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Abstract. *Australophanus*, **new genus**, is described and illustrated for *Cryptamorpha redtenbacheri* (Reitter). *Platamus* Erichson is synonymized under *Telephanus* Erichson, **new synonymy**. *Euplatamus* Sharp, **new status**, replaces *Platamus* Erichson as the genus name. Type species are designated for *Aplatamus* Grouvelle and *Euplatamus* Sharp. *Telephanus velox* (Haldeman) is synonymized under *Telephanus atricapillus* Erichson. A diagnosis of the tribe Telephanini, a key to the described telephanine genera of the world is presented, and a phylogeny of the family Silvanidae is proposed.

Introduction

Redtenbacher (1867) described the genus *Parabrontes* for *P. silvanoides* from New Zealand, and Reitter (1876) described *Parabrontes redtenbacheri* from Chile. Waterhouse (1876) synonymized *Parabrontes* under *Cryptamorpha* Wollaston (1854) and *P. silvanoides* under *C. brevicornis* (White 1846). However, Waterhouse (1876) did not mention *P. redtenbacheri*, which by his synonymy moved to *Cryptamorpha*, where Hetschko (1930) subsequently listed it. In a review of New Zealand Cucujidae (*sens. lat.*), Lefkovitch (1961) accepted Waterhouse's (1876) synonymies.

Cryptamorpha redtenbacheri differs significantly from other members of the genus, and, since it fits in no other described telephanine genus, a new genus is here erected. As a diagnosis was recently supplied for the Brontini (Thomas 2004), a tribal diagnosis and a key to the genera for Telephanini are provided.

Silvanidae classification has long been unsettled (see review by Thomas 1984). Most recent authors have used four subfamilies: Brontinae, Psammoecinae, Cryptamorphinae, and Silvaninae. Thomas (1984) grouped the first three taxa together based on shared possession of a number of characters (e.g., inverted male genitalia, mandibular mycangium). In an attempt to shed some light on silvanid relationships, a preliminary phylogenetic analysis was performed to offer a testable hypothesis for the classification.

The senior author is responsible for the taxonomic and nomenclatural decisions and drew up the character matrix for the analysis. The junior author performed the analysis.

Phylogenetic Methods

The data matrix was coded and edited in WinClada (Nixon 2002). Sixteen morphological characters with 33 character states were coded for 21 taxa (Table 1 and 2). Leschen et al. (2005) found support for a monophyletic Cucujidae+Silvanidae. The cucujid *Pediacus subglaber* LeConte is utilized as the outgroup. All characters were equally weighted and non-additive. Data were analyzed using NONA (Goloboff 1995) as implemented in WinClada heuristics. The commands 'hold 10000', 'hold/20', 'mult*50' and 'mult*max*' were used to find the most parsimonious trees. Unsupported nodes were collapsed in all trees using WinClada. Consistency Index (CI) and Retention Index (RI) were calculated in WinClada. Bremer support values (Bremer 1994) were calculated using NONA by reading in the consensus of the most parsimonious

Table 1. Characters and character states.

Adults
1. Maxillary palp: 0) simple; 1) securiform
2. Labial palp: 0) simple; 1) securiform
3. Mandibular mycangium: 0) present; 1) reduced or absent
4. Frontoclypeal suture: 0) present; 1) absent
5. Frontal lines: 0) present; 1) absent
6. Antennal scape: 0) elongate; 1) not elongate
7. Procoxal cavities: 0) open; 1) closed
8. Third tarsomere: 0) simple; 1) with single ventral lobe; 2) bilobed
9. Male tarsal formula: 0) same as female; 1) different than female
10. Scutellum: 0) not excavate; 1) excavate posteriorly
11. Scutellary striole: 0) present; 1) absent
12. Orientation of aedeagus: 0) normal; 1) inverted, with parameres located on the ventral aspect of the median lobe
13. Parameres: 0) normal; 1) reduced or absent

Larvae
14. Antennae: 0) with distinct antennomere III; 1) antennomere III reduced and fused to II.
15. Urogomphi: 0) present; 1) absent.
16. Tarsungular setae: 0) separated; 1) close together.

cladograms and using the commands "hold 1000; sub 1; find*", "hold 2000; sub 3; find*", "hold 4000; sub 5; find*", and "bsupport 10."

Results of the Cladistic Analysis

Phylogenetic analyses resulted in 12 most parsimonious trees (TL = 30). The strict consensus of these trees (TL = 36, CI = 47, RI = 77) suggests that the subfamilies Silvaninae and Brontinae are monophyletic sister groups, with the tribe Telephanini as a monophyletic group within the Brontinae (Figs. 28, 29). Bremer support values ranged from 1 to 3. A relatively high Bremer support value of 3 was reported for the Brontinae clade. Relatively lower branch support values of 2 and 1 were reported for the Silvaninae and Telephanini clades respectively.

Correct name of the tribe

Pal (1981, 1985) and Pal et al. (1985) divided telephanine genera between two subfamilies, the Psammoecinae Reitter and the Cryptamorphinae Casey, but did not assign all genera to those subfamilies. Hetschko (1930) also used the two subfamilial designations but listed some genera now included in them within the Silvaninae. As this group of genera appears to be of equivalent rank to the Brontini, we prefer to treat the group as one tribe within the subfamily Brontinae. Telephanini LeConte (1861) is the correct name for the tribe. It has priority over Psammoecini Reitter (1880), Telephanini Casey (1884), and Cryptamorphini Casey (1884).

Tribe Telephanini LeConte 1861

Diagnosis. Within the Brontinae, all members share inverted male genitalia, a dorsal mandibular mycangium, longitudinal frontal grooves, tuberculate to spinose lateral pronotal margins, and elongate to very elongate antennal scapes. Members of Telephanini differ from members of Brontini in their posteriorly closed anterior coxal cavities, narrowly separated anterior and middle coxae, and lobed tarsomere III.

