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## New and little known Epilamprinae (Dictyoptera: Blaberidae) from the collections of the Muséum d'histoire naturelle de Genève and the Zoological Institute RAS, Saint Petersburg. Part 2

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**Abstract:** A new species of cockroach, *Gurneya rothi* sp. nov., is described from Brazil. *Rhabdoblatta erubescens* (Gerstaecker, 1883) and *Rh. punctipennis* (Saussure, 1895) are transferred to the genus *Africalolampra* Roth, 1995. A lectotype of *Audreia carinulata* (Saussure, 1895) is designated. The Neotropical genus *Audreia* Shelford, 1910 is ascribed to the tribe Morphnini McKittrick, 1964. A detailed morphological description of the new species is given, and *Africalolampra erubescens*, *A. punctipennis*, *Audreia carinulata* and *Pinaconota bifasciata* (Saussure, 1862) are redescribed. The male genitalia of *G. rothi* sp. nov., *Africalolampra erubescens*, *A. punctipennis* and the structures of ovipositor of *Africalolampra erubescens* and *Audreia carinulata* are described for the first time.

**Keywords:** *Gurneya rothi* sp. nov. - *Africalolampra erubescens* - *Africalolampra punctipennis* - *Audreia carinulata* - *Pinaconota bifasciata* - morphology.

### INTRODUCTION

This work is a continuation of a planned series of papers devoted to dictyopterans in the collections of the Muséum d'histoire naturelle in Geneva. It also uses additional material from the collections of the Zoological Institute Russian Academy of Sciences, Saint Petersburg, Russia. The aim of this paper is to provide morphological descriptions of insufficiently known taxa which are detailed enough for further phylogenetic investigations. Special attention is paid to the structure of the male and female genitalia.

### MATERIAL AND METHODS

The methods described in Anisyutkin (2014, 2015) were used. The present study follows Rehn's (1951) interpretation of the venation of the tegmina and wings. Description of the anterior margin of fore femur armament follows Bey-Bienko (1950) and Roth (2003). The terminology of male genital sclerites follows Klass (1997) with some modifications. The terminology used by Grandcolas (1996) for genital structures is given in parentheses. The terminology of the female genital structures follows McKittrick (1964) and Klass (1998). The terms introduced by the author (in the present work and in Anisyutkin, 2014) are given in quotation marks.

All material studied has been deposited in the Muséum d'histoire naturelle in Geneva, Switzerland (MHNG) or the Zoological Institute Russian Academy of Sciences in Saint-Petersburg, Russia (ZIN).

### Abbreviation used in figures

(See text for further details):

- aa.* - anterior arch of second valvifer of the female genitalia;
- ap.scl.* - "apical sclerite" of the sclerite L2D in the male genitalia;
- bsv.* - basivalvula of the female genitalia;
- c.p.RIT* - caudal part of sclerite R1T of the male genitalia;
- a.R4* - additional sclerite of right phallomere of the male genitalia;
- b.L2D* - basal part of sclerite L2D of the male genitalia;
- b.L3* - basal subsclerite of the sclerite L3 in the male genitalia;
- b.o.* - "bent outgrowth" of basal part of the sclerite L2D in the male genitalia;
- b.pr.* - finger-like basal projection of sclerite L3 of the male genitalia (*sensu* Roth, 1974);
- bul.* - bulges at sides and in the middle of caudal margin of anal plate;
- ch.a.* - "chaeta-bearing areas" of the male genitalia;

- d.o.* - "dorsal outgrows" of apical part of the sclerite L2D in the male genitalia;
- f.s.* - "folded structure" of the sclerite L3 in the male genitalia;
- gg.* - gonangulum of the female genitalia;
- hge* - groove of the sclerite L3 in the male genitalia (*sensu* Klass, 1997);
- l.scl.* - lateral sclerites situated lateral to paratergites of ovipositor;
- m.l.* - membranous lobe of sclerite L3 of the male genitalia;
- m.pl.* - medial plate in the female genitalia;
- out.* - outgrowth at caudal end of sclerite L2D of the male genitalia;
- par.* - paraproct;
- pl.s.* - plate-like sclerite of the male genitalia;
- r.scl.* - rounded sclerite of right phallomere of the male genitalia;
- L3, L4U, R1T, R2, R3, R4, R5* - sclerites of the male genitalia;
- s.t.* - "small tooth" of apical part of the sclerite L3 in the male genitalia;
- scl.* - large rectangular sclerite of the male genitalia;
- sp.* - spines of "apical sclerite" of the male genitalia;
- tub.* - cone-like tubercle of 1st abdominal tergite;
- teVIII.* - tergal process of the 8th abdominal tergite;
- teIX.* - tergal process of the 9th abdominal tergite;
- v.I., v.III.* - the 1st and 3rd valves of ovipositor respectively;
- vs.* - vestibular sclerite in the female genitalia.

## TAXONOMIC PART

### Genus *Africalolampra* Roth, 1995

**Remarks:** The genus *Africalolampra* initially comprised a single species, *A. ehrmanni*, from Kenya (Roth, 1995). The genus diagnosis used a complex of characters, including weak sexual dimorphism (tegmina and wings completely developed in both sexes), metatarsus with 2 rows of spines along lower margin, tarsal claws distinctly serrated, first abdominal tergite of male with medial specialization, left stylus absent (Roth, 1995).

The two species discussed below roughly correspond to the diagnosis of Roth, but *A. punctipennis* has a pronounced sexual dimorphism, tegmina and wings completely developed in the male, but distinctly shortened in the female, and an unspecialized first abdominal tergite (see description below). The structure of the head is markedly different in *A. erubescens* and *A. punctipennis* (compare Fig. 1 and 24 of present paper).

The structure of the male genitalia of *A. ehrmanni* was described only briefly. The statement that sclerite L2D (=L2d in Roth, 1995) of the male genitalia is not divided into a basal and apical part is probably erroneous because a small sclerotization is discernible on Fig. 4 in the original description (Roth, 1995). This sclerotization

could correspond to the "apical sclerite" of sclerite L2D (compare fig. 4 in Roth, 1995 and Figs 10, 11 of present paper).

**Included species:** The type species, *A. erubescens* (Gerstaecker, 1883) and *A. punctipennis* (Saussure, 1895).

### *Africalolampra erubescens* (Gerstaecker, 1883)

Figs 1-19

- Epilampra erubescens* Gerstaecker, 1883: 54.  
*Heterolampra erubescens.* – Kirby, 1904: 123.  
*Epilampra erubescens.* – Shelford 1910: 14. – Rehn, 1933: 408, 451, pl. 32, fig. 6, 7. – Princis, 1962: 210, 230.

**Material examined:** MHNG; 1 male; "*Epilampra erubescens* Gerst.", "Kamerun L. Conradt 1898-1899", genital complex in prep. 100815/01. – ZIN; 2 males; "Mundanie Mungo Kamerun H. Rolle Berlin W.", "*Epilampra erubescens* Gerst.", "R. Shelford det.", "purchase [in Cyrillic L.A.] H. Rolle". – ZIN; 2 females; "Mundanie Mungo Kamerun H. Rolle Berlin W.", "purchase [in Cyrillic L.A.] H. Rolle". – ZIN; 1 female; "Mundanie Mungo Kamerun H. Rolle Berlin W.", "*Epil. erubescens* Gerst. R. Shelford det.", "purchase [in Cyrillic L.A.] H. Rolle".

