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A review of the family *Hobartiidae**
(Coleoptera: Cucujoidea)

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ABSTRACT. The Cucujoid family *Hobartiidae* is characterized on the basis of adult and larval characters. Two genera and six species are presently recognized. The larvae of *Hobartius* and *Hydnobioides* are described and illustrated. The world species (5 Australian and 1 Neotropical) of *Hobartiidae* are reviewed and figured, and the keys to their determination are provided. Distribution and nomenclatural history is provided for each species. Four new species are described: *Hydnobioides lawrencei* (Australia), *Hobartius newtonorum* (Australia), *H. niger* (Australia) and *H. chilensis* (Chile, Argentina). *Atomaria eucalypti* BLACKBURN is transferred from *Cryptophagidae* to *Hobartiidae* and is regarded as a senior synonym of *Hobartius tasmanicus* SEN GUPTA & CROWSON.

Key words: entomology, taxonomy, revision, *Coleoptera*, *Cucujoidea*, *Hobartiidae*.

INTRODUCTION

The taxon *Hobartiidae*, was erected by SEN GUPTA & CROWSON (1966) as the tribe *Hobartiini* for two new Australian genera, *Hobartius* and *Hydnobioides*. It was originally erected within a broadly defined family *Boganiidae* (including also *Cavognathidae* and Phloeostichid *Hymaeinae*). The same authors latter (1969) split their old family *Boganiidae* into *Boganiidae* and *Cavognathidae*, and defined broader the family *Phloeostichidae* to include *Hymaeinae*, *Phloeostichinae* and *Agapythinae*. SEN GUPTA & CROWSON (1969) kept hobartiids as a subfamily of

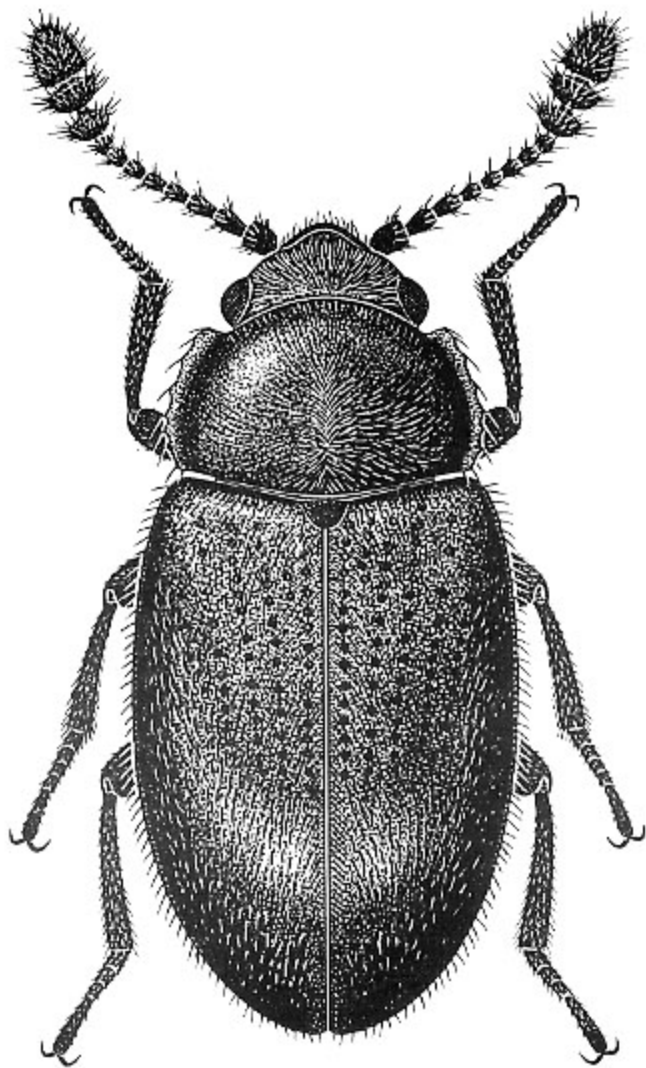
Boganiidae, and provided a description of a supposed larva of *Hydnobioides pubescens*. The described larva was apparently not that of *Hydnobioides* (LAWRENCE 1991, R.A. CROWSON, pers. comm.) and its identity remains still unclear. The first larval description, and a formal recognition of *Hobartiidae* as independent family (in a sense of *Hobartiini* of SEN GUPTA & CROWSON) are contained in LAWRENCE (1991). This concept of the family was then followed by LAWRENCE & BRITTON (1991, 1994), PAKALUK et al. 1994, and CROWSON & ŚLIPIŃSKI, in prep.).

Although, originally included in *Boganiidae*, *Hobartiidae* do not seem to be closely related to boganiids as currently defined (CROWSON 1990). The adult dorsal mandibular tubercle usually with an associated cavity, used as the basis for placing *Hobartiidae* in the boganiid-phloeostichid group, is widely distributed in the Cucujoidea families. It is sometimes thought (R.A. CROWSON, pers. comm.) to be an ancestral feature of all *Cucujoidea*, then lost independently in different lineages. Comparative studies of mandibles of most Cucujoidea groups by one of us (S.A. ŚLIPIŃSKI, unpublished) show that these structures are almost certainly non-homologous (in a cladistic sense) and were probably independently derived and lost many times.

A preliminary attempt to place this and the relative Cucujoidea families within the system of *Cucujoidea* is provided by ŚLIPIŃSKI & PAKALUK (in preparation). They concluded that *Hobartiidae* might be a sister group to the clade *Agapythidae* + *Protocucujidae* + *Aspidiphoridae* (= *Sphindidae*). This preliminary analysis is based only on a reduced data set and a limited number of taxa. The adult and/or larval characters analyzed may be correlated with fungal/mycetozoan spore feeding and are difficult to evaluate and easily prone to a convergence, and this hypothesis should be only treated as a preliminary one. The present study has not revealed new characters nor conclusions contradicting the arguments of ŚLIPIŃSKI & PAKALUK, which might have helped us to resolve problems presented there. We believe that a more detailed analysis must await further, complex studies including all families within *Cucujoidea*.

FAMILY DIAGNOSIS

Adult hobartiids are characterized by the following combination of characters: (1) antenna 11-segmented with loose, 3-segmented club; (2) clypeus constricted at base; (3) mandible with distinct dorsal tubercle but devoid of associated cavity; (4) frontoclypeal suture distinct; (5) procoxa slightly transverse with fully exposed trochantin, its cavity internally and externally open; (6) mesocoxae moderately separated, meso-metasternal junction with single, broad knob; (7) mesocoxal cavity externally open, trochantin exposed; (8) wing with relatively complete radial cell, without subcubital fleck; (8) elytra irregularly punctate, setose, flanges not apically widened; (9) tarsi 5-5-5 in both sexes or 5-5-4 in males, tarsomeres simple; (10) abdomen with 7 functional spiracles and 5 freely articulated ventrites; (11) male genitalia turned on side when retracted, tegmen bearing articulated parameres; (12) female ovipositor with elongate styli.



1. *Hobartus eucalypti* (BLACKBURN) by S.P. KIM

Larvae of *Hobartius* and *Hydnobioides* examined are characterized by the following: (1) frontoclypeal suture absent, labrum large and distinctly separate; epicranial stem and median endocarina absent; (3) frontal arms distinctly separate at base, lyriform; (4) stemmata 5 in rows 3-2; (5) antenna elongate, sensorium on antennomere II ventro-mesal to antennomere III; (6) mandible bidentate apically, with ventral crushing tubercle, without prostheca; (7) ventral mouth-parts retracted; (8) labial palp 1-segmented; (9) maxillary articulating area fairly large; (10) mala narrowing apically to apparently falcate with sclerotized teeth apically; (11) hypopharynx sclerotized, sclerome narrow, bracon apparently absent; (12) hypostomal rods short and divergent; (13) trunk terga bearing asperities and tubercles, setae simple; (14) urogomphi simple, upturned; (15) segment 10 forming cylindrical pygopod; (16) spiracles annular-biforous borne on tubercles; (17) tarsal claw simple, with 2 setae.

