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REVISION AND PHYLOGENY OF PROTOCUCUJIDAE (COLEOPTERA: CUCUJOIDEA)

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Abstract.— The family Protocucujidae is characterized on the basis of adult and larva, and its phylogenetic position within the basal families of Cucujoidea is discussed. The species of the temperate genus *Ericmodes* Reitter (=*Protocucujus* Crowson) are revised. Seven species, 4 from southern South America and 3 from Australia, are recognized. Four new species are described: *Ericmodes costatus* (Australia: NSW), *E. lawrencei* (Australia: QLD), *E. tarsalis* (Chile) and *E. nigris* (Chile). Descriptions of all species, figures and a key to the species of *Ericmodes* are provided. *E. synchitoides* Reitter, 1878 is designated as the type species of *Ericmodes* Reitter, 1878. A neotype is designated for *Ericmodes fuscitarsis* Reitter, 1878. Lectotypes are designated for: *Coxelus sylvaticus* R. Philippi, 1864; *Ericmodes australis* Grouvelle, 1893 and *E. synchitoides* Reitter, 1878. *Ericmodes chilensis* (Crowson, 1954) is synonymized with *E. fuscitarsis* Reitter, 1878 **syn. nov.**

The proposed phylogeny of the species of *Ericmodes* postulates that the Australian and South American species form separate clades, probably originating before the break up of Gondwanian bridge between these land masses through Antarctica. *Ericmodes* shows the closest relationship to the temperate sphindid genus *Protosphindus* Sen Gupta et Crowson, and the sister group relationship between Sphindidae (=Aspidiphoridae) and Protocucujidae seem to be well supported by the presented data.

Key words.— Coleoptera, Cucujoidea, Protocucujidae, *Ericmodes*, adult, larva, phylogeny.

INTRODUCTION

The family Protocucujidae was proposed by Crowson (1954) for a new Chilean genus *Protocucujus* which was supposed to be "the most primitive type of living Cucujoidea." Crowson (1954, 1955) also mentioned an undescribed species from Australia. Since the original description, the family has received very little attention except mentions in general papers on phylogeny of beetles (Crowson 1960, Lawrence and Newton 1982, Lawrence 1991) or discussions of primitive cucujoids (Sen Gupta and Crowson 1966, McHugh 1993).

The first genus described for the family was actually *Ericmodes*, established by Reitter (1878) for two new species from Chile. Reitter included the genus in Nitidulidae, and this placement was supported by Grouvelle (1893) who described the third known species from southern Australia.

Germain (1892) observed that *Coxelus sylvaticus* Philippi (1864) did not have the characters of *Coxelus* Dejean (Colydiidae) and moved the species to Nitidulidae, placing it in a new genus *Aprozoum* Germain. The latter was synonymized with *Ericmodes* by Grouvelle (1913), who also synonymized one of Reitter's species (*synchitoides*) with *E. sylvaticus* (R. Philippi). Except for Crowson (1954) and a brief diagnoses of the family by Lawrence (1982) and Lawrence and Britton (1991, 1994) there have been no taxonomic papers on *Ericmodes* since Grouvelle (1913).

The phylogenetic position of this enigmatic family is unknown. From its original description (Crowson 1954) the family is placed at the base of Cucujoidea (sensu Lawrence 1982), with a supposed close relationship to Sphindidae (=Aspidiphoridae). The similarities of Protocucujidae to Sphindidae are particularly manifested in the Chilean sphindid genus *Protosphindus* Sen Gupta et Crowson (1979). Based on this assumption *Ericmodes* was used as a sister group to Sphindidae by McHugh (1993) in his cladistic analysis of Sphindidae. His cladogram confirms the most basal position of *Protosphindus* being a sister group to the remaining taxa of sphindids.

Biology for the family remains a mystery. Tillyard's (1926) record of *E. australis* Grouvelle from *Uromycladium* rust galls on *Acacia* has not been confirmed by recent collecting data. Australian and Chilean species have several times been collected from vegetation, as were the supposed larvae of the genus. These records, combined with adult lobed tarsomeres and large empodium, supposedly facilitating walking on a foliage, suggest that *Ericmodes* food may consist of spores of rust fungi there. However, no spores or other fungal material have been identified in gut contents of adult and presumed larvae yet.

The aim of the present study was to provide modern descriptions of adult and larval stages of the family, facilitating further phylogenetic work in the Cucujoidea, to revise the species of *Ericmodes*, and to provide an initial phylogenetic hypotheses for the placement of the family among the basal Cucujoidea. Further studies, including all cucujoid families, are necessary to generate reliable cladistic hypotheses for this very large and diverse superfamily.

Materials and methods

Material

This revision is based on approximately 1300 adult specimens borrowed from various collections from all over the world. In addition to the specimens borrowed, the extensive adult and larval collections of cucujoid beetles accumulated by R.A. Crowson (Glasgow) and J.F. Lawrence (ANIC) were examined.

The following abbreviations are used for the names of the institutions where the specimens used for this study are held. The names in parentheses are the curators who arranged loans.

- ANIC Australian National Insect Collection, Division of Entomology, CSIRO, Canberra, Australia (J.F. Lawrence);
- BMNH The Natural History Museum, London, England (R.J.W. Aldridge; M. Kerley; R.D. Pope);
- CASC California Academy of Sciences, San Francisco, USA (D. Kavanaugh, N. Penny);
- CMNO Canadian Museum of Nature, Ottawa, Canada (R. Anderson);
- CNCI Canadian National Insect Collection: Biosystematic Research Institute, Ottawa, Canada (A. Smetana);
- FMNH Field Museum of Natural History, Chicago, Illinois, USA (A. Newton, Jr.);
- JFLC John F. Lawrence, personal collection;
- MAIC Michael A. Ivie, personal collection;
- MCZC Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts, USA (D. Furth);
- MLTA Museum M. Lillo, Tucuman, Argentina (A. Teran);
- MHNG Muséum d'Histoire Naturelle, Geneva, Switzerland (I. Löbl);
- MIIZ Muzeum i Instytut Zoologii, PAN, Warszawa, Poland;
- MNHN Muséum National d'Histoire Naturelle, Paris, France (N. Berti);
- MNSC Museo Nacional de Historia Natural, Santiago (M. Elgueta)
- MVMC Museum of Victoria, Melbourne, Australia (A. Neboiss);
- PIMQ Queensland Department of Primary Industires, Mareeba, Australia (R. Storey);
- QMBC Queensland Museum, Brisbane, Australia (G. Monteith);
- SAMC South Australian Museum, Adelaide, Australia (E. Matthews);
- TMB Termeszettudomanyi Muzeum, Budapest, Hungary (O. Merkl);
- UQIC Department of Entomology, University of Queensland, Brisbane, Australia (M. Schneider);
- USNM National Museum of Natural History, Washington DC, USA (P. J. Spangler);
- ZMCC Zoologisk Museum, Copenhagen, Denmark (O. Martin)

Methods

In order to examine characters that might be used for further phylogenetic analysis at least one male of each species was completely cleared, disarticulated and placed on glycerine slides for further examination. After study, the specimens were transferred to microvials and permanently kept in glycerine. The structural illustrations of adults and larvae were made from these glycerine slides from an Olympus microscope with attached camera lucida. In the taxonomic part dealing with generic and species descriptions, standard procedures were followed.

Measurements. In general 5 specimens of extreme size and variations were measured, always including the largest and the smallest ones available ones. The number presented is the mean number, or ranges of these measurements. Length is the total length, including head, in mm); PL — median pronotal length, median length of pronotum; PW — greatest pronotal width; EL — elytral length along suture, from the base of scutellum to apex of elytra; EW — greatest combined elytral width; TL — body length, excluding head, = PL+EL.

Terminology used for adult morphology follows Lawrence and Britton (1991, 1994) including the nomenclature of the hindwing by Kukalová-Peck and Lawrence (1993). Terms used for larval morphology follow Lawrence (1991) and Lawrence and Britton (1994).

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Phylogenetic analysis

Methods

Because of uncertain affinities of the Protocucujidae to other cucujoids, it was necessary to include in the analysis some genera representing additional basal Cucujoidea to shed some light on the relationships in broader context. The taxa included, represent a postulated sister group – Sphindidae (Crowson 1954, McHugh 1993) and families showing similarities in adult and/or larval characters to Protocucujidae and Sphindidae. Two analyses were initially done. In the first one, I decided to include as many taxa as it was necessary to demonstrate the monophyly of the Protocucujidae, and to establish a preliminary hypotheses about the relationships of the family within the Cucujoidea. In the second step a more detailed analysis at the species level was performed, to investigate a species relationship – with a working hypothesis that both South American and Australian clades are monophyletic. The matrix and cladograms of the second analysis are not illustrated but discussed in the phylogeny section.

Cladistic analysis were undertaken using Hennig86 (Farris 1988). The mapping of character states and production of final cladograms from Hennig86 were accomplished using CLADOS (Nixon 1992).

Taxa

The taxa selected for this level of analysis were mostly representing higher taxa whose adult and/or larval characters show apparent similarities to *Ericmodes*. The taxa chosen, except for Brachypteridae, share the following characters, which are pressumed to be plesiomorphic for the Cucujoidea (A-adult, L-larval characters): male tarsal formula 5-5-4 (A); trochantins in pro- and mesocoxae exposed (A); mesocoxal cavity externally open (A); maxillary articulation area present (L); tarsungulus with 2 setae (L). Taxonomic placement of examined taxa follow Pakaluk *et al.* (1994) and Lawrence and Newton (1995).

Agapytho foveicollis Broun (Phloeostichidae, Agapythinae). This subfamily includes single species from New Zealand. This species is included as an outgroup because of the similarities in the larval urogomphi and head to that of *Ericmodes* (Sen Gupta and Crowson 1969). Adults and larvae of this species were collected by R.A. Crowson in a black encrusting fungal growth on living *Nothofagus* trunks in New Zealand.

Amartus rufipes LeConte was coded for the family Brachypteridae (=Kateretidae). This is used as a distant outgroup for the complex. Audisio (1993) and Crowson (personal communication) suggested this group plus Nitidulidae and Smicripidae (=Nitiduloidea) to form a sister group to all remaining Cucujoidea.

Hobartius eucalypti (Blackburn) (Hobartiidae). Larvae of this Australian and South American temperate genus show distinct similarities in their body vestitutre and shape of urogomphi to that of Protocucujidae. Larvae of *Hobartius* are developing in soft, rotting fruiting bodies of basidiomycete fungi *Grifolia* (Polyporaceae). Lawrence (1991), Tomaszewska and Ślipiński (1995).

Protosphindus chilensis Sen Gupta et Crowson (Protosphindinae) and *Odontosphindus clavicornis* Casey (Odontosphindinae) are used for the family Sphindidae. Both subfamilies are monogeneric, and represent basal lines within the family (McHugh 1993). Adult and associated larvae of both species were used to score the characters. Descriptions of adults and larvae are provided by Sen Gupta and Crowson (1979) and Burakowski and Ślipiński (1987). All species of this family are known to be myxomycophagous in adult and larval stages.

Protocucujidae. Adults of two species were scored: *E. sylvaticus* (Chile) and *E. costatus* (Australia). Characters for a Chilean larva were assigned to *E. sylvaticus*, while the Australian specimen was coded as a larva of *E. costatus*. However, these larvae do not differ with respect to the characters used in the analysis.

Characters (Table 1)

0. Antenna with dense setose punctures on the three apical club segments (0); antenna with dense setose punctures only on the apical part of terminal club segment (1). ***Note.*** This character was first used by McHugh (1993, char. 8) in his sphindid data. This is potentially very interesting character, but more comparative SEM studies are needed to develop reliable classification of antennal sensory areas in Cucujoidea.

1. Antennal club segments flattened, distinctly oval in cross section (0); antennal club segments distinctly circular in cross section (1).

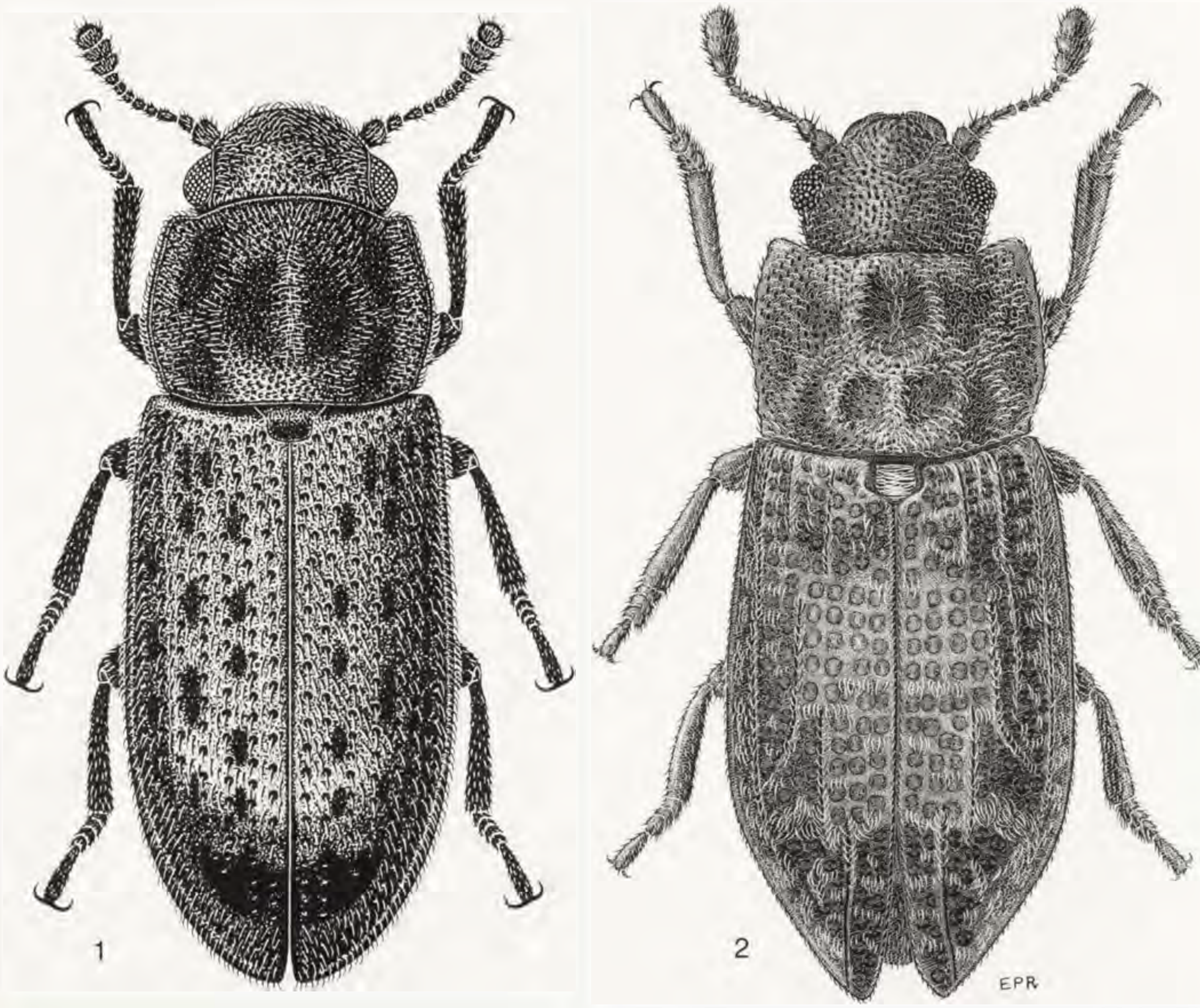
2. Antennomere IV subequal to V (0); antennomere IV shorter than V (1).

