

Redescription of *Pycnoscelus rufus* Bey-Bienko, *Heminauphoeta picea* Shelford and *Eutheganopteryx mirabilis* Shelford (Dictyoptera: Blattina)

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Redescriptions of poorly known species *Pycnoscelus rufus* B.-Bien. (Blaberidae, Pycnoscelinae), *Heminauphoeta picea* Shelf. (Blaberidae, Oxyhaloinae) and *Eutheganopteryx mirabilis* Shelf. (Blattellidae, Ectobiinae), based on the type material, are given. The male genitalia of these species are described for the first time. Lectotypes of *H. picea* and *E. mirabilis* are designated.

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The type specimens of *Pycnoscelus rufus* Bey-Bienko, 1950, *Heminauphoeta picea* Shelford, 1912 and *Eutheganopteryx mirabilis* Shelford, 1912 are kept at Zoological Institute, Russian Academy of Sciences. The necessity of redescription of these species stems from the fact that available descriptions are insufficient and, in particular, the male genitalia are still not described.

For the male genitalia of *P. rufus* and *H. picea* (Blaberidae), the author follows the terminology of Grandcolas (1996), but distal, cap-like part of sclerite L1 (L2d sensu McKittrick, 1964) is termed apical sclerite L1 and proximal, rod-like part of sclerite of L1 (L2vm sensu McKittrick, 1964) is termed basal sclerite L1 (Fig. 11). For the male genitalia of *E. mirabilis* (Blattellidae), the author uses descriptive names of sclerites (Figs 31-34), because their homology is somewhat doubtful.

Family **BLABERIDAE** Brunner von Wattenwyl, 1865

Subfamily **PYCNOSELINAE** Princis, 1960

Genus **Pycnoscelus** Scudder, 1862

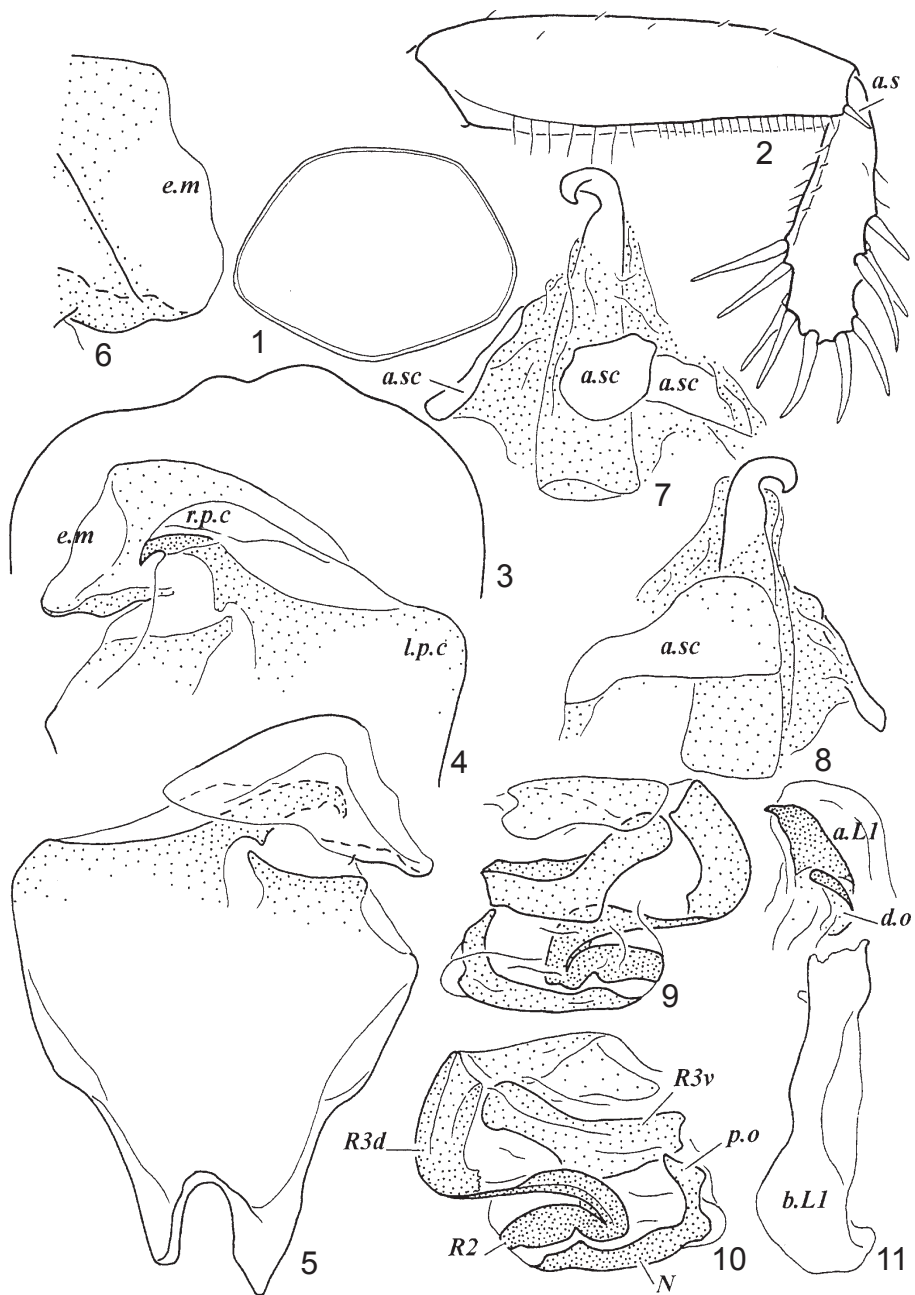
Pycnoscelus rufus Bey-Bienko, 1950 (Figs 1-11)

