

New and little known Blattidae (Dictyoptera) from the collection of the Muséum d'histoire naturelle de Genève

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New and little known Blattidae (Dictyoptera) from the collection of the Muséum d'histoire naturelle de Genève. - A new genus and species of cockroaches, *Afrostylopyga angolensis* gen. et sp. nov., are described from Angola. A detailed morphological description of the new taxa, and a redescription of *Deropeltis erythrocephala* (Fabricius, 1781), *Maoriblatta novaeseelandiae* (Brunner von Wattenwyl, 1865) and *Celatoblatta undulivitta* (Walker, 1868) are given.

Keywords: *Afrostylopyga angolensis* gen. et sp. nov. - *Deropeltis erythrocephala* - *Maoriblatta novaeseelandiae* - *Celatoblatta undulivitta* - morphology.

INTRODUCTION

During the last two years I have had the pleasure of studying the rich dictyopteran collections of the Muséum d'histoire naturelle in Geneva. In the course of these investigations a lot of new data were discovered. This paper is the first in a series devoted to material from the collections in this museum.

The family Blattidae is one of the largest of the order Dictyoptera. It is characterized by a rather primitive type of oviposition and by very complicated structures of the male genitalia. The structures of the male genitalia are crucial for taxa determination and reconstruction of phylogeny in cockroaches. The female genitalia, i.e. ovipositor, spermatheca and related structures, are potentially very useful for taxonomical purposes as well. It is surprising that these structures have scarcely been studied in representatives of this family.

Deropeltis erythrocephala (Fabricius, 1781) and *Maoriblatta novaeseelandiae* (Brunner von Wattenwyl, 1865) are the type species of the large African genus *Deropeltis* Burmeister, 1838 and of the New Zealand and New Caledonian genus *Maoriblatta* Princis, 1966, respectively. The genus *Celatoblatta* Johns, 1966 is characterized by a peculiar habitus, more similar to that of Ectobiidae than to Blattidae. The existing morphological descriptions of these taxa are not detailed enough and therefore precise morphological descriptions are necessary for further investigations into the phylogeny and biology of cockroaches.

The purposes of this paper are to describe new taxa and give morphological descriptions suitable for further phylogenetical investigations.

MATERIAL AND METHODS

All material studied was dry and pinned. In order to study the structures of the male and female genitalia, the specimens were softened and the apical part of the abdomen was removed and treated with 10% KOH. The genitalic structures are preserved in microvials (in 70% ethanol) to prevent the distortion of delicate structures that often occurs with slide-mounted preparations, and to facilitate their detailed examination at various angles. On permanent slide mounts these structures can be observed only from one fixed angle.

The ratio "Distance between eyes/length of eye" was calculated as the interocular distance on the vertex (*i.o.* in Fig. 1) divided by the dorsoventral length of the eye (*d.e.* in Fig. 1).

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 following the author's designations. The terminology of the female genital structures follows McKittrick (1964) and Klass (1998). The terms introduced by the author (here and in Anisyutkin *et al.*, 2013) are given in quotation marks.

All material studied, including the types of the newly described species, is deposited in the Muséum d'histoire naturelle, Genève.

TAXONOMY

Afrostylepyga gen. nov.

TYPE SPECIES: *Afrostylepyga angolensis* sp. nov., designated here.

ETYMOLOGY: The name means "Stylepyga from Africa".

DIFFERENTIAL DIAGNOSIS: The new genus belongs to the functionally wingless blattids, i.e. cockroaches with tegmina and wings absent or reduced to lateral lobes. This group includes the genera *Apterisca* Princis, 1963, *Brinckella* Princis, 1963, *Macrostylepyga* Anisyutkin, Anichkin & Nguyen, 2013, *Maoriblatta* Princis, 1966, *Miostylepyga* Princis, 1966 and *Neostylepyga* Shelford, 1911. The genera *Macrostylepyga*, *Maoriblatta* and *Neostylepyga* can be readily differentiated from the new genus by the structure of their male genitalia (e.g. shape of sclerites L4C, R1H and R2, see Anisyutkin, 2010; Anisyutkin *et al.*, 2013 and Figs 71-74 of this paper). From the monotypic genus *Miostylepyga*, described from Java (Princis, 1966), the new genus differs in larger size, presence of tegmina reduced to lateral lobes (Fig. 3), euplantulae on hind metatarsi and arolia on hind metatarsi.

Afrostylepyga gen. nov. is probably related to the African genera *Apterisca* and *Brinckella*, but differs from these genera in the presence of tegmina (Fig. 3), an unmodified abdominal tergite VI and a clearly diminished abdominal tergite VII (Fig. 9) (in *Apterisca* and *Brinckella* these tergites are: "Tergite 6-7 eingesenkt und lateral aufwärts gebogen..." Princis, 1963: 90-91). Additionally, the new genus differs from *Brinckella* in the presence of an arolium on the pretarsi of all legs (Fig. 8).

INCLUDED SPECIES: The type species only.

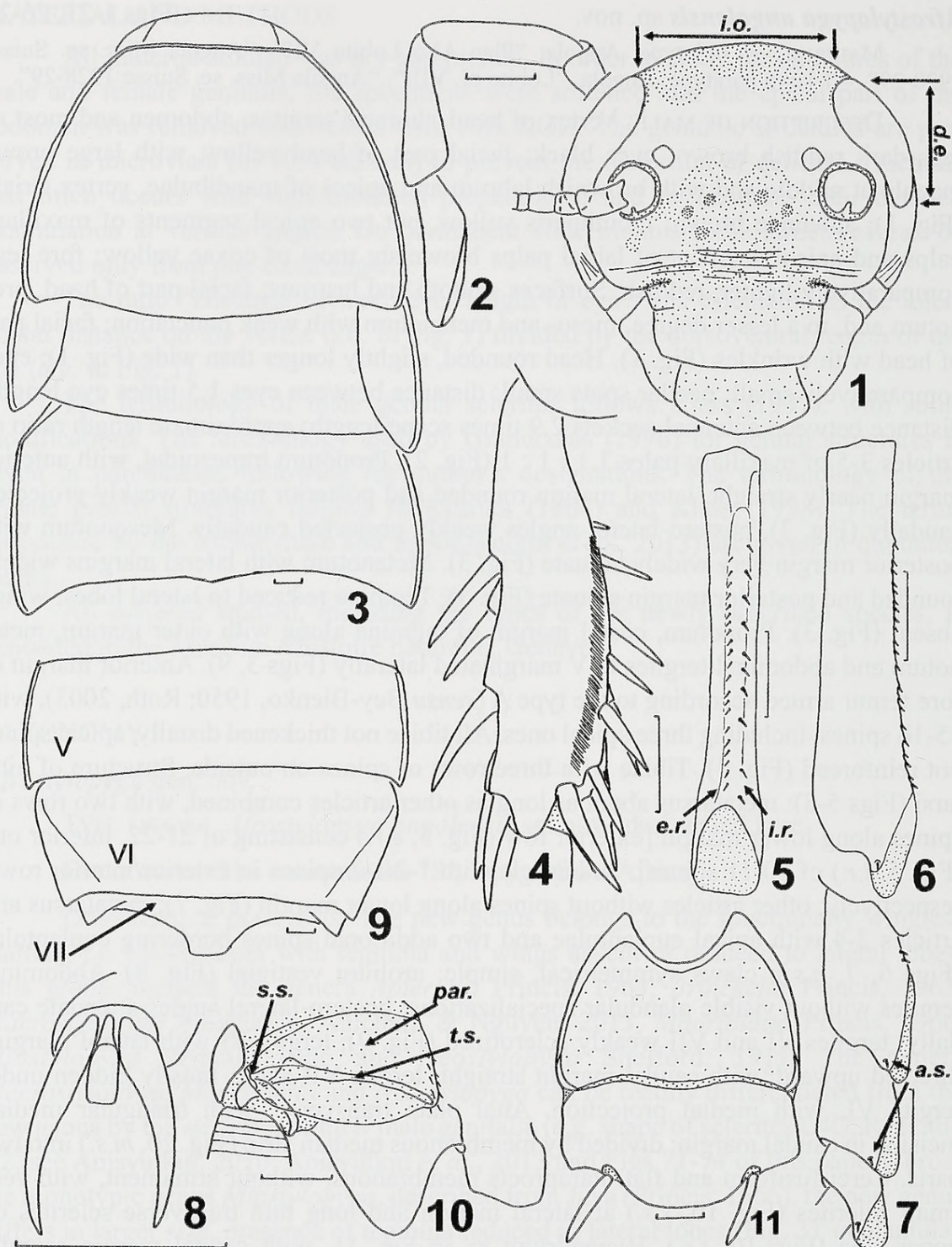
Afrostylepyga angolensis sp. nov.

