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Revision of the *Bengalia spinifemorata* species-group (Diptera, Calliphoridae)

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Abstract

The Afrotropical *Bengalia spinifemorata* species-group is revised and their male genitalia illustrated by means of digital colour photography. Six species are recognized and keyed, and their geographical distribution reconsidered, i.e., *Bengalia akamanga* (Lehrer, 2005), **comb. nov.** (Malawi); *B. racovitzai* (Lehrer, 2005) (Democratic Republic of Congo, Kenya); *B. seniorwhitei* (Lehrer, 2005) (Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Malawi, Tanzania, Uganda); *B. smarti* (Lehrer, 2005), **comb. nov**. (Democratic Republic of Congo, Namibia, South Africa, Zimbabwe); *B. spinifemorata* Villeneuve, 1913 (Democratic Republic of Congo) and *B. wangariae* (Lehrer, 2005), **comb. nov.** (Democratic Republic of Congo). *Maraviola congoliana* Lehrer, 2005, *M. samburella* Lehrer, 2005, *M. amlaka* Lehrer & Freidberg, 2008, *M. danakiliana* Lehrer & Freidberg, 2008, and *M. akufulana* Lehrer, 2011 are recognized as synonyms of *Bengalia seniorwhitei*, **syn. nov**. The genus group names *Sindhigalia* Lehrer, 2006 and *Anshuniana* Lehrer & Wei, 2010 are reduced to synonyms of *Bengalia* Robineau-Desvoidy, 1830, **syn. nov**. The distiphallus is described in detail and new morphological terms introduced. Ten synapomorphies defining the *B. spinifemorata* species-group are listed. A re-assignment of the Oriental species *B. fani* Feng & Wei, 1998 to the Afrotropical *B. spinifemorata* species-group to replace its current position in the *B. peuhi* species-group is rejected since *B. fani* shares none of the ten synapomorphies of the former group.

Key words: Diptera, Calliphoridae, *Bengalia*, revision, new synonyms, Afrotropical Region

Introduction

In the course of the last six years Lehrer (2005, 2006, 2010) has proposed 13 nominal genera and four family group names (as subfamilies) all within and thus splitting up the old genus *Bengalia* Robineau-Desvoidy, 1830. In addition, he has raised the rank of this single genus to a family of its own. This amounts to an example of splitting "ad absurdum" according to Evenhuis *et. al.* (2010: 28). The names and actions have been reviewed by Rognes (2006, 2009b), who reduced all the nominal genera to synonyms of *Bengalia* and replaced the subfamily names with informal species-group names.

One of the subfamilies Lehrer (2005) proposed, i.e., Maraviolinae, was created for *Bengalia spinifemorata* Villeneuve, 1913 and eight newly described species, which were all assigned to the single new Afrotropical genus *Maraviola* Lehrer. Rognes (2006) replaced this subfamily name with an informal name—the *Bengalia spinifemorata* species-group.

Subsequently Lehrer & Freidberg (2008) described two new species in *Maraviola* from Ethiopia, raising the number of described nominal species in the *B. spinifemorata* species-group to 11.

In a recent paper Lehrer & Wei (2010) proposed a 14th genus, *Anshuniana*, for a single species, *Bengalia fani* Feng & Wei *in* Feng *et al*., 1998. Lehrer had apparently not been aware of the existence of this species when he wrote his book (Lehrer 2005). Lehrer (2010: 28) first introduced the name *Anshuniana* as a *nomen nudum*, announcing its future appearance as an available name in these terms:

> *"... si ce falsificateur [Rognes] a pu introduire* Anshuniana fani *(Feng & Wei) (Lehrer & Wei, 2010) dans le «*Bengalia peuhi *species-group» au lieu de la sous-famille Maraviolinae Lehrer, 2005, alors il n'est pas surprenant qu'il se trouve dépourvu de toute inclination scientifique pour la taxonomie. "* [… if this falsifier

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[Rognes] was able to assign *Anshunia fani* (Feng & Wei) (Lehrer & Wei, 2010) to the "*Bengalia peuhi* species-group" instead of the sub-family Maraviolinae Lehrer, 2005, then it comes as no surprise that he turns out to lack all scientific inclination for taxonomy.]

Thus Lehrer & Wei, by assigning *B. fani* to the "Maraviolinae", raised the number of species in the *B. spinifemorata* group to 12.

Rognes (2009b) had assigned *B. fani* to the *Bengalia peuhi* species group (the equivalent of Lehrer's subfamily Afridigaliinae, cf. Lehrer 2005) because, even if aberrant in some ways, e.g., the distiphallus having a very long lateral finger, it agreed in most details, both in external and genital features, with other members assigned to that group. Lehrer & Wei (2010) were not satisfied with this assignment and believed I had not been able to "… *saisir la position systématique de cette espèce à l'intérieur de la famille Bengaliidae*" [… grasp the systematic position of this species within the family Bengaliidae], my comprehension "*de la morphologie du phallosome de cette espèce*" [of the morphology of the aedeagus of this species] being "*bloquée par une terminologie vulgaire, versatile et inexact*" [blocked by a vulgar, unstable and inaccurate terminology]. Furthermore, they claimed that the digital images published by Rognes (2009b) "… *ne correspondent pas à la recherche scientifique des détails microscopiques, parce qu'elles ne peuvent montrer clairement tous les plans internes de l'organe et qui réalisent ainsi des artefacts graphiques*" [do not correspond to a scientific examination of microscopic details, because they cannot show all the internal surfaces of the organ clearly and will therefore display photographic artifacts].

Lehrer & Wei (2010: 22) wrote that "[*à*] *la suite de nos recherches, nous avons constaté avec la plus grand sûreté que* Bengalia fani *Feng & Wei a le type phallosomique de la sous-famille Maraviolinae Lehrer*" [as a result of our research we have concluded with the utmost confidence that *Bengalia fani* Feng & Wei has an aedeagus typical of the subfamily Maraviolinae Lehrer] (equivalent to the *B. spinifemorata* species-group), but judged that the distal part of the surstyli ("*paralobes*") did not conform to the shape of the surstyli in the other members of this group, all belonging to the single genus *Maraviola* Lehrer, and all having "*paralobes très larges et pourvue de prolongement postérieures sinueux*" [very broad surstyli provided with undulating projections posteriorly]. Therefore they found it necessary to create a second nominal genus for it, i.e., *Anshuniana*, the alleged first Oriental member of the group, diagnosed by the presence of a distal surstylar part which "*n'est pas très large et n'a pas de prolongements postérieures; elle est plus ou moins triangulaire et étroite*." [is not very broad and does not have posterior projections; it is more or less triangular and narrow.].

Lehrer (2011) described a 12th nominal species in the nominal genus *Maraviola*, raising the number of species in the B. *spinifemorata* group to 13.

The purpose of the present paper is to revise the *Bengalia spinifemorata* species-group; more specifically

(1) to formally synonymise *Anshuniana* Lehrer & Wei, 2010 and another genus-group name created by Lehrer (2006) with *Bengalia*;
(2) to discuss diagnostic and synapomorphic features of the members of the *B. spinifemorata* species-group including features of the distiphallus not adequately described by Lehrer (2005);
(3) to introduce a simple and easily manageable terminology for key features of the distiphallus of the *B. spinifemorata* species-group to replace the unwieldy terminology of Lehrer;
(4) to diagnose the six species of the *B. spinifemorata* species-group that I consider valid, and to reduce five names to synonyms;
(5) to reconsider the geographical distribution of these six species;
(6) to examine and evaluate the arguments of Lehrer & Wei (2010) for considering the aedeagus of *B. fani* typical of the *B. spinifemorata* group;
(7) to restate the arguments in favour of treating *B. fani* as a member of the *B. peuhi* species-group.

Methods

Acronyms for collections.

BMNH	The Natural History Museum, London, United Kingdom
BMSA	National Museum Bloemfontein, Bloemfontein, South Africa
CDPCAG	Centre for Disease Prevention and Control, Anshun City, Guizhou, China
MRAC	Musée Royal de l'Afrique Centrale, Tervuren, Belgium
MSNM	Museo Civico de Storia Naturale, Milano, Italy
TAU	Department of Zoology, Tel Aviv University, Tel Aviv, Israel
ZMUC	Zoological Museum, Natural History Museum of Denmark, University of Copenhagen, Copenhagen, Denmark
ZMUN	Natural History Museum, Department of Zoology, University of Oslo, Oslo, Norway

Abbreviations used on figures of distiphallus.

b.	beak
b.s.	bacilliform sclerite (the upper one of the two present in *Bengalia*)
d.p.	dentate process ("*apophyses paraphallique*" of Lehrer [2005: 155, couplet 8 in key])
ej.o.	opening of ejaculatory duct
h.l.	hypophallic lobe
l.v.	left part of veil
v.	veil ("*juxta*" of Lehrer [2005: 154], or "*les apophyses apicales postérieures du distiphallus*" of Lehrer [2005: 155, key], or "*les apophyses postérieures*" of Lehrer & Freidberg [2008: 3, line 5]; or "[*l*]*es apophyses terminales postérieures du paraphallus*" of Lehrer & Freidberg [2008: 4, lines 1–2]); or even "*les apophyses postérieures de l'acrophallus*" of Lehrer & Wei [2010: 22, under item d])
v.p.	veil process ("*apophyses latérales postérieures du distiphallus*" of Lehrer [2005: 21, key; 154]; or "*apophyses latérales du paraphallus*" of Lehrer & Freidberg [2008: 3, line 3]; or "*apophyses latérales*" of Lehrer & Freidberg [2008: 3–4]); or even "*les apophyses antérieures de l'acrophallus*" of Lehrer & Wei [2010: 22, under item d]).
r.v.	right part of veil
v.v.	ventral extension of veil (in *B. seniorwhitei*)
s.s.	semicircular sclerotisation

Condition of material and photography. Many of the specimens studied have been dissected by Lehrer. He seems not to perform dissections of the genitalia from the starting point of an unharmed abdomen in fluid, but removes the genitalia and ST5 flap directly from the tip of a dried abdomen apparently without breaking off the latter first. In many cases this has led to some destruction or dislocation of various parts. Most of the genitalic material dissected from specimens designated as holotypes by him have been embedded in glycerol-jelly of a kind which has not subsequently dissolved completely in glycerol. The jelly is often present as grey opaque masses or strings on various surfaces or as internal infiltrates obscuring the finer details of the aedeagus and associated structures. For example the semicircular sclerotisation in *B. smarti* (Lehrer) is very difficult to discern in the holotype of *Maraviola smarti* because of the remains of the jelly, but is easily observed in specimens in pure glycerol. Most importantly, this undissolved jelly has made it difficult to study and futile to photograph the genitalia in transmitted light, i.e., by means of a compound microscope. The inhomogeneity and the varying refractive indices of the preparation make it very dark when examined under such a microscope. Therefore only a few photographic images have been made by such means as regards Lehrer material (Figs. 3–6, 8, 14, 18, 58). Most of the images have been taken through a stereomicroscope with incident light. Since such a microscope does not have optics with the same resolving power as a compound microscope, the images are of lower quality than wished for. The images shown in Figs. 17, 23–33, 38, 41, 42 have been taken through a compound microscope from preparations that have not been embedded in glycerol jelly, only glycerol. Photographic methods are as described by Rognes (2009b). The genitalia present in the big Lehrer-type opaque plastic vials have routinely been transferred to small clear glass microvials to facilitate their study and simplify the extraction from the vial, should this be needed.

Format of lists of material. In the lists in the sections named "Material examined" under each species, labels are numbered successively from the top to the bottom of the pin, the numbers being enclosed within parentheses. The lines on each label are separated by a slash (/). If the label text itself contains a printed or handwritten slash, I have separated the label lines by double slashes (//). The label text is cited without use of quotation marks to simplify the typesetting.

Genus *Bengalia* Robineau-Desvoidy

Bengalia Robineau-Desvoidy, 1830: 425. Type species: *Bengalia testacea* Robineau-Desvoidy, 1830, by designation of Duponchel (1842: 542) (= *Musca torosa* Wiedemann, 1819).
Sindhigalia Lehrer, 2006: 13. Type species: *Ochromyia jejutora* Lehrer, 2005 (= *Musca torosa* Wiedemann, 1819), by original designation. **Syn. nov.**
Anshuniana Lehrer, 2010: 28. *Nomen nudum*. No taxonomic characters. **Syn. nov.**
Anshuniana Lehrer & Wei, 2010: 23. Type species: *Bengalia fani* Feng & Wei, 1998, by original designation. **Syn. nov.**

Other generic synonyms are listed by James (1977), Pont (1980) and Rognes (2006, 2009a).

The genus *Bengalia* has been characterised by several authors, including Bezzi (1911, 1913), Surcouf (1920), Malloch (1927), Senior-White *et al*. (1940), Zumpt (1956), and Lehrer (2005, as Bengaliidae), and its defining character states need not be repeated here. A phylogenetic analysis of its systematic position is given by Rognes (1997) and a discussion of Lehrer's work on the genus is given by Rognes (2006, 2009b).

Diagnosis of the *Bengalia spinifemorata* species-group

All members of the wholly Afrotropical *Bengalia spinifemorata* species-group (Maraviolinae of Lehrer 2005) have a pair of discal setae on the fifth abdominal tergite. For this reason Rognes (2009b) suggested that it is the sister-group of the *Bengalia peuhi* species-group (= Afridigaliinae of Lehrer 2005), at least sharing this one synapomorphy. No members of other *Bengalia* species-group have such setae. A list of characters I consider synapomorphies of the *Bengalia spinifemorata* species-group are given in the section "Systematic position of *Bengalia fani*".

External features. Lehrer (2005) has given descriptions of most of the external features of the *Bengalia spinifemorata* species-group (as "Maraviolinae") and they will not be repeated here. Only a few features of significance for the problem of the systematic position of *Bengalia fani* Feng & Wei will be mentioned. **Thorax**. The anepimeron usually is covered only with yellow setulae, even though occasionally a few black setulae may be found in the uppermost part. **Legs**. The fore femur has 2–3 very strong spine-like setae on the middle of the posteroventral side (Fig. 9), a feature unmentioned by Lehrer (2005). This property was behind Villeneuve's name for the species *Bengalia spinifemorata* (cf. Villeneuve 1913: 154). The fore tibia has a short row of 4–6 strong spine-like setae in the basal third of the ventral surface, similar to the ones in *B. lyneborgi* James (Rognes 2009b: fig. 179), but very different from the usual condition in the *B. peuhi* species-group (Rognes 2009b: figs. 173–178, 180–186). The lowest one is the largest, being hardly as long as the width of the tibia, and they diminish gradually in size upwards (Fig. 9). The hind tibia has no fringe of long slender tightly set setae on the anteroventral, ventral or posteroventral side, which is in stark contrast with the condition of the hind tibia in the *B. peuhi* species-group, where such fringes are the rule (Rognes 2009b: figs. 199–210). **Abdomen**. The abdomen is usually all yellow, with very narrow dark marginal bands, rarely the bands are almost absent, or reaching a quarter or so of segment length.

