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Classification, natural history, and evolution of Tarsosteninae (Coleoptera: Cleroidea: Cleridae) Part II. Taxonomy of the *Pylus* complex of Australia and Tasmania

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OPITZ W. 2015: Classification, natural history, and evolution of Tarsosteninae (Coleoptera: Cleroidea: Cleridae). Part II. Taxonomy of the *Pylus* complex of Australia and Tasmania. *Acta Musei Moraviae, Scientiae biologicae* (Brno) **100(2):** 251–279. – Species of the *Pylus* complex are found in Australia and Tasmania. The complex involves the genera *Apopylus* Kolibáč, *Apteropilo* Lea, *Fallopylus* Opitz, *Neopylus* Solervicens, *Parapylus* Blackburn, *Pseudopylus* Opitz, and *Pylus* Newman. The tibial spur formula is considered crucial evidence for the discrimination of genera, whereas the arrangement of punctation in the elytral stria and features of the aedeagus are considered important in predictions of specific discontinuities. New species are described in the genera *Pseudopylus* (*P. apterus*), *Apopylus* (*A. cruslumus*, *A. kolibaci*, *A. nactus*), *Fallopylus* (*F. astrictus*, *F. cavus*, *F. creperus*, *F. leptofustus*, *F. redactus*), and *Pylus* (*P. cracentus*). Lectotype designation involves *Fallopylus pallipes* (Macleay). Mouthpart morphology and label information suggest that these beetles are predators of lignicolous insects. This treatise contains a key to the genera and species of the *Pylus* complex, one phylogenetic tree, scenarios of evolutionary relationships, 48 line drawings, 10 electron micrographs, 2 distributional maps, and 14 habitus photographs.

Keywords. Coleoptera, Cleridae, Australia, systematics, natural history, evolution

Introduction

Concerning the tibial spur formula, OPITZ (2010a: 50) wrote, "*This is one of the strongest characteristic within genera. Incompatibility involving the tibial spur formula has consistently indicated incongruous placement of species*". The tibial spur formula has been found extremely important in the identification of generic taxa within the *Pylus* complex. With one exception, each genus in this complex shows a different tarsal spur formula. The exception being 0-0-0 found in *Apopylus* Kolibáč and in *Pseudopylus* Opitz. The *Pylus* complex, which forms a monophyletic group within Tarsosteninae (OPITZ 2012: 32), involves the genera *Apopylus* Kolibáč, *Apteropilo* Lea, *Fallopylus* Opitz, *Neopylus* Solervicens, *Parapylus* Blackburn, *Pseudopylus* Opitz, and *Pylus* Newman. Original or detailed descriptions of these genera have been provided as follows: *Apopylus* Kolibáč (2003: 65), *Apteropilo* Lea (BARTLETT 2009: 43), *Fallopylus* Opitz (2012: 9), *Neopylus* Solervicens (1989: 233), *Parapylus* Blackburn (1891: 305), *Pseudopylus* Opitz (2012: 16), and *Pylus* Newman (1842: 35). All of these genera have been most recently redescribed by OPITZ (2012: 3).

Concerning the tarsal pulvillar formula, I have found that the metabasitasal pulvillus may be highly reduced in the smaller-sized species of *Pseudopylus* Opitz, *Fallopylus* Opitz, and *Pylus* Newman. With that in mind, the tarsal pulvillar formula for all of Tarsososteninae is 3-3-3 and does not have a component of 3-3-2 as indicated in OPITZ

(2012: 4). The purpose of this study is to further elucidate the species composition of Tarsosteninae with particular reference to the genera *Apopylus* Kolibáč and *Fallopylus* Opitz, and *Pylus* Newman. The intent is also to provide a key to the genera of the *Pylus* complex and a key of the species of *Apopylus* Kolibáč. *Fallopylus* Opitz, *Pseudopylus* Opitz, and *Pylus* Newman.

Methods

This study is based on the morphology of 145 adult specimens. At first glance, the majority of the members of the *Pylus* complex are similar superficially; only the species of *Apteropilo* Lea and *Parapylus* Blackburn are morphological standouts. The technical methods in sorting specimens to species were difficult. Each specimen was relaxed in soapy warm water, then examined to establish the tarsal spur formula, tarsal pulvillar formula, pattern of elytral punctation, and in males, the characteristics of the genitalia. All primary types were examined. Procedures involving dissections and the preparation of illustration follow those described in Opitz (2010b: 2). The biological species concept as proposed by Standfuss (1896: 115), Dobzhansky 1937: 312), and Mayr (1963: 19) is used as the theoretical basis for predicting species status. Herein, characteristics of the male genitalia and stria arrangement of the elytral punctation were used to predict species-level reproductive isolation. The first row of punctation involves the closest stria to the sutural margin. Abbreviations are defined as follows: EW/FW= eye width/frons width; PW/PL= pronotal width/pronotal length; EL/EW= elytral length (from the anterior transverse carina to the elytral apex), elytral width (the greatest width of an elytron in dorsal view). Methods toward assessment of supraspecific discontinuities were essentially the same as those described in Opitz (2011: 141). Micrographs (SEM) were taken with a JEOL JSM-5510L V Scanning Electron Microscope. Habitus photographs were prepared with a Leica Z 16 APO microscope equipped with JVC KY-F75U-CCD camera and controlled by Syncroscopy Auto Montage software, then digitally printed.

Repositories of specimens

I relied on Arnett *et al.* (1993) for codens identifying repositories of specimens. Addresses and names of curators are provided to facilitate specimen retrieval.

AMSA . . . . . Australian Museum, 6 College Street, Sydney NSW 2010, Australia (Derek J. Smith)

ANIC . . . . . Australian National Insect Collection, CSRIO, Division of Entomology, GPO Box 1700, Canberra, ACT, 2601 Australia (Adam Slipinski, Cate Lemann)

BMNH . . . . . The Natural History Museum, Department of Entomology, Cromwell Road, London SW7 5BD, United Kingdom (Beulah Garner)

BPBM . . . . . The Bernice Pauahi Bishop Museum, Entomology, 1525 Bernice Street, Honolulu, Hawaii 96817 (Neil L. Evenhuis)

FMNH . . . . . Field Museum of Natural History, Zoology Department, Division of Insects, 1400 S. Lake Shore Drive, Chicago, Illinois 60605-2496 (James H. Boone)

QMBA . . . . . Queensland Museum, PO Box 3300, South Park Queensland 4101, Australia (Christine Lambkin)

QPIM . . . . . Primary Industries, Insect Collection, P.O. Box 1054, Mareeba, Queensland 4880, Australia (R. I. Storey)

RGCG . . . . . Roland Gerstmeier, Technische Universität München, Lehrstuhl für Tierökologie, Hans-Carl-von-Carlowitz-Platz 2, 85350 Freising, Germany
SAMA . . . . . South Australian Museum, Department of Entomology, North Terrace, Adelaide 5000 South Australia, Australia (Jo Wood)
WOPC . . . . . Weston Opitz Collection, Research Associate: Florida Collection of Arthropods, Division of Plant Industry/Entomology, Florida department of Agriculture and Consumer Services, 1911 SW 34th Street, Gainesville, Florida 32614-7100
WFBM . . . . . William F. Barr Museum, Division of Entomology, 606 Rayburn Street, University of Idaho, Moscow, Idaho, 83844-2339 (Frank Merickel)

Natural history

The morphology of the mouth parts suggests that these beetles are predatory. Specimen label data and body coloration indicates that these insects are mostly associated with the bark of several hardwoods. The trees mentioned are *Eukalyptus pauciflora* Sieber ex Spreng., the hoop pine *Araucaria cunninghamii* Alton ex D. Don., and the Bunya pine *Araucaria bidwillii* Hook. Most often these clerids were flushed out of bark niches with pyrethrum aerosol spray. A few specimens were collected from the bracket fungus *Ganoderma applantatum* (Pers.) Pat.

Phylogeny

The methodologies with which I postulated the evolutionary relationships among the genera of the *Pylus* complex follows the canons of Hennig (1966), but I am in agreement with Tuomikoski (1967) who advocates the use of "apotypic" and "plesiotypic" instead of "apomorphic" and "plesiomorphic" on the grounds that phylogenetic work is not restricted to morphological characters. To evolutionary polarize characters I relied on the procedures of Ekis (1977: 117), Watrous & Wheeler (1975: 5) and Nixon & Carpenter (1993: 414). To find the most parsimonious phylogenetic tree I relied on the computer program NONA (Goloboff 1993) in combination with Winclada version 1.00.08 (Nixon 2002).

Character states given the value of "0" are considered plesiotypic, whereas those assigned a value of 1, or more, are judged apotypic (Table 1).

Character 0 Elytral 2° setae: present (0); absent (1).
Character 1 Pronotal side margins: not serrulated (0); serrulated (1).
Character 2 Ocular plate: not large (0); large (1).
Character 3 Elytral punctation: not diminutive in distal third (0); diminutive in distal third (1).
Character 4 Elytral base: without tumescence's (0); with tumescence's (1).
Character 5 Tibial spurs: all present (0); some lost (1).
Character 6 Elytral punctation: not nodulated (0); nodulated (1).
Character 7 Tibial spur formula: 2-2-2 (0); 2-2-1 (1).; 1-2-2 (2) 1-2-1 (3); 0-2-1 (4); 0-0-0 (5).
Character 8 Humeral angle: obtuse (0); not obtuse, sharp (1).

Character 9 Hind body: not suboval (0); suboval (1).
Character 10 Elytral disc: without setal wisps (0); with setal wisps (1).
Character 11 Pronotal disc: without glabrous tumescences (0); with glabrous tumescences (1).

Table 1. Character matrix of 12 adult morphological characters of *Curacavi* and genera of the *Pylus* complex.

Taxa	**Characters**
	0 1
	0 1 2 3 4 5 6 7 8 9 0 1
Curacavi	1 1 0 0 0 0 0 0 0 0 0 0
Parapylus	1 0 1 1 1 0 0 0 0 0 0 0
Apopylus	1 0 1 1 0 1 1 5 1 0 0 0
Pseudopylus	1 0 1 1 0 1 1 5 0 1 0 0
Apteropilo	1 0 1 1 0 1 1 4 0 0 0 1
Fallopylus	1 0 1 1 0 1 1 3 0 0 0 0
Pylus	1 0 1 1 0 1 1 1 0 0 0 0
Neopylus	1 0 1 1 0 1 0 0 0 0 1 0

Key to the genera and new species of the *Pylus* complex

1 Pronotal disc, mesoscutellum, and elytral disc with white setal tufts (Chile). ..... ***Neopylus*** **Solervicens**
1’ Pronotal disc, mesoscutellum, and elytral disc without white setal tufts. 2

2(1’) Large elytral asetiferous punctation do not extend to elytral apex. 3
2’ Large elytral asetiferous punctation extend to elytral apex. 4

3(2) Pronotal sides with secondary tubercle (Fig. 23) (Australia). .... ***Parapylus*** **Blackburn**
3’ Pronotal sides without secondary tubercle (Australia). .... ***Apteropilo*** **Lea**

4(2’) Tibial spur formula 0-0-0. 5
4’ Tibial spur formula not 0-0-0. 10

5(4) Hind body suboval, humeral angle broadly rounded (Australia). .... ***Pseudopylus apterus*** **sp.nov.**
5’ Hind body rectangulate, humeral angle angular (Australia) (*Apopylus* species). 6

6(5’) Probasitarsomere modified into acuminate spike (Fig. 15) (Australia). .... ***Apopylus cruslumus*** **sp.nov.**
6’ Probasitarsomere not modified into acuminate spike. 7

7(6’) Ninth stria of elytral punctation comprise 6–7 punctation (Australia). .... ***Apopylus unumgarensis*** **Kolibáč**

7’ Ninth stria of elytral punctation comprise 9–12 punctation. 8

8(7’) Last antennomere transversely narrow, body length about 6 mm (Australia). ..... ***Apopylus nactus* sp.nov.**

8’ Last antennomere oval, body length about 5 mm (Australia). 9

9(8’) Specimens from western Australia. ..... ***Apopylus kolibaci* sp.nov.**

9’ Specimens from southeastern Australia. ..... ***Apopylus okei* (Elston)**

10(4’) Tibial spur formula 2-2-1 (Australia) (*Pylus* species). 11

10’ Tibial spur formula 1-2-1 (Australia) (*Fallopylus* species). 12

11(10) Probasitarsomere not narrowly sclerotized, last maxillary palpomere strongly securiform, usually about 10 mm (Australia). ..... ***Pylus fatuus* (Newman)**

11’ Probasitarsomere narrowly sclerotized, last maxillary palpomere subsecuriform, usually about 5 mm (Australia). ..... ***Pylus cracentus* sp.nov.**

12(10’) Terminal antennomere acuminate (Australia). ..... ***Fallopylus pallipes* Macleay**

12’ Terminal antennomere not acuminate. 13

13(12’) Elytral disc with wide basal brown fascia (Australia). ..... ***Fallopylus creperus* sp.nov.**

13’ Elytral disc uniformly red-brown. 14

14(13’) Pronotal disc deeply impressed at middle (Australia). ..... ***Fallopylus cavus* sp.nov.**

14’ Pronotal disc not deeply impressed at middle. 15

15(14’) Frons not narrower than width of eye. ..... ***Fallopylus redactus* sp.nov.**

15 Frons narrower than width of eye. 16

16(15) Phallic apex wide (in dorsal view). ..... ***Fallopylus leptofustus* sp.nov.**

16’ Phallic apex narrow (in dorsal view). ..... ***Fallopylus astrictus* sp.nov.**

T a x o n o m y

Pseudopylus Opitz, 2012: 16.

