. Scale: 1.0 mm.

Measurements (in mm). Male and female, respectively: body length 10.34–10.93, 10.92–11.02; body width 5.64–5.89, 5.79–5.99; head length 1.41–1.54, 1.51–1.61; head width 2.39–2.43, 2.40–2.49; pronotum length 3.07–3.22, 3.22–3.32; pronotum width 5.35–5.45, 5.44–5.51; scutellum length 4.13–4.26, 4.31–4.46; scutellum width 3.51–3.61, 3.51–3.71; antennal segments: 0.50–0.51 : 0.72–0.74 : 0.83–0.87, 4th and 5th segments missing, 0.49–0.53 : 0.73–0.76 : 0.80–0.86, 4th and 5th segments missing.

Type material. Holotype ♂: [MADAGASCAR]: “Madagascar, Tamatave prov., Moramanga env., 14–18.12.1995, leg. J. Stolarczyk” (USMB). Paratypes: [MADAGASCAR]: 1♂, 2♀, “Madagascar, Tamatave prov., Moramanga env., 13–17.12.1995, leg. J. Stolarczyk” (USMB, JL).

Distribution. Madagascar.

Macroscythus tamatavei sp. n.

(Figs 11–12)

Diagnosis. The new species is similar to *M. madagascariensis* in its general habitus; nevertheless, the species differ in the number of setigerous punctures on the costal margin (*M. tamatavei* – two, *M. madagascariensis* – none), the ocular index (*M. tamatavei* – about 1.9, *M. madagascariensis* – 2.5–2.9), the third/second antennal segment length ratio (*M. tamatavei* – about 1.4, *M. madagascariensis* – 1.0–1.1). Moreover, they differ in the shape of paramere (Figs 12, 25).

Description

Head. Black, with lateral parts more castaneous in shade; dorsal surface polished, slightly wrinkled laterally, at first sight looking impunctate, but bearing numerous tiny, hardly visible punctures; ventral surface impunctate

in anterior third, posterior two thirds as well as bucculae coarsely punctured; clypeus parallel-sided, free, as long as paraclypei, subapically without pair of setigerous punctures; each paraclypeus submarginally with single setigerous puncture bearing long hairlike seta; eyes large, reddish brown, ocular index 1.90; ocelli large, reddish brown, ocellar index 3.3, distance between ocelli about 6.7 times longer than distance between ocellus and eye; antennae brown, third segment about 1.4 times longer than the second; rostrum brown, apex reaching anterior margin of middle coxae.

Prothorax. Pronotum trapezoid, black, posterior margins of umbones more brownish in shade; puncturation of pronotal disc quite visible, especially behind head and callal areas; transverse discal impression behind calli well developed, deep and punctured; lateral margins of pronotum with 4–5 submarginal setigerous punctures bearing long hairlike setae. Prosternal carinae low, coarsely punctured; anterior convexity of propleuron dulled and densely punctured with small punctures, posterior convexity with large scattered punctures, its puncturation weaker than that of anterior convexity, propleural depression densely and coarsely punctured.

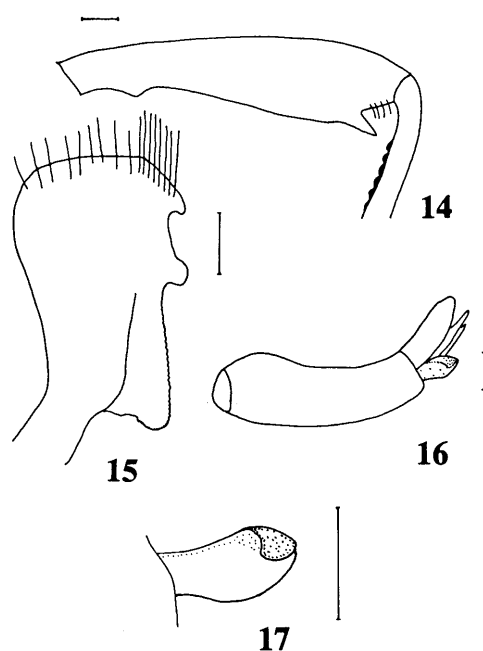
Mesothorax. Scutellum black, apex more castaneous; scutellar disc with irregularly scattered punctures as large as those on pronotum, its basal fourth impunctate. Mesopleural evaporatorium with longitudinal rugae, posterior wedge-shaped polished band with small, somewhat elongated punctures.

Metathorax. Hemelytra dark castaneous, clavus, exocorium, and punctures on mesocorium almost black; clavus medially with one complete and laterally with two incomplete rows of punctures; mesocorial disc almost evenly punctured; exocorium narrow, weakly punctured; mesocorium and exocorium separated along their entire length; costa narrow, slightly convex, basally somewhat flattened, separated from exocorium almost on its entire length, its margin with two setigerous punctures bearing long hairlike setae; membranal suture almost straight; membrane semihyaline, slightly embrowned, with dark median patches. Metapleural evaporatorium with longitudinal rugae; lateral area of metapleuron impunctate, posterior area with small, coarse punctures.

