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Author: Anisyutkin, Leonid N.

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# Little known Epilamprinae (Dictyoptera: Blaberidae) from the collections of the Muséum d'histoire naturelle de Genève. Part 3

Leonid N. Anisyutkin

*Zoological Institute of the Russian Academy of Sciences, Universitetskaya Emb. 1, 199034 Saint Petersburg, Russia. E-mail: leonid.dictyoptera@gmail.com, Leonid.Anisyutkin@zin.ru*

**Abstract:** The genus *Morphnodes* Hebard, 1930 is restored from synonymy with *Rhabdoblatta* Kirby, 1903. Detailed morphological descriptions of *Morphna maculata* (Brunner von Wattenwyl, 1865), the type species of the genus *Morphna* Shelford, 1910, of *Morphnodes goliath* (Shelford, 1906), *Pseudocalolampra inexpectata* Roth & Princis, 1971, and *Colapteroblatta compsa* Hebard, 1919, the type species of the genus *Colapteroblatta* Hebard, 1919, are given. The male genitalia of *Morphna maculata* and *Morphnodes goliath* and the ovipositor and adjacent structures of *M. maculata* and *C. compsa* are described for the first time. Relationships of the genera *Morphna*, *Morphnodes* and *Rhabdoblatta* are briefly discussed.

**Keywords:** Cockroaches - *Morphna maculata* - *Morphnodes goliath* - *Pseudocalolampra inexpectata* - *Colapteroblatta compsa* - morphology.

## INTRODUCTION

This paper is devoted to cockroaches of the subfamily Epilamprinae (Blaberidae). It is the third paper of a series of papers dealing with this taxon. The aim of this and previously published papers (Anisyutkin, 2015, 2016) is to provide morphological descriptions which are detailed enough for further phylogenetic investigations.

*Morphna maculata* (Brunner von Wattenwyl, 1865) and *Colapteroblatta compsa* Hebard, 1919 are the type species of the genera *Morphna* Shelford, 1910 and *Colapteroblatta* Hebard, 1919, respectively. These are the type genera of the tribes Morphnini McKittrick, 1964 and Colapteroblattini Hebard, 1919, respectively. Consequently, the morphology of these species is important for the reconstruction of Epilamprinae phylogeny. The genera *Morphnodes* Hebard, 1930 and *Pseudocalolampra* Roth & Princis, 1971 are insufficiently known and a detailed redescription of their morphology allows us to elucidate their phylogenetic position in the subfamily Epilamprinae.

## MATERIAL AND METHODS

This study is mostly based on material deposited in the collection of the Muséum d'histoire naturelle in Geneva. Additional material from the collections of the Zoological Institute of the Russian Academy of Sciences (Saint Petersburg, Russia) and of the Natural History Museum of London (United Kingdom) is used as well.

The author generally follows methods described in Anisyutkin (2014, 2015) and Anisyutkin & Yushkova (2017). Rehn's (1951) interpretation of tegmina and wing venation is used. Description of 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. Terminology of female genital structures follows McKittrick (1964) and Klass (1998). Terms introduced by the author (in the present work and in Anisyutkin, 2014, 2015) are given in quotation marks.

Material studied has been deposited in the Muséum d'histoire naturelle in Geneva (MHNG), in the Natural History Museum, London (BMNH) and in the Zoological Institute of the Russian Academy of Sciences in Saint-Petersburg, Russia (ZIN).

### Abbreviation used in figures

For further details see text.

*a.a.* anterior arch of second valvifer of female genitalia;

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| | |
|---|---|
| *a.s.* | "additional spines" i.e. spines bordering euplantulae at inside and outside; |
| *a.scl.* | "additional sclerite" under basal part of sclerite L2D in male genitalia; |
| *ap.scl.* | "apical sclerite" of sclerite L2D in the male genitalia; |
| *ap.t.* | "apical tooth" of apical part of sclerite L2D in male genitalia; |
| *b.L2D* | basal part of sclerite L2D in male genitalia; |
| *b.L3* | basal subsclerite of sclerite L3 in male genitalia; |
| *b.o.* | "bent outgrowth" of basal part of sclerite L2D in male genitalia; |
| *bd.s.* | brood sac of female genitalia; |
| *bsv.* | basivalvula of female genitalia; |
| *c.p.R1T* | caudal part of sclerite R1T in male genitalia; |
| *cr.p.R1T* | cranial part of sclerite R1T in male genitalia; |
| *d.o.* | "dorsal outgrows" of apical part of sclerite L2D in male genitalia; |
| *e.r.* | exterior row of spines along lower margin of hind metatarsus; |
| *gg.* | gonangulum of female genitalia; |
| *hge.* | groove of sclerite L3 in male genitalia (*sensu* Klass, 1997); |
| *i.r.* | interior row of spines along lower margin of hind metatarsus; |
| *IX* | 9th abdominal tergite; |
| *L3*, *L4U* | sclerites in male genitalia; |
| *l.s.* | large spines located on lateral sides of metatarsus; |
| *m.a.* | membranous area at anteromedian angles of paraprocts; |
| *p.a.* | posterolateral angles of abdominal tergite VIII; |
| *par.* | paraproct; |
| *pl.* | sclerotized lobes of 2nd and 3rd pairs of valves in female genitalia; |
| *r.plm.* | right phallomere of male genitalia; |
| *R2, R3, R4, R5* | sclerites in male genitalia; |
| *s.t.* | "small tooth" of apical part of sclerite L3 in male genitalia; |
| *spi.* | spinules located on metatarsal euplantula; |
| *teVIII.* | tergal process of 8th abdominal tergite; |
| *teIX.* | tergal process of 9th abdominal tergite; |
| *tr.l.* | "upper triangular lobe" of right phallomere of male genitalia; |
| *v.I.*, *v.II.*, *v.III.* | 1st, 2nd and 3rd valves of ovipositor; |
| *vs.* | vestibular sclerite in female genitalia; |
| *X* | 10th abdominal tergite. |

## TAXONOMIC PART

### Genus *Morphna* Shelford, 1910

**Type species:** *Epilampra maculata* Brunner von Wattenwyl, 1865, by subsequent designation.

**Remarks:** The genus *Morphna* includes relatively large and wide cockroaches (Figs 1, 3) in comparison with the vast majority of Epilamprinae. The genus is characterized by the structure of its hind tarsi (Figs 14, 15): metatarsus slightly shorter or about as long as other segments combined, with large euplantula along lower margin, tarsal spines few or absent.

**Species included:** As given in Beccaloni (2014), with the addition of *M. indica* Anisyutkin in Anisyutkin & Yushkova, 2017 and *M. srilankensis* Anisyutkin in Anisyutkin & Yushkova, 2017.

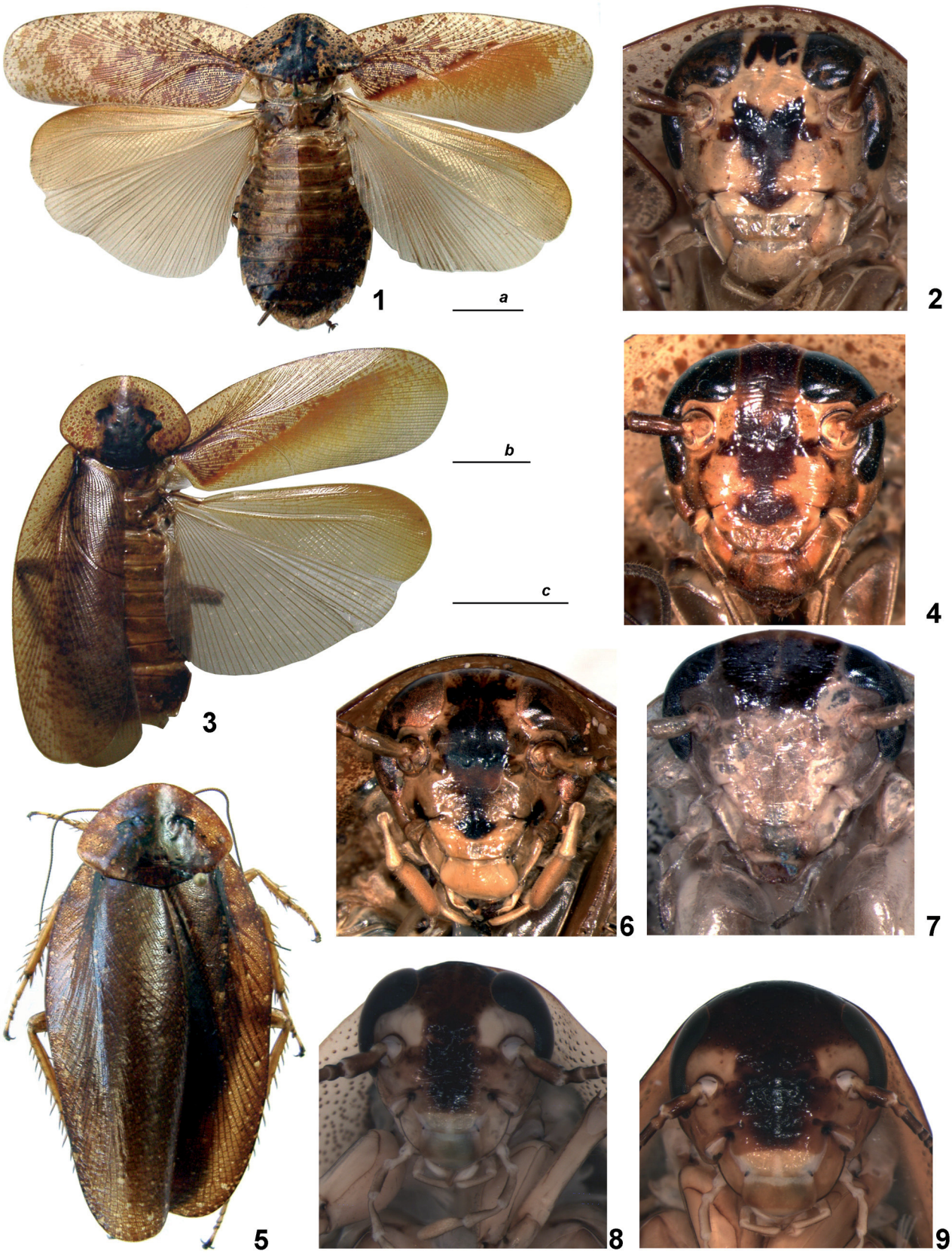
### *Morphna maculata* (Brunner von Wattenwyl, 1865)