Type species: *Pseudopylus apterus* sp.nov. By present designation. **[**In Kolibáč (2003: 61) this species was identified as *Pylus okei* Elston, whereas in Opitz (2012: 12) it was identified as *Pseudopylus okei* (Elston).]

Diagnosis. Within the *Pylus* complex, only in members of this genus is the humeral angle rounded and the hind body oval.

Synapotypic characteristics. Humeral angle broadly rounded and hind body oval.

Notes. This genus is adequately described in Opitz (2012: 16). Unfortunately, in that publication the name *Pylus okei* Elston is based on an erroneous identification. Therefore, it is necessary to describe a new species to serve as the type species of this genus.

***Pseudopylus apterus* sp.nov.**
Figures 1, 28, 61, 75.

Material. Holotype: ♂: Australia: ACT, Mt. Aggie Brindabella Range, 12-III-1978, under bark, J.W. Lawrence (ANIC).
Paratypes: Thirty specimens. 35.28S 148.48E ACT, Mt. Aggie, Brindabella Range, 4 Dec. 1993, S.A. Slipinski & J.F. Lawrence (ANIC, 1); Australia: Australian Capital Territory: 3 km N Mt. Aggie, 1-21-II-1979, D. Rentz (ANIC, 6; WOPC, 4); 36.21S 148.32E, Kosciusko NP, Wilsons Valley, Maintenance Depot area, 1490 m, 21 Feb. 1993, open *Euc. pauciflora* forest, pyr. Fogging, old *Euc.paucif.* logs, A. Newton & M. Thayer (ANIC, 1; FMNH, 1); 36.32S 148.13E, NSW, Kosciusko NP, 4.1 km W Dead Horse Gap, 1500 m, 19 Dec. 1986-14 Feb. 1987, flight intercept trap, *Euc. pauciflora*, A. Newton & M. Thayer (ANIC, 1; FMNH, 2; WOPC, 1); 34.21S 139.31E, SA, Brookfield Con. Pk, 20Mar.-1 May 1993, malaise, S. Shattuck (ANIC, 1); Mt. Franklin, ACT, 5 Jan 79, J.F. Lawrence, D. Rentz (ANIC, 4; WOPC, 1); 35.33S 148.47E. 1 km N Mt. Gingera, ACT, 18 Feb 1981, A.A. Calder (ANIC, 2); Mt. Buffalo, 20-VIII-1935, O. Swezey (ANIC, 1); *idem*, 22-VIII-1935, O. Swezey (ANIC, 2); *idem*, 23-VIII-1935, O. Swezey (WOPC, 1); Mt. Ginini, Brindabella Range, ACT, 16-X-1979, Lawrence, Weir (ANIC, 1).

Description. *Size*: Length 4.0 mm; width 1.8. *Color*: Reddish brown. *Form* (Fig. 61): Oblong, short hind body, about 2.2 times longer than broad. *Head*: Frons wider than width of eye (EW/FW-12:50); antenna (Fig. 1), capitulum compact, scape about as long as combined length of pedicel and antennomere 3, funicular antennomeres subfiliform, capitular antennomeres transverse, antennomeres 9 and 10 triangular, antennomere 11 ovoid; terminal palpomere subsecuriform in maxilla and strongly securiform in labium. *Thorax*: Pronotum transverse (PW/PL-86:78), side margins with primary and secondary tubercles, disc with small setiferous punctation and fewer large round asetiferous punctation, center of disc slightly depressed; elytron 2.3 longer than wide (EL/EW-150:65), epipleural fold not serrate distally, disc sculptured with 9 complete striae of small spheroid asetiferous binodal punctation; metathoracic wing absent. *Abdomen*: Aedeagus not as long as length of abdomen, phallobase reduced, lobate distally; phallic plates very narrow, long. Male and female mesodermal organs are described in Opitz (2012: 17) and female mesodermal organs are figured in Kolibáč (2003: 61).

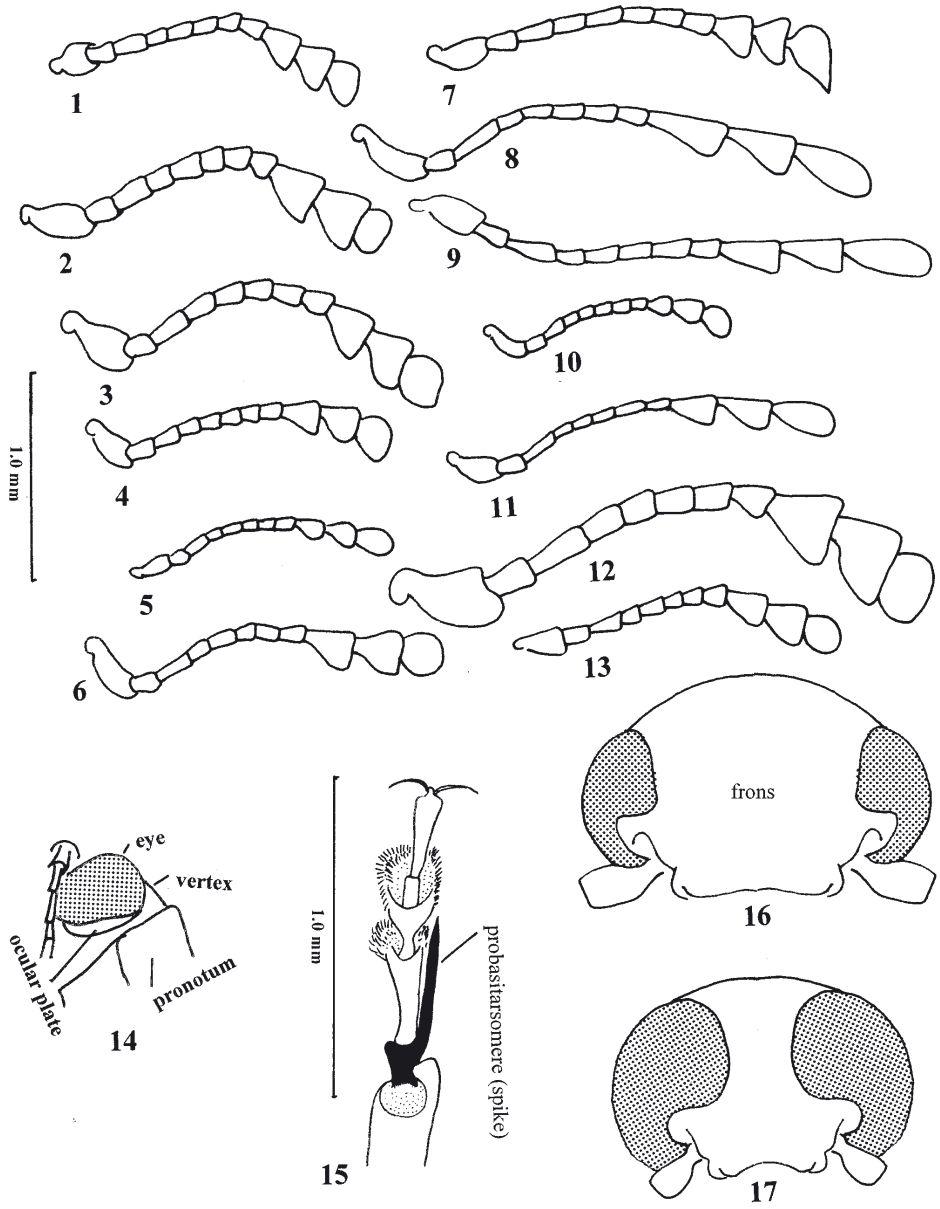
Variation. The specimens before me are quite homogeneous.

Distribution (Fig. 75). This species is known from southeastern Australia.

Diagnosis. Within the *Pylus* complex, only in members of this species is the humeral angle broadly rounded and the hind body suboval. This species is amply figured in Kolibáč (2003: 61) and in Opitz (2012: 12).

Natural History. Specimens have been collected during August, December, February thru May; some in woodland laden with *Eucalyptus pauciflora* Sieber ex Spreng; at 1490 m. One specimen was gathered in a malaise trap and one in a flight intercept trap.

Etymology. The specific epithet *apterous* is derived from the Greek prefix *a-* (= without) and the Greek noun *pteron* (= wing). The refer to the absence in these beetles of the metathoracic wing.



Figs 1–17. Various structures: 1–13 Antennae. 1 – *Pseudopylus apterus*. 2 – *Apopylus nactus*. 3 – *A. cruslumus*. 4 – *A. kolibaci*. 5 – *A. unumgarensis*. 6 – *Pylus cracentus*. 7 – *Fallopylus pallipes*. 8 – *F. leptofustus*. 9 – *F. astrictus*. 10 – *F. creperus*. 11 – *F. redactus*. 12 – *Pylus fatuus*. 13 – *Apopylus okei*. 14 – Forebody (lateral view) *Pylus fatuus*. 15 – Probasitarsomere of *Pseudopylus cruslumus*. 16–17 Heads: 16 – *Fallopylus nactus*. 17 – *F. leptofustus*.

***Apopylus* Kolibáč, 2003: 65.**

Type species: *Apopylus unumgarensis* Kolibáč, 2003: 67. By original designation.

Diagnosis. Tibial spur formula 0-0-0. This characteristic is also present in the monotypic *Pseudopylus*, in which it is considered a homoplasic apotypy. Application of homoplasic apotypies is discussed in Opitz (2011: 142).

***Apopylus cruslumus* sp.nov.**
Figures 3, 30, 42, 43, 62, 75.

Material. Holotype ♂: Type locality: Tindal, N. T. (Australia), 14.31S 132.22E, 1–20 Dec. 1967, Light trap, W.J.M. Vestjens (SAMA).