Legs. Femora dark castaneous, their margins almost black; anterior tibiae castaneous, middle and posterior tibiae dark castaneous with black margins; all tarsi brown; hind femur with row of well visible tubercles on ventral margin, and large subapical tooth on dorsal margin (Fig. 11); hind tibia with row of subapical denticles (Fig. 11).

Abdomen. Sterna black, slightly alutaceous, punctured laterally, around spiracles and trichobothria. Ventral surface of male pygophore impunctate, dorsal surface pilose, longitudinal sclerites on infolding of dorsal rim dark and well developed; penis with theca almost straight, 2nd conjunctival appendages mutilated; paramere as in Fig. 12.

Measurements (in mm). Male only: Body length 12.58; body width 6.42; head length 1.66; head width 2.63; pronotum length 3.42; pronotum width 5.99; scutel-



Figs 14–17: *Macroscytus viettei* sp. n. 14 – male hind femur and tibia in dorsal view; 15 – paramere; 16 – penis; 17 – second conjunctival appendage. Scale: 0.1 mm.

lum length 5.18; scutellum width 4.05; antennal segments: 0.60 : 0.76 : 1.07 : 1.39, 5th segment missing.

Type material. Holotype ♂: [MADAGASCAR]: “Madagascar, Tamatave prov., Moramanga env., 13–17.12.1995, leg. J. Stolarczyk” (USMB).

Distribution. Madagascar.

Macroscytus viettei sp. n.

(Figs 14–17)

Diagnosis. The new species is similar to *M. privignus*, but it can at once be separated from the latter by the body length (8.39–9.85 mm in *M. privignus*, 5.44–7.33 mm in *M. viettei*), dark tibiae (tibiae of *M. privignus* are yellow or yellowish brown), and by the costa being entirely separated from the exocorium (it is separated from the exocorium only basally in *M. privignus*).

Description

Head. From dark castaneous to black; dorsal surface alutaceous, impunctate except for setigerous punctures and sometimes few small punctures laterally; ventral surface punctured only in posterior third, bucculae entirely coarsely punctured; clypeus free, as long as paraclypei, parallel-sided, subapically without a pair of setigerous punctures; each paraclypeus submarginally with 3–5 setigerous punctures bearing long hairlike setae; eyes dark reddish brown, ocular index 2.40–2.85; ocelli reddish brown, distance between ocelli about 8.0–13.0 times longer than distance between ocellus and eye, ocellar index 4.8–6.4; antennae pale brown or brown; rostrum brown or dark brown, reaching middle of mesosternum.

Prothorax. Pronotum from castaneous to blackish brown, posterior margins somewhat lighter in shade; puncturation of pronotal disc well developed, punctures small, especially visible behind head and calli, the latter

impunctate, discal transverse impression absent; lateral margins of pronotum with 6–10 submarginal setigerous punctures bearing long hairlike setae. Prosternal carinae low, coarsely punctured basally; anterior convexity of propleuron alutaceous, impunctate or almost impunctate, posterior convexity distinctly coarsely punctured close to propleural depression, latter coarsely punctured.

Mesothorax. Scutellum coloured as the anterior half of pronotum, disc with almost evenly spaced punctures as large as those on pronotum, basal fifth of scutellar disc impunctate. Mesopleural evaporatorium with weak longitudinal rugae, its posterior wedge-shaped polished band impunctate or with few punctures.

Metathorax. Hemelytra lighter than pronotum and scutellum, densely punctured, punctures darker and larger than those on scutellum; clavus with one complete and two incomplete rows of punctures; mesocorial disc densely and almost evenly punctured; exocorium densely punctured; mesocorium and exocorium separated along their entire length; costa narrow, raised, separated from exocorium along its entire length, costal margin with 2–4 setigerous punctures; membranal suture almost straight; membrane semihyaline, embrowned, distinctly surpassing posterior extremity of abdomen. Metapleural evaporatorium with weak longitudinal rugae; lateral area of metapleuron impunctate or with few punctures close to margin of evaporatorium, posterior area with row of coarse punctures.

Legs. Femora from castaneous to dark castaneous, tibiae from dark castaneous to almost black, tarsi pale brown or yellowish brown; male hind femur with subbasal and subapical teeth on dorsal margin (Fig. 14), and row of setae on ventral margin; male hind tibia with row of very small denticles (Fig. 14); female hind femora with row of setae on margins, female tibiae simple.

Abdomen. Sterna alutaceous, more or less polished, impunctate or with few punctures posteriorly to spiracles. Ventral surface of male pygophore impunctate or with few small punctures laterally, dorsal surface pilose, longitudinal sclerites on infolding of dorsal rim well developed; penis elongated (Fig. 16), 2nd conjunctival appendages lobed (Fig. 17), paramere as in Fig. 15.

Measurements (in mm). Male and female, respectively: Body length 6.04–7.33, 5.44–7.18; body width 3.44–4.05, 3.24–3.90; head length 1.09–1.22, 0.97–1.17; head width 1.45–1.72, 1.40–1.63; pronotum length 1.78–2.15, 1.73–2.10; pronotum width 3.07–3.63, 2.95–3.54; scutellum length 2.22–2.73, 2.19–2.83; scutellum width 1.99–2.39, 1.97–2.27; antennal segments: 0.26–0.28 : 0.32–0.50 : 0.33–0.47 : 0.43–0.56 : 0.50–0.60, 0.24–0.31 : 0.35–0.42 : 0.38–0.44 : 0.51–0.57 : 0.55–0.60.