3. Antennal insertions dorsal, exposed from above (0); antennal insertions hidden under frontal extensions (1). ***Note.*** This is an autapomorphy for *Ericmodes* in the present data set.

4. Fronto-clypeal impression distinct (0); fronto-clypeal impression absent (1). ***Note***. Although generally present in *Ericmodes*, the impression is almost absent in *E. tarsalis*.

5. Mandible without dorsal cavity (0); mandible with dorsal cavity (1).

6. Mandible without dorsal tubercle (0); dorsal tubercle elongate, flat with associated cavity (1); tubercle strongly



Figures 1–2. *Ericmodes* adult habitus. 1. *E. australis*; 2. *E. costatus*; Fig. 1 by S.P.Kim, 2 by E. Roberts.

raised, angulate without associated cavity (2). ***Note.*** The characteristic cavities and tubercles on adult mandibles occur in various basal Cucujoidea (Sen Gupta and Crowson 1966, McHugh 1993). Large tubercle and associated cavity occur in all known members of Sphindidae, Boganiidae and Hymaeinae (reduced). Small cavities without tubercles can be found in some Silvanidae (e.g., *Dendrophagus*) and their traces in Laemophloeidae and Phalacridae, while Hobartiidae have strong tubercles but no cavities. The internal vesicles which open on outer edge of mandibles occur in Cavognathidae and some Boganiidae (*Metacucujus*, personal observation). R.A. Crowson (personal communication) believes the cavities, serving as mycangia, were present in the ancestral Cucujoids and then reduced or lost independently in most of the groups. This seems to be a plausible scenario, although cavities and tubercles in these groups look quite different (e.g., Sphindidae vs. Hymaeinae), and may well be of independent origin in some groups.

7. Maxillary stipes oriented horizontally (0); maxillary stipes oriented almost perpendicularly (1). ***Note.*** This character is correlated with the mandibular shape and its and convexity. In the Sphindiids and Boganiids the mandible ventro-laterally encircles maxilla, which is (and probably operates) perpendicular to the body axis. The maxilla is usually horizontal in Cucujoidea.

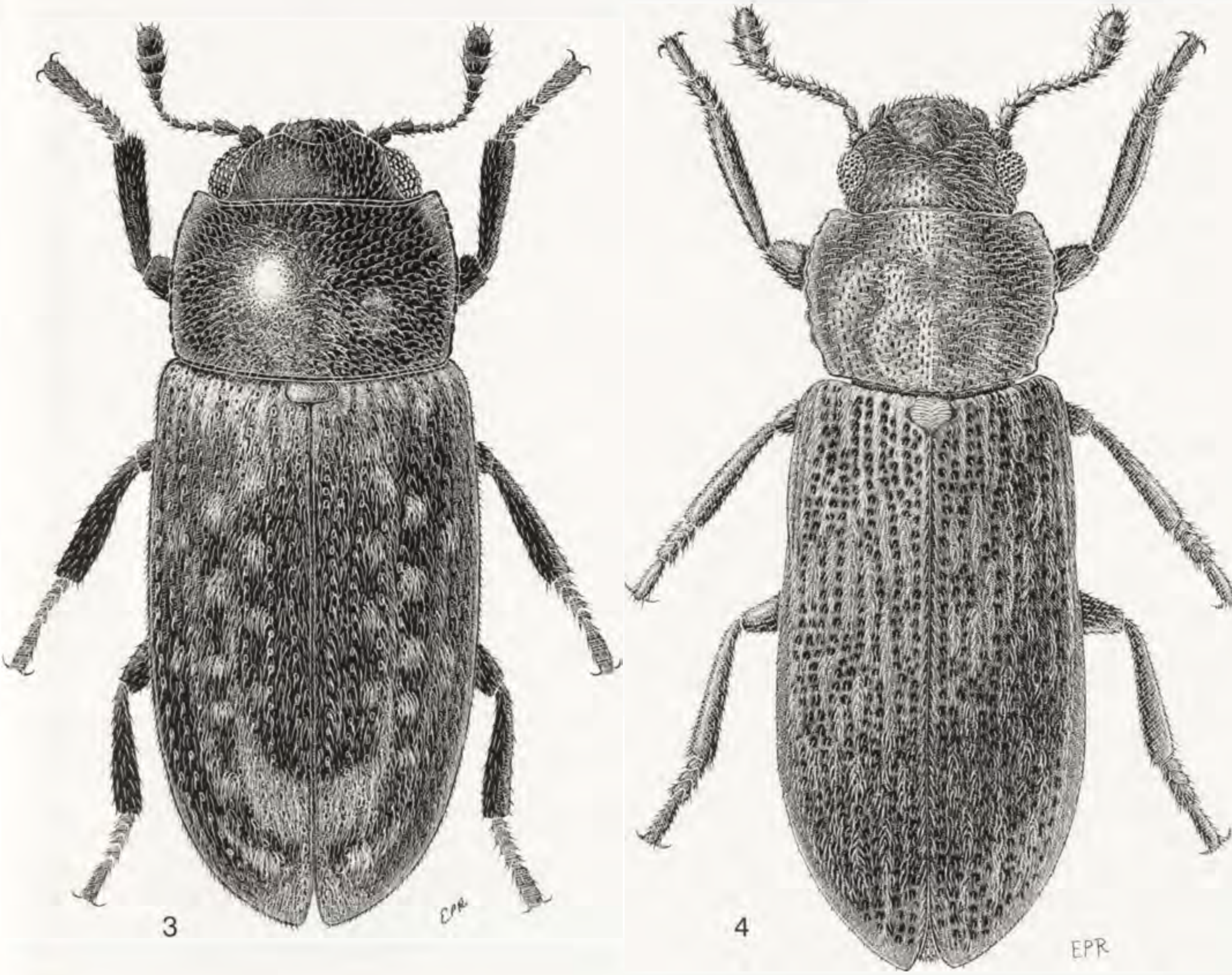
8. Mentum trapezoidal, weakly transverse (0); mentum short and strongly transverse (1).

9. Labial palps at base approximate (0); labial palps at base widely separated (1).

10. Prothorax with complete lateral margins (0); prothorax with lateral margins obsolete (1). ***Note.*** An autapomorphy for *Agapytho* in present data set.

11. Procoxal cavities externally open (0); procoxal cavities externally closed (1).

12. Elytral punctures in regular rows (0); elytral punctures at least laterally confused (1).



Figures 3–4. *Ericmodes* adult habitus.3. *E. lawrencei*; 4. *E. sylvaticus*. by E. Roberts.

13. Wing with radial cell well developed (0); wing with radial cell absent (1).

14. Mesocoxae broadly separated (0); mesocoxae approximate medially (1).

15. Mesotarsomeres I-III not markedly widened (0); mesotarsomeres I-III distinctly widened (1).

16. Ovipositor with styli long and terminal (0); ovipositor with styli short and subterminal (1).

17. Aedeagus without U-shaped sclerite near apex (0); aedeagus with U-shaped sclerite near apex (1, Fig. 51). ***Note.*** The sclerite (Figs. 53, 54) is lost in two species of *Ericmodes*.

18. Tegmen with distinct parameres (0); tegmen with parameres fused or absent (1).

19. Median lobe without basal complex sclerite in internal sac (0); internal sac with basal complex sclerite, Figs. 50-54) (1).

20. Larva: maxillary mala falcate (0); mala blunt apically (1).

21. Larva: stemmata 6 (0); stemmata 5 or less (1).*Note.* The state (1) includes cases were there are 5 lenses and a dark spot below (as in *Ericmodes*).

22. Larva: epicranial stem absent (0); epicranial stem short but present (1).

23. Larva: spiracles annular (0); annular-biforous (1). ***Note.*** Spiracles in *Agapytho* are of complex annular-biforous type.

24. Larva: tarsungulus simple (0); tarsungulus toothed at base (1).

25. Larva: surfaces of thoracic and abdominal terga simple (0); surfaces of thoracic and abdominal terga tuberculate (1).

26. Larva: hypostomal rods absent (0); hypostomal rods present and divergent (1).

27. Larva: mandible without ventral tubercle (0); mandible with ventral crushing tubercle (1).

											1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7
Amartus	0	1	0	0	0	0	0	0	1	0	0	1	1	1	0	1	1	0	0	0	1	1	0	0	0	0	1	0
Protosphindus	1	1	1	0	0	1	1	1	0	1	0	1	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	1
Odontosphindus	1	1	1	0	0	1	1	1	0	1	0	1	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	1
Agapytho	0	1	0	0	1	0	0	0	0	1	1	0	1	1	0	0	0	0	1	1	0	0	0	1	0	0	1	0
Hobartius	0	1	1	0	0	0	2	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1
E. costatus	0	0	1	1	1	0	0	0	1	0	0	1	0	0	1	1	0	1	1	1	0	1	1	1	1	1	1	1
E. sylvaticus	0	0	1	1	0	0	0	0	1	0	0	1	1	0	1	1	0	1	1	1	0	1	1	1	1	1	1	1

Table 1. Data matrix used in phylogenetic analysis.

Results

Family level. The analysis of the data matrix including adult and larval characters of Protocucujidae, Sphindidae, Hobartiidae, Agapythinae and Brachypteridae (Table 1) was performed using Hennig86 implicit enumeration option (*ie*) with all characters unordered (nonadditive), and unweighted. *Amartus* was assigned as an outgroup to the investigated complex. Only single tree was obtained (Fig. 81) of 42 steps, a CI of 69 and RI of 63. The successive weighting procedure did not change the tree topology, reaching length 192, CI 91 and RI 91.

The cladogram is consistent with the hypothesis that Sphindidae and Protocucujidae are sister taxa, as postulated by Crowson (1954, 1955). The monophyly of Sphindidae + Protocucujidae is largely based on the characters of male genitalia (# 17–19), showing apparent homoplasy in *Agapytho* (reduction of parameres, sclerite in internal sac). These groups also share reduced number of stemmatan lenses (# 21, independent loss in *Amartus*), and short epicranial stem in larva (# 22).

Protocucujidae show the following apomorphies: (#1,1) – antennal club relatively flat; (# 3,1) antennal insertion not visible from above; (# 14, 1) mesocoxae approximate medially; (# 24, 1) larval tarsungulus with basal tooth. This suite of characters, should be tentatively used as synapomorphies of Protocucujidae and Sphindidae should be accepted as the sister group, untill a complete analysis of the Cucujoidea yields more reliable data.

Species of Ericmodes. All known species of *Ericmodes* share the suite of apomorphies listed above and are believed to form a monophyletic group. The character distribution between the species clearly shows both the South American and the Australian clades being monophyletic. The South American group is characterized by the following apomorphic characters (polarized using *Protosphindus* as an outgroup): (1) hind angles of pronotum with at least a few posteriorly directed setae (Fig. 47); (2) anterior pronotal angles rounded (Fig. 4); (3) elytral striae laterally irregular; (4) scutellary stria composed of 10–14 confused punctures [***Note***. This character, and most of other elytral characters are well visible on cleared specimens only]. The Australian group bears at least three distinct synapomorphies: (1) elytral epipleuron complete apically; (2) elytral striae 3 and 4 joined before apex; (3) prosternum with a deep notch anteriorly near notosternal suture (Figs 46, 48). The characters listed above with several additional ones were coded and analyzed using "*ie*" option in Hennig86, producing single tree with CI and RI of 100. With no contrary arguments available at the moment, I believe these clades form cladistically monophyletic groups, and their separatiom may be dated back to the late Cretaceous/early Paleogene. This distribution pattern is seen in a few more "basal" families of Cucujoidea: Hobartiidae (*Hobartius*, Tomaszewska and Ślipiński 1995); Hymaeinae (*Rhopalobrachium*, Lawrence 1995); Cavognathidae (*Cavognatha*, *Taphropiestes*, Lawrence and Newton 1995; Ślipiński, unpublished). More investigations are necessary to construct cladistic hypotheses involving boigeographic data on those groups. This will be possible after the phylogeny of Cucujoidea or Cucujiformia is given a serious cladistic attempt.

ERICMODES REITTER

Ericmodes Reitter, 1878: 167. Type species, here designated, *Ericmodes synchitoides* Reitter, 1878.

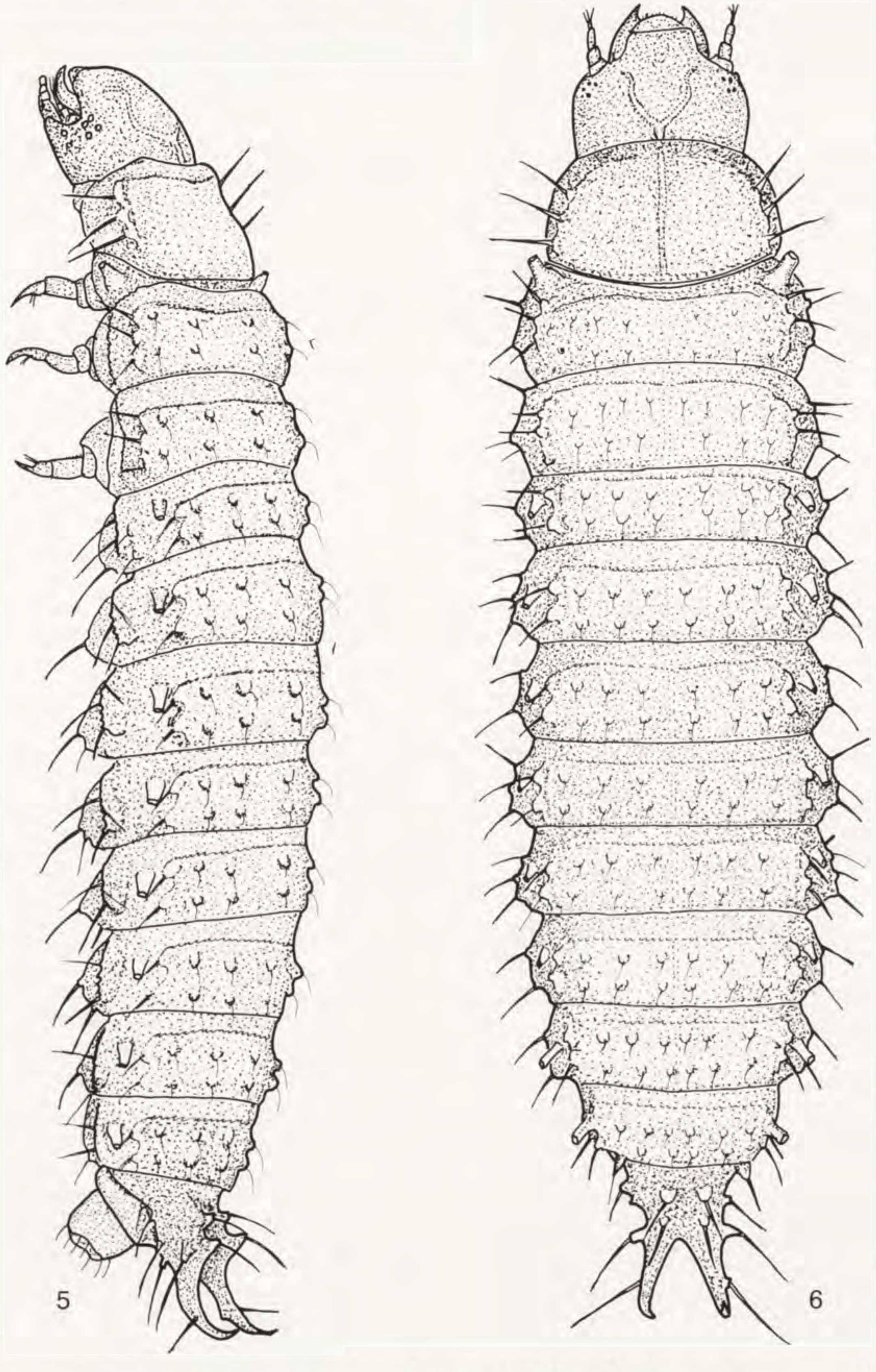
Aprozoum Germain, 1892: 251. Type species, original designation, *Coxelus sylvaticus* R. Philippi, 1864. Synonymized by Grouvelle 1913: 107.