KEY TO THE GENERA OF *HOBARTIIDAE*

ADULT

1. Antennomeres 5 and 7 asymmetrically enlarged (fig. 42). Wing with two anal veins; radial cell reduced (fig. 53). Tarsi 5-5-5 segmented in both sexes *Hydnobioides*
- , Antennomeres 5 and 7 not asymmetrically enlarged (fig. 6); Wing with single anal vein; radial cell well-developed (fig. 13). Tarsi 5-5-5 segmented in female, 5-5-4 in male *Hobartius*

LARVA

1. Abdominal terga with strongly prominent and complex tubercles (fig. 17). Urogomphi apparently longer, narrowly separated at bases and slightly curved. Mandibular incisor edge serrate. Maxillary articulated area large (fig. 20); mala falcate with 2 distinct teeth apically (fig. 20) *Hobartius*
- , Abdominal terga with small, conical tubercles (fig. 18). Urogomphi apparently shorter, widely separated at bases and more strongly upturned (fig. 27). Mandibular incisor edge smooth (fig. 59). Maxillary articulated area narrow (fig. 67); mala broader pically bearing 3 teeth *Hydnobioides*

REVIEW OF THE GENERA AND SPECIES

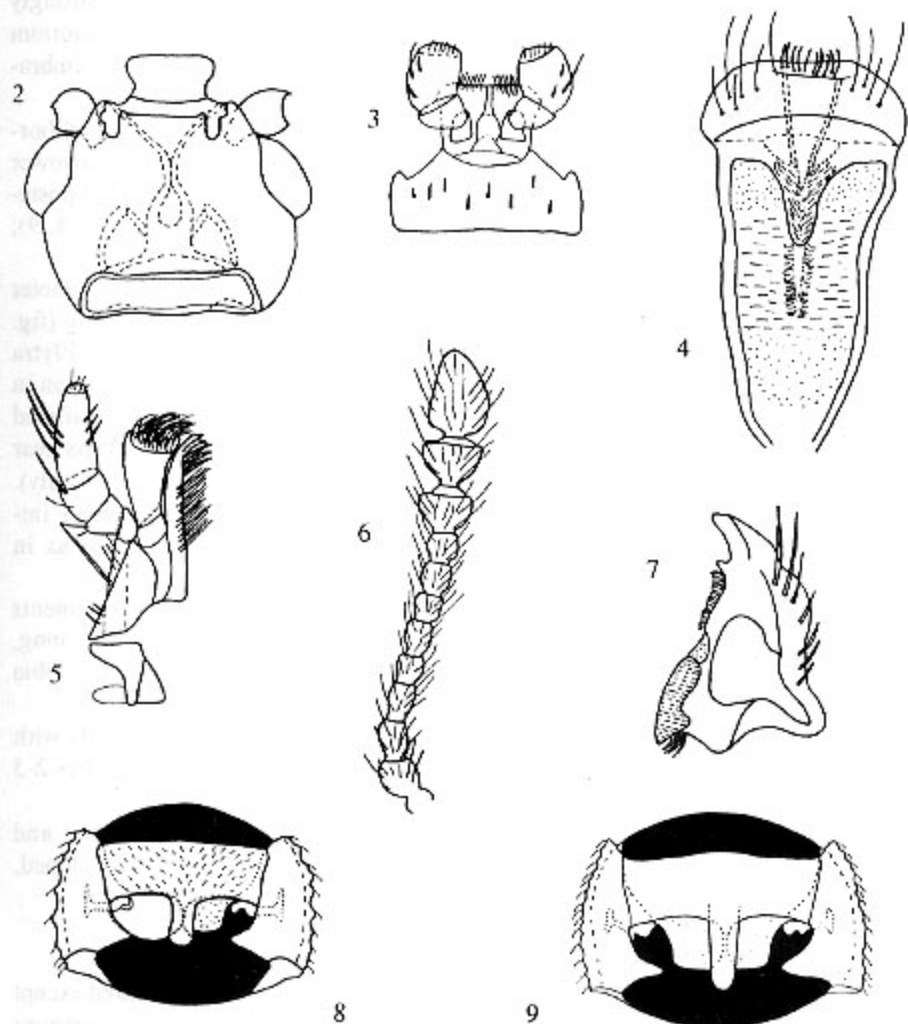
Hobartius SEN GUPTA and CROWSON

Hobartius SEN GUPTA and CROWSON, 1966: 74. Type species, by original designation, *Hobartius tasmanicus* SEN GUPTA and CROWSON.

ADULT

Length 2.05-2.85 mm; body ovoid (fig. 1) convex; yellowish-brown to almost black, pubescent.

Head broad; 0.51-0.61x as long as wide. Fronto-clypeal suture straight and sharply defined. Antenna (fig. 6) 11-segmented with loose, distinct, 3-segmented club; scape comparatively small, about as long as pedicel. Clypeus transverse, flat, constricted at base. Labrum (fig. 4) transverse, weakly sclerotized, labral rods long, divergent anteriorly. Mandible (fig. 7) broad, weakly convex dorsally, concave



2-9. Adult *Hobartius*. 2-8 - *H. eucalypti* (Blackburn), 9 - *H. chilensis* sp. n.; 2 - head ventral, 3 - labium, ventral, 4 - labrum, dorsal, 5 - maxilla, ventral, 6 - antenna, 7 - mandible, dorsal, 8-9 - prothorax, ventral

ventrally; protheca large, membranous with brush of moderately long setae; mola large with transverse ridges; dorsal tubercle well-developed, large, dorsal cavity absent. Maxilla (fig. 5) with 4-segmented palp; palpomere 2 longer and wider than basal one; apical palpomere about twice longer than the length of palpomere 3; galea densely setose, distigalea without pubescence; lacinia with a few spines on inner edge. Lacinial setae extending to 2/3 of its length. Labium (fig. 3) with 3-segmented palp; palpomeres comparatively short and stout; palpomere 2 longer and wider than basal one; apical one about twice the length of palpomere 2; terminal palpomere as wide basally as at apex. Mentum transverse, trapezoidal; prementum strongly sclerotized; ligula with brush of short setae. Gular sutures widely separated. Tentorium (fig. 2) with anterior arms closely approximate near middle; anteriorly membranous. Corpotentorium moderately wide, without median process.

Prothorax transverse with lateral margins slightly crenulate, denticulate, bordered, provided with projecting setae directed posteriorly. Anterior margin narrower than posterior; pronotum convex; prosternal process narrow, extends behind posterior margin of coxae; procoxa transverse with fully exposed trochantin (figs 8, 9); procoxal cavities open both internally and externally.

Pterothorax. Mesocoxal cavities separated by less than half of coxal diameter and open outwardly. Mesocoxa slightly transverse, trochantin exposed. Wing (fig. 13) with single anal vein and with radial cell comparatively well-developed. Elytra moderately convex, covered with short to long pubescence; primary puncturation in various degree of reduction (fig. 12); in addition to a dense, confused micropuncturation often there are macropunctures in more or less distinct rows near humeral part or only on sides of elytra (well visible on cleared specimens only). Scutellum transverse, punctured and pubescent. Metasternum with median impressed line extending for more than half of its length. Metendosternite as in *Hydnobioides* (fig. 57). Metacoxa strongly transverse.

Legs (figs 14-15). Tarsal formula 5-5-5 in female, 5-5-4 in male; segments simple, densely setose; in male 1-3 tarsomeres of pro- and mesotarsi with long, dense setae in inner edge; claws simple, empodium small but distinct, bisetose. Tibia narrow, elongate with two normal spurs on inner apical angle.

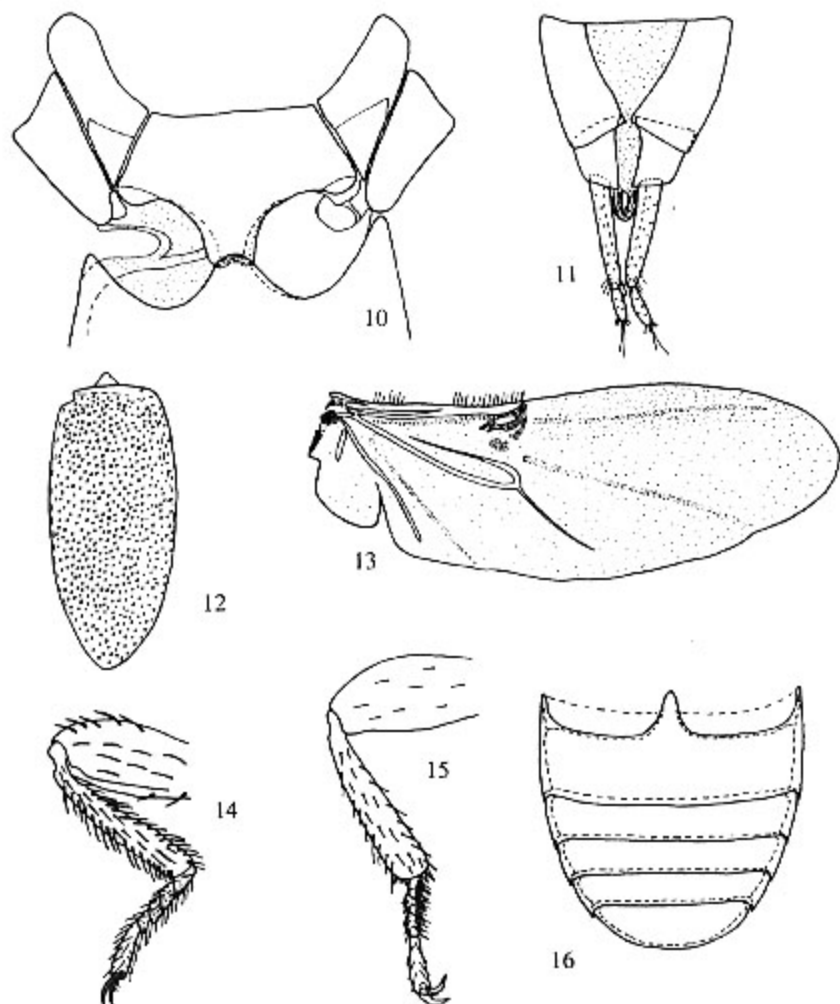
Abdomen (fig. 16) with five freely articulated ventrites; ventrites laterally with bordering line. Ventrite I slightly longer than the next two combined; ventrites 2-5 subequal. Intercostal process of ventrite I narrow, acute apically.