**Redescription of male:** The original description and the description of Rehn (1933) can be supplemented with the following details. Most surfaces of body (head, pronotum, tegmina and abdomen) smooth and lustrous, distal parts of antennae (approximately from 15-16th segments) dull; very weak punctuation present in vertex, facial part of head, pronotum and proximal parts of tegmina, especially in costal field. Head about as long as wide or slightly wider than long (Fig. 1); ocellar spots small; facial part globular, without impression or wrinkles between eyes; distance between eyes 0.7-0.9 times eye length; distance between antennal sockets about 1.7-1.9 times scape length (0.8-1.0 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.2 : 1.0 : 1.2. Pronotum as in Fig. 2. Tegmina and wings completely developed, surpassing abdominal apex. Tegmina with rounded apex, coriaceous in proximal and membranous in distal parts; venation subobsolete in about proximal fourth, distinct in distal half; costal field long and narrow; *Sc* thickened (well visible on ventral side of tegmen) with 1-4 apical branches; *R*, *M* and *CuA* stems not separated basally; *CuP* distinct. Wings mostly membranous, with only weakly sclerotized area of anterior rami of *R*; *Sc* long and simple; *RA* long, with slightly incrassated anterior veins; *RS* weak; *M* long and simple; *CuA* pectinate with 4-5 complete (reaching wing margin) veins; behind *CuA* a long and simple vein, probably corresponding to 1st plical vein *sensu* Rehn (1951) or *CuP* [probably *CuP* + *AI sensu* Bey-Bienko (1950)]; next long and simple

vein probably corresponds to 3rd plical vein *sensu* Rehn (1951); between 1st and 3rd plical veins at base of wing located sclerotized field with short reduced vein, probably corresponds to 2nd plical vein *sensu* Rehn (1951); anal fan consisting of 16-17 veins reaching margin of wing; 2-3 possibly jugal veins situated behind anal fan. Fore tibiae not thickened distally. Anterior margin of fore femora of armed type B, with 5-7 spines, including 2 apical one. Tibial spines well developed. Structure of hind tarsi: metatarsus about as long as other segments combined; euplantulae of 1st-4th segments small and apical; metatarsus with 2 more or less equal rows of spines along lower margin; "additional spines" bordering euplantulae of 2nd-3rd segments from inside and outside present; claws symmetrical, very weakly serrated; arolium distinct, about as half as claw length. Abdomen with 1st tergite specialized (Fig. 3): small cone-shaped tubercle (Fig. 3, *tub.*) situated in medial hollow, the anterior part of this tubercle densely covered with hair. First and, in lesser degree, following abdominal tergites with membranous strip along caudal margin (Fig. 3). Anal plate (tergite X) short and transverse, nearly rectangular, caudal margin weakly concave, without medial incision (Figs 4, 6); three small more or less expressed bulges located at sides and in the middle of caudal margin of anal plate (Figs 4, 5, *bul.*). Cerci with distinct segments. Paraprocts of blaberid-type (Figs 4-6, *par.*). Hypandrium asymmetrical, caudal margin angularly projected caudally; right stylus cylindrical, left stylus absent (Fig. 7). Genitalia (Figs 8-15). Right phallomere (R+N): sclerite R1T well sclerotized, serrated, caudal part of R1T in shape of separated large plate-like sclerite (Figs 8, 9, *pl.s.*), lateral part of this sclerite probably correspond to sclerite R4 (Figs 8, 9, *R4?*); bristles absent; R2 slightly curved, without hollow; R3 "V"-shaped, with long and thin branches; R4 probably fused with large plate-like sclerite; R5 large, well sclerotized, plate-like. Sclerite L2D (L1) divided into basal and apical parts (Figs 10, 11); basal part rod-like, with outgrowth at caudal end (Fig. 11, *out.*); "apical sclerite" small, thimble-like; bristles absent (Fig. 11, *ap.scl.*). Sclerite L3 (L2d) without basal subsclerite, "folded structure" and bristles present (Figs 12-15, *f.s.*); apex of L3 with attenuated "small tooth" (Figs 13-15, *s.t.*); "apical crest" and groove *hge* absent. Sclerite L4U (L3d) distinct, plate-like (Fig. 12).

**Redescription of female:** Similar to male, but body slightly more robust and ovoid. Distance between antennal sockets of the head about 2.0 times of the scape length (0.9-1.0 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.0 : 1.0 : 1.1. Abdomen without visible glandular specializations. Anal plate (tergite X) trapezoidal, with distinct median incision on caudal margin (Fig. 16). Paraprocts medially membranous (Fig. 18, *par.*). Genital plate as in Fig. 17. Ovipositor and adjacent structures (Figs 18, 19):

Intercalary sclerite absent; tergal processes of abdominal segment VIII not reaching paratergites of VIII tergite (Fig. 18, *teVIII.*); tergal processes of abdominal segment IX completely developed (Fig. 18, *teIX.*). Two rounded sclerites (Fig. 18, *l.scl.*) situated lateral to paratergites. Gonangulum distinct, well sclerotized (Figs 18, 19, *gg.*). First valves of ovipositor large and membranous at apex (Fig. 18, *v.I.*), with setae (not shown in Fig. 18) along inner side. Base of 2nd and 3rd pairs of valves as in Fig. 19. Anterior arch of second valvifer as in Fig. 19, *aa.* 2nd valves of ovipositor small. 3rd valves of ovipositor (gonoplasts) wide, partly membranous (Fig. 18, *v.III.*). Basivalvulae weakly sclerotized, in shape of two slightly asymmetrical plates with reflexed outer margins (Figs 18, 19, *bsv.*). Vestibular sclerite weakly sclerotized, horseshoe-like, with articulated lateral parts (Figs 18, 19, *vs.*). Brood sac membranous, with indistinct weakly sclerotized medial plate (Fig. 18, *m.pl.*).

**Measurements** (in mm): Head length: male 3.4-3.7, female 4.0-4.2; head width: male 3.6-3.7, female 4.1-4.2; pronotum length: male 5.0, female 5.5-6.4; pronotum width: male 6.2-6.8, female 7.5-8.2; tegmen length: male 19.9-20.3, female 21.2-21.7; tegmen width: male 6.0-6.5, female 6.7-7.6.

**Note:** This species was described from Cameroon (Gerstaecker, 1883) in the genus *Epilampra* Burmeister, 1838 and transferred into the genus *Rhabdoblatta* Kirby, 1903 by Princis (1967). *Africalolampra erubescens* is probably relatively frequent in West Africa (Rehn, 1933).

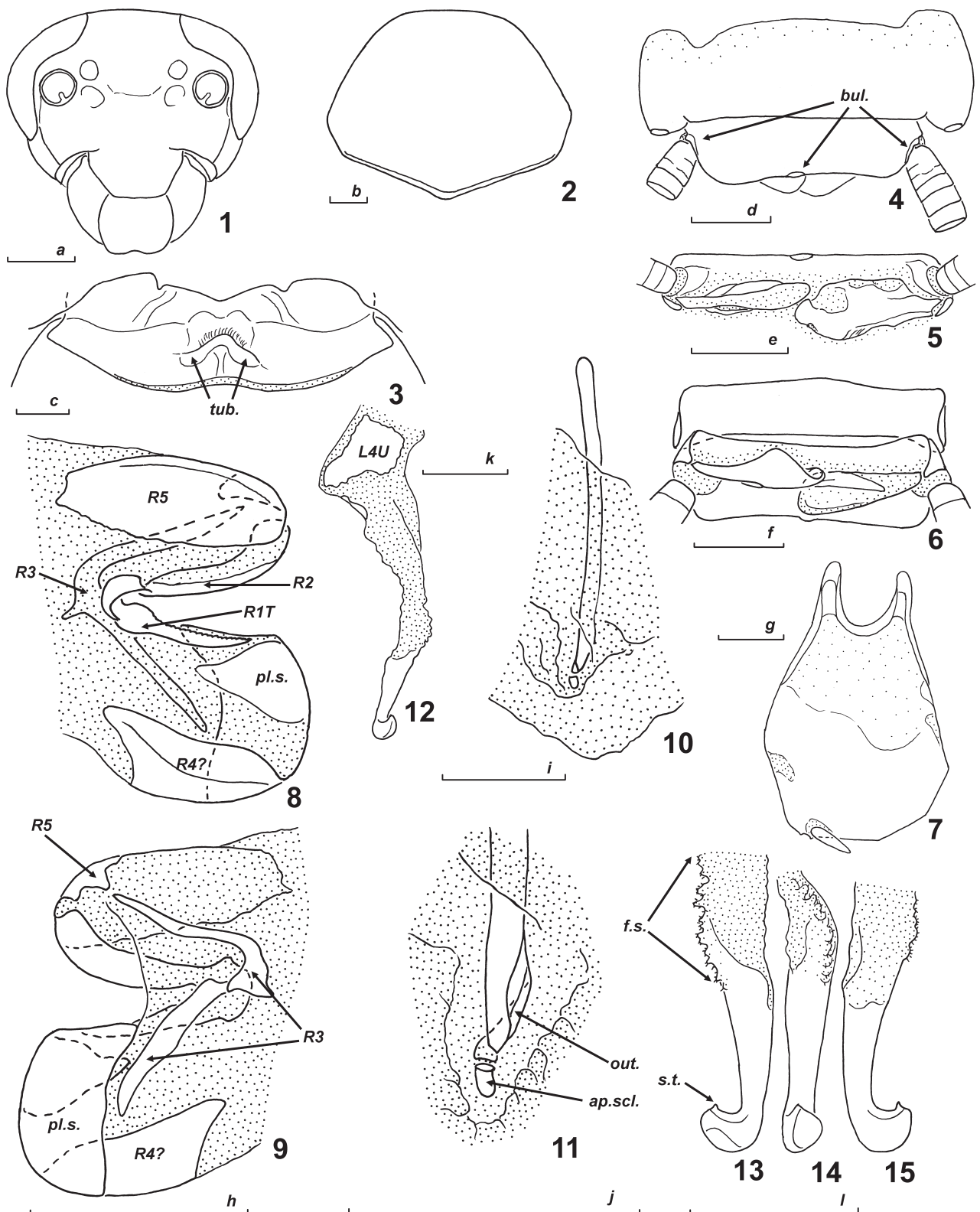
### *Africalolampra punctipennis* (Saussure, 1895)