Type material. Holotype ♂: [COMOROS]: “Grande Comore, N'Tsoudjini, 100 m, 23/30-IV-1980, P. Viette, Muséum Paris” (MNHN). Paratypes: [COMOROS]: 1♂, “Grande Comore, N'Tsoudjini, 100 m, 23/30-IV-1980, P. Viette, Muséum Paris” (JL); 2♀, “Grande Comore, N'Tsoudjini, 100 m, 29/31-III-1980, P. Viette, Muséum Paris” (MNHN, JL); 1♀, “Grande Comore, H. Pobéquin, 1899, Muséum Paris” (MNHN); 1♀, “Moroni, G^{de} Comore, Malet, Coll. E. Fleutiaux,

1919, Muséum Paris” (MNHN); 1♂, 1♀, “Djouma-Dougna, Mohéli, Iles Comores, Pupier, Coll. E. Fleutiaux, 1919, Muséum Paris” (MNHN, JL); 1♂, “Mohéli, Bandamalé, 420 m, IX-58, Raharizonina, Institut Scientifique Madagascar, Muséum Paris” (MNHN); 1♂, “Mayotte, Convalescence, 380 m, XI-58, Raharizonina, Institut Scientifique Madagascar, Muséum Paris” (MNHN); [MADAGASCAR]: 1♂, “Madagasc., Muséum Paris” (MNHN); 2♂, “Madagascar, Coll. Sicard 1930, Muséum Paris” (MNHN, JL); 2♂, 1♀, “Madagascar Est, district de Maroantsetra, station forestière de Farankarina, toute de Navana, km 16.5, vallée d'Antoroaka, 100 m, 8/18-I-1964, P. Viette, Muséum Paris” (MNHN, JL); 1♀, “Madagascar, Baie d'Antongil, A. Mocquerys, Coll. Noualhier 1898, Muséum Paris” (MNHN); 1♀, “Madagascar, Région du Sud-Est, Fort-Dauphin, Ch. Alluaud 1901, Muséum Paris” (MNHN); 1♂, “Madagascar, Mora Mora, Tulear, at the coast, 25-30.X.1981, leg. E. Tham” (MZLU).

Distribution. Madagascar, Comoros.

SPECIES REDESCRIPTIONS

Macroscythus fryeri Distant, 1913

(Fig. 13)

Macroscythus fryeri Distant, 1913: 140 [Aldabra].

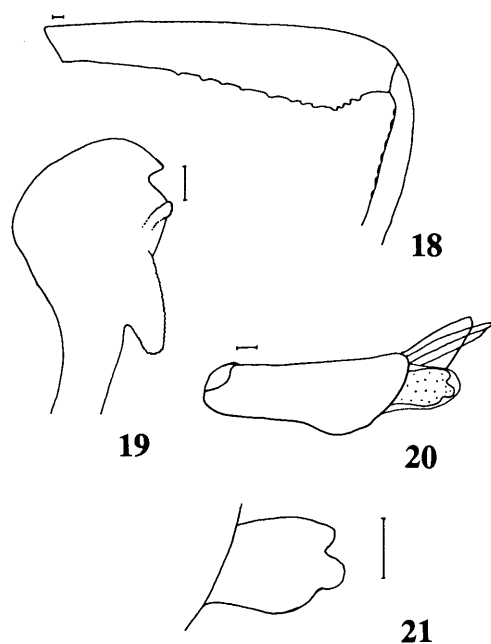
Redescription

Head. From dark castaneous to blackish brown; dorsal surface alutaceous, impunctate except for setigerous punctures; ventral surface punctured only in posterior half, bucculae entirely coarsely punctured; clypeus free, as long as paraclypei, almost parallel-sided, subapically without pair of setigerous punctures; each paraclypeus submarginally with 3 setigerous punctures bearing long hairlike setae; eyes reddish brown, ocular index 2.35; ocelli reddish brown, distance between ocelli about 8.7 times longer than distance between ocellus and eye, ocular index 5.1; antennae yellowish brown; rostrum brown, reaching middle coxae.

Prothorax. Pronotum dark castaneous, posterior margins of umbones lighter in shade; puncturation of pronotal disc weak, few punctures present behind calli and in posterior half of disc, discal transverse impression absent; lateral margins of pronotum with 8–9 submarginal setigerous punctures bearing long hairlike setae. Prosternal carinae low, coarsely punctured basally; anterior convexity of propleuron alutaceous, sparsely punctured with small punctures, posterior convexity distinctly punctured with punctures larger than those on anterior convexity, propleural depression coarsely punctured.

Mesothorax. Scutellum castaneous, its disc with almost evenly spaced punctures as large as those on pronotum, basal fifth of scutellar disc impunctate. Mesopleural evaporatorium with weak longitudinal rugae, posterior wedge-shaped polished band almost impunctate, bearing only few punctures.