Holotype. ♂, **Afghanistan**, between Nemlia and Jala-labad, in a cotton field, VIII.1940 (A.A. Kostylev).

The original description by Bey-Bienko (1950) may be supplemented with the following data.

Description. Male (holotype). Eyes black; ocellar spots pale. Pronotum with a pair of indistinct, diffuse pale spots (local weakening of pigmentation) on the anterolateral margin (very usual feature in this genus, see Roth, 1998). Interval between eyes about half the length of eye; interval between antennal sockets about 2.3 times the length of scapus. Hind wings with 10 and 7 branches of *CuA*, on left and right wings, respectively; 2 apical branches of *CuA* reaching margin of wing. Fore legs (Fig. 2): femora with a fringe of chaetae on anteroventral margin; chaetae longer at proximal part; apical spine present (Fig. 2, *a.s.*); tibiae widened distally, with spines comparatively long and slender. Anal plate (X, ultimate tergite) widely rounded caudally, slightly asymmetrical and notched on caudal margin (Fig. 3). Cerci usual of this genus, slender, with larger apical segment. Hypandrium asymmetrical (Figs 4, 5); right posterolateral corner (Figs 4, 5, *r.p.c.*) acute, tooth-like, somewhat displaced medially; left posterolateral corner (Figs 4, 5, *l.p.c.*) rounded and prominent; right style large (Figs 4-6), plate-like, with external margin (Figs 4-6, *e.m.*) feebly sclerotized (this makes accurate observation difficult); left style absent.

Male genitalia (Figs 7-11). Apical sclerite L1 strongly sclerotized and elongated (Fig. 11, *a.LI*), with tooth-like apex; dorsal outgrowth present (Fig. 11, *d.o.*), its margins neither denticulate nor serrate, but very feebly uneven (this is visible only at high magnification); chaetae absent. Basal sclerite L1 broad (Fig. 11, *b.LI*), irregularly sclerotized, with uneven margins. Sclerite L2d comparatively small, distinctly sclerotized only apically



Figs 1-11. *Pycnoscelus rufus* B.-Bien., male (holotype). 1, pronotum, outline from above; 2, fore femur and tibia in front view; 3, anal plate, outline from above; 4, caudal part of hypandrium from above; 5, hypandrium from below; 6, lateral, membranous part of stylus from below, spread; 7, 8, sclerite L2d and accessory sclerites from sides; 9, 10, complex R+N from below (9), and above (10); 11, apical and basal sclerites L1 from above. Dotted area shows sclerotized (4-6, 9-11) and membranous parts (7, 8). In Fig. 11, sclerotization of basal sclerites L1 not indicated.