Description. *Size*: Length 6.5 mm; width 2.0. *Color*: Reddish brown. *Form* (Fig. 62): Oblong, hind body subquadrate, about 3.3 times longer than broad. *Head*: Frons wider than width of eye (EW/FW-28:38); antenna (Fig. 3), capitulum compact, scape about as long as combined length of pedicel to antennomere 3, funicular antennomeres subfiliform, capitular antennomeres transverse, antennomeres 9 and 10 triangular, antennomere 11 rotund; terminal palpomere securiform in maxilla and labium. *Thorax*: Pronotum (Fig. 30) transverse (PW/PL-105:92), side margins with primary and secondary tubercles, disc with small setiferous and large oval asetiferous punctation, center of disc slightly depressed; elytron 3.4 longer than wide (EL/EW-240:70), epipleuron not serrate distally, disc sculptured with 10 striae of large spheroid asetiferous binodal punctation, tenth stria comprised of 7 punctation; probasitarsomere (Fig. 15) and mesobasitarsomere transformed into elongated narrow spike; metathoracic wing present. *Abdomen*: Aedeagus (Figs 42, 43) not as long as length of abdomen, phallobase slightly sclerotized, lobate distally, lobes acuminate; phallic plates narrow.

Distribution (Fig. 75). Known only from the Northern Territory, in northern Australia.

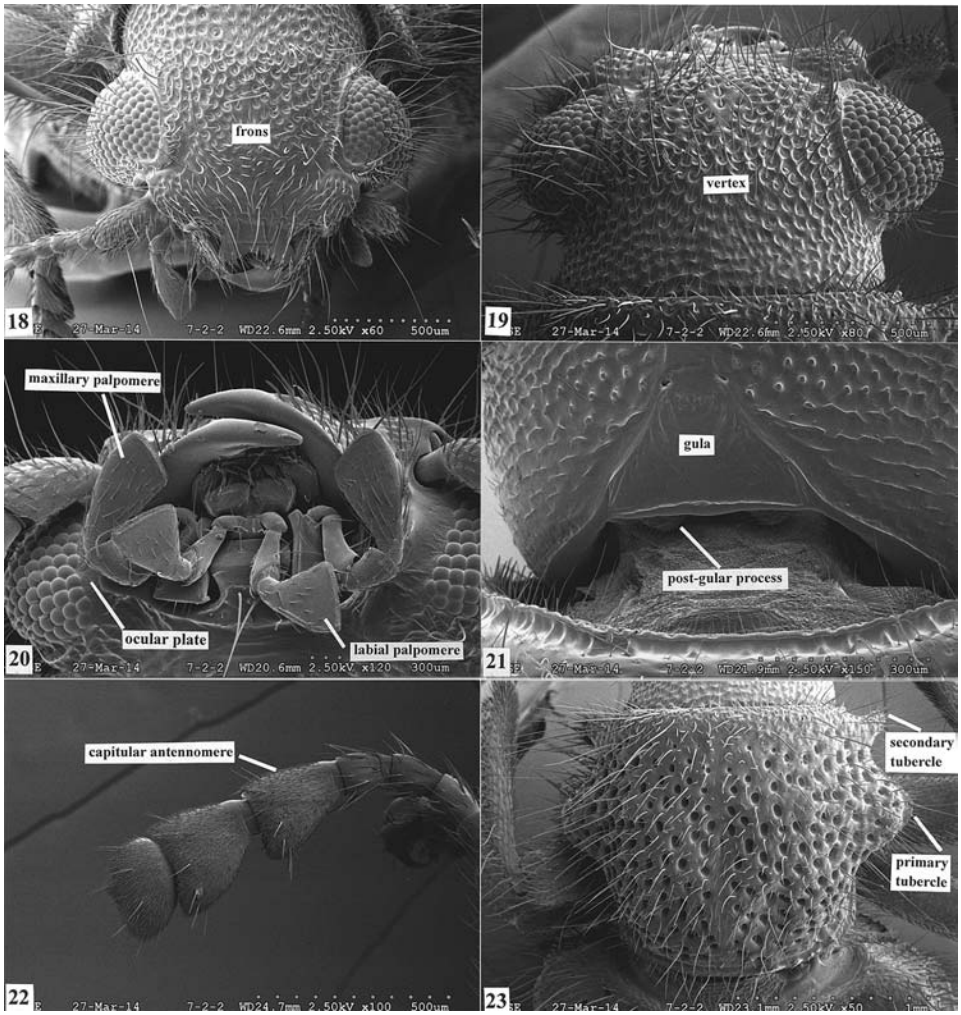
Diagnosis. The spinous condition of the probasitasomere (Fig. 15) and mesobasitarsomere will distinguish the members of this species from congeners.

Natural History. The holotype was collected in December in a light trap.

Etymology. The specific epithet *cruslumus* is a compound name that stems from the Latin *crus* (= leg) and the Latin *luma* (= thorn). I refer to the spinous condition of the probasitarsomere and mesobasitarsomere.

***Apopylus kolibaci* sp.nov.**
Figures 4, 31, 44, 45, 63, 75.

Material. Holotype ♀. Type locality: (21.35S 117.04E), Millstream, WA (Australia), nr. Mouth of Dawson's Ck., 7.xi.70, at light, E.B. Britton (SAMA).
Paratypes: Three specimens. (23.15S 119.52E), 13 km. E. by N. of Newman, WA., 12.xi.70, E.B. Britton (SAMA, 1); (21.35S 117.04E), Millstream, W.A., 31.x.70, at light, eucalypt woodland, E.B. Britton (ANIC, 1); 32.11S 121. 38E WA, W of Norseman, 1–17 Nov 2003, C. Lambkin & J. Recsei, *Eucalyptus* woodland (WOPC, 1).



Figs 18–23. *Apopylus nactus*: 18–19 Heads, dorsal views: 20 – Mouthparts. 21 – Head, ventral view. 22 – Antenna. 23 – Pronotum, dorsal view.

Description. *Size*: Length 5.0 mm; width 1.8. *Color*: Reddish brown. *Form* (Fig. 63): Oblong, hind body subquadrate, about 2.8 times longer than broad. *Head*: Frons wider than width of eye (EW/FW-17:40); antenna (Fig. 4), capitulum compact, scape about as long as combined length of pedicel to antennomere 2, funicular antennomeres subfiliform, capitular antennomeres transverse, antennomeres 9 and 10 triangular, antennomere 11 rotund; terminal palpomere securiform in maxilla and labium. *Thorax*: Pronotum (Fig. 31) transverse (PW/PL-85:75), epipleuron not serrate distally, side

margins with primary and secondary tubercles, disc with small setiferous and large oval asetiferous punctation, center of disc slightly depressed; elytron 3.3 longer than wide (EL/EW-195:60), disc sculptured with 10 striae of large spheroid asetiferous binodal punctation, tenth stria comprised of 9 punctation; metathoracic wing present. *Abdomen*: Aedeagus (Figs 44, 45) not as long as length of abdomen, phallobase slightly sclerotized, lobate distally, lobes fimbriate; phallic plates broad in apical fourth.

Variation. The number of punctation that comprise the tenth stria of elytral punctation may vary from 9 to 12.

Distribution (Fig. 75). This species is known only from Western Australia.

Diagnosis. In the members of this species the tenth stria of the elytra consists of 9 to 12 punctation. This will distinguish these beetles from congeners.

Natural History. Specimens were captured during October and November, two at light in *Eucalyptus* L'Heritier woodland.

Etymology. The trivial name is a dedicative patronymic to Jiří Kolibáč for his many contributions to the systematics of Cleroidea.

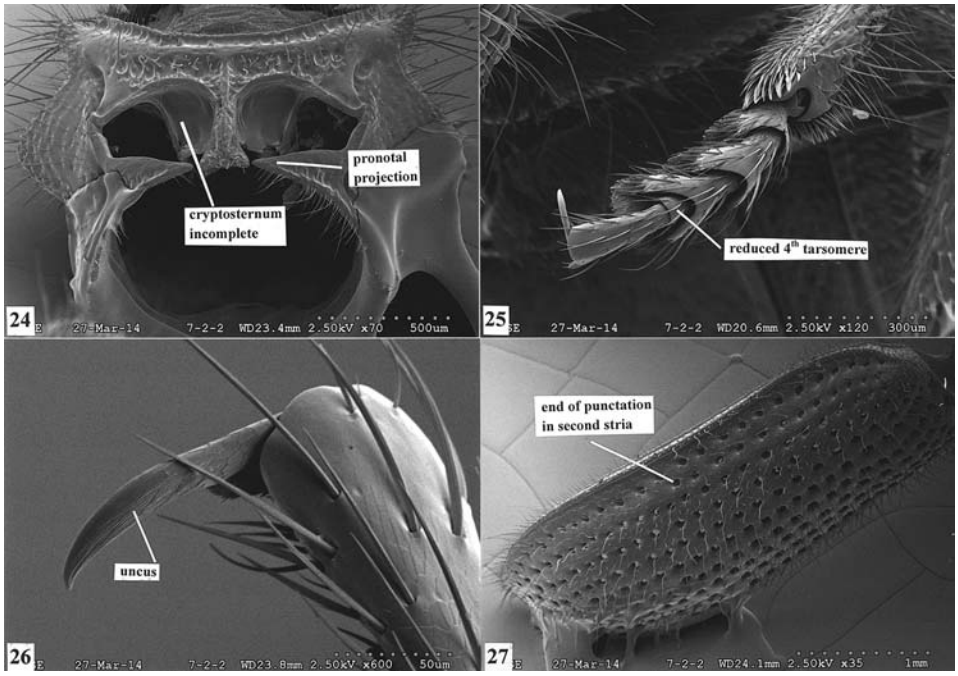
Apopylus nactus sp.nov.

Figures 2, 16, 18–27, 29, 46, 47, 64, 75.

Material. Holotype ♀. Type locality: 34.21S 139.31E SA (South Australia), Brookfield Con. Pk., 3–12 Sept. 1991, Site 5, J. Lawrence, T. Weir, W. Dressler. A second label reads: Berlesate, ANIC 1175, litter under mallee (ANIC).

Paratypes: Twenty five specimens. Australia: 34.19S 139.30E SA, Brookfield Con. Pk., 3–12 Sept. 1991, Site 1, J. Lawrence, T. Weir, W. Dressler (ANIC, 1); 34.21S 139.31E SA, Brookfield Con. Pk., 20 Feb.–31 Mar. 1992, A. Calder, W. Dressler (ANIC, 2); 34.21S 139.31E SA, Brookfield Con. Pk., 4–20 Feb. 1992 1992, J. Stelman, S. Williams, malaise (ANIC, 1; WFBM, 1; WOPC, 1); 34.21S 139.31E SA, Brookfield Con. Pk., 20 Mar.–1 May 1993, S. Shattuck (ANIC, 1; WOPC, 2); 34.21S 139.31E SA, Brookfield Con. Pk., 24 Feb.–20 Mar. 1993, E.S. Nielsen, malaise (ANIC, 3; WOPC, 3); 34.21S 139.31E SA, Brookfield Con. Pk., 20 Mar.–1 May 1993, S. Shattuck, malaise (ANIC, 2; WOPC, 1); 34.21S 139.31E SA, Brookfield Con. Pk., 20 Oct.–3 Nov. 1991, E. Edwards, S. Shattuck, malaise (ANIC, 1); 34.21S 139.31E SA Brookfield Con. Pk., 18 Jan.–24 Feb. 1993, J. Stelman, S. Williams, malaise (ANIC, 1); 34.21S 139.31E SA, Brookfield Con. Pk., 31 Mar.– 29 Apr. 1992, E.S. Nielsen, malaise (ANIC, 1); 33.57S 140.42E SA, 24 km N by W Renmark, 13 Dec. 1995, at light, K.R. Pullen (ANIC, 1); 34.07S 140.37E, 14 km WNW Renmark, SA, 13 Dec. 1995-25 Jan. 1996. Flight intercept/pitfall trap, K.R. Pullen (ANIC, 1); 20.27S 144.49E QLD, White Mountain N. P., 25 Km W of RGSQ/AG, Base camp, 4 Apr. 2000, at light, T. Weir (ANIC, 2); Parry Harbour (BMNH, 1).