Aedeagus. Tegmen with articulated parameres and tegminal struts long and fused apically. Ovipositor moderately sclerotized, (fig. 11) with well-developed, elongate styli.

LARVA

Body elongate, fusiform (fig. 17), somewhat flattened, lightly pigmented except for more heavily sclerotized mandibles, tips of urogomphi and claws; vestiture consists of sparse, moderately long simple setae. Length 4.1-4.5 mm.

Head protracted and prognathous, 0.7-0.8 times as long as wide, slightly narrower than prothorax. Dorsal surface with irregular patterns of granules and transversely arranged tubercles bearing setae (fig. 19). Epicranial stem and median endocarina absent; frontal arms almost complete, distinctly lyriform, widely separated at base. Stemmata 5 in two transverse rows (fig. 26), ventral row consists of two stemmata which are apparently less pigmented than dorsal row. Antenna (fig. 22), 0.3 times as long as head situated on protracted membranes; antennomere 1



10-16. Adult *Hobartius*: 10, 12-16 - *H. eucalypti* (BLACKBURN), 11 - *H. chilensis* sp. n.; 10 - meso-metasternum, ventral, 11 - ovipositor, dorsal, 12 - elytron, dorsal, 13 - hind wing, 14 - female mesothoracic leg, 15 - male metathoracic leg, 16 - abdomen, ventral

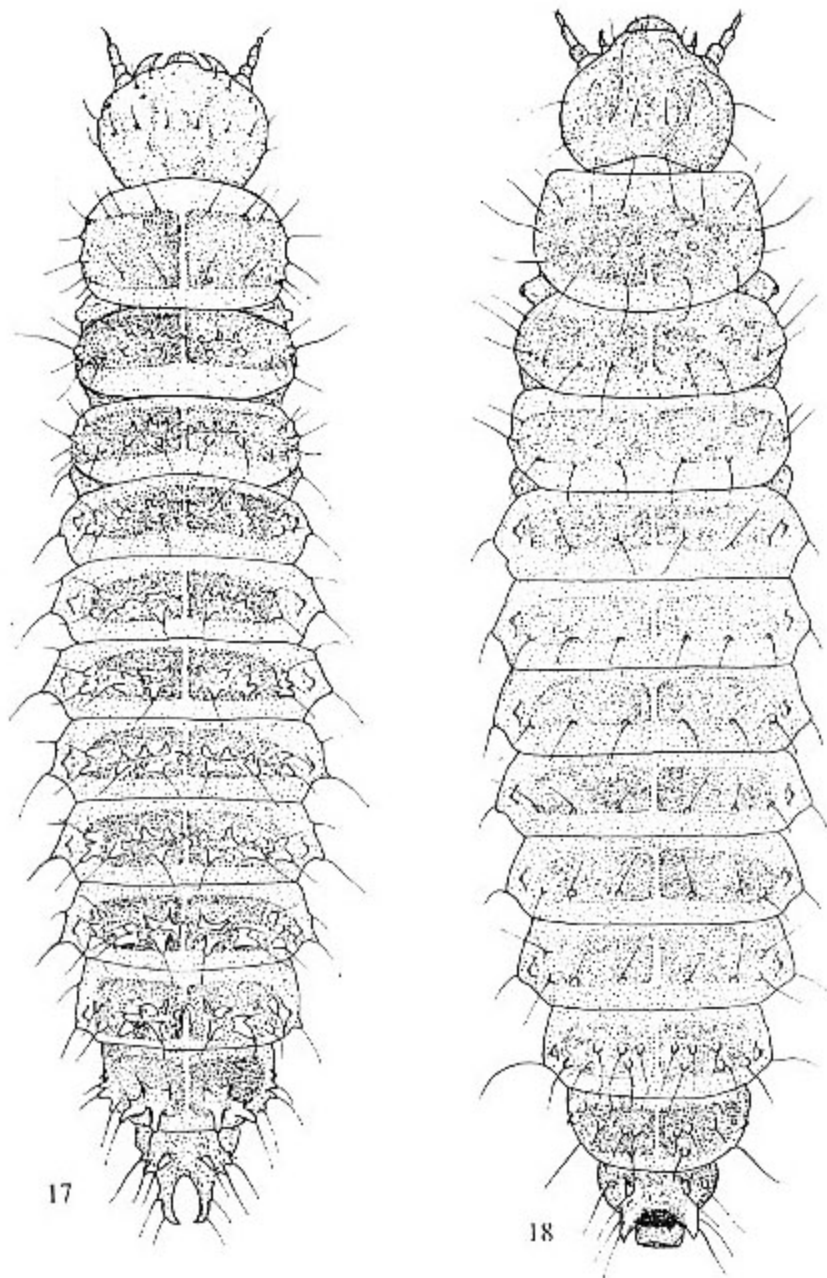
transverse, II and III elongate; sensorium on second antennomere small, conical, less than half as long as antennomere III and lying ventro-mesally to it. Frontoclypeal suture absent. Labrum free, transverse, rounded anteriorly. Mandibles with molae slightly asymmetrical; each bidentate apically; incisor edge serrate; prostheca small, narrow and tubercle-like (fig. 21); mola well-developed with transverse rows of asperities extending onto ventral surface; ventral tubercle moderately large. Ventral mouth-parts retracted. Maxilla with cardo oblique, stipes elongate, maxillary articulated area large; mala narrow, falcate apically (fig. 20) with 2-3 sclerotized teeth on inner apical angle; palp 3-segmented. Labium (fig. 20) with mentum long, and free weakly narrowing basally, and almost encircling apparently reduced prementum; labial palp 1-segmented. Hypopharynx sclerotized, hypopharyngeal sclerome narrow, transverse, hypopharyngeal bracon apparently absent. Hypopharyngeal ridges sclerotized, rods short and strongly diverging, moderately sclerotized.

Trunk terga weakly divided along midline, covered with granules and triangular asperities (figs 17, 24). Prothorax 0.57-0.60 times as long as wide, tergal sclerites lightly sclerotized and not clearly delimited, each bearing 1-2 transverse rows of tubercles, which towards abdominal apex are gradually becoming more strongly prominent and complex (fig. 25); tubercles bear simple setae; pleural lobes on abdominal segments prominent, each with single seta. Urogomphi narrowly separated at base, upturned. Segment 10 cylindrical forming a short pygopod. Legs short; coxae moderately widely separated; claw with 2 short and closely situated setae (fig. 23). Spiracles annular-biforous, borne on distinct spiracular tubes (fig. 68).

Material examined: Tasmania: Mt. Field NP, 160-240 m., 30.I.1980, JFL lot 80-100, *Grifolia campyla*, J.F. LAWRENCE (associated with adults of *H. eucalypti*).

KEY TO THE SPECIES OF ADULT *HOBARTIUS*

1. Body covered with short or moderately long, recumbent or suberect pubescence. Pronotum 0.61-0.68x as long as wide 2
- , Body covered with long, erect pubescence. Pronotum about 0.71-0.74x as long as wide; [lateral margins of pronotum sparsely and deeply denticulated] *H. newtonorum* n. sp.
2. Pubescence short, recumbent. Pronotum more transverse, 0.64- 0.68x as long as wide; Australia 3
- , Pubescence moderately long, suberect. Pronotum narrower, 0.61-0.63x as long as wide; Chile, Argentina *H. chilensis* n. sp.
3. Body brownish black with anterior 1/5 of elytra lighter. Lateral margins of pronotum distinctly denticulated; denticles dense but shallow. Pronotum 0.64-0.68x as long as wide *H. niger* n. sp.
- , Body yellowish brown to brown. Lateral margins of pronotum variable, denticulation weak or distinct and sparse. Pronotum 0.65-0.67x as long as wide *H. eucalypti*



17-18. Larva, dorsal. 17 - *Hobartius* sp., 18 - *Hydnobioides* sp.