Abbreviations: *a.L1*, apical sclerite L1 of complex L1; *a.s.*, apical spine of fore femur; *a.sc.*, accessory sclerite of complex L2; *b.L1*, basal sclerite L1 of complex L1; *d.o.*, dorsal outgrowth of apical sclerite L1 of complex L1; *e.m.*, external, membranous margin of right style; *l.p.c.*, left posterolateral corner of hypandrium; *p.o.*, perpendicular outgrowth of sclerite N of complex R+N; *r.p.c.*, right posterolateral corner of hypandrium; *R3d*, *R3v*, *R2*, *N*, sclerites of male genitalia (see text).

(Figs 7, 8); apex with small tooth; median incision and any armament on inner side of hook absent; three accessory sclerites (Figs 7, 8, *a.sc*) present. Complex of sclerites R+N well sclerotized (Figs 9, 10): R3d rounded and prominent; R2 slightly curved, with notch opposite to sclerite N; sclerotized enlargement of R2 (like that in *P. surinamensis*, *P. gorochovi*, *P. vietnamensis* and *P. rothi* – Anisyutkin, 2002, Figs 20, 21, 23, 24) absent; R3v curved; N elongate, with perpendicular outgrowth (Figs 9, 10, *p.o*) directed to R3v.

Length (mm): head 2.6; pronotum 3.9; tegmina 15.5. Width (mm): head 2.6; pronotum 5.2.

Female unknown.

Note. *P. rufus* was described from a single specimen from Afghanistan (Bey-Bienko, 1950). Princis (1964) considered *P. rufus* to be a synonym of *P. tenebriger* (Walker). It is unknown to the author, whether Princis examined the holotype of *P. rufus*, but the coloration of these species is completely different. Whereas black coloration is indicated for *P. tenebriger* [“Black, fusiform, smooth, shining, tawny beneath. ... Palpi piceous. Antennae black, tawny at the base. ... Fore wings (= tegmina – *L.A.*) piceous...” (Walker, 1868, p. 31)], *P. rufus* is a comparatively light-coloured species. Its general colour is yellowish brown, with reddish shade. The darkest areas are the facial part of the head, pronotum and proximal parts of tegmina, which are reddish brown. Palpi (maxillary and labial) and antennae of *P. rufus* are yellow, only apical part of antennae is brownish; most of tegmina (except darker proximal parts) is brownish yellow.

Later, Roth (1998) considered *P. rufus* a valid species. Judging from the description of *P. tenebriger* given by Roth (this author did not examine the holotypes of *P. rufus* and *P. tenebriger*), these species clearly differ in the shape of the anal plate (almost symmetrical in *P. tenebriger* – Roth, 1998, fig. 35) and right style (Roth, 1998, figs 37, 38).

Examination of the holotype confirmed Roth's (1998) supposition that *P. rufus* belongs to the *P. striatus* species group.

Subfamily OXYHALOINAE Finot, 1897

Genus *Heminauphoeta* Saussure, 1891

Heminauphoeta picea Shelford, 1912
(Figs 12-21)

Lectotype (present designation). ♂, **Madagascar**, “Madagascar mer. Sicora 1899”, “*Heminauphoeta picea* sp. n. Type ♂”, “R. Shelford det.”.

Paralectotypes. **Madagascar**: 1 ♀, “Fort Dauphin Madagascar mer. Sicora 20-25.VI.99”, “*Heminauphoeta picea* Shelf. R. Shelford det.”; 1 ♀, “Andromana Madagascar mer. Sicora 1899”, “*Heminauphoeta picea* Shelf. R. Shelford det.”.