Erichmodes, Germain 1911: 64. (misspelling).

Protocucujus Crowson, 1954: 60. Type species, original designation, *Protocucujus chilensis* Crowson, 1954. Synonymized by Crowson 1960: 128.

Larva

Diagnosis. The putative *Ericmodes* larva has characters of the basal Cucujoidea (mandible with strong mola, moderate prostheca and ventral crushing tubercle, tarsal claw with 2 setae, 5 stemmata, and well developed maxillary articulating area). It can be immediately separated from the nitidulid group (Nitidulidae, Brachypteridae, Smicripidae) that are lacking the maxillary articulating area, and apparently have protracted ventral mouthparts. The larvae of Sphindidae (Burakowski and Ślipiński 1987) have the spiracles annular or multicameral not situated on tubes; terga simple, without setiferous tubercles; urogomphi simple or absent; prostheca narrow-based but distinct, and mala obtuse apically. The larvae of Boganiidae (Endrödy-Younga and Crowson 1986) are immediately recognized by the abdominal segment X forming long appendages, the urogomphi minute to absent, and the mala narrow and apparently articulated at base. *Rhopalobrachium* and *Hymaea* larvae (Hymaeinae, Sen Gupta and Crowson 1966) are recognized by the flattened body, abdominal segment 10 forming short transverse, tenebrionoid type structure, the frontal arms separate at base and 6 stemmata. The larva of *Agapytho* (Agapythinae, Sen Gupta and Crowson 1969) has spiracles not situated on tubes, the trunk terga have simple pubescence without tubercles and spiracles of complex bicameral type.



Figures 5, 6. *Ericmodes* larva from Chile: (5) lateral view; (6) dorsal view.

Description. Measurements (in mm) of two larvae from Chile, smaller larva first, followed by full grown one: total length 3.1-5.8, head length 0.49-0.55, head width 0.59-0.78, pronotal length 0.39-0.63, pronotal width 0.71-1.14.

Body elongate, slightly flattened dorsally, widest near middle, slightly tapering anteriorly and posteriorly, constricted between segments (Figs 5, 6). Color yellowish-white, with dorsal side slightly darker than venter; lightly sclerotized except for mandibles and tips of urogomphi that are dark brown and sclerotized.

Head (Figs 7, 17) about 0.7–0.8× as long as wide, and about 0.7–0.8× as wide as prothorax. Surface irregularly, but densely granulate, forming a granulose pattern. Five stemmata in two transverse rows, anterior of three and posterior of 2, with black spot ventrally. Head capsule straight or weakly emarginate posteriorly; epicranial stem very short; frontal arms translucent, lyriform, anteriorly obsolete, bases contiguous; endocarinae absent. Clypeus relatively long, trapezoidal, fused with frons but clearly articulated to labrum, bearing a transverse row of 4–6 setae. Labrum subtrapezoidal, weakly produced antero-medially, sinuate laterally; epipharynx membranous, anterior margin with several long, curved setae on each side, medially with group of placoid sensilla and conical spinulae, posteriorly with median setal brush and transverse plates.

Mandibles slightly asymmetrical (Figs 11, 12), bidentate or tridentate apically (Figs 13, 14; prostheca reduced, in mature larva often forms a sclerotized tubercle (Fig. 11); mola asperate-tuberculate, strong; ventral accessory tubercle well developed.

Ventral mouthparts retracted; hypostomal rods short and diverging posteriorly (Figs 9, 19; maxilla (Fig. 10): mala strong, falciform, with 2 non-articulated teeth apically, dorsally with row of curved setae along inner margin; maxillary articulating area large, undivided, maxillary palp without peg sensillum. Labium (Fig. 15) free as far as base of prementum; mentum and prementum distinctly separated; ligula rounded, medially prominent, with two sensilla and two setae apically. Hypopharynx (Fig. 16): hypopharyngeal bracon present; hypopharyngeal sclerome consists of single, flat, weakly crenulate sclerite.

Antenna (Figs 8, 18): sensory appendage on antennomere 2 always ventral to antennomere 3.

Trunk: thoracic and abdominal terga (except prothorax and tergite 9) with 6–8 pairs of conical or flat (Australian larva) tubercles, anterior somewhat irregular bordering line, and posteriorly directed granules or microspinules (Fig.22); epipleural area protuberant, each with two setae. Prothorax considerably longer than other segments, 0.50-0.60× as long as broad; tergite with weak median elongate impression and anterior transverse fold; median paler line or impression usually well visible on all thoracic and abdominal terga; surface of protergum granulose and asperate with three setae laterally. Mesothoracic spiracle annular-biforous, situated on relatively long, anteriorly directed process. Tergum 9 with two pairs of pregomphal tubercles and strongly upturned and acuminate apically urogomphi; Australian larva has more strongly developed pregomphal tubercles, and the entire pregomphal region is raised to form a quite distinct plate (Figs 23, 24). Segment 10 ventral, forming distinct pygopod. Abdominal spiracles annular-biforous (Fig. 21), all placed at ends of spiracular tubes; spiracle on segment 8 functional, about as large as that on 7.

Legs relatively short, coxae moderately widely separated; claw distinctly toothed with 2 closely placed setae (Fig. 20).

Variation. There is considerable ornamental variation between Australian and Chilean, as well as among several Chilean larvae examined. This mostly concerns: the degree of development tergal tubercles, which remain more or less conical in Chilean larvae and are flat in the Australian larva; the shape of the pregomphal plate and urogomphi themselves (described above) and the length and numbers of tergal setae (generally longer in the Australian larva).

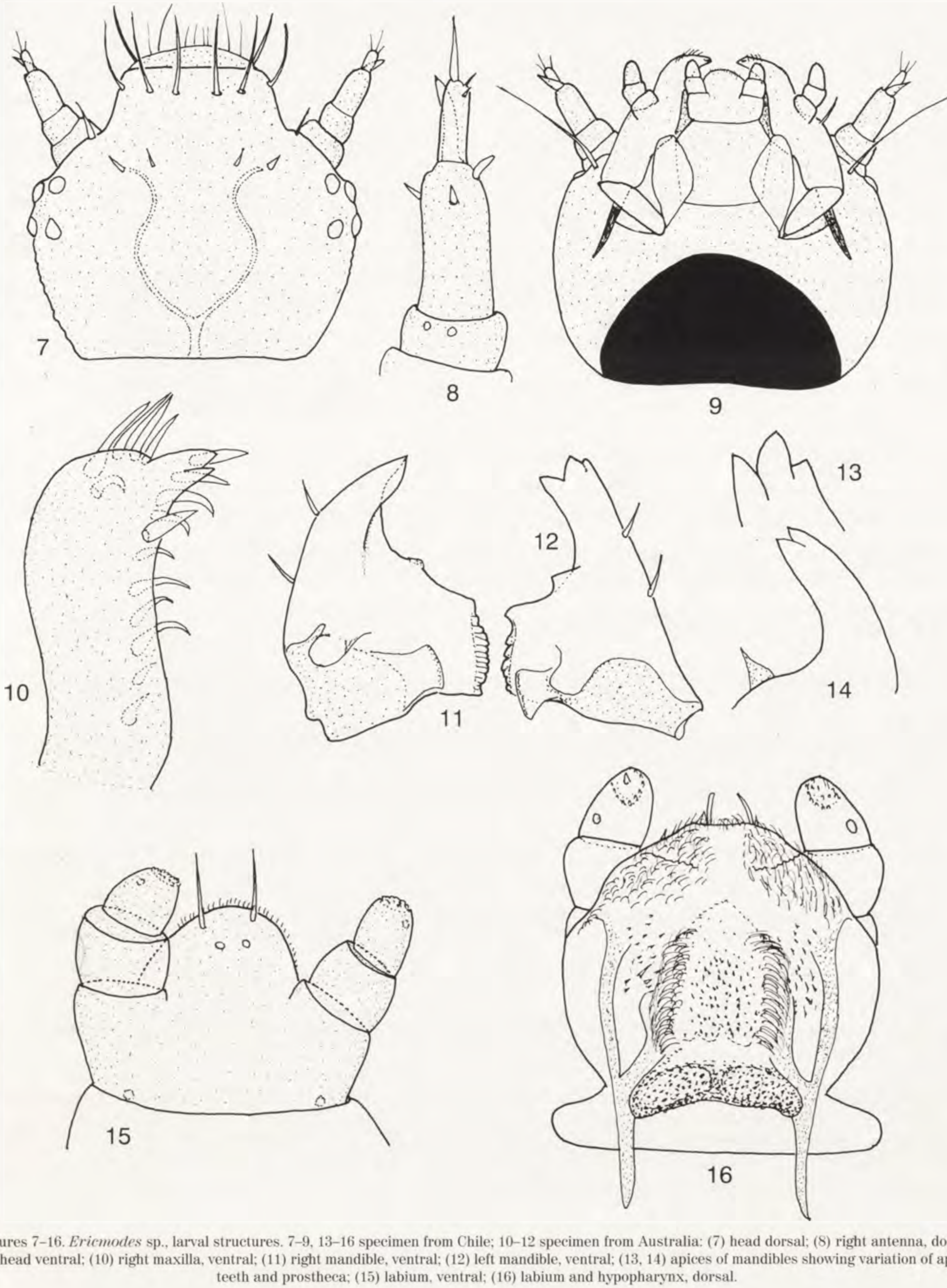
Larval material examined. Chile: Estero Chahuilaco, Cautín Prov., 23.II.1983. T. Cekalovic (JFLC, MIIZ); Osorno Prov. 4.1 km E. Anticura, Paraguе. 19-26.XII.1982, in litter, A.F. Newton & M.K. Thayer (JFLC, slide); Conception, Ramacho, 6.III.1976, T. Cekalowic (JFLC, 2 larvae on slides); Chualpen, I.1988, T. Cekalovic (JFLC, slide); Concepcion, Agua Della Gloria, 10.IV.1972, T. Cekalovic (JFLC, slide); Conception, Aqua de la Gloria, 14.VIII.1978, T. Cekalovic (MIIZ, slide); Australia: Victoria, Lerderderg Riv., 4.8 km WNW Blackwod, 25.X.1983, A.J. Boulton (JFLC, slide).

Adult

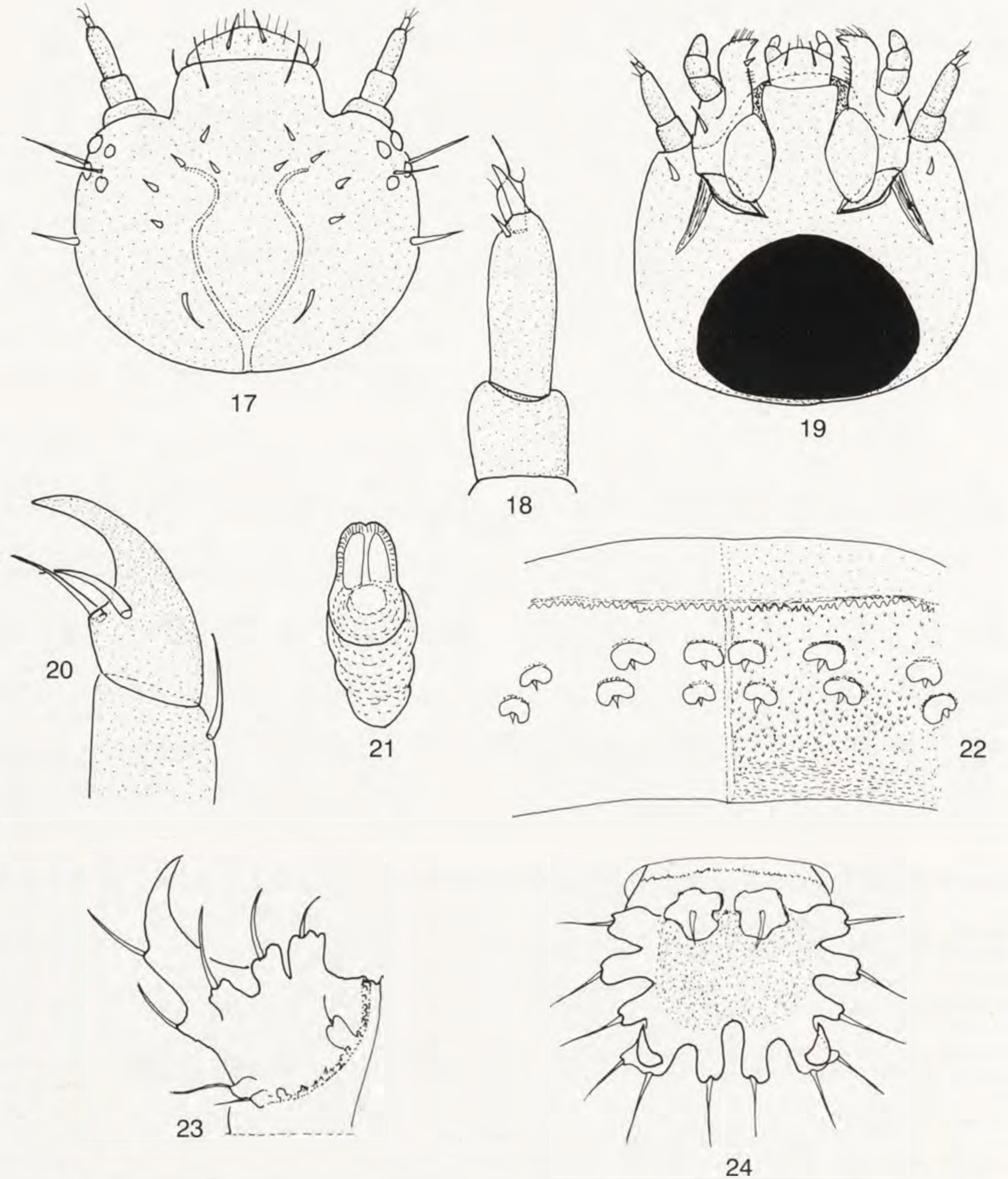
Diagnosis. These beetles, especially the South American species, superficially resemble *Protosphindus*, but they differ in several features. Most notable are that *Ericmodes* has the antennal insertions hidden and the tarsomeres 1-3 are distinctly broadened and lobed. *Ericmodes* was formerly placed among the nitiduloid families which differ in having the maxillary lacinia strongly reduced (Brachypteridae) or absent (Nitidulidae, Smicripidae).