Form. Elongate, fusiform to ovate, mostly elongate, parallel-sided; size small to medium, 3-7mm in length.

Table 2. List of taxa included in analysis and character matrix.

Taxon/Character	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Cucujidae																
*Pediacus subglaber**	0	0	1	1	0	1	0	0	1	0	1	1	0	0	1	1
Silvanidae: Brontinae: Telephanini																
Telephanus atricapillus Erichson	1	1	0	0	1	0	1	1	0	1	1	1	0	0	1	0
Aplatamus sp.	0	1	0	1	0	0	1	0	0	1	0	1	1	?	?	?
Euplatamus sp.	0	1	0	1	0	0	1	1	0	1	0	1	0	?	?	?
Psammoecus sp.*	1	1	0	0	0	0	1	1	0	0	1	1	0	0	1	0
Australophanus redtenbacheri (Reitter)	0	0	0	0	0	0	1	1	0	1	0	1	1	?	?	?
Cryptamorpha desjardinsi (Guérin-Menéville)	0	1	0	0	0	0	0	2	0	1	0	1	0	0	0	0
Indophanus dakshinus Pal	1	1	0	0	0	0	1	1	0	?	1	1	?	?	?	?
Megapsammoecus christinae Karner	0	0	0	0	0	0	1	2	0	1	0	1	1	?	?	?
Psammaechidius spinicollis Fairmaire	1	1	0	0	0	0	1	1	0	1	0	1	0	?	?	?
Silvanidae: Brontinae: Brontini																
Uleiota dubius (Fabricius)	0	1	0	1	0	0	0	0	0	0	1	1	0	0	0	0
Parahyliota fallax (Grouvelle)*	0	1	0	1	1	0	0	0	0	0	1	1	1	0	0	1
Macrohyliota spinicollis (Gory)	0	1	0	1	1	0	0	0	0	0	0	1	0	?	?	?
Australohyliota chilensis (Blanchard)*	0	1	0	1	1	0	0	0	0	0	0	1	0	0	0	?
Dendrophagus cygnaei Mannerheim*	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	?
Silvanidae: Silvaninae																
Nausibius major Zimmermann	0	0	1	1	1	1	1	0	0	0	1	0	0	?	?	?
Oryzaephilus surinamensis (L.)	0	0	1	1	1	1	1	0	0	0	1	0	0	1	1	1
Silvanus planatus Germar	0	0	1	1	1	1	1	0	0	0	1	0	0	?	?	?
Ahasverus rectus (LeConte)*	0	0	1	1	1	1	1	1	0	0	1	0	0	1	1	1
Cathartus quadricollis (Guérin-Menéville)	0	0	1	1	1	1	1	1	0	0	1	0	0	?	?	?
Monanus concinnulus (Walker)*	0	0	1	1	1	1	1	1	0	0	1	0	0	1	1	1

***Notes:** For *Pediacus*, larval characters from *P. japonicus* Reitter (Klausnitzer 2001); for *Psammoecus*, larval characters from *P. trimaculatus* Motschulsky (Sen Gupta and Pal 1996); for *Parahyliota*, larval characters from *P. indica* (Arrow) (Sen Gupta and Pal 1996); for *Australohyliota chilensis*, larval characters from Cekalovic and Quezada (1972); for *Dendrophagus*, larval characters from *D. longicornis* Reitter (Klausnitzer 2001); for *Ahasverus*, larval characters from *A. advena* (Waltl) (Sen Gupta and Pal 1996); for *Monanus concinnulus*, larval characters from Sen Gupta and Pal 1996.

Surface sculpture and pubescence. Moderately to densely punctate, with pubescence usually long and conspicuous. None known with surface encrustation.

Head. Transverse, somewhat triangular in shape; frontoclypeal suture present or not; apex of clypeus subtruncate, epistome usually deeply emarginate over antennal insertions; frontal region bounded laterally by longitudinal grooves in most genera; temples slightly to markedly produced; head usually transversely impressed behind temples and abruptly constricted to form neck; gular region simple or semicircularly impressed; gular sutures present, widely separated, divergent posteriorly. **Mouthparts.** Mandibles stout, laterally expanded or carinate, with two apical teeth and a dorso-basally located, small to large mycangium bounded anterolaterally with a tubercle (Fig. 11); prostheca and mola present. Labrum short, transverse, apparently immovable. Mentum transverse. Maxillary palps with apical palpomere simple to strongly securiform; galea broadly rounded and densely setose; lacinia with two apical teeth. Labial palps with terminal palpomere simple to securiform. **Antennae.** Filiform, elongate; terminal antennomeres not forming a distinct club; scape elongate to very elongate; pedicel usually shorter than antennomere III. **Eyes.** Moderate to large, flattened to hemispherical.

Thorax. Pronotum. Quadrate to transverse, lateral margins tuberculate to spined. **Prosternum.** Anterior coxal cavities narrowly separated (Fig. 10) (moderately separated in *Aplatamus*), closed posteriorly; intercoxal process narrow; protrochantin not exposed. **Scutellum.** Moderate, rounded or angulate posteriorly, usually with a distinct transverse carina or groove paralleling posterior margin (Fig. 15, 17, 23, 24). **Mesosternum.** Meets metasternum in a straight to curved line, suture simple; mesocoxal cavities approximate to narrowly separated (Fig. 10) (moderately separated in *Aplatamus*), open laterally; closed by mesepimeron only, mesepisternum does not contribute to closure; mesepisternum apparently fused to mesepimeron and mesosternum, sutures obliterated (Fig. 9); mesotrochantin not exposed. **Metasternum.** Transverse; discrimen present for half or more of length.