Male genitalia. The cerci (Figs. 1, 11, 20, 35, 44, 52) are usually rather stout in the apical half, much stouter than in the *Bengalia peuhi* species-group, and their apices are converging as seen in dorsal view and bent downwards in lateral view. In addition the dark, strongly sclerotised part is much shorter than in the members of the *Bengalia peuhi* species-group. The surstyli are also much more complex than in the *Bengalia peuhi* species-group, being triangular (Figs. 2, 21, 22, 53) or with almost parallel upper and lower edges (Figs. 12, 36, 45), usually with small processes along the circumference or a bulge along the upper edge. It is concave on the inside, in two species very strongly so (Figs. 13, 37). The dorsal projection of the bacilliform sclerite (i.e., the upper one of the two sclerites situated between the surstylus and the posterior arm of the hypandrium) varies from a very low protuberance

from a small part of the sclerite (Figs. 12, 45), to a massive triangular hook whose base occupies almost the whole sclerite (Fig. 54). Lehrer (2005) never mentions this feature of great diagnostic value for many *Bengalia* species. The ST5 flap is of three main types. The first, present in *B. akamanga* and *B. seniorwhitei* (Figs. 8, 33), has a hind edge that is rather shallowly excavated. The second, present in *B. racovitzai*, *B. smarti* and *B. spinifemorata* (Figs. 18, 42, 50), has the hind edge very deeply excavated. The third type, found only in *B. wangariae*, is quite unusual in that the whole ST5 flap is shaped as a semicircle with the hind transverse edge slightly indented in the middle (Fig. 59). The pre-and postgonites have been illustrated by Lehrer (2005) and Lehrer & Freidberg (2008) and will not be re-described or figured here. The aedeagus has a long well sclerotised basiphallus and an unsclerotised epiphallus, neither described here. The distiphallus is very characteristic for the *Bengalia spinifemorata* species-group and will be described in detail below.

Distiphallus, description of main features and glossary of new terms. The distiphallus is very different from the one in the *Bengalia peuhi* species-group, particularly regarding its distal half. The main features will be detailed here.

Beak and semicircular sclerotisation. In all the species, in the sagittal plane of the distal half of the distiphallus, a strong sclerotisation is present that is semicircular in lateral view. I will call this structure the semicircular sclerotisation (*s.s.*). Due to the quality of some of the preparations used for photography it is not equally evident in all the figures in every angle of view. In all species the lowermost end of the semicircle contributes to form the uppermost part of the beak (*b.*). The beak is a rather broad and somewhat swollen projecting structure that is situated at the anteriormost end of the ventral surface of the distiphallus and which carries the narrow opening of the ejaculatory duct (*ej.o.*) at its anterior end. The beak is recognizable in all species (Figs. 6, 14, 17, 23, 28, 32, 38, 41, 47, 57). At the uppermost part of the semicircle, closest to the dorsal side of the distiphallus and slightly proximal to its apical end, there is in one species a well developed ventrally directed process (Figs. 23, 31, 32), and in another species two minute cones directed ventrolaterally (Figs. 3, 5, 7). The apical and anteriormost part of the semicircle is sometimes widening out to a more or less sclerotised triangular structure (Figs. 3, 4, 7, 23, 29–31, 56–58) usually with a distal concave margin. In other cases it is of even width or somewhat narrowing apically (Figs. 15, 16, 39, 40, 48). The semicircular sclerotisation is evident in many but not all of Lehrer's (2005) figures of the "*Maraviola*" distiphallus, but nowhere described or discussed even though nothing like it is present in other *Bengalia* species.

Veil and veil process. Lehrer (2005: 21, first option under couplet 3 in key) characterised the *B. spinifemorata* group (as Maraviolinae) as follows: "[*a*]*pophyses latérales postérieures du distiphallus sont long et minces* [long and thin], *courbées en avant et en haut* [curved upwards and forwards]. *Juxta est membraneuse et parfois trés developpée* [membraneous and sometimes well developed]…". Elsewhere (e.g. Lehrer 2005: 155, both options under couplets 3 and 7 in key) he uses another term for the "*juxta*", i.e., "*apophyses apicales postérieures du distiphallus*". Lehrer (2005: 154) says the "*juxta*" is "*orientée en arrière*" [directed backwards]. Lehrer (2005: 155, key) qualifies the latter as sometimes "*développées*" [developed] (*M. erithreana*, *M. seniorwhitei*), "*rudimentaires*" [rudimentary] (*M. samburella*, *M. congoliana*) or "*très grandes, plus ou moins ovales, larges*" [very large, more or less oval, broad] (*M. racovitzai*, *M. smarti*). To summarise Lehrer's concepts: on the one hand we have "*apophyses latérales …*" which are long thin and curved upwards (= basad towards the basiphallus), on the other hand "*apophyses apicales …*" which are membranous and sometimes reduced or very large and oriented backwards (= dorsad).

Since Lehrer figures these "*apophyses*" only in lateral view, which hardly encourages a proper understanding of their morphology, I will redescribe and illustrate them in some detail including in apical, lateral, dorsal and ventral views. At the same time I will introduce a simpler, hopefully more easily manageable terminology. I replace Lehrer's term "*juxta*" (or "*apophyses apicales postérieures du distiphallus*") with the term veil, and Lehrer's term "*apophyses latérales postérieures du distiphallus*" with the term veil process, terms that have no other connotations in Diptera literature (as opposed to juxta, a term used in the description of sarcophagid genitalia for a structure that is probably not homologous to Lehrer's "*juxta*" in *Bengalia*). A crucial fact is that the veil and the veil process together form a compound structure attached to the apex of the dorsal wall of the distiphallus well in front of the opening of the ejaculatory duct (*ej.o.*) (Figs. 3–5, 7, 14, 16, 23, 29, 38, 39, 47, 55–58). The veil and veil process are best understood from descriptions of each species in turn.

In *B. akamanga* (Figs. 3–7) the right and left (*l.v.*) parts of the veil are large, broad, weakly sclerotised and roughly horizontal structures on each side of the apex of the semicircular sclerotisation. Their distal margin is ser-

rate with 8–10 serrations on each side. The base of each veil part is seen to join the more strongly sclerotised dorsal wall of the distiphallus along a line that proceeds laterally and slightly backwards from the apex of the semicircular sclerotisation. Laterally along this basal line and on its ventral side the veil process (*v.p.*) takes its origin (Figs. 4, 7, lost on left side). It proceeds basad and ventrad (Figs. 6, 7) and is dentate distally, but cylindrical and of gently diminishing size (not flattened) all the way to the tip.

Lehrer (2005: 155, first item of couplet 6 in key), describes the veil of *B. akamanga* in these terms: "*Les apophyses apicales postérieures du distiphallus sont petites* [are small]". Describing the veils as small is quite misleading, since they in fact are very large. He may refer to the heart-shaped part at the lower right of his drawing of the *B. akamanga* distiphallus (Lehrer 2005: 156, Fig. 69C) immediately adjacent to the letter "C", but this represents only a small fraction of the true veil. The whole drawing is quite unrepresentative and shows the inadequacy of a lateral-view-only approach to a *Bengalia* genitalia iconography.

In *B. racovitzai* (Figs. 14–16), *B. smarti* (Figs. 38–40) and *B. spinifemorata* (Figs. 47–49) the veil (*v.*) consists of two vertical, very weakly sclerotised parts, one on each side of the midline. Each is quite large as seen in apical view (Figs. 16, 39, 48) but is varying in size. Along the flat anterior surface of each half there may be a vertical slightly curved keel or projecting rib (Figs. 15, 16), but such a rib is apparently absent in *B. spinifemorata*. The upper edge of each veil half is smoothly rounded, not serrated. The veil process (*v.p.*) is expanded and flattened antero-posteriorly and dentate distally, along margin and on most of its flat surface.

In *B. seniorwhitei* (Figs. 23, 28–31) the veil (*v.*) also has ventral extension (*v.v.*) which is broad and "hangs down" on each side of the apical triangle of the semicircular sclerotisation (Figs. 23, 29). Both parts are extremely weakly sclerotised and easily missed, which is likely to be the reason why Lehrer (2005: 155, key option 5) characterises the main parts of the veil as "*rudimentaires*" ["rudimentary"] in the nominal species *Maraviola congoliana* and *M. samburella* (all synonyms of *B. seniorwhitei*). The upper main part of the *veil* is strengthened on each side by 5–6 radiating ribs or keels that originate near the base of the veil process (Figs. 28, 29). The upper edge of the veil is weakly serrated. The veil process is cylindrical in cross-secion, not flattened distally. The distal half of the veil process (*v.p.*) sometimes has irregularities such as a subapical abrupt narrowing sometimes accompanied by a change of direction of the distal part of the process (Figs. 24, 26), a subterminal small projection (Fig. 25) or even a small bifurcation (Fig. 27), all of which are easily overlooked. Rognes (2006: 466) reported a subapical tooth in a specimen he dissected for that paper (Fig. 25). Subsequently, Lehrer & Freidberg (2008) based two nominal species (*Maraviola amlaka* and *M. danakiliana*) on specimens with the tip of the veil process shaped as in Figs. 26, 27. Lehrer (2005) even overlooked the presence of such a process in one of his nominal species (*M. erithreana*). This is a variable feature that even varies between the left and right side of the distiphallus, and the various shapes cannot be used to distinguish species.

In *B. wangariae* (Figs. 55–58) the veil (*v.*) is a complex, mainly horizontal and weakly sclerotised structure, where, like in *B. akamanga*, the basal line separating the veil from the more strongly sclerotised dorsal wall of the distiphallus is proceeding outwards and slightly backwards. The veil process (*v.p.*) originates at the lateral end of this basal line on the ventral side. It is curved and slightly flattened, expanded and also dentate distally.

In conclusion, it is important to acknowledge the fact that the origin of the veil process directly from the lower end of the veil itself with no structures of any kind between them, cannot be deduced from a lateral view only of the distiphallus. In such a view the veil process sometimes appears to originate well behind the base of the veil itself. The significance of this fact for Lehrer & Wei's (2010) misinterpretation of the morphology of the distiphallus of *B. fani*, and for their claim that *B. fani* belongs in the *B. spinifemorata* species-group will be discussed below, both in the subsection "Position of opening of ejaculatory duct and homologies of distiphallic parts" (after the next subsection, below), and in the section "Arguments brought forth by Lehrer & Wei (2010) for assigning *B. fani* to the *B. spinifemorata*-group and their merits".

Hypophallic lobes and dentate process. In all the species of the *B. spinifemorata* group there is at least one hypophallic lobe (*h.l.*) on each side of the midline with backwardly directed denticles over most of its exposed surface. It is almost flat and horizontal, and to see it in its broadest aspect one must examine it from the ventral or anteroventral side. In profile view of the distiphallus one can hardly arrive at a correct understanding of its morphology. At the anterior end it continues into a dentate process (*d.p.*) ("*apophyses paraphallique*" of Lehrer 2005: 155, both items of couplet 8 in key) of varying length that flanks the beak (*b.*) on each side. In *B. akamanga*, *B. seniorwhitei* and *B. wangariae* the dentate process appears to be a folded structure as seen in lateral view. The ventralmost part being folded apically, at the side of the beak, proceeds backwards again above the main part to join a

strong sclerotisation arising from the dorsal side of distiphallus ("*paraphallus*" in Lehrer's terminology) (Figs. 6, 7, 28, 31, 32, 55, 57). In *B. racovitzai*, *B. smarti* and *B. spinifemorata* I can see no traces of a fold, the dentate process being just shaped as a long strong dentate structure proceeding forwards from the junction of the anterior end of the hypophallus with the paraphallus. Each dentate process is lying slightly above the beak on both sides of the midline (Figs. 16, 17, 38–41, 47–49).

At the posterior end, in some species, each hypophallic lobe tapers into a narrow "handle" close to the midline. It is possible that the distiphallus has a second hypophallic lobe, but it is very difficult to determine. In profile view of the distiphallus one can partly see a micro-serrated ridge ventrally slightly in front of and reaching back to the ventral plate which possibly represents the denticles of the second hypophallic lobe. Note that in the *B. peuhi* species-group there are two, external and internal, hypophallic lobes, and that these, contrary to the conditions in the *B. spinifemorata* group, are vertical ridges, very narrow and sharp in ventral view, and must be examined in lateral view to see them in their broadest aspect.

In *B. akamanga* (Figs. 3, 7) the hypophallic lobe (*h.l.*) is broader than long. The dentate process (*d.p.*) is broad in ventral view. In profile view it is seen to lie at the same level as the beak (Fig. 6).

In *B. racovitzai*, *B. smarti* and *B. spinifemorata* (Figs.14, 17, 38, 40, 41, 47, 49) each hypophallic lobe (*h.l.*) is broad anteriorly and in ventral view narrowing to a "handle" in the posterior half. The dentate process (*d.p.*) is curved slightly downwards and lies above the *beak* (*b.*) in lateral view.

In *B. seniorwhitei* (Figs. 23, 28, 31, 32) each hypophallic lobe (*h.l.*) is broad in ventral view, and the dentate process (*d.p.*) is at least half as broad, and lies at a level slightly below the beak (*b.*)

In *B. wangariae* (Figs. 57–58) the hypophallic lobe (*h.l.*) appears broader than long in ventral view, and it has a very short narrow "handle" at its hind end near the midline. The dentate process (*d.p.*) is very long.

Position of opening of ejaculatory duct and homologies of distiphallic parts. The position of the opening of the ejaculatory duct (*ej.o.*) is an important landmark in the morphology of the distiphallus in *Bengalia*. In all the species of the *B. spinifemorata* species-group the opening of the ejaculatory duct (*ej.o.*) is situated on the underside of the apex of the beak (*b.*) (Figs. 3, 4, 5, 7, 16, 17, 28, 31, 32, 39, 41, 47, 58), although this is not shown equally well in all the figures. This is a position far behind the apex of the distiphallus, and different from the position of the ejaculatory duct opening in most members of the *B. peuhi* species-group, where the opening is just below the upper lip, close to the anterior end of the distiphallus, and at about the same level as or very slightly behind the base of the antlers. *Bengalia fani* stands out among the *B. peuhi* group members by the fact that both the antler and the lateral finger are situated much further behind the opening of the ejaculatory duct than in the other member species (Rognes 2009b: 32, figs. 57, 62). Thus, in *B. fani* no well defined part of the distiphallus is situated distal to the opening of the ejaculatory duct. In the *B. spinifemorata* species-group, on the contrary, extensive parts of the distiphallus (veil, veil process, most of the semicircular sclerotisation) are situated distal to the opening of the ejaculatory duct. Neither Lehrer (2005, or elsewhere) nor Lehrer & Wei (2010) describe, figure or discuss the position of the opening of the ejaculatory duct.

The different position of the opening of the ejaculatory duct means that it may be doubtful to equate (or compare or homologise) any structure distal to the opening in the *B. spinifemorata* species-group with any structure in the distiphallus of the *B. peuhi* species-group. However, this is precisely what Lehrer does when he gives the same term ("*apophyses latérales postérieures du distiphallus*") to both the antler in the *Bengalia peuhi* species-group (Afridigaliinae) and the veil process in the *Bengalia spinifemorata* species-group (Maraviolinae) (Lehrer 2005: 21, key, both options under couplet 3), even though the processes (1) are proceeding in totally different directions and (2) belong to parts of the distiphallus that may not be comparable. For these two reasons I reject the homologisation implicit in his terminology of these structures.