Figs 1-4, 10-43

**Material examined:** BMNH; female syntype; "Syntype", "Sarawak. Shelford. 1900-117.", "*Morphna maculata* Brunner". – BMNH; 1 male (genital complex in prep. 220317/01); "Malaya Bukit Kutu F.M.S. 28.III.1932, N.C.E. Miller. 1000 ft.", "*Morphna maculata* Br. W. Det. B. Uvarov 1933". – ZIN; 1 male (specimen No. 141012/03, genital complex in prep. 220317/02), 1 female (specimen No. 141012/04, genital complex in prep. 220317/03); Malaysia, Borneo I., Sarawak State, environs of Kuching City, environs of Bako National Park, on sea bank, lowlying forest and forest on hills; 18.-22.03.2012; leg. A. Gorochov, M. Berezin, E. Tkatsheva, I. Kamskov. – ZIN; 1 male, 1 female; Malaysia, Pahang State, environs of Kuala Tahan Village on Tembeling River near Taman Negara (= National Park); December 2014; leg. M. Berezin. – ZIN; 1 female; Malaysia, Fraser's Hill near border with Selangor (17-18 km SW of Raub), 1000-1300 m; 15-23.04.2016; leg. A. Gorochov, M. Berezin, E. Tkatsheva.

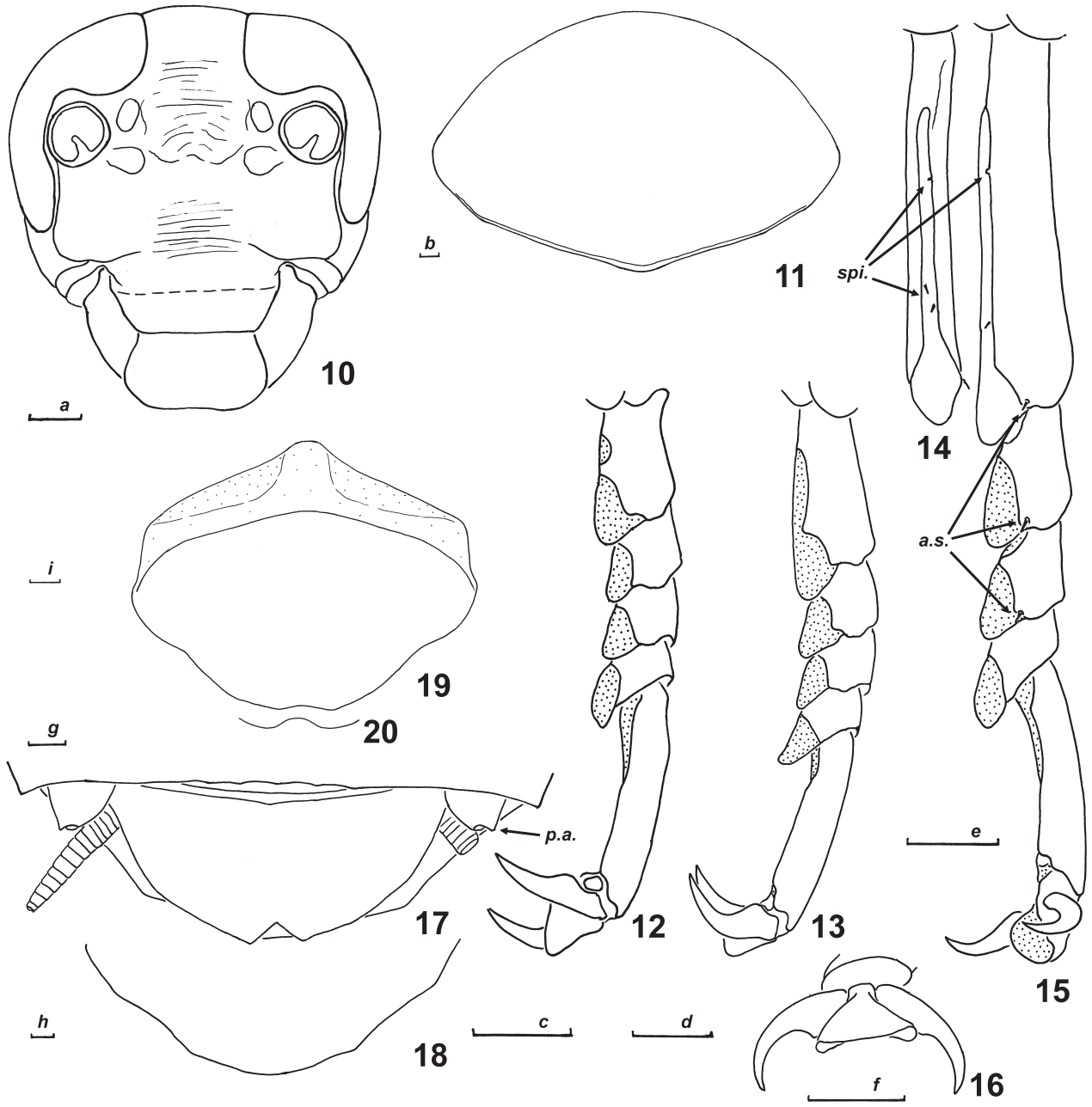
**Redescription of female syntype** (Figs 1-2, 10-18): General colour yellow-brown, with scattered dark dots (Fig. 1). Colouration of head as in Fig. 2, eyes dark brown, facial part of head with arrow-like black spot. Scapi brown, other parts of antennae broken off. Surfaces smooth and lustrous, head with transverse wrinkles (Figs 2, 10), weak punctuation present in proximal part of tegmina, mostly in costal field. Head longer than wide, with indistinct transverse impression between antennal sockets and eyes (Figs 2, 10); ocellar spots small; distance between eyes 0.5 times eye length; distance between antennal sockets about twice scape length (1.5 mm); approximate length ratio of 3rd-5th segments of maxillary palps 0.8 : 1.0 : 1.0. Pronotum as in Figs 1, 11. Tegmina and wings

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Figs 1-9. Photos of *Morphna maculata* (Brunner von Wattenwyl, 1865) (1-2: female, syntype, 3-4: male), *Morphnodes goliath* (Shelford, 1906) (5-6: male), *Pseudocalolampra inexpectata* Roth & Princis, 1971 (7: male), *Colapteroblatta compsa* Hebard, 1919 (8: male, 9: female). (1, 3, 5) Dorsal view of entire specimen. (2, 4, 6-9) Facial part of head. Abdominal apex removed in Fig. 3. Scale bars 10 mm: a = 1, b = 3, c = 5. Other photos not to scale.

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Figs 10-20. *Morphna maculata* (Brunner von Wattenwyl, 1865), females (10-18: syntype, 19-20: specimen No. 141012/04). (10) Facial part of head. (11) Pronotum, dorsal view. (12-13, 15) Fore (12), mid (13) and hind (15) tarsus, prolateral view. (14) Hind metatarsus, ventral view. (16) Hind pretarsus, distal view. (17) Abdominal apex, dorsal view. (18) Genital plate, outlines of hind margin. (19) Genital plate, ventral view. (20) Genital plate, outline of medial part of hind margin, posterior view. Dotted areas show membranous parts (not shown for metatarsus in Figs 14-15). Abbreviations: *a.s.*, *p.a.*, *spi.* – see paragraph "abbreviation used in figures"; for details see text. Scale bars 1 mm: a = 10, b = 11, c = 12, d = 13, e = 14-15, f = 16, g = 17, h = 18, i = 19-20.

completely developed (Fig. 1), surpassing abdominal apex. Tegmina with truncated apex, sclerotized in costal field; venation distinct; costal field wide; *Sc* thickened (well visible on ventral side of tegmen); *R*, *M* and *CuP* basally fused. Wings membranous, only with weakly sclerotized area of *Sc* and anterior rami of *R*. Fore tibiae not thickened distally. Anterior margin of fore femora of armed type B, with 6-7 spines, including 1-2 apical ones. Tibial spines well developed. Structure of hind tarsus (Figs 14-15) (only left hind tarsus present): metatarsus slightly shorter than other tarsal segments combined, euplantula large, with two spines located on euplantula and one spine at margin of euplantula (Figs 14-15, *spi.*); euplantulae of 2nd-4th tarsal segments

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large; euplantulae of 1st-3rd tarsal segments with "additional spines" on their outside (Fig. 15, *a.s.*); claws symmetrical, simple; arolium distinct, about half as long as claw (Fig. 16). Fore (Fig. 12) and mid (Fig. 13) tarsi similar to hind tarsi, but segments comparatively shorter and spines completely absent. Abdomen without visible glandular specializations; spiracle-bearing outgrowths of tergite VIII with sharp and attenuate posterolateral angles (Fig. 17, *p.a.*). Anal plate (tergite X) wider than long and widely rounded, with triangular medial incision on hind margin (Fig. 17). Cerci slender, with distinct segments (Fig. 17). Genital plate wide, without distinct emargination on hind margin (Fig. 18).