Figure 1-6. Habitus. **1)** *Australophanus redtenbacheri* (Reitter). **2)** *Euplatamus* sp., Bolivia. **3)** *Aplatamus* sp., Mexico. **4)** *Telephanus dentatus* Nevermann, Haiti. **5)** *Psammoecus* sp., Sulawesi. **6)** *Cryptamorpha desjardinsi* (Guérin-Menéville).

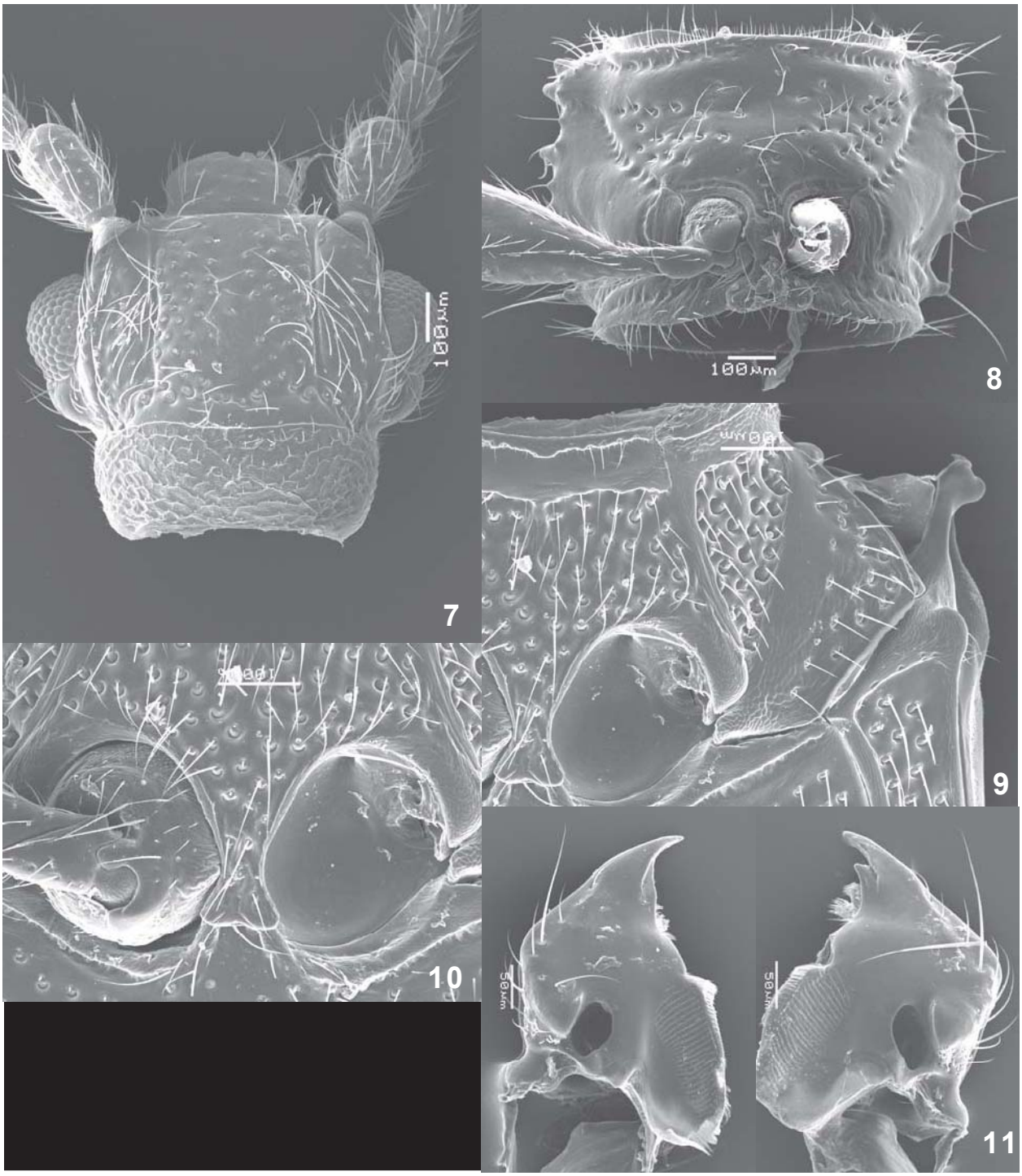

Figure 7-11. *Australophanus redtenbacheri*.**7)** Head, dorsal. **8)** Prosternum. **9)** Mesocoxal cavity and associated sclerites. **10)** Mesosternal process. **11)** mandibles, dorsal

Elytra and hind wings. Elytra striatopunctate, disk usually with six or seven rows of punctures plus a scutellary striole (Fig. 17, 23, 24) (absent in *Telephanus*, *Psammoecus*, and *Indophanus*); intervals flat to convex; lateral margin explanate to a greater or lesser degree, sometimes denticulate; epipleura usually complete to about apical fifth, narrow to very broad. Hind wing venation well developed (Fig. 18-20).