Description. Size: Length 6.2 mm; width 2.6. Color: Reddish brown. Form (Fig. 64): Oblong, hind body subquadrate, about 2.4 times longer than broad. *Head* (Figs 18, 19, 21): Frons wider than width of eye (EW/FW-20:48); antenna (Figs 2, 22), capitulum compact, scape about as long as combined length of pedicel to antennomere 3, funicular antennomeres subfiliform, capitular antennomeres transverse, antennomeres 9 and 10 triangular, antennomere 11 rotund; terminal palpomere subsecuriform in maxilla and strongly securiform in labium (Fig. 20). *Thorax* (Fig. 24): Pronotum (Figs 23, 29) transverse (PW/PL-113:100), side margins with primary and secondary tubercles (Fig.



Figs 24–27. *Apopylus nactus*: 24 – Prothorax, ventral view. 25 – Metatarsus. 26 – Metatarsal ungues. 27 – Elytra, dorsal view.

23), disc with small setiferous and large oval asetiferous punctation, center of disc slightly depressed; elytron (Fig. 27) 3.2 longer than wide (EL/EW-275:85), epipleuron not serrate distally, disc sculptured with 10 striae of large spheroid asetiferous binodal punctation, ninth stria (Fig. 27) comprised of 9–12 punctation; metatarsus as in Figs 25, 26; metathoracic wing present. *Abdomen*: Aedeagus (Fig. 46, 47) not as long as length of abdomen, phallobase slightly sclerotized, trilobed apically, outer lobes acuminate and fimbriate; phallic plates broad in distal three fourths.

Variation. The number of punctation that comprise the ninth stria of elytral punctation may vary from 9 to 12.

Distribution (Fig. 75). Known from South Australia and Queensland.

Diagnosis. The last antennomere (Fig. 22) is highly compressed to form a narrow transverse unit. This characteristic will distinguish these beetles from congeners.

Natural History. Specimens have been collected during September, December thru May, some by light and flight intercept/pitfall trap and one from a *Eucalyptus* woodland.

***Apopylus okei* (Elston, 1929)**
Figures 13, 35, 48, 49, 65, 75.

Material. *Pylus okei* Elston, 1929: 351. Holotype ♂. Type locality: Gypsum, V (Victoria, Australia), Nov. 1926, C. Oke (AMSA)

Redescription. *Size*: Length 4.5 mm; width 1.8. *Color*: Reddish brown. *Form* (Fig. 65): Oblong, hind body subquadrate, about 2.5 times longer than broad. *Head*: Frons wider than width of eye (EW/FW-15:37); antenna (Fig. 13), capitulum compact, scape about as long as combined length of pedicel to antennomere 2, funicular antennomeres subfiliform, capitular antennomeres short, antennomeres 9 and 10 subtriangular, antennomere 11 rotund; terminal palpomere securiform in maxilla and labium. *Thorax*: Pronotum (Fig. 35) transverse (PW/PL-85:75), side margins with primary and secondary tubercles, disc with small setiferous punctation and one large setiferous punctation on each side, center of disc depressed; elytron 3.2 longer than wide (EL/EW-210:65), epipleuron serrated distally, disc sculptured with 10 striae of large spheroid asetiferous binodal punctation, ninth stria comprised of 9 punctation; metathoracic wing present. *Abdomen*: Aedeagus (Figs 48, 49) not as long as length of abdomen, phallobase slightly sclerotized, lobate distally, lobes obtuse; phallic plates broad.

Distribution (Fig. 75). Known only from southeastern Australia**.**

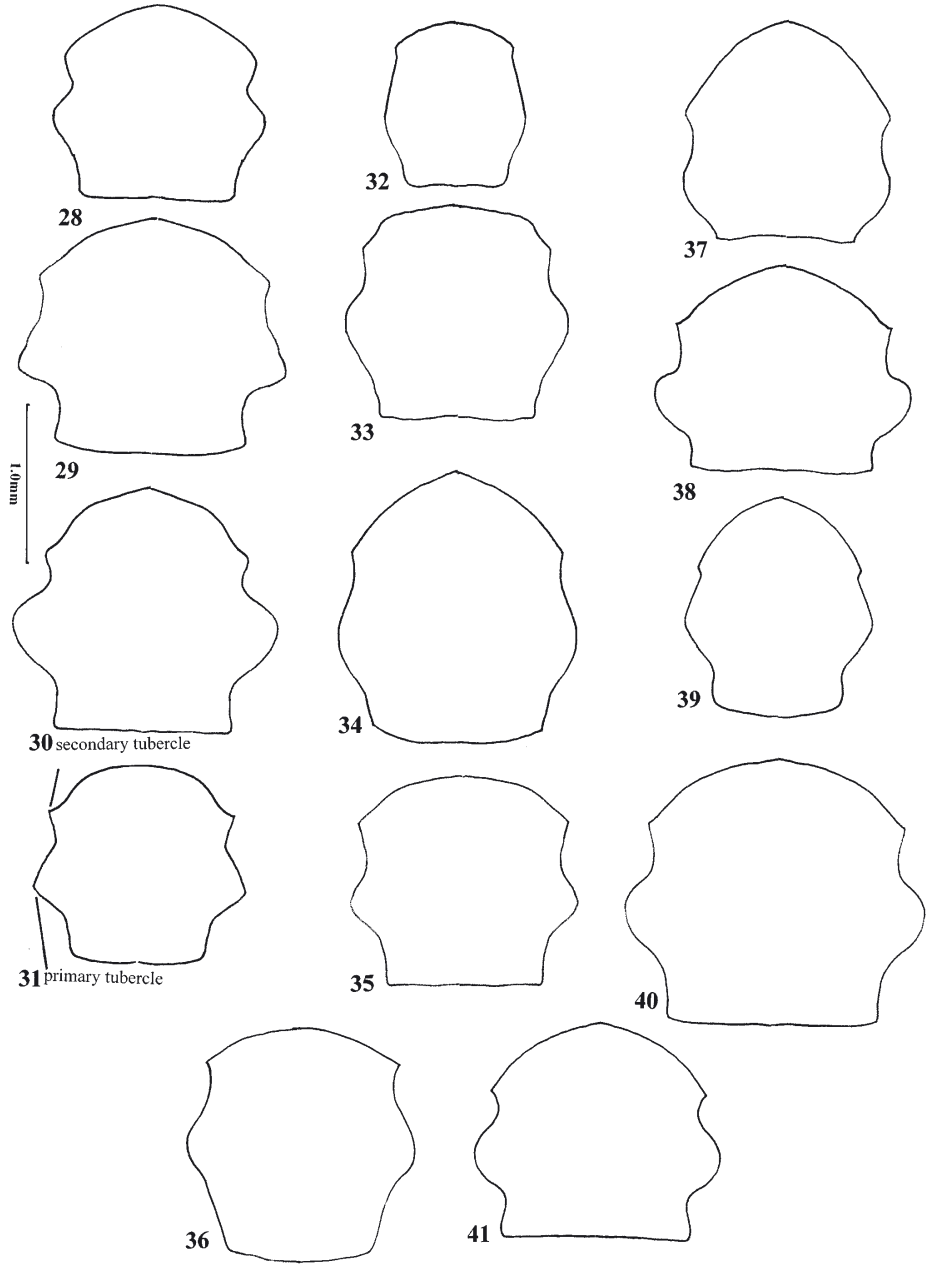
Diagnosis. The spherical condition of the last antennomere will distinguish the members of this species from the superficially similar specimens of *Apopylus nactus*.

Natural History. The holotype was collected in November.

***Apopylus unumgarensis* Kolibáč, 2003**
Figures 5, 32, 50, 51, 66, 75.

Material. *Apopylus unumgarensis* Kolibáč, 2003: 67. Holotype ♀. Type locality: 28.24S 152.40E NSW, Unumgar S. F. 430 m nr Woodenbong, Pole Bridge Road 788, 2–11 Jan. 1987, A. Newton & M. Thayer. A second label reads: dry rain. Arauc.-Euc., pyrethrin fogging old fungusy logs (ANIC).
Additional material: 8 specimens from the following Australian localities: Bunya Mts., SEQ, 25-I-68; Bulburin, S.F. 600 m, 9 km E Mary Peaks, C. Qld., 17 Sept 1989, G.B. Monteith, Pyrethrum, Rainforest; Nagarigoon Area, Lamington NP, SEQ, 21 Apr 1995, G.B. Monteith, Pyrethrum, tree trunks; QLD: 26.881°S x 151.60°E Bunyas**,** Dandabab, 1000 m, 2 Oct 2010, G. Monteith, RF barkspray, 34628; SEQ: 24°32′S X 151°28′E Bulburin barracks, G.B. Monteith, rainforest, Pyrethrum, trees, 7816; Qld, 27°19.1′S x 152°06.5′E, Crows Nest NP, Perseverence Section site 1, 540 m, 4 Dec 2003, hoop pine scrub, C.J. Burwell, pyrethrum, 51768; SEQ, 26°54′S x 151°38′E Bunya Mtns, nr Munros Camp, 24 Oct 1997, G. Thompson, Pyrethrum, hoop trunks. Specimens are deposited in ANIC, QMBA and WOPC.

Redescription. *Size*: Length 3.5 mm; width 1.2. *Color*: Reddish brown. *Form* (Fig. 66): Oblong, hind body subquadrate, about 2.9 times longer than broad. *Head*: Frons wider than width of eye (EW/FW-10:27); antenna (Fig. 5), capitulum narrow, scape about as long as combined length of pedicel to antennomere 2, funicular antennomeres subfiliform, capitular antennomeres transverse, antennomeres 9 and 10 suboval, antennomere 11 rotund; terminal palpomere securiform in maxilla and labium. *Thorax*: Pronotum (Fig. 32) quadrate (PW/PL-60:60), side margins with primary and secondary tubercles, disc with small setiferous punctation and one large setiferous punctation on



Figs 28–41. Pronota: 28 – *Pseudopylus apterus*. 29 – *Apopylus nactus*. 30 – *A. cruslumus*. 31 – *A. kolibaci*. 32 – *A. unumgarensis*. 33 – *Fallopylus pallipes*. 34 – *F. leptofustus*. 35 – *Apopylus okei*. 36 – *Fallopylus astrictus*. 37 – *F. creperus*. 38 – *F. cavus*. 39 – *F. redactus*. 40 – *Pylus fatuus*. 41 – *Pylus cracentus*.

each side, center of disc not depressed; elytron 4.0 longer than wide (EL/EW-150:40), epipleuron serrated distally, disc sculptured with 10 striae of large spheroid asetiferous binodal punctation, ninth stria comprised of 5 punctation; metathoracic wing present. *Abdomen*: Aedeagus (Figs 50, 51) not as long as length of abdomen, phallobase slightly sclerotized, lobate distally, lobes obtuse, fimbriate; phallic plates very broad, phallic apex deeply notched.

Variation. *Size*: Length 3.0–5.0 mm; width 1.0–1.5. The number of punctation that comprise the ninth stria of elytral punctation may vary from 5 to 7.

Diagnosis. Within *Apopylus*, only in members of this species is the ninth elytral stria composed of 5–7 punctation.

Distribution (Fig. 75). Australia.

Natural History. Specimens have been collected during September, October, and April, mostly with pyrethrum spray on tree trunks. Altitudinally, these beetles were collected from 540 to 1000 m.

Notes. Kolibáč (2003: 66) illustrated the metathoracic wing and the mesodermal female reproductive organs.

Fallopylus Opitz, 2012: 9.

Type species: *Pylus pallipes* Macleay, 1872: 275. By original designation.

Diagnosis. The members of this species have a 1-2-1 tarsal spur formula.