Description. Length 3.5-5.8 mm. Body (Figs. 1–4) elongate, weakly to strongly convex; light brown or yellowish brown to almost black; dorsum usually shiny; vestiture apparent, of short to moderately long hairs.

Head (Fig. 33) subquadrate. Eye large, prominent and slightly bulging; interfacetal setae very short, pointed apically. Fronto-clypeal impression arcuate, usually distinct, deep. Antenna (Figs 36, 67, 68) 11-segmented, with loose, slightly flattened 3-segmented club; antennomere 3 about 2× longer than 4; antennal groove by lower margin of eye extending to middle of eye, usually convergent. Clypeus transverse, flat, usually on lower plane than front. Labrum (Figs 29, 35) transverse, anterior edge membranous; tormae convergent, fused apically; labral rods short, weakly sclerotized. Mandible (Figs 30, 31, 34) bidentate apically, apex flattened dorsally, with subapical dorsal tooth and brush of long setae below it; prostheca small, membranous; mola large, quadrangular, transversely ridged (Fig. 32); dorsal tubercle and cavity absent. Maxilla (Figs 25, 26, 38) with 4-segmented palp, palpomeres 2–4 wider than basal one; cardo and stipes large, horizontal; galea curved



Figures 7–16. *Ericmodes* sp., larval structures. 7–9, 13–16 specimen from Chile; 10–12 specimen from Australia: (7) head dorsal; (8) right antenna, dorsal; (9) head ventral; (10) right maxilla, ventral; (11) right mandible, ventral; (12) left mandible, ventral; (13, 14) apices of mandibles showing variation of apical teeth and prostheca; (15) labium, ventral; (16) labium and hypopharynx, dorsal.



Figures 17–24. *Ericmodes* sp., larva from Australia: (17) head dorsal; (18) right antenna, ventral; (19) head, ventral; (20) tarsungulus; (21) prothoracic spiracle; (22) abdominal tergum VI, simplified ornamentation; (23) urogomphi, lateral; (24) urogomphi, dorsal.

apically, densely setose (Fig. 27); lacinia bearing numerous stout setae along mesal edge. Labium (Fig. 39) with palps approximate; palpomeres 2 and 3 much larger, wider than basal one; mentum transverse, trapezoidal; prementum strongly sclerotized, densely setose; ligula partially membranous, weakly emarginate medially. Gular sutures widely separated, convergent. Tentorium with anterior arms approximate near middle; corpotentorium narrow, without median process.

Prothorax transverse with lateral edges smooth, crenulate to weakly denticulate, narrowly bordered. Pronotal disk with 3 impressions on elevated, central part, lateral portions narrowly to modertely explanate. Prosternal process (Fig. 47) about 0.5× as wide as coxal diameter, gradually expanded apically; procoxa transverse (Fig. 47) with fully exposed trochantin, approximate near middle; procoxal cavities open internally, externally, closed by narrow notal projections.

Pterothorax (Fig. 45). Mesosternal process about 0.3× as wide as mesocoxa; mesocoxae approximate medially, weakly transverse, trochantins exposed; mesocoxal cavities outwardly open. Elytron with short scutellary striole, composed of 5–12 regular or irregular punctures, often confused with the first row; punctures in 10 or 11 striae, laterally often confused; epipleuron narrow, usually incomplete apically. Meso-metasternal junction with a single knob. Metasternum with long median impressed line usually extending about 3/4 its length, without femoral lines or pits. Metendosternite (Fig. 49) with anterior arms widely separate, anterior tendons approximate, moderately long. Wing (Fig. 44) with closed radial cell, two cubito-anal cells, and weak median fleck.

Legs (Fig. 37). Tarsi in male 5-5-4, in female 5-5-5; tarsomeres 1-3 widened and weakly lobed, ventrally densely setose; tibial spurs, short, subequal 2-2-2; claws simple; emopdium long, bisetose (Fig. 28).

Abdomen (Fig. 45) with five freely articulated ventrites; ventrites laterally with bordering line; intercoxal process of ventrite 1 narrow and acute. Aedeagus lying on its side when retracted; apical part of tegmen (consisting of fused and not articulated parameres) dorsal to median lobe, partially encircling its apical piece, lateral struts fused apically or narrowly separated (Figs 55–57). Tergite 7 large, sclerotized, with functional spiracles (Fig. 41). Tergite 8 in male (Fig. 42) elongate, heavily sclerotized, dorsally setose; sternite 8 pointed apically (Figs 69–75). Ovipositor (Fig. 43) with long terminal styli, spermatheca weakly sclerotized (Fig. 40) without additional glands.

Key to species of *Ericmodes*

1. Elytra distinctly costate (Fig. 2). [Australia] . . . . *E. costatus* Ślipiński et Pakaluk, sp. nov.
–. Elytra never costate, with intervals nodulose, flat to weakly convex 2
2. Elytron with 10 regular striae; scutellary stria simple and composed of 5–6 punctures; epipleuron complete; anterior pronotal angles well marked (Fig. 3); body stouter with elytra devoid of impressions but bearing weak nodules covered by setose patches (Fig. 1) [Australia] 3
–. Elytron with 11 striae, striae at least in lateral portion, irregular; scutellary stria complex and composed of 10-12 punctures; epipleuron incomplete apically; anterior pronotal angles broadly rounded (Fig. 4); body more slender with elytra bearing impressions or nodules without setose patches [S. America] 4
3. Anterior pronotal angles prominent (Fig. 3); color dark brown to black, elytra usually with brown patches; pronotum without marked depressions near base, discal punctures about 0.5 diameter apart, interspaces shiny. . . . . *E. lawrencei* Ślipiński et Pakaluk, sp. nov.
–. Anterior pronotal angles less prominent and more rounded (Fig. 1); color brown, elytra with mottled dark brown to black elongate spots; pronotum with weak admedian impressions before middle, discal punctures elongate and strigose, less than 0.3 diameter apart, interspaces reticulate. . . . . *E. australis* Grouvelle
4. Elytra with distinct impressions or with intervals nodulate; body brown to black; dorsum densely setose; elytra with intervals 7 and 9 separate apically; wings normal 5
–. Elytra without impressions or nodules; body yellowish to light brown; dorsum sparsely setose; elytra with intervals 7 and 9 meeting apically; brachypterous . . . . *E. tarsalis* Ślipiński et Pakaluk, sp. nov.
5. Elytron with multiple weak impressions, intervals irregularly nodulate. . . . . *E. sylvaticus* (Philippi)
–. Elytron with 3–5 distinct impressions, intervals never nodulate 6
6. Body usually black; pronotum with sides narrowly explanate and edges weakly denticulate; elytron with weak impression near middle on intervals 2–3; aedeagus (Fig. 66) without a large sclerite . . . . *E. nigris* Ślipiński et Pakaluk, sp. nov.
–. Body brown to dark brown; pronotum with sides broadly explanate and edges crenulate; elytron without weak impression near middle on intervals 2–3; aedeagus (Fig. 65) with a large sclerite . . . . . . *E. fuscitarsis* Reitter

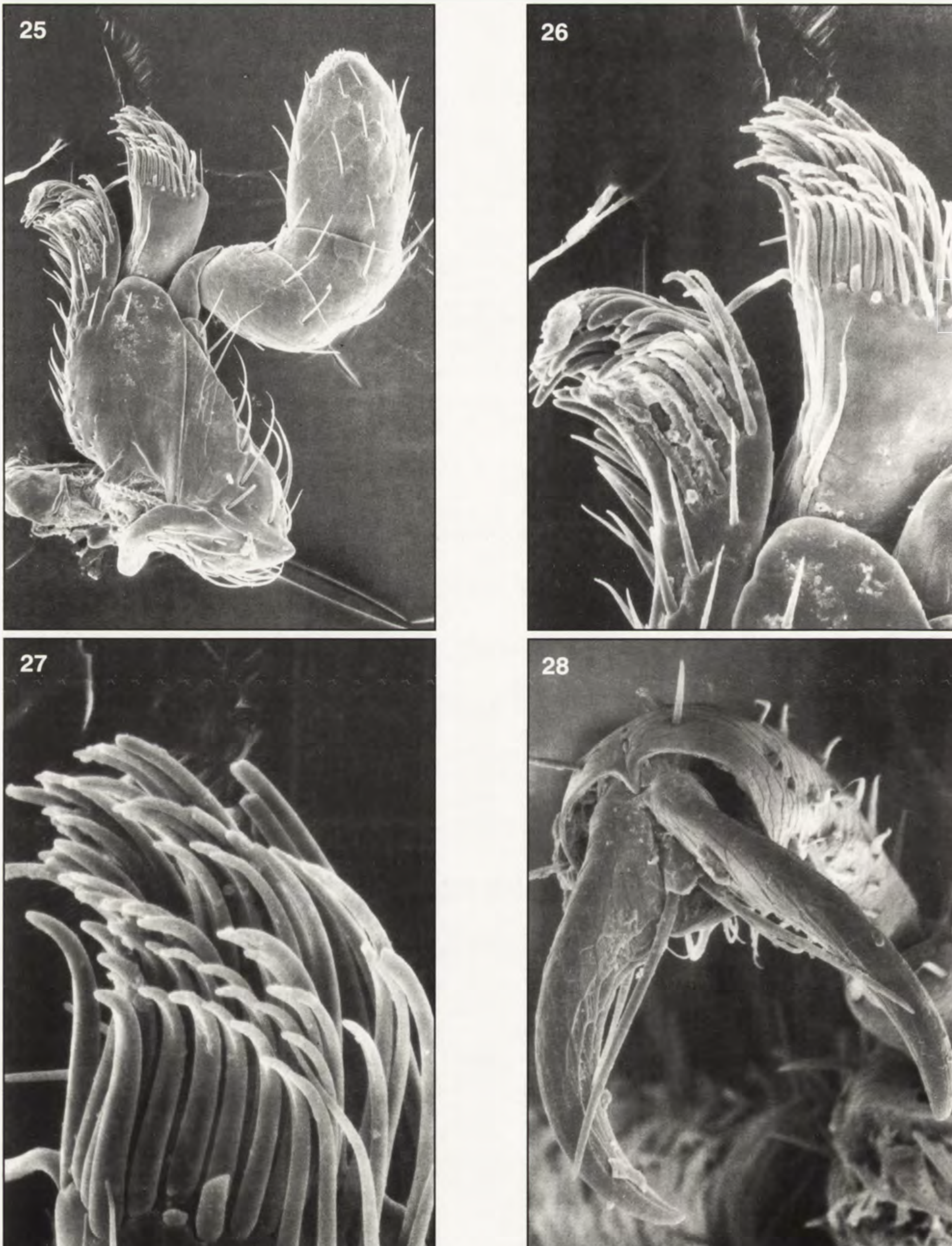
Species descriptions

Ericmodes australis Grouvelle (Figs 1, 51, 57, 73)

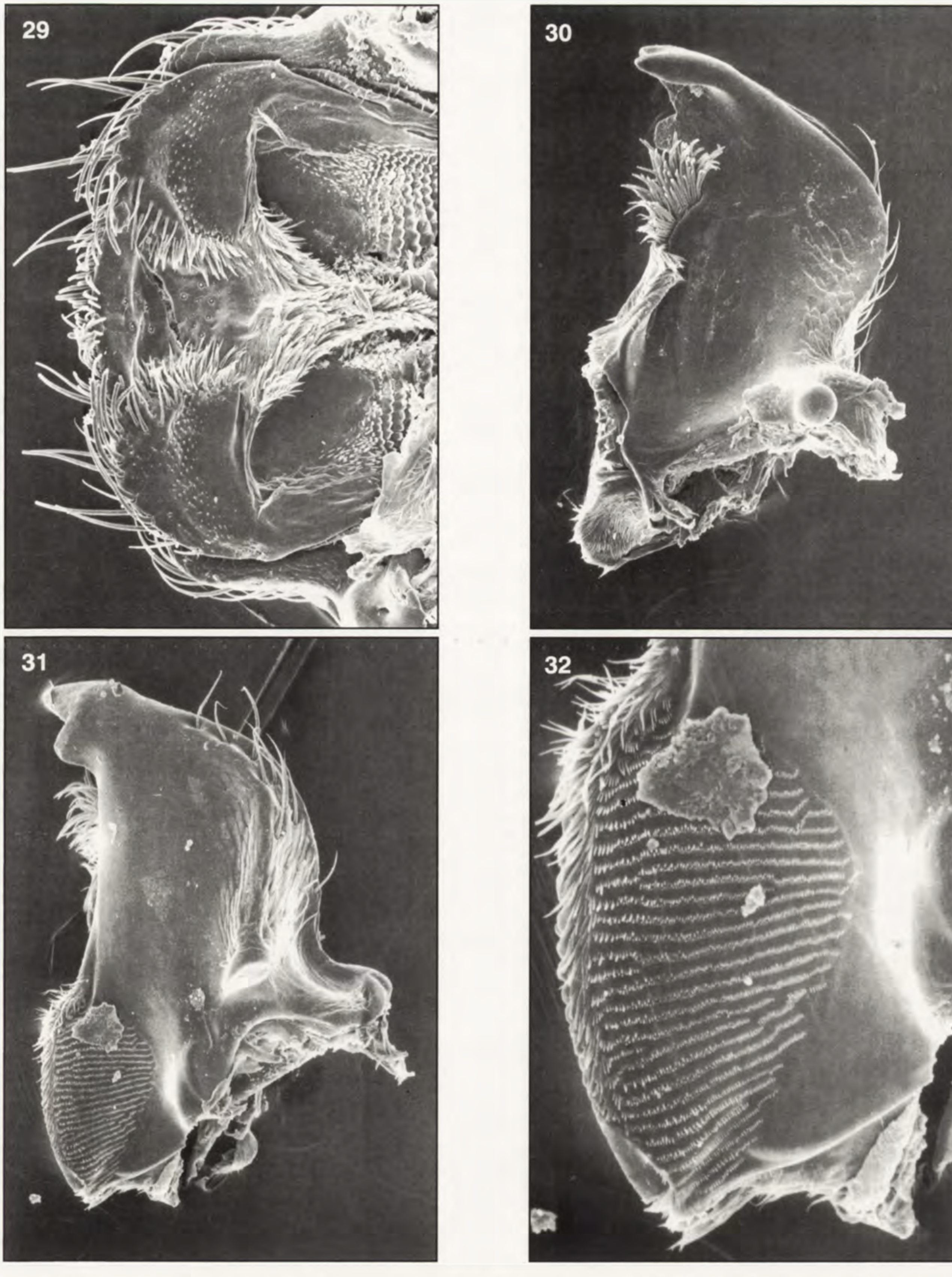
Ericmodes australis Grouvelle, 1893: 141. Lectotype, here designated, South Australia (MNHN, examined).

Diagnosis. This species is very similar to *E. lawrencei*, but is usually brown with darker spots on elytra, the anterior pronotal angles are less prominent, the pronotal disk bearing weak but distinct subbasal impressions, and the pronotal punctures denser and strigose, separated by reticulate, feebly shiny interspaces. Both species are geographically separated with the range of *E. australis* being more southern (Victoria, Tasmania, South Australia) while that of *E. lawrencei* limited to northern Queensland (Fig. 78).