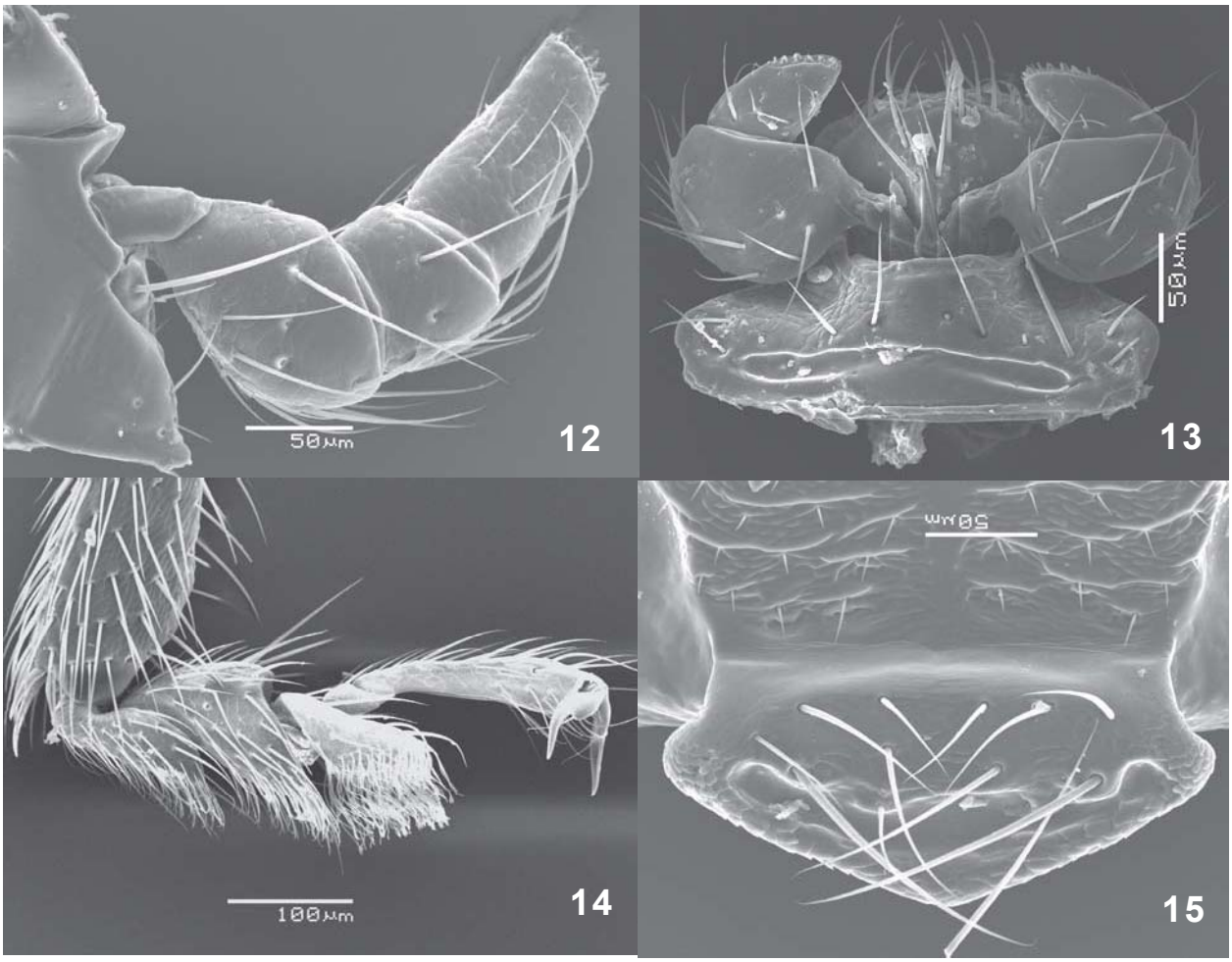

Figure 12-15. *Australophanus redtenbacheri.* **12)** Maxillary palp. **13)** labial palp. **14)** tarsus. **15)** scutellum.

Legs. Usually elongate; tibial spurs present, short, subequal; tarsal formula 5-5-5 in both sexes; tarsomere I short, oblique; II usually simple, sometimes lobed; III strongly lobed (except in *Aplatamus*) or bilobed; IV very short and deeply imbedded in III; V elongate, tarsal claws simple (Fig. 14).

Abdomen. Five subequal sternites, punctate, no sexual dimorphism; intercoxal process narrow; femoral lines closed.

Genitalia. Male genitalia of inverted cucujoid type. Parameres located on the ventral aspect of the median lobe, usually elongate and articulated (Fig. 22), reduced in *Aplatamus* (Fig. 27) and *Megapsammoecus*, absent in *Australophanus* (Fig. 21); internal sac usually with a flagellum.

***Australophanus* Thomas, new genus**

Type species. *Parabrontes redtenbacheri* Reitter 1876: 45.

Diagnosis. *Australophanus* is most similar to *Cryptamorpha*, but differs from it by the non-securiform palpi (securiform in *Cryptamorpha*), non-bilobed tarsi (bilobed in *Cryptamorpha*), and lack of parameres (present in *Cryptamorpha*).

Description. With characteristics of Brontinae: Telephanini as described above, plus: frontoclypeal suture present (Fig. 16); one pair of longitudinal frontal lines present (Fig. 16); eyes large, hemispherical, about 0.4 length of head capsule; temples long, about 0.5 length of eye; antennal scape about 0.5 length of