SPECIES DESCRIPTIONS

Hobartius newtonorum new species

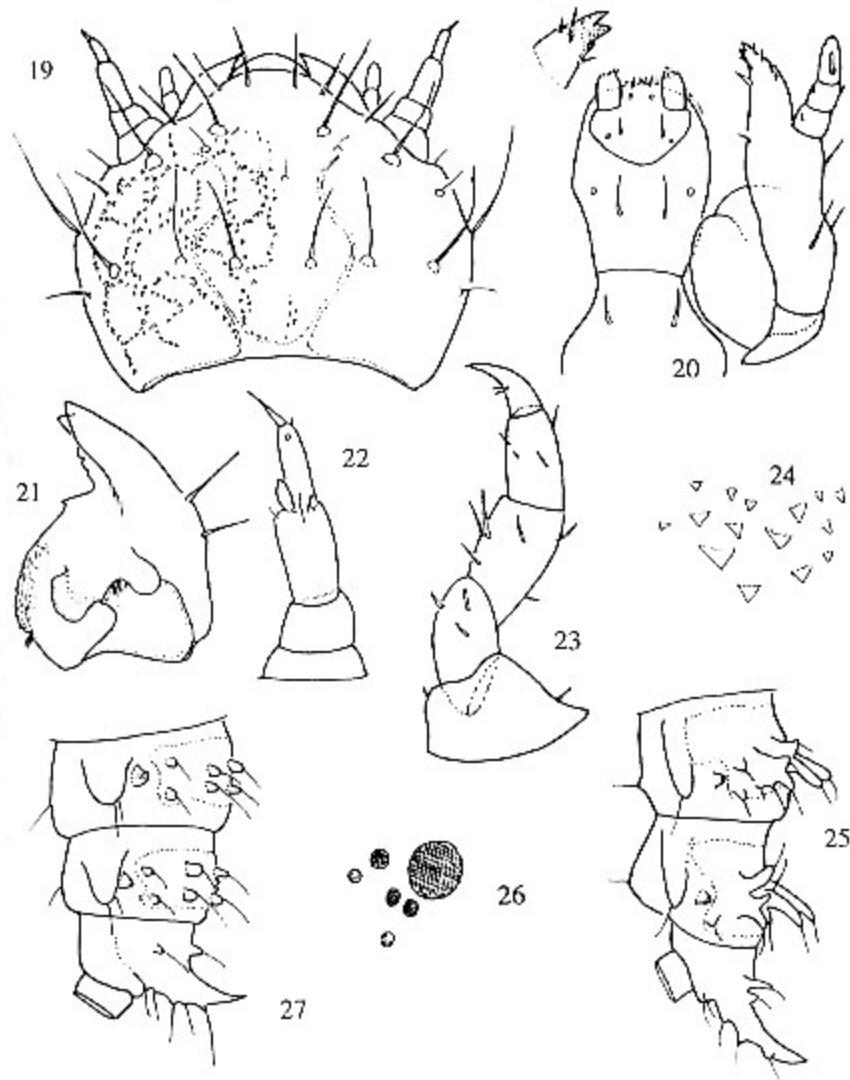
Length: 2.16-2.40 mm; body light brown to brown; elongate-ovate, 2.03-2.10x as long as wide; moderately convex; uniformly and confusedly punctured; covered with long, erect hairs. Pronotum (fig. 30) 0.56-0.63 mm long, 0.78-0.87 mm wide; 0.71-0.74x as long as wide; its lateral margins deeply and sparsely denticulated; margins distinctly bordered; anterior and hind margin almost equal in length; pronotum widest in about 1/2 length. Elytra 1.60- 1.75 mm long, 1.03-1.18 mm wide; 2.75-2.90x as long as pronotum, 1.27-1.32x as wide as pronotum. Aedeagus as in figs 39, 40.

This species is distinguished by its long and erect pubescence and relatively elongate pronotum. It is dedicated to Drs. M.K. THAYER and A. NEWTON, Jr. (FMNH), collectors of many species of *Hobartiidae*, including the type series of this one.

Holotype: AUSTRALIA, VICTORIA: 37.43S, 145.42E Cement Creek, 625 m N. of Warburton, 814, 27.I.-11.II.1987, A. NEWTON, M. THAYER, *Enc. regnans* - *Noth. cunn.* on white wavy-gilled mushroom on tree. (ANIC).

Paratypes - VICTORIA: same data as holotype (5: ANIC, IZPAN); same, but *Enc. regnans*-*Noth. cunn.* FMHD #87-234 Berlesate, leaf & log litter (1: ANIC); same, but 670 m, 812, 26.I.-11.II.1987, FMHD #87-222 flight interc. (window) trap (6: ANIC, IZPAN); 37.43S, 145.41E Mt. Donna Buang, 1200 m N. of Warburton, 810, 26.I.-11.II.1987, A. NEWTON, M. THAYER, wet scler. - *Noth. cunn.* FMHD #87-216 flight interc. (window) trap (1: ANIC); 38.45S, 143.33E Otway N.P. 260 m Maits Rest, 807, 25.I.-8.II.1987, A. NEWTON, M. THAYER, wet scler. - *Noth. cunn.* FMHD 87-206 flight interc. (window) trap (7: ANIC, IZPAN); same, but FMHD 87-208 Berlesate leaf & log litter (6: ANIC); same, but *Noth. cunn.* on tan-topped white mushrooms on ground (1: ANIC); same, but *Noth. cunn.* pyrethrin fogging *Nothofagus* logs (1: ANIC); 38.43S, 143.35E Otway NP 390 m Binn, Rd. 4.3 km N. Cape Horn, 808, 25.I.-8.II.1987, A. NEWTON, M. THAYER, wet scler. forest, FMHD #87-210 flight, interc. (window) trap (7: ANIC); 36.57S, 147.21E Bogong N.P. 5.5 km E. Strawberry Saddle 1450 m, 803, 22.I.-13.II.1987, A. NEWTON, M. THAYER, wet scler. forest FMHD 87-194 flight interc. (window) trap (3: ANIC); 36.56S, 147.19E Bogong N.P. 1650 m Strawberry Saddle, 804, 22.I.-13.II.1987, A. NEWTON, M. THAYER, *Enc. pauciflora* woodland FMHD 87-197 flight interc. (window) trap (2: ANIC); same, but FMHD 87-199 Berlesate, leaf & log litter (1: ANIC); 38.39S, 143.42E Haines Junct. 525 m, 1.9 km W. on Turtons Track, 809, 25.I.- 8.II.1987, A. NEWTON, M. THAYER, wet scler. forest FMHD # 87-213 flight interc. (window) trap (3: ANIC); 37.50S, 146.12E, 6.1 km ESE of Tanjil Bren 590 m, 818, 29.I.-10.II.1987, A. NEWTON, M. THAYER, wet scler. forest FMHD #87-244 flight interc. (window) trap (3: ANIC); 37.34S, 145.53E Cumberland Ck. 13 km ESE of Marysvide

18.I.1978 V. LAWRENCE & WEIR, under bark rotten logs (1: ANIC); same, but LAWRENCE & WEIR, J.F. LAWRENCE, lot 18-10, *Gloeoporus theleporoides* (1: ANIC); NEW SOUTH WALES: South Ramshaed 1850 Kosciusko Nat. Pk. II.1981, Ken Green, A.N.I.C. Coleoptera Voucher No. 83-0107. (1: ANIC).



19-27. Larva. 19-25. *Hobartius* sp.: 26-27. *Hydnobioides* sp. 19 - head dorsal, left side showing pattern of asperities, 20 - ventral mouth-parts, ventral; detail showing tip of mala, 21 - left mandible, ventral, 22 - left antenna, ventral, 23 - prothoracic leg, 24 - shape and distribution of asperities on abdominal tergite V, 25 - terminal segments of abdomen, lateral view, 26 - diagram of size and position of stemmata, large circle - antennal base (dorsal), 27 - terminal segments of abdomen, lateral view

Hobartius niger new species

Length: 2.05-2.65 mm; body brownish black, 2.12-2.26x as long as wide, convex; covered with short, appressed, moderately dense pubescence. Pronotum (fig. 31) 0.50-0.65 mm long, 0.77-1.00 mm wide; 0.64-0.68x as long as wide, convex, punctured confusedly, lateral margins densely but shallowly denticulated; anterior margin slightly narrower than basal margin. Elytra 1.50-1.90 mm long, 1.00-1.17 mm wide; 2.70-3.00x as long as pronotum, 1.18-1.22x as wide as pronotum; basal part of elytra distinctly lighter. Aedeagus as in fig. 33.

This species is separated from all its congeners by its brownish-black body, the most convex pronotum with margins densely but shallowly denticulate, and short pubescence.

Holotype: AUSTRALIAN CAPITAL TERRITORY, Blundells Cr. Rd. 850 m, 3.5 km E of Piccadilly Circ. 13.I.1983, J.F. LAWRENCE, lot 83-1, unidentified fungus (ANIC);

Paratypes: AUSTRALIAN CAPITAL TERRITORY: same data as holotype (3: ANIC); same, but 27.I.1982, berlesate, ANIC 864, leaf & log litter (2: ANIC, IZPAN); NEW SOUTH WALES: Sassafras Toning - Nerriga Rd. S. Tablelands, 16.VI.57 BALDERSON (1: ANIC);

Hobartius chilensis new species

Length: 2.65-2.87 mm; body orange-brown to yellowish-brown, 2.15-2.35x as long as wide; moderately convex; uniformly and confusedly punctured; covered with moderately long, rather erect hairs. Pronotum (fig. 32) 0.58-0.62 mm long, 0.94-1.00 mm wide; 0.61-0.63x as long as wide; lateral margins distinctly denticulate and bordered; anterior margin slightly narrower than basal margin. Elytra 1.92-2.10 mm long, 1.16-1.30 mm wide; 2.24-2.35x as long as pronotum, 1.25-1.30x as wide as pronotum. Aedeagus as in fig. 34.

This is a distinctive species, and the only species of *Hobartiidae* known from the New World.