Figs 1-21, 26-29

MATERIAL: ♂ holotype; Angola, "Plan Alto Lobito VII", "Angola Miss. se. Suisse 1928-29". – 1 larva paratype; Angola, "Lobito pl. VIII", "Angola Miss. se. Suisse 1928-29".

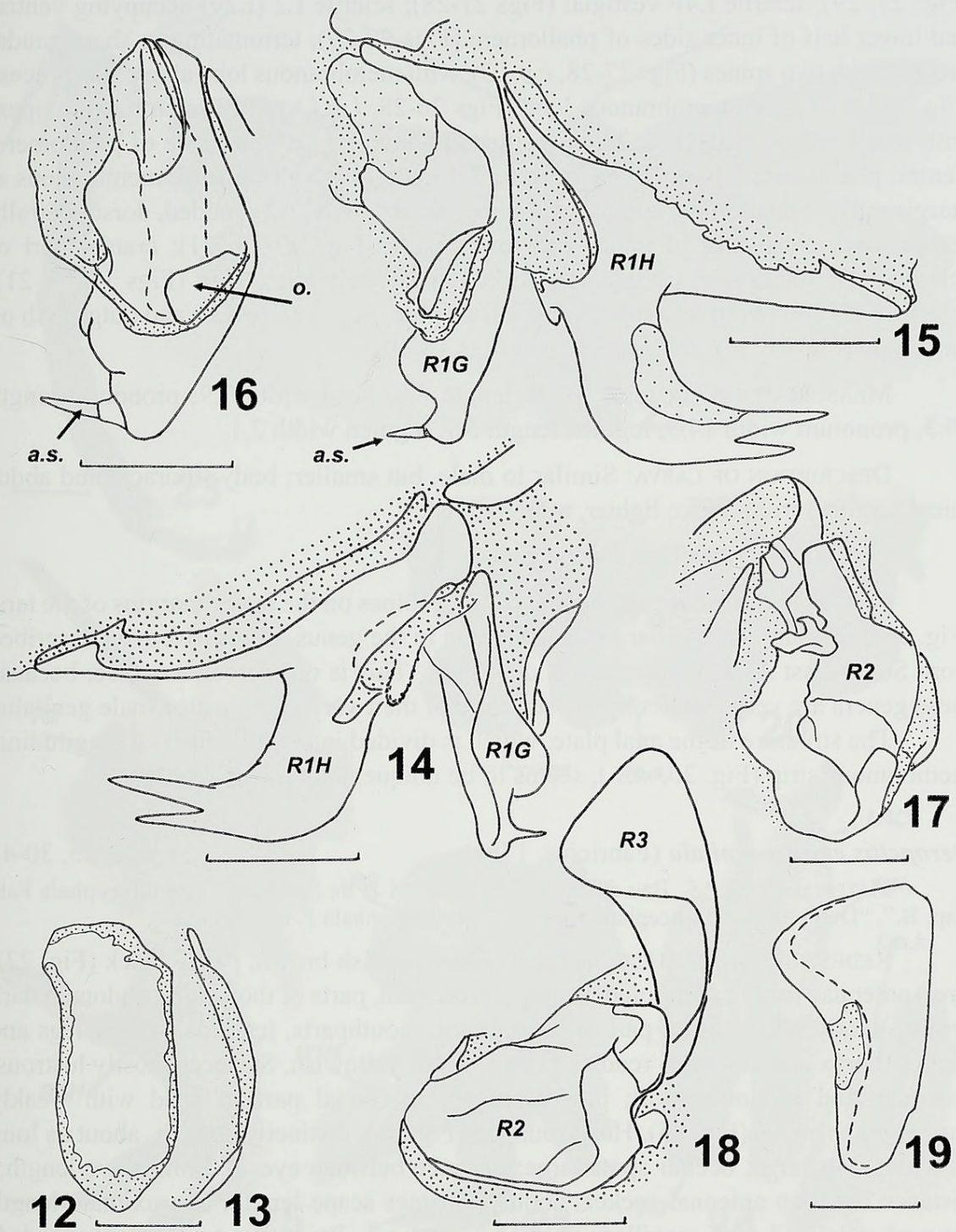
DESCRIPTION OF MALE: Vertex of head, thoracic tergites, abdomen and most of legs dark reddish brown; eyes black; facial part of head yellow, with large brown macula at middle and with brownish labrum and apices of mandibulae, vertex striate (Fig. 1); antennae brown; mouthparts yellow, but two apical segments of maxillary palps and apical segment of labial palps brownish; most of coxae yellow; fore legs comparatively lighter, reddish. Surfaces smooth and lustrous; facial part of head, pronotum and, to a lesser degree, meso- and metanotum with weak punctation; facial part of head with wrinkles (Fig. 1). Head rounded, slightly longer than wide (Fig. 1); eyes comparatively small; ocellar spots small; distance between eyes 1.5 times eye length; distance between antennal sockets 2.9 times scape length; approximate length ratio of articles 3-5 of maxillary palps 1.1 : 1 : 1 (Fig. 2). Pronotum trapezoidal, with anterior margin nearly straight, lateral margin rounded and posterior margin weakly projected caudally (Fig. 3), postero-lateral angles weakly projected caudally. Mesonotum with posterior margin very widely arcuate (Fig. 3). Metanotum with lateral margins widely rounded and posterior margin sinuate (Fig. 3). Tegmina reduced to lateral lobes; wings absent (Fig. 3). Pronotum, costal margin of tegmina along with outer margin, metanotum and abdominal tergites II-V marginated laterally (Figs 3, 9). Anterior margin of fore femur armed according to the type A (*sensu* Bey-Bienko, 1950; Roth, 2003), with 15-16 spines, including three apical ones. All tibiae not thickened distally, apical spines not reinforced (Fig. 4). Tibiae with three rows of spines on outside. Structure of hind tarsi (Figs 5-8): metatarsus about as long as other articles combined, with two rows of spines along lower margin [exterior row (Fig. 5, *e.r.*) consisting of 21-22, interior one (Fig. 5, *i.r.*) of 10-11 spines]; 2nd article with 1-2/1-2 spines in exterior/interior rows, respectively; other articles without spines along lower margin (Fig. 7); metatarsus and articles 2-4 with apical euplantulae and two additional spines bordering euplantulae (Figs 6, 7, *a.s.*); claws symmetrical, simple; arolium vestigial (Fig. 8). Abdominal tergites without visible glandular specializations; postero-lateral angles attenuate caudally; tergites VI and VII weakly sclerotized (Fig. 9); tergite VI with lateral margins directed upward, with caudal margin straight; tergite VII short, mostly hidden under tergite VI, with medial projection. Anal plate transverse, with triangular median incision in caudal margin; divided by membranous median strip (Fig. 20, *m.s.*) into two parts. Cerci fusiform and flat. Paraprocts membranous, without armament, with very small sclerites (Fig. 10, *s.s.*) at lateral margin and long thin transverse sclerites on upper side (Fig. 10, *t.s.*). Hypandrium as in Fig. 11, with caudal margin roundly projecting between styles; styli elongated, fusiform.

Genitalia (Figs 16-19, 21, 26-29): Left phallomere (Figs 26-29) with sclerite L4C (L2D, here and in the following the terminology according to Grandcolas, 1996 is given in parentheses) large, bent ventrally in cranial part with long outgrowth (Figs 27, 29, *l.o.*), occupying most of dorsal and part of outer sides of phallomere, with dorsal field of spinules (Fig. 26, *spi.*, similar to those of *D. erythrocephala*, Fig. 24, *spi.*, but smaller), without outgrowths or process, caudally rounded and membranous; sclerite L4D (L3v) small, convex (Figs 26-29); sclerite L3 (L3d) comparatively slender



FIGS 1-11

Afrostylopyga angolensis gen. et sp. nov. (1) Facial part of head. (2) Distal articles of maxillary palps. (3) Head and thorax, dorsal view. (4) Fore tibia seen from anterior. (5) Hind metatarsus, ventral view. (6) The same seen from outside. (7) Articles 2-4 of hind tarsus seen from outside. (8) Hind pretarsus. (9) Abdominal tergites V-VII, dorsal view. (10) Right half of anal plate, ventral view. (11) Hypandrium, ventral view. Dotted areas show dark colour (1) or membranous parts (4-7, 10, 11). Abbreviations: V, VI, VII = numbers of abdominal tergites; a.s. = additional spines; d.e. = dorsoventral length of eye; e.r. = exterior row of spines; i.o. = interocular distance on vertex; i.r. = interior row of spines; par. = paraproct; s.s. = small sclerite of paraproct; t.s. = transverse sclerite of paraproct. For details see text. Scale bars 1 mm.