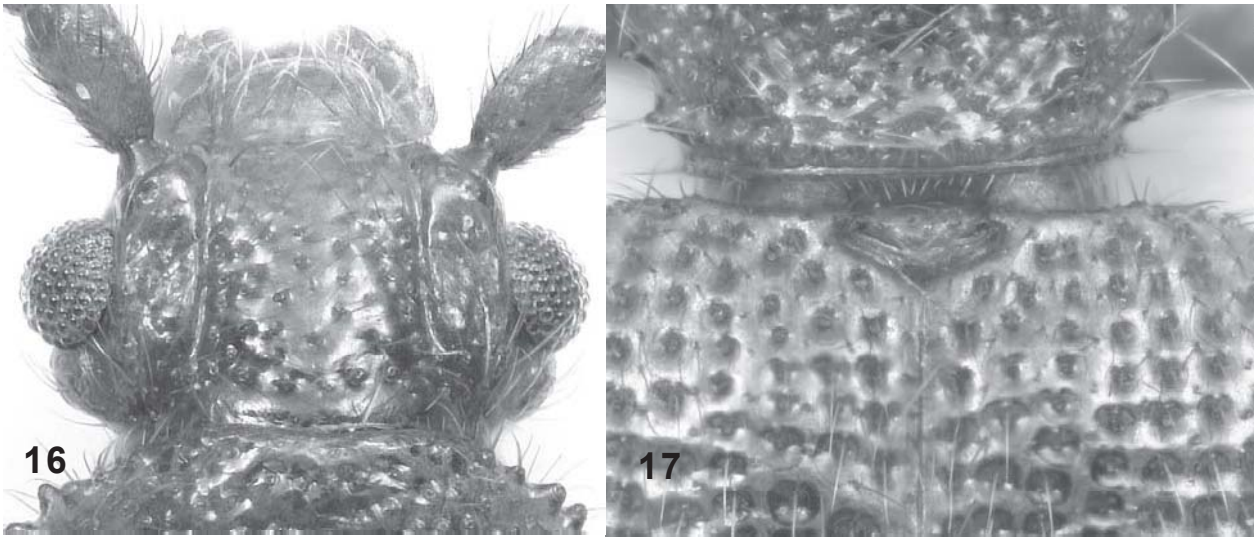

Figure 16-17. *Australophanus redtenbacheri*. **16)** Head, dorsal. **17)** Scutellum and base of elytra.

head (Fig. 16). Maxillary palps with palpomere III not securiform (Fig. 12); labial palps with palpomere I large, globose; palpomere II small, obliquely truncate but not securiform (Fig. 13). Pronotum transverse, 1.2x wider than long, laterally denticulate; anterior angles rounded; posterior angles obtuse. Elytral disk with scutellary striole and six rows of punctures. Prosternal process narrow, width between coxae less than one coxal cavity, expanded apically behind procoxae (Fig. 10). Tarsomere III lobed (Fig. 14), but not bilobed. Male genitalia without parameres, as in Fig. 21.

Included species. *Australophanus redtenbacheri* (Reitter), **new combination**.

Nomenclatural discussion

Erichson (1846) described *Platamus* in a footnote without assigning any species, although he wrote that it was based on a species collected by Moritz in Colombia. Chevrolat (1863) described *Platamus ? pallidulus* from Puerto Rico and Cuba. Grouvelle (1876) described *Platamus schaumi* from Colombia, and much later (Grouvelle 1912) incorrectly suggested this was the type species of the genus. Reitter (1877) noted that *Platamus pallidulus* Chevrolat belonged in *Telephanus* Erichson. Both Grouvelle and Reitter subsequently described several species in *Platamus*. Sharp (1899) used the name *Platamus* for a group of species congeneric with *Platamus mexicanus* Grouvelle, and described the genus *Euplatamus* for a group of species with lobed and ventrally pubescent tarsi. In his discussion of *Platamus*, Sharp (1899) noted: "Considerable confusion has occurred in connection with it, due not improbably to the fact that it was too briefly defined by Erichson, and that no species was described at the time."

Although brief, Erichson's (1846) description clearly states that the tarsi have the "...four first members much in each other pushed, beneath closely and finely hairy" (our translation), which agrees with the group of species congeneric with *Platamus schaumi* Grouvelle, and not with those congeneric with *P. mexicanus* Grouvelle. Grouvelle (1912) synonymized *Euplatamus* Sharp under *Platamus* Erichson and described *Aplatamus* for the species allied with *P. mexicanus*. Hetschko (1930) followed the Grouvelle (1912) synonymy.

Chevrolat's description of *Platamus pallidulus* made it the type of the genus by monotypy and its subsequent transfer to *Telephanus* resulted in *Platamus* Erichson becoming a junior synonym of *Telephanus* Erichson. As the next available name, *Euplatamus* Sharp becomes the name of the genus and all species assigned to *Platamus sensu* Grouvelle are transferred to *Euplatamus*. For nomenclatural stability, type species are here designated for *Euplatamus* Sharp and *Aplatamus* Grouvelle.

Erichson (1846) described *Telephanus* also in a footnote and included the species "*T. atricapillus* Nob. aus Pensylvania." Since this species was not explicitly described, it has been treated as a *nomen nudum*