Metathorax. Hemelytra yellowish brown, lighter than pronotum and scutellum, densely punctured, punctures dark and large; clavus with one complete and two incomplete rows of punctures; mesocorial disc densely and almost evenly punctured; exocorium densely punctured; mesocorium and exocorium separated along their entire length; costa flattened, and separated from exocorium



Figs 18–21: *Macroscytus lobatus* Signoret. 18 – male hind femur and tibia in dorsal view; 19 – paramere; 20 – penis; 21 – second conjunctival appendage. Scale: 0.1 mm.

only in its basal half, costal margin with 2 setigerous punctures bearing hairlike setae; membranal suture slightly sinuated; membrane semihyaline, slightly embrowned, surpassing posterior extremity of abdomen. Metapleural evaporatorium with well developed longitudinal rugae; lateral area of metapleuron impunctate, posterior area with a row of coarse punctures.

Measurements (in mm). Holotype only: Body length 7.47; body width 4.06; head length 1.01; head width 1.69; pronotum length 2.12; pronotum width 3.69; scutellum length 2.65; scutellum width 2.19; antennal segments: 0.24 : 0.50 : 0.49, 4th and 5th missing.

Type material examined. Holotype (by monotypy): [SEYCHELLES ISLANDS]: “Aldabra, 1908–9, Fryer” (BMNH).

Distribution. Seychelles Islands (Aldabra).

Remarks. The holotype specimen is damaged; it bears neither abdomen nor posterior legs, and therefore it is impossible to deduce its sex (which was also not given in the original description).

Macroscytus lobatus Signoret, 1883

(Figs 18–21)

Macroscytus lobatus Signoret, 1883: 470 [Bourbon Island].

Redescription

Head. From dark castaneous to almost black; dorsal surface at first sight looking impunctate, slightly alutaceous, bearing small and hardly visible irregularly scattered punctures, lateral parts of paraclypei slightly wrinkled, sometimes with few large punctures; male specimen with posterior half of ventral surface, as well as posterior half of bucculae coarsely punctured, female specimens with ventral surface and bucculae almost entirely coarsely punctured; clypeus parallel-sided, free, as long as or slightly shorter than paraclypei, subapically

without pair of setigerous punctures; each paraclypeus only with 2 primary setigerous punctures, submarginal setigerous punctures absent; eyes brown or dark castaneous; ocular index 2.30–2.45; ocelli yellowish brown or reddish brown, ocellar index about 4.6–7.0, distance between ocelli about 3.5–5.7 times longer than distance between ocellus and eye; antennae from yellowish brown to brown, second segment longer than third; rostrum yellowish brown, reaching (male) or surpassing (female) middle coxae.

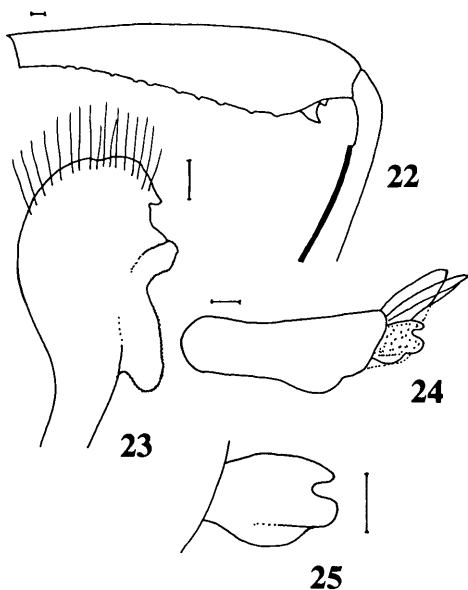
Prothorax. Pronotum with anterior half from dark castaneous to almost black, posterior half more brownish in shade; puncturation well visible, especially behind calli, punctures large and coarse; transverse discal impression well developed, deep, bearing large, coarse, crowded punctures; lateral margins of pronotum without submarginal setigerous punctures, primary setigerous punctures on pronotal disc also absent. Prosternal carinae low, coarsely punctured; anterior and posterior convexities of propleuron coarsely punctured, punctures on posterior convexity larger than those on anterior, propleural depression with numerous coarse and deep punctures.

Mesothorax. Scutellum almost totally black, apex more castaneous; scutellar disc densely and coarsely punctured, punctures almost of same size as those on pronotum, anterolateral parts and apex impunctate. Mesopleural evaporatorium with distinctive rugae, its posterior wedge-shaped polished band punctured.

Metathorax. Hemelytra castaneous, punctures darker, lateral margins of corium black; clavus with one almost indistinct and two distinctly visible rows of punctures, punctures between rows present; mesocorial disc densely and almost evenly punctured, punctures smaller than those on scutellum; exocorium broad, densely and evenly punctured, punctures as large as those on mesocorial disc; mesocorium and exocorium separated along their entire length; costa broad, almost totally flattened, slightly elevated and separated from exocorium only basally, costal margins punctured, but without setigerous punctures; membranal suture slightly bisinuate, membrane extending beyond posterior extremity of abdomen, semihyaline, embrowned. Metapleural evaporatorium with longitudinal rugae; lateral area of metapleuron punctured only close to evaporatorium margin, posterior area with broad row of coarse punctures.

Legs. Femora dark castaneous to black-brown; tibiae dark castaneous; tarsi yellowish brown; ventral margin of hind male and female femur with a row of 6–7 short setae, dorsal margin with numerous very small denticles (Fig. 18); hind male tibia with few very small denticles on its inner margin; hind female tibia without denticles on inner margin.

