Three New Species of *Myrabolia* Reitter (Coleoptera: Cucujoidea: Myraboliidae)

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THREE NEW SPECIES OF *MYRABOLIA* REITTER (COLEOPTERA: CUCUJOIDEA: MYRABOLIIDAE)

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Abstract.— Three new species of the Australian genus *Myrabolia* (*M. championi, M. malgosiae, M. weiri*) are described, diagnosed and illustrated. The key to the known species of the genus is updated.

Key words.— Entomology, taxonomy, new species, Cucujoidea, Myraboliidae, *Myrabolia*.

INTRODUCTION

The endemic Australian genus *Myrabolia* was established by Reitter (1876) and placed in Cucujidae based on resemblance of the adult beetles to some Silvaninae. Subsequently Blackburn (1892, 1903) classified *Myrabolia* in Silvanidae. The relationships of this group remained unknown until Lawrence (1988) proposed to include it in Phloeostichidae, the 'primitive' cucujoid group as outlined by Sen Gupta and Crowson (1969). In 1991 Lawrence and Britton proposed a new subfamily for inclusion *Myrabolia* as it could not be placed satisfactorily in any of the recognized phloeostichid subfamilies. Leschen *et al*. (2005) elevated the subfamily Myraboliinae, to the family rank within the basal Cucujoidea following cladistic analysis of larval and adult characters.

Since Reitter's description of the genus, only Blackburn (1892, 1903) described a few new species and tried to make sense of numerous, very similar externally species. In his 1903 paper, Blackburn provided identification key for 6 species, commented Reitter's species, and erroneously synonymized *M. grouvelliana* Reitter with *Silvanus brevicornis* Erichson.

For a further hundred years *Myrabolia* remained an enigmatic and little known beetle genus until revision by Tomaszewska and Ślipiński (2008). That revision resulted in: (a) transfer of *Ocholissa leai*, described by Grouvelle (1911) in the family Colydiidae, to *Myrabolia*, (b) synonymy of *M. haroldiana* (not *M. grouvelliana* as proposed by Blackburn) with *S. brevicornis*, and (c) description of eight new species bringing the total number of *Myrabolia* species up to 13.

During a recent study of newly available Myraboliidae material, three new species of *Myrabolia* were found and are described here as *M. championi* sp. nov., *M. malgosiae* sp. nov. and *M. weiri* sp. nov.

MATERIAL AND METHODS

This paper is based on the examination of the material from the Australian National Insect Collection, Canberra, Australia (ANIC) and The Natural History Museum, London, England (NHM).

Measurements were made using an ocular micrometer attached to an Olympus SZH-10 dissecting microscope as follows: (BL) total body length, from apical margin of clypeus to apex of elytra; (PL) pronotal length, from the middle of anterior margin to margin of basal foramen; (PW) pronotal width at widest part; (EL) elytral length along suture, including scutellum; (EW) elytral width across both elytra at widest part. Male and female genitalia were dissected, cleared in

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10% solution of KOH, and subsequently transferred in glycerine on slides for further study. Illustrations were made from slide preparations using a camera lucida attached to the Carl Zeiss Jenamed microscope. After examination the genitalia were transferred to microvials and pinned beneath the specimen.

Scanning electron micrograph photographs were made using a HITACHI S-3400N machine. Digital photographs were made using a Leica digital camera mounted on microscope and subsequently enhanced using Auto-Montage software in the Electron Microscopy Laboratory of the MIZ.

Terminology used in this paper follows Ślipiński *et al*. (2010).

In the key numbers in square brackets [ ] refer to figures in the review of *Myrabolia* (Tomaszewska and Ślipiński 2008); all the remaining numbers refer to the figures of the present paper.

SYSTEMATICS

Species descriptions

Myrabolia championi sp. nov.
(Figs 1–11, 31)

Etymology. Named after G. C. Champion, whose collection contained the holotype of this new species.

Diagnosis. *M. championi* resembles *M. longicornis* and *M. kioloa* in having prosternal process regularly rounded at apex. It however can be distingushed from both these species by shorter body and the elytra, and antennomeres 3 and 5 longer than wide. In *M. longicornis* the antennomeres 3–5 and 7–8 are at least slightly longer than wide while in *M. kioloa* antennomeres 3–8 are at most as long as wide (although in its original description it was erroneously written as "3 and 5 slightly longer than wide").