Description. Length 3.8–5.5 mm. Body elongate (TL/EW = 2.2–2.3), convex, feebly shiny; dorsal and ventral surfaces



Figures 25–28. *Ericmodes sylvaticus*, adult SEM: (25) maxilla, ventral; (26) galea and lacinia, ventral; (27) setal comb at tip of galea, ventral; (28) tarsal claw, dorsal.



Figures 29–32. *Ericmodes sylvaticus*, adult SEM: (29) epipharynx, ventral; (30) mandible, ventral; (31) mandible, dorsal; (32) mandibular mola, dorsal.

brown to dark brown; elytra with mottled dark brown to black elongate spots (Fig. 1); dorsum covered with light brown to brown decumbent setae, setae associated with nodules in apical 2/3 of elytra much more apparent and lighter.

Head: fronto-clypeal impression distinct; frons flat, densely punctate and setose. Antennomere III about 2× as long as IV; relative lengths of antennomeres as follows: IV-5; V-6.5; VI-5; VII-5; VIII-4; VII as broad as VI, slightly broader than VIII.

Pronotum 0.65–0.73× longer than wide, widest just before middle; anterior angles blunt, feebly produced; lateral and basal edges distinctly margined, explanate; lateral edge crenulate; disc densely punctate, punctures less than 0.5 diameter apart, their interspaces distinctly reticulate; median part convex with weak admedian impressions before base.

Elytra about 1.56–1.72× longer than wide and 2.7–2.9× longer than pronotum; disk convex, without impressions or costae; each elytron separately rounded at apex; epipleuron broad, complete. Scutellary stria consists of 5–6 punctures; elytron with 10 regular striae; strial punctures large, rectangular, longitudinally separated by 0.2–0.6 of their longitudinal diameter; intervals 3, 5, 7, 9 broader than even ones, somewhat convex and nodulose in apical 2/3, surfaces slightly granulate, feebly shiny; setae along intervals not serial, usually 2–3 in groups. Male genitalia and associated sclerites as in Figs 51, 57, 73.

Types. Lectotype: "S. Australia Blackburn; 554; Type; Syntype; Ericmodes australis Grouv; Museum Paris 1917 Coll. Grouvelle" (1, MNHN).

Other material examined. Australia. No specific locality, Griffith collection, id by M. Lea (3, SAMC); coll. French (1 MNHN). **South Australia**: no specific locality (1, SAMC); K.I. Kely Caves, in main cave, 140ft below ground, 2.xii.1982, D. Lacis & J. Thurner (1, SAMC); Port Lincoln, Blackburn, 1884, Sharp Coll. 1905–313 (2, BMNH); Yorke Peninsula, 13 km E. Marion Bay, 4–7.xi.1981, H. & A. Howden (1,CNCI). **Tasmania**: no specific locality (1 MVMC, 1 SAMC); Hobart, Lea (1 ANIC; 2 SAMC); Hobart Univ. Tasmania Campus, litter under *Eucalyptus globula*, 26–30.I.1977, J. Kethley, FMHD #77-101 (1 FMNH); Launceston (1, BMNH,1 MVMC); Lower Gordon River, 42.51.5S 145.48E–42.50.5S 145.51.5E, ii.1976, litter, voucher specimen 11, Howard, Hill... (1 ANIC); Mt. Field N. P., 42.41S 146.43E, 160–240 m, 30.i–4.ii.1980 (1 ANIC); Ridgeway, 17.x.1948, C. Oke (2 MVMC); 12 km W Smithton, *Eucalyptus* litter at stump base, 25.ii.1977, J. Kethley, FMHD #77-166 (1 FMNH); East Tamar (1, MVMC). **Victoria**: Baxter, J.E. Dixon (2 MVMC); Beaconsfield, 15.iii.1936, F.E. Wilson (1 ANIC); Belgrave, 5.viii.1922, C. Oke (1 MVMC); 3.8 km WNW Blackwood, Lerderderg River, 22.iii.1983, A.J. Boulton (1 ANIC); Blairgowrie; 4.i.1976, M.S. Moulds (1 MVMC); Croydon District (1 MVMC); East Warburton, 17.ii.1976, A. Neboiss (1 MVMC); Heaksville Gap (1 MVMC); 23 km NNE Licola, Wallingford River, 25.ii.1978, MV light (1 MVMC); Macalister-Caledonia River Junction, 16.ii.1977, MV light (1 MVMC); near Olinda, Olinda Falls, ca. 350 m, 15.i.1980, berlesed from *Eucalyptus* litter, A. Newton & M.K. Thayer (1 ANIC); Port Philip (1 BMNH); Tarra Valley, 27.x.1973, A. Neboiss (1 MVMC); Woar Yallock, F.E. Wilson (1 MVMC).

Ericmodes costatus Ślipiński et Pakaluk, sp. nov.
(Figs 2, 48, 50, 58, 67, 69, 78)

Etymology. The name is derived from the Latin *costa* meaning rib, referring to the costate elytra.

Diagnosis. This species clearly belongs to the Australian species group because of the elytra bearing 10 regular striae, complete epipleuron and short scutellary stria. The costate elytra (Fig. 2) are unique to this species.

Description. Length 3.8–4.8 mm. Body elongate (TL/EW = 2.2–2.3), convex, very feebly shiny; dorsal and ventral surfaces light to dark brown; dorsum covered with light yellowish brown to brown decumbent setae, setae associated with elevated parts on pronotum and costae in apical part of elytra denser and more apparent.

Head: fronto-clypeal impression distinct; frons densely granulose and setose. Antennomere (Fig. 67) III about 3.3× as long as IV; relative lengths of antennomeres as follows: IV-3; V-4; VI-3; VII-3.5; VIII-3; VII slightly broader than VI and VIII.

Pronotum 0.55–0.62× longer than wide, widest near middle; anterior angles blunt, slightly produced anteriorly; lateral and basal edges distinctly margined, lateral margins broadly explanate; lateral edge smooth or weakly crenulate; disc densely punctate; median part convex with three well marked impressions, one along midline in front of middle and admedian pair just behind it.

Elytra about 1.71–1.75× longer than wide and 3.1–3.2× longer than pronotum; disk convex, with broken costae on intervals 3, 4, 5 and 7, as in Fig. 1, only the first costa reaches elytral apex; elytra apically prominent, each separately rounded at apex; epipleuron broad, complete. Scutellary stria straight, consists of 5–6 punctures; elytron with 10 regular striae (somewhat distorted by interrupted costae); strial punctures large, rectangular, longitudinally separated by 0.5–1 diameter; surfaces reticulate, feebly shiny and setose.

Male genitalia and associated sclerites as in Figs 50, 58, 69

Types. Holotype: Australia, New South Wales, 31.54S 151.33E, Moppy Lookout, Barrington Tops S.F., 18.xi.1981, T. Weir & A. Calder, Berlesate ANIC 755, leaf litter *Nothofagus* rainforest (ANIC).

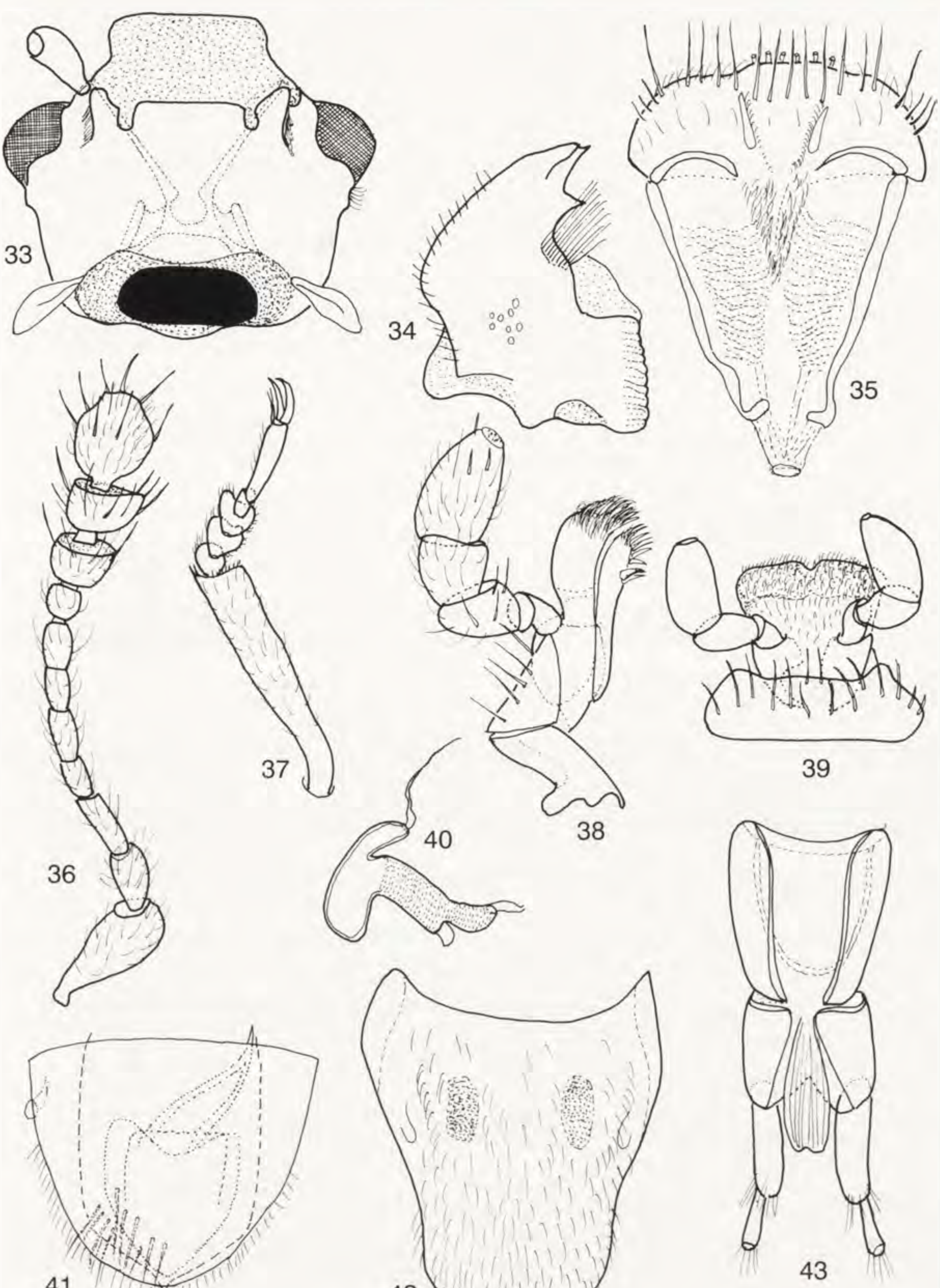
Paratypes: **New South Wales**: Brown Mountain, 36.36S 149.23E, 26.xii.1988, beating fallen *Eucalyptus* branches, C. Reid (4 ANIC); Cobark Forest Park, Barrington Tops, 11.ii.1984, I.D. Naunmann (1 ANIC); 31.54S 151.33E, Moppy Lookout, Barrington Tops S.F., 18.xi.1981, T. Weir & A. Calder, Berlesate ANIC 755, leaf litter *Nothofagus* rainforest (1 ANIC); 48 km N Singleton, Mt. Royal, 750 m, 13–15.xi.1981, H. & A. Howden (1 CNCI); New England Nat. Park, via Ebor, 1–2.i.1967, G. Monteith (4 UQIC, 2 ANIC, 5 MHZ); Upper Willliams R., x.1926, Lea & Wilson (2 MVMC); Mt. Allyn, Barrington Tops via Salisbury, 8.i.1967, G. Monteith (7 UQIC).

Ericmodes fuscitarsis Reitter
(Figs 40, 43–47, 49, 60, 64, 65, 71, 76, 79)

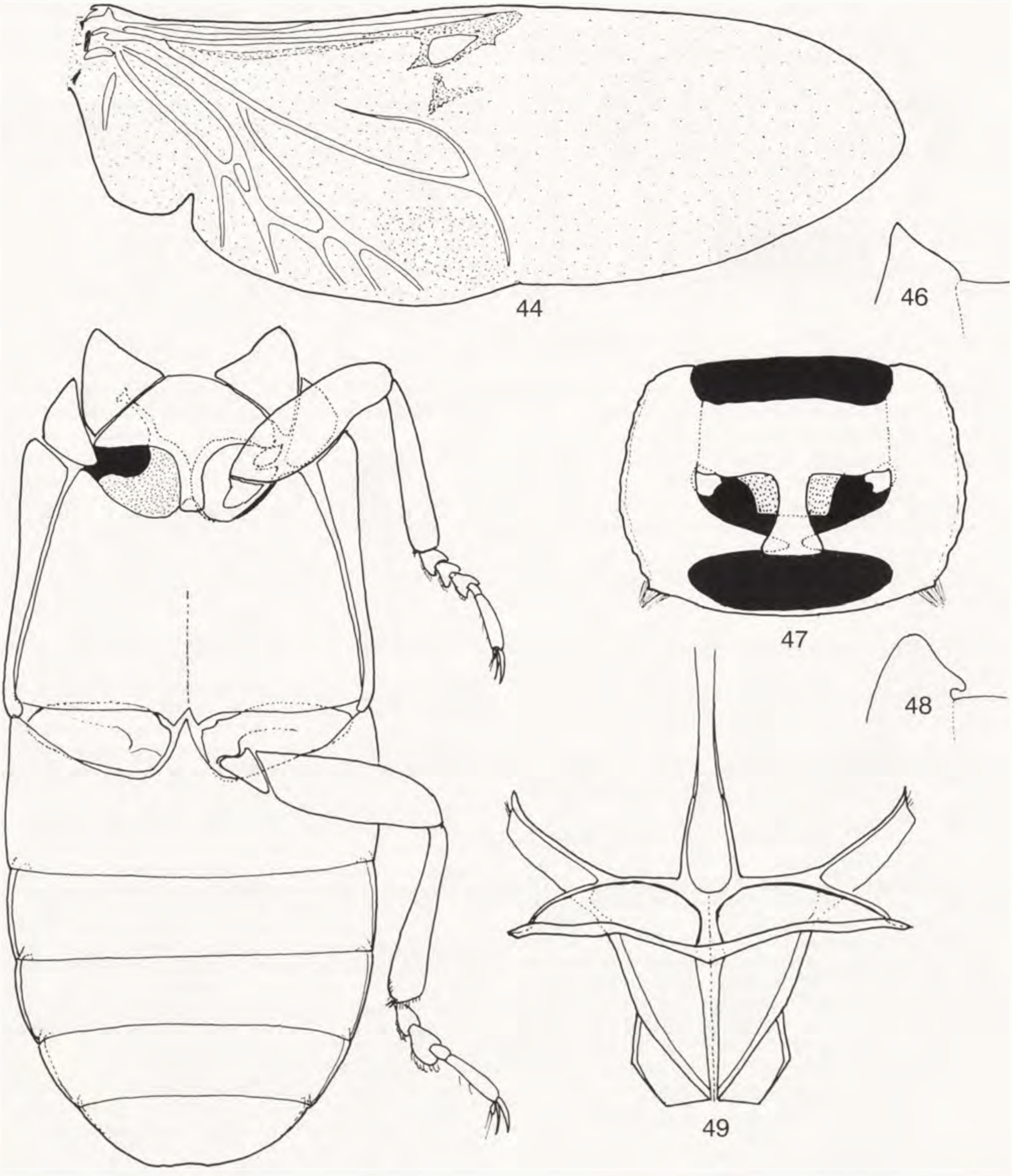
Ericmodes fuscitarsis Reitter, 1878: 168. Neotype, here designated, Chile (MNHN, examined).