Abdomen. Sterna almost black, distinctly coarsely punctured in lateral two thirds. Ventral surface of male pygophore punctured, its dorsal surface pilose, longitudinal sclerites on infolding of its dorsal rim dark and well developed; penis with theca distinctly broadened in its apical half (Fig. 20), second conjunctival appendages broad (Fig. 21); paramere as in Fig. 19.



Figs 22–25: *Macroscyrtus madagascariensis* sp. n. 22 – male hind femur and tibia in dorsal view; 23 – paramere; 24 – penis; 25 – second conjunctival appendage. Scale: 0.1 mm.

Measurements (in mm). Male and female, respectively: Body length 11.51, 11.32–11.61; body width 6.44, 6.43–6.63; head length 1.78, 1.80–1.83; head width 2.63, 2.70–2.76; pronotum length 3.52, 3.31–3.47; pronotum width 5.69, 5.89–5.94; scutellum length 5.05, 4.55–4.75; scutellum width 3.76, 3.60–3.76; antennal segments: 0.54 : 0.96 : 0.78 : 1.15, 5th segment missing, 0.51–0.55 : 0.88–1.01 : 0.83–0.93, 4th and 5th segments missing.

Type material examined. Lectotype ♂ (present designation): [REUNION]: “Bourbon, Coll. Signoret”; “lobatus, det. Signoret”; “Lectotype, lobatus Sign., labelled by R.C. Froeschner '59” (NHMW).

Other material examined. REUNION: La Réunion, Ile Bourbon, Bréon, 2♀ (MNHN, JL).

Distribution. Réunion Islands (Bourbon Island).

Macroscyrtus madagascariensis (Signoret, 1861)

(Figs 22–25)

Aethus madagascariensis Signoret, 1861: 922 [Madagascar].

Macroscyrtus madagascariensis: Stål, 1865: 24.

Redescription

Head. From castaneous to almost black; dorsal surface impunctate, slightly alutaceous; ventral surface impunctate in anterior third, posterior two-thirds as well as entire bucculae coarsely punctured with large punctures; clypeus free, as long as or somewhat shorter than paraclypei, subapically without pair of setigerous punctures; each paraclypeus with single submarginal setigerous puncture just anterior to eye; latter reddish brown or blackish brown, ocular index 2.50–2.90; ocelli large, reddish brown or yellowish brown, ocellar index about 4.2–5.5, distance between ocelli about 4.0–6.0 times longer than distance between ocellus and eye; antennae from yellowish brown to brown, third segment almost as long as

second; rostrum yellowish brown or pale brown, reaching or slightly surpassing anterior margin of middle coxae.

Prothorax. Pronotum from castaneous to dark castaneous, anterior half darker than the posterior, sometimes almost black, disc impunctate except for row or band of large coarse punctures behind calli; transverse discal impression very shallow or absent; lateral margins of pronotum with 3–4 submarginal setigerous punctures bearing long hairlike setae. Prosternal carinae low, coarsely punctured; anterior convexity of propleuron alutaceous, coarsely punctured anteriorly and laterally; the posterior convexity alutaceous, with irregularly scattered large punctures; propleural depression with broad band of large, coarse and deep punctures.

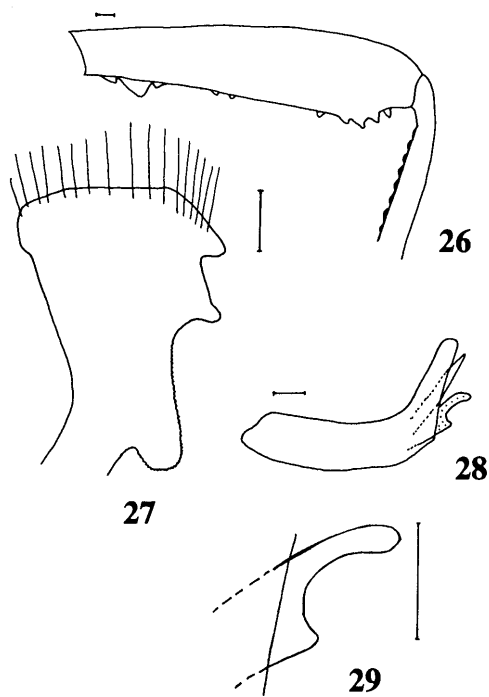
Mesothorax. Scutellum coloured as posterior half of pronotal disc, puncturation dense, well visible, punctures blackish brown or almost black, larger than those on pronotum; basal fifth and extreme apex of scutellar disc impunctate. Mesopleural evaporatorium with clearly visible longitudinal rugae, posterior wedge-shaped polished band with few irregularly scattered small punctures.

Metathorax. Hemelytra lighter than pronotum and scutellum, exocorium usually yellowish brown; clavus with one complete and two incomplete rows of punctures; mesocorial disc densely and evenly punctured, punctures distinctly smaller than those on scutellum; exocorium densely punctured, punctures slightly smaller than those on mesocorial disc; mesocorium and exocorium separated along their entire length; costa narrow, raised, and separated from exocorium only basally, its remaining part flattened, costal margin punctured, but without setigerous punctures; membranal suture bisinuated, membrane extending well beyond posterior extremity of abdomen, semihyaline, embrowned, and bearing irregular dark brown median patches. Metapleural evaporatorium with longitudinal rugae; lateral area of metapleuron almost impunctate, except for band of punctures close to evaporatorium margin, posterior area with row of coarse punctures.