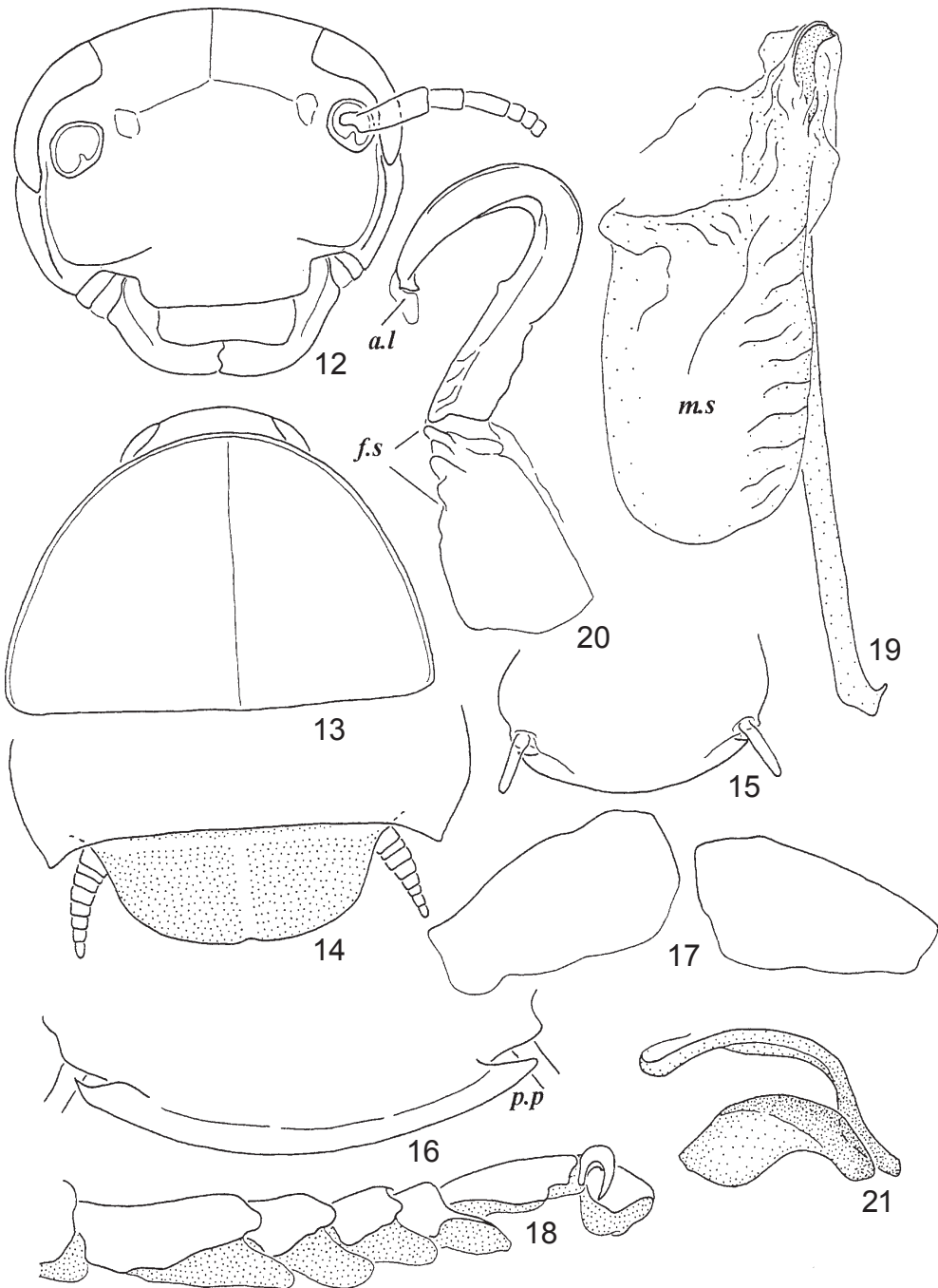
Other material examined. **Madagascar**: 1 ♂, 7 ♀, 1 larva, same data as in holotype; 1 ♀, “Fort Dauphin Madagascar mer. Sicora 1899”; 1 ♀, “Andromana Madagascar mer. Sicora 1899”.

Description. *Male* (holotype). General colour dark brownish black with reddish shade; eyes black; labrum and adjacent part of clypeus, proximal parts of antennae, maxillary and labial palpi and legs yellowish brown; distal parts of antennae greyish. Surfaces of upper side of body shining, slightly rugose, comparatively sparsely punctured; head and lower part of abdomen nearly smooth. Head rounded (Fig. 12); eyes comparatively small; interval between eyes about 1.3 times the length of eye; interval between antennal sockets about 2.4 times the length of scapus. Pronotum crescent-like (Fig. 13), evenly rounded anteriorly, with caudal margin nearly straight. Tegmina and wings completely absent. Anteroventral margin of fore femora only with weak fringe of chaetae, any spines absent. Fore tibia distally not widened. Hind metatarsus shorter than following segments combined (Fig. 18); all tarsomeres unarmed; pulvilli and arolium large. Abdominal tergites and sternites unspecialized. Anal plate (X, ultimate tergite) rounded caudally (Fig. 14), slightly notched on caudal margin. Hypandrium slightly asymmetrical (Figs 15, 16), with a pair of laterally directed, pointed projections posterior to styli (Fig. 16, *p.p*); styli subcylindrical. Cerci comparatively short (Fig. 14), distinctly multisegmented. Paraprocts weakly sclerotized, unarmed, in shape of nearly symmetrical lobes (Fig. 17).