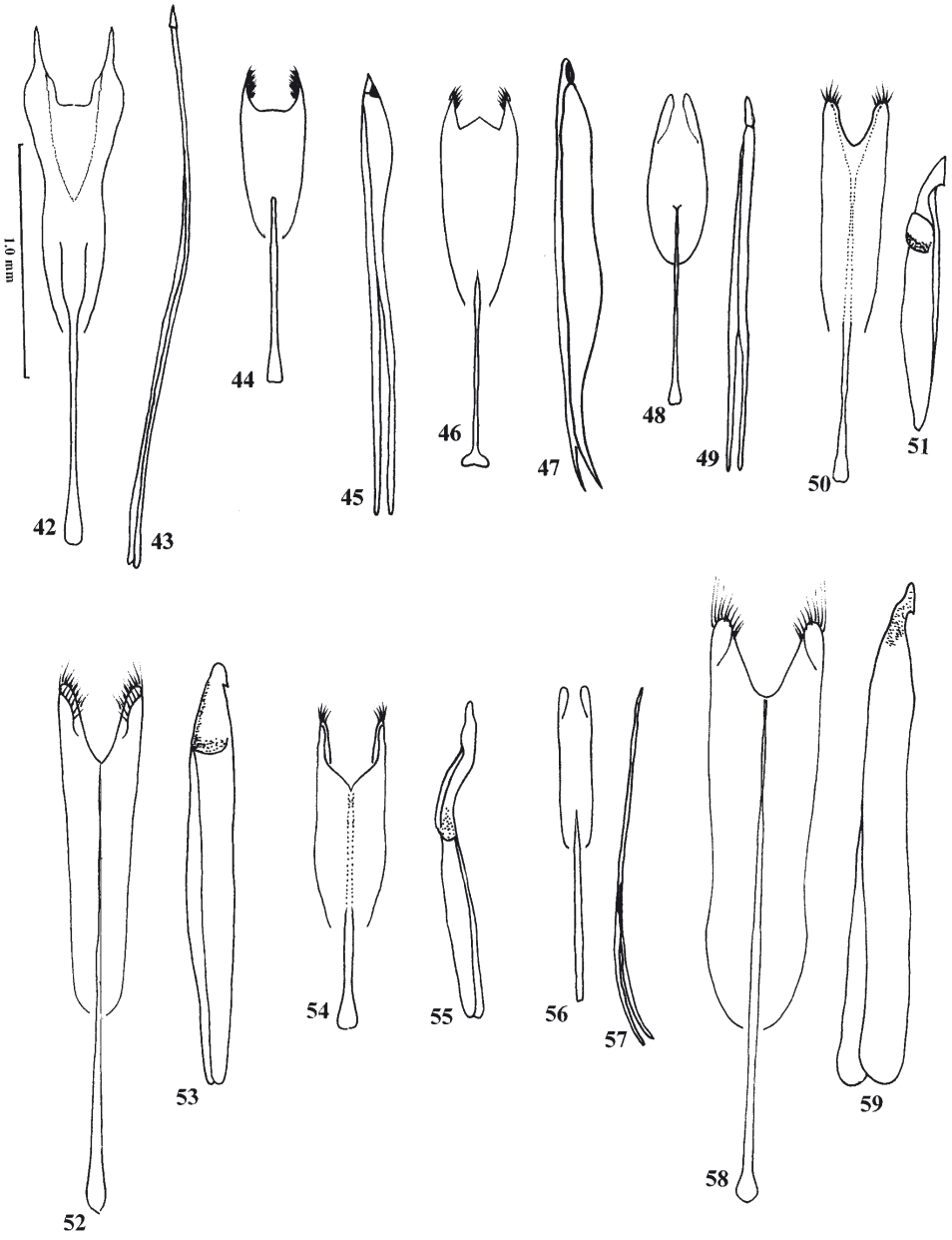
Synapotypic characteristics. Tarsal spur formula 1-2-1 and female bursal sclerite cyclic.

Fallopylus astrictus sp.nov.

Figures 9, 36, 52, 53, 67, 76.

Material. Holotype ♂. Type locality**:** Tambourine Mountain (Australia), H. Hacker, 28-10-1912 (BMNH).

Description. *Size*: Length 7.0 mm; width 2.2. *Color*: Reddish brown. *Form* (Fig. 67): Oblong, hind body subquadrate, about 3.2 times longer than broad. *Head*: Frons not as wide as eye (EW/FW-30:26); antenna (Fig. 9), capitulum loose, scape about as long as combined length of pedicel to antennomere 2, antennomere 2 particularly long, funicular antennomeres subfiliform, capitular antennomeres elongate, antennomeres 9 and 10 long triangular, antennomere 11 oval; terminal palpomere securiform in maxilla and labium. *Thorax*: Pronotum (Fig. 36) quadrate (PW/PL-100:100), side margins with primary obtuse and secondary tubercles, disc with small setiferous punctation and one large setiferous punctation on each side, center of disc not depressed; elytron 4.3 longer than wide (EL/EW-280:66), epipleuron serrated distally, disc sculptured with 10 striae of large spheroid asetiferous quadrinodal punctation, ninth stria comprised of 7 punctation; metathoracic wing present. *Abdomen*: Aedeagus (Figs 52, 53) shorter than length of abdomen, phallobase lobate distally, lobes very fimbriate; phallic plates broad, phallic apex large, slightly uncinate.



Figs 42–59. Tegmina and phalli: 42–43 *Apopylus cruslumus* (42 – tegmen, 43 – phallus). 44–45 *A. kolibaci* (44 – tegmen, 45 – phallus). 46–47 *A. nactus* (46 – tegmen, 47 – phallus). 48–49 *A. okei* (48 tegmen, 49 phallus). 50–51 *A. unumgarensis* (50 – tegmen, 51 – phallus). 52–53 *Fallopylus astrictus* (52 – tegmen, 53 – phallus). 54–55 *F. creperus* (54 – tegmen, 55 – phallus). 56–57 *Pylus cracentus* (56 – tegmen, 57 – phallus). 58–59 *Fallopylus leptofustus* (58 – tegmen, 59 – phallus).

Distribution (Fig. 76)**:** Known only from southeastern Australia.

Diagnosis. The narrow phallic apex will distinguish the male members of this species from superficially similar male specimens of *F. leptofuscus*, in which the phallic apex is broad. The females of these two species may not be distinguishable on the basis of external characteristics.

Natural History. The holotype was collected in October.

Etymology. The specific epithet *astrictus* (= narrow) is a Latin adjective. I refer the relatively slender condition of the phallic apex.

***Fallopylus cavus* sp.nov.**
Figures 38, 68, 76.

Material. Holotype. ♀. Type locality. QLD 27°19.1′S 152°06.5′E. Crows Nest NP, Perseverance Section, site 1, 540 m, 4 Dec. 2003, hoop pine scrub, C.J. Burwell, pyrethrum (QMBA).

Description. *Size*: Length 5.5 mm; width 2.0. *Color*: Reddish brown. *Form* (Fig. 68): Oblong, hind body subquadrate, about 2.8 times longer than broad. *Head*: Frons wider than eye (EW/FW-20:30); antennal capitulum loose, scape about as long as combined length of pedicel to antennomere 2, antennomere 2 not particularly long, funicular antennomeres subfiliform, capitular antennomeres elongate, antennomeres 9 and 10 long triangular, antennomere 11 oval; terminal palpomere securiform in maxilla and labium. *Thorax*: Pronotum transverse (PW/PL-90:80), side margins with primary obtuse and secondary tubercles, disc with small setiferous punctation and large asetiferous punctation, center of disc depressed; elytron 3.5 longer than wide (EL/EW-210:60), epipleuron not serrated distally, disc sculptured with 10 striae of large spheroid asetiferous binodal punctation, ninth stria comprised of 10 punctation; metathoracic wing present. *Abdomen*: Aedeagus not available.

Distribution (Fig. 76). Known only from the type locality.

Diagnosis. The wide frons and depression of the pronotal disc will distinguish the members of this species from superficially similar specimens of *Fallopylus leptofuscus,* and *F. astrictus.*

Natural History. The Holotype was collected in December via pyrethrum spray.

Etymology. The specific epithet *cavus* (= hole) is derived from a Latin noun. I refer to the large punctation at the sides of the pronotum.

***Fallopylus creperus* sp.nov.**
Figures 10, 37, 54, 55, 69, 76.

Material. Holotype ♂. Type locality: QLD: 26°18′S x 150°52′E, Turkey Mtn, 5.5 km N, 18 Dec 2001, G.B. Monteith, Pyrethrum, brigalow trunks, 450 m (QMBA).
Paratypes: Three specimens. Australia: Qld, 7 km NE of Tolga, Nov. 1987, Storey & De Favori, Light trap (QPIM, 1); Tolga, N. QLD, 13-20-XII-1985, J.D. Brown, light trap (WOPC, 1); Mission Bch. NQ, 26 June 1982, in *Phellinus* sp., P. Schroeder (ANIC, 1).

Description. *Size*: Length 5.0 mm; width 1.5. *Color*: Reddish brown; elytral disc with wide dark brown fascia. *Form* (Fig. 69): Oblong, hind body subquadrate, about 3.3 times longer than broad. *Head*: Frons wider than width of eye (EW/FW-22:35); antenna (Fig. 10), capitulum compact, scape about as long as combined length of pedicel to antennomere 2, antennomere 2 particularly long, funicular antennomeres subfiliform, capitular antennomeres subspheroid; terminal palpomere securiform in maxilla and labium. *Thorax*: Pronotum (Fig. 37) quadrate (PW/P-85:85), side margins with primary obtuse and secondary tubercles, disc with small setiferous punctation, center of disc not depressed; elytron 3.3 longer than wide (EL/EW-196:60), epipleuron serrated distally, disc sculptured with 10 striae of large spheroid asetiferous trinodal punctation, ninth stria comprised of 9 punctation; metathoracic wing present. *Abdomen*: Aedeagus (Fig. 54, 55) shorter than length of abdomen, phallobase lobate distally, lobes very fimbriate; phallus bipartite, phallic plates broad, phallic apex obtuse.

Distribution (Fig. 76). Known only from Queensland, Australia.

Diagnosis. The broad dark elytral fascia will distinguish the members of this species from congeners.

Natural History. Specimens were collected in June, November, and December; one on the fungus *Phellinus* Quél.; one on brigalow trunks with pyrethrum aerosol; and one via light trap.

Etymology. The trivial name *creperus* is a Latin adjective derived from *creper* (= dark). I refer to the dark macula on the elytral disc.

Fallopylus leptofustus **sp.nov.**

Figures 8, 17, 34, 58, 59, 70, 76.

Material. Holotype ♂. Type locality: NEQ: 17°19′S x 145°37′E, Peeramon Scrub, 750 m, 9 Dec 1995, G. Monteith, Pyrethrum, trees (QMBA).