Figs 24-37

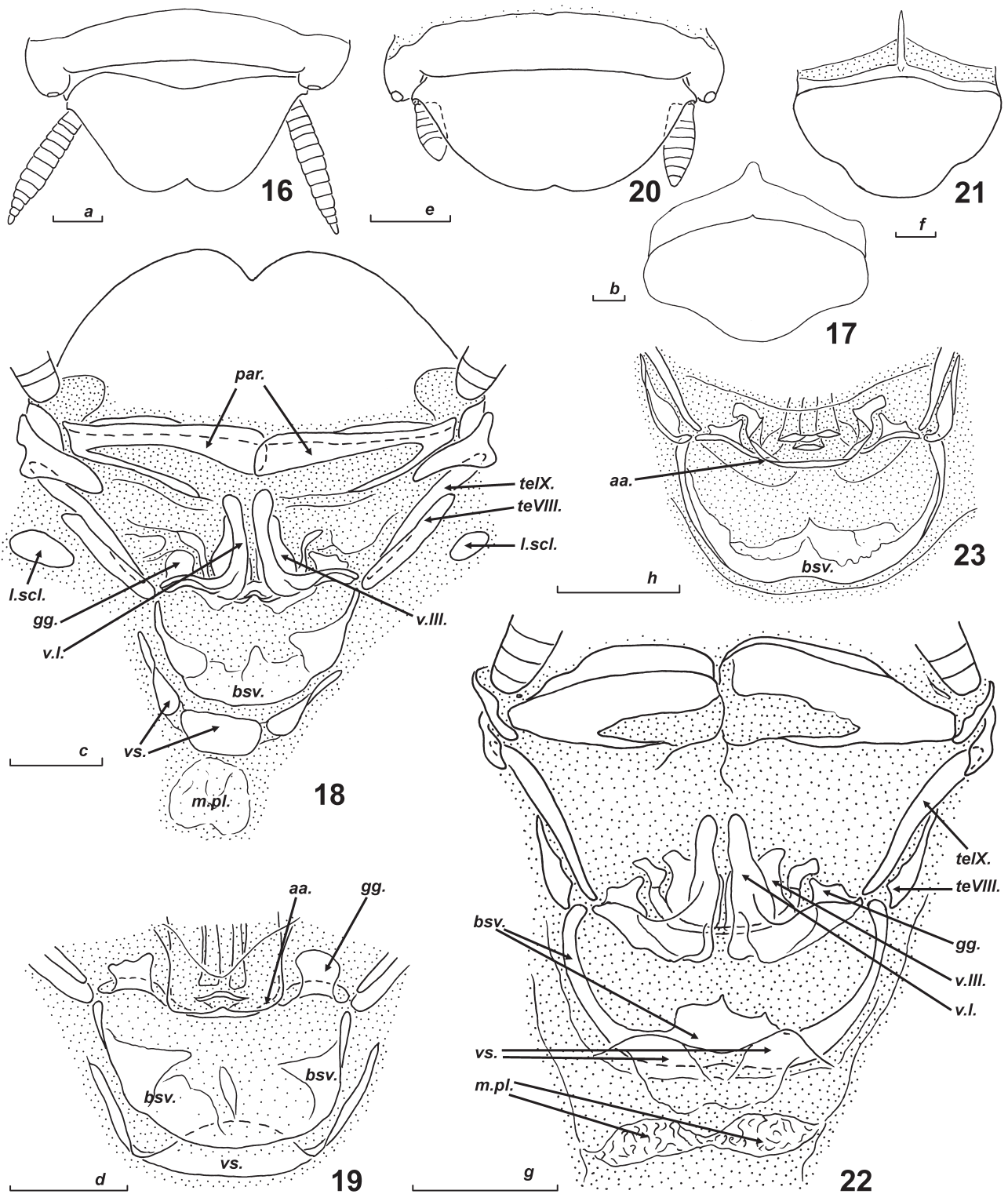
*Epilampra punctipennis* Saussure, 1895: 355, 356, pl. 9 fig. 12.  
*Heterolampra punctipennis*. – Kirby, 1904: 123.  
*Epilampra punctipennis*. – Shelford, 1910: 14. – Princis, 1963: 200.

**Material examined:** MHNG; 1 male; "Daressalam. Afrique orient. allemande. Dr J. Carl.", "Gen. M", "*Epilampra punctipennis* (Sauss). ♂", genital complex in prep. 100815/02.

**Redescription of male:** General colour light yellowish with small scattered brownish spots. Eyes black; ocellar spots pale; facial part of head above antennal sockets brownish. Surfaces smooth and lustrous, distal parts of antennae (approximately from 12-13th segments) and 5th segment of maxillary palps dull; punctuation very weak, present only in proximal parts of tegmina. Head longer than wide (Fig. 24); ocellar spots large; facial part with distinct impression between eyes and weak transverse wrinkles above antennal sockets, between eyes; distance between eyes 0.3 times eye length;



Figs 1-15. *Africalolampra erubescens* (Gerstaecker, 1883), male. (1) Facial part of head. (2) Pronotum, dorsal view. (3) First abdominal tergite, dorsal view. (4) Abdominal apex, dorsal view. (5) The same, caudal view. (6) The same, hypandrium and genitalia removed, ventral view. (7) Hypandrium, ventral view. (8) Right phallomere, dorsal view. (9) The same, ventral view. (10) Sclerite L2D, dorsal view. (11) Caudal part of sclerite L2D, dorsal view. (12) Sclerites L3 and L4U. (13-15) Apex of sclerite L3. Dotted areas show membranous parts. Abbreviations: *ap.scl.*, *bul.*, *f.s.*, *L4U*, *out.*, *pl.s.*, *R1T*, *R2*, *R3*, *R4?*, *R5*, *s.t.*, *tub.* - see chapter "abbreviation used in figures", for details see text. Scale bars 1 mm: a = 1, b = 2, c = 3, d = 4, e = 5, f = 6, g = 7, h = 8, 9, i = 10, j = 11, k = 12, l = 13-15.



Figs 16-23. Females of *Africalolampra erubescens* (Gerstaecker, 1883) (16-19) and *Audreia carinulata* (Saussure, 1895), paralectotype (20-23). (16, 20) Abdominal apex, dorsal view. (17, 21) Genital plate, ventral view. (18, 22) Abdominal apex, ventral view, genital plate removed. (19, 23) Basal part of ovipositor, view from within. Dotted areas show membranous parts. Abbreviations: aa., bsv., gg., l.scl., m.pl., par., teVIII., teIX., v.I., v.III., vs. - see chapter "abbreviation used in figures", for details see text. Scale bars 1 mm: a = 16, b = 17, c = 18, d = 19, e = 20, f = 21, g = 22, h = 23.

distance between antennal sockets about 1.8 times scape length (0.7 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.0 : 1.0 : 1.0. Pronotum as in Fig. 25. Tegmina and wings completely developed, surpassing abdominal apex. Tegmina with rounded apex, sclerotized in costal and, in lesser degree, anal fields; venation distinct; costal field wide; *Sc* thickened (well visible on ventral side of tegmen); *R* and *M* stems basally fused; *CuP* distinct. Wings membranous, without sclerotized areas; *Sc* long and simple; *RA* long, with few anterior veins; *RS* distinct; *M* long and simple; *CuA* pectinate with 5 complete (reaching wing margin) veins; behind *CuA* a long and simple vein, probably corresponding to 1st plical vein *sensu* Rehn (1951) or *CuP* [probably *CuP* + *A1* *sensu* Bey-Bienko (1950)]; next vein short and reduced, proximally incrassated, not reaching wing margin, probably corresponds to 2nd or 3rd plical veins *sensu* Rehn (1951); anal fan consisting of 14-15 veins reaching margin of wing; 3-4 possibly jugal veins situated behind anal fan. Fore tibiae not thickened distally. Anterior margin of fore femora of armed type B, with 4-5 spines, including 1-2 apical ones. Tibial spines well developed. Structure of hind tarsi similar to those of *A. erubescens* (see description above). Abdomen without visible glandular specializations. Anal plate (tergite X) short and transverse, caudal margin weakly sinuate, without medial incision (Fig. 26). Cerci with distinct segments (Fig. 26). Paraprocts of blaberid-type (Fig. 27). Hypandrium asymmetrical, caudal margin widely rounded; right stylus small, left absent (Fig. 28).