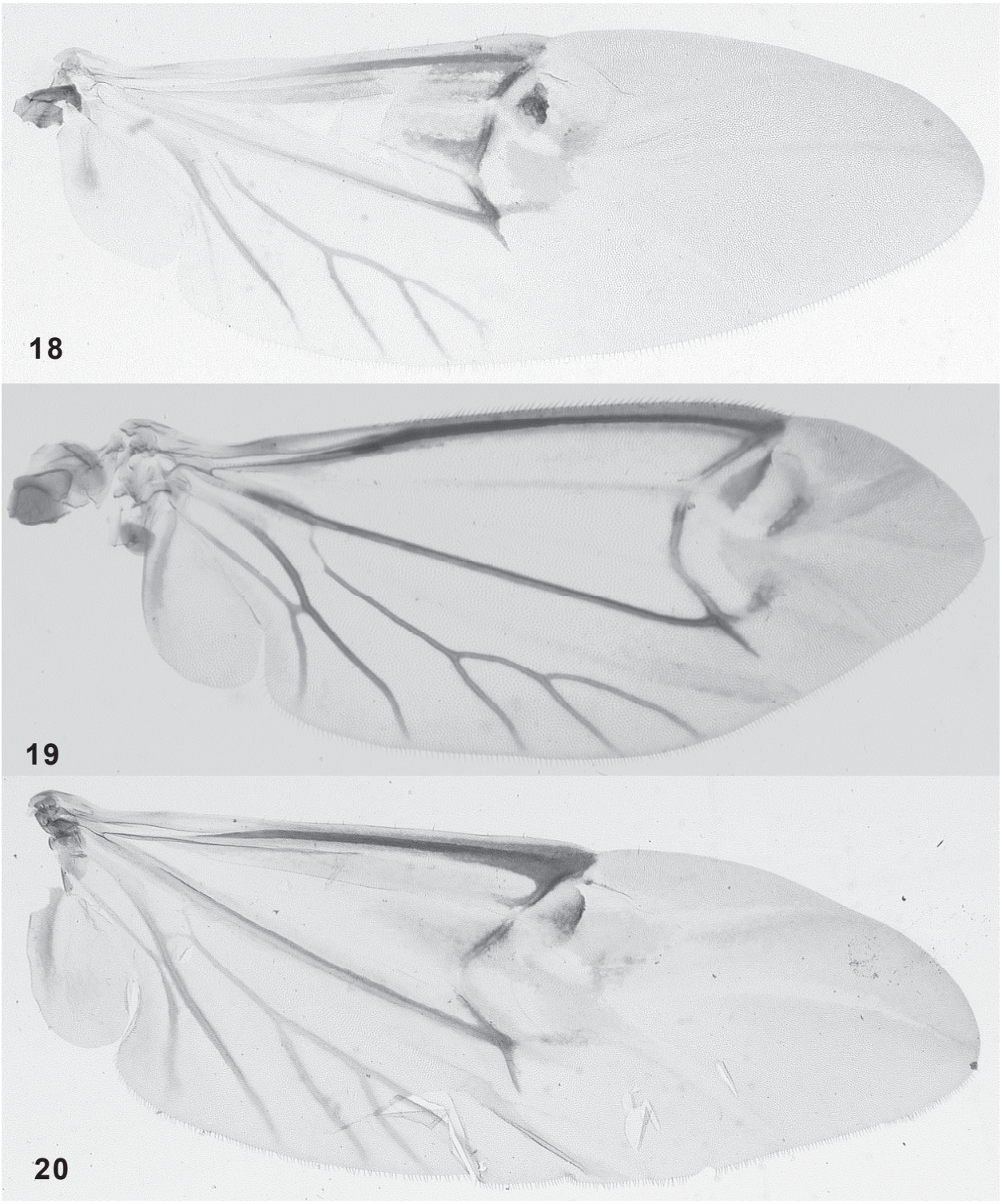

Figure 18-20. Hind wings. **18)** *Australophanus redtenbacheri.* **19)** *Euplatamus* sp., Bolivia. **20)** *Aplatamus* sp., Mexico.

by all subsequent authors except Smith (1851). Apparently unaware of Erichson's genus, Haldeman (1846) described *Heterodromia velox*. Melsheimer (1853) synonymized Haldeman's genus under *Telephanus* and assigned *H. velox* to *Telephanus*, which is how it has stood for more than 150 years.