Description. Length 2.66 mm; BL/EW = 2.80; PL/PW = 0.82; PL/EL = 0.41; PW/EW = 0.87; EL/EW = 1.71; EL/PL = 2.41.

Body elongate-oval, uniformly light brown with moderately long hairs (Figs 1, 2, 31). Antenna (Fig. 4) about 0.9 times as long as pronotum, antennomeres 3 and 5 longer than wide; antennomeres 4, 6–8 about as long as wide; antennomere 4 shorter than 3 or 5; antennomere 5 scarcely wider than 4 or 6; club long, broad and compact. Pronotum (Fig. 1) with sides weakly sinuate; broadest at about $^1/_3$ of basal length; lateral margins very finely crenulate; anterior angles rounded and slightly produced; posterior angles with small tooth; punctures rather small and dense, 2–4 diameters apart. Prosternal process (Fig. 3) about 1.2 times as wide as coxal diameter and expanded apically, at apex about 1.6 times its width between coxae; apical margin rounded; punctured; punctures fine and sparse present only along lateral and apical margins. Elytra (Figs 1, 9, 10) with punctures in rows 2–2.5 diameters apart; lateral margins along shoulders with very fine crenulation, with sharp, small tooth at anterior angle. Mesoventral process sparsely covered with large punctures 1–3 diameters apart (Fig. 3); metaventrite with intercoxal process indistinctly, narrowly bordered, and shallowly incised into mesoventrite (Fig. 3). Male abdominal ventrite I with a pair of moderately large, obliquely oval pore plates (Fig. 11). Median lobe and male genital segment as in Figures 5 and 8. Tegmen with parameres about $^1/_6$ as long as rest of tegmen; parameres bear long setae in mid length projecting inwardly and several long setae at apex (Figs 6, 7).

Female not known.

Holotype, male, "Sydney Lea/ New S. Wales, Australia/ G.C. Champion Coll., B.M. 1927-409/ Myrabolia grouvelliana Reitt. NSW" (NHM).

Distribution. New South Wales.

Myrabolia malgosiae sp. nov.
(Figs 12–19, 32)

Etymology. This species is dedicated to the memory of our friend and colleague Małgorzata Banaszkiewicz. The name of the new species is derived from Małgosia, Polish diminutive of Małgorzata.

Diagnosis. This is the only species of *Myrabolia* with distinctly elongate antennomeres 3, 5 and 7, while antennomeres 4, 6 and 8, at most, as long as wide.

Description. Length 2.35 mm; BL/EW = 2.85; PL/PW = 0.79; PL/EL = 0.37; PW/EW = 0.85; EL/EW = 1.79; EL/PL = 2.68.

Body elongate-oval, light brown, covered with moderately long hairs (Figs 12, 13, 32). Antenna (Fig. 15) 0.85 times as long as pronotum with antennomeres 3, 5 and 7 at least slightly longer than wide; antennomeres 4, 6, 8 about as long as wide, antennomere 4 shorter than 3 or 5 and antennomere 6 shorter than 5 or 7; club long, broad and rather compact. Pronotum (Fig. 12) rectangular, with sides almost parallel, weakly widened at anterior angles; anterior angles somewhat produced anteriorly, rounded; lateral margins crenulate, with small, rounded denticles; posterior angle with small, sharp tooth; punctures moderately large and dense, about 2–3 diameters apart. Prosternal process (Fig. 14) between coxae 1.2 times as wide as coxal diameter and at apex 1.65 times broader than its width between coxae; apex truncate; finely and sparsely punctured only along lateral and apical margins. Elytra (Figs 12, 17, 18) with punctures in rows, 3 diameters apart; rows distinct from elytral apex to about ¾ of basal length; lateral margins along shoulders with small, rounded denticles, with tooth at anterior angle as large as teeth

below it. Mesoventral process covered with large punctures about 1.5–2.5 diameters apart (Fig. 14); metaventrite narrowly bordered, with intercoxal process widely but shallowly incised into mesoventrite (Fig. 14). Abdominal ventrite I in female uniformly, densely puncured (Fig. 19). Female genitalia as in Fig. 16.

Male not known.