**Variation of somatic characters of non-type females:** The characterization of this species can be supplemented with the following details taken from other specimens examined. Eyes black in some specimens; ocellar spots yellow to orange; black spot on facial part of head in some specimens larger than in syntype. Complete antennae brown. Distance between eyes 0.5-0.6 times eye length; distance between antennal sockets about 1.7-2.0 times scape length (~1.5-1.8 mm); approximate length ratio of 3rd-5th segments of maxillary palps 0.8-1.0 : 1.0 : 1.0. Tegmina with truncated or widely rounded apices. Anterior margin of fore femora with 4-7 spines, including 1-2 apical ones. Structure of hind tarsus as in syntype, but in all other specimens spines situated along lower margin of metatarsus (including spines on euplantula) absent; arolium slightly shorter or longer than half of claw length. Hind margin of genital plate with distinct or weak emargination (Fig. 19) or with sinuate invagination (Fig. 20).

**Ovipositor and adjacent structures of non-type females** (Figs 21-24): Intercalary sclerite absent. Tergal processes of abdominal segment VIII reduced, not reaching paratergites of tergite VIII (Fig. 21, *teVIII.*); tergal processes of abdominal segment IX fully developed (Fig. 21, *teIX.*). Gonangulum distinct, well sclerotized (Figs 21-23, *gg.*). All valves of ovipositor mostly membranous, only partly sclerotized. First valves large, membranous at apex, with numerous setae along inner side (Fig. 22, *v.I.*). Base of 2nd and 3rd pairs of valves as in Fig. 23, sclerotized lobes well developed (Fig. 23, *pl.*). Anterior arch of second valvifer as in Fig. 23, *a.a.* Second valves of ovipositor small, completely hidden under 1st ones (Fig. 22, *v.II.*). Third valves of ovipositor (gonoplacs) wide (Figs 21-22, *v.III.*). Basivalvula developed as slightly asymmetrical, widely rounded and partly sclerotized plates (Figs 21-23, *bsv.*). Vestibular structure sclerotized along with sides, with long lateral branches (Figs 21-23, *vs.*). Brood sac (Fig. 21, *bd.s.*) without sclerotized structures.

**Somatic characters of males:** Generally similar to female, but different in the following details. Head with eyes slightly larger (Fig. 25); distance between eyes 0.5-0.6 times eye length; distance between antennal sockets about 1.4-1.5 times scape length (~1.8-1.9 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.0 : 1.0 : 1.1-1.2. Pronotum less wide (Fig. 26). Anterior margin of fore femora with 5-7 spines, including 1-2 apical ones. Tarsal spines (i.e. spines located along lower margin of segments, euplantulae, and "additional spines") absent in some specimens. Shape of spiracle-bearing outgrowths of abdominal tergite VIII quite variable: posterolateral angles distinctly attenuated (Fig. 17, *p.a.*) or rounded (Figs 27-28). Anal plate (tergite X) widely rounded, with triangular medial incision on hind margin (Figs 27-28). Cerci longer (Fig. 27) than in female. Paraprocts of blaberid-type (Figs 28-29, *par.*). Hypandrium nearly symmetrical, hind margin with weak median incision (Fig. 30); styli short, cylindrical.

**Male genitalia** (Figs 31-43): Right phallomere (R+N): caudal part of sclerite R1T well sclerotized, subrectangular in shape (Figs 31-32, *c.p.R1T*), densely covered with bristles; R2 angulate; R3 robust, widened caudally; R4 large, plate-like; R5 small, fused with R3. Sclerite L2D (L1) divided into basal and apical parts (Fig. 33); basal part rod-like, weakly widened cranially; "apical sclerite" partly covered with recumbent bristles; "dorsal outgrowth" large (Figs 34-39, *d.o.*). Sclerite L3 (L2d) without basal subsclerite (Fig. 40); "folded structure" distinct, with short bristles; apex of L3 with "small tooth" (Figs 41-43, *s.t.*); groove *hge* absent. Sclerite L4U (L3d) large.

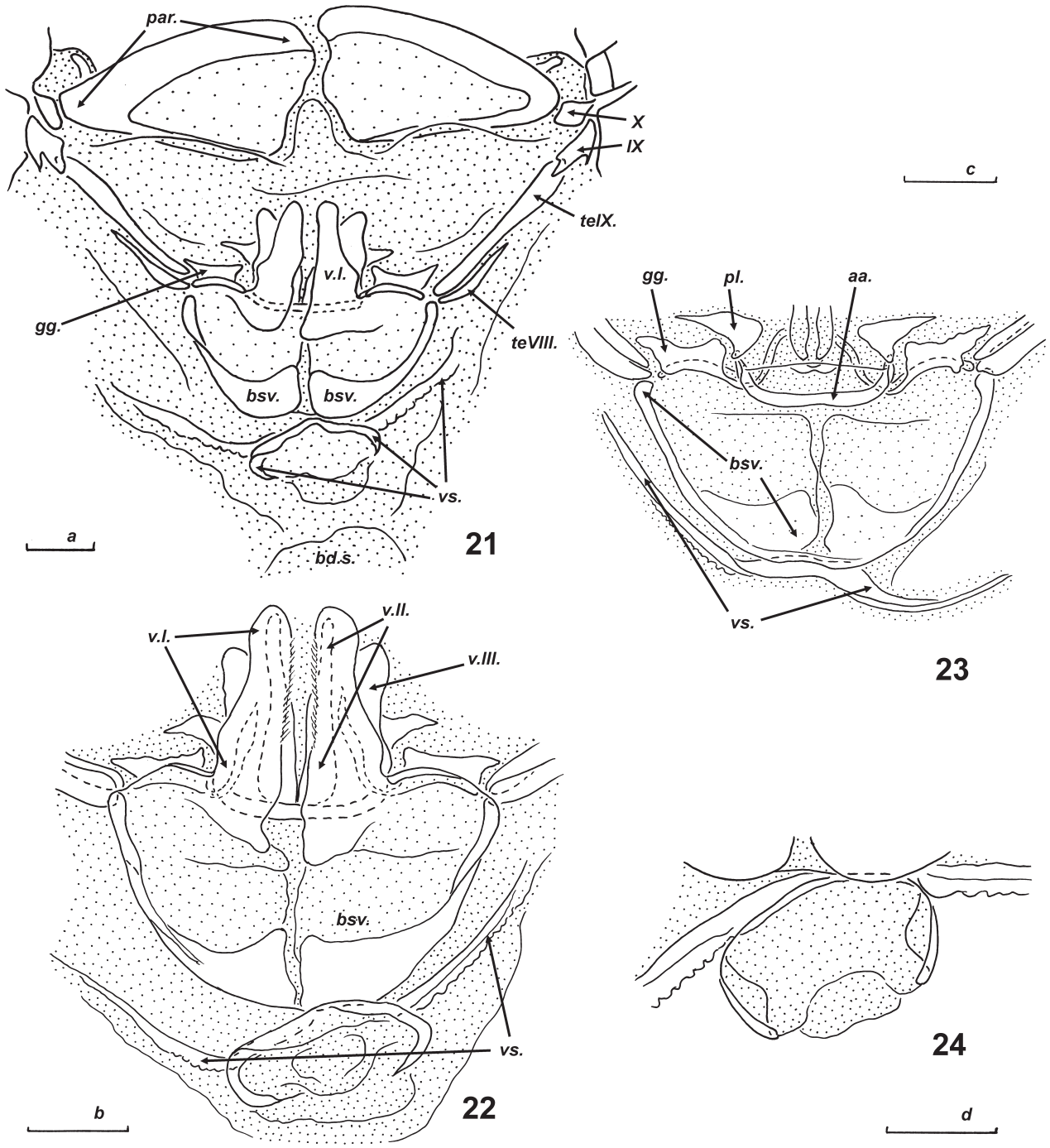
**Dimensions** (in mm): Head length: male 6.7-7.2, female 6.7-7.6 (7.1); head width: male 5.8-6.2, female 6.1-6.9 (6.3); pronotum length: male 11.2-11.8, female 11.7-12.4 (11.8); pronotum width: male 16.5-16.7, female 16.5-18.2 (18.2); tegmen length: male 38.0-39.0, female 38.0-40.0 (40.0); tegmen width: male 16.0, female 14.0-17.5 (16.0). Measurements in parenthesis are those of syntype.