FIGS 12-19

Afrostylopyga angolensis gen. et sp. nov., male genitalia structures. (12) Ventral phallomere, ventral view. (13) The same seen from outside. (14) Sclerites R1H and R1G of right phallomere, dorsal view. (15) The same, ventral view. (16) Sclerite R1G seen from outside. (17) Upper part of sclerite R2, ventral view. (18) Lower part of sclerite R2 and sclerite R3, dorsal view. (19) Sclerite R3 seen from outside. Dotted areas show membranous parts. Abbreviations: *a.s.* = apical spine of sclerite R1G; *o.* = outgrowth on outer side of sclerite R1G; R2, R3, R1G, R1H = sclerites of right phallomere. For details see text. Scale bars 1 mm.

(Figs 27, 29); sclerite L4F vestigial (Figs 27-28); sclerite L2 (L2v) occupying ventral and lower half of inner sides of phallomere (Figs 28-29), terminating in sharp caudal process with two spines (Figs 27-28, *c.p.L2*), with membranous lobe above this process (Fig. 28, *m.l.*); large membranous lobe (Figs 26-28, *l.m.l.*) partly sclerotized at apex, with small thin sclerite (Fig. 28, *t.s.*) situated above L2 on inner side of phallomere. Ventral phallomere L4G (VP) as in Figs 12-13, slightly bent upward, membranous at margins. Right phallomere complex in shape; basal sclerite R2 rounded, dorsoventrally compressed, consisting of upper and lower parts (Figs 17-18, 21); cranial part of sclerite R1H transverse, caudal with forked apex, well sclerotized (Figs 14-15, 21); sclerite R1G comparatively short, with apical spine (Figs 15-16, *a.s.*) and outgrowth on outer side (Fig. 16, *o.*); sclerite R3 as in Figs 18-19.

MEASUREMENTS (in mm): Head length 8.8, head width 7.9; pronotum length 10.3, pronotum width 14.3; tegmen length 5.7, tegmen width 2.1.

DESCRIPTION OF LARVA: Similar to male, but smaller; body (thoracic and abdominal tergites) from above lighter, more reddish.

COMPARISON: As given for the genus.

NOTES: The presence of unequal rows of spines on the lower margins of the tarsi (Fig. 5) is unusual and similar to the spination in the genus *Macrostylopyga* described from South-East Asia (Anisyutkin *et al.*, 2013). This is due to convergence, because these genera are very distinct by the structure of their very complicated male genitalia.

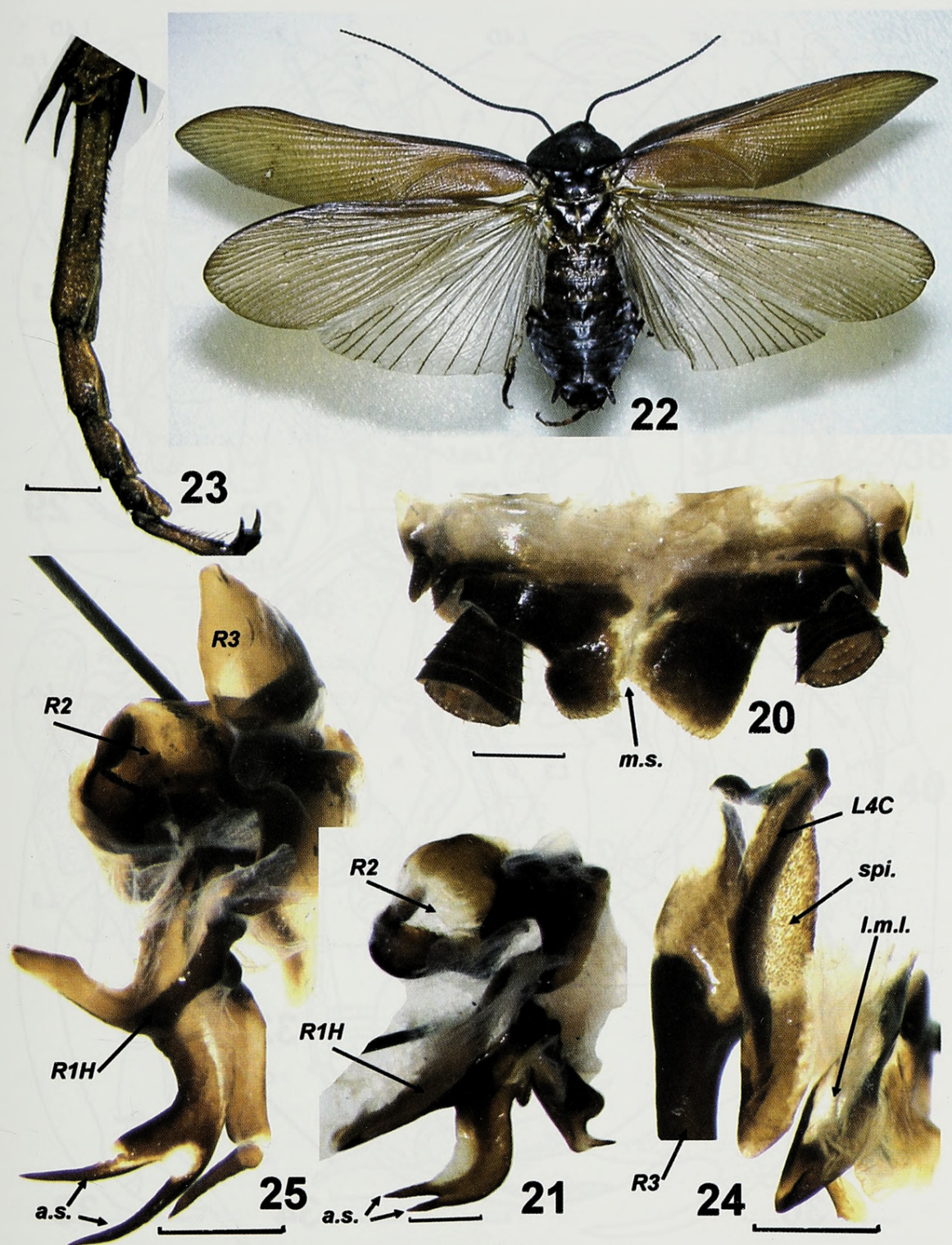
The structure of the anal plate, which is divided into two parts by a longitudinal membranous strip (Fig. 20, *m.s.*), seems to be unique among cockroaches.