**Genitalia** (Figs 29-37): Right phallomere (R+N): sclerite R1T well sclerotized, weakly curved, caudal part R1T slightly separated, with shape of large plate-like sclerite (Figs 29, 30, *pl.s.*), lateral part of this sclerite probably corresponds to sclerite R4 (Figs 29, *R4?*); bristles absent; R2 slightly curved; R3 “V”-shaped, with long, thin and slightly curved branches; R4 probably fused with large plate like sclerite; R5 large, plate-like. Sclerite L2D (L1) not divided into basal and apical parts, widened cranially (Fig. 31); apex of L2D in shape of convoluted thorn (Figs 32-34). Sclerite L3 (L2d) without basal subsclerite, “folded structure” and bristles present (Figs 35-37, *f.s.*); apex of L3 blunt; “apical crest” and groove *hge* absent. Sclerite L4U (L3d) distinct, triangular.

**Female** (not studied by the author): Widely ovoid in shape, with tegmina and wings shortened, not reaching abdominal apex (Saussure, 1895, fig. 12).

**Measurements** (in mm): Head length 3.2, head width 2.9; pronotum length 5.3, pronotum width 8.2; tegmen length 19.2, tegmen width 7.0.

**Note:** This species was described in the genus *Epilampra* based on female specimens (at least two specimens – the number seen is unclear from the original description) from Zanzibar (Saussure, 1895).

Later *E. punctipennis* was transferred into the genus *Rhabdoblatta* by Princis (1967).

### Genus *Audreia* Shelford, 1910

**Type species:** *Calolampra carinulata* Saussure, 1895, by subsequent designation.

**Remarks:** The genus *Audreia* was diagnosed in the original description as follows: “Differs from *Calolampra* by the reduced tegmina of the male, which fail to reach the apex of abdomen and by the tegmina of the female, which are sub-quadrate or absent” and originally included 8 species (arranged as in the original description): *A. pulchra* Shelford, 1910, *A. truncata* (Brunner von Wattenwyl, 1865), *A. biolleyi* (Saussure, 1895), *A. carinulata* (Saussure, 1895), *A. cicatricosa* Rehn, 1903, *A. hamiltoni* Rehn, 1903, *A. heusseriana* (Saussure, 1864) and *A. catharina* Shelford, 1910 (Shelford, 1910, p. 11). The type species was not designated by Shelford. *Audreia carinulata* was subsequently selected as the type species by Hebard (1920).

Later, Roth (1970) considered the genus *Audreia* in detail and restricted it to a single species – *A. carinulata*. In 1976 Gurney and Roth wrote: “The type species of *Audreia*, *Calolampra carinulata* Saussure, designated by Hebard (1920: 92), appears generically distinct from *Epilampra*.” (Gurney, Roth, 1976, p. 80). Nevertheless, *Audreia* was synonymized with *Epilampra* by Fisk & Schal (1981) and restored by Lopes *et al.* (2010). Later, doubts were expressed about *Audreia* belonging to the tribe Epilamprini (Lopes *et al.*, 2014).

The detailed description of the male genital structures of *A. carinulata* (see description below) suggest a strong similarity with those of the genera *Morphna* Shelford, 1910, *Rhabdoblatta*, Kirby, 1903 and other genera of the tribe Morphnini McKittrick, 1964. There is a similar structure of the right phallomere and sclerite L2D (compare Figs 46-55 and Anisyutkin, 1999, 2000, 2003, 2014). In the author’s opinion, the genus *Audreia* undoubtedly belongs to the tribe Morphnini.

**Included species:** At the present time only the type species, *A. carinulata* (Saussure, 1895), can be undoubtedly included in the genus.

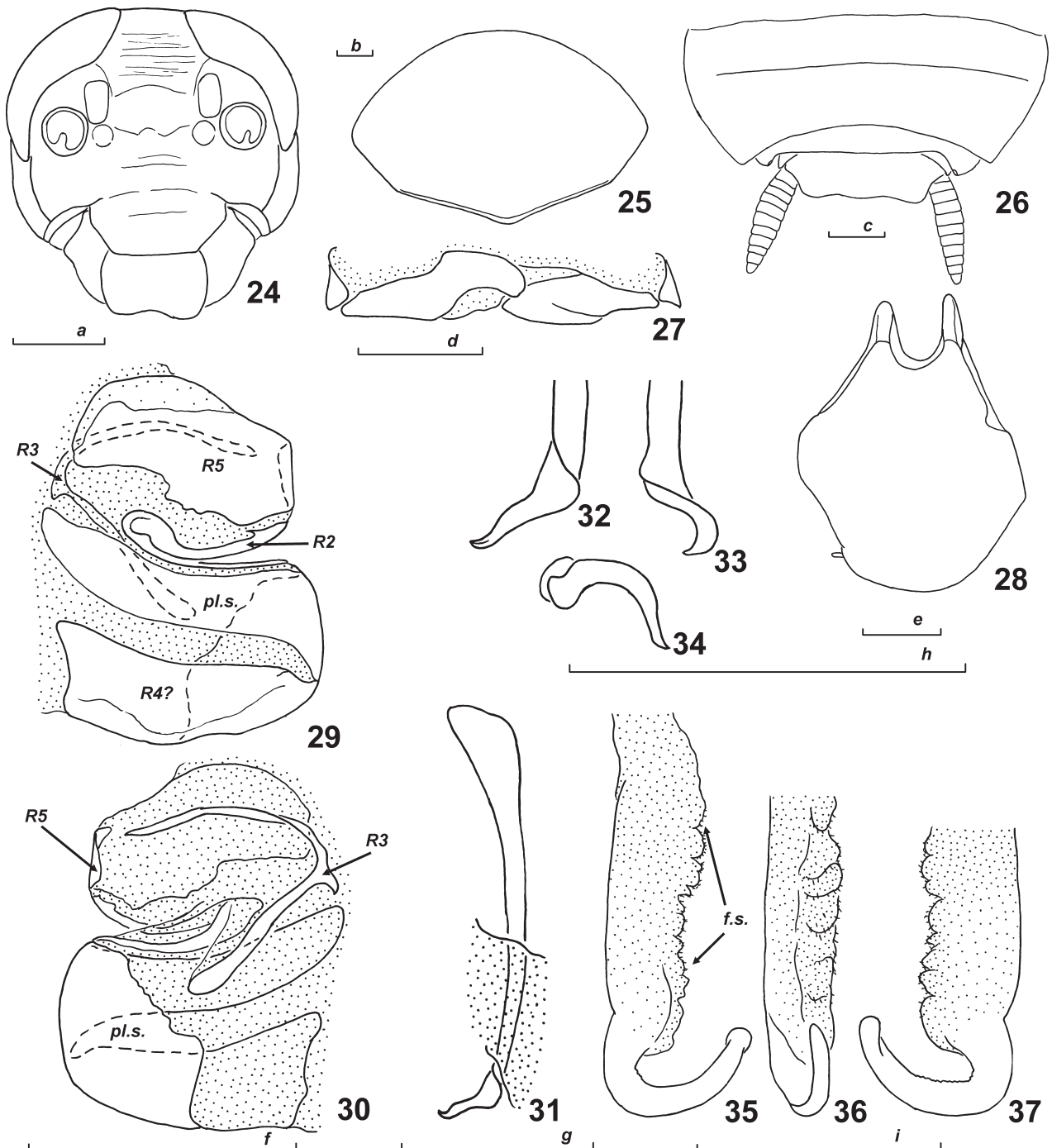
### *Audreia carinulata* (Saussure, 1895)

Figs 20-23, 38-58

*Calolampra carinulata* Saussure, 1895: 345-347, pl. 9 fig. 9. – Kirby, 1904: 117. – Shelford, 1910: 11.