Legs. Femora from dark brown to almost black; tibiae from brown to dark brown; tarsi yellowish brown or pale brown; ventral margin of hind male femur with a row of small denticles bearing short setae, and with large subapical tooth, dorsal margin with a row of small denticles (Fig. 22); hind male tibia carinated on inner margin (Fig. 22); ventral and dorsal margin of hind female femur with row of short setae; hind female tibia without carina on inner margin.

Abdomen. Sterna from castaneous to almost black, polished, slightly alutaceous, punctured in lateral third, around trichobothria and spiracles. Ventral surface of male pygophore almost impunctate, bearing only few scattered punctures laterally, dorsal surface pilose, longitudinal sclerites on infolding of dorsal rim dark and well developed; penis with theca slightly broadened apically (Fig. 24), second conjunctival appendages short and bilobed (Fig. 25); paramere as in Fig. 23.

Measurements (in mm). Male and female, respectively: Body length 11.70–11.90, 11.51–12.68; body width 5.94–6.14, 5.79–6.73; head length 1.53–1.68,



Figs 26–29: *Macroscyrtus privignus* Horváth. 26 – male hind femur and tibia in dorsal view; 27 – paramere; 28 – penis; 29 – second conjunctival appendage. Scale: 0.1 mm.

1.34–1.61; head width 2.48–2.52, 2.34–2.59; pronotum length 3.07–3.22, 2.87–3.17; pronotum width 5.54–5.59, 5.29–5.84; scutellum length 4.65–4.75, 4.55–5.02; scutellum width 3.61–3.72, 3.46–3.76; antennal segments: 0.48–0.50 : 0.72–0.83 : 0.73–0.87 : 1.01–1.14 : 1.19–1.32, 0.44–0.50 : 0.72–0.80 : 0.79–0.80 : 0.97–1.07 : 1.18–1.26.

Type material examined. Lectotype ♂ (present designation): [MADAGASCAR]: “Madagasc. Coll. Signoret”; “madagasc. det. Signoret”: “Type, madagascariensis Sign., labelled by R.C. Froeschner ’59” (NHMW).

Other material examined. MADAGASCAR: Madagascar, Catai, 1890, 1♂ (MNHN); Madagascar, Coridon, 1894, 1♀ (MNHN); Madagascar Est, envir. de Perinet, 1025 m, 7/10.xi.1967, P. Viette et P. Griveaud, 2♀ (MNHN, JL); Madagascar Sambirano, Manongarivo, 1,150 m, xii.1960, P. Griveaud, 1♀, (MNHN); Madagascar, Lac Andramdse, 28.i.1967, Y. Gomy, 1♀ (MNHN); Madagascar Est, massif du Marojejy, 600 m, 9/12.xii.1972, A. Peyrieras, 1♀ (MNHN).

Distribution. Madagascar.

Macroscyrtus privignus Horváth, 1919

(Figs 26–29)

Macroscyrtus privignus Horváth, 1919: 237 [Madagascar]; China, 1924: 427 [Rodriguez].

Redescription

Head. From castaneous to black; dorsal surface alutaceous, impunctate except for setigerous punctures, sometimes few very small punctures laterally; ventral surface punctured only in posterior half, bucculae more or less punctured; clypeus free, as long as paraclypei, almost parallel-sided, subapically without pair of setigerous punctures; each paraclypeus submarginally with 2–5

setigerous punctures bearing long hairlike setae; eyes from dark reddish brown to blackish brown, ocular index 2.10–2.70; ocelli reddish brown, distance between ocelli about 7.0–12.0 times longer than distance between ocellus and eye, ocellar index 3.5–4.5; antennae from yellowish brown to brown; rostrum pale brown or brown, reaching middle coxae.

Prothorax. Pronotum from castaneous to almost black, posterior margins somewhat lighter, apices of umbones sometimes pale brown or yellowish brown; puncturation of pronotal disc distinct, punctures small, better visible behind head and calli, latter impunctate, discal transverse impression absent or very shallow; lateral margins of pronotum with 6–10 submarginal setigerous punctures bearing long hairlike setae. Prosternal carinae low, impunctate; anterior convexity of propleuron alutaceous, impunctate or almost impunctate, posterior convexity distinctly coarsely punctured close to propleural depression, latter with band of coarse punctures.

Mesothorax. Scutellum coloured as anterior half of pronotum, disc densely punctured with almost evenly spaced punctures larger than those on pronotum, anterolateral angles of scutellar disc impunctate. Mesopleural evaporatorium with very weak longitudinal rugae, posterior wedge-shaped polished band impunctate or with punctures.