## Genus *Morphnodes* Hebard, 1930

**Type species:** *Epilampra vasta* Walker, 1868, by original designation.

**Remarks:** The genus *Morphnodes* was described as closely related to *Morphna*, but differs from it as follows: "Pronotal disk with a weak to moderately developed impression latero-cephalad. Tegmina showing distinct distal truncation. Hind metatarsus biseriately spined ventrad." (Hebard, 1930: 93). Later, *Morpnodes* was synonymized with *Pseudophoraspis* Kirby, 1903 by Princis (1958). It was argued that the type species of *Morphnodes*, *E. vasta*, belongs to the genus *Pseudophoraspis* as stated by Shelford (1910). It must be noted that Shelford (1910: 12) did not discuss

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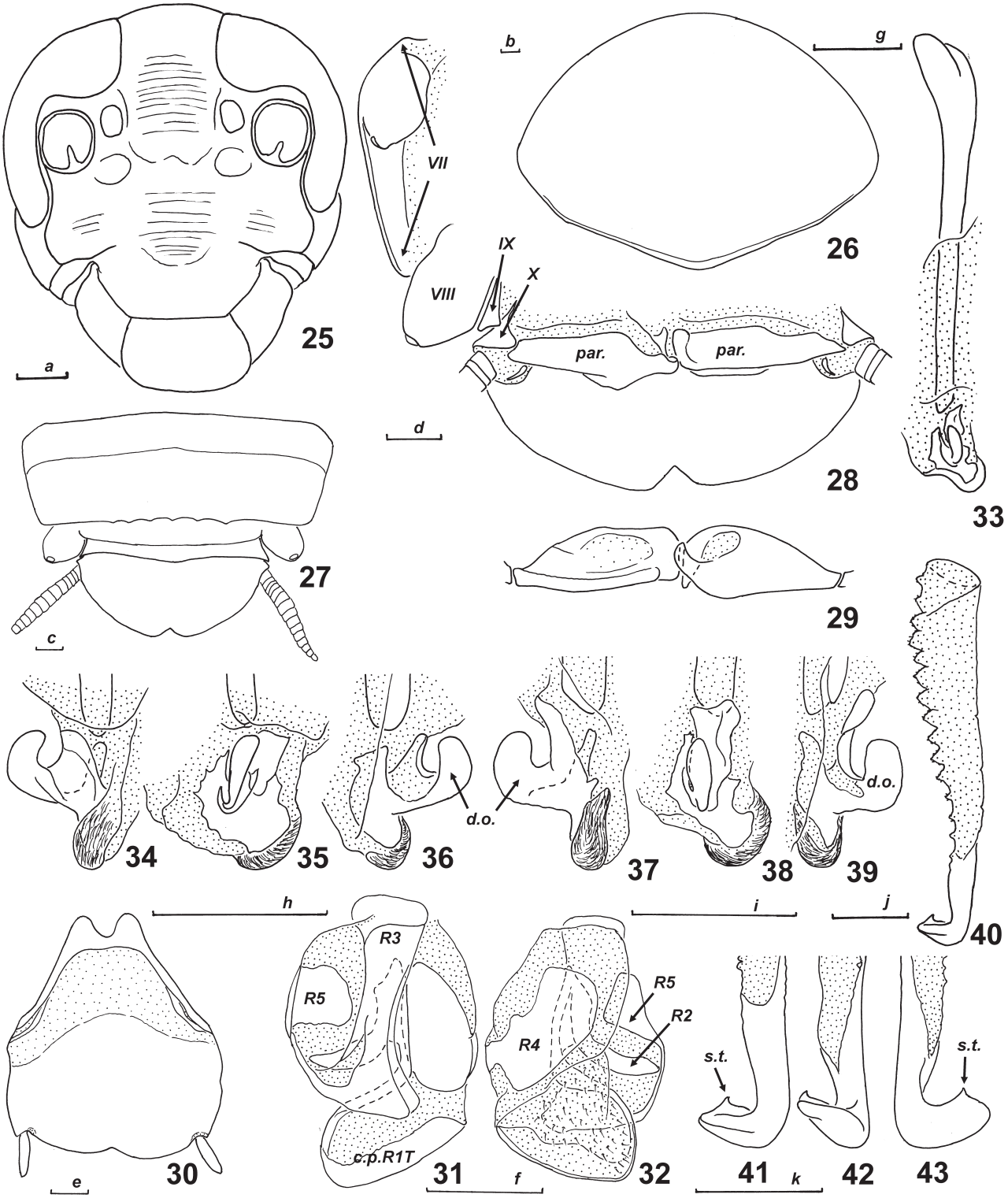



Figs 21-24. *Morphna maculata* (Brunner von Wattenwyl, 1865), female specimen No. 141012/04. (21) Abdominal apex, ventral view, genital plate removed. (22) Ovipositor and adjacent structures, ventral view. (23) Basal part of ovipositor, dorsal view. (24) Vestibular sclerite. Dotted areas show membranous parts, except for valves of ovipositor. Abbreviations: *bd.s.*, *bsv.*, *gg.*, *par.*, *pl.*, *teVIII.*, *teIX.*, *v.I.*, *v.II.*, *v.III.*, *vs.* – see paragraph "abbreviation used in figures"; *IX*, *X* - abdominal tergites IX-X; for details see text. Scale bars 1 mm: a = 21, b = 22, c = 23, d = 24.

the taxonomical position of *E. vasta*, but only listed this species under the genus *Pseudophoraspis*. In 1967 Princis listed *E. vasta* in the genus *Rhabdoblatta* Kirby, 1903 and placed *Morphnodes* in the synonymy of that genus without giving reasons (Princis, 1967).

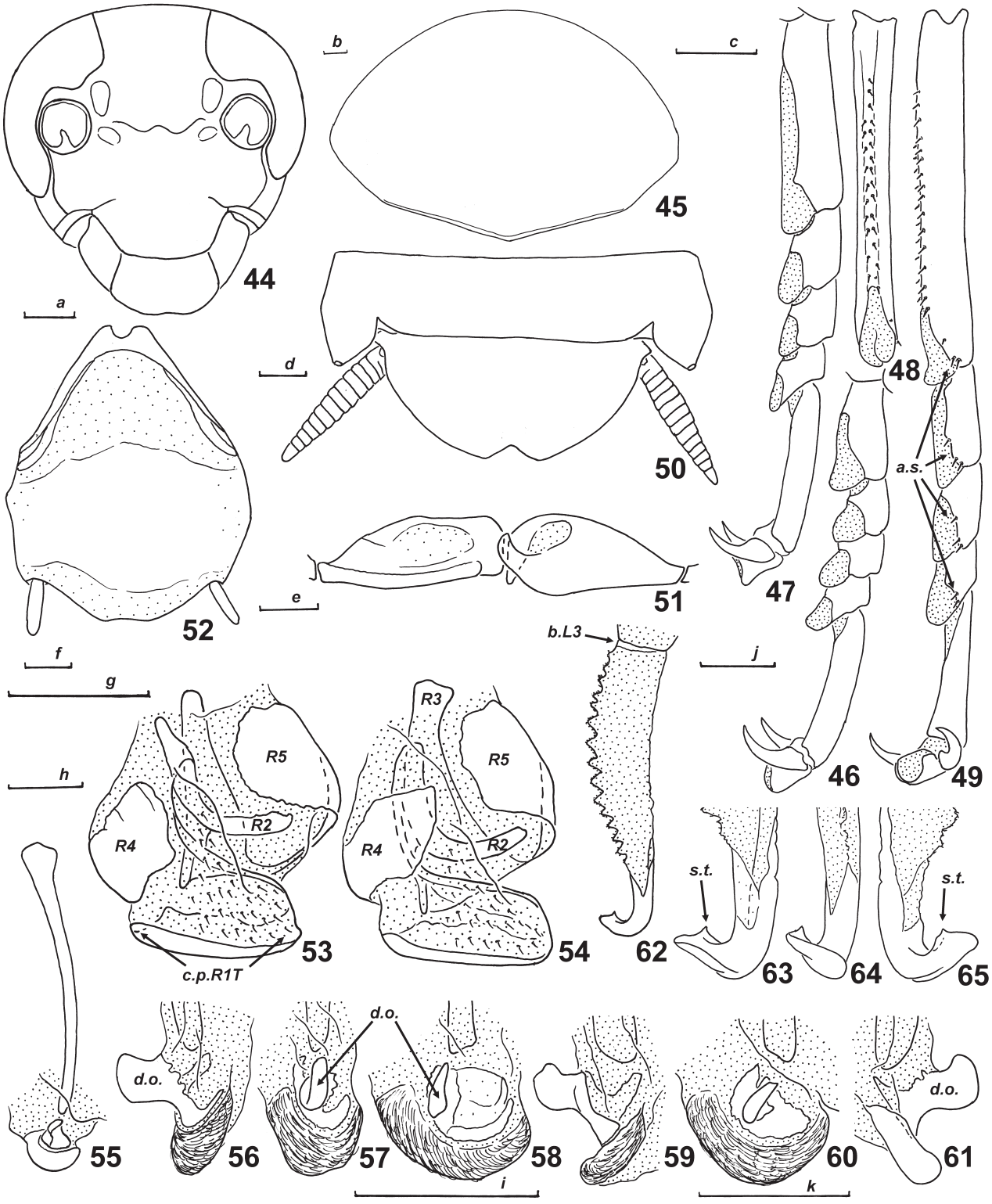
*Morphnodes goliath* (Shelford, 1906), redescribed below, is similar to *Morphna maculata*, but differs from this and other representatives of the genus *Morphna* in the structure of the hind tarsi – a character mentioned by Hebard in the original description of the genus *Morphnodes*. *Morphnodes goliath* differs from *Rhabdoblatta praecipua* (Walker, 1868), the type species of the genus

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Figs 25-43. *Morphna maculata* (Brunner von Wattenwyl, 1865), males (25-26, 33, 37-43: specimen in BMNH, 27-32, 34-36: specimen in ZIN, No. 141012/03). (25) Facial part of head. (26) Pronotum, dorsal view. (27) Abdominal apex, dorsal view. (28) Abdominal apex, ventral view (only right sides of VII and VIII tergites are shown). (29) Paraprocts, posterior view. (30) Hypandrium, ventral view. (31) Right phallomere, ventral view. (32) Same, dorsal view. (33) Sclerite L2D, dorsal view, bristles not shown. (34, 37) Posterior part of sclerite L2D, lateral view. (35, 38) Same, dorsal view. (36, 39) The same, contralateral view. (40) Sclerite L3. (41-43) Apex of sclerite L3. Dotted areas show membranous parts. Abbreviations: *c.p.R1T*, *d.o.*, *par.*, *R2*, *R3*, *R4*, *R5*, *s.t.* – see paragraph "abbreviation used in figures"; *VII*, *VIII*, *IX*, *X* - abdominal tergites VII-X; for details see text. Scale bars 1 mm: a = 25, b = 26, c = 27, d = 28-29, e = 30, f = 31-32, g = 33, h = 34-36, i = 37-39, j = 40, k = 41-43.