Ericmodes chilensis Crowson, 1954: 60. Holotype, Chile, Concepcion (BMNH, examined), **syn. nov.**

Diagnosis. This species is very similar to *E. nigris* and *E. sylvaticus* and the 3 species may be distinguished from their congeners by the elytra bearing distinct impressions or nodules and body setae dense and apparent. *E. fuscitarsis*



Figures 33–43. *Ericmodes*, adult structures. 33–39, 41, 42. *E. sylvaticus*; 40, 43. *E. fuscitarsis*: (33) head, ventral; (34) mandible, dorsal; (35) labrum-epipharynx, ventral; (36) antenna; (37) protibia and tarsus; (38) maxilla, ventral; (39) labium, ventral; (40) spermatheca; (41) male abdominal tergites VII, VIII and sternite VIII, dorsal; (42) male tergite VII, dorsal; (43) ovipositor.



Figures 44-49. *Ericmodes*, adult structures (44–47, 49. *E. fuscitarsis*, 48. *E. costatus*): (44) wing; (45) pterothorax and abdomen, ventral; (46, 48) prothorax, lateral view, junction of notosternal suture and anterior margin of prosternum; (47) prothorax, ventral; (49) metendosternite, ventral.

and *E. nigris* differ from *E. sylvaticus* in their elytra bearing impressions but not nodulate intervals. *E. fuscitarsis* can be separated from *E. nigris* because of brown color, broadly explanate pronotal sides and the elytra without impression on intervals 2–3 near middle. Both these species are somewhat variable and in these cases the best characters on male genitalia (Figs 64, 65) should be consulted.

Description. Length 4.5–6.0 mm. Body elongate (TL/EW = 2.5–2.6), moderately convex, shiny; dorsal and ventral surfaces light to dark brown; dorsum covered with yellowish brown decumbent setae, setae associated with elevated parts on pronotum and elytra somewhat denser and lighter.

Head: fronto-clypeal impression distinct; frons densely punctate and setose. Antennomere III about 1.6–1.7× as long as IV; relative lengths of antennomeres as follows: IV-6; V-7; VI-5; VII-5; VIII-4; VII distinctly broader than VI and VIII.

Pronotum 0.68–0.73× longer than wide, widest at anterior third, more strongly narrowing posteriorly than anteriorly; anterior angles broadly rounded; lateral and basal edges distinctly margined, lateral margins explanate; lateral edge crenulate; disc densely punctate; median part convex with three well marked impressions, one along midline in front of middle and admedian pair just behind it.

Elytra about 1.86–1.94× longer than wide and 2.9–3.2× longer than pronotum; disk convex, with 4 shallow irregular impressions, one oblique starting below humerus toward suture, and 3 ovoid ones: one near middle on intervals 7–9, and two at apical third on intervals 1–3 and 5–7; elytra apically prominent, each separately rounded at apex; epipleuron incomplete apically. Scutellary stria irregular, consists of 8–12 punctures; elytron with 11 partially irregular striae, especially on rows towards lateral margins; strial punctures small, ovoid, longitudinally separated by 1 diameter; all intervals of similar width, surfaces shiny and setose.

Male genitalia and associated sclerites as in Figs 60, 64, 65, 71.

Types. *E. fuscitarsis*: "Chile Germain; 311; Museum Paris 1917 Coll. Grouvelle; Nitidulopus inaequalis mihi" (Neotype, MNHN) [right specimen of two on a single card].

P. chilensis: "Type; Chile, Concepcion, 26–28.xii.1926, F. & M. Edwards, BM 1927–63; Protocucujus chilensis Crowson, holotype" (BMNH).

Other material examined. ARGENTINA. **Chubut**: Esquel, Lago Menedez, 550 m, 20.ii.1979 (3 ZMCC). **Rio Negro:** Lago Nahuel Huapi, Puerto Blest, 770 m, 2.xii.1979 (1 ZMCC); Norquincó, 16.x.1967, A. Kovacs [labelled as Chile] (1 BMNH); CHILE. No specific locality (2 BMNH); P. Germain coll. (3 MNSC). **Aisen:** Puerto Aisen, 21.i.1968, L.& C.W. O'Brien (1 JFLC); 33 km E Pto. Aisen, Rio Simpson N. P., 70 m, 31.xii.1984–26.i.1985, select cut forest, FIT, S. & J. Peck (1 CMNO); 15 km. S Las Juntas, 30 km. N Puyuhuapi, 100 m, 30.xii.1984–29.i.1985, *Nothofagus* forest, FIT, S. & J. Peck (2 CMNO); Rio Correntoso, 22.i.1971, F. Silva (3 MNSC). **Cautín:** 20 km E Temuco, 7–8.i.1951, Ross & Michelbacher (2 CASC); NW Nueva Imperial, W Temuco, Fdo. Las Selvas, 600–700 m, 18.ii.1981, L.E. Peña (2 USNM); Villarica, Cudico, i.1980, L. Peña (5 MAIC). **Chiloé:** Chalten, 5–8.ii.1954, L. Peña (2 MNSC); 30 km N Quellon, 6.ii.1968, L.& C.W. O'Brien (1 JFLC); Dalcahue, 23.i.1962, R. Usinger (1 JFLC); San Pedro, 42'S, 2050ft, xi.1958 (2, BMNH). **Esperanza:** Puerto Eden, Isla Wellington, 49 S, 1–30.xii.1958 (8 BMNH); Lucky Retreat, Isla Piazzi, 25ft, 26.xii.1958, *Nothofagus* forest (1, BMNH). **Llanquihue:** Los Muermes Forest, 20.i.1951, Ross & Michelbacher (10 CASC); Pto. Varas, 26.ii.1945, E. A. Chapin (1 USNM); Fresia, xi.1982, L.E. Peña (1 FMNH); Lago Chapo, 16.ii.1982, G. Ariagada (1 MNSC). **Nuble:** Nogueche, 15.xii.1958, L. Peña (2 MNSC). **Osorno:** Osorno, 4.iii.1950, G. Kuschel (1 MNSC); 20 km W Puyehue, 26.i.1951, Ross & Michelbacher (27 CASC); Parque Nac. Puyehue, Anticura, 300 m, 7–9.iii.1978 (2 ZMCC); Parque Nac. Puyehue, 4.1 km E Anticura, 430 m, 19–26.xii. 1982, Valdivian RF, A. Newton & M.K. Thayer (2 ANIC); Parque Nac. Puyehue, Antillanca Rd., 690 m, 18–24.xii1982, Valdivian RF, A. Newton & M.K. Thayer (1 ANIC); 10 km E Puyehue, 26.i.1951, Ross & Michelbacher (2 CASC); 30 km. W Puranque, 16.i.1951, Ross & Michelbacher (10 CASC); Puyehue N. P., Aquas Calientes, 600 m, 18.xii.1984–8.ii.1985, malaise trap, *Nothofagus* forest, S. & J. Peck (6 CMNO); Puyehue N.P., Aquas Calientes, Derumbes Forest Trail, 500 m, 20.xii.1984–8.II.1985, FIT, S. & J. Peck (2 CMNO). **Valdivia:** Valdivia, 22.xi.1980, E. Krahmer (2 ZMCC); 8 mi E Rio Bueno, 15.i.1951, Ross & Michelbacher (11 CASC); 30 km S Valdivia, 13.i.1951, Ross & Michelbacher (4 CASC); Valdivia (1 MNSC); Chuiguayco, i.1980, L. Peña (4 MAIC); Pucura, i.1980, L. Peña (2 MAIC).

Comments. The type series of the Reitter species is apparently lost, and to stabilize the identity of his name I designate one of the specimens standing in the Grouvelle collection under the name "fuscitarsis" as the Neotype of this species. The original description by Reitter leaves little doubt this is the same species as described by Crowson under the name *P. chilensis*. The type series of *P. chilensis* Crowson, examined at BMNH, contains 2 species: the holotype is identical with *E. fuscitarsis* Reitter, while the paratypes clearly belong to *E. sylvaticus* (Philippi).

Ericmodes lawrencei Ślipiński et Pakaluk, sp. nov.
(Figs 3, 52, 59, 74, 77, 78)

Etymology. This species is named for Dr. John F. Lawrence (ANIC), in recognition of his tremendous contributions to our knowledge of the Australian beetle fauna.

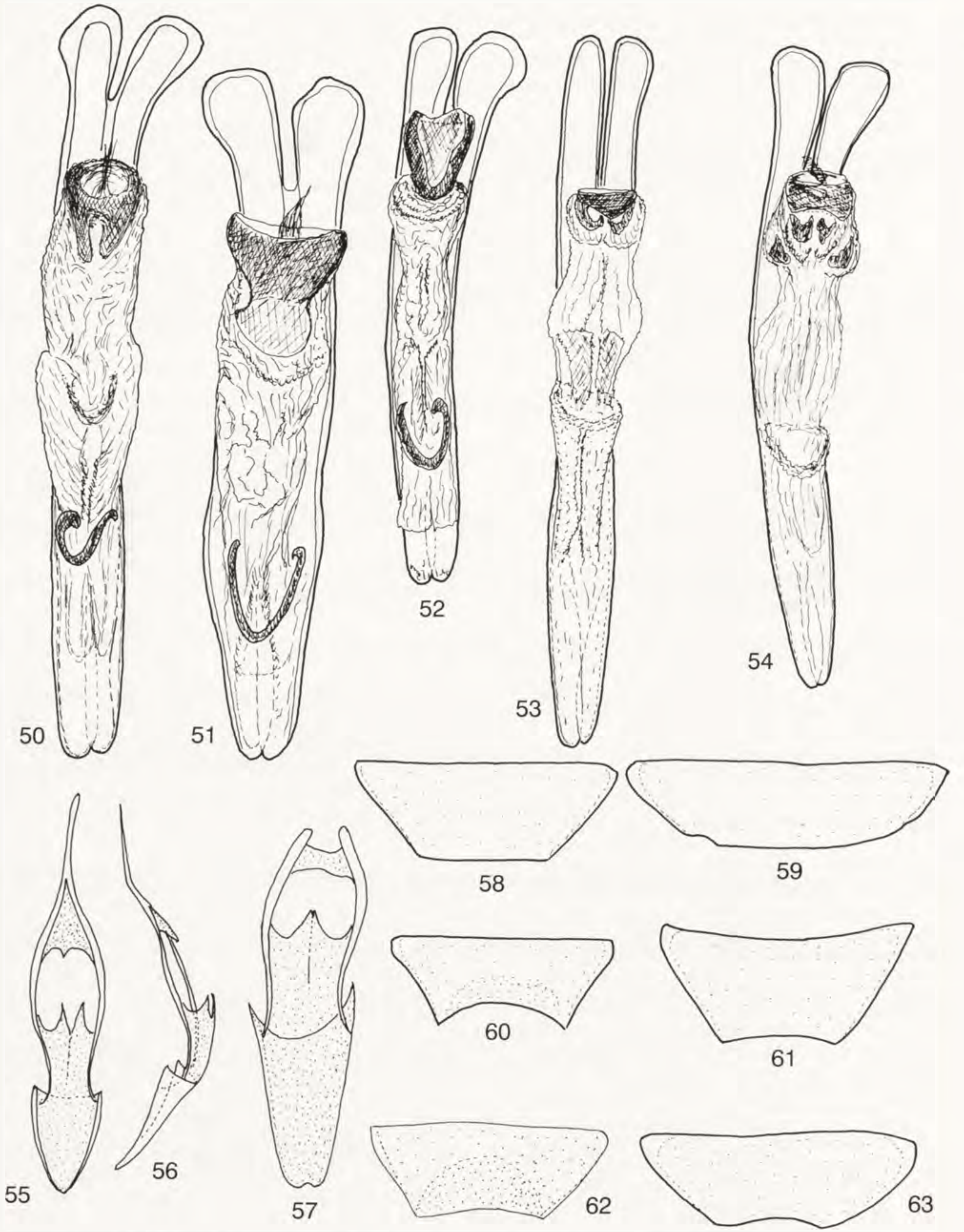
Diagnosis. This species is most similar to *E. australis* but is readily separated by its darker, more evenly colored body, the distinctly produced anterior angles of the pronotum, and the pronotal disk without admedian impressions near base.

Description. Length 3.9–4.7 mm. Body moderately elongate (TL/EW = 2.1–2.2), convex, shiny; dorsal and ventral surfaces dark brown to almost black, elytra usually with brownish spots in apical 2/3; dorsum covered with yellowish brown to light brown decumbent setae, setae along alternate intervals and on lighter spots in apical 2/3 of elytra apparently denser and lighter (Fig. 3).

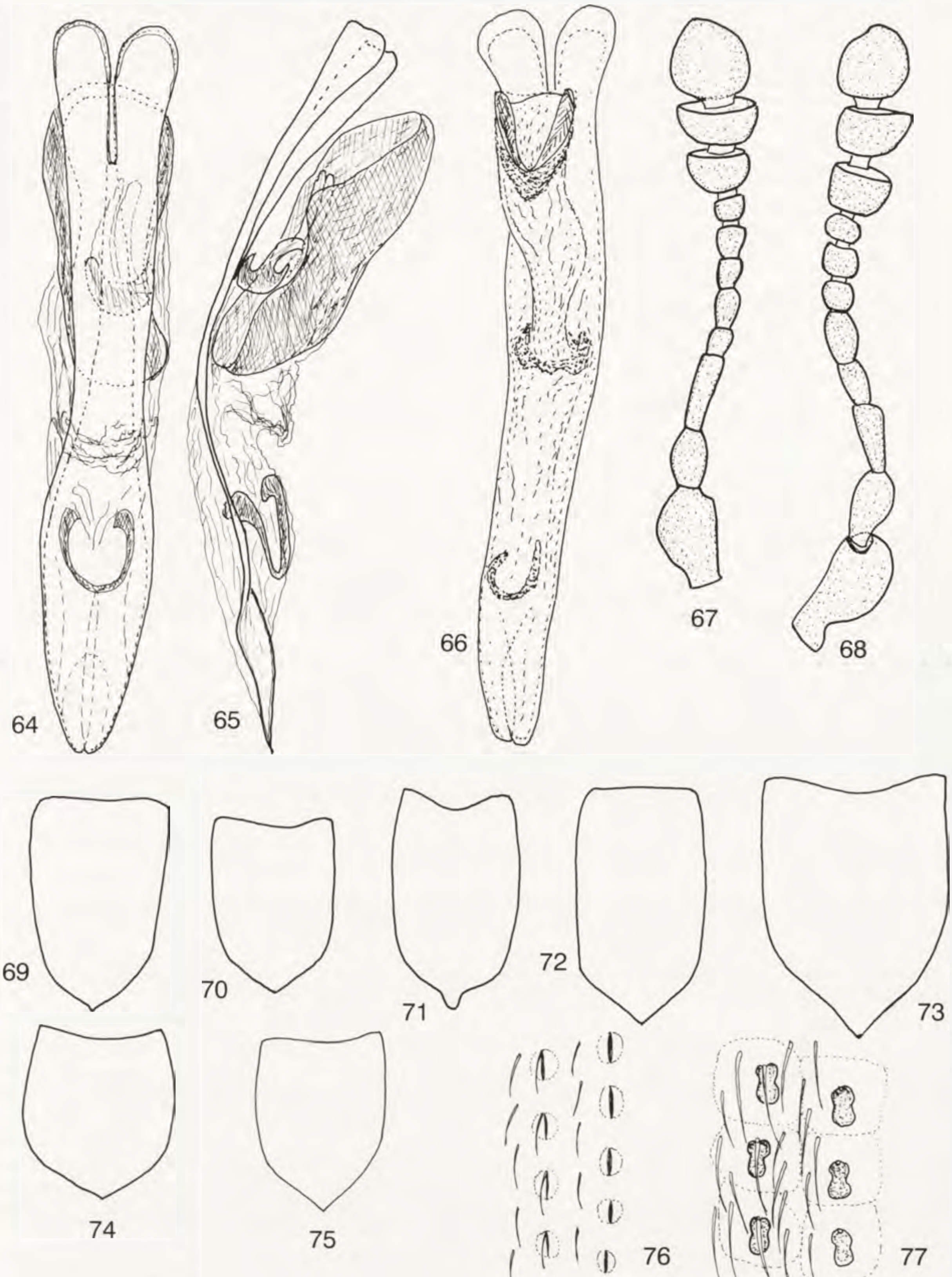
Head: fronto-clypeal impression weak; frons flat, densely punctate and setose. Antennomere III about 2× as long as IV; relative lengths of antennomeres as follows: IV-5; V-6; VI-4; VII-4; VIII-3; VII as broad as VI, slightly broader than VIII.