Male genitalia (Figs 19-21). Complex of sclerites L1 associated with large membranous sac (Fig. 19, *m.s*); apical sclerite L1 strongly reduced, in shape of weakly sclerotized strip, without any outgrowths or chaetae; basal sclerite L1 rod-like, rather weakly sclerotized. Sclerite L2d consists of two parts (Fig. 20); distal part in shape of strongly sclerotized hook with weak longitudinal keels, weakly sclerotized apical lobes (Fig. 20, *a.l*) and small tooth; proximal part of sclerite L2d widened, less sclerotized, with folded structures (Fig. 20, *f.s*). Complex of sclerites R+N strongly reduced, only well sclerotized sclerite R2 present (Fig. 21).

Variation. Head and pronotum quite symmetrical; mandibles completely covered by labrum; interval between eyes about 1.4 times the length of eye; interval between antennal sockets about 2.5 times the length of scapus. Caudal margin of pronotum slightly sinuate: posterolateral angles and median part somewhat protruded caudally. Hook of sclerite L2d of the male genitalia curved to a lesser degree.

Female. Similar to male, but larger. Labrum frequently more or less shortened (in 4 of 11 fe-



Figs 12-21. *Heminauphoeta picea* Shelf., male (holotype). 12, head in front view; 13, head and pronotum from above; 14, abdominal apex from above; 15, hypandrium from below; 16, caudal margin of hypandrium from above, enlarged; 17, paraprocts, outline from below; 18, hind tarsus from outer side; 19, complex L1 from above; 20, sclerite L2d from side; 21, sclerite R2 from above. Dotted area shows dark-coloured (14), membranous (18) and sclerotized parts (19, 21).

Abbreviations: *a.l.*, apical lobe of sclerite L2d; *f.s.*, folded structures of sclerite L2d; *m.s.*, membranous sac of complex L1; *p.p.*, pointed projection of hypandrium (see text).

males examined); interval between eyes on average 1.5 times the length of eye; interval between antennal sockets on average 2.6 times the length of scapus. Pronotum more or less sinuate caudally (similar to male paratype). Cerci shorter than in male, their segmentation frequently indistinct.

Length (mm): head ♂ 4.5-4.6 (4.5), ♀ 4.9-5.4; pronotum ♂ 6.5 (6.5), ♀ 6.6-8. Width (mm): head ♂ 4.7-4.8 (4.8), ♀ 5-5.5; pronotum ♂ 9.9-10.7 (10.7), ♀ 10.9-12.6. Measurements in parentheses are those of holotype.

Family **BLATTELLIDAE** Karny, 1908

Subfamily **ECTOBIINAE** Brunner von Wattenwyl, 1865

Genus **Eutheganopteryx** Shelford, 1912

Eutheganopteryx mirabilis Shelford, 1912 (Figs 22-34)

Lectotype (present designation). ♂, **Madagascar**, "Madagascar mer. Sikora 1899", "R. Shelford det.", "*Eutheganopteryx mirabilis* sp. n. ♂ Type".

Paralectotypes. **Madagascar**: 1 ♂, "Madagascar mer. Sikora 1899", "*Eutheganopteryx mirabilis* Shelf. R. Shelford det."; 2 ♂, 1 ♀, "Fort Dauphin Madagascar mer. Sikora 1899", "R. Shelford det."; 1 ♂, "Fort Dauphin Madagascar mer. Sikora 20-25.VI.99", "R. Shelford det."