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Figs 44-65. *Morphnodes goliath* (Shelford, 1906), specimen in MHNG (44-53, 55, 59-65), specimen No. 200709a (54, 56-57) and specimen No. 200709b (58). (44) Facial part of head. (45) Pronotum, dorsal view. (46-47, 49) Fore (46), mid (47) and hind (49) tarsus, prolateral view. (48) Hind metatarsus, ventral view. (50) Abdominal apex, dorsal view. (51) Paraprocts, ventral view. (52) Hypandrium, ventral view. (53-54) Right phallomere, dorsal view. (55) Sclerite L2D, dorsal view, bristles not shown. (56, 59) Posterior part of sclerite L2D, lateral view. (57-58, 60) Same, dorsal view. (61) Same, contralateral view, bristles not shown. (62) Sclerite L3. (63-65) Apex of sclerite L3. Dotted areas show membranous parts. Abbreviations: *a.s.*, *b.L3*, *c.p.R1T*, *d.o.*, *R2*, *R3*, *R4*, *R5*, *s.t.* see paragraph "abbreviation used in figures"; for details see text. Scale bars 1 mm: a = 44, b = 45, c = 46-49, d = 50, e = 51, f = 52, g = 53-54, h = 55, i = 56-61, j = 62, k = 63-65.

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*Rhabdoblatta* (see redescription in Anisyutkin, 2014), and other species of this genus (Anisyutkin, 2000, 2003) in the presence of a well developed "dorsal outgrowth" of the apical part of sclerite L2D (Figs 56-61) and in the structure of fore and mid tarsi: presence of large euplantulae and absence of any spines (Figs 46-47). In all representatives of *Rhabdoblatta* known to the author all metatarsal euplantulae are small and apical. *Morphnodes goliath* is similar to representatives of the genus *Pseudophoraspis* in the presence of a "dorsal outgrowth" on the apical part of sclerite L2D, but differs from species of *Pseudophoraspis* in the shape of the "dorsal outgrowth". In *M. goliath* the "dorsal outgrowth" is short and directed upward (Figs 56-61, *d.o.*), in contrast to the long and cranial-directed "dorsal outgrowth" of *Pseudophoraspis* species (see Anisyutkin, 1999; Wang *et al.*, 2013). The head structure is also different: in species of *Pseudophoraspis* the facial part of the head has a distinct longitudinal impression (see Anisyutkin, 1999; Wang *et al.*, 2013). The apical part of sclerite L2D in *Pseudophoraspis fruhstorferi* Shelford, 1910 and *P. tramlapensis* Anisyutkin, 1999 have no "dorsal outgrowth" (Anisyutkin, 1999; Wang *et al.*, 2013), but these species probably belong to another genus.

Taking into account the aforementioned, I prefer to restore the genus *Morphnodes* from synonymy. To clarify the status of the genus *Morphnodes*, it is necessary to redescribe the type species, *Epilampra vasta*.

The genera *Morphna* and *Morphnodes* are similar in appearance and in the structure of the male genitalia. They are probably sister-groups with the following synapomorphies: (1) wide costal field of tegmina; (2) fore and mid tarsi with large euplantulae; (3) fore and mid tarsi with reduced spines; (4) "dorsal outgrowth" of apical part of sclerite L2D large and directed upward (large and directed cranially in *Pseudophoraspis*).

A species with a similar venation of the tegmina was described from the Paleocene (Vršanský *et al.*, 2013).

In the catalogues of Princis (1967) and Beccaloni (2014) the date of publication of Hebard's paper is incorrectly given. Volume 81 of the Proceedings of the Academy of Natural Sciences of Philadelphia for the year 1929 was in fact published in 1930, as stated on the first page of the issue.

**Included species:** *Morphnodes vasta* Walker, 1868, *M. imperatoria* (Stål, 1877), *M. goliath* (Shelford, 1906), *M. miranda* (Shelford, 1906).

### *Morphnodes goliath* (Shelford, 1906)

Figs 5-6, 44-65

**Material examined**: MHNG; 1 male (genital complex in prep. 240317/01); Malaysia, Sabah State, Mt. Kinabalu, 1550 m; 23.04.1987; leg. C. Besuchet, I. Löbl. – ZIN; 2 males (genital complexes in prep. 240317/02 and 240317/03); Malaysia, Sabah State, Gunung Alab Resort, 1500-1600 m; 25.-28.09.2008; leg. A. Michailov.

**Somatic characters of male:** General colour brownish, with scattered light dots (Fig. 5). Colouration of head as in Fig. 6, eyes brown or black, facial part of head with large longitudinal dark (brown or black) spot. Scapi and proximal parts of antennae yellowish, distal parts of antennae greyish. Impressions on pronotum blackish. Mouthparts, thorax from below, legs and abdomen yellowish; 3rd-7th abdominal tergites and sternites with pairs of black lateral spots. Surfaces smooth and lustrous, head with several very weak transverse wrinkles between eyes, weak punctuation present in proximal part of tegmina, mostly in costal field. Head slightly longer than wide, with indistinct transverse impression between antennal sockets (Figs 6, 44); ocellar spots small but distinct; distance between eyes 0.6 times eye length; distance between antennal sockets about 1.5-1.6 times scape length (~1.6-1.7 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.0 : 1.0 : 1.2-1.3. Pronotum as in Figs 5, 45, with a pair of impressions; anterior margin widely rounded. Tegmina and wings completely developed (Fig. 5), surpassing abdominal apex. Tegmina with rounded apex, sclerotized in costal field; venation slightly obliterated when seen from above, well visible on ventral side of tegmen; costal field wide; *Sc* thickened (well visible on ventral side of tegmen); *R*, *M* and *CuP* basally fused. Wings membranous, only with weakly sclerotized area of *Sc* and anterior rami of *R*. Fore tibiae not thickened distally. Anterior margin of fore femora of armed type B, with 4-7 spines, including 2 apical ones. Tibial spines well developed. Structure of hind tarsus (Figs 48-49): metatarsus slightly shorter than other tarsal segments combined, with small euplantula and 2 more or less equal rows of spines along lower margin; 2nd-4th segments with large euplantulae, spines along lower margins absent; 1st-3rd segments bordered with 0-3 "additional spines" on inside and outside (Figs 48-49, *a.s.*), in some males "additional spines" absent; claws symmetrical, simple; arolium distinct, about half as long as claw (Fig. 49). Fore (Fig. 46) and mid (Fig. 47) tarsi dissimilar to hind tarsi: metatarsal euplantulae large, spines along lower margin absent; one pair of "additional spines" present only on 1st-3rd segment of mid tarsi of one specimen. Abdomen without visible glandular specializations; spiracle-bearing outgrowths of tergite VIII without attenuate posterolateral angles (Fig. 50). Anal plate (tergite X) with widely rounded hind margin, with a triangular medial incision (Fig. 50). Cerci slender, with distinct segments (Fig. 50). Paraprocts of blaberid-type (Fig. 51). Hypandrium nearly symmetrical, with hind margin between styli projected and membranous, median incision weak (Fig. 52); styli short, cylindrical.

**Male genitalia** (Figs 53-65): Right phallomere

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(R+N): caudal part of sclerite R1T well sclerotized, subrectangular in shape, with more or less attenuate medial angle (Figs 53-54, *c.p.R1T*), densely covered with bristles; R2 angulate; R3 robust, widened caudally; R4 and R5 large, plate-like; R5 fused with R3. Sclerite L2D (L1) divided into basal and apical parts (Fig. 55); basal part rod-like, weakly widened cranially; "apical sclerite" variable in shape (Figs 56-61), covered with recumbent bristles; "dorsal outgrowth" large (Figs 56-61, *d.o.*). Sclerite L3 (L2d) with basal subsclerite (Fig. 62, *b.L3*); "folded structure" distinct, with short bristles; apex of L3 with "small tooth" (Figs 63-65, *s.t.*); groove *hge* absent. Sclerite L4U (L3d) large.

**Dimensions** (in mm): Head length 5.8-6.0, head width 5.5-5.7; pronotum length 9.1-10.1, pronotum width 13.6-15.1; tegmen length 32.5-45.0, tegmen width 15.0.

**Remark:** This species was described on the basis of one male from Mt Matang in northern Borneo (Shelford, 1906). The holotype (not examined) is kept in the University Museum of Oxford (Beccaloni, 2014).