However, Lehrer & Wei (2010) consider the antler in *B. fani* to be something else than the antlers in the other members of the *B. peuhi* species-group, namely the same as what I, above, have termed the veil ("*apophyses apicales postérieures du distiphallus*"), for which they now use the term "*les apophyses postérieures de l'acrophallus*" (Lehrer & Wei 2010: 22). Furthermore, they consider the lateral finger in *B. fani* to be something else than the lateral finger in the other members of the *B. peuhi* species-group, namely the same as the veil process ("*apophyses latérales postérieures du distiphallus*") which they now term "*les apophyses antérieures de l'acrophallus*" (Lehrer & Wei 2010: 22). For these reasons they assign *B. fani* to the *B. spinifemorata* species-group. The merits of this view will be discussed later in the section "Arguments brought forth by Lehrer & Wei (2010) for assigning *B. fani* to the *B. spinifemorata*-group and their merits".

Female genitalia. Unknown.

Distribution. When Zumpt (1956: 168) stated that "*B. spinifemorata* probably occurs all over the Ethiopian Region and is recorded, or I have seen it, from Nigeria, the Belgian Congo, Uganda, Abyssinia, Tanganyika, Nyasaland, N. and S. Rhodesia, Transvaal, Natal and Cape Province", only a single species was known in the *B. spinifemorata* species-group. In view of what is known now about the composition of the species-group, these records obviously encompass a number of species. The distribution of each species within the Afrotropical Region is reappraised below.

Key to males of the *Bengalia spinifemorata* species-group

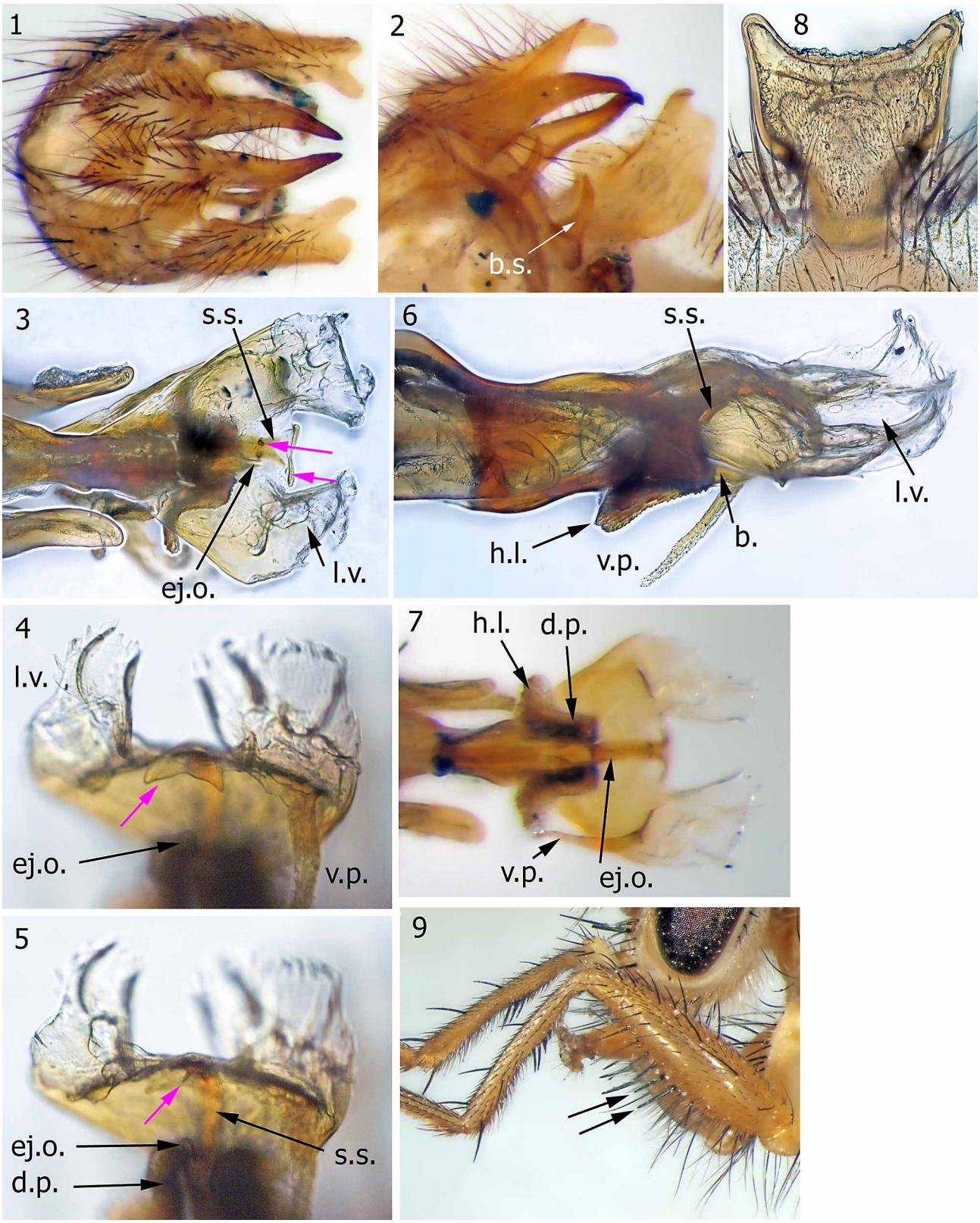
1. ST5 flap broad, semicircular, with a straight posterior margin, latter with a slight notch in the middle (Fig. 59). Bacilliform sclerite process forming a massive hook (Fig. 54). Semicircular sclerotisation apically with triangular expansion, its apical margin strongly concave (Figs. 56–58). Veil process curved and distally dentate and slightly flattened (Figs. 57, 58) . . . . . 6. *Bengalia wangariae* (Lehrer)
- ST5 flap shaped otherwise, with a broad, shallow or deep excavation in the hind margin. Bacilliform sclerite process much smaller. Semicircular sclerotisation apically expanded, or narrow and not apically expanded. Veil process almost straight, rounded in cross-section, and not expanded distally, or curved, distally expanded and flattened 2
2. ST5 flap with a shallow excavation in posterior margin (Figs. 8, 33). Bacilliform sclerite process moderate in size (Figs. 2, 21). Distal end of semicircular sclerotisation expanded into a triangle with a concave anterior margin (Figs. 3, 4, 29, 30). Distal end of veil process rounded in cross-section, not broad and flattened, sometimes with small subapical processes (Figs. 6, 23–28). No narrow backward extension of the hypophallic lobes, as seen in ventral view (Figs. 6, 7, 31). 3
- ST5 flap with a deep excavation in posterior margin (Figs. 18, 42, 50). Bacilliform sclerite process forming a very low protuberance (Figs. 12, 36, 45). Distal end of semicircular sclerotisation narrow, not expanded (Figs. 16, 39, 40, 48). Distal end of veil process expanded and flattened (Figs. 16, 39, 48). Posterior half of the hypophallic lobe half as wide as the anterior part as seen in ventral view (Figs. 40, 49) 4
3. Veil large and horizontal, with a few radiating ribs present, distal edge with 8–10 serrations (Figs. 3–7). Two minute cones on underside of dorsalmost part of the semicircular sclerotisation (Figs. 3, upper pink arrow; 5, pink arrow) . . . . . 1. *Bengalia akamanga* (Lehrer)
- Veil smaller and vertical, consisting of upper and lower parts, upper part with radiating ribs as seen from front (Figs. 28, 29), lower part "hanging" down in front of apex of semicircular sclerotisation (Figs. 23, 29, 30). Strongly developed, ventrally directed flat knob at the dorsalmost part of the semicircular sclerotisation (Figs. 23, 31, 32, pink arrows) . . . . . 3. *Bengalia seniorwhitei* (Lehrer)
4. ST5 flap deeply sunk in the main part of ST5, its hind margin at the side of the excavation, i.e., the tips of the "horns", not reaching back to level of the hind margin of ST5 proper (Fig. 50). Surstylus with parallel upper and lower edges in lateral view (Fig. 45), slightly concave on inside (Fig. 46). Veil relatively small, without anterior rib (Figs. 47, 48). Tip of beak at level of junction of veil and veil process in lateral view of distiphallus (Fig. 47) . . . . . 5. *Bengalia spinifemorata* Villeneuve
- ST5 flap not deeply sunk in the main part of ST5, the hind margin at the side of the excavation, i.e., the tips of the "horns", projecting backwards well beyond the hind margin ST5 proper (Figs.18, 42). Surstylus slightly broadening distad, with a conspicuous long and low bulge middorsally (Figs. 12, 36), very strongly concave on inside (Figs. 13, 37). Veil large, with anterior rib (Figs. 15, 38). Tip of beak well behind level of junction of veil and veil process (Figs 14, 38) 5
5. Excavation in hind margin of ST5 flap V-shaped, the projections or "horns" being straight or even slightly convex on inside (Fig. 18). The dentate process of the distiphallus gradually tapering distally (Fig. 17) . . . . . 2. *Bengalia racovitzai* (Lehrer)
- Excavation in hind margin of ST5 flap U-shaped, the projections or "horns" being concave on inside (Fig. 42). The dentate process of the distiphallus narrows subapically and widens out again apically, apical area with broad pale part ventrally and distally (Fig. 41) . . . . . 4. *Bengalia smarti* (Lehrer)

1. *Bengalia akamanga* (Lehrer, 2005), comb. nov.

Figs. 1–10.

Maraviola akamanga Lehrer, 2005: 155, 156 fig. 69. Holotype male (MSNM, examined), by original designation. Type locality: Malawi, Kamanga [as "N. Nyasa, Akamanga"].

Diagnosis. *Male*. Length: 12mm (mean 12mm, n=1). Frons at vertex / head width ratio: 0.308 (n=1). ST5 flap roughly as broad as long, with a very shallow distal emargination. Surstylus with finger-like projection at upper distal corner. Bacilliform sclerite process moderate in size. Distiphallus with semicircular sclerotisation dorsally with two small cones directed ventrolaterally, apex broad and weakly sclerotised with distal margin slightly concave. Right and left parts of veil large, weakly sclerotised and mostly horizontal. Distal margin with 8–10 serrations on each side. Base of each veil part joining the more strongly sclerotised dorsal wall of the distiphallus along



FIGURES 1–9. *Bengalia akamanga* (Lehrer), male (from holotype of *Maraviola akamanga* Lehrer in MSNM). **1**. Cerci and surstyli, dorsal view. **2**. Cerci and surstyli, oblique "inside" view. **3**. Distiphallus, dorsal view (pink arrows point to details of semicircular sclerotisation shown in Figs. 4, 5). **4**. Anterior part of distiphallus, slightly oblique anteroventral view (focus corresponding to lower pink arrow in Fig. 3). **5**. Anterior part of distiphallus, slightly oblique anteroventral view (focus corresponding to upper pink arrow in Fig. 3). **6**. Distiphallus, left lateral view. **7**. Distiphallus, ventral view. **8**. ST5 flap. **9**. Fore femur and tibia, left lateral view (arrows point to posteroventral spine-like setae).

a line that proceeds laterally and slightly backwards from the apex of the semicircular sclerotisation. Veil process originating laterally on this basal line and on its ventral side. Veil process, proceeding basad and ventrad, dentate distally, cylindrical (not flattened) all the way to the tip. Hypophallic lobe broad, without narrower "handle" posteriorly. Dentate process broad in ventral view.

Female. Unknown.

Discussion. *Bengalia akamanga* is known only from the holotype. Lehrer (2005: 157) claimed that Akamanga is in Tanzania. However, Bezzi (1912: 616, 618, 620, 623, 624) in a report on a collection of Bombyliidae from central Africa, refers to material from "… North Nyasa, (…) Akamanga, South Rukuru River, October 10 (or 8), 1909 …" which was collected by "Dr. J. B. Davey". Thus the type locality is near South Rukuru River, which is in Malawi. Lehrer also misspelt the collector's name as "… Daney". I cannot find Akamanga on any map, only Kamanga, which is near the said river, at 11°17'S, 34°01'E.

Distribution. Malawi.

Material examined. Type material. *Maraviola akamanga* Lehrer, 2005. Holotype male, in MSNM, labelled (1) N.NYASA / AKAMANGA / Dr. J.B.Davey / 10.10.09 / J.B.D. [handwritten, but third line in a different hand than the others]; (2) Bengalia / spinifemorata / Villen. / Cotyp. ♂ [handwritten by Villeneuve]; (3) spinifemorata / COTYPUS [printed museum label]; (4) HOLOTYPUS [black print on white label, latter glued on top of bigger red label]; (5) *Bengalia* ♂ / *akamanga* Lehrer sp.n. / Det. Dr. A.Z. LEHRER / XII.2004 [printed; pinhole at middle]; (6) *Bengalia* ♂ / *akamanga* Lehrer sp.n. / Det. Dr. A.Z. LEHRER / XII.2004 [printed; pinhole near right end of label] (Fig. 10). Both front legs intact; left mid leg intact, right mid leg lost tibia and tarsus; left hind leg lost, right hind leg lacking distal four tarsomeres glued to carton below specimen. Genitalia dissected by Lehrer. Genitalia in glycerol transferred from big opaque plastic vial to glass microvial by KR. In distiphallus left veil process lost.

FIGURE 10. *Bengalia akamanga* (Lehrer), male. **10**. Labels from holotype of *Maraviola akamanga* Lehrer in MSNM.

2. *Bengalia racovitzai* (Lehrer, 2005)

Figs. 11–19.

Maraviola racovitzai Lehrer, 2005: 161, 163 fig. 72. Holotype male (MRAC, examined), by original designation. Type locality: Democratic Republic of Congo, Lubumbashi [as "Cubumbus"].

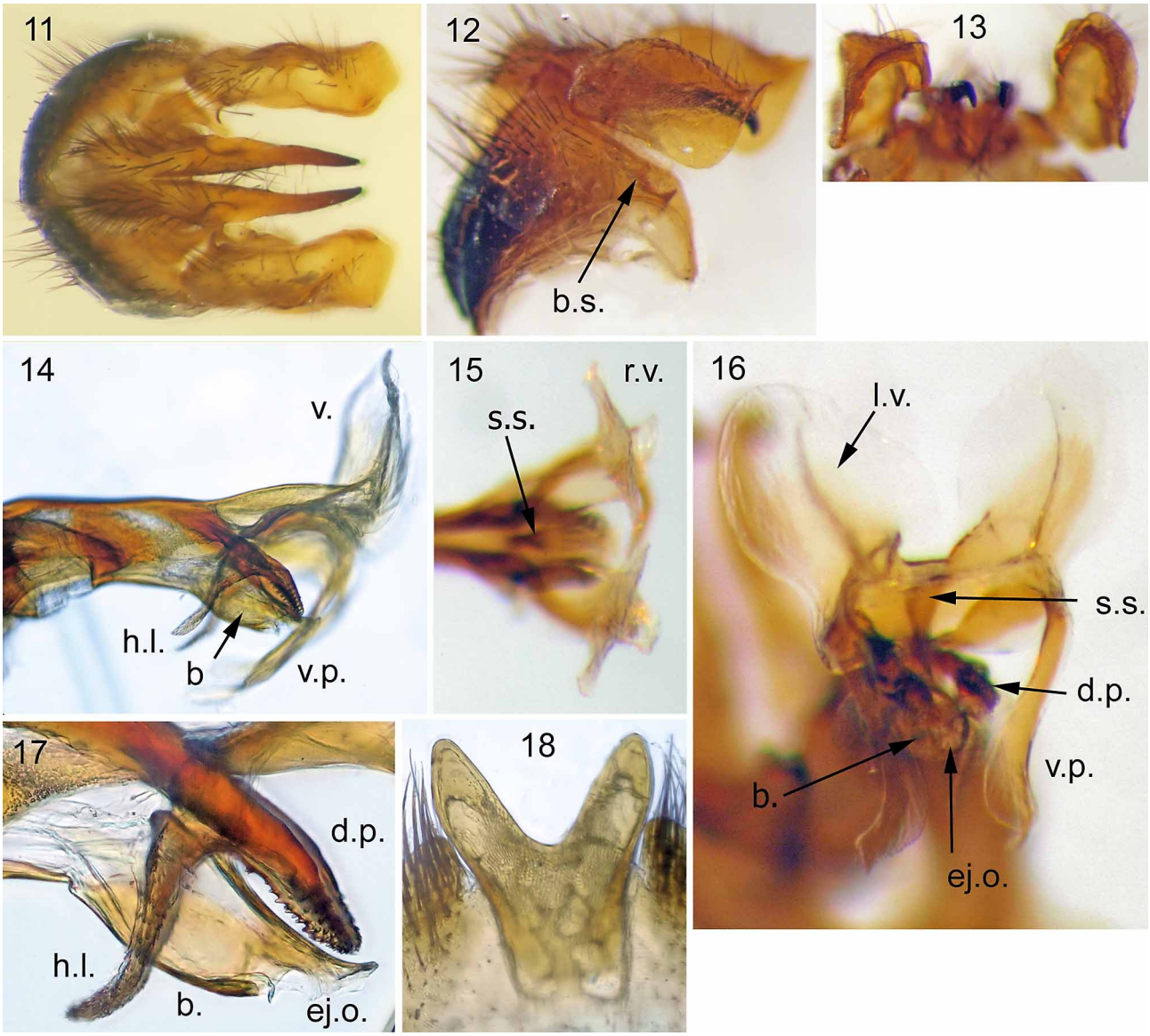
Note. Rognes (2006) by error synonymised *racovitzai* and *smarti*. Lehrer (2005: 162) miscited the locality on the label as "Cubumbus".