Paratypes: Twenty seven specimens. NEQ: 17°19′S x 145°37′E, Peeramon Scrub, 750 m, 9 Dec 1995, G. Montelth, pyrethrum, trees (QMBA, 1; WFBM, 1; WOPC, 1); SEQ: 25°34′S x 151°42′E, Wetheron, 3 km SW, 10 Oct 1998, Vine Scrub, G.B. Monteith, 150 m, pyrethrum, trees (WOPC, 1); NEQ: 17°33′S x 145°33′E, Mt. Fisher, summit, 1360 m, 8 Feb 1999, rainforest, G.B. Monteith, pyrethrum, trees & logs (QMBA, 1); NEQ: 17°26′S x 145°42′E, Hughes Road, Topaz, 6 Dec 1993-25 Feb 1994, Monteith, Cook, Janetzki, RF Intercept, 650 m (QMBA, 1); NEQ: 16°35′S x 145°16′E, Upper Leichhardt Creek, 18 Nov. 1997, 840 m, G.B. Monteith, pyreth, on Bunya Pines (QMBA, 1); NEQ: 16°14′S x 145°00′E, Windsor Tabld, 5.7 km past barracks, 1300 m, 24 Nov 1997, G. Monteith, pyrethrum, trees & logs (QMBA, 1); NEQ: 17°13′S x 145°25′E, 3 km W. Bones Knob, 10 Dec 1995, 1100 m, Monteith, Cook, Thompson, pyrethrum, trees & logs (QMBA, 1); NEQ: 16°35′S x 145°16′E, Leichhardt Creek, upper, 28 May 2003, G.B. Monteith, pyrethrum on Bunya Pine trunks (QMBA, 1; WOPC 3); QLD. 26°10′S x 152°20′E, Oakview SF, summit, 26 May 2002, G.B. Monteith, pyrethrum on trees, 600 m, rainforest (WOPC, 1); QLD: 26°18′S x 150°52′E, Turkey Mtn, 5.5 km N, 18 Dec 2001, G.B. Monteith, pyrethrum, brigalow trunks, 450 m (QMBA, 1); QLD. 27°24′S x 152°47′E, Boombana Nat. Pk. Site 1, 21 April 2004, C.J. Burwell, 440 m, pyrethrum, rainforest (QMBA, 1); 18°55′S x 146°09′E, QLD, Mt. Spec S3. 880 m, 6 Apr–8 May 1995, M. Cermak, Malaise trap (QMBA, 1); Kondallila, N.P, Blackall Ra, S.E. Qld, 3 Oct 1979, G.B. Monteith (QMBA, 1); Bulburin S.F. 600 m, 9 km E. Many Peeks, C. Qld, 17 Sept 1989, G.B. Monteith, Pyrethrum rainforest (QMBA, 1); 19°00′S x 146°11′E, QLD, Mt. Spec S 1, 875 m, 6 Dec 1994–10 Jan. 1995, M. Cermak (WOPC, 1); Australia: N. QLD, Wongabel S.F. via Atherton, 4–16.1.1990, Storey & Defavert, Malaise Trap (QPIM, 1); Australia: N. QLD, Tully Falls, S. F., 730 m, 18 km SSW Ravenshoe, 1-X-

5-XI-1987, Storey & Dickinson (QPIM, 1); Australia: N. QLD, Wongabel S.F. via Atherton, 29.III–30.IV.1990, Storey & Haifpapp, Malaise Trap (WOPC, 1); Kondalilia N.P., Blackall Ra, SE QLD, 30 Oct. 1979, G.B. Monteith (QMBA, 1; WOPC, 1); Binna Burra, QLD, 900 m, 23 June 1978, S. & J. Peck & J. F. Lawrence, *Ganoderma applanatum* (Pers.) Pat. (ANIC, 1).

Description. *Size*: Length 6.0 mm; width 2.0. *Color*: Reddish brown. *Form* (Fig. 70): Oblong, hind body subquadrate, about 3.0 times longer than broad. *Head*: Frons not as wide as eye (EW/FW-30:20); antenna (Fig. 8), capitulum loose, scape about as long as combined length of pedicel to antennomere 2, antennomere 2 particularly long, funicular antennomeres subfiliform, capitular antennomeres elongate, antennomeres 9 and 10 long triangular, antennomere 11 oval; terminal palpomere securiform in maxilla and labium. *Thorax*: Pronotum (Fig. 34) quadrate (PW/PL-95:95), side margins with primary obtuse and secondary tubercles, disc with small setiferous punctation and one large setiferous punctation on each side, center of disc slightly depressed; elytron 3.4 longer than wide (EL/EW-275:75), epipleuron serrated distally, disc sculptured with 10 striae of large spheroid asetiferous quadrinodal punctation, ninth stria comprised of 6 punctation; metathoracic wing present. *Abdomen*: Aedeagus (Fig. 58, 59) shorter than length of abdomen, phallobase lobate distally, highly fimbriate; phallic apex uncinate, plates broad.

Variations. The number of punctation that comprise the ninth stria of elytral punctation may vary from 6 to 9.

Distribution (Fig. 76). Most of the specimens were collected from northeastern Queensland.

Diagnosis. The broad phallic apex, seen most readily in dorsal view, will distinguish the male members of this species from superficially similar specimens of *F. astrictus*, in which the phallic apex is narrow. The females of these two species cannot be distinguishable on the basis of external characteristics.

Natural History. Specimens have been collected from June, and from October thru May, many by spraying pyrethrum on trees and logs. Some were gathered on Bunya Pines. The known altitudinal range of this species extends from 450–1300 m. One specimen was collected from the bracket fungus *Ganoderma applanatum* (Pers.) Pat.

Etymology. The specific epithet is a compound name that stems from the Greek *leptos* (= thin) and the Latin *fustis* (= club). I refer the relatively slender condition of the capitulum.

Fallopylus pallipes **(Macleay)**

Figures 7, 33, 71, 76.

Material. *Pylus pallipes* Macleay, 1872: 275. Lectotype. Here designated. Gender not determined. Type locality: Australia (AMSA).
Additional material: 8 specimens. Australia, QLD, Morehead river, 35 km se Musgrave, 29-5-1993, M. & B. Baehr; Repe's Ck, N.S. Wales; Brisbane, Queensland, G.E. Bryant, 2.II.09; Galston, New South Wales; Bowen, Queensland, A. Simson. Specimens are deposited in AMSA, RGCG, and WOPC.

Redescription. *Size*: Length 5.5 mm; width 1.8. *Color*: Reddish brown. *Form* (Fig. 71): Oblong, hind body subquadrate, about 3.1 times longer than broad. *Head*: Frons wider

than width of eye (EW/FW-25:35); antenna (Fig. 7), capitulum subcompact, scape about as long as combined length of pedicel to antennomere 2, funicular antennomeres subfiliform, capitular antennomeres transverse, antennomeres 9 and 10 triangular, antennomere 11 acuminate; terminal palpomere subsecuriform in maxilla and strongly securiform in labium. *Thorax*: Pronotum (Fig. 33) transverse (PW/PL-91:75), side margins with primary obtuse tubercles, second tubercle present, disc with small setiferous and large oval asetiferous punctation, center of disc slightly depressed; elytron 3.4 longer than wide (EL/EW-240:67), epipleuron not serrated distally, disc sculptured with 10 striae of large spheroid asetiferous binodal punctation, tenth stria comprised of 9 punctation; metathoracic wing present. *Abdomen*: Aedeagus not as long as length of abdomen, phallobase slightly sclerotized, lobate distally, lobes acuminate; phallic plates narrow.

Variation. Body color varies from yellow-brown to reddish brown.

Distribution (Fig. 76). Australia.

Diagnosis. The apical acumination on the last antennomere will distinguish the members of this species from congeners.

Natural History. Specimens were collected in February and May.

Notes. This species was copiously figured in Opitz (2012: 16). The mesodermal female reproductive organs and the 6th visible sternite were figured by Kolibáč (2003: 63).

***Fallopylus redactus* sp.nov.**
Figures 11, 39, 72, 76.

Material. Holotype ♀. Type locality: Tamborine Mt., Joalah NP, NSW (Australia), 25 Nov. 1982, J. & E. Doyen (ANIC).

Description. *Size*: Length 5.0 mm; width 2.0. *Color*: Reddish brown. *Form* (Fig. 72): Oblong, hind body subquadrate, about 2.5 times longer than broad. *Head*: Frons as wide as eye (EW/FW-25:25); antenna (Fig. 11), capitulum loose, scape about as long as combined length of pedicel to antennomere 2, antennomere 2 particularly long, funicular antennomeres filiform, capitular antennomeres elongate, antennomeres 9 and 10 long triangular, antennomere 11 oval; terminal palpomere securiform in maxilla and labium. *Thorax*: Pronotum (Fig. 39) slightly oblong (PW/PL-80:85), side margins with primary obtuse and secondary tubercles, disc with small setiferous punctation and large asetiferous punctation, center of disc not depressed; elytron 3.5 longer than wide (EL/EW-240:70), epipleuron serrated distally, disc sculptured with 10 striae of large spheroid asetiferous tetranodal punctation, tenth stria comprised of 6 punctation; metathoracic wing present. *Abdomen*: Aedeagus not available.

Distribution (Fig. 76). Known only from southeastern Australia.

Diagnosis. The tenth stria of the elytral disc is comprised of 6 punctation. This will distinguish the members of this species from similar members of *Fallopylus leptofustus* and *F. astrictus*, in which the punctation of the tenth stria extends to the elytral apex.

Natural History. The holotype was collected in November.

Etymology. The trivial name *redactus* (= reduced) is a Latin adjective. I refer to the reduced number of punctation on the first stria of the elytral disc.

Pylus cracentus sp.nov.

Figures 6, 41, 56, 57, 73, 76.

Material. Holotype ♂. Type locality: Galston, NSW (AMSA).
Paratype: 1 specimen from Cairns dist., F.P. Dodd (SAMA).

Description. *Size*: Length 5.0 mm; width 2.0. *Color*: Reddish brown. *Form* (Fig. 73): Oblong, hind body subquadrate, about 2.5 times longer than broad. *Head*: Frons wider than width of eye (EW/FW-20:40); antenna (Fig. 6), capitulum compact, scape about as long as combined length of pedicel to antennomere 2, funicular antennomeres filiform, antennomeres 9 and 10 triangular, antennomere 11 oval; terminal palpomere subsecuriform in maxilla, more securiform in labium. *Thorax*: Pronotum (Fig. 41) transverse (PW/PL-92:78), side margins with primary obtuse and secondary tubercles, disc with small setiferous punctation and large asetiferous punctation, center of disc depressed; elytron 3.7 longer than wide (EL/EW-240:65), epipleuron not serrated distally, disc sculptured with 10 striae of large spheroid asetiferous tetranodal punctation, tenth stria comprised of 10 punctation; metathoracic wing present. *Abdomen*: Aedeagus (Fig. 56, 57) not as long as abdomen, narrow, phallobase slightly sclerotized, slightly lobate distally; phallic plates long, narrow.S

Variation. The two specimens before me are quite homogeneous.

Diagnosis. The heavily sclerotized base of the probasitasomere will distinguish the members of this species from superficially similar specimens of *Pylus fatuus*.

Distribution (Fig. 76). Known only from southeastern Australia.

Etymology. The specific epithet *cracentus* is a Latin adjectival from *cracens* (= slender). I refer to the slender condition of the probasotarsomere.

Pylus fatuus (Newman, 1842)

Figures 12, 40, 74, 76.

Material. *Clerus fatuus* Newman, 1842: 35. Holotype ♀. Type locality: Van Dieman's Land (Australia) (BMNH).
Additional material: 68 specimens from: QLD, 26°13′S x 150°35′E, Barakula 23 km NNE, 18 Dec 2001, pyrethrum, G.B. Monteith, brigalo trunks, 400 m, 10312; QLD, 26°18′S x 150°52′E, Turkey Mtn, 5.5 km N, 18 Dec 2001, pyrethrum, G.B. Montteith, brigalo trunks, 450 m, 10314; Broomehill, 33.51 S 117.38 E, Western Australia, R.P McMillan; Australia: NSW, Khancoban, 380 m, 20.X.1963, J Sedlacek; Condor Ck. A,C.T., 11-12-1976, D.P. Carne, under Euc. bark; 1km NW Numeralla, NSW 29 Nov. 1995, ex soil & under bark of living trees, G.W. Ulrich; 35.16S 149.06, EACT, Black Mtn nr light trap, 12 Sept.1994, T. Weir & W. Dressler, Berlesate, dry Eucalypt. litter; Cotter R, ACT, 8-12-76, D.P. Carne, under bark; Australia, Tas, Apsley Gorge, Douglas Apsley National Park, 41°52′S, 148°10′E, 6 December 1993, D.S. Horning, Jr., under bark Eucalyptus sp. TAS-126; Launceston, Tasmania, J.J. Walker; Australia, NSW, Kurrajong, 24-VII-1966, M.I. Nikitin; Illawarra, NSW, G.E. Bryan, 1-X-1908; Ulverstone, Tasmania, X mar 1924, R. Blackwood; Ringwood, V. R. Blackwood; Launceston; Bridgetown, W. Australia, J. Clark; Mt. Talbingo, NSW, T.G. Sloane; Sydney;