*Audreia carinulata*. – Hebard, 1920: 92. – Princis, 1967: 658. – Roth, 1970: 464, figs 347-352. – Gurney & Roth, 1976: 80.

*Epilampra carinulata*. – Fisk & Schal, 1981: 694, 695.



Figs 24-37. *Africalolampra punctipennis* (Saussure, 1895), male. (24) Facial part of head. (25) Pronotum, dorsal view. (26) Abdominal apex, dorsal view. (27) Paraprocts, ventral view. (28) Hypandrium, ventral view. (29) Right phallomere, dorsal view. (30) The same, ventral view. (31) Sclerite L2D, dorsal view. (32, 33) Caudal part of sclerite L2D. (34) The same, caudal view. (35-37) Apex of sclerite L3. Dotted areas show membranous parts. Abbreviations: *f.s.*, *pl.s.*, *R2*, *R3*, *R4?*, *R5* - see chapter "abbreviation used in figures", for details see text. Scale bars 1 mm: a = 24, b = 25, c = 26, d = 27, e = 28, f = 29, 30, g = 31, h = 32-34, i = 35-37.



**Material examined:**

*Lectotype*: MHNG; Lectotype, designated herewith; male; "620 76 Costa-Rica Amer. cent", "74", "*Calolampra carinulata* ♂ Sss.", genital complex in prep. 100815/03. *Paralectotypes*; MHNG; 2 males; same data as lectotype. – 2 males; "620 76 Costa-Rica Amer. cent", "*Calolampra carinulata* # Sss.". – 2 females; "620 76 Costa-Rica Amer. cent", "5.", "*Calolampra carinulata* Sss.". – 1 female; "620 76 Costa-Rica Amer. cent", "73", "*Calolampra carinulata* ♀ Sss.", genital complex in prep. 100815/05. – 1 female; "620 76 Costa-Rica Amer. cent", "*Calolampra carinulata* ♀ Sss.". – 1 female; "620 76 Costa-Rica Amer. cent", "La Palula 73 1600 m D. Biolley". – 2 females; "Volcan de Barba. Amer. cent. Mr. H. de Saussure", "Musée San José No 5.", "*Calolampra carinulata* ♀ Sauss.". – 5 females; "*Calolampra carinulata* Biolley 73". 2 females; "*Calolampra carinulata* Biolley ♀ 73". – MHNG, labelled in box as "*carinulata* var. *pallida*": 1 male; "620 76 Costa-Rica Amer. cent", "21.", labelled as *carinulata* var. *pallida*, genital complex in prep. 100815/04. – 1 male; "620 76 Costa-Rica Amer. cent", "76.", "*Calolampra carinulata* # Sss.". 1 female; "San José. Amer. cent. Mr. H. de Saussure", "Musée San José No 11.", "*Calolampra carinulata* Sauss. var. *pallida*". – 1 larva; "620 76 Costa-Rica Amer. cent", "*Calolampra carinulata* ♂ larva Sauss.". – 1 larva; "620 76 Costa-Rica Amer. cent", "21", "*Calolampra carinulata* Sss. larva ♂".

**Redescription of male (lectotype):** General colour reddish-brown with scattered small dark dots. Eyes and 5th (ultimate) segment of maxillary palps black. Scapi, mouthparts (with exception of 5th segment of maxillary palps) and legs dirty yellowish. Surfaces smooth and lustrous, distal parts of antennae (from 14th segments) dull; very weak punctuation present in tegmina. Head about as long as wide (Fig. 38); ocellar spots small; facial part globular, without impression or wrinkles between eyes; distance between eyes about as long as eye length; distance between antennal sockets about 1.7 times scape length (0.8 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.0 : 1.0 : 1.4. Pronotum as in Fig. 39. Tegmina strongly shortened, about as long as wide (Fig. 40), reaching 3rd abdominal tergite; venation obsolete, thickened *Sc* visible only on ventral side of tegmina, remnants of *CuP* discernible on dorsal side. Wings vestigial, completely hidden under tegmina. Fore tibiae not thickened distally. Anterior margin of fore femora of armed type B, with 4-5 spines, including 1-2 apical one. Tibial spines well developed. Structure of hind tarsi: metatarsus about as long as other segments combined; euplantulae of 1st-4th segments small and apical; metatarsus with 2 more or less equal rows of spines along lower margin; "additional spines" bordering euplantulae of 2nd-3rd segments from inside and outside present; claws symmetrical, simple; arolium small, less than half of claw length. Abdomen without

glandular specializations. Anal plate (tergite X) partly membranous, trapezoidal in shape, caudal margin weakly concave, without medial incision (Fig. 41). Cerci short, with distinct segments. Paraprocts of blaberid-type (Fig. 42, *par.*). Hypandrium asymmetrical, caudal margin membranous, concave; right stylus flattened and weakly sclerotized, left stylus absent (Figs 43, 44).

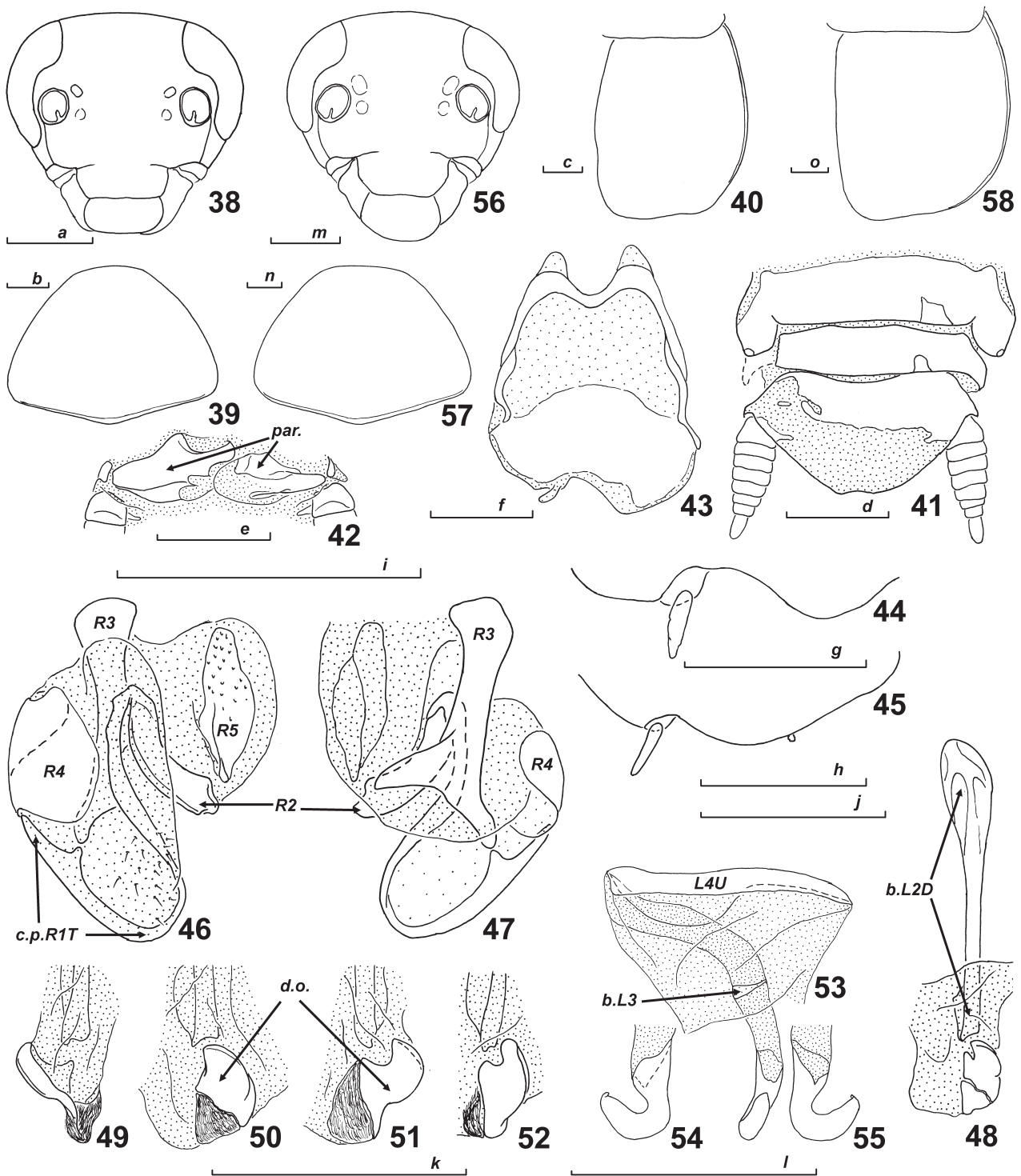
Genitalia (Figs 46-55). Right phallomere (R+N): caudal part of sclerite R1T well sclerotized, subrectangular in shape, with rounded apex (Figs 46, 47, *c.p.R1T*), covered with bristles; R2 weakly curved; R3 subtriangular, widened caudally; R4 large, plate-like; R5 plate-like, situated in dorsal side of phallomere, partly covered with very small tubercles. Sclerite L2D (L1) divided into basal and apical parts (Figs 48-51); basal part rod-like, distinctly widened cranially (Fig. 48, *b.L2D*); "apical sclerite" densely covered with bristles; "dorsal outgrowth" large (Figs 49-52, *d.o.*); Sclerite L3 (L2d) small, with basal subsclerite, (Fig. 53, *b.L3*); "folded structure", bristles, "apical crest" and groove *hge* absent. Sclerite L4U (L3d) large (Fig. 53).