### Genus *Pseudocalolampra* Roth & Princis, 1971

**Type species:** *Epilampra pardalina* Walker, 1868, by original designation.

**Remarks:** This genus was described on the basis of two species from Africa: *P. pardalina* Walker, 1868 (from Kenya to Botswana) and *P. inexpectata* Roth & Princis, 1971 (Kenya). Later, *P. pilosa* Grandcolas, 1993 from Madagascar was added (Grandcolas, 1993).
There are several types of armament along the lower margin of the tarsus. In one of the most common types, two more or less symmetrical rows of spines are present along the lower margin of the tarsus. Each of the two rows of spines (interior and exterior) is situated on a more or less developed longitudinal elevation. These elevations are symmetrical. In my opinion this is a plesiomorphic state, at least for the Blaberidae. In a derived state, one of these elevations is displaced laterally and consequently the corresponding row of spines is displaced to a lateral position (see Anisyutkin, 1999: figs 7-8). This character state is probably a synapomorphy of several genera of Epilamprinae: *Calolamprodes* Bey-Bienko, 1969, *Paracalolamprodes* Anisyutkin, 2015 and *Pseudocalolampra*.

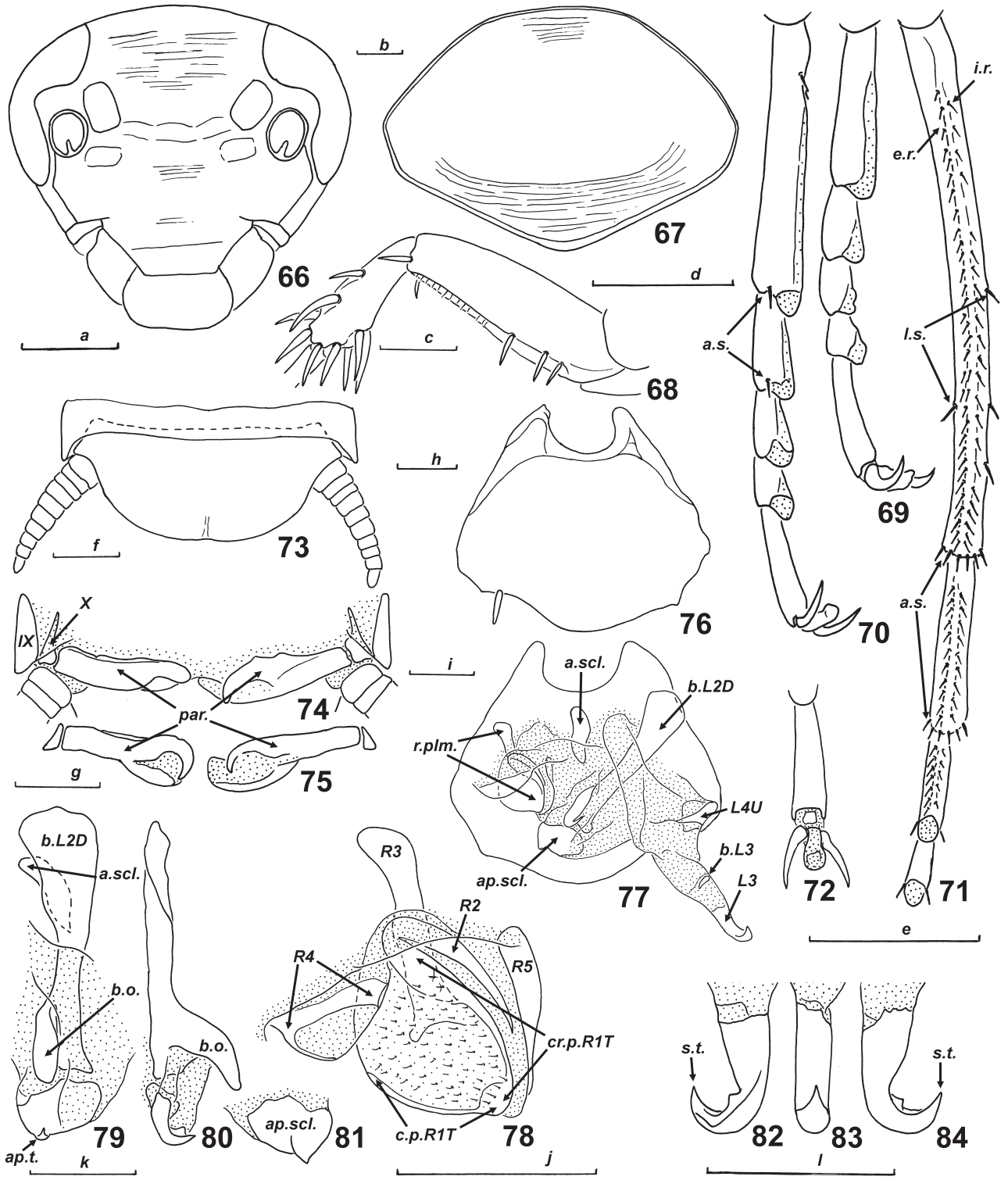
### *Pseudocalolampra inexpectata* Roth & Princis, 1971
Figs 7, 66-84

**Material examined:** MHNG; 2 males (genital complex of one male in prep. 250317/01); Kenya, Mombasa, Leisure Lodge; 6.-10.06.1980; coll. C. Schomo. – MHNG; 1 male; Kenya, "Leisure L. Jioni Gerch" (handwritten illegible text); 4.06.1981; coll. C. Schomo.

**Remarks:** The original description (Roth & Princis, 1971) can be supplemented with the following details, based on specimens listed above. The holotype (not examined) of this species is kept in Natural History Museum of London.

**Somatic characters of male:** General colour yellowish brown, with scattered black dots. Colouration of head as in Fig. 7, eyes black, facial part of head with large black or dark brown spot between eyes. Scapi and about 8-10 proximal segments of antennae yellowish, distal part greyish. Rest of head, mouthparts, legs, thorax and abdomen seen from below dirty yellow. Surfaces smooth and lustrous, head and pronotum with distinct transverse wrinkles (Figs 7, 66-67), weak punctuation present on pronotum. Head wider than long, with large impression between eyes and antennal sockets (Figs 7, 66); ocellar spots large; distance between eyes about as long as eye length; distance between antennal sockets about 2.3-2.7 times scape length (~0.6-0.7 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.1-1.2 : 1.0 : 1.0. Pronotum as in Fig. 67. Tegmina and wings completely developed, surpassing abdominal apex. Tegmina with rounded apex, sclerotized in costal field; venation slightly reticulate; costal field long, about one third of tegmen length, and narrow; *Sc* thickened (well visible on ventral side of tegmen); *R*, *M* and *CuP* basally fused; *CuP* long, about one half of tegmen length. Wings membranous, only with weakly sclerotized area of *Sc* and anterior rami of *R*. Fore tibiae distinctly thickened distally (Fig. 68). Anterior margin of fore femora of armed type B, with 4 spines, including 1 apical one (Fig. 68). Tibial spines well developed. Structure of hind tarsus (Figs 69-72): metatarsus a little longer than other tarsal segments combined, with 2 unequal rows of spines along lower margin: exterior row (Fig. 71, *e.r.*) consisting of 31-37, interior row (Fig. 71, *i.r.*) of 16-23 spines; 2nd and 3rd segments with 10-13/5-8 and 6-9/3-5 spines in exterior and interior rows, respectively; other segments without spines along lower margin; very small euplantulae present on 3rd-4th segments; distal ends of 1st-4th segments bordered with 6, 5 and 3 "additional spines, respectively (Figs 70-71, *a.s.*); 1-3 large spines located on lateral sides of metatarsus (Fig. 71, *l.s.*); interior rows of spines displaced laterally on all segments; claws symmetrical, simple; arolium distinct, about half as long as claw (Figs 69-72). Fore (Fig. 69) and mid (Fig. 70) tarsi dissimilar to hind tarsi: metatarsal euplantulae large, spines along lower margin absent; one pair of "additional spines" present only on 1st-2nd segments of mid tarsi. Abdomen without visible glandular specializations; spiracle-bearing outgrowths of tergite VIII weakly expressed, without attenuate posterolateral angles. Anal plate (tergite X) wider than long, with nearly straight hind margin (Fig. 73). Cerci robust, with distinct segments (Fig. 73). Left and right

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Figs 66-84. *Pseudocalolampra inexpectata* Roth & Princis, 1971, male in MHNG. (66) Facial part of head. (67) Pronotum, dorsal view. (68) Right fore leg, prolateral view. (69-70) Fore (69) and mid (70) tarsus, prolateral view. (71) 1st - 4th tarsal segments of right hind tarsus, ventral view. (72) 5th tarsal segment, ventral view. (73) Abdominal apex, dorsal view. (74-75) Paraprocts, ventral (74) and posterior (75) view. (76) Hypandrium, ventral view. (77) Hypandrium and male genitalia, dorsal view. (78) Right phallomere, dorsal view. (79-80) Sclerite L2D, dorsal (79) and lateral (80) view. (81) Apical sclerite L2D, ventral view. (82-84) Apex of sclerite L3. Dotted areas show membranous parts. Abbreviations: *a.s.*, *a.scl.*, *ap.scl.*, *ap.t.*, *b.L2D*, *b.L3*, *b.o.*, *c.p.R1T*, *cr.p.R1T*, *e.r.*, *i.r.*, *l.s.*, *L3*, *L4U*, *par.*, *r.plm.*, *R2*, *R3*, *R4*, *R5*, *s.t.* – see paragraph "abbreviation used in figures"; *IX*, *X* - abdominal tergites IX-X; for details see text. Scale bars 1 mm: a = 66, b = 67, c = 68, d = 69-70, e = 71-72, f = 73, g = 74-75, h = 76, i = 77, j = 78, k = 79-81, l = 82-84.