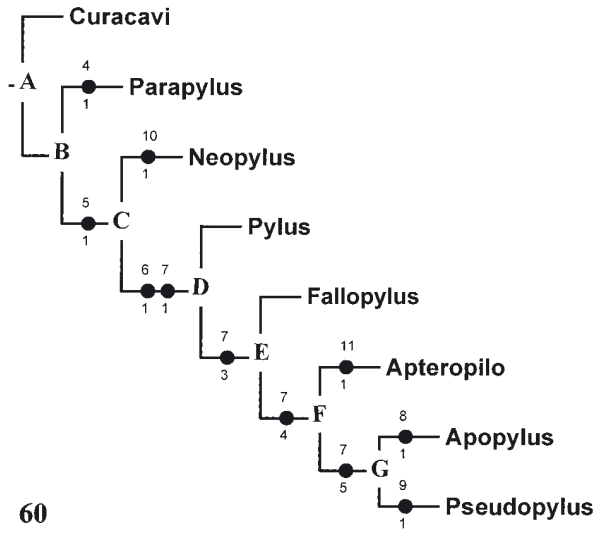
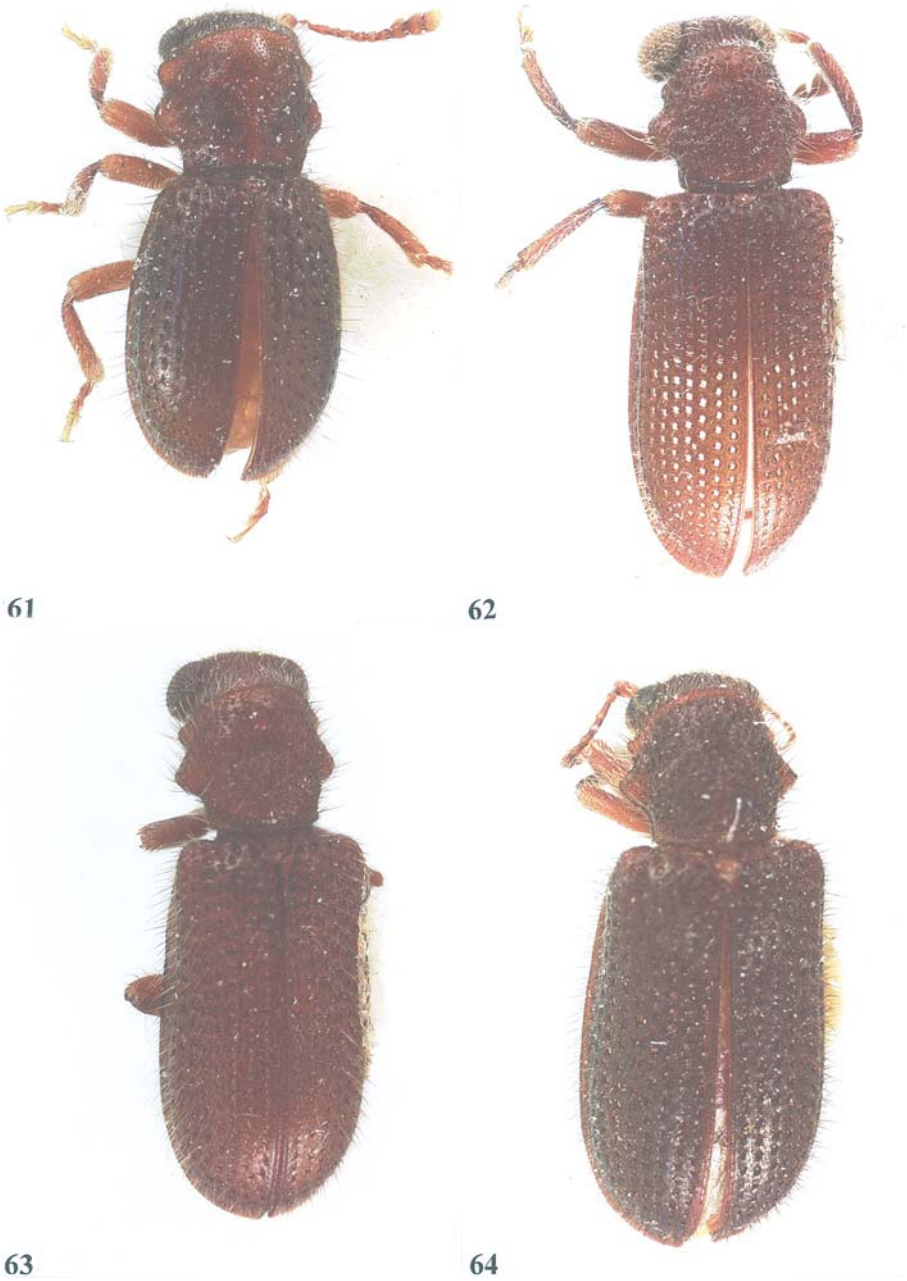


Fig. 60. Phylogenetic tree pf *Pylus* complex genera.

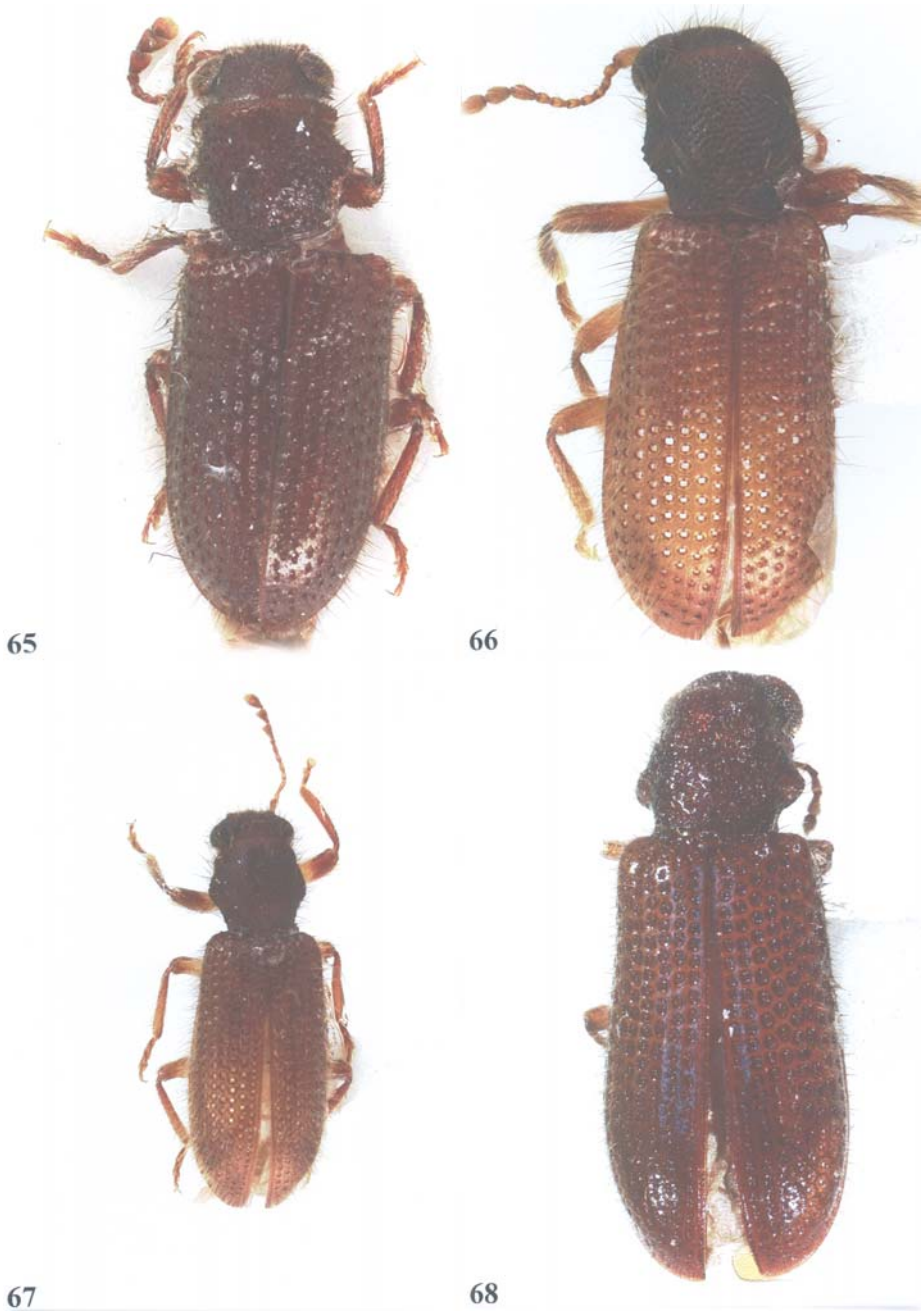
Beaconsfield, 2-9-1917, H. Pottinger; Mt. Arthur, Tas., F.M. Littler; NSW, Khancohan, 380 m, 20-X-1963; Mingenew, 25-XI-1963; Tumutu R., 1600 m, I-1956, J. Sedlacek; NSW, Greta, 100 mk, xi-1951, J. Sedlasek; Launceston, T., F.M. Littler; Ferntree Gully, V. 9-3-1918, H. Pottinger; Launceston. Specimens are deposited in AMSA, ANIC, BMNH, BPBM, QMBA, and WOPC.

Redescription. *Size*: Length 12.0 mm; width 4.0. *Color*: Reddish brown. *Form* (Fig. 74): Oblong, hind body subquadrate, about 3.0 times longer than broad. *Head*: Frons wider than width of eye (EW/FW-20:26); antenna (Fig. 12), capitulum subcompact, scape about as long as combined length of pedicel to antennomere 2, funicular antennomeres subfiliform, capitular antennomeres transverse, antennomeres 9 and 10 triangular, antennomere 11 acuminate; terminal palpomere subsecuriform in maxilla and strongly securiform in labium. *Thorax*: Pronotum (Fig. 40) transverse (PW/PL-165:150), side margins with primary obtuse tubercles, second tubercle present, disc with small setiferous and large oval asetiferous punctation, center of disc slightly depressed; elytron 3.4 longer than wide (EL/EW-460:145), epipleuron not serrated distally, disc sculptured with 10 striae of large spheroid asetiferous binodal punctation, tenth stria comprised of 9 punctation; metathoracic wing present. *Abdomen*: Aedeagus not as long as abdomen, phallobase reduced, lobate distally; phallic plates long, narrow. *Female Mesodermal Reproductive Organs*: Spermathecal capsule well sclerotized; spermathecal gland attached to base of capsule; bursa copulatrix saccular, bursal plate present.