Bengalia spinifemorata: Zumpt, 1956: 169, specimens from "Elisabethville … CH. SEYDEL", "Katanga: Kakinga … leg. H. J. BRÉDO" and "Thysville; 1929 … leg. M. DIDIER", 169 fig. 97 (lower right?). Examined. Misidentifications, not *spinifemorata* Villeneuve.

Diagnosis. *Male*. Length: 11–13mm (mean 12.1mm, n=5). Frons at vertex / head width ratio: 0.304–0.317 (mean 0.311, n=5). ST5 flap not sunk deeply into main part of ST5, its lateral tips projecting well beyond hind edge of main part of ST5. ST5 flap deeply excavated, excavation V-shaped, the inside of the V is straight or even convex towards the midline and its bottom narrow (Fig. 18). The tip of the lobes ("horns") is somewhat pointed, rounded and not flattened from side to side. Surstylus slightly broadening distad, with a low conspicuous bulge middorsally, very strongly concave on inside. Bacilliform sclerite process forming a very low protuberance. Semicircular sclerotisation of distiphallus with no particular characteristics except for being narrow at apex. Tip of beak far behind level of junction of veil and veil process. Right and left parts of veil large, vertical, very weakly sclerotised and transparent, with a rib on anterior side along middle. Upper margin smooth and without serrations. Distal end of

veil process flattened and denticulate along edge and on flat surface. Posterior half of the hypophallic lobe half as wide as the anterior part as seen in ventral view. Dentate process evenly narrowing distally, appearing rather acute in exact profile view, and denticulate laterally and ventrally.

Female. Unknown**.**



FIGURES 11–18. *Bengalia racovitzai* (Lehrer), male (11–16, 18 from holotype of *Maraviola racovitzai* Lehrer in MRAC; 17 from male paratype of *Maraviola racovitzai* labelled "… Thysville … M. Didier …" in MRAC). **11**. Cerci and surstyli, dorsal view. **12**. Cerci and surstyli, left lateral view. **13**. Tip of cerci and surstyli, apical view. **14**. Distiphallus, left lateral view. **15**. Anterior half of distiphallus, dorsal view. **16**. Distiphallus, slightly oblique anterior view. **17**. Dentate process, hypophallic lobe, beak and opening of ejaculatory duct, left lateral view. **18**. ST5 flap.

Discussion. *Bengalia racovitzai* can be separated from *B. smarti* on the characters given in the key. Lehrer's (2005: 172) lectotype designation for *Bengalia spinifemorata* Villeneuve, 1913 has restricted the name to the apparently very rare species having the hind end of the "horns" of the ST5 flap not projecting beyond the posterior edge of ST5 (Fig. 50) (known only from the lectotype; see below for a treatment of *B. spinifemorata*). The figures of the ST5 flap by Malloch (1927) and Zumpt (1956) all show the tip of the horns of the ST5 flap to project well beyond the hind of the main part of ST5. Thus the species from which these figures have been made do not belong to *B. spinifemorata*. Malloch's material belongs to *Bengalia smarti* (Lehrer), see below under that species.

Some of the specimens listed from the "Collection Musée du Congo" (MRAC) by Zumpt (1956) have been seen by Lehrer and have status as paratypes of *Maraviola racovitzai* Lehrer.

Zumpt (1956: 168) thought for some time that two species were involved under his "*B. spinifemorata*", but came to the conclusion that there "is really only one, the hypopygium of which is subject to a slight variability". His first opinion was correct: at least his material from Congo consisted both of *B. racovitzai* (specimens from "Elisabethville … CH. SEYDEL", "Katanga: Kakinga … leg. H. J. BRÉDO" and "Thysville; 1929 … leg. M. DIDIER") and *B. seniorwhitei* (see below, under holotype and paratype of *Maraviola congoliana*, for misidentified Zumpt material from "… Rutshuru … leg. LIPPENS" and "Mulungu près Shabunda … leg. HAUTMANN"). Comparing the list of material in MRAC below, and the corresponding list for *M. congoliana* (under *B. seniorwhitei*, below) it seems that I have examined males from all the localities that Zumpt (1956) mentions for his "*B. spinifemorata*" from the "Belgian Congo". From other Congo localities only females are mentioned.

Lehrer (2005) has misidentified some of his own paratypes of *racovitzai*, i.e., those from South Africa (3 specimens) in MRAC and those from South Africa and Zimbabwe (3 specimens) in BMNH, see below under *B. smarti*.

Distribution. Democratic Republic of Congo (Bas-Congo, Katanga), Kenya.

Material examined. Type material. *Maraviola racovitzai* Lehrer, 2005. Due to an accident in the mail some of the specimens borrowed from MRAC had lost legs, and in one case an abdomen had come loose. No loose heads were recovered, so the specimens without heads are assumed to have lacked them before the specimens were mailed to me. **Holotype** male, in MRAC, labelled (1) Zaire / Lubumbashi / 28.I.1972 / col. A B Stam [handwritten]; (2) BENGALIA // SPINIFEMORATA // ♂ 9 /1981 [?] Vill. [handwritten by Stam]; (3) Coll. Mus. Tervuren / ex.Coll.Dr. A.Stam [printed]; (4) HOLOTYPE [black print on red label]; (5) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr. A.Z.LEHRER / 2004 [pin hole at middle]; (6) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr. A.Z.LEHRER / 2004 [pin hole at right end of label] (Fig. 19). Note. The specimen lacks the head. **Paratypes**. **BMNH** [1 specimen is listed here; the remaining 3 of the 4 original paratypes in BMNH, i.e., those from South Africa (Johannesburg and Ingogo) and Zimbabwe have been misidentified by Lehrer: they belong to *B. smarti* (Lehrer) and are listed under that species, below]: 1 male labelled: (1) Dr. van Someren / NAIROBI / January 1928; (2) V.G.L. van Someren / Collection / Brit.Mus.1959-468.; (3) same as (2); (4) *Maraviola* ♂ / *racovitzai* Lehrer n. sp. / Det. Dr. A.Z.LEHRER / 2004. Note. This specimen had the dried genitalia in a big plastic vial, apparently nipped off by Lehrer from the tip of the abdomen where perhaps at least the epandrial complex was in an exerted position already. The left surstylus was a separate loose piece, the right surstylus was absent. ST5 and ST5 flap with associated parts made up a second unit in the vial. The third unit consisted of the cerci and epandrium with aedeagus, gonites and hypandrium. I had an accident with the genital parts during KOH treatment of the dried pieces for purposes of glycerol storage and lost the epandrial complex with the aedeagus. Fortunately, I had taken a stereomicroscope photograph of the distiphallus before the accident. The ST5 with the ST5 flap, and the left surstylus were recovered. The specimen belongs to *B. racovitzai* both by the shape of the ST5 flap and the dentate process. **MRAC** [7 specimens are listed here; the remaining 3 of the 10 original paratypes in MRAC, i.e., those from South Africa, have been misidentified by Lehrer: they belong to *Bengalia smarti* (Lehrer) and are listed under that species, below]: 1 male labelled: (1) MUSÉE DU CONGO / Elisabethville [now = Lubumbashi] / Dr. M. Bequaert; (2) R. DÉT / U / 4926 [U is handwritten]; (3) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. This specimen has the genitalia exerted and clearly visible. • 1 male labelled (1) MUSÉE DU CONGO / Elisabethville / Dr. M. Bequaert; (2) R. DET / 6933 / F. [F. is handwritten]; (3) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. The dried genitalia are glued to a piece of card below specimen. • 1 male labelled (1) MUSÉE DU CONGO / Elisabethville / (A. Smaelen) / (Don. Mr. Garpentier) [three last lines handwritten]; (2) R. DET / 6933 / F. [F. is handwritten]; (3) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. The dried genitalia are glued to a piece of card below specimen. • 1 male labelled: (1) MUSÉE DU CONGO / Elisabethville R. Lu- / bumbashi) – 1920 / Dr. M. Bequaert; (2) R. DÉT / U / 4926 [U is handwritten]; (3) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. This specimen has the genitalia exerted and clearly visible. • 1 male labelled (1) MUSÉE DU CONGO / Elisabethville / II.- 1925 / Ch. Seydel; (2) Bengalia ♂ / spinifemorata Vill. / det. Zumpt 55 [folded handwritten label in Zumpt's hand]; (3) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. The dried genitalia are on a card below the specimen. • 1 male labelled (1) MUSÉE DU CONGO / Thysville [now = Mbanza-Ngungu] / 1929 / (Réc. Mr. Didier.) [handwritten]; (2) R. DET / 6933 / F. [F is handwritten]; (3) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. This specimen has been dissected by Lehrer. Genitalia transferred to glass microvial with glycerol by KR. Abdomen had got loose but is now glued to card below specimen. • 1 male labelled (1) MUSÉE DU CONGO / Katanga: Kakinga / II- 1931 / H. J. Brédo [Kakinga is handwritten]; (2) R. DET. / 6933 / F. [F. is

handwritten]; (3) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. The dried genitalia are on a card below the specimen. The abdomen is lost, no corresponding abdomen was recovered so it must have been absent before the specimen was mailed to me.

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FIGURE 19. *Bengalia racovitzai* (Lehrer), male. **19**. Labels from holotype of *Maraviola racovitzai* Lehrer in MRAC.

3. *Bengalia seniorwhitei* (Lehrer, 2005)

Figs. 20–34.

Maraviola seniorwhitei Lehrer, 2005: 165, fig. 74. Holotype male (BMNH, examined), by original designation. Type locality: Kenya, Nanyuki.
Note. Rognes (2006) synonymised *seniorwhitei* and *erithreana* and by First Reviser action selected *seniorwhitei* to be the valid specific name for this species.

Maraviola congoliana Lehrer, 2005: 157, 158 fig. 70. Holotype male (MRAC, examined), by original designation. Type locality: Democratic Republic of Congo, Rutshuru. **Syn. nov.**

Maraviola erithreana Lehrer, 2005: 159, 160 fig. 71. Holotype male (BMNH, examined), by original designation. Type locality: Eritrea, Dongollo Basso.
Note. This synonymy was first suggested by Rognes (2006). See entry under *Maraviola seniorwhitei* above.

Maraviola samburella Lehrer, 2005: 164, fig. 73. Holotype male (TAU, examined), by original designation. Type locality: Kenya, "25 km NE Kericho". **Syn. nov.**

Maraviola amlaka Lehrer & Freidberg, 2008: 1, 2 fig. 1. Holotype male (TAU, examined), by original designation. Type locality: Ethiopia, "Shola, Ahmar Mts.". **Syn. nov.**

Maraviola danakiliana Lehrer & Freidberg, 2008: 3, 4 fig. 2. Holotype male (TAU, examined), by original designation. Type locality: Ethiopia, "Shewa / Menagesha". **Syn. nov.**

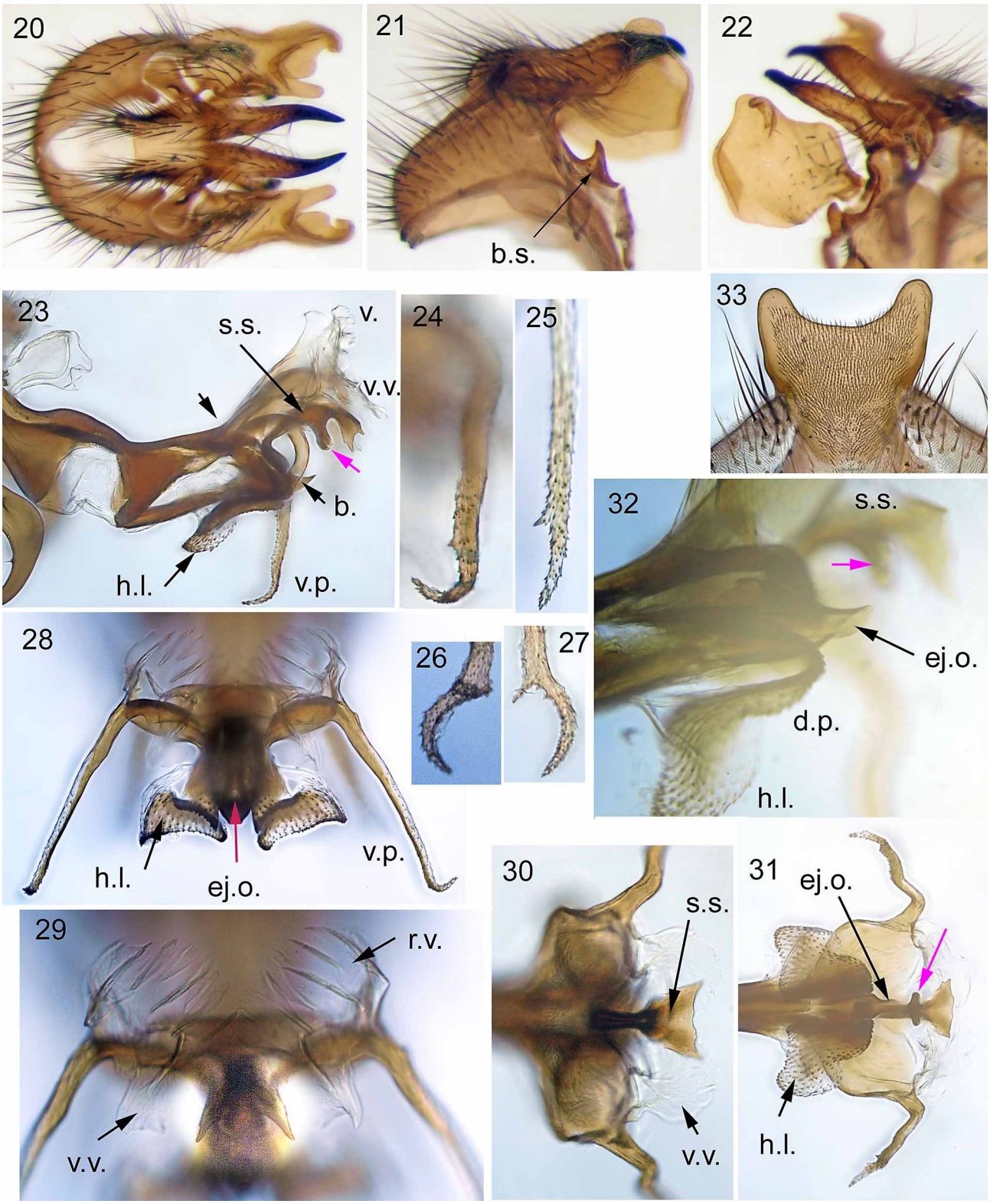
Maraviola akufulana Lehrer, 2011: 9, 10 fig. 3. Holotype male (TAU, not examined), by original designation. Type locality: Malawi, "Viphya Mts, Kasito Lodge, … , 1730 m, …". **Syn. nov.**

Bengalia spinifemorata: Zumpt, 1956: 170, specimens from Democratic Republic of Congo, i.e., those listed from "Rutshuru, VI. 1930, … leg. L. LIPPENS" and "W.Kivu: Mulungu près Shabunda, 1939 … leg. HAUTMANN". Misidentification, not *spinifemorata* Villeneuve.