***Deropeltis erythrocephala* (Fabricius, 1781)**

Figs 22-25, 30-45

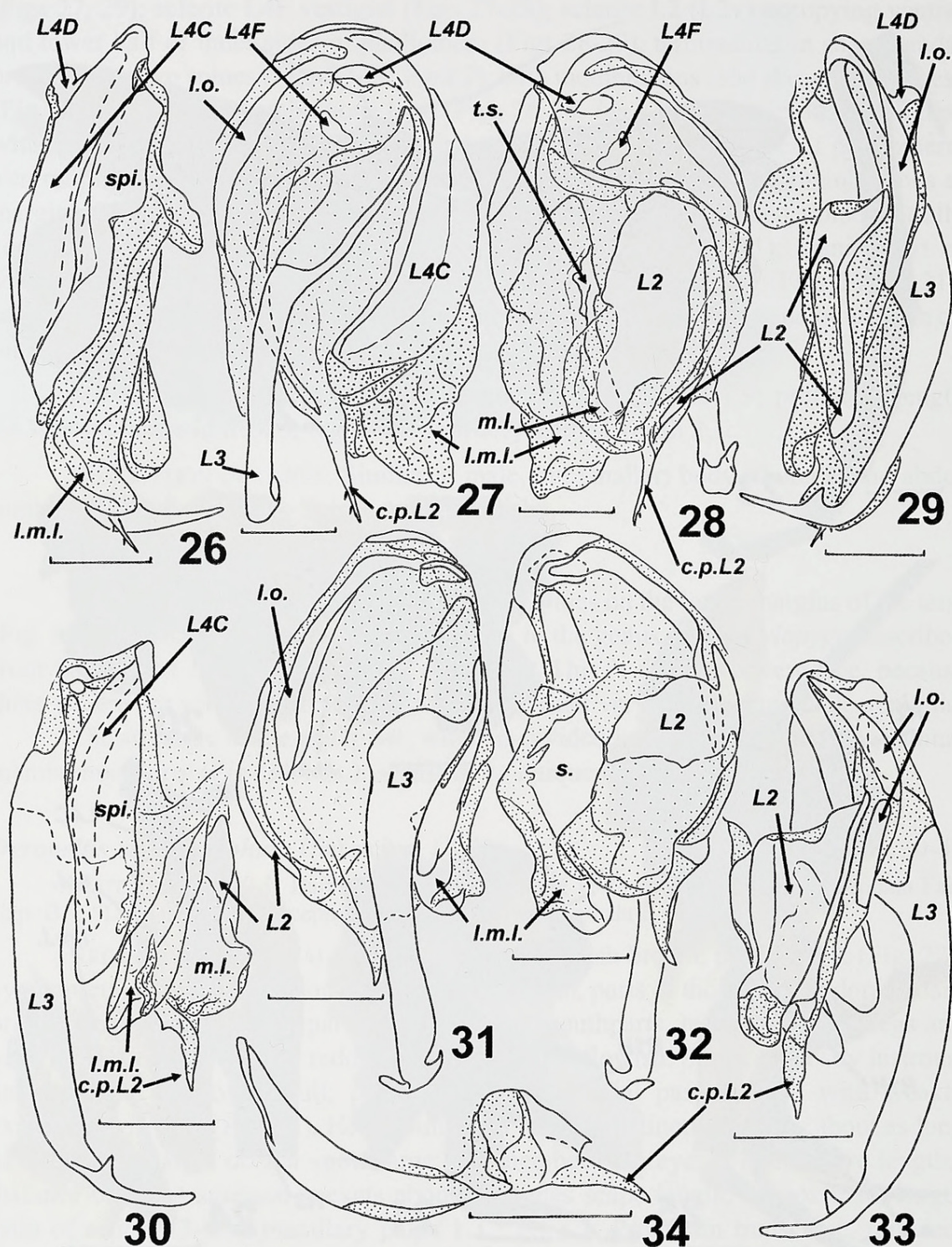
MATERIAL: 1 ♂; “♂, Bau d'Algoa, Cap b. sp. M H de Saussure”, “erythrocephala Fab. Cap. B.”, “*Deropeltis erythrocephala* Fab. ♂”, “erythrocephala F. det. Princis”.

REDESCRIPTION OF MALE: General colour reddish brown, partly black (Fig. 22); eyes, antennae (with exception of scapus), pronotum, parts of thorax and abdomen dark brown, nearly black; facial part of head, scapi, mouthparts, tegmina, wings, legs and part of thorax and abdomen reddish brown; ocelli yellowish. Surfaces mostly lustrous; antennae and pronotum dull; punctation absent; facial part of head with weakly expressed wrinkles (Fig. 35). Head rounded (Fig. 35), distinctly convex, about as long as wide; eyes large; ocellar spots large; distance between eyes 0.7 times eye length; distance between antennal sockets about 1.6 times scape length; approximate length ratio of articles 3-5 of maxillary palps 1.3 : 1.1 : 1. Pronotum transverse, rounded, emarginated cranially (Figs 22, 36). Tegmina and wings fully developed, not sclerotized, with distinct venation (Fig. 22). Anterior margin of fore femur armed as in type A (*sensu* Bey-Bienko, 1950; Roth, 2003), with 11-13 spines, including 2-3 apical spines. Fore tibiae not thickened distally, spines not reinforced. Structure of hind tarsi (Figs 23, 37-38): metatarsus longer than other articles combined, with large euplantula occupying about one third of metatarsus length, and three or four irregular rows of spines along lower margin, euplantula bordered with additional spines (Fig. 38, *a.s.*); articles 2-4 with large euplantulae, without spines; claws symmetrical, simple; arolium



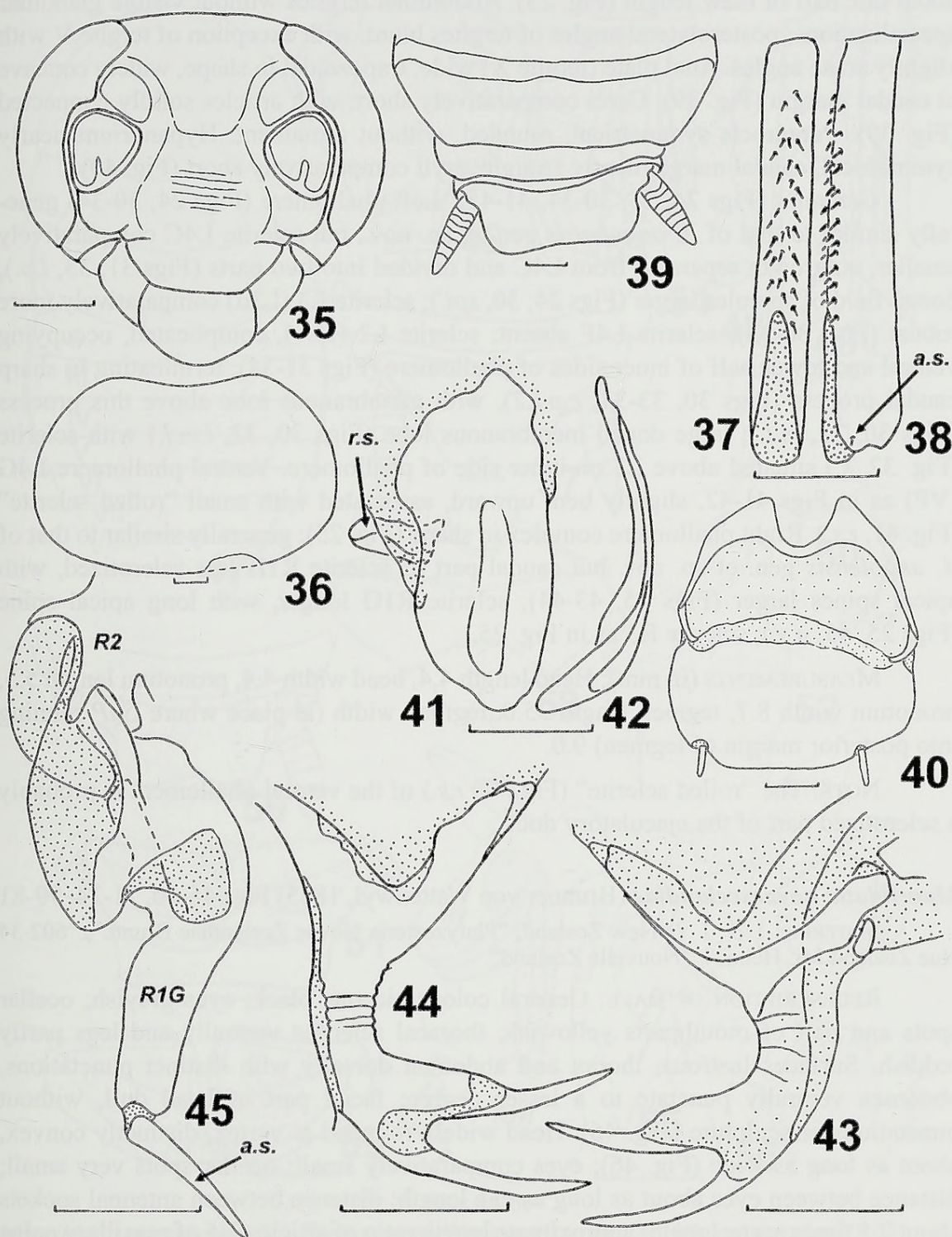
FIGS 20-25

Afrostylopyga angolensis gen. et sp. nov. (20-21) and *Deropeltis erythrocephala* (Fabricius) (22-25). (20) Abdominal apex, dorsal view. (21) Caudal part (sclerites R1H, R1G and part of R2) of right phallomere, dorsal view. (22) Habitus (wingspan: 75 mm), dorsal view. (23) Hind tarsus seen from posterior. (24) Proximal half of left phallomere, dorsal view. (25) Right phallomere, dorsal view. Abbreviations: *a.s.* = apical spines of sclerite R1H; L4C = sclerite of left phallomere; *l.m.l.* = large membranous lobe, of left phallomere; *m.s.* = membranous median strip of anal plate (indicated by arrow); R1H, R2, R3 = sclerites of right phallomere; *spi.* = dorsal field of spinules of left phallomere. For details see text. Scale bars 1 mm.