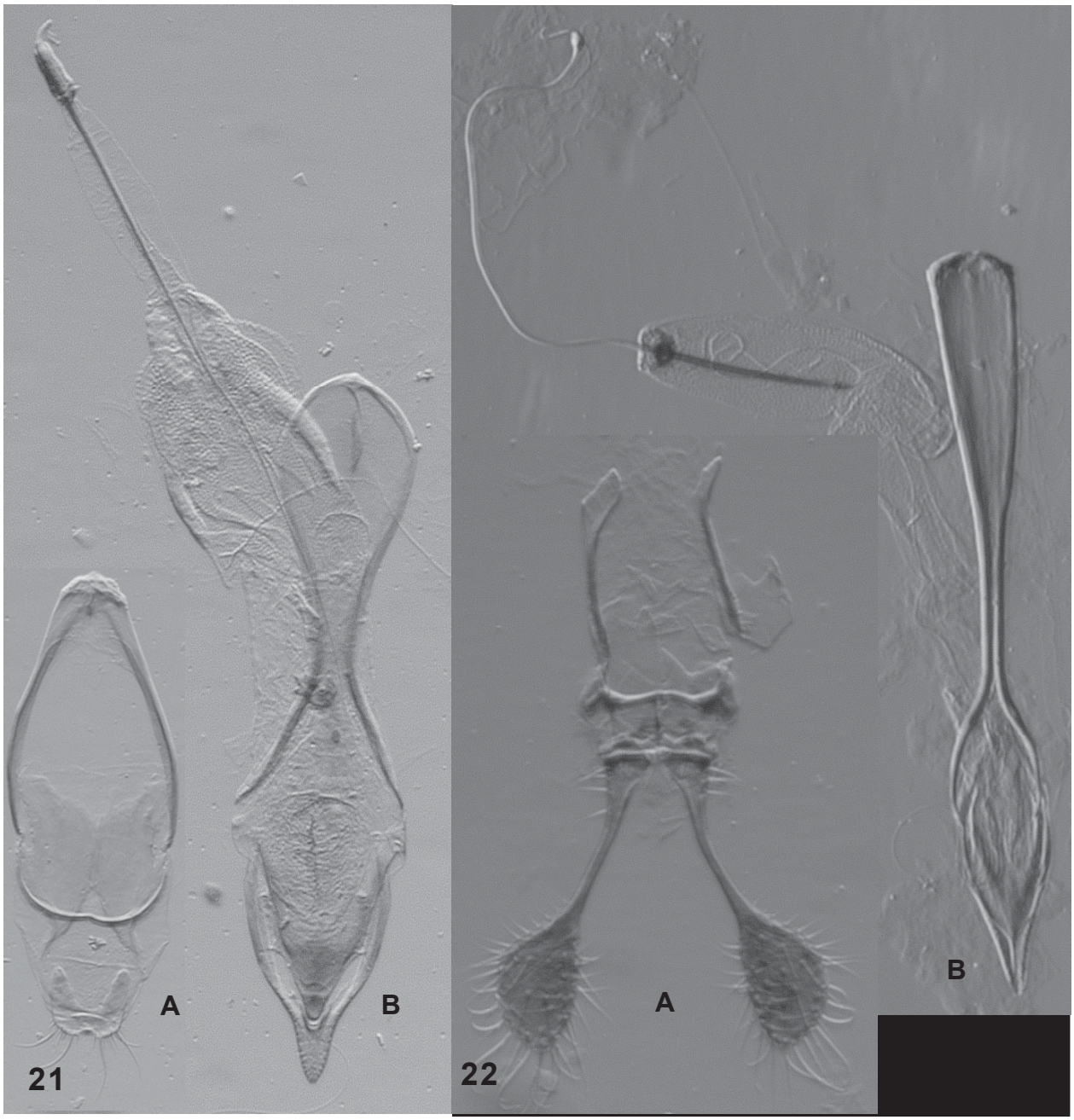

Figure 21-22. Male genitalia, A, tegmen; B, aedeagus. **21)** *Australophanus redtenbacheri*. **22)** *Euplatamus* sp., Bolivia.

Erichson's (1846) complete description is translated as follows: "*Telephanus*, new genus, standing between *Psammoecus* and *Brontes*: antenna nearly subequal to body length, the 1st segment as long as the head. The terminal segment of the maxillary palpi truncated at an acute angle, hatchet-shaped; the labial palpi likewise hatchet-shaped, flat truncate. The 4th segment of the tarsi is overlapped. A series of new species from America; of which *T. atricapillus* Nob. from Pennsylvania, resembles *Demetrias unipunctatus* in body shape and color."

The description clearly fulfills the requirements of Article 13.4 of the International Code of Zoological Nomenclature, which states: "**Combined description of new genus-group taxon and new species**. The combined description or definition of a new nominal genus or subgenus and a single included new

nominal species, if marked by "gen. nov., sp. nov." or an equivalent expression, is deemed to confer availability on each name..." (ICZN 1999).

Thus, *Telephanus atricapillus* Erichson is the correct name for the North American species, and is the type species of the genus by monotypy.

Synonymy for these genera is as follows:

Telephanus Erichson 1846: 329. **Type species**: *Telephanus atricapillus* Erichson 1846: 329, by monotypy.

Heterodromia Haldeman 1846: 127; **syn**. by Melsheimer 1853: 45. **Type species**: *Heterodromia velox* Haldeman 1846: 127, by monotypy.

Platamus Erichson 1846: 329. **Type species**: *Platamus ? pallidulus* Chevrolat 1863: 612, by subsequent monotypy.

Euplatamus Sharp 1899: 549. **Type species**: *Euplatamus debilis* Sharp 1899: 549, here designated.

Aplatamus Grouvelle 1912: 314. **Type species**: *Platamus mexicanus* Grouvelle 1876: 490, here designated.

Platamus sensu Sharp 1899: 547.

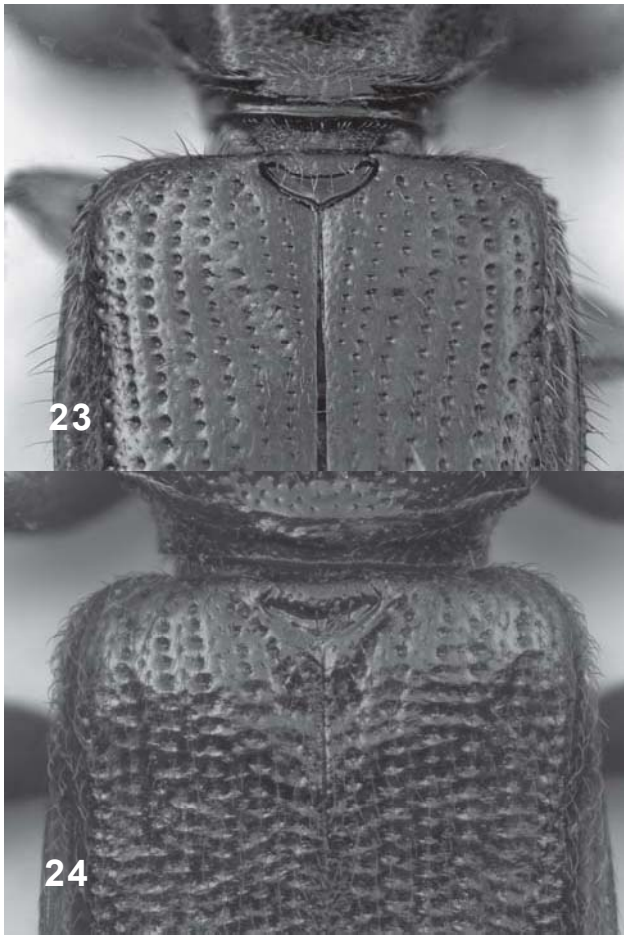

Figure 23-24. Scutellum and base of elytra. **23)** *Euplatamus* sp., Bolivia. **24)** *Aplatamus* sp., Mexico.

Key to genera of Telephanini of the world

Note: Specimens of *Indophanus* and *Megapsammoecus* were not available for examination; characters for these taxa are derived from the literature.

1. Scutellary striole absent (Fig. 4, 5) **2**
— Scutellary striole present (Fig. 17, 23, 24) **4**

2 (1). Frontal grooves present and well-marked; scutellum without posterior marginal groove; Old World ..... ***Psammoecus* Latreille** (Fig. 5)
— Frontal grooves indistinct or absent; scutellum with or without posterior marginal groove 3

3 (2). Frontal grooves absent; pronotum laterally tuberculate at most; New World, Madagascar, and Reunion Is. ..... ***Telephanus* Erichson** (Fig. 4)
— Frontal grooves present, but indistinct; pronotum laterally with long, spiniform processes; India ..... ***Indophanus* Pal**

4(1). Tarsomere III incrassate, but definitely not lobed; hind legs of males elongate, hind tarsi modified; intercoxal process of mesothorax wider than mesocoxal cavity; parameres reduced; Mexico and Central America ..... ***Aplatamus* Grouvelle** (Fig. 3)

Figure 25-27. 25) *Euplatamus* sp., Bolivia, head. **26-27)** *Aplatamus* sp., Mexico. **26)** Head. **27)** Tegmen.