Bengalia seniorwhitei: Rognes 2006: 466, 469.

Diagnosis. *Male*. Length: 9–11mm (mean 10mm, n=6). Frons at vertex / head width ratio: 0.308–0.350 (mean 0.327, n=6). ST5 flap with shallow excavation in hind margin though sometimes deeper than shown in Fig. 33. "Horns" of the flap flat dorsoventrally. Surstylus of complex build, triangular in broadest aspect, with processes above and below on the distal edge. It sometimes varies somewhat in shape among individuals, particularly the process near middle of dorsal edge. Sometimes a slight depression is present in the distal edge. Bacilliform sclerite process moderate in size. Semicircular sclerotisation at the dorsalmost part of the semicircle with a broad ventrally directed flat process. Semicircular sclerotisation distally expanded into a triangular projection, the apical edge of which is concave as seen from front. Right and left parts of veil very transparent, difficult to observe and easily overlooked, with 5–7 radiating ribs originating from base of veil process, upper margin of each part serrate. A ventral extension of the veil "hangs down" on each side of the apical triangle of the semicircular sclerotisation. Veil process rounded in cross-section, dentate in distal third to half, sometimes with a small subapical tooth or bifurcation, an abrupt narrowing, a distal curved section not quite in line with the basal part, or similar irregularities (Figs. 24–27). Posterior half of hypophallic lobe broad, with no posterior narrow extension. Anterior narrow part of hypophallic lobe is folded with a backwardly directed upper part, the lower part of the fold constitutes the dentate process which is flanking the beak.

Female. Unknown.



FIGURES 20–33. *Bengalia seniorwhitei* (Lehrer), male (20–24, 28–33 from specimen from "Ngare Narok" [Kenya] in ZMUN; 25 from specimen from "Nairobi Westlands" [Kenya] in ZMUC; 26, 27 from holotype of *Maraviola amlaka* Lehrer & Freidberg [Ethiopia] in TAU). **20**. Cerci and surstyli, dorsal view. **21**. Cerci and surstyli, left lateral view. **22**. Cerci and surstyli, oblique "inside" view. **23**. Distiphallus, left lateral view (pink arrow points to detail of semicircular sclerotisation). **24.** Tip of veil process. **25**. Tip of veil process. **26**. Tip of right veil process. **27**. Tip of left veil process. **28**. Distiphallus, apical view (focus at tip of opening of ejaculatory duct). **29**. Distiphallus, apical view (focus at tip of semicircular sclerotisation and enlarged). **30**. Distal half of distiphallus, dorsal view. **31**. Distal half of distiphallus, ventral view (pink arrow points to detail of semicircular sclerotisation). **32**. Tip of distiphallus, enlarged oblique ventral view (pink arrow points to detail of semicircular sclerotisation). **33**. ST5 flap.

Discussion. The lower part of the veil is present in the holotype of *M. congoliana*, but a grey opaque mass of stiff glycerol-jelly covers the tip of the distiphallus and it is difficult to determine whether the upper part is present or not, most likely it is curled up and hidden because of its transparency. All parts of a normal veil are present in the paratype of *M. congoliana*. The veil was described by Lehrer (2005: 155, second item in key option 3) as "rudimentaires" but this is an error.

The holotype and paratype of *Maraviola congoliana* Lehrer had been misidentified as *B. spinifemorata* by Zumpt (1956: 170). Zumpt had suspected that two species were involved under his "*B. spinifemorata*" although he gave up the idea. He was right as far as his Congo material concerns, see discussion above under *B. racovitzai*.

The veil is described as rudimentary also in *M. samburella* (Lehrer, 2005: 155, second item in key option 3). In the holotype the veil is somewhat crimpled and bent, but it is perfectly normal otherwise, not at all rudimentary. Lehrer separated *M. samburella* from *M. congoliana* on the basis of minute differences in the drawings of the ST5 flap, which I do not accept as sufficient reason to create a separate species.

The nominal species *M. amlaka* Lehrer & Freidberg and *M. danakiliana* Lehrer & Freidberg were based mainly on the presence of small irregularities in the distal part of the veil processes. In my review of Lehrer's book (Rognes 2006: 466) I described the presence of a "small subterminal tooth not illustrated by Lehrer … on both the long lateral aedeagal apophyses [= veil process].". This feature is shown in Fig. 25. Lehrer & Freidberg (2008) do not cite this observation on my part, in spite of the fact that *amlaka* and *danakiliana* are both based on similar modifications of the veil process. The tip of the veil process on the right side of the holotype of *M. amlaka* is illustrated in Fig. 26, and the one on the left side in Fig. 27. Lehrer & Freidberg (2008: 2, fig. 1C) illustrated only the left side for their *amlaka* and failed to notice that the shape of the tip of the veil process on the right side in the *amlaka* holotype is identical to the one on the left side of the holotype of their *M. danakiliana* (illustrated by Lehrer & Freidberg 2008: 4, fig. 2C), and that the tip of the veil process on the right side in the holotype of *danakiliana*, having a similar rather prominent tooth and a curved distalmost part beyond the tooth, is almost identical with the one present on the left side in *amlaka* (Fig. 27). Both nominal species were based on holotypes from high altitude in Ethiopia. Again, this demonstrates the futility of studying genitalia from the left side only.

The veil itself is described by Lehrer & Freidberg (2008), respectively, as "*relativement courtes*" [relatively short] (*M. amlaka*, p. 3, under the term "[*l*]*es apophyses postérieures*"), and "*assez petites*" [rather small] (*M. danakiliana*, p. 4, under the term "[*l*]*es apophyses terminales postérieures du paraphallus*").

Interestingly, the holotype of *M. erithreana* (Eritrea, Dongolo Basso) has a conspicuous projection of the right veil process, which is broken beyond it (the veil process on this side is stuck to the hypophallic lobe and difficult to observe). The veil process on the left side is also broken and a very small projection is present a little proximal to its broken end. In the paratype of *M. erithreana* (Ethiopia, Kefa province near Jima) a similar projection or tooth is present on one of the veil processes, whereas the other is covered with a layer of more or less opaque glycerol jelly and it is not possible to decide whether a projection is present or not. No such projections were reported by Lehrer in *M. erithreana* and those present have evidently been overlooked by him.

It is clear that one cannot uphold species status on features that vary between the right and left sides of the body, and which vary gradually from specimen to specimen.

In the holotype of *Maraviola amlaka* the beak is distally broad and flaring and the ejaculatory opening is rather large. This may possibly be an artifact or perhaps an after-effect of a mating. The feature is shown in Lehrer & Friedberg's figure of the distiphallus (Lehrer & Freidberg 2008: 2, fig. 1C). No such modification is present in the *Maraviola danakiliana* holotype, and neither in any other specimens of *B. seniorwhitei* I have seen.

M. erithreana is keyed and illustrated as having a slightly different ST5 flap than *M. seniorwhitei*. I do not accept such slight variations among drawings as good enough reason to establish or diagnose species.

The nominal species *M. congoliana*, *M. erithreana*, *M. samburella*, *M. amlaka* and *M. danakiliana* all have very characteristic and very similar surstyli. The differences described by Lehrer & Freidberg (2008) regarding the size of a projection on the upper edge of the surstylus reflect individual variation and is not a species characteristic.

On the basis of the above I do not accept any of the arguments provided by Lehrer (2005) and Lehrer & Freidberg (2008) for keeping the aforementioned nominal species as good species and synonymise them all under *B. seniorwhitei*.

Lehrer (2011: 8) wrote that his most recently described nominal species *M. akufulana* may be mixed up with *M. akamanga* or *M. congoliana* because of the shape of the posterior excavation of the ST5 flap (his "*sternite VII*"), but otherwise has given up diagnosing it. According to him "*la spécificité, de celle-ci* [M. akufulana] *peut*

être mis en evidence seulement par l'étude de tous les charactères du complexe génital mâle." [the specific status … can be established only by studying all the characters of the male genital complex.]). The illustrations provided (Lehrer 2011: 10, fig. 3) indicate clearly that he has re-described *B. seniorwhitei* for the sixth time.

Distribution. Democratic Republic of Congo (Nord-Kivu, Sud-Kivu), Eritrea, Ethiopia, Kenya, Malawi, Tanzania, Uganda.

Material examined. Type material. *Maraviola seniorwhitei* Lehrer, 2005. **Holotype** male, in BMNH, labelled (1) HOLOTYPE [printed on round label with red rim]; (2) HOLOTYPUS [printed on red label]; (3) van Someren / Nanyuki (S:) / Kenya, 5 48 [printed]; (4) Pres. By / Com.Inst.Ent. / B.M.1950-323. [printed]; (5) COM. INST. ENT. / COLL. NO. 10998 [printed]; (6) Bengalia / spinifemorata / van Emden det. 1948 Vill [handwritten except van Emden det. 194]; (7) *Maraviola* ♂ / *seniorwhitei* Lehrer sp.n. / Det. Dr. A. Z. LEHRER / HOLOTYPUS 2004 [printed on white label] (Fig. 34). In this specimen there is no trace of a subterminal tooth, bifurcation or projection on the distal part of the veil processes. The genitalia, of which the genital capsule is deformed, have been transferred to small glass microvials from the original big plastic vials used by Lehrer. **Paratypes**. **BMNH**: 1 male labelled (1) Asuma // 26/10/11 [handwritten in pencil]; (2) ABYSSINIA / NOV. 1911 / R.J.Stordy [printed]; (3) Pres.by / Comm.Inst.Ent. / B.M.1953-343. [printed]; (4) *Maraviola* ♂ / *seniorwhitei* Lehrer sp.n. / Det. Dr. A. Z. LEHRER / HOLOTYPUS 2004 [printed on white label]. Note. There are no irregularities on the veil processes in this specimen. Lehrer (2005: 167) misinterprets the handwritten Stordy label reading "Asuma …" as "Abissinia …". Asuma is in Ethiopia. • 1 male labelled (1) KENYA: / 9–13.xii.1970 / A.E.Stubbs / B.M. 1972–211 [printed]; (2) Karura For., / Nairobi, / 5500 feet [printed]; (3) *Maraviola* ♂ / *seniorwhitei* Lehrer sp.n. / Det. Dr. A. Z. LEHRER / HOLOTYPUS 2004 [printed on white label]. Note. There are no irregularities on the veil processes. The left third of the ST5 flap has been cut away obliquely, lacking. • 1 male labelled (1) van Someren / Nyeri (S.) / Kenya 12 48 [printed]; (2) V.G.L.van Someren / Collection. / Brit.Mus.1959-468. [printed]; (3) COM INST. ENT. / COLL. NO. 11280 [printed]; (4) Bengalia / spinifemorata van Emden det 1949 Vil. [handwritten, except van Emden det. 194]; (5) *Maraviola* ♂ / *seniorwhitei* Lehrer sp.n. / Det. Dr. A. Z. LEHRER / HOLOTYPUS 2004 [printed on white label]. Note. This specimen has the ST5 flap *in situ* on the abdominal tip. There are very small irregularities on the distal parts of the veil processes.

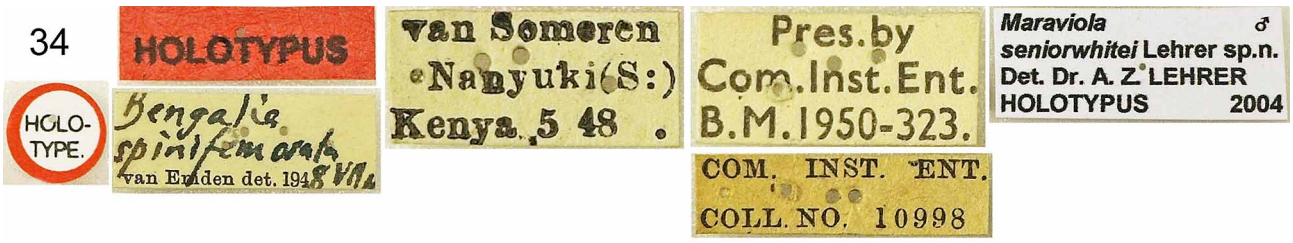


FIGURE 34. *Bengalia seniorwhitei* (Lehrer), male. Labels from holotype of *Maraviola seniorwhitei* Lehrer in BMNH.

Maraviola congoliana Lehrer, 2005. **Holotype** male, in MRAC, labelled: (1) COLL. MUS. CONGO / Rutshuru / 2 -VI - 36 / L. Lippens / 179 [the numbers 2 and 179 are handwritten; the latter is written along the left margin of label]; (2) R. DET. / 6933 / F. [the F is handwritten]; (3) *Maraviola* ♂ / *congoliana* sp.n. / HOLOTYPUS / Det. Dr. A.Z.LEHRER / 2004; (4) HOLOTYPUS [red label with smaller white label with text glued to its upper side]; (5) large label with same text as label (3). Note. This specimen has been dissected by Lehrer and the genitalia were placed in a large plastic vial. The vial contents were stuck at the bottom and totally dried out when I received the specimen. The stopper was impossible to loosen so the vial was cut open transversely with a scalpel to gain access to the contents. These were allowed to soak in alcohol, then glycerol. The ST5 flap was lacking; genital capsule with one surstylus intact; second surstylus separate; hypandrium with aedeagus separate, veil process on left side broken halfway. Tip of distiphallus a grey amorphous mass. It seems to be the same specimen as listed from Rutshuru by Zumpt (1956: 170) under *Bengalia spinifemorata*. **Paratype**. **MRAC**: 1 male labelled (1) COLL. MUS. CONGO / W.Kivu: Mulungu près / Shabunda 1939 / Dr. Hautmann; (2) R. DET. / 6933 / F. [the F is handwritten]; (3) *Maraviola* ♂ / *congoliana* sp.n. / PARATYPUS / Det. Dr. A.Z. LEHRER / 2004; (4) PARATYPUS [red label with smaller white label with text glued to its upper side]. Note. This specimen had the dried genitalia glued to card above the labels. The genitalia show the distiphallus to have an intact veil (both upper and lower parts), although wrinkled and appearing white, and both veil processes are present. This specimen appears to be the one listed from this locality by Zumpt (1956: 170) under *Bengalia spinifemorata*.