**Variation** (paralectotypes): Antennae dull from 12th segments. Caudal margin of hypandrium more rounded, as compared with that of lectotype; left stylus present as very small vesicle (Fig. 45). "Dorsal outgrowth" of "apical sclerites" slightly vary in shape (Fig. 52, *d.o.*).

**Redescription of female:** Similar to male, but larger. Antennae dull from 11-12th segments. Head with distance between eyes 1.1 times eye length (Fig. 56); distance between antennal sockets about 1.6 times of the scape length (0.9 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.3 : 1.0 : 1.3. Pronotum and tegmen as in Figs 57, 58. Anal plate transverse, caudal margin widely rounded with weak medial incision (Fig. 20). Cerci shortened, as compared with male (Fig. 20). Genital plate as in Fig. 21.

Ovipositor and adjacent structures (Figs 22, 23): Intercalary sclerite absent; tergal processes of abdominal segment VIII not reaching paratergites of VIII tergite (Fig. 22, *teVIII.*); tergal processes of abdominal segment IX completely developed (Fig. 22, *teIX.*). Gonangulum distinct, well sclerotized (Figs 18, 19, *gg.*). First valves of ovipositor large and membranous at apex (Fig. 22, *v.I.*), with setae (not shown in Fig. 22) along inner side. Base of 2nd and 3rd pairs of valves as in Fig. 23. Anterior arch of second valvifer as in Fig. 23, *aa.* 2nd valves of ovipositor small. 3rd valves of ovipositor (gonoplacs) wide, partly membranous (Fig. 22, *v.III.*). Basivalvulae well sclerotized, semicircular, not divided into two parts, with reflexed outer margins (Figs 22, 23, *bsv.*). Vestibular sclerite weakly sclerotized, bilobed (Fig. 22, *vs.*). Brood sac membranous, with indistinct weakly sclerotized medial plate (Fig. 22, *m.pl.*).

**Measurements** (in mm): Head length: male 2.5-2.7 (2.5), female 3.1-3.4; head width: male 2.5-2.8 (2.6),



Figs 38-58. *Audreia carinulata* (Saussure, 1895), males: lectotype (38-44, 46-51, 53-55), paralectotype (45, 52), female, paralectotype (56-58). (38, 56) Facial part of head. (39, 57) Pronotum, dorsal view. (40, 58) Left tegmen, dorsal view. (41) Abdominal apex, dorsal view. (42) Paraprocts, ventral view. (43) Hypandrium, ventral view. (44, 45) Caudal margin of hypandrium, ventral view. (46) Right phallomere, dorsal view. (47) The same, ventral view. (48) Sclerite L2D, dorsal view. (49, 51) Caudal part of sclerite L2D, seen from outside. (50, 52) The same, dorsal view. (53) Sclerites L3 and L4U. (54, 55) Apex of sclerite L3. Dotted areas show membranous parts. Abbreviations: *b.L2D*, *b.L3*, *c.p.R1T*, *d.o.*, *L4U*, *R2*, *R3*, *R4*, *R5*, *par.* – see chapter “abbreviation used in figures”, for details see text. Scale bars 1 mm: a = 38, b = 39, c = 40, d = 41, e = 42, f = 43, g = 44, h = 45, i = 46, 47, j = 48, k = 49-52, l = 53-55, m = 56, n = 57, o = 58.

female 3.1-3.5; pronotum length: male 3.5-4.0 (3.5), female 4.1-5.1; pronotum width: male 4.6-5.4 (4.7), female 5.5-7.0; tegmen length: male 4.5-5.0 (4.5), female 4.8-6.2; tegmen width: male 3.5-4.0 (3.5), female 4.0-5.0. Measurements in parenthesis are those of lectotype.

**Note:** In the author's opinion, the series labelled "*carinulata* var. *pallida*" do not deserve a separation at the infraspecific level as they differ only in the slightly lighter colouration.

#### Genus *Gurneya* Roth, 1974

**Remarks:** This genus initially comprised a single species, *G. obliqua*, from Brazil (Beccaloni, 2015).

**Included species:** The type species and *G. rothi* sp. nov.

#### *Gurneya rothi* sp. nov.

Figs 59-70

**Etymology:** The species is named in honor of Dr. Louis Roth, famous specialist in cockroach taxonomy.

**Material examined:** Holotype; ZIN; male; Brazil, "Bahia", "*Pinaconota bifasciata* Sauss.", "R. Shelford det.", genital complex in prep. 120815/01.

**Description of male (holotype):** General colour dirty yellowish; epicranium and two proximal antennal segments brownish; eyes grey; antennae, with exception of two proximal segments, grey, yellowish toward apex; maxillary and labial palps, tegmina in about distal half, wings and abdomen yellow; pronotum with 2 black stripes (Fig. 60). Surfaces smooth and lustrous, distal parts of antennae (approximately from 7-8th segments) dull; head (Fig. 59), pronotum and tegmina in about proximal third with deep punctuation. Head about as long as wide (Fig. 59); ocellar spots absent; facial part globular, with weak semicircular plate between eyes; distance between eyes 0.8 times eye length; distance between antennal sockets about 1.7 times scape length (0.9 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.5 : 1.0 : 1.3. Pronotum widely rounded anteriorly with weakly angulate caudal margin (Fig. 60). Tegmina and wings completely developed, surpassing abdominal apex. Tegmina with rounded apex; venation subobsolete in proximal fourth, distinct in distal half; costal field long and narrow with obsolete venation; *Sc* thickened (well visible on ventral side of tegmen); *R*, *M* and *CuA* stems not separated basally; *CuP* distinct. Wings membranous, *Sc* in length as half as wing; *RA* with 5-6 not incrassated anterior veins; *RS* with 6 veins; *M* long and simple; *CuA* pectinate with 3 complete (reaching to wing margin) veins; behind *CuA* a long and simple vein, probably corresponding to 1st plical vein *sensu* Rehn (1951) or *CuP* [probably *CuP*