Description. *Male* (holotype). General colour light brownish yellow; eyes black; tegmina and lateral parts of pronotum subhyaline; tegmina, except area along anterior margin, densely covered with small brownish spots. Surfaces smooth, impunctate. Head subtriangular (Fig. 24); interval between eyes about 0.7 times the length of eye; interval between antennal sockets about 1.3 times the length of scapus. Pronotum suboval (Fig. 25), anterior and lateral margins widely rounded, posterior slightly protruded caudally. Tegmina with poorly visible venation, veins behind *R* subobsolete (Fig. 22); *R* with approximately 10-12 branches (many of them indistinct, making accurate observation difficult). Wings with developed appendicular field (apical triangle) (Fig. 23), two connivent veins between *C* and *R* (first vein concave, second convex), 12-15 somewhat incrassate branches of *R*, bifurcate *CuA* and simple, unbranched *CuP* crossing appendicular field. Armament on anteroventral margin of fore femur of B-type (sensu Bey-Bienko, 1950; Roth, 2003), with 2 apical and 3 proximal spines. Hind tarsi of holotype missing. Abdominal tergites and sternites unspecialized. Anal plate (X, ultimate tergite) (Figs 27, 28) transverse, with 3 projections: lateral projections long (Fig. 27, 28, *l.p.*),

proximally curved and outlining a rounded area, distally whip-like, protruded beyond anal plate and bent downward; median projection comparatively short (Fig. 27, *m.p.*), situated in rounded area outlined by proximal parts of lateral outgrowths, and bifurcate at apex; caudal margin of anal plate medially with feebly sclerotized protruded lobe (Fig. 28, *lob*). Paraprocts unarmed, in shape of almost symmetrical lobes (Fig. 28, *par*), feebly sclerotized. Cerci long, distinctly segmented. Hypandrium asymmetrical (Figs 29, 30), with a pair of bilobate outgrowths at posterolateral corners (Fig. 29, *b.o.*); styli long, tubular, with feebly sclerotized funnel-like structure at apex (Fig. 29).

Developed muscular system present in hypandrium (Fig. 30); well visible three muscular fascicles on each side of hypandrium: lateral fascicles (Fig. 30, *lf*) originating from bilobate outgrowths at posterolateral corners, medial fascicles (Fig. 30, *mf*) originating from base of styli, and inner fascicles (Fig. 30, *if*) originating approximately from point between bases of styli on caudal margin. Unfortunately, the condition of material (old and dry pinned specimens) makes accurate observation about muscular system impossible.

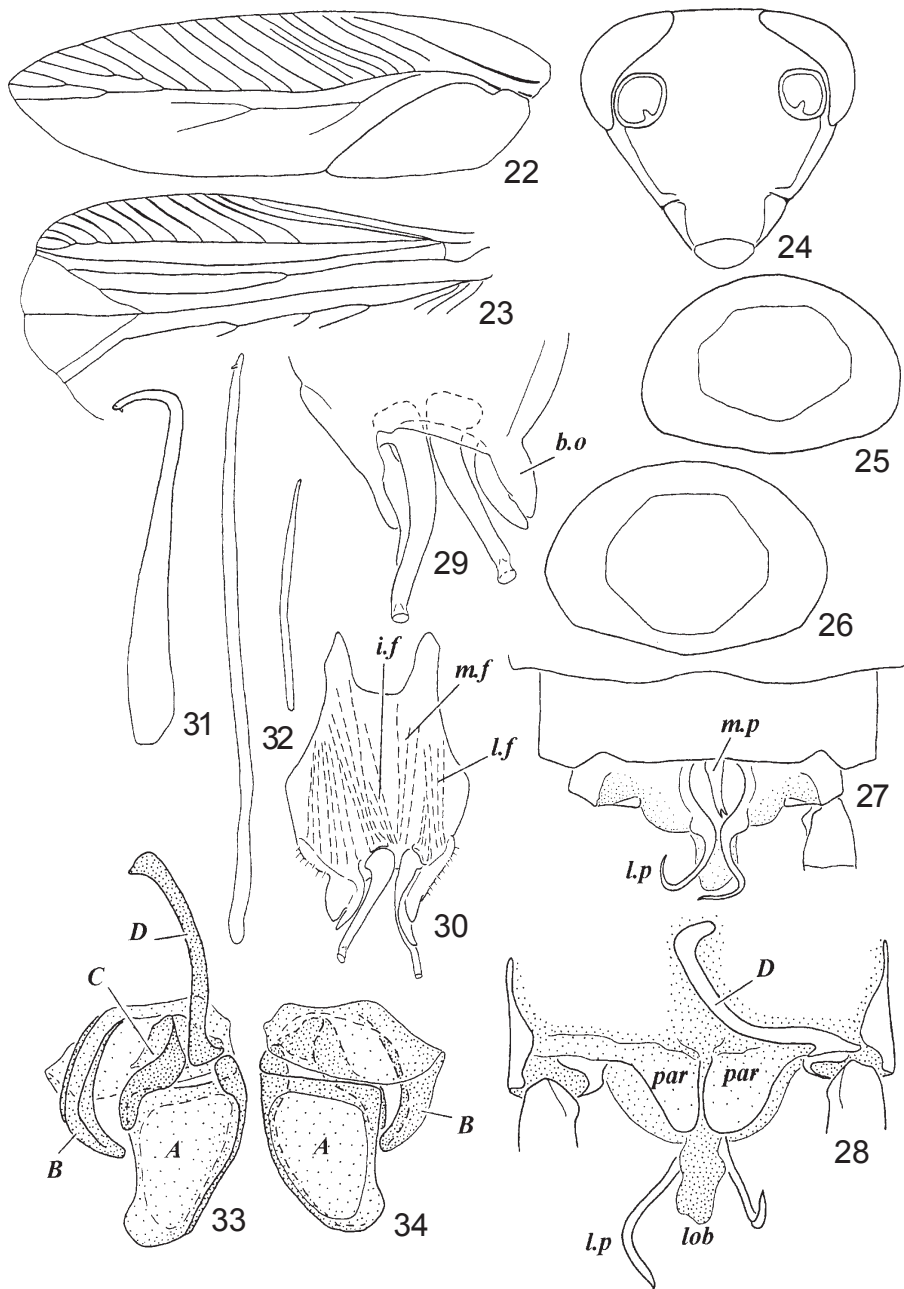
Male genitalia (Figs 31-34) with one compound complex of sclerites (Figs 33, 34), hook-like (Fig. 31) and two rod-like sclerites (Fig. 32); complex of sclerites consists of three sclerites of complicated shape (Figs 33, 34, *A, B, C*) and elongated sclerite (Figs 28, 33, *D*) connected with left paraproct and base of left cercus; hook-like sclerite elongate, with small tooth at apex; larger rod-like sclerite with small tooth at apex.