Lehrer (2005: 159) also lists a paratype in BMNH from Uganda that lacks the aedeagus, but "… *les autres pieces sont identiques à* B. [sic] congoliana *n.sp.* …" [the other pieces are identical to *B.* [sic] *congoliana* n.sp. …]. I have not seen this specimen. Because the surstylus allegedly is shaped as figured by Lehrer (2005: 158, fig. 70B) I accept this record.

Maraviola erithreana Lehrer, 2005. **Holotype** male, in BMNH, labelled: (1) HOLOTYPE [printed on round label with red rim]; (2) HOLOTYPE [printed on red label]; (3) ERITREA: / Dongollo / Basso / 7.II.1957 / D.J.Greathead [handwritten except first and last line, and 7.II. and 7 in fourth line]; (4) *Maraviola* ♂ / *erithreana* Lehrer n.sp. / HOLOTYPUS / Det. Dr. A. Z. LEHRER / 2004 [printed on white label]. Dongollo Basso is at 14°41'50"N, 38°19'31"E (Google Earth, search words 'Dongollo Eritrea'). Note. This specimen has a small projection at the distal third of the right veil process, which is broken beyond it. The process itself is stuck to the under surface of the right hypophallic lobe, probably by some artifact associated with the glycerol jelly used by Lehrer, making it difficult to observe. The other veil process is also broken and a small projection is present near its broken end (not mentioned by Lehrer). Most of the triangular apical sclerotisation of the semicircular sclerotisation is damaged and lost. The cerci lacks a middorsal depression in profile view (cf. Lehrer 2005: 160, fig. 71 B), apparently because of shrinkage, but it is present in the paratype. The genitalia have been transferred to small glass microvials from the original big plastic vials used by Lehrer. **Paratype**. **BMNH**: 1 male labelled (1) ETHIOPIA / Kaffa Prov. / Jimma area / Andode near Serbo [printed] AT LIGHT [handwritten at upper right part of label]; (2) Aug. 1973 / G.B. White / B.M.1974–85 [printed, except Aug. which is handwritten]; (3) Bengalia / spinifemorata Vill / det. J.P.Dear 1974 [handwritten, last line which is printed]; (4) *Maraviola* ♂ / *erithreana* Lehrer n.sp. / Det. Dr. A. Z. LEHRER / 2004 [printed]. Note. The genitalia vial lacked the ST5 and ST5 flap. In the distiphallus both veil processes were broken but on one side a small subterminal projection or tooth is visible. The other veil process is covered with a grey irregular layer of stiff glycerol jelly and it is impossible to observe details in its surface structure. The cerci in profile have a middorsal depression. The genitalia have been transferred to small glass microvials from the original big plastic vials used by Lehrer.

Maraviola samburella Lehrer, 2005. **Holotype** male, in TAU, labelled: (1) KENYA 25 km / NE Kericho / 17.XI.1986 / A. Freidberg; (2) holotypus [red label with black print]; (3) *Maraviola* n.g. ♂ / *samburella* n. sp. / Det.Dr.A.Z.LEHRER [pinhole in middle]; (4) *Maraviola* n.g. ♂ / *samburella* n. sp. / Det.Dr.A.Z.LEHRER [pinhole towards the end]. Note. The abdomen has been glued back to the thorax. The dried genitalia of this specimen were stuck at the bottom of the plastic vial without any fluid present. I assume they had already been exerted by the collector, as is the case of the two paratypes (see below). To get the genital capsule out from the vial I soaked the genitalia with a few drops of 10% KOH solution. This made the genitalia loosen from the plastic wall and they could then easily be taken out, rinsed in water and subsequently transferred to alcohol and glycerol. **Paratypes**. **TAU**: 1 male labelled: (1) KENYA Rt. A104 / 15KmSENairobi / 29.IV-15.V. / 1991 / A. FREIDBERG / & FINI KAPLAN ; (2) paratypus [red label with black print] ; (3) *Maraviola* n.g. ♂ / *samburella* n. sp. / Det.Dr.A.Z.LEHRER. Note. The genital capsule was exerted before I received the specimen. I nipped it off the abdominal tip and dissected the genitalia, which were transferred to glycerol in a glass microvial. • 1 male labelled: (1) KENYA Tambach / 40KmE Eldoret / 12.V.1991 / A. FREIDBERG / & FINI KAPLAN; (2) paratypus [red label with black print]; (3) *Maraviola* n.g. ♂ / *samburella* n. sp. / Det.Dr.A.Z.LEHRER. Note. This specimen has the genitalia partly exerted. I have not dissected it or examined it further.

Maraviola amlaka Lehrer & Freidberg, 2008. **Holotype** male, in TAU, labelled: (1) ETHIOPIA: Shola / 2200m, Ahmar Mts / 9°06.4'N 40°57.4'E / 12.xi.2007 / L. FRIEDMAN; (2) holotypus [red label with black print]; (3) *Maraviola* ♂ / *amlaka* n. sp. / Det.Dr.A.Z.LEHRER; (4) *Maraviola* ♂ / *amlaka* n. sp. / Det.Dr.A.Z.LEHRER [very big label]. Note. The genitalia have been transferred to a glass microvial with glycerol by KR.

Maraviola danakiliana Lehrer & Freidberg, 2008. **Holotype** male, in TAU, labelled: (1) ETHIOPIA: SHEWA / Menagesha / Forest 3050 m / 9°02'N 38°35'E / 11.x.2005 / A. FREIDBERG; (2) holotypus [red label with black print]; (3) *Maraviola* ♂ / *danakiliana* n. sp. / Det.Dr.A.Z.LEHRER; (4) *Maraviola* ♂ / *danakiliana* n. sp. / Det.Dr.A.Z.LEHRER [very big label]. Note. The genitalia have been transferred to a glass microvial with glycerol by KR. **Paratypes**. Lehrer & Freidberg list 2 female paratypes from the same locality as the holotype, as well as 4 female paratypes from other localities in Ethiopia. I have not examined any of these.

Other material. BMNH [5 specimens]: 1 male labelled (1) van Someren / NGONG [Kenya; at about 1940 m a.s.l. according to Google Earth] / April 1941 [handwritten]; (2) Pres.by / Comm.Inst.Ent. / B.M.1950-323 [printed]; (3) Bengalia / spinifemorata Vill. / van Emden det. 1949 [handwritten except last line, 9 in last line also

handwritten]; (4) COM. INST. ENT. / COLL. NO. 11280 [printed]. Note. The specimen pin was heavily corroded, with numerous projecting corrosion outgrowths almost breaking the thorax in half. Upon pinching off the tip of the abdomen to study the genitalia, one body half broke loose from the pin. This has been glued to a card on a separate pin, which is labelled (1) van Someren / Ngong / April 1941; (2) Half of body / loose from main / pin because of / massive corrosion; (3) K. Rognes / 18.11.2010 [all labels printed]. The abdomen has rather broad dark marginal bands for a member of the *spinifemorata* species-group, possibly due to the relatively high elevation of the locality. Genitalia dissected by KR. T4–5, ST5 with ST5 flap and genitalia are in glycerol in glass microvial on the separate pin. Apparent irregularities distally on veil processes turn out to be small stuck dust particles on close examination in microscope. • 1 male labelled (1) van Someren / Ngong X. 43 [van Someren's handwriting]; (2) Bengalia / spinifemorata Villen. / van Emden det. 1946 [printed except the last number in third line which is handwritten]; (3) V.G.L.van Someren / Collection. / Brit.Mus.1959-468. [printed]. Note. The specimen has not been dissected. The ST5 flap is visible and identical with the one in the dissected specimen from Coryndon Museum (cf. next entry). • 1 male labelled (1) Coryndon Museum / Expdt. Chyulu Hills [Kenya] / May: 38 Alt. [printed]; (2) Ochromyia / spinifemorata Villen. / van Emden det. 38, ssp.n.? [handwritten, except van Emden det. 38 which is printed]; (3) Pres.by / Imp.Inst.Ent. / B.M.1939-563. [printed, except the number 563 in last line which is handwritten]. Note. I have dissected the genitalia. Dried T1–5 glued to card on pin above labels; genitalia in glycerol in glass microvial on pin below labels. • 1 male labelled: (1) TANGANYIKA: / Singida d. / 14 miles N of / Mkalama / 7.VIII.53 [handwritten except first line which is printed]; (2) COM. INST. ENT: / COLL. NO. 13444 [printed except number which is handwritten]; (3) Pres. By / Com.Inst.Ent. / B.M.1954-110. [printed]; (4) Bengalia / spinifemorata Villen. / van Emden det. 1953 [handwritten except van Emden det. 195 which is printed]. Note. I had an accident and knocked off the left hind leg; now glued to card. Not dissected, since ST5 flap matches exactly the similarly labelled specimen from the day after; cf. next entry. • 1 male labelled (1) TANGANYIKA: / Singida d. / 14 miles N of / Mkalama / 8.VIII.53 [handwritten except first line which is printed]; (2) COM. INST. ENT: / COLL. NO. 13444 [printed except number which is handwritten]; (3) Pres. By / Com.Inst.Ent. / B.M.1954-110. [printed]. Note. This specimen was already dissected before receipt with genitalia in one piece in glycerol in a glass microvial. I have changed the cork stopper to a white plastic one. **ZMUC** [1 specimen]: 1 male labelled (1) Kenya, Nairobi Westlands / 01°16'S 36°47'E 1750m / 28–31.vii.1975 / Børge Petersen leg.; (2) Bengalia (m) / seniorwhitei (Lehrer) / K. Rognes det. 2006; (3) Dissected / January 2006 / By Knut Rognes. Abdomen glued to card below specimen, genitalia in glycerol in glass microvial below labels. **ZMUN** [1 specimen]: 1 male labelled (1) Brit. E. Africa. / Ngare Narok / Masai Reserve. / 31.12.13. about 6,000 ft. / A.O.Luckman; (2) Bengalia / spinifemorata Vill. / van Emden det. 1942 [line1 and 2 are handwritten, on line 3 only the number 2 is handwritten]; (3) Department of Zoology / Natural History Museum / University of Oslo (ZMUN) / World collection. Note. The specimen has been dissected by KR. Dried abdomen glued to card on pin; genitalia in glycerol in glass microvial below labels. The locality is in Kenya at 1°10'N, 36°24'E.

4. *Bengalia smarti* (Lehrer, 2005), comb. nov.

Figs. 35–43.

Maraviola smarti Lehrer, 2005: 168, 169 fig. 75. Holotype male (BMNH, examined), by original designation. Type locality: South Africa, KwaZulu-Natal, Mooi River.

Note. Rognes (2006: 468) erroneously synonymised *M. smarti* with *M. racovitzai.*

Bengalia (*Ochromyia*) *spinifemorata*: Malloch, 1927: 409, incl. fig. 12. Misidentifications, not *spinifemorata* Villeneuve. A specimen from Willow Grange identified by Malloch has been examined.

Note. Malloch figures the ST5 flap excavation to be broadly U-shaped. He reports to have seen material from "Willow Grange, Natal, March and April, 1914 (*R. C. Wroughton*); …" which is the type locality of *M. smarti*, "… ; Salisbury, S. Rhodesia; …", and "… Entebbe, Uganda, 3.v.1909 (*C. C. Gowdey*).". A specimen from Willow Grange dated "7.iii.1914" and collected by R. C. Wroughton is present in BMNH and has been identified and labelled by Malloch as "*Bengalia spinifemorata* Vill.". It belongs to *B. smarti* (Lehrer), cf. list below.

Bengalia (*Ochromyia*) *spinifemorata*: Malloch, 1929: 119. Misidentifications, not *spinifemorata* Villeneuve. Not examined.

Note. Malloch here records "Two males and one female, Salisbury, S. Rhodesia, 29.ii.1912, 10.iii.1927, and iv.1928, the last two collected by A. Cuthbertson …". None of the specimens in BMNH I have seen from "S. Rhodesia" have dates that correspond to those cited by Malloch. Cuthbertson (1933: 93) explains that the specimens cited by Malloch from Salisbury and collected by Cuthbertson were collected in "dark corners of the Entomological Laboratory."

Ochromyia spinifemorata: Cuthbertson, 1933: 93. Misidentification, not *spinifemorata* Villeneuve. Examined.

Note. I have examined two specimens in BMNH collected by Cuthbertson in "S.Rhodesia", both belonging to *B. smarti*. One is a misidentified paratype of *M. racovitzai* Lehrer from Salisbury, the other is a specimen from Umtali. I take this to signify that all Cuthbertson's material from "Southern Rhodesia" belongs to this species. Cuthbertson also reports on the material from Zimbabwe (as "Southern Rhodesia") mentioned by Malloch (1929), cf. previous entry.

Bengalia spinifemorata: Zumpt: 1956: 169, fig. 97 (two upper figures of the "hypopygium", from "Natal").

Note. These figures may refer either to *B. smarti* or to *B. racovitzai*, because of the strongly sclerotised dentate process. Since *B. racovitzai* is not known from Natal in South Africa, I assume the figures represent *B. smarti*, which agrees with the fact that the drawing shows a non-tapering dentate process. I am not able to say with any confidence which species the two figures of the ST5 flap ("apical plates") below the hypopygium figures belong to. The left figure, with shallow excavation, may be from *B. seniorwhitei*, and the right one, with deeper excavation, from *B. racovitzai* or *B. smarti*, but no sources are given for the material used for the drawings.

Bengalia spinifemorata: Zumpt, 1959: 429. Not examined.

Note. Zumpt lists material from South Africa (Natal: Tugela Valley, Royal National Park) which probably belongs to this species.

Maraviola racovitzai: Lehrer, 2005: 162–163. Paratypes from South Africa in MRAC and paratypes from South Africa and Zimbabwe in BMNH, misidentifications, not *racovitzai* Lehrer.

Note. I have examined all these specimens and they are listed below.

Bengalia spinifemorata: Kurahashi & Kirk-Spriggs, 2006: 63, 17 fig. 2. Misidentifications, not *spinifemorata* Villeneuve. Not examined.

Note. Their fig. 2 shows a U-shaped excavation to the ST5 flap which also has horns projecting well beyond hind edge of the main part of ST5, thus most likely having been prepared from a specimen of *B. smarti*. Their material is from Namibia.

Bengalia racovitzai: Rognes, 2006: 466, 468, 469. Misidentification, not *racovitzai* Lehrer

Note. For that paper I examined a specimen from South Africa (Pretoria) in BMNH. It has now been re-examined and re-identified as *B. smarti*.

Diagnosis. *Male*. Length: 9–12mm (mean 10.4mm, n=7). Frons at vertex / head width ratio: 0.317–0.358 (mean 0.341, n=5). Very similar in almost all characters to *B. racovitzai*. The ST5 flap has a deep excavation that is rounded, not triangular, in outline, thus broadly U-shaped (Fig. 40) with a broad bottom. The medial edge of the lobes ("horns") are concave. The lateral lobes of the flap may be even narrower than shown in Fig. 40, the tip being rounded in cross-section and even slightly flattened from side to side in dried specimens. In the distiphallus the dentate process is not tapering and pointed, but blunt and broadest distally, with a pale apical ventrolateral part as seen in lateral or dorsolateral view (Figs. 38, 41). The expanded and flattened part of the veil process is dentate along margin and on its main surface.