Type material. Holotype, female, "SW Tasmania, Lower Gordon R, 42.36S 145.42E, Howard, Hill/ H.E.C. Surey; IIL. 1020, Jan 1976, handpicking/ VOUCHER SPECIMEN ILL/ Myrabolia grouvelliana Reitt., det. J.F. Lawrence" (ANIC).

Distribution. Tasmania.

Myrabolia weiri sp. nov.
(Figs 20–30, 33)

Etymology. This species is dedicated to Tom Weir, ANIC curator and one of the collectors of the holotype.

Diagnosis. This is the smallest species among the uniformly brown species of *Myrabolia* (body size below 2.00 mm). Moreover the sinuate apical margin of the prosternal process combined with antennomeres 3 and 5 longer than wide will separate this species from all uniformly coloured *Myrabolia*.

Description. Lenght 1.98 mm; BL/EW = 2.72; PL/PW = 0.80; PL/EL = 0.40; PW/EW = 0.86; EL/EW = 1.72; EL/PL = 2.50.

Body elongate-oval, yellowish brown, covered with comparatively long hairs (Figs 20, 21, 33). Antenna (Fig. 23) 0.9 times as long as pronotum with antennomeres 3 and 5 slightly longer than wide; antennomeres 4, 6–8 as long as wide, antennomere 4 shorter than 3 or 5; club long, broad and rather compact. Pronotum (Fig. 20) with sides weakly sinuate; broadest at about $^1/_3$ of basal length; lateral margins weakly crenulate; posterior angle with small, weak tooth; punctures rather small, 4–5 diameters apart. Prosternal process (Fig. 22) between coxae about 1.15 times as wide as coxal diameter, expanded apically; at apex about 1.6 times its width between coxae; apical margin sinuate; finely and sparsely punctured only along lateral and apical margins. Elytra (Figs 20, 28, 29) with punctures in rows about 4 diameters apart; lateral margins along shoulders finely crenulate, with small tooth at anterior angle. Mesoventral process covered with large punctures 1.0–2.0 diameters apart (Fig. 22); metaventrite narrowly bordered with intercoxal process rather shallowly incised into mesoventrite (Fig. 22). Male abdominal ventrite I with a pair of small, weakly oval pore plates (Fig. 30). Median lobe and male genital segment as in Figures 24 and 27. Tegmen with parameres somewhat curved inwardly, about $^1/_3$ as long as rest of tegmen (Figs 25, 26).

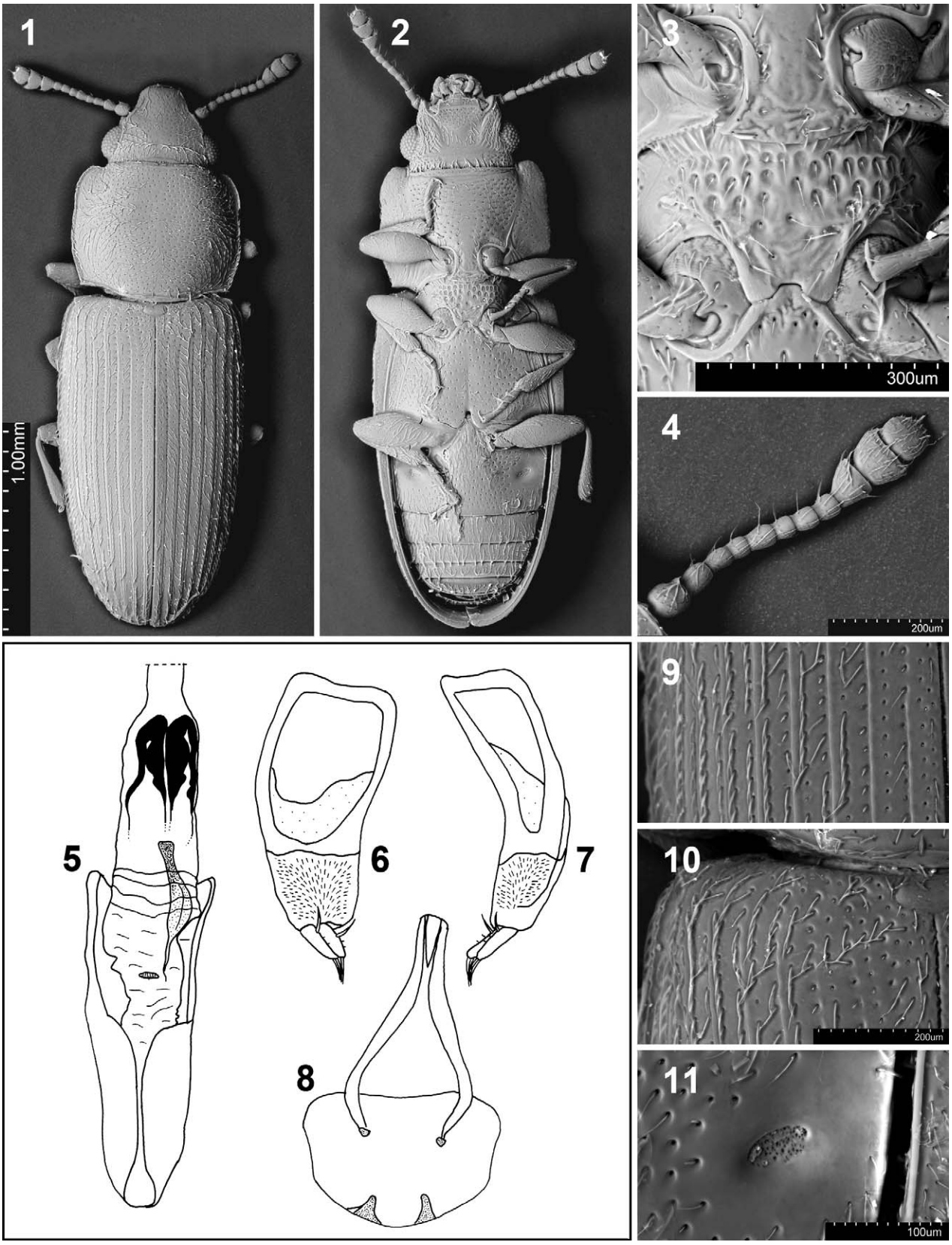
Female not known.