Pronotum 0.60–0.65× longer than wide, widest just before middle; anterior angles distinctly produced anteriorly; lateral and basal edges distinctly margined, explanate; lateral edge crenulate; disc densely punctate, punctures about 0.4–0.7 diameter apart, their interspaces shiny; median part convex, without distinct impressions.

Elytra about 1.50–1.62× longer than wide and 2.7–2.9× longer than pronotum; disk convex, without impressions or costae; each elytron separately rounded at apex; epipleu-



Figures 50–63. *Ericmodes*, adult, male structures. 50, 58. *E. costatus*; 51, 57. *E. australis*; 52, 59. *E. lawrencei*; 53, 61. *E. tarsalis*; 54-56, 63. *E. sylvaticus*; 60. *E. fuscitarsis*; 62. *E. nigris*. (50–54) Median lobe, inner view; (55, 57) tegmen, inner view; (56) tegmen, ventral; (58–63) last abdominal ventrite, ventral.



Figures. 64–77. *Ericmodes*, adult, male structures. 64, 65, 71, 76 *E. fuscitarsis*; 66, 75. *E. nigris*; 67, 69. *E. costatus*; 68, 72. *E. tarsalis*; 70. *E. sylvaticus*; 73. *E. australis*; 74, 77. *E. lawrencei*. (64–66) Median lobe; (67, 68) antenna; (69–75) tergite VIII, dorsal; (76, 77) elytral punctures and setae (rows 3–4, in middle length).

Figure 78. Known distribution of *Ericmodes* in Australia, *E. lawrencei* (▲); *E. costatus*(■); *E. australis* (●).

ron broad, complete. Scutellary stria consists of 5–6 punctures; elytron with 10 regular striae; strial punctures large, rectangular, longitudinally separated by about 1 diameter; intervals 3, 5, 7, 9 slightly broader than even ones and weakly convex; surfaces shiny and multi setose, setae in groups on brighter spots.

Male genitalia and associated sclerites as in Figs 52, 59, 74.

Types. Holotype: AUSTRALIA, Queesland, Paluma, 18.59S 146.09E,18.i.1970, rainforest, at 1ight, Britton, Holloway, Misko (ANIC).

Paratypes: **Queensland**: near Atherton, Mt. Baldy, ca. 4000 ft, 5.xii.1968, rainforest, Forest Reserve #194, Britton & Misko (2 ANIC); Bellenden Ker Range, 1054 m, Cable Tower 3, 17.x–5.xi.1981, MV light, rainforest (1 QMBC); 3 km SE Crater N.P., 18.xii.1982, J.F. Lawrence (1 ANIC); 2 km S Eongella, Broken River Road Rest Area, 13.i.1967, J.G. Brooks (2 ANIC) Kauri Creek, Tinaroo Dam, 24.iv.1970, G.B. Monteith (1 UQIC); N. side of Tinaroo, at light, 9.xi.66, E. Britton (1 ANIC); Kennedy Forest Road, 18.13.5S 145.47.5E, 8.xii.1968, rainforest, Britton & Misko (1 ANIC); Mt: Lewis via Julatten, 3500 Ft, 8.xii.1966, B. Cantrell (6 UQIC); Mt. Lewis Road, 3000 ft, 30.x.1966, at light, E. Britton (2 ANIC); Mt. Lewis, tin working site, 3.xii.1968, rainforest, at light, Britton & Misko (3 ANIC); Paluma, 18.59S 146.09E,18.i.1970, rainforest, at 1ight, Britton, Holloway, Misko (1 ANIC) Paluma, 6 km NW on Paluma Dam Rd, 14.i.1970, rainforest, at light, E. Britton (1 ANIC); 8 km W Paluma, Ewan Road, 8.i.1967, at light, J.G. Brooks (1 ANIC); 5 mi W Paluma, Ewan Road, 3.i.1966, J.G. Brooks (1 ANIC); Star Valley Lookout, Paluma, 13.i.1970, at light, J.G. Brooks (6 ANIC, 5 BMNH, 6 MVNM, 7 UQIC); Star Valley Lookout, c 5 km W of Paluma, 3.vii.1967, at light, J.G. Brooks (4 ANIC) 5 km W Paluma, ca. 950 m., 12.vii.1971, rainforest, ANIC berleseate 374, Taylor & Feehan (1 ANIC); Mt. Spec (Paluma), 12.i.1969, 3000', J.G. Brooks (2 BMNH); same data but 3.i.67 (4 BMNH); Mt. Spec, via Paluma, 17.xii.1966, B. Cantrell (1 UQIC); Mt. Spec, via Paluma, 21.iv.1968, G. Monteith (1 UQIC); Mt. Spec, 5–7.i.1965, J.G. Brooks (4 ANIC); Mt. Spec, 2.ii.1971, J.G. Brooks (1 ANIC); Mt. Spec, i.1969, J.G. Brooks (2 ANIC); Mt. Spec, near Paluma, i.1968, J.G. Brooks (3 ANIC); Paluma, 18.59S 146.09E,12 & 13.i.1970, at 1ight, Britton & Misko (12 ANIC); Paluma Dam Road, 13.i.1968, J.G. Brooks (1 ANIC); 8 km W Paluma, 3.i.1967, at light (5 ANIC); Paluma Dam Rd. 7 km WNW Paluma, 29.xi.1988, at light, R. Storey & G. Dicknacex (3 PIMQ); 8 km NW Paluma, 18.i.1970, rainforest, at light (4 ANIC); 2 km. SE Paluma,17.i.1970, rainforest, at light, Britton & Misko (4 ANIC); Paluma, ca. 2900 ft, 13.i.1970, at light, Britton & Misko (4 ANIC, 6 MVMC, 7 UQIC).

Ericmodes nigris Ślipiński et Pakaluk, sp. nov.
(Figs 62, 66, 75, 79)

Etymology. The name is an arbitrary combination of letters referring to the blackish body coloration.

Diagnosis. Separable from other *Ericmodes* species by its dark coloration and distinct impressions on elytra. The differences with *E. fuscitarsis* are discussed under diagnosis of that species.

Description. Length 4.5–5.8 mm. Body elongate (TL/EW = 2.2–2.9), convex, shiny; dorsal and ventral surfaces dark brown to black; dorsum covered with light silvery, decumbent setae, setae associated with elevated parts on pronotum and elytra somewhat denser and more apparent.

Head: fronto-clypeal impression distinct; frons convex, densely punctate and setose. Antennomere III about 1.6–1.7 as long as IV; relative lengths of antennomeres as follows: IV-6; V-6; VI-5; VII-4; VIII-4; VII distinctly broader than VI, as broad as VIII.

Pronotum 0.65–0.74× longer than wide, widest below anterior third, more strongly narrowing posteriorly than anteriorly; anterior angles blunt, not produced; lateral and basal edges distinctly margined, lateral margins narrowly explanate; lateral edge crenulate or denticulate; disc densely, strigosely punctate; median part convex with three well marked impressions, one along midline in front of middle and admedian pair just behind it.

Elytra about 1.72–1.80× longer than wide and 2.9–3.3× longer than pronotum; disk convex, with shallow, irregular impressions, an oblique one starting below humerus toward suture, and 4 ovoid ones: 2 near middle on intervals 1–2 and 6–8, and 2 at apical third on intervals 1–2 and 5–7; elytra apically slightly prominent, each separately rounded at apex; epipleuron incomplete apically. Scutellary stria consists of 8–12 punctures; elytron with 11 partially irregular striae, especially towards lateral margins; strial punctures small, ovoid, longitudinally separated by less than 1 diameter; all intervals of similar width, surfaces shiny and serially setose.

Male genitalia and associated sclerites as in Figs 62, 66, 75.

Types. Holotype: CHILE, Coquimbo, Fray Jorge Parq. N., 2.x.1967, L.& C.W. O'Brien (MNSC).

Paratypes: CHILE, same data as holotype (1 MCZC); Coquimbo: Bosque Fray Jorge, 11.xii.1950, Ross & Michelbacher (17 CASC; 4 MIIZ); Coquimbo, Talinay, 650–800 m, 16.x.1957, G. Kuschel (4 MNSC).

Ericmodes sylvaticus (R. Philippi)
(Figs 4, 25–39, 54–56, 63, 70, 80)

Coxelus sylvaticus R. Philippi, 1864: 405. Lectotype, here designated, Chile (MNSC, examined).

Ericmodes synchitoides Reitter, 1878: 168. Lectotype, here designated, Chile (MNHN, examined).

Diagnosis. This species differs from other members of the genus mainly in the presence of nodules along the elytral intervals giving uneven appearance (Fig. 4). In other respects, it shares the general body form and setal pattern with *E. fuscitarsis* and *E. nigris*. Darker specimens with less apparent nodules on elytra may resemble lighter colored *E. nigris*, but they also differ from that species in having the anterior pronotal margin broadly rounded and much more explanate margins of pronotum. In contrast to *E. fuscitarsis*, this species is usually smaller and the median lobe does not bear an elaborate sclerite in its internal sac.

Description. Length 3.5–4.7 mm. Body elongate (TL/EW = 2.4–2.5), moderately convex, shiny; dorsal and ventral surfaces light to dark brown; dorsum covered with light yellowish, decumbent setae, setae associated with elevated parts on pronotum and elytral nodules apparently denser and lighter.

Head: fronto-clypeal impression distinct; frons concave, densely punctate and setose. Antennomere III about 1.6–1.7× as long as IV; relative lengths of antennomeres as follows: IV-6; V-7; VI-5; VII-5; VIII-4; VII distinctly broader than VI, about as broad as VIII.

Pronotum 0.62–0.70× longer than wide, widest at anterior third, more strongly narrowing posteriorly than anteriorly; anterior angles broadly rounded, not produced; lateral and basal edges distinctly margined, lateral margins moderately explanate; lateral edge slightly crenulate; disc densely punctate; median part convex with three well marked impressions, one along midline in front of middle and admedian pair just behind it.

Elytra about 1.85–2.00× longer than wide and 2.3–3.7× longer than pronotum; disk convex, with numerous shallow, irregular impressions and nodules; elytra apically slightly prominent, each separately rounded at apex; epipleuron incomplete apically. Scutellary stria irregular, consists of 8–12 punctures; elytron with 11, mostly irregular striae, especially on rows towards lateral margins; strial punctures small, ovoid, longitudinally separated by 0.5–1.0 diameter; all intervals of similar width, surfaces shiny and setose.

Male genitalia and associated sclerites as in Figs 54–56, 63, 70.

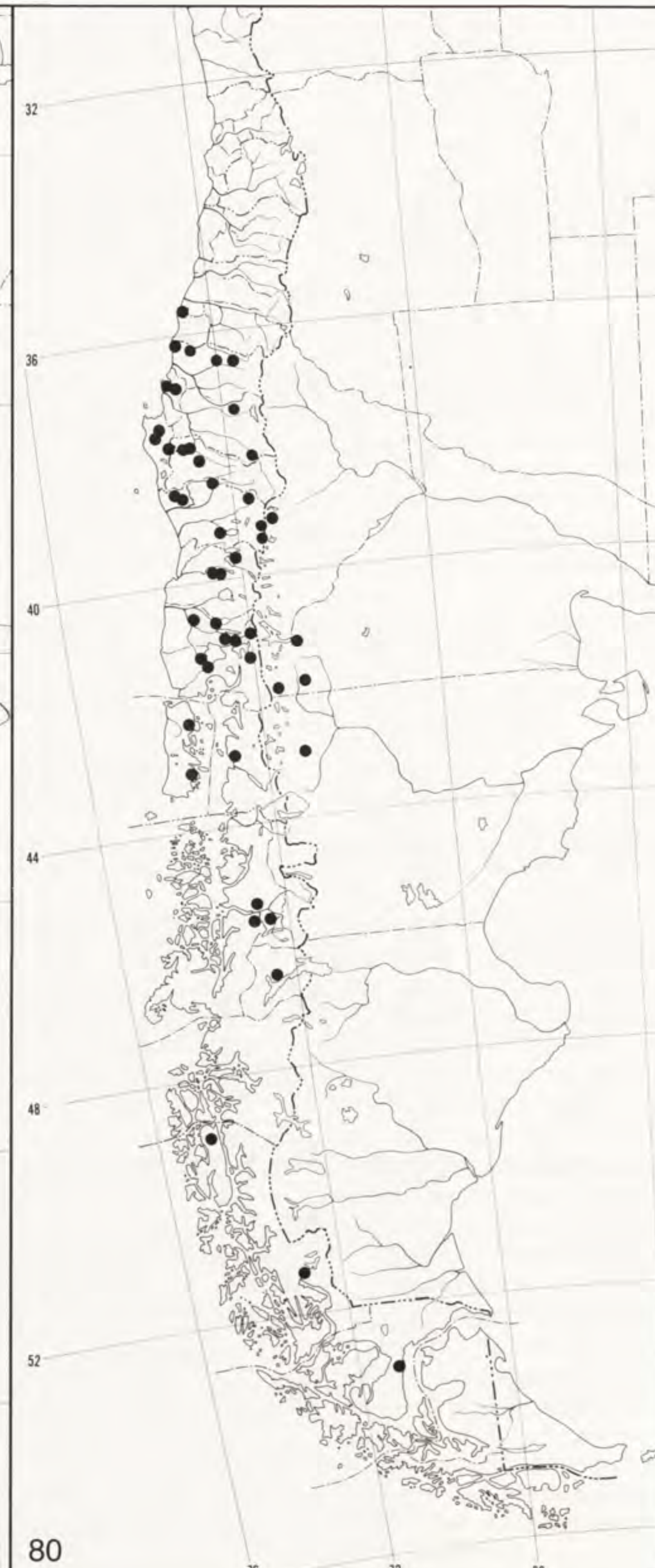
Types. *C. sylvaticus*: "R. Philippi; Sintipo; Chile MNHN, Tipo No 2849 (Lectotype, MNSC); data as above but No 2848. (2 Paralectotypes, MNSC).