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paraprocts with hook-shaped caudomedial process (Figs 74-75, *par.*). Hypandrium asymmetrical, hind margin between styli projected and rounded (Figs 76-77); right stylus slender and cylindrical, left one vestigial or absent.

**Male genitalia** (Figs 77-84): Right phallomere (R+N): caudal part of sclerite R1T thin and weakly sclerotized (Fig. 78, *c.p.R1T*), cranial part widely rounded (Fig. 78, *cr.p.R1T*); R1T densely covered with bristles; R2 rounded; R3 long, with cranial part rod-like and caudally forked; R4 only partly sclerotized; R5 elongated. Sclerite L2D (L1) divided into basal and apical parts (Figs 77, 79-80); basal part robust, distinctly widened cranially (Figs 77, 79-80, *b.L2D*), with large "bent outgrowth" at caudal end (Figs 79-80, *b.o.*), "additional sclerite" under basal part of L2D large (Figs 77, 79, *a.scl.*); apical part in shape of flattened, plate-like sclerite (Figs 77, 79-81, *ap.scl.*), with upward-curved "apical tooth" (Figs 79-81, *ap.t.*); bristles absent. Sclerite L3 (L2d) with basal subsclerite (Fig. 77, *b.L3*); "folded structure" and bristles absent; apex of L3 with "small tooth" (Figs 82-84, *s.t.*); groove *hge* absent. Sclerite L4U (L3d) large (Fig. 77).

**Dimensions** (in mm): Head length 2.8-3.1, head width 3.0-3.2; pronotum length 4.5-5.0, pronotum width 6.5-7.2; tegmen length 17.2-18.0, tegmen width 5.5-6.1.

### Genus *Colapteroblatta* Hebard, 1919

**Type-species:** *Colapteroblatta compsa* Hebard, 1919, by monotypy.

**Remarks:** The genus was described as monotypical, on the basis of 1 male, 7 females and 3 larvae (Hebard, 1919). The morphology of external structures was described in detail in the original description. The male genitalia of *C. compsa* were illustrated by Roth (1971). Later, the genera *Poroblatta* Hebard, 1919, *Acroporoblatta* Hebard, 1919 and *Nauclidas* Rehn, 1930 were synonymized under *Colapteroblatta* by Roth & Gutiérrez (1998).

### *Colapteroblatta compsa* Hebard, 1919
Figs 8-9, 85-105

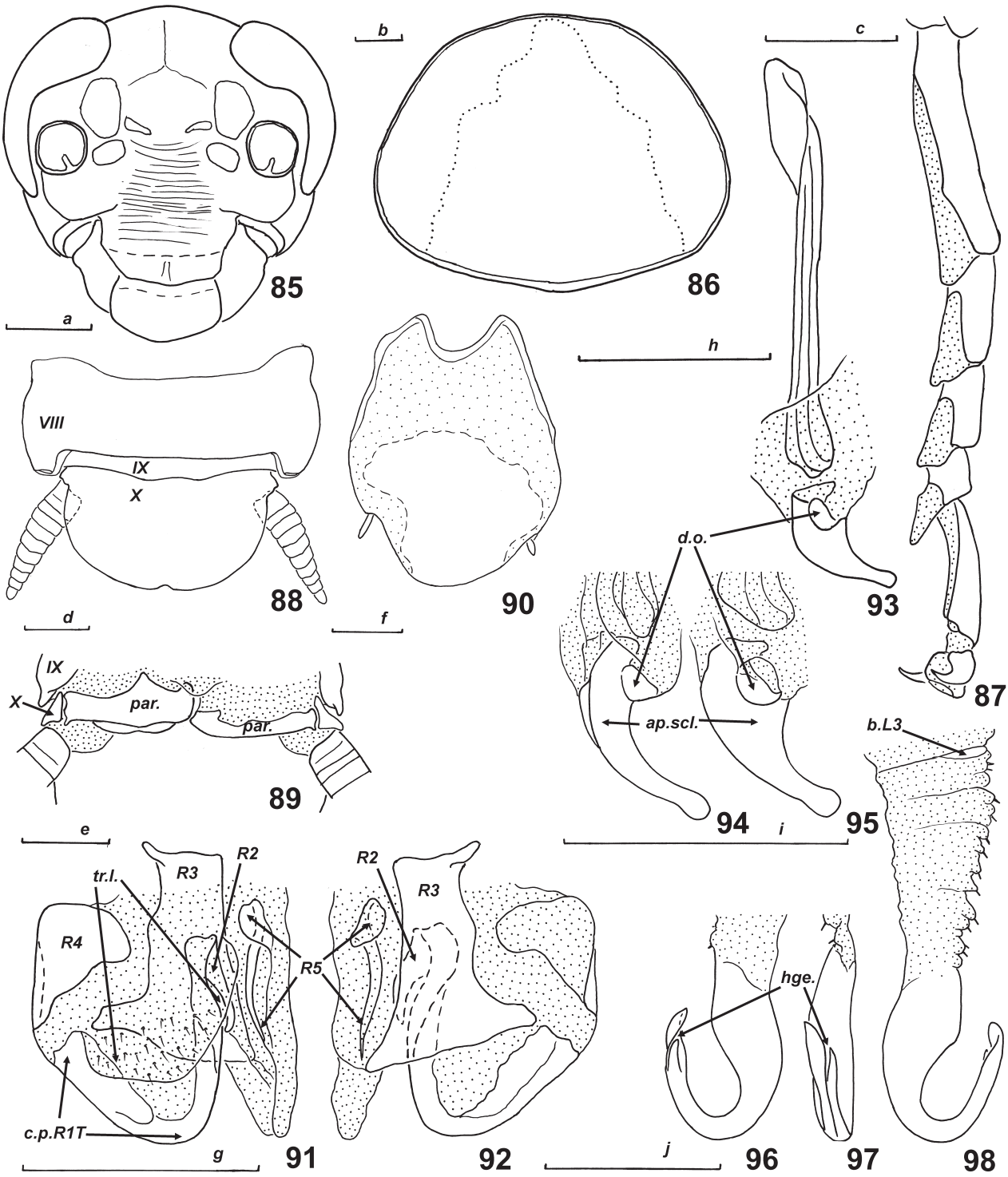
**Material examined:** MHNG; 1 male; N. Colombia, Dept. Magdalena, N. Sierra Nevada de Sta. Marta, San Lorenzo, 2200 m; 18.-24.08.1985; coll. H.G. Müller, "am Wegrand, aus der Vegetation". – MHHG; 1 female; same data as for the male, but 22.08.1985, "am Wegrand, unter Stein".

**Remarks:** The original description (Hebard, 1919) and the data of Roth (1971) and Roth & Gutierrez (1998) are sufficient and a re-examination of the types is therefore not necessary. The type material (not examined) is probably kept in entomological collection of Academy of Natural Sciences of Drexel University (former Academy of Natural Sciences of Philadelphia). The type locality is "San Lorenzo, Sierra Nevada de Santa Maria, Magdalena, Colombia" (Hebard, 1919), i.e. the specimens redescribed below were collected not far away from the type locality. The following supplementary details can be given.

**Somatic characters of male:** General colour yellowish brown. Colouration of head as in Fig. 8, eyes black, facial part of head with large longitudinal dark brown spot. Antennae yellowish brown. Central part of pronotum dark brown, lateral part yellow (Fig. 86). Surfaces smooth and lustrous; head with transverse wrinkles (Fig. 85); head, pronotum and costal field of tegmina with distinct punctuation. Head longer than wide, vertex projected between eyes, with indistinct transverse impression between antennal sockets (Figs 8, 85); ocellar spots large; distance between eyes 0.8 times eye length; distance between antennal sockets about 0.5 times scape length (~1.2 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.3 : 1.0 : 1.2. Pronotum rounded, with hind margin weakly projected (Fig. 86). Tegmina and wings completely developed, strongly elongated, surpassing abdominal apex. Tegmina membranous, only proximal part of costal field slightly sclerotized; apex rounded; venation distinct; costal field short and narrow; *Sc* thickened (well visible on ventral side of tegmen); *R*, *M* and *CuP* basally fused. Wings membranous. Fore tibiae not thickened distally. Anterior margin of fore femora of armed type C, with single apical spine. Tibial spines well developed. Structure of hind tarsus (Fig. 87): metatarsus distinctly shorter than other tarsal segments combined, with large euplantula; spines absent; claws symmetrical, simple; arolium distinct, about half as long as claw. Fore and mid tarsi similar to hind tarsi but segments comparatively shorter. Abdomen without visible glandular specializations; spiracle-bearing outgrowths of tergite VIII without attenuate posterolateral angles (Fig. 88). Anal plate (tergite X) with widely rounded hind margin with weak medial incision (Fig. 88). Cerci slender, with distinct segments (Fig. 88). Paraprocts of blaberid-type (Fig. 89). Hypandrium asymmetrical, hind margin between styli projected and rounded (Fig. 90); styli short, cylindrical and asymmetrical: right stylus about twice as long as left stylus (Fig. 90).