Type material. Holotype, male, "35.22S 148.48E, Piccadilly Circus, 1240 m ACT May '84, J. Lawrence, T. Weir, M-L. Johnson coll./ flight intercept window; through trap" (ANIC).

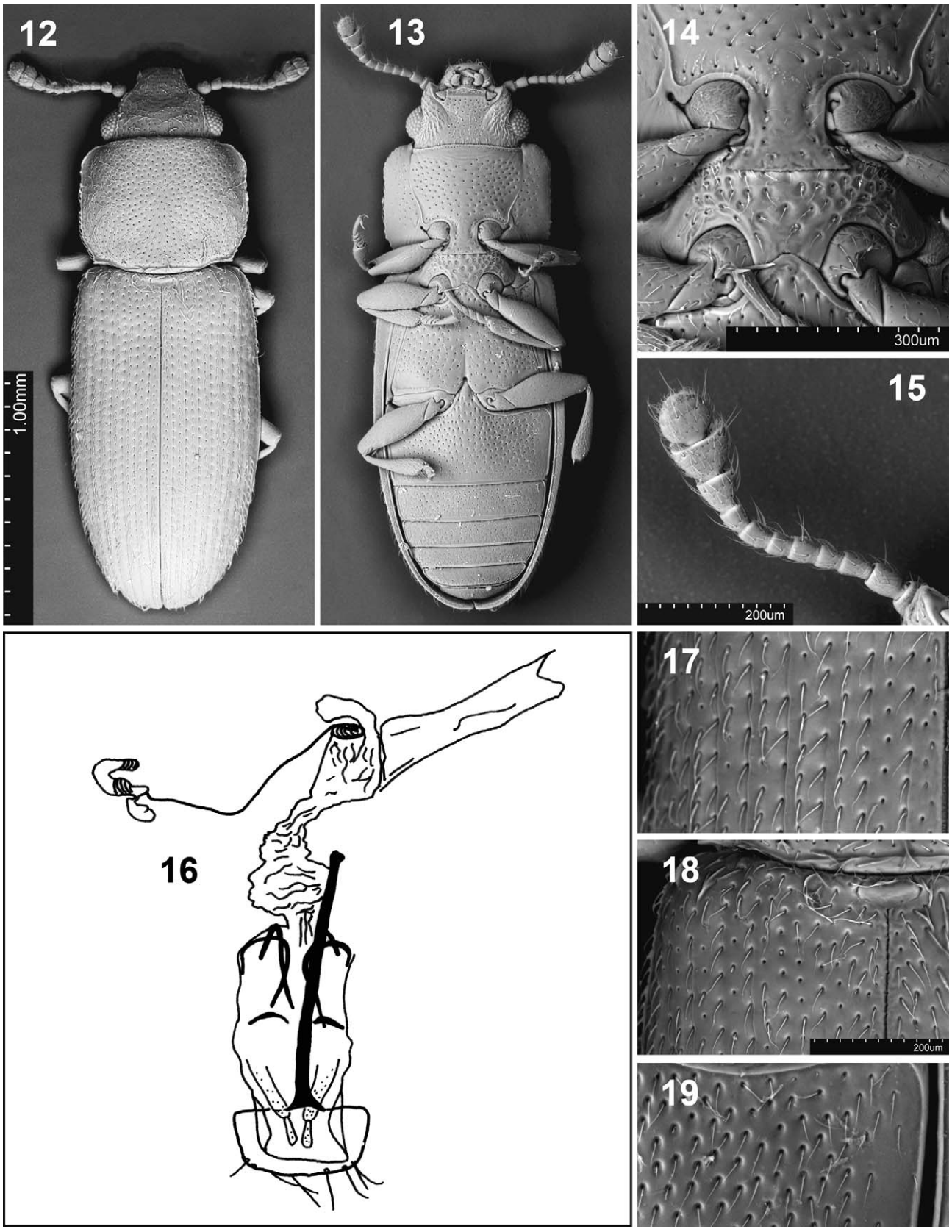
Distribution. Australian Capital Territory.