— Tarsomere III lobed or bilobed; intercoxal process of mesothorax narrower than mesocoxal cavity **5**

5(4). Tarsomere III bilobed **6**
— Tarsomere III with single ventral lobe **7**

6(5). Terminal labial palpomere securiform; two grooves on each side of frons (except one in *Cryptamorpha desjardinsi*); pronotum laterally tuberculate at most; Old World Tropics (1 cosmopolitan species) ..... ***Cryptamorpha*** **Wollaston** (Fig. 6)
— Terminal labial palpomere not securiform; one groove on each side of frons; pronotum laterally with long, spiniform processes; China ..... ***Megapsammoecus*** **Karner**

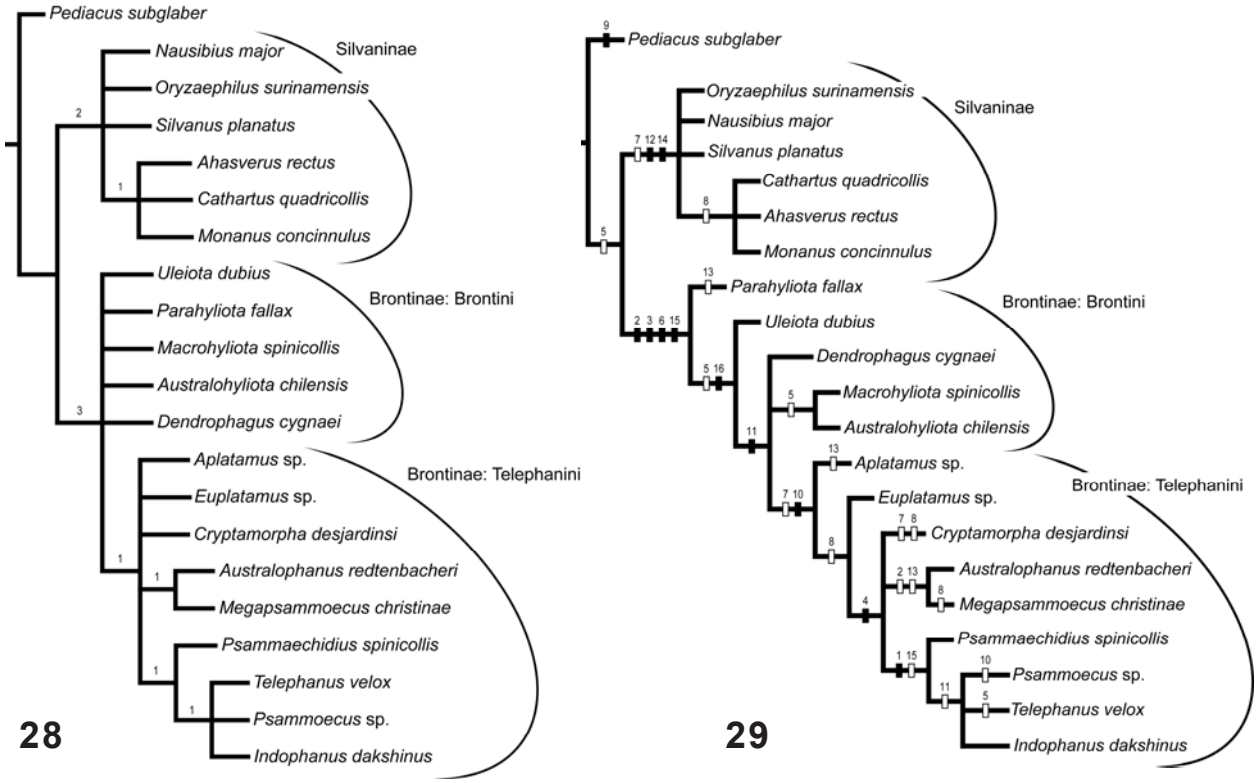

Figure 28-29. 28) Strict consensus of 12 most parsimonious trees (TL = 36, CI = 47, RI = 77) resulting from cladistic analysis of Silvanidae. Bremer support values are reported above the branches. **29)** One arbitrarily chosen cladogram of 12 most parsimonious trees (TL = 36, CI = 47, RI = 77) resulting from cladistic analysis of Silvanidae, with characters mapped using ACCTRAN (fast) optimization. Black hash marks indicate unambiguous changes, white hash marks indicate homoplasious changes or reversals. Numbers above hash marks are character numbers.

7(5). Terminal maxillary palpomere securiform; Madagascar ..... ***Psammaechidius*** **Fairmaire**
— Terminal maxillary palpomere not securiform 8

8(7). Two grooves on each side of frons; terminal labial palpomere securiform; frontoclypeal suture absent; parameres long and spatulate (Fig. 22); Neotropics ..... ***Euplatamus*** **Sharp** (Fig. 2)
(Note: In *E. buqueti* (Grouvelle) and related species, the frontal grooves are reduced to short segments or series of punctures, but the other diagnostic characters are sufficient to separate them from *Australophanus*.)
— One groove on each side of frons; terminal labial palpomere not securiform (Fig. 13); frontoclypeal suture present; parameres absent (Fig. 21); Chile ..... ***Australophanus*** **Thomas** (Fig. 1)

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