Metathorax. Hemelytra usually lighter than pronotum and scutellum, at least costa and part of exocorium brown or yellowish brown; corium densely punctured, punctures dark and as large as those on pronotum; clavus with one complete and two incomplete rows of punctures; mesocorial disc densely and almost evenly punctured; exocorium more or less densely punctured; mesocorium and exocorium separated along their entire length; costa flattened, separated from exocorium only in its basal third, costal margin with 2–3 setigerous punctures; membranal suture slightly bisinuate; membrane semihyaline, slightly browned, surpassing posterior extremity of abdomen. Metapleural evaporatorium with weak longitudinal rugae; lateral area of metapleuron impunctate, posterior area with row of coarse punctures.

Legs. Femora from castaneous to almost black, tibiae yellow or yellowish brown, tibial spines dark brown or black, tarsi pale brown or yellowish brown; male hind femur with row of small teeth on dorsal margin, among them three subapical (Fig. 26), and row of well-visible teeth on ventral margin, among them one larger subbasal and three subapical; male hind tibia with row of very small denticles (Fig. 26); female hind femora with row of setae on margins, female tibiae simple.

Abdomen. Sterna alutaceous, more or less polished, almost totally impunctate, bearing only patch of few small punctures posteriorly to spiracles. Ventral surface of male pygophore impunctate or with few small punctures laterally, dorsal surface pilose, longitudinal sclerites on infolding of dorsal rim well developed; penis elongated and slightly recurved (Fig. 28), 2nd conjunctival appendages long (Fig. 29), paramere as in Fig. 27.

TABLE 1. Distribution of particular species of *Macroscytus* in the Madagascan subregion.

Species	Madagascar	Comoros	Aldabra	Réunion	Rodriguez
<i>M. fryeri</i>			+		
<i>M. lobatus</i>				+	
<i>M. madagascariensis</i>	+				
<i>M. mayottensis</i>		+			
<i>M. privignus</i>	+				+
<i>M. simulans</i>	+				
<i>M. tamatavei</i>	+				
<i>M. viettei</i>	+	+			
Total	5	2	1	1	1

Measurements (in mm). Male and female, respectively: Body length 8.39–9.66, 8.39–9.85; body width 4.75–5.37, 4.60–5.45; head length 1.27–1.43, 1.28–1.42; head width 1.93–2.11, 1.94–2.19; pronotum length 2.37–2.88, 2.43–2.93; pronotum width 4.30–4.95, 4.21–5.05; scutellum length 3.19–3.90, 3.14–3.91; scutellum width 2.68–3.12, 2.75–3.37; antennal segments: 0.37–0.39 : 0.45–0.60 : 0.55–0.68 : 0.76–0.85 : 0.77–0.88, 0.34–0.40 : 0.51–0.60 : 0.58–0.69 : 0.78–0.88 : 0.79–0.88.

Type material examined. Lectotype ♂ (present designation): [MADAGASCAR]: “Madagascar, Finarantsoa”; “privignus det. Horváth”; “*Macroscytus privignus*” (HNHM).

Other material examined. MADAGASCAR: Madagascar, 1 ♀ (MNHN); Madagascar, Sicard, 1930, 1 ♂, 1 ♀ (MNHN, JL); Madagascar Sambirano, Nord-est de Maromandia, Base du Manongarivo, xii.1960, P. Griveaud, 1 ♂, 1 ♀ (MNHN, JL); Madagascar Sud, plateau Mahafaly, 11/12 km Ouest d’Ankalinano, 250 m, 14–17.i.1974, P. Viette et A. Peyrieras, 1 ♂ (MNHN); Madagascar Ouest, Ankarafantsika, Ampijoroa, 10.ii.1973, A. Peyrieras, 1 ♂ (MNHN); N. d’Ivohibe, Station Forest d’Angodongodona, 1,130 m, 23–25.x.1970, 1 ♀ (MNHN); Madagascar, Région de Sud, Pays Androy, Jehara, xii.1901, Alluaud, 1 ♂ (MNHN); Madagascar, Région de Sud, Andrahomana, XI-01, Alluaud, 1 ♀ (JL); Madagascar, Province de Fort-Dauphin, Antanimora, 1926, R. Decary, 1 ♂ (MNHN); Madagascar, Lambomakandro, Tuléar, 1935, B. Catala, 1 ♀ (MNHN); Madagascar, Ikongo, 1902, G. Grandidier, 1 ♂ (MNHN); Madagascar, Périnet, xii.1932, Olsufiev, 1 ♂ (ZMAS); Madagascar, Mahajanga prov., Mahajamba riv., Ampatika env., 15.xi.1995 1 ♂, 17.–20.xi.1995, 1 ♀, Ivo Jeniš (USMB, JL); Madagascar, Mahajanga env., Mahajanga distr., 1.–10.xii.1996, at light, Ivo Jeniš, 2 ♀ (USMB); Madagascar, Mahajanga distr., Ambodimanga env., 14.–16.xi.1995, J. Stolarczyk, 1 ♀ (JL).

Distribution. Madagascar, Rodriguez.