Key to the species of *Myrabolia*

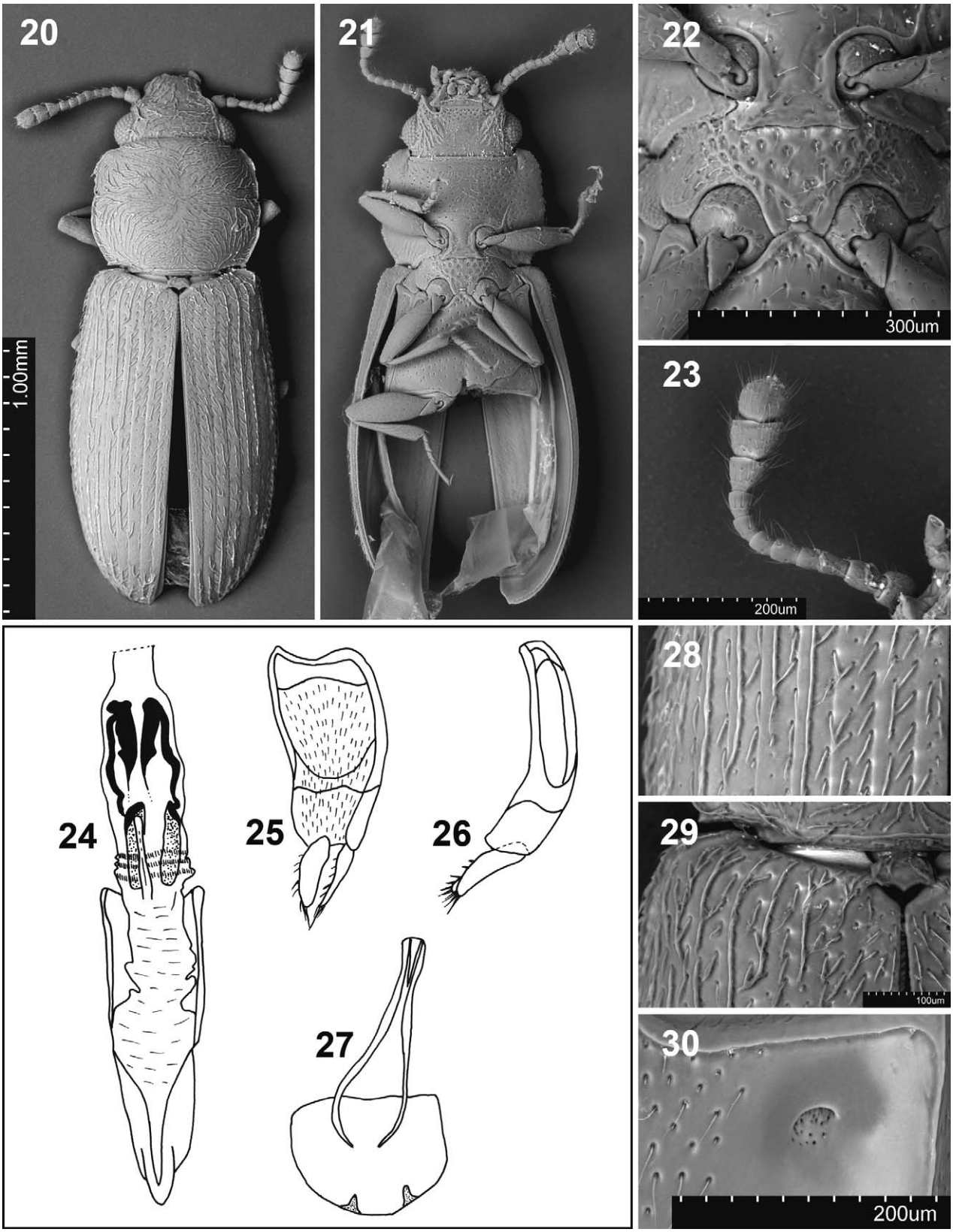
1. Antennomeres 4–8 at most as long as wide **2**
–. At least antennomere 5 distinctly longer than wide **9**
2. Body black, basal part of elytra, legs and antennal club orange-brown; length 1.80–1.98 mm; pronotum less elongate, 0.74–0.77 times as long as wide; Western Australia ..... ***M. micra*** Tomaszewska et Ślipiński
–. Body uniformly yellowish-brown to dark brown, sometimes with darker pronotum; length more than 2.00 mm; pronotum 0.78–0.89 times as long as wide **3**
3. Body 3.30–3.38 times as long as wide; pronotum 0.93–0.95 times as long as wide; elytra 2.00 times as long as wide; male abdominal ventrite 1 without dimorphic features; New South Wales ..... ***M. elongata*** Tomaszewska et Ślipiński
–. Body 2.76–3.09 times as long as wide; pronotum 0.83–0.93 times as long as wide and elytra at most 1.82 times as long as wide; male dimorphic features variable **4**
4. Antennomeres 4–6 subequal in length and width; prosternal process sinuate at apex [Figs 37, 46] **5**