E. synchitoides: "Chili; Ericmodes synchitoides m (Nitidulidae); Mus Paris 1917 Coll. Grouvelle; syntype (Lectotype, MNHN).

Other material examined. **PERU**: no specific locality (1 MNHN). **ARGENTINA**.

Chubut: Esquel, Lago Menedez, 550 m, 20.ii.1979 (10 ZMCC); El Puelo, Topal, 19.xi.1961 (1 TMB). **Neuquen:** Villa Angostura, 12.xii.46, Hayward (1 MLTA). **Rio Negro**: El Bolson, 7.i.1967 (6 MNHG); Norquincó, 16.x.1967 [labelled as Chile] (4 BMNH); El Bolson, 12.vi.58 [labelled as Chile] (1 BMNH); El Bolson, 20.x.61 [labelled as Chile] (1 BMNH); El Bolson, 4.xi.61 [labelled as Chile] (1 BMNH); El Bolson, Topal, 16.x.61 (20 TMB); Lago Nahuel Huapi, Puerto B1est, 2–3.xii.1926 [paratypes of *P. chilensis* Crowson] (2 BMNH); Lago Nahuel Huapi, Puerto Blest, 770 m, 1–10.xi.1980, Nielsen & Karsholt (1 ZMCC); Lago Nshuel Huapi, Puerto Blest, 13.xi.1978 (1 ZMCC); Lago Nahuel Huapi, Puerto Blest, 770 m, 22.xi.1978 (1 ZMCC).

CHILE. no specific locality (12 BMNH, 3 FMNH, 31 MNHN). **Aisen**: 15 km. S Las Juntas, 30 km N Puyuhuapi, 100 m, 30.xii.1984–29.i.1985, FIT, *Nothofagus* forest, S. & J. Peck (8 CMNO); 16 km NW Cisnes Medio, Rio Grande, 200 m, 30.xii.1984–28.i.1985, FIT, mature beech forest, S. & J. Peck (1 CMNO); 33 km E Pto Aisen, Rio Simpson N.P., 70 m 31.xii.1984– 26.i.1985, FIT, select cut forest, S. & J. Peck (11 CMNO); 33 km W. Coyhaique, 32.i.1968, L.& C.W. O'Brien (1, MCZC); Aysen, i.1979 (2 USNM); same, i.1961 (2 USNM); 33 km. E Pto Aysen, Rio Simson N.P., 31.xii.1984–26.i.1985, FIT, select moist cut forest, S. & J. Peck, FMHD #85–958, P #85–75 (8 FMNH); 33 km. W Coyhaique, 23.i.68 (1 MCZC); Rio Correntoso, 23.i.71, ex *Barberis buxifolia* (2 MNSC); Rio Correntoso, 22.i.1971, ex *Lomatia ferruginea*, J. Solevicens (2 MNSC); Rio Simpson Correntoso, 22.i.1971, ex *Myntacea*, J. Solevicens (1 MNSC); Lago B. Aires, Rio Murta, 25.i.56 (1 MNSC). **Arauco:** Cord. Nahuelbuta, Pillín Pilli, 14.i.54, L. Peña (4 MNSC); Cord. Nahuelbuta, Caramavida, 1200–1400 m, 1–6.ii.54, L. Peña (2 MNSC); Butamalil, 23.i.54 (1 MNSC). **Biobio:** El Abanico, Bio Bio, 30.xii.50, Ross & Michelbacher (2 CASC); El Abanico, Bio Bio, 3.xii.50, Ross & Michelbacher (1 CASC); El Abanico, Bio Bío, 3.i.51, Ross & Michelbacher (3 CASC); Los Muermes Forest, 20.i.51, Ross & Michelbacher (57 CASC); Los Muermes Forest, 19.i.1951, Ross & Michelbacher (6 CASC); Lepihue, sea coast W P. Montt, 21.i.51, Ross & Michelbacher (11 CASC); 8 mi W Puerto Varas, 16.i.51, Ross & Michelbacher (12 CASC); 10 NE Pucon, 12.i.51, Ross & Michelbacher (3 CASC); 45 km W Angol, Nahuelbuta N.P., 1400 m, 9.xii.1984–16.ii.1985, car trap, *Nothofagus-Araucaria* forest, S. & J. Peck (1 CMNO); 40 km W Angol, Nahuelbuta N.P., 1500 m, 9.xii.1984-17.ii.1985, FIT, *Nothofagus-Araucaria* forest, S. & J. Peck (2 CMNO); Pto. Montt, 20.ii.1945, E. A. Chapin (1 USNM); Pto. Varas, 26.ii.1945, E.A. Chapin (8 USNM). **Cauquenes:** Constitución, Fdo. El Litre, 22.ii.77, T. Montecinos (1 MNSC). **Cautín:** Chacamo, NW Nueva Imperial, 600–700 m, 17–23.ii.1981, L.E. Peña (80 USNM); Chiquaico,



Figures 79, 80. Known distribution of *Ericmodes* Chile and Argentina. 79. *E. nigris* (▲), *E. tarsalis* (■) and *E. fuscitarsis* (●). 80. *E. sylvaticus*.

i.1978, L. Peña (3 ZMCC); Villarrica, Oxilico, i.1980, L. Peña (15 MAIC); Fdo. Las Selvas, NW Nueva Imperial, W Temuco, 8.ii.81 (16 USNM); Can. Llaina, 16.i.72, C. Vivar (1 MNSC); 20 km E Temuco, 7–8.i.51, Ross & Michelbacher (24 CASC); Volcan Villarica, 1120 m, site 654, 15–29.xii.1982, FIT, A. Newton & M.K. Thayer (1 ANIC); Pucon, Vol. Villarrica; N.P., 900 m, 15.xii.1984–10.ii.1985, FIT, *Nothofagus* grove on ash, S. & J . Peck (3 CMNO); 21 km NE Pucon, Lago Caburga, 600 m, 15.xii.1984–10.ii.1985, FIT, mixed forest remnant, S. & J. Peck (2 CMNO); Fdo. Las Selvas, 600–700 m, 18.ii.1981, L. E. Peña (38 USNM). **Chiloé**: no specific locality (5 MNSC); Chiloé Island, Ahoni Alto, xi.1988, MT, primary forest, L.E. Peña (1 CNCI); Chiloé Island, 8 km S Ancud, 1.ii.1985, forest remnant, berlese, S. & J. Peck, FMND #85–993, P #85–110 (1 FMNH); Chiloé, 42S, 18.x.58 (1 BMNH); Quellon, 1955 (2 MNSC); Dalcahue, 10–12.ii.54, L. Peña (2 MNSC);Dalcahue, 18.i.62, R. Usinger (1 MCZC, 1 USNM); Chaiten, 5–8.ii.54, L. Peña (1 MNSC). **Concepción**: no specific locality, 25.xi.54 (1 MNSC); 6 km S San Pedro, 360 m, 12.xii.1982–2.i.1983, FIT, *Pinus* forest, A. Newton & M.K. Thayer (1 JFLC, 3 ANIC). **Esperanza**: Puerto Eden, Isla Wellington, 49 S, 13.xii.1958 (3 BMNH). Frutillar Bajo: Univ. Chile Forest Reserve, 100 m, 22.xii.1984–2.ii.1985, FIT, ravine mixed forest, S. & J. Peck (3 CMNO). **Llanquihue**: no specific locality, v.1976 (1 USNM); Peulla, 7.iii.1959, J.Clarke (3 USNM); Peulla, 9.iii.1959, J.Clarke (3 USNM); Lago Chapo, 16.ii.82, G. Arriagada (1 MNSC); Frutillar, 29.xii.43, G. Kuschel (1 MNSC); Casa Pangue; 4–10.xii.26 [paratypes of *chilensis* Crowson] (2 BMNH); Puerto Veras, 28.v.52 (1 MNSC); 4 km. S Los Muermos, 170 m, 12.xi.66, M.E. Irwin & E.I. Schlinger (2 CASC). Magallanes: Parque Nat. Torres del Paine, Lago Grey, 9.x.85, ex *Nothofagus pumilio* (1 MNSC); Punta Arenas, Puerto Varas, 5.ii.51 (1 MNSC); Dos Lagunas, 13.i.68 , C.W.L. O'Brien (1 CASC). **Magallanes:** P.N. torres del Paine, Lago Grey, 9.x.1985, M. Elgueta (1, MNSC); Pta Arenos, Pen. Varas, 5.ii.1951, T. Cekalovic (2, MNSC). **Malleco:** Cabreria, i.1977, L. Peña (16 MAIC); 6.i.51, Ross & Michelbacher (10 CASC); Sierra do Nahuelbata W of Angol, 1200 m, 3.i.51, Ross & Michelbacher (3 CASC); 17 km W Angol, 800 m, 8.xii.1984–16.ii.1985, FIT, mixed *Nothofagus*, S. & J. Peck (8 CMNO); 17 km W Angol, 8.xii.1984–16.ii.1985, S & J. Peck (7 FMNH); Angol, Los Alpes, 850 m, 17.iii.1979 (2 ZMCC); 4 km W Victoria, 300 m, 26–27.xii.1976, H.F. Howden (1 CNCI); 3 km W Victoria, 100 m, 13.xii.1984–12.ii.1985, FIT, mixed *Nothofagus* forest, S. & J. Peck (1 CMNO); Puren Contulmo Natur. Mon, 350 m, 11.xii.1984–13.ii.1985, FIT, mixed evergreen forest, S. & J. Peck (3 CMNO). **Nuble**: 40 km E San Carlos, 24.xii.50, Ross & Michelbacher (1 CASC); Estero Bulileo, 13–15.02.1981, M. Elgueta (1 MNSC); Nogueche, 12 km S de Cobquercura, 13–17.xii.1953, L. Peña (2 MNSC); Cobquercura, 14.xii.1953, L. Peña (2 MNSC). **Osorno**: Osorno, 4.iii.1950, G. Kuschel (1 MNSC); Parque Nat. Puyehue, 300 m, 7–9.iii.1979 (4 ZMCC); Parque Nat. Puyehue, Atillanca Road, 470–720 m, 18–24.xii.1982, screen sweeping at dusk, Valdivian Rainforest, A. Newton & M.K. Thayer (1 JFLC); Parque Nat. Puyehue, 4.1 km E Anticurs, 430 m, 26.xii.1982, sweep at dusk, A. Newton & M.K. Thayer (1 JFLC); Parque Nat. Puyehue, Atillanca Road, 720 m, 18–24.xii.1982, FIT, *Nothofagus* spp., A. Newton & M.K. Thayer (2 JFCL, 2 ANIC); 30 km E Purranque, 15.I.51, Ross & Michelbacher (27 CASC); 30 km W Purranque, 16.i.51, Ross & Michelbacher (21 CASC); 20 km E Puyehue, 26.i.51, Ross & Michelbacher (10 CASC). **Valdivia:** Valdivia, 22.xi.1980, E. Krahmer (6 ZMCC); Huellelhue, 7.iii.1972, L. Alfaro (3 MNSC); Raiñhue, 1949, L. Peña (1 MNSC); Chianguyco, i.1980, L. Peña (7 MAIC); Pucura, i.1978, L. Peña (13 MAIC). Specimens with no label data (22 MNHN, 6 MNSC).

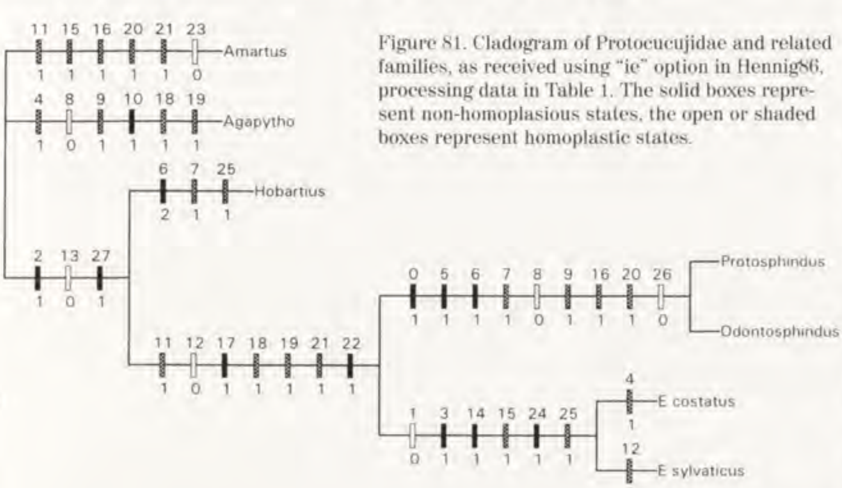


Figure 81. Cladogram of Protocucujidae and related families, as received using "ie" option in Hennig86, processing data in Table 1. The solid boxes represent non-homoplasious states, the open or shaded boxes represent homoplastic states.

Ericmodes tarsalis Ślipiński et Pakaluk, sp. nov. (Figs 53, 61, 68, 72, 79)

Etymology. The name is derived from the Greek "tarsos", meaning foot and referring to the unusually broad tarsomeres in this species.

Diagnosis. This species is easily distinguished by the characters given in the key. It is most notable for its light brown color combined with in conspiciuous pubescence and even elytra.

Description. Length 4.1–4.7mm. Body elongate (TL/EW = 2.6–2.8), moderately convex, shiny; dorsal and ventral surfaces light brown or yellowish; dorsum covered with sparse, not conspiciuous, light yellowish decumbent setae.

Head: fronto-clypeal impression indistinct; frons densely punctate and setose. Antennomere III about 2× as long as IV; relative lengths of antennomeres as follows: IV-5; V-7; VI-5; VII-4; VIII-3; VII distinctly broader than VI and VIII.

Pronotum 0.72–0.75× longer than wide, widest at anterior third, more strongly narrowing posteriorly than anteriorly; anterior angles rounded, not produced; lateral and basal edges distinctly margined, lateral margins moderately explanate; lateral edge almost smooth; disc densely punctate; median part convex with three barely traceable impressions, one along mid line in front of middle and admedian pair just behind it.

Elytra about 2.0–2.1× longer than wide and 2.9–3.0× longer than pronotum; disk convex, without impressions or nodules, not distinctly prominent apically, each separately rounded at apex; epipleuron incomplete apically. Scutellary stria consists of 8–10 punctures; elytron with 11 striae, these fairly regular on disk but irregular towards apices and lateral margins; rows 7 and 9 joined in apical third; strial punctures small, ovoid, longitudinally separated by 1 diameter; all intervals of similar width, apparently convex, surfaces shiny, with single row of setae. Legs: lobed tarsomeres comparatively broader than in other South American species.

Male genitalia and associated sclerites as in Figs 53, 61, 68, 72.

Types. Holotype: CHILE: P.N. Lag. San Rafael, Paso Ruesahuen, 22.1.1978, J. Solervicens (MNSC);

Paratypes: Chile: no specific locality (1, MNHN); same data as holotype (1 MNSC, 1 MIIZ); CAUTÍN: Chacamo, NWN Imperial, 600–700 m, 15–20.ii.1981, L.E.Peña (2, FMNH); Fdo. Las Selvas, 600–700 m, 18.ii.1981, L. E. Peña (2 USNM); Arauco: Cord. Nahuelbuta Caramavida, 1200–1400 m, 1–6.1.1954, L. Peña (MIIZ).

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