FIGS 26-34

Afrostylopyga angolensis gen. et sp. nov. (26-29) and *Deropeltis erythrocephala* (Fabricius) (30-34). (26, 30) Left phallomeres of the male genitalia, dorsal view. (27, 31) The same, outside view. (28, 32) The same, inside view. (29, 33) The same, ventral view. (34) Sclerite L2, ventro-lateral view. Dotted areas show membranous parts. Abbreviations: c.p.L2 = caudal process of sclerite L2; L2, L3, L4C, L4D, L4F = sclerites of left phallomere; l.m.l. = large membranous lobe; l.o. = lower part of sclerite L4C; m.l. = membranous lobe of sclerite L2; s. = sclerite on inner side of phallomere; spi. = dorsal field of spinules; t.s. = small thin sclerite. For details see text. Scale bars 1 mm.



FIGS 35-45

Deropeltis erythrocephala (Fabricius). (35) Facial part of head. (36) Pronotum, dorsal view. (37) Hind metatarsus, ventral view. (38) The same, outside view. (39) Abdominal apex, dorsal view. (40) Hypandrium, ventral view. (41) Ventral phallomere, ventral view. (42) The same seen from outside. (43) Sclerite R1H, dorsal view. (44) The same, ventral view. (45) Sclerite R1G seen from outside. Dotted areas show membranous parts. Abbreviations: *a.s.* = additional spines; *r.s.* = "rolled sclerite"; R1G, R2 = sclerites of right phallomere. For details see text. Scale bars 1 mm.

about one half of claw length (Fig. 23). Abdominal tergites without visible glandular specializations; posterolateral angles of tergites blunt, with exception of tergite V with slightly acute angles. Anal plate (tergite X) wide, trapezoidal in shape, widely concave at caudal margin (Fig. 39). Cerci comparatively short, with articles solidly connected (Fig. 39). Paraprocts symmetrical, rounded, without armament. Hypandrium nearly symmetrical, caudal margin nearly straight; styli comparatively short (Fig. 40).

Genitalia (Figs 24, 25, 30-34, 41-45): Left phallomere (Figs 24, 30-34) generally similar to that of *A. angolensis* gen. et sp. nov., but sclerite L4C comparatively smaller, outgrowth separated from L4C and divided into two parts (Figs 31, 33, *l.o.*), dorsal field of spinules larger (Figs 24, 30, *spi.*); sclerite L3 (L3d) comparatively more robust (Figs 30-33); sclerite L4F absent; sclerite L2 (L2v), complicated, occupying ventral and lower half of inner sides of phallomere (Figs 31-34), terminating in sharp caudal process (Figs 30, 33-34, *c.p.L2*), with membranous lobe above this process (Figs 30, 32, *m.l.*); large dorsal membranous lobe (Figs 30, 32, *l.m.l.*) with sclerite (Fig. 32, *s.*) situated above L2 on inner side of phallomere. Ventral phallomere L4G (VP) as in Figs 41-42, slightly bent upward, associated with small "rolled sclerite" (Fig. 41, *r.s.*). Right phallomere complex in shape (Fig. 25); generally similar to that of *A. angolensis* gen. et sp. nov. but caudal part of sclerite R1H less sclerotized, with apical spines larger (Figs 25, 43-44); sclerite R1G longer, with long apical spine (Figs 25, 45, *a.s.*); sclerite R3 as in Fig. 25.

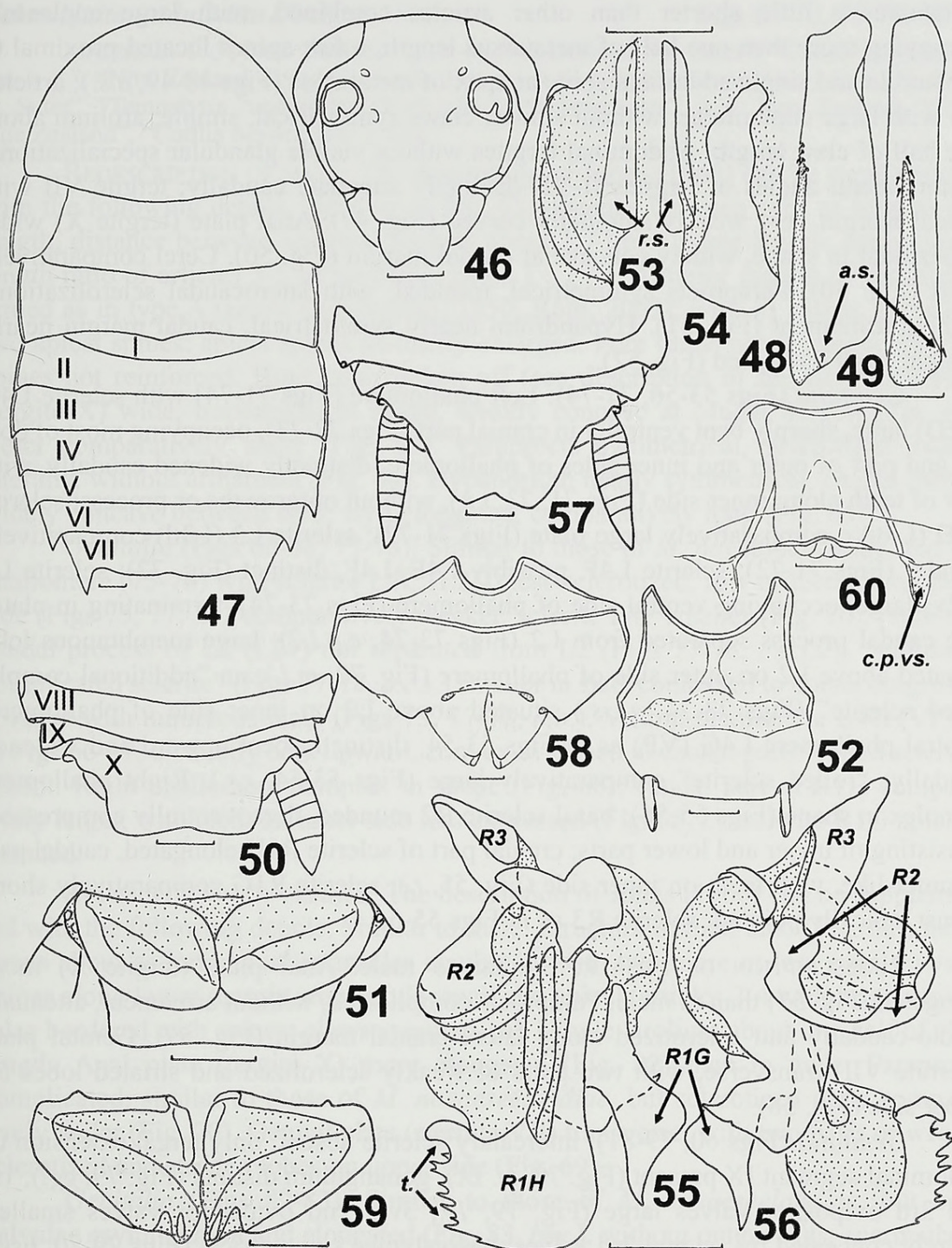
MEASUREMENTS (in mm): Head length 4.4, head width 4.4, pronotum length 5.5, pronotum width 8.7, tegmen length 35.0, tegmen width (at place where *CuP* running into posterior margin of tegmen) 9.0.

NOTE: The "rolled sclerite" (Fig. 41, *r.s.*) of the ventral phallomere is probably a sclerotized part of the ejaculatory duct.

Maoriblatta novaeseelandiae (Brunner von Wattenwyl, 1865) Figs 46-60, 71-74, 79-81

MATERIAL: 1 ♂, 1 ♀; New Zealand, "Platyzoisteria Novae Zeelandiae Brunn.", "602 34 Nue Zealand Mr. Helms", "Nouvelle Zealand".