Key to the species of *Macroscytus* known from Madagascar and adjacent islands

- 1 Submargins of head without setigerous punctures; paramere and penis as in Figs 19, 20. *M. lobatus* Signoret
- Submargins of head with at least a single preocular setigerous puncture bearing a long hairlike seta; paramere and penis not as above. 2
- 2 Each paraclypeus with a single preocular setigerous puncture bearing a long hairlike seta. 3
- Each paraclypeus with at least two setigerous punctures bearing long hairlike setae. 5

- 3 Head dorsally with deep, well-visible punctures; umbones of pronotum entirely yellow or yellowish brown in contrast to black pronotal disc (Fig. 6); paramere and penis as in Figs 8, 9. *M. simulans* sp. n.
- Head dorsally impunctate or almost impunctate, bearing only almost indistinct, very small punctures; pronotum entirely brown or blackish brown, sometimes posterior margins of umbones somewhat yellowish; paramere and penis not as above. 4
- 4 Costa without setigerous punctures; eyes smaller, ocular index 2.5–2.9; third antennal segment at most slightly longer (1.0–1.1×) than second; paramere as in Fig. 23. *M. madagascariensis* (Signoret)
- Costa with 2 setigerous punctures; eyes larger, ocular index about 1.9; third antennal segment about 1.4 times longer than second; paramere as in Fig. 12. *M. tamatavei* sp. n.
- 5 Tibiae yellow or yellowish brown, distinctly lighter than tibial spines and femora; paramere and penis as in Figs 27, 28. *M. privignus* Horváth
- Tibiae from castaneous to dark castaneous, coloured as tibial spines and femora; paramere and penis not as above. 6
- 6 Costa separated from exocorium along its entire length; paramere and penis as in Figs 15, 16. *M. viettei* sp. n.
- Costa separated from exocorium only in its basal half; paramere and penis not as above. 7
- 7 Larger species, about 8.8–9.4 mm in length; punctures on corium colourless; lateral margins of pronotum with 6 submarginal setigerous punctures bearing long hairlike setae; pronotal transverse impression behind calli more or less developed; paramere and penis as in Figs 3, 4. *M. mayottensis* sp. n.
- Smaller species, about 7.5 mm in length; punctures on corium distinctly darker than corial disc; lateral margins of pronotum with 8–9 submarginal setigerous punctures bearing long hairlike setae; pronotal transverse impression behind calli absent; paramere and penis not as above. *M. fryeri* Distant

COMMENTS

The Afrotropical fauna of the genus *Macroscytus* is less rich than faunas of other Palearctic regions. The genus is represented by seven species in the continental tropical Africa (Linnavuori, 1993; Lis, 1999c), and eight species (4 previously known and 4 described as new) in the Madagascan subregion, whereas in the Oriental and Australian Regions it has 21 and 20 species, respectively (Lis, 1994, 1999a, b, c).

Of the 15 species known at present from the Afrotropical Region none is shared by the continental Africa and

the Madagascan subregion, and all Madagascan species seem at present to be endemic.

Five species are distributed in Madagascar, two in Comoros; the other islands (Aldabra, Réunion, Rodriguez) are known so far to have only a single species each (Table 1).

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REFERENCES

- CHINA W.E. 1924: The Hemiptera-Heteroptera of Rodriguez, together with the description of a new species of Cicada from that island. *Ann. Mag. Nat. Hist. (Ser. 9)* **14**: 427–453.
- DISTANT W.L. 1913: The Percy Sladen Trust Expedition to Indian Ocean in 1905. Vol. 5. No. IX. Rhynchota. Part I: Suborder Heteroptera. *Trans. Linn. Soc. Lond.* **16**: 139–191.
- HORVÁTH G. 1919: *Analecta ad cognitionem Cydnidarum*. *Ann. Hist. Nat. Mus. Nat. Hung.* **17**: 205–273.
- LINNAVUORI R.E. 1993: Cydnidae of West, Central and North-East Africa (Heteroptera). *Acta Zool. Fenn.* **192**: 1–148.
- LIS J.A. 1994: *A Revision of Oriental Burrower Bugs (Heteroptera: Cydnidae)*. Upper Silesian Museum, Department of Natural History, Bytom, 349 pp.
- LIS J.A. 1995: The genus *Macroscytus* Fieber (Heteroptera: Cydnidae) in the East Palaearctic subregion. *Entomol. Ber. (Amsterdam)* **55**: 163–165.
- LIS J.A. 1999a: A revision of Australian species of the genus *Macroscytus* Fieber (Hemiptera: Heteroptera: Cydnidae). *Entomol. Scand.* **29**: 459–479.
- LIS J.A. 1999b: *Macroscytus unisetosus* n. sp., the first species of the javanus-group from New Guinea (Hemiptera: Heteroptera: Cydnidae). *Genus (Wroclaw)* **10**: 33–36.
- LIS J.A. 1999c: Burrower bugs of the Old World – a catalogue (Hemiptera: Heteroptera: Cydnidae). *Genus (Wroclaw)* **10**: 165–249.
- SIGNORET V. 1861: Faune des Hémiptères de Madagascar, 2. Hémiptères. *Ann. Soc. Entomol. Fr. (Ser. 3)* **8**: 917–972.
- SIGNORET V. 1883: Révision du Groupe des Cydnides de la Famille des Pentatomides. Part 8(1). *Ann. Soc. Entomol. Fr. (Ser. 6)* **2**: 465–484.
- STÅL C. 1865: *Hemiptera Africana I*. Nordstetiana, Holmiae, 256 pp.

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