–. Antennomere 5 at least slightly longer and wider than 4 or 6 [Figs 56, 64]; prosternal process widely rounded or truncate at apex **6**
5. Body 2.76–2.91 times as long as wide; antennomere 10 distinctly broader than 9 or 11 [Figs 30, 34]; pronotal sides almost straight [Fig. 31]; metaventral process deeply incised into mesoventrite [Fig. 37]; male abdominal ventrite 1 with a pair of rounded pore plates [Fig. 36]; spermatheca as in [Fig. 42]; parameres as in [Figs 40 and 41]; widely distributed from Queensland to South Australia and Tasmania ..... ***M. brevicornis*** (Erichson)
–. Body 2.96–3.09 times as long as wide; antennomere 10 slightly broader than 9 or 11 [Fig. 44]; pronotal sides usually weakly widening posteriorly, widest at about $^1/_3$ of basal length [Fig. 45]; metaventral process shallowly incised into mesoventrite [Fig. 46]; male abdominal ventrite 1 without dimorphic features; spermatheca as in [Fig. 54]; parameres as in [Figs 52 and 53]; New South Wales to Tasmania and South Australia ..... ***M. grouvelliana*** Reitter
6. Prosternal process broadly rounded at apex [Fig. 57]; New South Wales ..... ***M. kioloa*** Tomaszewska et Ślipiński