REDESCRIPTION OF MALE: General colour piceous black; eyes greyish; ocellar spots and part of mouthparts yellowish; thoracal sclerites ventrally and legs partly reddish. Surfaces lustrous; thorax and abdomen dorsally with distinct punctations, abdomen ventrally punctate to a lesser degree; facial part of head dull, without punctations or sculpture (Fig. 46). Head widely rounded at vertex, distinctly convex, about as long as wide (Fig. 46); eyes comparatively small; ocellar spots very small; distance between eyes about as long as eye length; distance between antennal sockets about 2.5 times scape length; approximate length ratio of articles 3-5 of maxillary palps 1.3 : 1.2 : 1. Pronotum campaniform, transverse, anterior and lateral margins widely rounded, posterior margin weakly projecting caudally (Fig. 47). Meso- and metanotum transverse, with posterior margins weakly projecting caudally (Fig. 47). Tegmina lateral; wings absent (Fig. 47). Tegmina, metanotum and abdominal tergites II-IV marginated laterally (Fig. 47). Anterior margin of fore femur armed as in type A (*sensu* Bey-Bienko, 1950; Roth, 2003), with seven spines, including two apical spines. Fore tibiae not thickened distally, spines not reinforced. Structure of hind tarsi (Figs 48-49):



FIGS 46-60

Maoriblatta novaeseelandiae (Brunner von Wattenwyl), male (46-56) and female (57-60). (46) Facial part of head. (47) Thorax and abdominal segments I-VII, dorsal view. (48) Hind meta-tarsus seen from outside. (49) The same, ventral view. (50, 57) Abdominal apex, dorsal view. (51) Abdominal apex with hypandrium and genitalia removed, ventral view. (52) Hypandrium, ventral view. (53) Ventral phallomere and "rolled sclerite" seen from outside. (54) Ventral phallomere, ventral view. (55) Right phallomere, dorsal view. (56) The same, ventral view. (58) Genital plate, ventral view. (59) Paraprocts, ventral view. (60) Vestibular sclerite, ventral view. Dotted areas show membranous parts. Abbreviations: I-X = numbers of abdominal tergites; a.s. = additional spines; c.p.vs. = caudal process of vestibular sclerite; r.s. = "rolled sclerite"; R1G, R2, R3 = sclerites of right phallomere. For details see text. Scale bars 1 mm.

metatarsus a little shorter than other articles combined, with large euplantula occupying more than one half of metatarsus length, a few spines located proximal to euplantula and single additional spine at apex of metatarsus (Figs 48-49, *a.s.*); articles 2-4 with large euplantulae, without spines; claws symmetrical, simple; arolium about one half of claw length. Abdominal tergites without visible glandular specializations; posterolateral angles of tergites II-VII distinctly attenuate caudally; tergite VII with caudal margin very weakly sinoidally curved (Fig. 47). Anal plate (tergite X) wide, trapezoidal in shape, widely concave at caudal margin (Fig. 50). Cerci comparatively short (Fig. 50). Paraprocts symmetrical, rounded, with laterocaudal sclerotizations, without armament (Fig. 51). Hypandrium nearly symmetrical, caudal margin nearly straight; styli elongated (Fig. 52).

Genitalia (Figs 53-56, 71-74): Left phallomere (Figs 71-74) with sclerite L4C (L2D) large, sharply bent ventrally in cranial part (Figs 72-73), occupying most of dorsal and part of outer and inner sides of phallomere, distinctly widened caudally, with row of teeth along inner side (Figs 71, 73, *t.r.*), without outgrowths or process; sclerite L4D (L3v) a comparatively large plate (Figs 71-72); sclerite L3 (L3d) comparatively slender (Figs 71-72); sclerite L4F, possibly L4E+L4F, distinct (Fig. 72); sclerite L2 (L2v) large, occupying ventral side of phallomere (Figs 73-74), terminating in plate-like caudal process separated from L2 (Figs 73-74, *c.p.L2*); large membranous lobe situated above L2 on outer side of phallomere (Fig. 72, *m.l.*); an "additional complicated sclerite" (Figs 73-74, *a.c.s.*) situated above L2 on inner side of phallomere. Ventral phallomere L4G (VP) as in Figs 53-54; distinctly bent upward and widened caudally; "rolled sclerite" comparatively large (Figs 53-54, *r.s.*). Right phallomere complex in shape (Figs 55-56); basal sclerite R2 rounded, dorsoventrally compressed, consisting of upper and lower parts; cranial part of sclerite R1H elongated, caudal part hammer-like, with teeth on inner side (Fig. 55, *t.*); sclerite R1G comparatively short, robust, apically pointed; sclerite R3 as in Figs 55-56.

REDESCRIPTION OF FEMALE: Similar to male. Anal plate (tergite X) more elongated (Fig. 57) than in male. Paraprocts complicated, without armament, attenuate medio-caudally and sclerotized along latero-cranial margin (Fig. 59). Genital plate (sternite VII) transverse, with two pairs of weakly sclerotized and striated lobes on upper side (Fig. 58).

Genitalia (Figs 60, 79-81): intercalary sclerite absent; only tergal extension of abdominal segment IX present (Fig. 79, *te. IX*); gonangulum distinct (Fig. 79, *gg.*); 1st and 3rd ovipositor valves large (Fig. 79, *1v.*, *3v.*), 2nd ovipositor valves smaller, entirely concealed by 1st and 3rd valves; basivalvulae symmetrical (Figs 79-80, *bsv.*) with two membranous outgrowths (Figs 79-80, *out.*); spermatheca fusiform, well sclerotized (Fig. 81, *sp.*); vestibular sclerite (= laterosternal plate *sensu* Johns, 1966) as in Figs 60, 79, with numerous short spines on caudal processes (Figs 60, 79, *c.p.vs.*).

MEASUREMENTS (in mm): Head length: male 4.3, female 4.5; head width: male 4.2, female 4.3; pronotum length: male 6.0, female 6.5; pronotum width: male 9.6, female 10.4; tegmen length: male 3.1, female 3.3; tegmen width: male 2.1, female 2.1.

Celatoblatta undulivitta (Walker, 1868)

Figs 61-70, 75-78, 82-83

MATERIAL: 1 ♂; New Zealand, "619 41 Nue Zealand Mr. Suter", "Cutilia Heydeniana Sauss ♂", "Nov. Zealand 619. 41", "Blatta Horsteiell (? - illegible inscription - L.A.) N. 2 leg. H. Suter", "Temnelytra ?undulivitta (Walk.) M.J. Mackerras det.". 1 ♀; New Zealand, "623 5 Nue Zealand", "Cutilia heydeniana ♀ Sss."

REDESCRIPTION OF MALE: The description of Johns (1966) can be supplemented with the following details. Head as in Fig. 61; distance between eyes as long as eye length; distance between antennal sockets about 1.7 times scape length; approximate length ratio of articles 3-5 of maxillary palps 1 : 1 : 1. Anterior margin of fore femur armed as in type A (*sensu* Bey-Bienko, 1950; Roth, 2003), with 11 spines, including two apical spines; apical spines distinctly enlarged. Fore tibiae not thickened distally, spines not reinforced. Hind tarsi broken off (see description of female). Anal plate (tergite X) wide, trapezoidal in shape, weakly concave at caudal margin (Fig. 63). Cerci comparatively short (Fig. 63). Paraprocts symmetrical, sclerotized caudo-laterally, without armament (Fig. 64). Hypandrium nearly symmetrical, caudal margin widely concave between styli; styli elongated, comparatively long (Fig. 65).