Variation. Sometimes eyes coloured as head, brownish yellow; tegmina with approximately 10-14 apical branches; anteroventral margin of fore femur with 2-4 proximal spines. Hind metatarsus longer than following segments combined, with two rows of spines along ventral side; pulvilli small, apical; arolium large.

Female. Similar to male, but slightly more robust. Eyes slightly smaller; interval between eyes subequal to length of eye; interval between antennal sockets subequal to length of scapus. Pronotum more rounded, with more expressed caudal projection (Fig. 26).

Length (mm): head ♂ 1.7-1.8 (1.7), ♀ 1.7; pronotum ♂ 2-2.3 (2.3), ♀ 2.4; tegmina ♂ 9-9.7 (10.2), ♀ 9.5. Width (mm): head ♂ 1.8 (1.8), ♀ 1.9; pronotum ♂ 3.2-3.5 (3.4), ♀ 3.5. Measurements in parentheses are those of holotype.

Note. The genus *Eutheganopteryx* was referred to Ectobiinae by Shelford (1912) and Grandcolas (1996), whereas Roth (2003) considered it to be a genus of questionable position.



Figs 22-34. *Eutheganopteryx mirabilis* Shelf. (22-25, 27, 29-34, male holotype; 28, male paratype; 26, female paratype). 22, tegmen from above; 23, anterior part of wing from above; 24, head in front view; 25, 26, pronotum from above; 27, abdominal apex from above; 28, abdominal apex from below (hypandrium and most parts of genitalia removed); 29, caudal part of hypandrium from below; 30, hypandrium from above; 31, hook-like sclerite of male genitalia from side; 32, rod-like sclerites of male genitalia; 33, 34, complex of sclerites of male genitalia from sides. Dotted area shows membranous (27, 28) and sclerotized parts (33, 34).

Abbreviations: *b.o.*, bilobate outgrowths of hypandrium; *i.f.*, inner muscular fascicles of hypandrium; *lob*, protruded lobe of anal plate; *l.f.*, lateral muscular fascicles of hypandrium; *l.p.*, lateral projection of anal plate; *m.f.*, medial muscular fascicles of hypandrium; *m.p.*, median projection of anal plate; *par*, paraprocts; *A, B, C, D*, sclerites of male genitalia (see text).

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