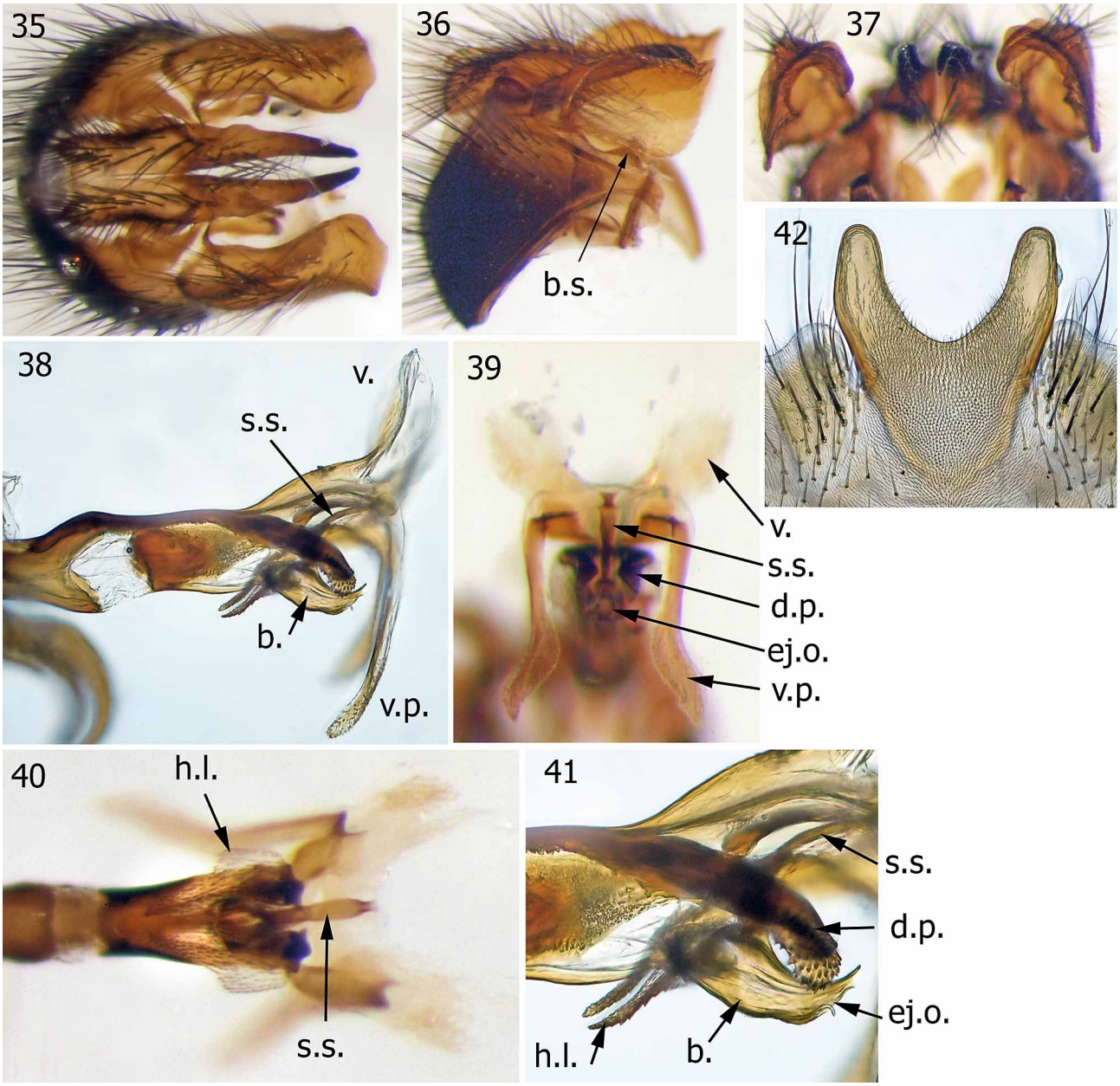
Female. Unknown.

Biology. Cuthbertson (1933: 93) reports on the behaviour of this species, common "around large nests of *Plagiolepis* ants, robbing the latter of the larvae and puparia of *Camponotus* ants which they were carrying … Spiders, partly crushed lepidopterous larvae … and small *Pheidole* pupae were also observed to attract the attention of *spinifemorata*, but only when carried by ants. It is remarkable that no notice was taken of the same food when exposed on a place free from ants in the immediate neighbourhood of many *Bengalia*."

Discussion. Undoubtedly, *B. smarti* is the most common species in the *B. spinifemorata* species-group besides *B. seniorwhitei*.

The three paratypes of *M. racovitzai* from South Africa in MRAC (cf. Lehrer 2005: 162), two from Johannesburg and one from Pretoria, all carrying Lehrer's identification labels reading "*Maraviola racovitzai*", display both key features of *Bengalia smarti* (Lehrer): a rounded U-shaped excavation of the ST5 flap (similar to the one shown in Fig. 42), and a distally expanded dentate process with a pale ventral area (Figs. 38, 41, which have been made from the Pretoria specimen). The same applies to the three other paratypes of *M. racovitzai* which are in BMNH and which are carrying the same Lehrer identification label, i.e., a specimen from "Transvaal" (Zumpt leg) (South Africa), a specimen from "Natal Ingogo" (South Africa) and a specimen from "Salisbury" (Zimbabwe). I have re-assigned them to *B. smarti*, labelled them accordingly, and listed them below. Evidently Lehrer has been unsure about the identification of his own species *B. racovitzai* and *B. smarti*.

Kurahashi & Kirk-Spriggs (2006: 17 fig. 2) figures the ST5 flap of a species they named "*Bengalia spinifemorata*". The flap projects well beyond posterior edge of the main part of ST5 and the flap is broadly U-shaped, although with a rather shallow excavation. I take this figure to indicate that their material, from Namibia, belongs to *B. smarti*.



FIGURES 35–42. *Bengalia smarti* (Lehrer), male (35 from specimen "… 18181 …" [South Africa] in BMSA; 36, 37, 40, 42 from specimen "… 18160 …" [South Africa] in BMSA; 38, 39, 41 from paratype of *Maraviola racovitzai* Lehrer from "… Pretoria …" [South Africa] in MRAC, misidentified by Lehrer). **35**. Cerci and surstyli, dorsal view. **36**. Cerci and surstyli, left lateral view. **37**. Tip of cerci and surstyli, apical view. **38**. Distiphallus, left lateral view. **39**. Distiphallus, apical view. **40**. Distiphallus, ventral view. **41**. Semicircular sclerite, dentate process, hypophallic lobe, beak and opening of ejaculatory duct, left lateral view. **42**. ST5 flap.

FIGURE 43. *Bengalia smarti* (Lehrer), male. Labels from holotype of *Maraviola smarti* Lehrer in BMNH.

Distribution. Democratic Republic of Congo (Katanga), Namibia, South Africa (Gauteng, Northern Province, KwaZulu-Natal), Zimbabwe.

Material examined. Type material. Holotype male, in BMNH, labelled (1) HOLOTYPE [printed on round label with red rim]; (2) HOLOTYPUS [printed on red label]; (3) NATAL / WILLOW GRANGE / MOOI RIVER / R.C. WROUGTHON / 20.IV.1913 [printed, except date which is handwritten]; (4) Pres.by / Comm.Inst.Ent. / B.M.1953-343. [printed]; (5) Bengalia / spinifemorata / Villen. [handwritten by Villeneuve on bluish grey label]; (6) *Maraviola* ♂ / *smarti* Lehrer sp.n. / Det. Dr. A.Z. LEHRER / HOLOTYPUS 2004 [printed] (Fig. 43). Note. Lehrer (2005: 169) miscites the locality as "Moon River" and the collector's name as "Wronghton".

Other material. BMNH: **South Africa** [13 specimens] 1 male labelled (1) Johannesburg / Transvaal / 26.IV.74 [handwritten by Zumpt in blue ink]; (2) Bengalia ♂ / spinifemorata / Villen. [handwritten by Zumpt in blue ink]; (3) *Maraviola* ♂ / *racovitzai* Lehrer n. sp. / Det. Dr. A.Z.LEHRER / 2004 [printed; pinhole in middle]; (4) *Maraviola* ♂ / *racovitzai* Lehrer n. sp. / Det. Dr. A.Z.LEHRER / 2004 [printed; pinhole towards the right side]. This is a paratype of *M. racovitzai* misidentified by Lehrer. The dry genitalia in the big plastic vial have been treated with KOH and transferred to glycerol in a glass microvial. • 1 male labelled (1) S. AFRICA / Natal / Ingogo / iii 1932 [printed]; (2) Pres.by / Com.Inst.Ent. / B.M.1950-323. [printed]; (3) J. Ogilvie [printed]; (4) Bengalia / spinifemorata Vill. / van Emden det. 1940 [handwritten, except last line which is printed]; (5) *Maraviola* ♂ / *racovitzai* Lehrer n. sp. / Det. Dr. A.Z.LEHRER / 2004 [printed; pinhole towards near middle]. This is a paratype of *M. racovitzai* misidentified by Lehrer. The ST5 flap and genitalia are *in situ* and exerted and easily examined. • 1 male labelled (1) NATAL / Weenen. / xi.–xii.1923. / H.P.Thomasset. [printed]; (2) Pres. By / Imp.Bur.Ent. / Brit. Mus. / 1925—230. [printed]; (3) Bengalia / depressa / Walk / De. E.Brunetti 1924 [handwritten except for last line where everything is printed but the number 4]. Note. Dissected by KR. Genitalia in glycerol in glass microvial, dried T1–5 glued to stage plate. • 1 male labelled (1) Pres. By / Imp.Bur.Ent. / Brit. Mus. / 1925—230. [printed]; (2) NATAL / Weenen. 2840 ft. i. 1924. / H.P.Thomasset. [printed]. Note. Not dissected. The ST5 flap is clearly visible and identical with the ST5 flap of the previous dissected specimen from Weenen. • 1 male labelled (1) Pres. By / Imp.Bur.Ent. / Brit. Mus. / 1935-78. [printed]; (2) NATAL / Weenen. 2840 ft. / vi.-vii.1923 / H.P.Thomasset. [printed]. Note. Not dissected. The ST5 flap is clearly visible and identical with the one of the dissected specimen from Weenen. • 1 male labelled (1) PRETORIA / E.K.H. / 25.IV.1944 / A.R.I. Pretoria; (2) Bengalia / spinifemorata Vill. / det. Zumpt. Note. This specimen was dissected by KR in 2006. Abdomen glued to card on pin below specimen, genitalia in glass microvial below labels (cf. Rognes 2006: 469, misidentified as *B. racovitzai*). • 1 male labelled (1) Natal. / Howick. / J.P.Cregoe. / 1904—46 [printed]. Note. Dissected by KR. Genitalia in glycerol in microvial below label, dried T1–5 glued to card above label. • 1 male labelled (1) Bengalia / spinifemorata / Vill. / det. JRMALLOCH [handwritten except last line which is printed]; (2) Pres.by / Imp.Inst.Ent. / B.M.1935-78.; (3) NATAL. / Willow Grange / 7.iii.1914 / R.C.Wroughton. [printed except third line which is handwritten]. Note. I have not dissected this specimen. The ST5 flap is clearly visible and conforms to the one of *B. smarti*. • 1 male labelled (1) NATAL / WILLOW GRANGE / MOOI RIVER / R.C. WROUGHTON / 24.ii.1913 [printed except last line which is handwritten]; (2) Pres. By / Comm.Inst.Ent. / B.M. 1953-343. [printed]. Note. I have not dissected this specimen as the ST5 flap is clearly visible and typical *B. smarti*. • 1 male labelled (1) NATAL / WILLOW GRANGE / MOOI RIVER / R.C. WROUGHTON / 20.iv.1913 [printed except last line which is handwritten]; (2) Pres. By / Comm.Inst.Ent. / B.M. 1953-343. [printed]. Note. I have not dissected this specimen as the ST5 flap is clearly visible and typical *B. smarti*. • 1 male labelled (1) 313 [handwritten]; (2) Pretoria / 26.5.15 [handwritten]; (3) W.W.Froggatt. / 1917-35 [printed]. Note. I have not dissected this specimen as the ST5 flap is visible through some whitish exudate and typical *B. smarti*. • 1 male labelled (1) Jhng. T. / Aug 01 [= Johannesburg Transvaal] [handwritten]; (2) Johnby / (Jory) [?] [handwritten, difficult to interpret]; (3) S. Africa / Distant Coll. / 1911—383. [printed]. Note. I have not dissected this specimen as the ST5 flap is clearly visible and typical *B. smarti*. • 1 male labelled (1) Jhng. T. / June 1910 [= Johannesburg Transvaal] [handwritten]; (2) Johnbg / (Jry) [?] [handwritten, difficult to interpret]; (3) S. Africa / Distant Coll. / 1911—383. [printed]. Note. I have not dissected this specimen as the ST5 flap is clearly visible and typical *B. smarti*. **Democratic Republic of Congo** [1 specimen] 1 male labelled: (1) Ruwe, / Lualaba R. / Congo Free State. / (Circa 11°S., 26°E.) / Feb. 1906 / Dr. A.Yale Massey. / 1906.98. [handwritten]. Note. Ruwe is in Katanga Province, about 10–15 km NNE of Kolwezi at 10°35'S, 25°30'E according to *The Times Atlas of the World, Comprehensive Edition*, Sixth Edition (1980). I have not dissected this specimen as the ST5 flap is clearly visible and typical *B. smarti*. **Zimbabwe** [7 specimens] 1 male labelled (1) Salisbury [now = Harare] / S. Rhodesia. / Dept. Agric. / IV. 1932 [printed, except parts of last line which are handwritten]; (2) Pres.by / Imp.Inst.Ent. / B.M. 1933-414. [printed]; (3) A. Cuthbertson / Collector. [printed]; (4) Ochromyia ♂ / spinifemorata, Vill. / Det. G A. K. Marshall. [handwritten, except last line which is printed]; (5) *Maraviola* ♂ /