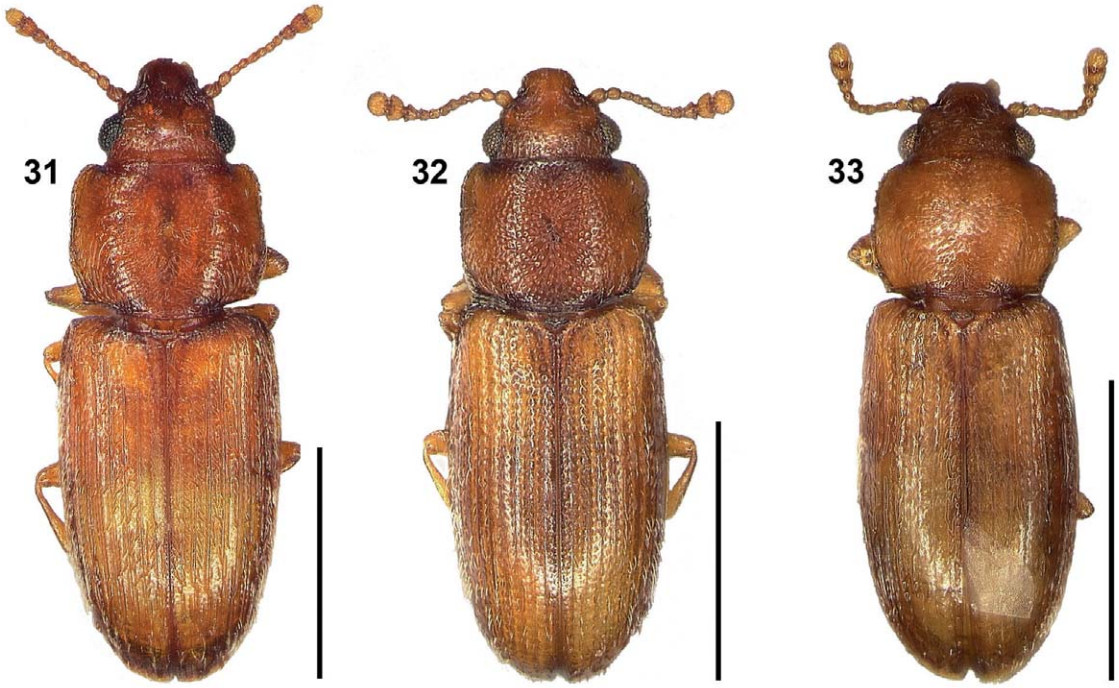
Figures 1–11. *Myrabolia championi* sp. nov. (1) dorsal view; (2) ventral view; (3) pro- and mesothorax ventral view; (4) antenna; (5) median lobe, (6) tegmen, ventral, (7) tegmen, lateral, (8) male genital segment, ventral view; (9) elytron, disc; (10) elytron, basal part; (11) male abdominal ventrite I, lateral part.



Figures 12–19. *Myrabolia malgosiae* sp. nov. (12) dorsal view; (13) ventral view; (14) pro- and mesothorax ventral view; (15) antenna; (16) female genitalia; (17) elytron, disc; (18) elytron, basal part; (19) female abdominal ventrite I, lateral part.



Figures 20–30. *Myrabolia weiri* sp. nov. (20) dorsal view; (21) ventral view; (22) pro- and mesothorax ventral side; (23) antenna; (24) median lobe, (25) tegmen, ventral, (26) tegmen, lateral, (27) male genital segment, ventral view; (28) elytron, disc; (29) elytron, basal part; (30) male abdominal ventrite I, lateral part.



Figures 31–33. Body outlines. (31) *Myrabolia championi* sp. nov.; (32) *M. malgosiae* sp. nov.; (33) *M. weiri* sp. nov. Scale bars = 1 mm.

–. Prosternal process truncated at apex [Figs 65, 78] **7**

7. Body length 2.06–2.31 mm; yellowish-brown to brown; pronotum more elongate with lateral margins weakly sinuate [Fig. 66]; prosternal process between coxae about as broad as coxal diameter, and at apex 1.7–1.8 times broader than its width between coxae; elytra with sharp tooth at humeral angle [Fig. 69]; [spermatheca as in Fig. 75; male abdominal ventrite 1 with obliquely oval pore plates, Fig. 68]; Tasmania . . . . . ***M. pelion*** Tomaszewska et Ślipiński

–. Body length 2.36–2.75 mm; dark, reddish-brown; pronotum shorter with lateral margins distinctly sinuate [Figs 77, 90]; prosternal process between coxae about 1.10–1.33 times broader than coxal diameter, and at apex 1.4–1.5 times broader than its width between coxae; elytra with blunt or weak humeral tooth [Figs 82, 93] **8**

8. Pronotum 0.88–0.90 times as broad as elytra; equally wide at $^1/_4$ of apical length and at $^1/_3$ of basal length [Fig. 77]; prosternal process 1.10 times as wide as coxal diameter [Fig. 78]; female genitalia as in [Fig. 88]; [male abdominal ventrite 1 with pair of oval pore plates, Fig. 81]; New South Wales, Victoria . . . . . ***M. lawrencei*** Tomaszewska et Ślipiński