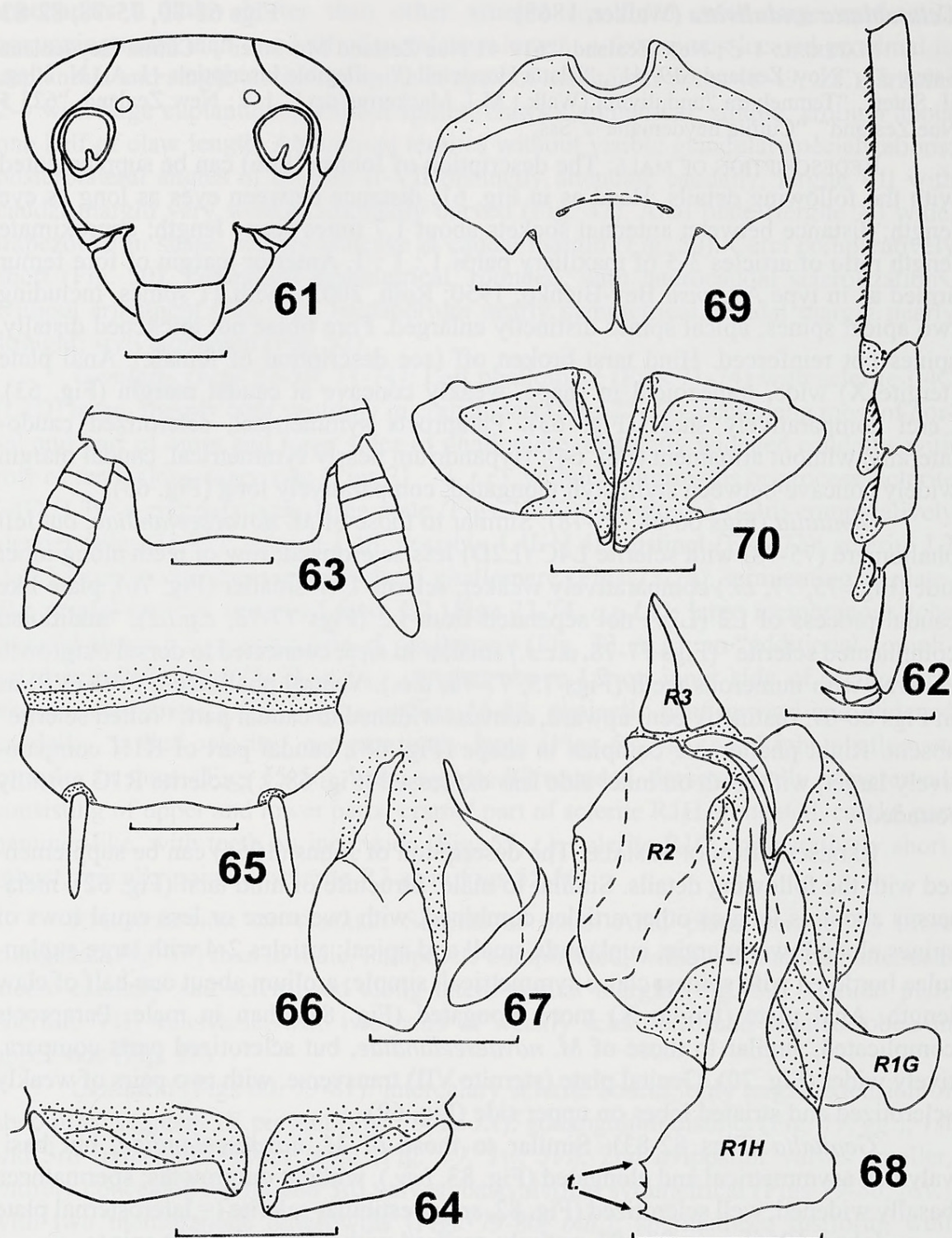
Genitalia (Figs 66-68, 75-78): Similar to those of *M. novaeseelandiae*, but left phallomere (75-78) with sclerite L4C (L2D) less sclerotized, row of teeth along inner side (Figs 75, 77, *t.r.*) comparatively weaker, sclerite L4F smaller (Fig. 76), plate-like caudal process of L2 (L2v) not separated from L2 (Figs 77-78, *c.p.L2*), "additional complicated sclerite" (Figs 77-78, *a.c.s.*) smaller in size, connected to dorsal outgrowth covered with numerous teeth (Figs 75, 77-78, *d.o.*). Ventral phallomere L4G (VP) as in Figs 66-67; distinctly bent upward, convex, widened in caudal part; "rolled sclerite" absent. Right phallomere complex in shape (Fig. 68); caudal part of R1H comparatively larger, with teeth on inner side less expressed (Fig. 68, *t.*); sclerite R1G apically rounded.

REDESCRIPTION OF FEMALE: The description of Johns (1966) can be supplemented with the following details. Similar to male. Structure of hind tarsi (Fig. 62): metatarsus about as long as other articles combined, with two more or less equal rows of spines along lower margin, euplantula small and apical; articles 2-4 with large euplantulae bordered with spines; claws symmetrical, simple; arolium about one half of claw length. Anal plate (tergite X) more elongated (Fig. 82) than in male. Paraprocts complicated, similar to those of *M. novaeseelandiae*, but sclerotized parts comparatively wider (Fig. 70). Genital plate (sternite VII) transverse, with two pairs of weakly sclerotized and striated lobes on upper side (Fig. 69).

Genitalia (Figs 82-83): Similar to those of *M. novaeseelandiae*, but basivalvulae asymmetrical and elongated (Fig. 83, *bsv.*), without outgrowths; spermatheca basally widened, well sclerotized (Fig. 82, *sp.*); vestibular sclerite (= laterosternal plate *sensu* Johns, 1966) as in Fig. 83, entirely covered with numerous short spines.

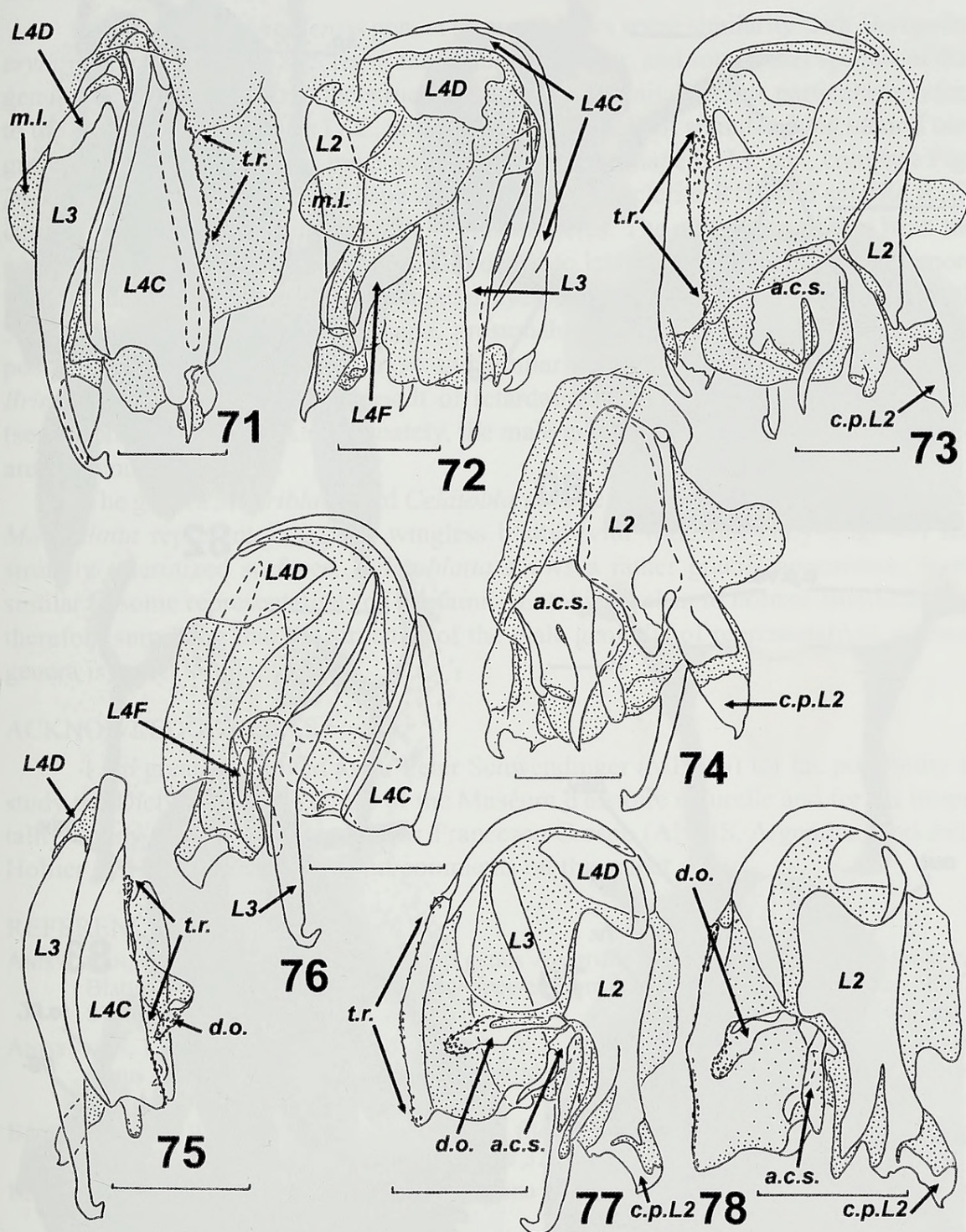
MEASUREMENTS (in mm): Head length: male 3.0, female 3.2; head width: male 3.0, female 3.1; pronotum length: male 4.2, female 4.8; pronotum width: male 6.1, female 6.6; tegmen length: male 4.5, female 4.5; tegmen width: male 3.5, female 4.0.