Holotype: CHILE: Osorno Prov., Puychuc Nat. Pk., Aguas Calientes, 600 m, 18.XII.1984-8.II.1985, FMHD #85-924, *Nothofagus* forest, S. & J. PECK, P #85-39, malaise (FMNH);

Paratypes: CHILE: same data as holotype (10: FMNH, IZPAN); same, but 500 m, 20.XII.1984-6.II.1985, FMHD #85-929, forest at tree base, S. & J. PECK, P #85-44, carrion trap (1: FMNH); Nuble Prov. 72 km SE Chillan, Trancas nr Termas, 6.XII.1984-19.II.1985, FMHD #85-895, beech forest, S. PECK, P #85010, carrion trap (7: FMNH); Aysen Prov. 33 km E Pto. Aysen, Rio Simpson N.P., 31.XII.1984-26.I.1985, FMHD #85-958, selec. moist cut forest, S. & J. PECK, P #85-75, FIT (4: FMNH); Malleco Prov., Puren Natur. Mon. Contulmo, 350 m, 11.XII.1984-13.II.1985, FMHD #85-902, mixed evergreen forest, S. PECK, P #85-16, FIT (58: FMNH);

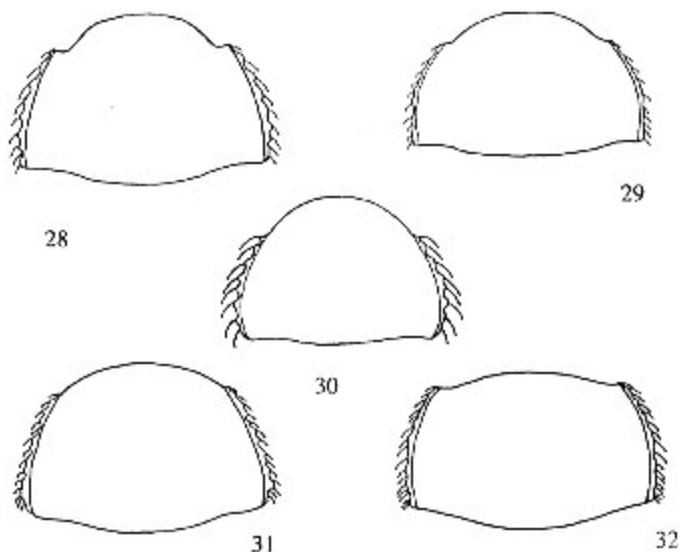
Malleco Prov., 45 km W Angol, Nahuelbuta Nat. Pk., 1500 m, 9.XII.1984, FMHD #85-898, *Araucaria*, *Nothofagus* forest litter, S. & J. PECK, P #85-13, berlese (1: FMNH); same, but 12-1500 m, 9.XII.1984-17.II.1985, FMHD #85-900, *Nothofagus Araucaria* for., S. & J. PECK, P #85-14A, FIT (3: FMNH); same, but 9.XII.1984-16.II.1985, FMHD #85-899, P #85-14, carrion trap (1: FMNH); Coihaique Prov., 10 km NW Coihaique Reserva Nac., 22.-27.I.1985, FMHD #85-981, beech forest, S. & J. PECK, P #85-98, carrion trap (10: FMNH); same, but beech forests, 900 m, FMHD #85-981 (8: FMNH, IZPAN); ARGENTINA: Neuquen, road between Pucara and Lago Venado, 24.-25.I.1972, 901, LCC HERMAN (1: AMNH).

Hobartius eucalypti (BLACKBURN) new combination

Atomaria eucalypti BLACKBURN, 1892: 33. Type locality: NSW, Blue Mountains (Holotype, BMNH, examined).

Hobartius tasmanicus SEN GUPTA and CROWSON, 1966: 75. Type locality: Tasmania (Holotype, BMNH, examined). New synonym - LAWRENCE and BRITTON 1991: 653.

Length: 2.22-2.47 mm; body yellowish-brown to dark brown, covered with short, recumbent pubescence; moderately convex to convex; elongate (fig. 1); 2.07-2.18x as long as wide; puncturation uniform and confused. Pronotum (figs 28, 29) 0.56-0.64 mm long, 0.86-0.95 mm wide; 0.65-0.67x as long as wide; anterior margin narrower than basal one; denticulation of lateral margins variable. Elytra



28-32. Adult *Hobartius*, outline of pronotum: 28 - *H. eucalypti* (BLACKBURN), specimen from Victoria, 29 - Same, specimen from Tasmania, 30 - *H. newtonorum* sp. n., 31 - *H. niger* sp. n., 32 - *H. chilensis* sp. n.

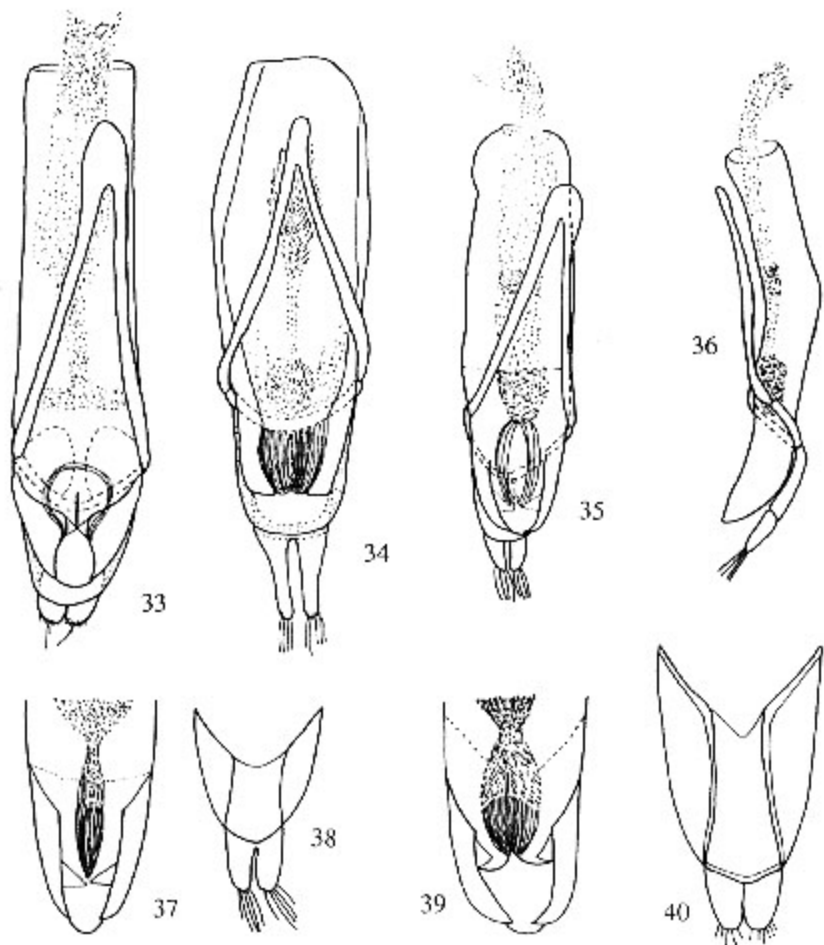
1.65-1.85 mm long, 1.06-1.15 mm wide; 2.90- 3.10x as long as pronotum, 1.20-1.23x as wide as pronotum. Aedeagus as in figs 35-38.

Variation. This species is somewhat variable in size and the pronotal shape. Most of the specimens from NSW and Victoria (including type of *eucalypti*) are slightly larger with lateral margins of pronotum deeply and sparsely denticulated, while those from Tasmania are smaller with their pronotal margins more densely but feebly denticulated. After examining a large series of specimens we found gradation of these external characters, and could not find genital characters to separate these populations. Therefore *H. tasmanicus* is here regarded as a synonym of *H. eucalypti*.

MATERIAL EXAMINED

TASMANIA: Mt. Field NP, Russel Falls Tr. 200 m, 31.I.-4.II.1980, A. NEWTON, M. THAYER, on polypore fungus on log (3: ANIC); Mt. Field NP, Lake Dobson Rd. 240 m, 30.I.- 5.II.1980, wet sclerophyll, A. NEWTON, M. THAYER, window trap 569 (2: ANIC); same, but 710 m, *Nothof.- Euc. for.* (4: ANIC); Mt. Field NP, Lake Dobson Rd. 610, 30.I.1980, *Nothof.- Euc. for.* A. NEWTON, M. THAYER, berlesed leaf litter (2: ANIC); Mt. Field NP, Lake Dobson Rd. 610 m, 4.II.1980, J.F. LAWRENCE, lot 80-22, unidentified fungus (4: ANIC); Mt. Field NP, nr. SE and Lake Fenton 1000 m, 30.I.-5.II.80, A. NEWTON, M. THAYER, *Nothofagus gunnii-Richea spp.-Athrotaxis spp.-Phyllocladus asplen.* forest, Carrion Trap (1: FISH); Mt. Field NP, E edge, Wombat Moor 1060 m, 30.I.-5.II.80, *Euc. coccifera* woodland, A. NEWTON, M. THAYER (1: ANIC); 42.41S, 146.37E, Mt. Field NP, nr. Lake Fenton Tas. 1000 m, 31.I.1980, LAWRENCE & WEIR, lot 80-12, *Grifola campyla* (2: ANIC); 42.41S, 146.43E, Mt. Field NP, 160-240 m, Tas. 30.I.-4.II.1980, LAWRENCE & WEIR, Berlesate, ANIC 671, moss on logs + trunks (1: ANIC); same, but lot 80-12, *Grifola campyla* (1: ANIC); 42.43S, 146.29E, 2 km ENE of Tim Shea, 600 m, Tas. 1.II.1980, LAWRENCE & WEIR, moss covered trunks and logs (1: ANIC); track off Mt. Barrow Rd. 780 m, 15.-17.II.1980, *Nothofagus etc.* A. NEWTON, M. THAYER (2: ANIC); same, but window trap 582 (2: ANIC); N side Hellyer Gorge 8 rd. km N Parrawe, 280 m, 18.II.1980, *Nothofagus etc.* A. NEWTON, M. THAYER, berlesed from leaf litter (6: ANIC); same, but 15 m N. of Waratah, N.W. 2.-4.II.1967, G. MONTEITH (3: ANIC); same, on loan from Ent. Dept. U. of Qld. (6: ANIC); 4 km SE Weldborough 450 m, 12.-14.II.80, *Nothofagus etc.* A. NEWTON, M. THAYER, berlesed from logs leaf litter (1: ANIC); same, but window trap 579 (1: ANIC); 4.4 km SE Weldborough 460 m, 12.-14.II.1980, *Nothofagus etc.* forest, A. NEWTON, M. THAYER, (1: ANIC); same, but pyrethrin fogging, *Nothofagus cuminghamii* bark (1: ANIC); W side L. St. Clair c 750 m, 25.-29.I.80, *Euc.- Acacia for.* A. NEWTON, M. THAYER, window trap 560 (1: ANIC); Florentine Vy. 29,2 km WNW Maydena, Eleven Rd. 460 m, 1.-6.II.1980, *Nothofagus*, A. NEWTON, M. THAYER, berlesed leaf litter (1: ANIC); SW Tasmania, Lower Gordon R. 42.43S, 145.45E, 42.43S, 145.50E, Howard Hill, H.E.C. Survey, A L. 1290, I.1977, moss (1: ANIC); Dervent Val. 7 km NW Maydena 16.II.1977, J. KETHLEY, FMHD #77-149 ex. *Eucalyptus globula* litter (1:

FMNH); Hobart, J.J. WALKER (BMNH, holotype of *H. tasmanicus*). VICTORIA: 38.45S, 143.33E Otway NP, 260 m Mait's Rest, 807, 25.I.-8.II.1987, A. NEWTON, M. THAYER, wet scler.-*Noth. cunn.* pyrethrin fogging, *Nothofagus* logs (3: ANIC); same, but *Noth. cunn.* on tan-topped white mushrooms on ground (1: ANIC); 38.43S, 143.35E Otway NP, 390 m Binn Rd. 4.3 km N. Cape Horn, 808, 25.I.-8.II.1987, A. NEWTON, M. THAYER, wet scler. forest, pyrethrin fogging, fungusy logs (4: ANIC); same, but wet scler. forest, FMHD #87-210 flight, interc. (window) trap (1: ANIC); 37.43S, 145.42E Cement Creek, 625 m N. of Warburton, 814, 27.I.-11.II.1987, A. NEWTON, M. THAYER, *Euc. regnans*-*Noth. cunn.* on white wavy-gilled



33-40. Adult *Hobartius*, male genitalia: 33 - *H. niger* sp. n. (ventral), 34 - *H. chilensis* sp. n. (ventral), 35-38 - *H. eucalypti* (ВЛАДКОВИЧ), 35 - genitalia of a specimen from Tasmania, ventral, 36 - same, lateral, 37 - tip of median lobe, specimen from Victoria, 38 - same specimen, apex of tegmen. 39 - *H. newtonorum* sp. n., apex of median lobe, ventral, 40 - same, tegmen, apical part

mushroom on tree (1: ANIC); same, but 670 m, 812, 26.I.-11.II.1987, *Enc. regnans-Notth. cunn.* FMHD #87-222 flight, interc. (window) trap (2: ANIC); Warburton, Cement Ck. 670 m, 10.-17.I.1980, *Nothofagus cunninghamii*, etc. A. NEWTON, M. THAYER, flood debris (1: ANIC); 37.41S, 145.44E Acheron Gap, 750 m NE of Warburton, 813, 27.I.-9.II.1987, A. NEWTON, M. THAYER, *Noth. cunn.-Enc. regnans*, pyrethrin fogging, fungusy logs (1: ANIC); same, but old fungusy logs (3: ANIC); same, but *Nothofagus* logs (2: ANIC); same, but *Noth. cunn.-Enc. regnans*, FMHD #87-226 flight, interc. (window) trap (1: ANIC); same, but FMHD #87-231 Berl. sifted rotten wood *Noth. & Enc.* (1: ANIC); Acheron Gap, 750 m nr. Warburton, 30.IV.1978, S. & J. PECK, *Nothofagus* litter (1: ANIC); 37.43S, 145.41E, Mt. Donna Buang, 1200 m N. of Warburton, 810, 26.I.-11.II.1987, A. NEWTON, M. THAYER, wet scler.-*Noth. cunn.* FMHD #87-216 flight, interc. (window) trap (6: ANIC); same, but 811, FMHD #87-219 flight, interc. (window) trap (4: ANIC); 38.39S, 143.42E, Haines Junct. 525 m, 1.9 km W. on Turtons Track, 809, 25.I.-8.II.1987, A. NEWTON, M. THAYER, wet scler. forest, FMHD #87-213 flight, interc. (window) trap (4: ANIC); 36.56S, 147.19E Bogong NP, 1650 m Strawberry Saddle, 804, 22.I.-13.II.1987, A. NEWTON, M. THAYER, *Enc. pauciflora* woodland, FMHD 87-197 flight, interc. (window) trap (1: ANIC); 37.50S, 146.12E, 6.1 km ESE of Tanjil, Bren 530 m, 818, 29.I.-10.II.1987, A. NEWTON, M. THAYER, wet scler. forest FMHD, #87-244 flight, interc. (window) trap (1: ANIC); Wilson's Prom NP, Lilly Pilly Tr., 14.V.1987, S. & J. PECK, log litter and fungi (1: ANIC); Bulga NP, 550 m, 17.V.1978, S. & J. PECK, log litter and fungi (1: ANIC); "T. 4/38. B.Z. Mts. Type H.T., Australia, BLACKBURN coll." (1: BMNH).

Hydnobioides SEN GUPTA and CROWSON

Hydnobioides SEN GUPTA and CROWSON, 1966: 72. Type species, by original designation *Hydnobioides pubescens* SEN GUPTA and CROWSON.

ADULT

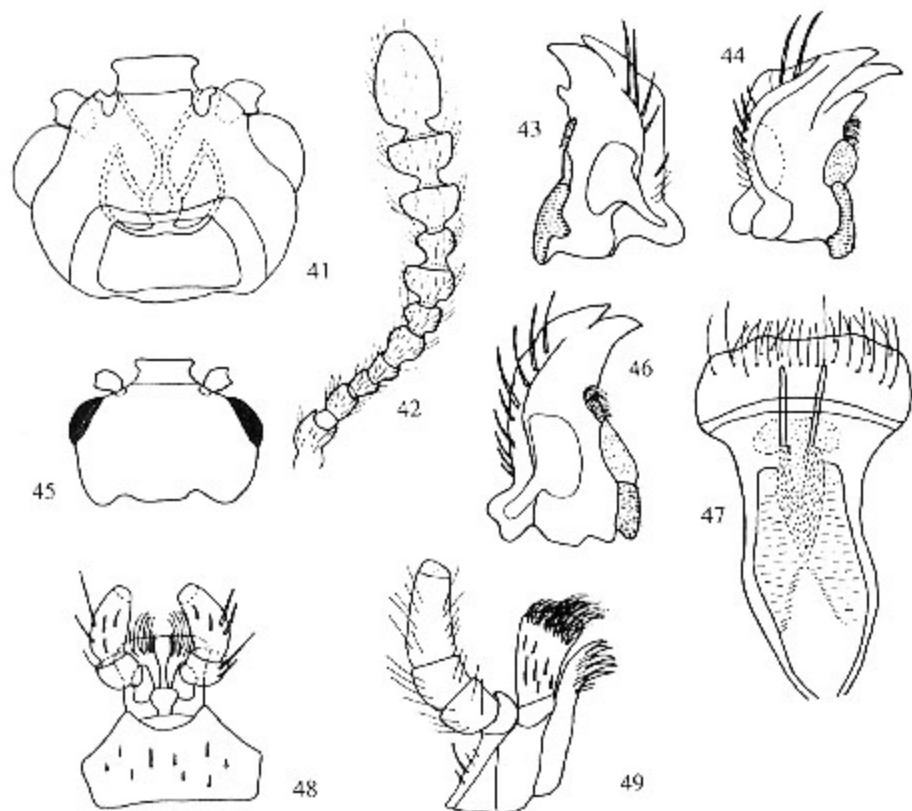
Length 2.25-2.65 mm; body short, broadly-oval to elongate, convex; yellowish brown to dark brown. Dorsum covered with short to moderately long pubescence.

Head (figs 41, 45) very broad. Eyes large. Frontoclypeal suture straight and sharply defined. Antenna (fig. 42) 11-segmented with loose 3-segmented club; antennomeres 5 and 7 asymmetrically enlarged; scape shorter and narrower than the two following antennomeres combined. Apical segment of club elongate, about twice the length of antennomere 10. Clypeus transverse, flat, strongly expanded at apex. Labrum (fig. 47) transverse, weakly sclerotized, labral rods long, almost parallel. Mandible (figs 43-44, 46) weakly convex dorsally, concave ventrally; protheca large, membranous with brush of moderately long setae; mola large with transverse ridges; dorsal tubercle large, well-developed, dorsal cavity absent. Maxilla (fig. 49) with 4-segmented palp. Palpomeres II and III subequal, longer and wider than basal one, and shorter than apical one; terminal palpomere about twice as long as II. Galea densely setose; distigalea with sparse pubescence; lacinia with a

few spines on inner edge. Labial palp 3-segmented; palpomere II much longer and wider than basal one; palpomere III more than twice the length of the palpomere II. Mentum (fig. 48) transverse, trapezoidal; prementum strongly sclerotized; ligula with brush of long setae. Gular sutures widely separated. Tentorium (fig. 41) with anterior arms closely approximate near middle, anteriorly membranous; corpotentorium moderately wide, without median process.