–. Pronotum 0.87 times as wide as elytra; widest at about $^1/_3$ of basal length [Fig. 90]; prosternal process between coxae 1.33 times wider than coxal diameter [Fig. 92]; female genitalia and shape of spermatheca as in [Fig. 95]; male unknown; Tasmania . . . . . ***M. australis*** Tomaszewska et Ślipiński

9. Prosternal process distinctly rounded apically [Fig. 99] and Fig. 3; male abdominal ventrite 1 with obliquely oval, moderately large pore plates [Fig. 103] and Fig. 11 . . . . . **10**

–. Prosternal process truncate or sinuate apically; male abdominal ventrite 1 with pore plates differently shaped [Fig. 103, 124, 139, 152,] and Fig. 30 . . . . . **11**

10. Body 3.06–3.16 times as long as wide; antennomeres 7 and 8 longer than wide [Fig. 98]; elytra 1.86–1.90 times longer than wide; mesoventral process about 0.8 times as wide as mesocoxal diameter [Fig. 99]; Victoria . . . . . ***M. longicornis*** Blackburn

–. Body 2.80 times as long as wide; antennomeres 7 and 8 at most as long as wide (Fig. 4); elytra 1.71 times longer than wide; mesoventral process about as wide as mesocoxal diameter (Fig. 3); New South Wales . . . . . ***M. championi*** sp. nov.

11. Among antennomeres 3–8 only antennomere 5 distinctly longer than wide [Fig. 111]; pronotum 0.76–0.79 times as long as wide and elytra 1.68–1.71 times as long as wide; mesoventral process with very coarse punctures almost touching each others [Fig. 110]; male abdominal ventrite 1 with small, rounded pore plates as in [Fig. 115]; South Australia . . . . . ***M. blackburni*** Tomaszewska et Ślipiński

–. Among antennomeres 3–8 at least 3 and 5 distinctly longer than wide; pronotum 0.79–0.88 times as long

as wide and elytra 1.71–1.84 times as long as wide; mesoventral process with very coarse punctures 0.5–3.0 diameters apart [Fig. 110]; male abdominal ventrite 1 with pore plates if rounded then larger (Fig. 30) **12**

12. Body uniformly brown **13**
–. Body bicoloured (black and brown) **15**
13. Body 2.93–2.96 times longer than wide; mesoventral process punctured to apex, with punctures 0.5–1.0 diameter apart [Fig. 125]; male abdominal ventrite 1 with a pair of very small, oval, obliquely directed pits [Fig. 124]; South Australia, Victoria ..... ***M. lindensis*** Blackburn
–. Body 2.72–2.85 times longer than wide; mesoventral process with punctures somewhat distant from apex, 1.0–2.5 diameters apart (Figs 14, 22); male abdominal ventrite 1 (if known) with a pair of moderately large, rounded pore plates (Fig. 30) **14**
14. Body length 1.98 mm; pronotum with lateral margins sinuate (Fig. 20); prosternal process sinuate apically (Fig. 22); antennomere 7 at most as long as wide (Fig. 23); Australian Capital Territory ..... ***M. weiri*** sp. nov.
–. Body length 2.35 mm; pronotum with lateral margins parallel (Fig. 12); prosternal process truncate apically (Fig. 14); antennomere 7 weakly elongate (Fig. 15); Tasmania ..... ***M. malgosiae*** sp. nov.
15. Elytra 1.71–1.80 times as long as wide; pronotum 0.38–0.39 times as long as elytra and 0.83–0.86 times as wide as elytra; abdominal pore plates moderately large, rounded [Fig. 139]; spermatheca as in [Fig. 144]; parameres as in [Figs 142, 143]; New South Wales, Victoria, Tasmania ..... ***M. leai*** (Grouvelle)
–. Elytra 1.80–1.84 times as long as wide; pronotum 0.40–0.42 times as long as elytra and 0.87-0.89 times as wide as elytra; pore plates very large, oval, setose [Fig. 152]; spermatheca as in [Fig. 157]; parameres as in [Figs 155, 156]; Tasmania ..... ***M. tasmanica*** Tomaszewska et Ślipiński

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