NOTE: The specimens examined were incorrectly identified as *Cutilia heydeniana* (Saussure, 1864). This species is now placed in the genus *Drymaplaneta* Tepper, 1893. *Drymaplaneta heydeniana* clearly differs from *Celatoblatta undulivitta* in having its tegmina reduced to lateral lobes (Beccaloni, 2007).



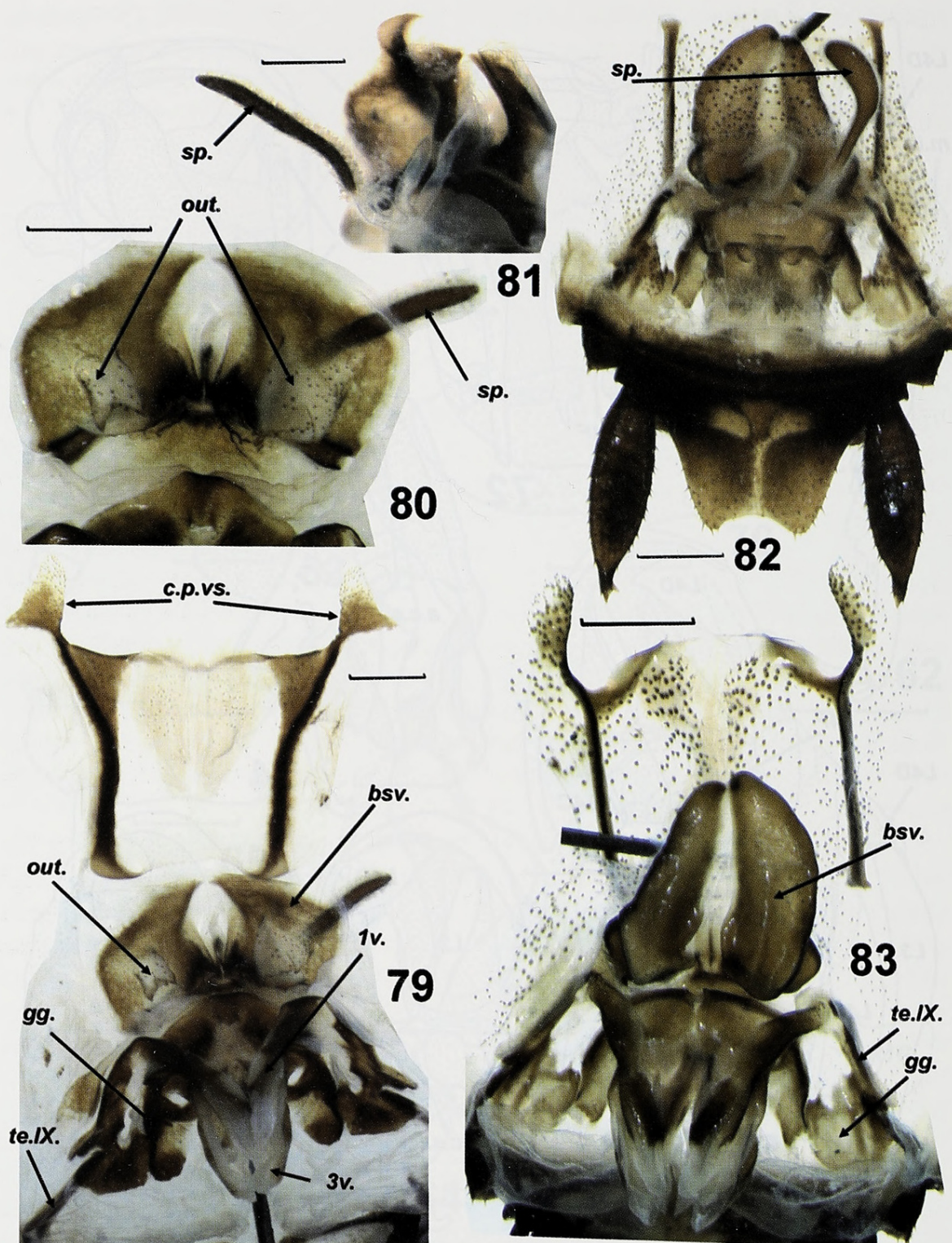
FIGS 61-70

Celatoblatta undulivitta (Walker), male (61, 63-68) and female (62, 69, 70). (61) Facial part of head. (62) Hind tarsus seen from posterior. (63) Anal plate and cerci, dorsal view. (64, 70) Paraprocts, ventral view. (65) Caudal part of hypandrium, ventral view. (66) Ventral phallomere, ventral view. (67) The same seen from outside. (68), Right phallomere, dorsal view. (69) Genital plate, ventral view. Dotted areas show membranous parts. Abbreviations: R1G, R1H, R2, R3 = sclerites of the right phallomere. For details see text. Scale bars 1 mm.



FIGS 71-78

Maoriblatta novaeseelandiae (Brunner von Wattenwyl) (71-74) and *Celatoblatta undulivitta* (Walker) (75-78). (71, 75) Left phallomeres of male genitalia, dorsal view. (72, 76) The same seen from outside. (73, 77) The same seen from inside. (74) The same, ventral view. (78) The same with sclerite L3 not shown, ventrolateral view. Dotted areas show membranous parts. Abbreviations: *a.c.s.* = "additional complicated sclerite"; *c.p.L2* = caudal process of sclerite L2; *d.o.* = dorsal outgrowth of "additional complicated sclerite"; L2, L3, L4C, L4D, L4F = sclerites of left phallomere; *m.l.* = membranous lobe of sclerite L2; *t.r.* = row of teeth of sclerite L4C. For details see text. Scale bars 1 mm.



FIGS 79-83

Maoriblatta novaeseelandiae (Brunner von Wattenwyl) (79-81) and *Celatoblatta undulivitta* (Walker) (82, 83). (79, 83) Female genitalia, ventral view, vestibular sclerite folded back. (80) Basivalvula, ventral view. (81) Spermatheca and basivalvula, dorsolateral view. (82) Abdominal apex and female genitalia, dorsal view. Abbreviations: *1v.*, *3v.* = 1st and 3rd ovipositor valves, respectively; *bsv.* = basivalvula; *c.p.vs.* = caudal process of vestibular sclerite; *gg.* = gonangulum; *out.* = membranous outgrowth of basivalvula; *sp.* = spermatheca; *te.IX.* = processes of abdominal segment IX. For details see text. Scale bars 1 mm.

DISCUSSION

Afrostylepyga angolensis gen. et sp. nov. shows some similarity with *Deropeltis erythrocephala*, the type species of the genus *Deropeltis*, and some other species of this genus (unpublished data) in the structure of the male genitalia. This particularly refers to the left (shape of sclerites L4C, presence of dorsal field of spinules, long ventral outgrowth of L4C, structure of inner side of phallomere, shape of L2 etc.; compare Figs 26-29 with 30-34) and right (shape of cranial part of sclerite R1H and sclerite R1G; compare Fig. 21 with 25 and 16 with 45) phallomeres. The new genus differs from the genus *Deropeltis* in having the tegmina reduced to lateral lobes, wings absent, a more rounded head with comparatively smaller eyes, reduced ocelli (compare Fig. 1 with 35), and a different pronotum shape, presumably all of them larval features. It is possible that *Afrostylepyga* gen. nov. and similar wingless genera (e.g. *Apterisca* and *Brinckella*) have evolved as a result of retardational paedomorphosis (retrogenesis) (sensu Iordansky, 2005). Unfortunately, the male genitalia of *Apterisca* and *Brinckella* are still undescribed.

The genera *Maoriblatta* and *Celatoblatta* have a strongly dissimilar appearance. *Maoriblatta* represents a typical wingless blattid with wide flat body (Fig. 47) and strongly sclerotized surfaces. *Celatoblatta* shows a rather gracile appearance, more similar to some representatives of the family Ectobiidae than to normal Blattidae. It is therefore surprising that the structure of the male genitalia of representatives of these genera is rather similar.

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