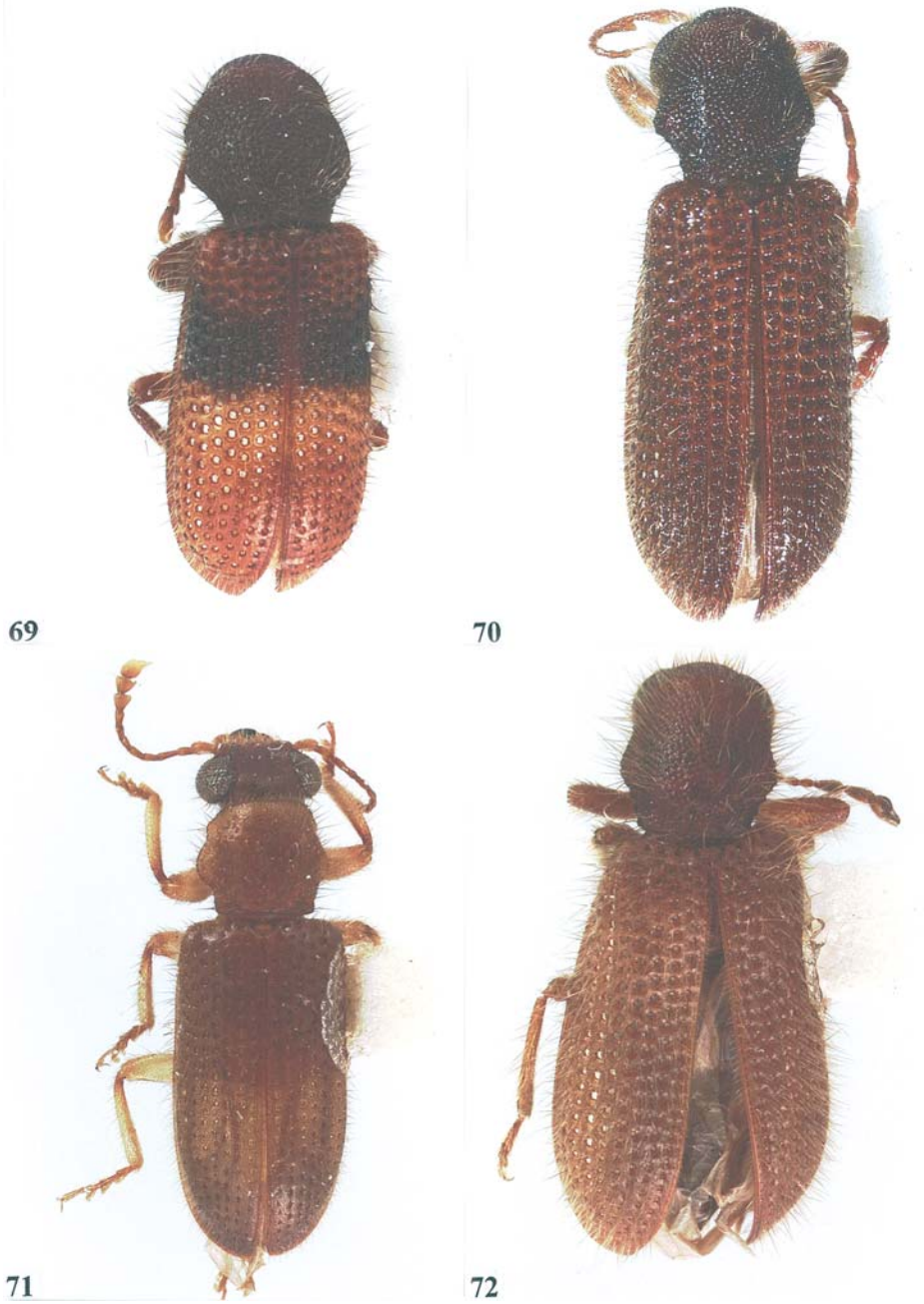
Variation. *Size*: Length 7.0–11.0 mm; width 3.0–3.2. The number of punctation that comprise the ninth elytral stria may vary from 10 to 14. Body color varies from yellow-brown to reddish brown.



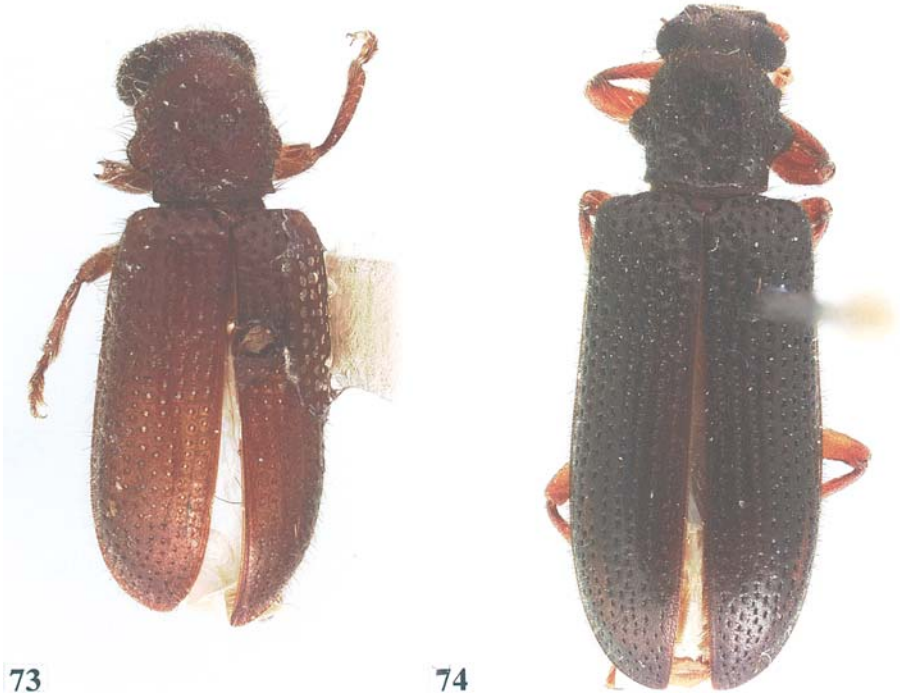
Figs 61–64. Habitus illustrations: 61 – *Pseudopylus apterus*. 62 – *Apopylus cruslumus*. 63 – *A. kolibaci*. 64 – *A. nactus*.



Figs 65–68. Habitus illustrations: 65 – *Apopylus okei*. 66 – *A. unumgarensis*. 67 – *F. astrictus*. 68 – *F. cavus*.



Figs 69–72. Habitus illustrations: 69 – *Fallopylus creperus*. 70 – *F. leptofustus*. 71 – *F. pallipes*. 72 – *F. redactus*.



Figs 73–74. Habitus illustrations: 73 – *Pylus cracentus*. 74 – *Pylus fatuus*.

Distribution (Fig. 76). Australia.

Diagnosis. The probasitarsomere is not narrowly heavily sclerotized in specimens of this species, which separates its members from those of *Pylus cracentus,* in which the probasitarsomere is narrowly sclerotized.

Natural History. Specimens were collected during September, October, November, and December, at altitudes ranging from 30 to 1600 meters. Most of the specimens examined are associated with the bark of *Eucalyptus* L' Hér.

Notes. Opitz (2012: 21) provides 10 illustrations of this species including the aedeagus whereas Kolibáč (2003: 53) provides 26 illustrations, including the mesodermal female reproductive organs.

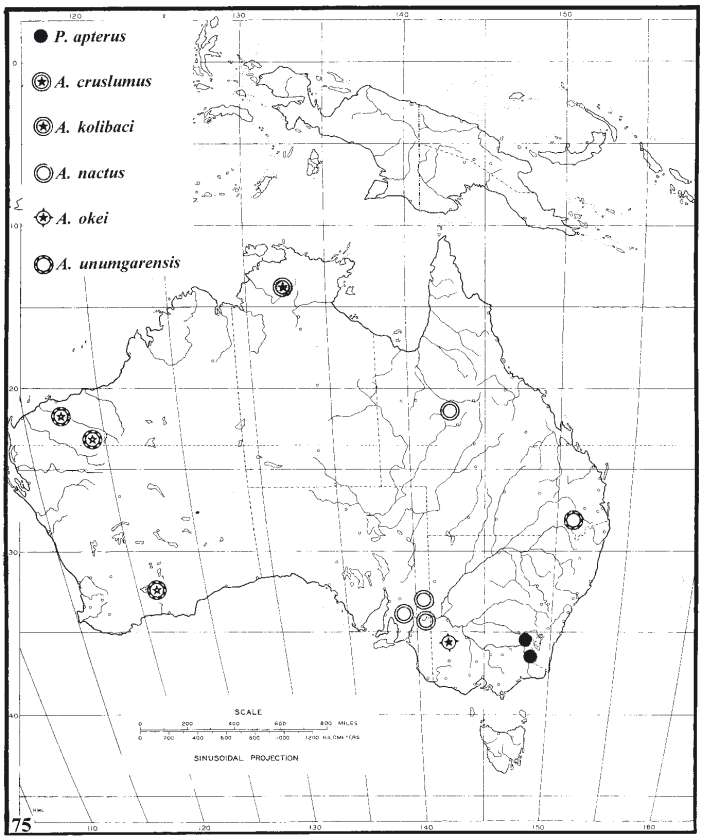


Fig. 75. Geographic distribution of species as indicated.

Evolutionary considerations

OPITZ (2012: 32) presented a computer generated phylogenetic tree which included the genera in question. During the present investigation, I found new evidence that suggests an alternative hypothesis for the evolution of the genera of the *Pylus* complex. The inclusion of Chilean elements into the mix of the *Pylus* complex complements the long standing view that the Chilean fauna has kinships with the Australian fauna; no doubt a manifestation of plate tectonics relevant to the Late Jurassic when the arrangement of continents provided dispersal routes for the ancestor of the *Pylus* complex (OPITZ 2003: 181). This hypothesis of ancient taxa distribution places the stem species of these genera prior to any extensive drift of Australia from Gondwana, a time when lignicolous beetle became prominent amidst the proliferation of Angiosperms (WHITE 1988: 40).

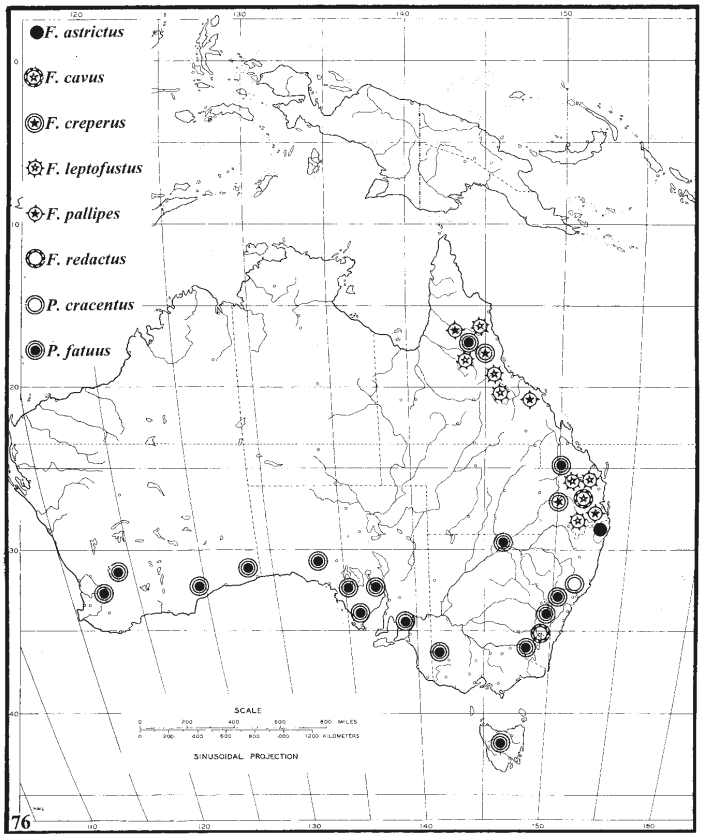


Fig. 76. Geographic distribution of species as indicated.

Analysis of twelve adult morphological characters generated a computer-based phylogeny (Fig. 60). The analysis produced a single tree (L = 15, Ci = 100, Ri = 100). Outgroup taxa involves the genus *Curacavi* Solervicens. The progenitor that evolved into ancestor A lost the elytral 2° setae. Ancestor A diverged to eventually produce *Curacavi*, characterized by the pronotal margins serrulate. In the complementary stock, which generated ancestor B, the elytral punctation became diminutive and the ocular plate expanded. Ancestor B diverged to produce *Parapylus*, in which the elytral base became adorned with tumescences. Ancestor B promulgated progenitor C, in which tibial spurs became reduced in numbers. Progenitor C split to generate *Neopylus*, in which white setal wisps appeared on the elytral disc, and ancestor D, in which the elytral punctation became nodulated. From ancestor D there evolved *Pylus*, characterized by a 2-2-1 tarsal spur formula, and progenitor E. The latter led to *Fallopylus*, characterized by a 1-2-1

tarsal spur formula, and ancestor F which generated *Apteropilo*, characterized by a 0-2-1 tarsal spur formula, and progenitor G. Progenitor G evolved *Apopylus*, characterized by a sharp humeral angle, and *Pseudopylus,* taxa that evolved a subovate hind body and a biology that involves existence in lignicolous litter.

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