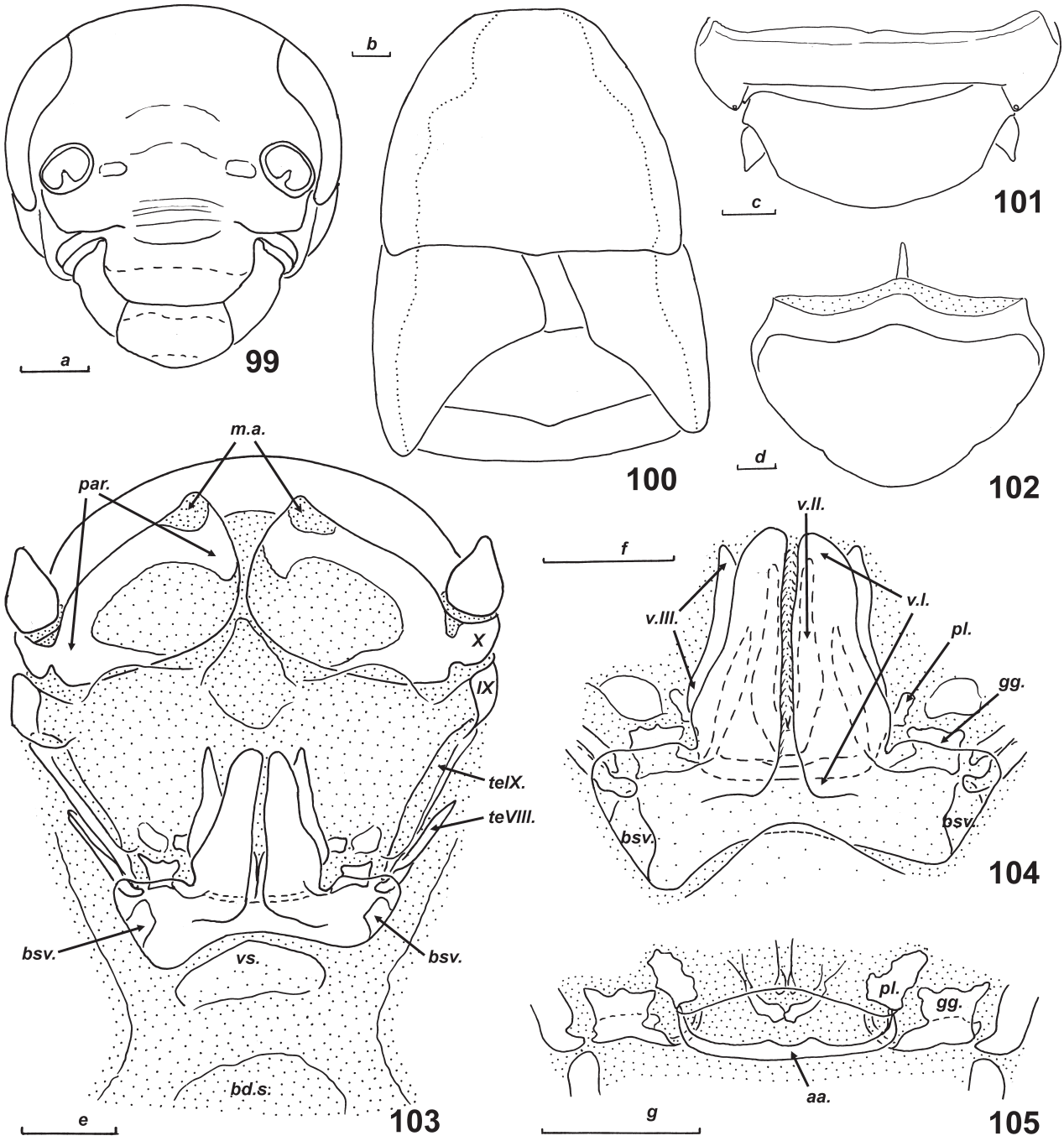
**Male genitalia** (Figs 91-98): Right phallomere (R+N): caudal part of sclerite R1T well sclerotized, dorsally with "upper triangular lobe" (Fig. 91, *tr.l.*), this lobe and adjacent membranes covered with bristles; R2 short and nearly straight, slightly rounded in plane perpendicular to plane of figure, not visible in Figs 91-92; R3 robust, widened caudally; R4 large, plate-like; R5 in shape of cranially widened, long and thin strip, surrounded with membranous lobe. Sclerite L2D (L1) divided into basal and apical parts (Fig. 93); basal part rod-like, weakly

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Figs 85-98. *Colapteroblatta compsa* Hebard, 1919, male in MHNG. (85) Facial part of head. (86) Pronotum, dorsal view. (87) Hind tarsus, prolateral view. (88) Abdominal apex, dorsal view. (89) Paraprocts, ventral view. (90) Hypandrium, ventral view. (91) Right phallomere, dorsal view. (92) Same, ventral view. (93) Sclerite L2D, dorsal view. (94) Posterior part of sclerite L2D, lateral view. (95) Same, dorsal view. (96-97) Apex of sclerite L3. (98) Sclerite L3. Dotted areas show membranous parts. Dotted line in Fig. 86 delimits yellow lateral stripes and dark central spot. Abbreviations: *ap.scl.*, *b.L3*, *c.p.R1T*, *d.o.*, *hge.*, *par.*, *R2*, *R3*, *R4*, *R5, tr.l.* – see paragraph "abbreviation used in figures"; *VIII*, *IX*, *X* - abdominal tergites VIII-X; for details see text. Scale bars 1 mm: a = 85, b = 86, c = 87, d = 88, e = 89, f = 90, g = 91-92, h = 93, i = 94-95, j = 96-98.

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Figs. 99-105. *Colapteroblatta compsa* Hebard, 1919, female in MHNG. (99) Facial part of head. (100) Anterior part of body, dorsal view. (101) Abdominal apex, dorsal view. (102) Genital plate, ventral view. (103) Abdominal apex with genital plate removed, ventral view. (104) Ovipositor, ventral view. (105) Basal part of ovipositor, dorsal view. Dotted areas show membranous parts, not indicated on valves of ovipositor. Dotted line in Fig. 100 delimits yellow lateral stripes and dark central part of tergites and tegmina. Abbreviations: *aa.*, *bd.s.*, *bsv.*, *gg.*, *m.a.*, *par.*, *pl.*, *teVIII.*, *teIX.*, *v.I.*, *v.II.*, *v.III.*, *vs.* – see paragraph "abbreviation used in figures"; *IX*, *X* - abdominal tergites IX-X; for details see text. Scale bars 1 mm: a = 99, b = 100, c = 101, d = 102, e = 103, f = 104, g = 105.

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widened cranially; apical part in shape of flattened, elongated and plate-like sclerite (Figs 93-95, *ap.scl.*), "dorsal outgrowth" small (Figs 93-95, *d.o.*); bristles absent. Sclerite L3 (L2d) with basal subsclerite (Fig. 98, *b.L3*); "folded structure" distinct, with bristles; apex of L3 attenuated; groove *hge* present (Figs 96-98, *hge*.). Sclerite L4U (L3d) present, weakly sclerotized.

**Somatic characters of female:** Brachypterous (Fig. 100), body convex, surfaces of abdomen strongly sclerotized. General colour darker than male, blackish; colouration of head as in Fig. 9; pronotum and tegmina with wide lateral yellow strip (Fig. 100); legs dirty yellow. Head with eyes and ocellar spots (Figs 9, 99) smaller than in male; distance between eyes 1.2 times eye length; distance between antennal sockets 2.1 times scape length (~1.1 mm); approximate length ratio of 3rd-5th segments of maxillary palps 1.6 : 1.0 : 1.4. Pronotum campaniform, as in Fig. 100. Tegmina strongly abbreviated and malformed, as in Fig. 100; venation absent. Wings vestigial, completely hidden under tegmina. Fore tibiae not thickened distally. Anterior margin of fore femora of armed type C, with 2 apical spines. Tibial spines well developed. Structure of tarsi similar to those of male. Abdomen without visible glandular specializations. Anal plate (tergite X) wider than long, its hind margin widely rounded (Fig. 101). Cerci strongly shortened, conical, with poorly visible traces of segmentation (Fig. 101). Paraprocts medially membranous (Fig. 103, *par.*), fused with anal plate, with membranous area at anteromedian angles (Fig. 103, *m.a.*). Genital plate as in Fig. 102.

**Ovipositor and adjacent structures** (Figs 103-105): Intercalary sclerite absent. Tergal processes of abdominal segment VIII reduced (Fig. 103, *teVIII.*); tergal processes of abdominal segment IX completely developed (Fig. 103, *teIX.*). Gonangulum distinct, well sclerotized (Figs 103-105, *gg.*). First valves of ovipositor large and membranous (Figs 103-104, *v.I.*), with setae along inner side. Base of 2nd and 3rd pairs of valves as in Fig. 105, sclerotized lobes of irregular shape (Figs 103-105, *pl.*). Anterior arch of second valvifer as in Fig. 105, *a.a*. Second valves of ovipositor small, completely hidden under first ones (Fig. 104, *v.II.*). Third valves of ovipositor (gonoplacs) wide, partly membranous (Figs 103-104, *v.III.*). Basivalvulae in shape of two small and weakly sclerotized plates (Figs 103-104, *bsv.*). Vestibular sclerite weakly sclerotized (Fig. 103, *vs.*). Brood sac (Fig. 103, *bd.s.*) without sclerotized structures.

**Dimensions** (in mm): Head length: male 3.9, female 5.2; head width: male 3.5, female 4.6; pronotum length: male 5.9, female 7.2; pronotum width: male 7.5, female 7.8; tegmen length: male 44.0, female 5.5; tegmen width: male 7.5, female 5.5.

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