Prothorax transverse; lateral margins weakly crenulate to denticulate, bordered. Pronotum convex. Prosternal process (fig. 52) narrow, extends to posterior margin of coxae. Procoxa transverse with fully exposed trochantin. Procoxal cavities widely open both internally and externally.

Pterothorax. Mesocoxal cavities (fig. 50) separated by less than a half of coxal diameter and open outwardly. Mesocoxa slightly transverse, trochantin exposed.



41-49. *Hydnobioides pubescens* SEN GUPTA & CROWSON, adult structures: 41 - head, ventral, 42 - antenna, 43 - right mandible, dorsal, 44 - same, ventral, 45 - head dorsal, 46 - left mandible, dorsal, 47 - labrum, dorsal, 48 - labium, ventral, 49 - maxilla, ventral

Meso-metasternal junction with single broad knob. Wing (fig. 53) with two anal veins, and recuded radial cell. Elytra convex, confusedly punctured. Scutellum transverse, punctured and pubescent. Metasternum with median impressed line extending about half or slightly more than a half of metasternal length. Metendosternite (fig. 57) with anterior arms widely separated; anterior tendons moderately long, approximate anteriorly.

Legs (figs 51, 56). Tarsal formula 5-5-5 in both sexes. Tarsomeres simple, ventrally densely setose. Tarsomeres III and IV subequal; tarsomere V the longest, tarsomere I only slightly shorter than V; claws simple; empodium small, bisetose. Tibia slightly flattened, markedly broadened towards apex, with a few spines on its outer edge and with two spurs in inner apical angle.

Abdomen (fig. 55) with five freely articulated ventrites; ventrites laterally with bordering line. Ventrite I about as long as the next two combined, remaining 4 equal in length. Intercostal process of ventrite I narrow, acute apically.

Aedeagus (figs 73-76). Tegmen with articulated parameres and a pair of elongated membranous structures ventral to parameres; tegminal struts long and not clearly joined apically. Ovipositor (fig. 54) moderately sclerotized, with well-developed styli.

LARVA (figs 18, 26, 27, 58-69)

Length 4.0-4.5 mm; head 0.63-0.68 times as long as wide; antenna 0.35-0.38 times as long as head length; prothorax 0.6-0.7 times as long as wide.

Larva of *Hydnobioides* is very similar to that of *Hobartius* described above and differs by a smaller size; dorsum less strongly granulate and asperities of different shape (fig. 69); terga almost not tuberculate or bearing at most simple and weakly projecting tubercles (figs 18, 27); urogomphi wider separated at bases and more strongly upturned. It also differs by the following characters: mandible (figs 59-60) with ventro-apical tooth smaller, incisor edge almost smooth; prostheca and ventral crushing tubercle more strongly reduced; axillary articulating area narrow (figs 61, 67); mala apparently blunt, and bearing 3 distinct and sclerotized teeth apically (fig. 62).

Material examined. Queensland: Bunya Mts NP., 21.VII.1979; JFL lot 79-16, *Peutotus*, J.F. LAWRENCE (3 larvae associated with adults of *H. pubescens*).

KEY TO THE SPECIES OF ADULT HYDNOBIOIDES

1. Dorsum covered with short, recumbent pubescence. Antennomeres III and IV equal in size, V much wider and longer than III or IV, VI slightly longer and wider than IV *H. pubescens*
- Dorsum covered with long, erect pubescence. Antennomere III longer than IV, V slightly longer and wider than IV, IV and VI subequal *H. lawrencei* sp. n.

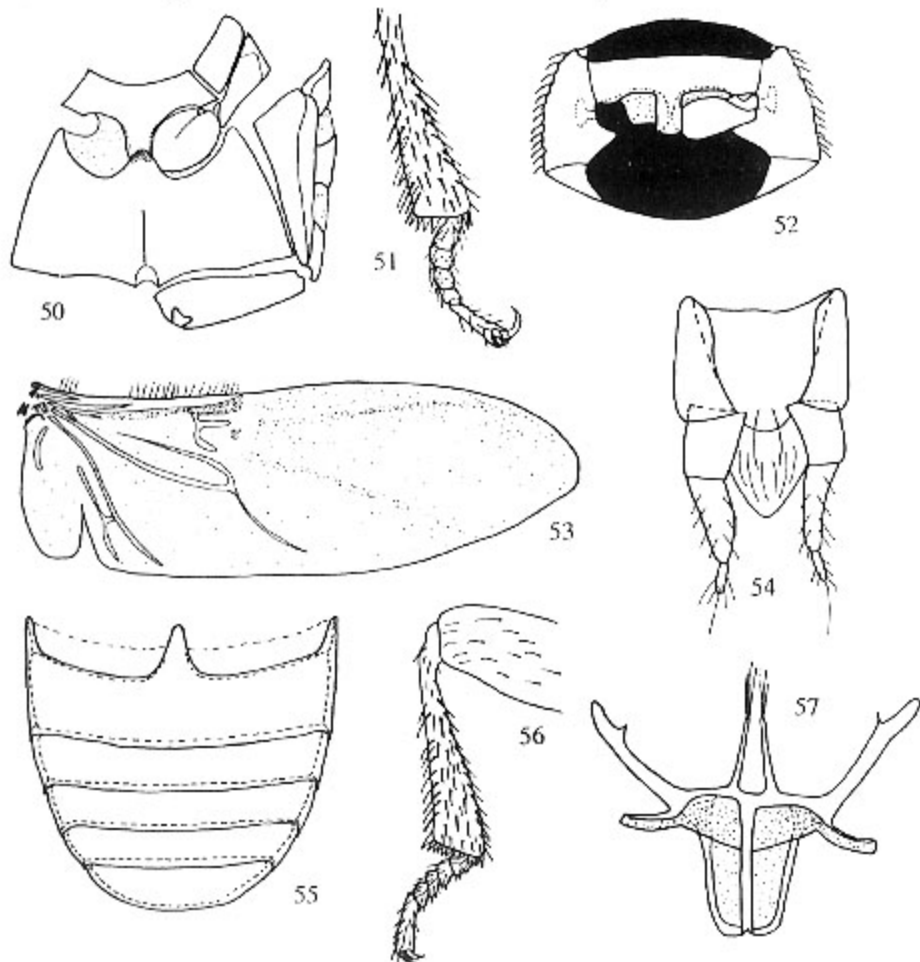
SPECIES DESCRIPTION

Hydnobioides pubescens SEN GUPTA AND CROWSON

Hydnobioides pubescens SEN GUPTA AND CROWSON, 1966: 74. Type locality Australia, New South Wales.

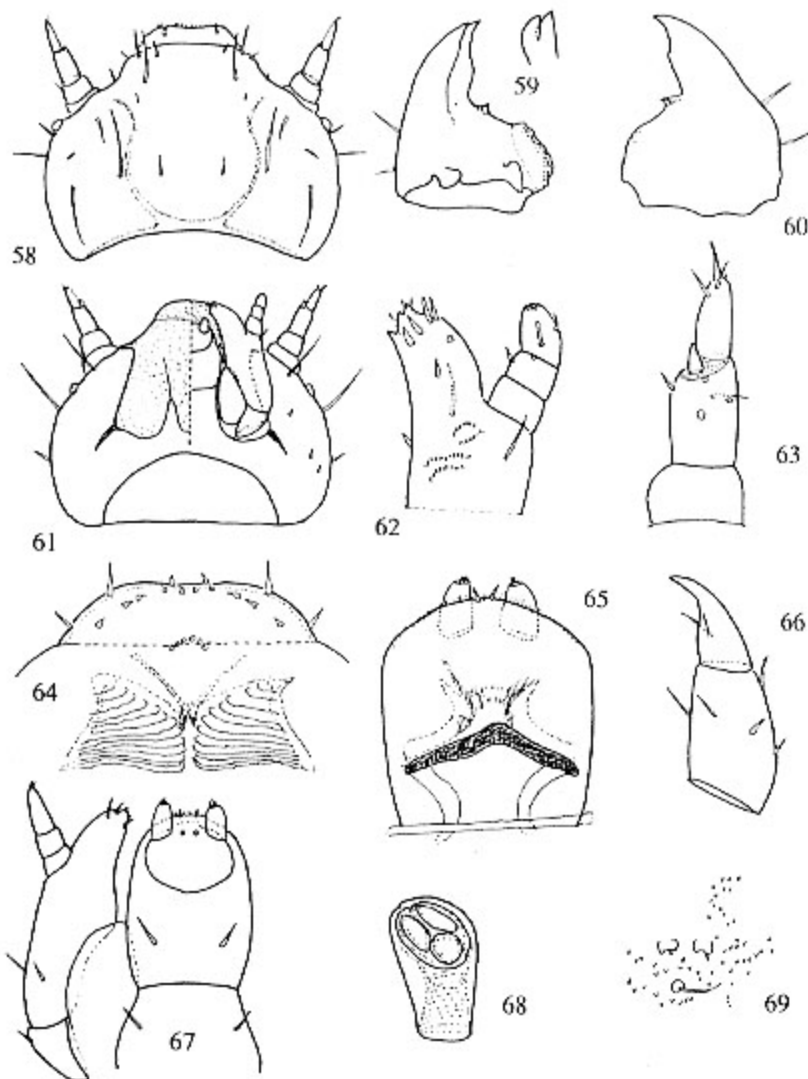
Holotype (BMNH, examined). - LAWRENCE AND BRITTON 1991: 653.