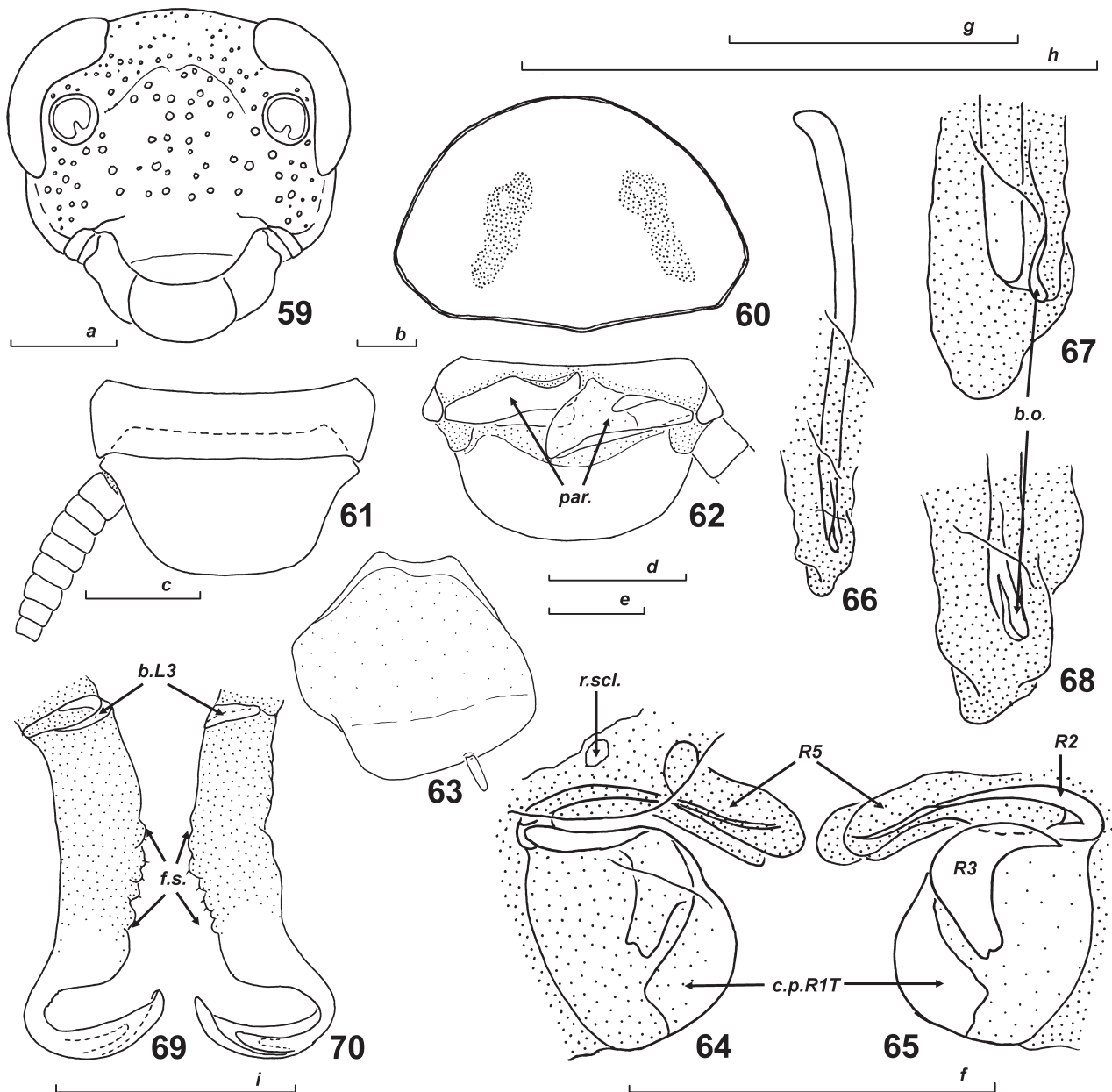
+ *Al sensu* Bey-Bienko (1950)]; next long and simple vein probably corresponds to 3rd plical vein *sensu* Rehn (1951); between 1st and 3rd plical veins located shorter vein not reaching wing margin, probably corresponds to 2nd plical vein *sensu* Rehn (1951); anal fan consisting of 11 veins reaching margin of wing; 2 possibly jugal veins situated behind anal fan. Fore tibiae not thickened distally. Anterior margin of fore femora of armed type A, with 25-27 bimarginally serrated spines and 1 not bimarginally serrated apical one. Tibial spines well developed. Structure of hind tarsi: metatarsus shorter than other tarsal segments combined, with euplantula more than one half segment length; euplantulae of 2nd-4th segments large; tarsal spines completely absent, replaced with irregularly placed bristles; claws symmetrical and simple; arolium longer than half of claw length. Abdomen without visible glandular specializations. Anal plate (tergite X) trapezoidal in shape, caudal margin rounded, without medial incision (Figs 61, 62). Cerci with distinct segments. Paraprocts of blaberid-type (Fig. 62, *par.*). Hypandrium asymmetrical and transverse, caudally rounded; left stylus cylindrical, right stylus broken off (Fig. 63).

**Genitalia** (Figs 64-70): Right phallomere (R+N): sclerite R1T with caudal part wide (Figs 64, 65, *c.p.R1T*); bristles absent; R2 long and sinuate; R3 crescentic, closely associated with R1T; R4 absent; R5 replaced with unsclerotized lobe. Cranial and above right phallomere situated small rounded sclerite of unclear homology (Fig. 64, *r.scl.*). Sclerite L2D (L1) not divided into basal and apical parts (Fig. 66), slightly bent cranially, with "bent outgrowth" at caudal end (Figs 67, 68, *b.o.*); "apical sclerite" absent, membranous lobe surrounding caudal part of L2D without discernible bristles or sclerites (Figs 67, 68). Sclerite L3 (L2d) with distinct basal subsclerite (Figs 69, 70, *b.L3*), "folded structure" and bristles (Figs 69, 70, *f.s.*); groove *hge* present. Sclerite L4U (L3d) weakly sclerotized, triangular in shape.

**Females:** unknown.

**Measurements** (in mm): Head length 2.9, head width 2.9; pronotum length 3.8, pronotum width 5.5; tegmen length 15.5, tegmen width 5.0.

**Comparison:** *Gurneya rothi* sp. nov. shares the peculiar structure of armament of the anterior margin of the fore femora (*i.e.*, bimarginally serrated spines) with *G. obliqua* (Walker, 1869), the type and only known species of the genus, and *Alphelixia sicca* (Walker, 1869). The presence of bimarginally serrated spines readily differentiates these species from all other known epilamprines. The new species differs from *G. obliqua* in less expressed dark stripes on the pronotum (compare Fig. 60 and figs 33, 35 in Roth, 1974), the presence of apical spine on the anterior margin of fore femora and the truncated caudal margin of anal plate (compare Fig. 61 and fig. 38 in Roth, 1974). *Gurneya rothi*



Figs 59-70. *Gurneya rothi* sp. nov., male, holotype. (59) Facial part of head. (60) Pronotum, dorsal view. (61) Abdominal apex, dorsal view. (62) The same, ventral view. (63) Hypandrium, ventral view. (64) Right phallomere, dorsal view. (65) The same, ventral view. (66) Sclerite L2D, dorsal view. (67) Caudal part of sclerite L2D, seen from outside. (68) The same, dorsal view. (69, 70) Apex of sclerite L3. Dotted areas show dark colour (60) or membranous parts (62-70). Abbreviations: *b.L3*, *b.o.*, *c.p.R1T*, *f.s.*, *par.*, *r.scl.*, *R2*, *R3*, *R5* - see chapter "abbreviation used in figures", for details see text. Scale bars 1 mm: a = 59, b = 60, c = 61, d = 62, e = 63, f = 64, 65, g = 66, h = 67, 68, i = 69, 70.

sp. nov. differs from *A. sicca* in strongly expressed punctuation and the shape of anal plate (compare Fig. 61 and figs 5, 7 in Roth, 1973).

### Genus *Pinaconota* Saussure, 1895

**Type species:** *Blatta bifasciata* Saussure, 1862, by monotypy.

**Remarks:** This genus was discussed in detail by Roth (1974).

**Included species:** The type species and *P. inaequalis* (Walker, 1868).

### *Pinaconota bifasciata* (Saussure, 1862)

Figs 71-84

*Blatta bifasciata* Saussure, 1862: 165. – Saussure, 1864: 98.  
*Phyllodromia bifasciata*. – Brunner von Wattenwyl, 1865: 94.  
*Blatta bifasciata*. – Walker, 1868: 87.  
*Epilampra bifasciata*. – Saussure, 1870: 84, pl. 2 fig. 44, 44A.  
*Pinaconota bifasciata*. – Saussure, 1895: 337.  
*Epilampra bifasciata*. – Kirby, 1904: 113.  
*Pinaconota bifasciata*. – Shelford, 1910: 5. – Princis, 1958: 68.  
 – Princis, 1967: 655, 656. – Roth, 1973: 3, 4. – Roth, 1974: 290-295, figs 1-23.

**Material:** Lectotype; MHNG; male; Brazil, “474 8 Brésil. ♂ M’ Sorvel”, “*Epilampra bifasciata*, ♂ Sss.”, “Lectotypus *Blatta bifasciata* Sauss. ♂ K. Princis 1970”, “*Pinaconota bifasciata* (Sauss.)”, genital complex in prep. 100815/06.

**Redescription of male (lectotype):** The original description and description of Roth (1974) can be supplemented with the following details. Head (Fig. 71) and pronotum (Fig. 72) contrastingly coloured. Surfaces smooth and lustrous, only proximal third of tegmina with punctuation. Head about as long as wide (Fig. 71); ocellar spots indistinct; facial part flat; distance between eyes about as long as eye length; distance between antennal sockets about twice scape length (0.8 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.4 : 1.0 : 1.4. Pronotum as in Fig. 72. Tegmina and wings slightly abbreviated, reaching to abdominal apex. Tegmina with rounded apex; venation distinct; costal field triangular with obsolete venation; *Sc* thickened (well visible on ventral side of tegmen); *R*, *M* and *CuA* stems not separated basally; *CuP* distinct. Wings abbreviated and membranous. Fore tibiae not thickened distally. Anterior margin of fore femora armed type B, with 6 spines, including 1 apical one. Tibial spines well developed. Structure of hind tarsi: metatarsus about as long as or shorter than other tarsal segments combined (5th tarsal segments of hind tarsi broken off), with euplantula apical, about one fourth of metatarsus length; euplantulae of 2nd-4th segments large; metatarsus with 2 more or less equal

short rows of spines along lower margin; one pair of “additional spines” bordering euplantulae from inside and outside. Only pretarsus of right fore leg present: claws symmetrical and simple; arolium large, about one half of claw length. Abdomen without visible glandular specializations. Anal plate (tergite X) widely rounded, with medial incision (Figs 73, 74). Cerci short, with distinct segments (Figs 73, 74). Paraprocts of blaberid-type (Fig. 74). Hypandrium asymmetrical, caudally projected; styli cylindrical (Figs 75, 76).

**Genitalia** (Figs 76-84): Right phallomere (R+N): sclerite R1T with caudal part wide (Figs 77, 78, *c.p.R1T*); bristles present; R2 curved; R3 triangular, closely associated with R1T; R4 large, closely associated with small additional sclerite (Figs 77, 78, *a.R4*); R5 lobe-like, sclerotized apically. Sclerite L2D (L1) divided into basal and apical parts (Figs 76, 79, 80), widened cranially; “apical sclerite” present (Figs 76, 79, 80, *ap.scl.*), strongly sclerotized along caudal margin, densely covered with recumbent bristles and not numerous large spines (Figs 79, 80, *sp.*). Large rectangular sclerite situated under caudal part of L2D (Fig. 79, *scl.*); fourth “chaeta-bearing areas” with large spines and bristles situated under sclerite L2D (Fig. 79, *ch.a.*). Sclerite L3 (L2d) with distinct basal subsclerite (Fig. 81, *b.L3*), “folded structure” absent, but a few bristles present (Fig. 81); groove *hge* and finger-like basal projection well developed (Figs 82-84, *hge*, *b.pr.*); apex of L3 with small membranous lobe (Figs 82-84, *m.l.*). Sclerite L4U (L3d) weakly sclerotized (Fig. 76).

**Measurements** (in mm): Head length 3.2, head width 3.2; pronotum length 5.0, pronotum width 7.2; tegmen length 13.5, tegmen width 5.3.

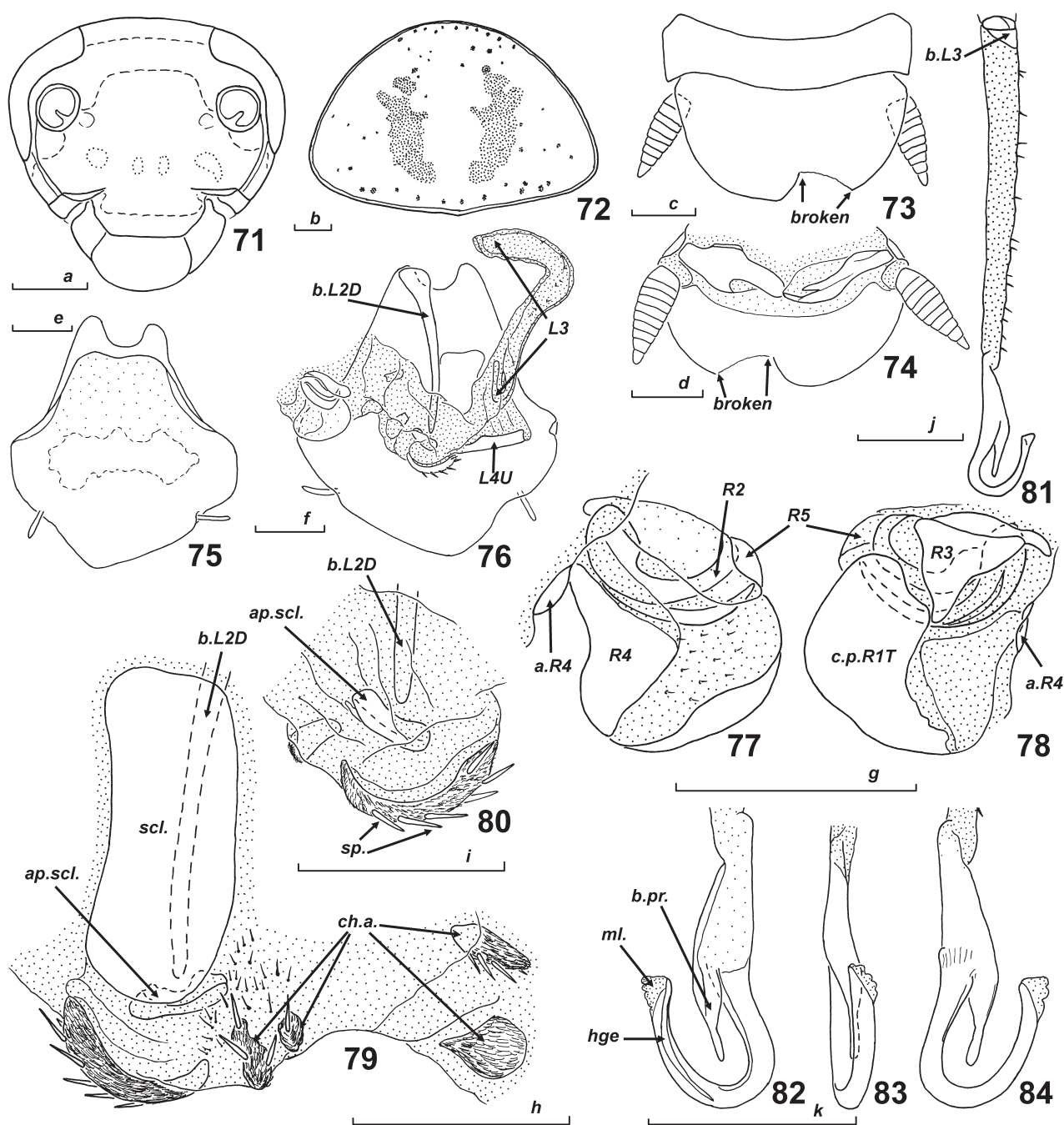
**Note:** Roth (1974) erroneously stated that Saussure’s type of *P. bifasciata* is female, but in fact it is male.

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Figs 71-84. *Pinaconota bifasciata* (Saussure, 1862), male, lectotype. (71) Facial part of head. (72) Pronotum, dorsal view. (73) Abdominal apex, dorsal view. (74) The same, ventral view. (75) Hypandrium, ventral view. (76) Hypandrium and genitalia, dorsal view. (77) Right phallomere, dorsal view. (78) The same, ventral view. (79) Caudal part of sclerite L2D and adjacent structures, ventral view. (80) Caudal part of sclerite L2D, dorsal view. (81) Sclerite L3. (82-84) Apex of sclerite L3. Dash lines show black maculae (71, 75). Dotted lines show yellowish maculae (71). Dotted areas show dark colour (72) or membranous parts (74-84). Abbreviations: *a.R4*, *ap.scl.*, *b.L2*, *b.L3*, *b.pr.*, *c.p.R1T*, *ch.a.*, *hge*, *L3*, *L4U*, *ml.*, *R2*, *R3*, *R4*, *R5*, *scl.* - see chapter "abbreviation used in figures", for details see text. Scale bars 1 mm: a = 71, b = 72, c = 73, d = 74, e = 75, f = 76, g = 77, 78, h = 79, i = 80, j = 81, k = 82-84.

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