Length 2.25-2.65 mm. Body yellowish-brown to brown, ovate, uniformly and confusedly punctured, 1.95x as long as wide, convex; dorsum covered with short, moderately dense, recumbent pubescence. Antenna as in fig. 42. Pronotum 0.54-0.62 mm long, 0.91-1.08 mm wide; 0.60x as long as wide. Anterior margin



50-57. *Hydnobioides pubescens* SEN GUPTA & CROWSON, adult structures: 50 - pterothorax, ventral, 51 - male metathoracic tarsus and tibia, 52 - prothorax, ventral, 53 - hind wing, 54 - female ovipositor, 55 - abdomen, ventral, 56 - male, prothoracic leg, 57 - metendosternite, dorsal

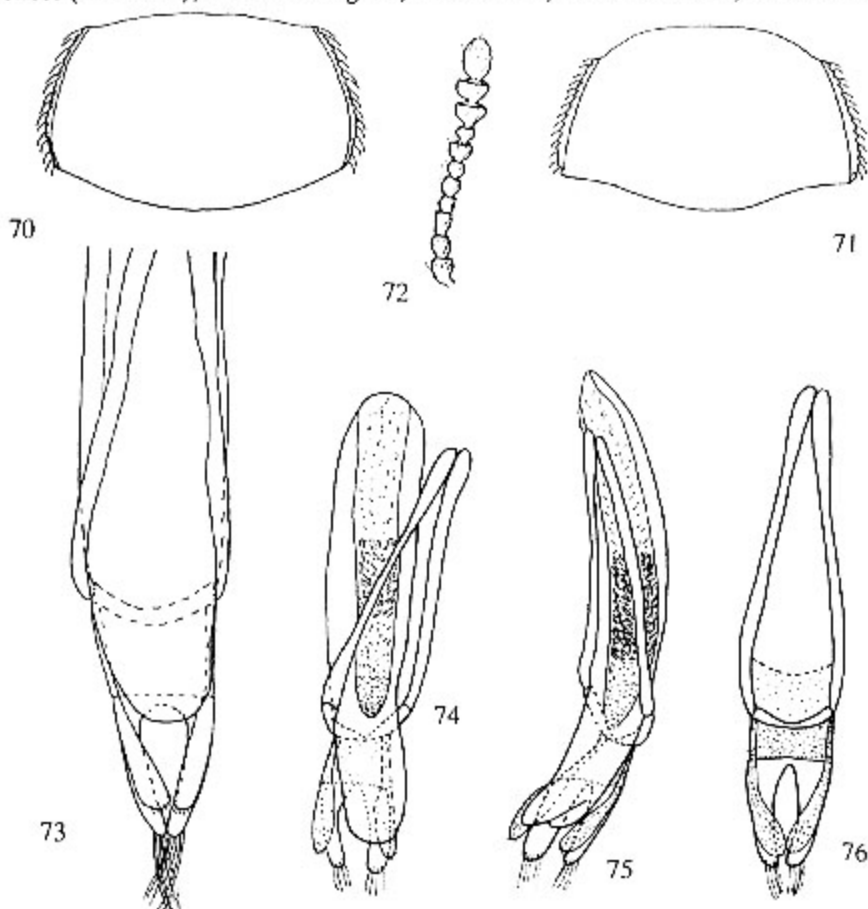
considerably narrower than hind margin; lateral margins weakly denticulate (fig. 71). Elytra 1.75-1.90 mm long, 1.09-1.34 mm wide, sometimes with apparent rows of black small punctures; 3.00-3.30x as long as pronotum, 1.23x as wide as pronotum. Aedeagus as in figs. 74-76.



58-69. *Hydnobioides* sp., larval structures: 58 - head, dorsal, 59 - right mandible, ventral; detail apex mesally, 60 - right mandible, dorsal, 61 - head ventral; part of mouthparts removed to show tentorium, 62 - left mala, ventral, 63 - right antenna, dorsal, 64 - labrum-epipharynx, ventral, 65 - labium-hypopharynx, ventral, 66 - tarsal claw (prothorax), dorsal, 67 - ventral mouthparts, ventral, 68 - abdominal spiracle, 69 - asperities of abdominal tergite V

MATERIAL EXAMINED

AUSTRALIA, NEW SOUTH WALES: 30.19S 152.43E, Dangar Falls, 2 km N Dorrigo, 6.IV.1993, C. REID, white gilled fungus on *Nothofagus moorei* (3: ANIC); same, but beating bushes (1: ANIC); Dorrigo NP, E Blackbutt Track, 710 m, 28.II.-5.III.1980, subtrop. rainforest, A. NEWTON, M. THAYER, in and under rotten mushrooms (7: ANIC); Dorrigo NP, 2.7 km NW, Never Never 760 m, 28.II.-5.III.1980, subtrop. rainforest, A. NEWTON, M. THAYER, in and under rotten mushrooms (1: ANIC); Dorrigo NP, 700 m, 11.VII.1978, S. & J. PECK, J. F. LAWRENCE, lot 78-150, *Grifola berkeleyi* (2: ANIC); Roseberry Sl. For. Mt. Glennie, 800 m, 30 km NNW, Kyogle, 21.VIII.1982, S. PECK, SBP109, log, fungi and leaf litter (6: ANIC); Mt. Wilson, 18.VII.1983, FMHD # 83-275, rainforest leaf and log litter, L.E. WATROUS, berlese (8: FMNH); Narabeen Lagoon, 19.VII.1983, FMHD #83-277, *Xostrum* and



70-76. *Hydnobitoidea* spp. adult structures: 70, 72, 73 - *H. lawrencei* sp. n., 71, 74-76 - *H. pubescens* SEXTON & CROWSON. 70-71 - pronotum, dorsal outline, 72 - antenna, 73-74 - male genitalia, ventral, 75 - same, lateral, 76 - tegmen of male genitalia, ventral

Casurina drift, L.E. WATROUS (1: FMNH); 48 km N. Singleton, Tuglo Wildlf. Ref., 24.VII.1983, FMHD #83-286, litter nr. stream, L.E. WATROUS (1: FMNH); QUEENSLAND: 28.14S 153.08E Lamington NP near O'Reilly's, 25.-28.X.1993, S.A. ŚLIPIŃSKI, J.F. LAWRENCE, coll. (1: ANIC); Binna Burra, Lamington Nat. Pk. 27.X.1993, S.A. ŚLIPIŃSKI, J.F. LAWRENCE (1: ANIC); same, but under bark, in rotten wood and fungi (1: ANIC); Bunya Mts. Nat. Park, 21.VII.1979, J. F. LAWRENCE, lot 79-16, *Pleurotus* sp. (4: ANIC); same, but lot 79-14, unidentified *Clavariaceae* (6: ANIC); same, but lot 79-23, *Ganoderma* (1: ANIC); 10 km S of Camungra, 1.III.1980, J. F. LAWRENCE, lot 80-25, *Piptoporus* sp. (1: ANIC).

The relatively convex, slightly elongate body and characters provided in the key, separate this species from *Hydnobioides lawrencei*.

Hydnobioides lawrencei new species

Length 2.53-2.59 mm; body light to dark brown; puncturation dense, coarse, distinct and confused; body 2.24x as long as wide; dorsum slightly convex, covered with long, moderately dense, erect pubescence. Antenna as in fig. 72.; antennal club slightly smaller than in *H. pubescens*. Pronotum 0.61-0.66 mm long, 1.00-1.02 mm wide; 0.65x as long as wide. Anterior margin of pronotum slightly narrower than hind margin; lateral margins weakly denticulate (fig. 70). Elytra 1.84-1.87 mm long, 1.14-1.16 mm wide, sometimes with apparent rows of black small punctures; 2.86-3.00x as long as pronotum, 1.14x as wide as pronotum. Aedeagus as in fig. 73.

The long, erect pubescence, antennal characters provided in the key, and less convex, more elongate body separate this species from *H. pubescens*. The species is named after Dr. J.F. LAWRENCE, collector of many species of hobartiids and their larvae, who also encouraged us to complete this revision.

Holotype: AUSTRALIA, NEW SOUTH WALES, Brown Mt. nr. Nimmitabel Rutherford Ck. 26.V.70 R.W.T & R. BARTELL (ANIC).

Paratype: NEW SOUTH WALES, Brown Mtn. c.3000ft. 9.XII.67, rainforest, Taylor, Brooks, ANIC Berlesate No.42, leafmould (ANIC).

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(Warszawa) for their comments on the manuscript. Some paratypes and duplicates are kept in the collection of Museum and Institute of Zoology (IZPAN).

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