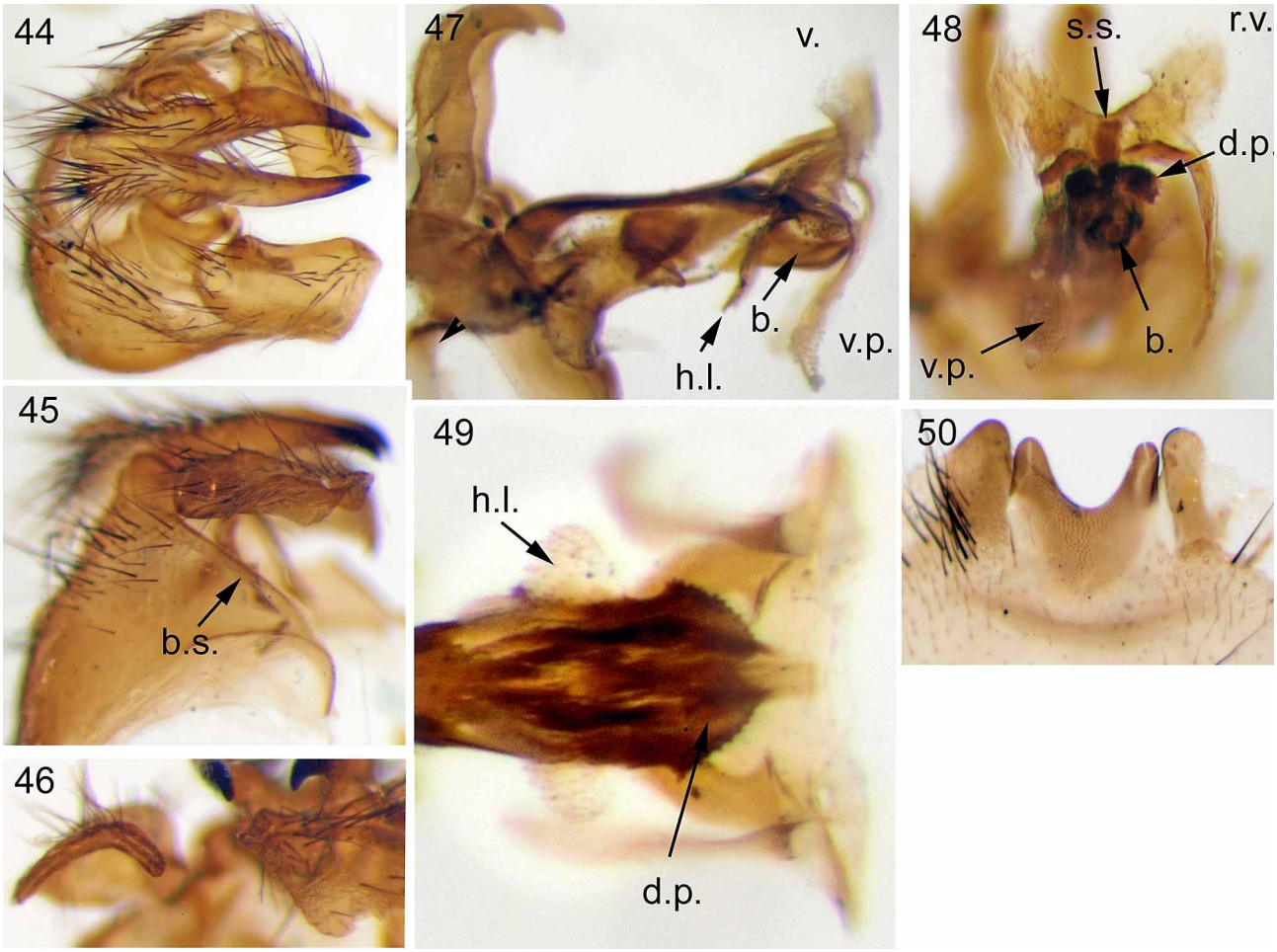
racovitzai Lehrer n. sp. / Det. Dr. A.Z.LEHRER / 2004 [printed; pinhole towards near middle]. This is a paratype of *M. racovitzai* Lehrer misidentified by Lehrer. I have dissected it. Genitalia in glycerol in glass microvial below labels, dried T1–5 glued to card on pin. • 1 male labelled (1) Umtali [now = Mutare], / S. Rhodesia / A. Cuthbertson / ix. 27 [printed except last line which is handwritten along right edge of label]; (2) 2012 / S. Rhodesia / Dept. Agric. [printed, except first line which is handwritten in pencil]; (3) Bengalia / spinifemorata / Vill. / det. James 69 [handwritten in ink]. Note. Not dissected but the shape of the ST5 flap agrees with *B. smarti*. • 1 male labelled (1) Pres.by / Imp.Bur.Ent. / Brit. Mus. / 1927–398. [printed]; (2) SALISBURY DIST: / S. RHODESIA. / H. S. L. 1927. Note. Dissected by KR. T4–T5, ST4–ST5, ST5 flap and genitalia in glycerol in glass microvial on pin below labels. • 1 male labelled (1) Pres.by / Imp.Bur.Ent. / Brit. Mus. / 1927–398. [printed]; (2) SALISBURY DIST: / S. RHODESIA. / H. S. L. 1927. Note. Not dissected. ST5 flap visible. • 1 male labelled (1) Pres.by / Imp.Bur.Ent. / Brit. Mus. / 1927–398. [printed]; (2) SALISBURY DIST: / S. RHODESIA. / H. S. L. 1927. Note. Not dissected. ST5 flap visible. • 1 male labelled (1) Pres.by / Imp.Bur.Ent. / Brit. Mus. / 1927–398. [printed]; (2) SALISBURY DIST: / S. RHODESIA. / H. S. L. 1927.; (3) Bengalia / det. spinifemorata Vill. / J.P. Dear 1973 [handwritten except det. in line 2, and 3 in line 3 which are printed]. Note. Not dissected. ST5 flap visible. • 1 male labelled (1) 19.9.25 / S'bury lab. [= Salisbury lab.] [handwritten on semicircular label]; (2) DEPRESSA / DET. G.A.K. MARSHALL / 1927. [printed except first line which is handwritten]; (3) Bengalia / spinifemorata [handwritten]; (4) London School of / Hygiene & Tropical / Medicine Coll. / BMNH(E) 1995-263. Note. Not dissected. ST5 flap visible. **BMSA**: **South Africa** [8 specimens] 1 male labelled: (1) E. R. L. / Mei 1971 / Pretoria; (2) Ex Dept. Of Entomology / University of Pretoria Coll. / Donated 2009 [yellow printed label]; (3) Entomology Dept. / National Museum / P.O.Box 266 / Bloemfontein 9300 / South Africa [blue printed label]; (4) BMSA(D) / 18179. • 1 male labelled: (1) E. R. L. / Mei 1971 / Pretoria; (2) Ex Dept. Of Entomology / University of Pretoria Coll. / Donated 2009 [yellow printed label]; (3) Entomology Dept. / National Museum / P.O.Box 266 / Bloemfontein 9300 / South Africa [blue printed label]; (4) BMSA(D) / 18181. Note. The specimen has been dissected by KR. Dried abdomen glued to card on pin; genitalia in glycerol in glass microvial below labels. • 1 male labelled: (1) Pretoria // 4/67 // H.P.; (2) Ex Dept. Of Entomology / University of Pretoria Coll. / Donated 2009 [yellow printed label]; (3) Entomology Dept. / National Museum / P.O.Box 266 / Bloemfontein 9300 / South Africa [blue printed label]; (4) BMSA(D) / 18172. • 1 male labelled: (1) Pretoria / 26 28 Ce / V. 80 / A. Groenewald / Dept. of Entomology / University of Pretoria [handwritten except last two lines which are printed]; (2) Ex Dept. Of Entomology / University of Pretoria Coll. / Donated 2009 [yellow printed label]; (3) Entomology Dept. / National Museum / P.O.Box 266 / Bloemfontein 9300 / South Africa [blue printed label]; (4) BMSA(D) 18160. Note. The specimen has been dissected by KR. Dried abdomen glued to card on pin; genitalia in glycerol in glass microvial below labels. • 1 male labelled: (1) J. J. O. / J. H. B. Tvl / 19.2.1954 [handwritten except for Tvl and the rightmost number 19 which are printed]; (2) Ex Dept. Of Entomology / University of Pretoria Coll. / Donated 2009 [yellow printed label]; (3) Entomology Dept. / National Museum / P.O.Box 266 / Bloemfontein 9300 / South Africa [blue printed label]; (4) BMSA(D) / 18166. • 1 male labelled: (1) South Africa Waverley / 25°40'S 28°15'E / 28 IV 1989 / P Snyman / Department of Entomology / University of Pretoria [handwritten label except country name on first line and two last lines which are printed]; (2) Ex Dept. Of Entomology / University of Pretoria Coll. / Donated 2009 [yellow printed label]; (3) Entomology Dept. / National Museum / P.O.Box 266 / Bloemfontein 9300 / South Africa [blue printed label]; (4) BMSA(D) 18152. • 1 male labelled: (1) WARMBATHS / 2428 CO / IV. 80 P. du Plessis / Dept. of Entomology / University of Pretoria [handwritten label except for two last lines which are printed]; (2) Ex Dept. Of Entomology / University of Pretoria Coll. / Donated 2009 [yellow printed label]; (3) Entomology Dept. / National Museum / P.O.Box 266 / Bloemfontein 9300 / South Africa [blue printed label]; (4) BMSA(D) 18155. Note. The specimen has been dissected by KR. Dried abdomen glued to card on pin; genitalia in glycerol in glass microvial below labels. • 1 male labelled: (1) Malaise traps / Leucosedea - / dominated scrub; (2) RSA: KZN, Royal Natal N.P. / Thendele, 1600m / 28º42.378'S, 28º56.083'E / 15–17.ii.2010 / A.H.Kirk-Spriggs; (3) Entomology Dept. / National Museum / P.O.Box 266 / Bloemfontein 9300 / South Africa [blue printed label]; (4) BMSA(D) 18147. **MRAC: South Africa** [the following three specimens are (misidentified) paratypes of *Maraviola racovitzai* Lehrer] 1 male labelled: (1) Johannesburg / Transvaal / 7.IX.62 [handwritten]; (2) Bengalia ♂ / spinifemorata Vill. / det. Zumpt 64 [handwritten by Zumpt]; (3) MUS. ROY. AFR. CENTR. / don Dr. F. Zumpt [last line handwritten]; (4) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. This specimen has the genitalia exerted and the distiphallus is clearly visible. • 1 male labelled (1) MUSÉE DU CONGO / Pretoria / (Van Saxeghem) [last two lines handwritten]; (2) Bengalia / spinifemorata / Villen. [folded blue handwritten label in Villeneuve's hand]; (3)

R. DÉT / G / 1285 [G is handwritten]; (4) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. This specimen has lost the head. The genitalia were exerted and the distiphallus clearly visible before I dissected it. The dried abdomen is glued to card on pin, the genitalia kept in glycerol in glass microvial below labels. Figs. 38, 39, 41 have been made from this specimen. • 1 male labelled: (1) In Library Cupboard / S.A.I.M.R. Johannesburg / Miss. D. Dix. / 11.2.1928. [handwritten]; (2) Ochromyia / spinifemorata Vil / Det. G.A.K.Marshall [handwritten]; (3) MUS. ROY. AFR. CENTR. / don Dr. F. Zumpt [handwritten]; (4) *Maraviola* ♂ / *racovitzai* Lehrer n.sp. / Det. Dr.A.Z.LEHRER / 2004. Note. This specimen lacks the head. The genitalia are exerted and clearly visible.

5. *Bengalia spinifemorata* Villeneuve, 1913

Figs. 44–51.

Bengalia spinifemorata Villeneuve, 1913: 153. Lectotype male (MRAC, examined), by designation of Lehrer (2005: 170–172). Type locality: Democratic Republic of Congo, Katanga, Sankishia [as "Sankisia"] [9°21'S, 25°54'E].
Bengalia spinifemorata: Rognes, 2006: 460.



FIGURES 44–50. *Bengalia spinifemorata* Villeneuve, male (from lectotype of *Bengalia spinifemorata* Villeneuve in MRAC). **44**. Cerci and surstyli, slightly oblique dorsal view. **45**. Cerci and surstyli, left lateral view. **46**. Tip of left surstylus, apical view. **47**. Aedeagus, left lateral view. **48**. Distiphallus, apical view. **49**. Distiphallus, ventral view. **50**. ST5 flap.

Diagnosis. *Male*. Length: 11 mm. Frons at vertex / head width ratio: 0.300 (n=1)**.** ST5 flap deeply sunk into the hind part of the ST5 proper so that the hind margin of the flap at each side of the excavation is flush with the hind margin of the ST5 proper. Surstyli with parallel upper and lower edges, weakly concave on inside. Bacilliform sclerite process forming a very low protuberance. Semicircular sclerotisation narrow at apex. Tip of beak at level with apical end of semicircular sclerotisation and with junction of veil and veil process. Right and left part of veil

vertical, without rib on anterior surface, partly sclerotised in lower half, and shorter and less transparent than in *B. racovitzai* and *B. smarti* (this may be due to a layer of greyish glycerol jelly still adhering to its anterior surface). Upper margin smooth and without serrations. Lower part of veil process flattened and expanded and denticulate along margin and on its flattened surface. Posterior part of hypophallic lobe half as wide as the anterior part as seen in ventral view. Dentate process distally widening somewhat in profile view.

Female. Unknown**.**

Discussion. Known only from the lectotype. Lehrer (2005: 170–172) designated as lectotype one of the specimens originally mentioned by Villeneuve (1913). Although the designation did not satisfy the original wording of Article 74.7.3 of the Code (ICZN 1999a) (since it did not "contain an express statement of the taxonomic purpose of the designation"), it satisfies the amended wording of the Article (ICZN 1999b) (since it does "contain an express statement of deliberate designation (merely citing a specimen as 'lectotype' is insufficient)"). Lehrer gives an express statement of deliberate designation.

It appears that the true *B. spinifemorata* may not have been seen by Zumpt (1956).

Distribution. Democratic Republic of Congo (Katanga).

Material examined. Type material. **Lectotype** male, designated by Lehrer (2005), in MRAC with labels as follows: (1) Sankisia / 4-IX-11 [handwritten]; (2) COLL. MUS. CONGO / Lualaba: Sankishia / 4 – IX – 1911 / (J. Becquaert) [handwritten except first line]; (3) R. DET. / 5575 / B. [printed except last line which is handwritten]; (4) PARATYPUS [printed on yellow label]; (5) Bengalia / spinifemorata / type Villen. [handwritten in Villeneuve's hand]; (6) LECTOTYPUS [printed on white label that is glued to a bigger red label]; (7) *Maraviola* ♂ / *spinifemorata* / (Villeneuve, 1913) / LECTOTYPUS / Det.Dr.A.Z. LEHRER / 2004 [printed] (Fig. 51). Lehrer (2005: 171) miscited "Sankisia …" as "Sankedia …" on one of the labels (Fig. 51, leftmost label), although the proper spelling was published by Villeneuve (1913). Dissected by Lehrer.

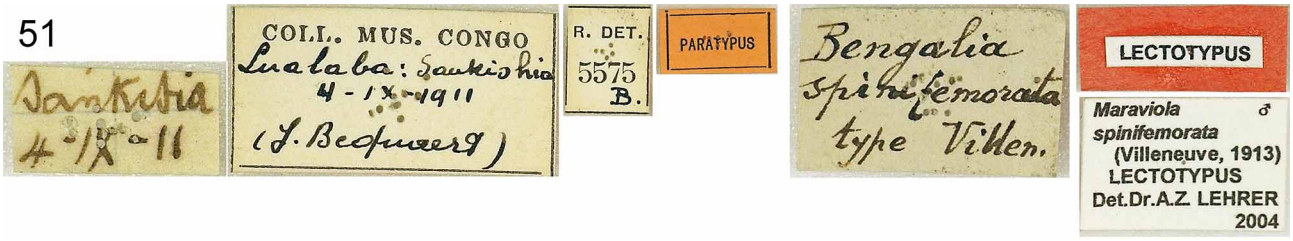


FIGURE 51. *Bengalia spinifemorata* Villeneuve, male. Labels from lectotype of *Bengalia spinifemorata* Villeneuve in MRAC.

6. *Bengalia wangariae*(Lehrer, 2005), comb. nov.

Figs. 52–59, 61.

Maraviola wangariae Lehrer, 2005: 172. Holotype male (MRAC, examined), by original designation. Type locality: Democratic Republic of Congo, Katanga, "Muelushi" [not located].

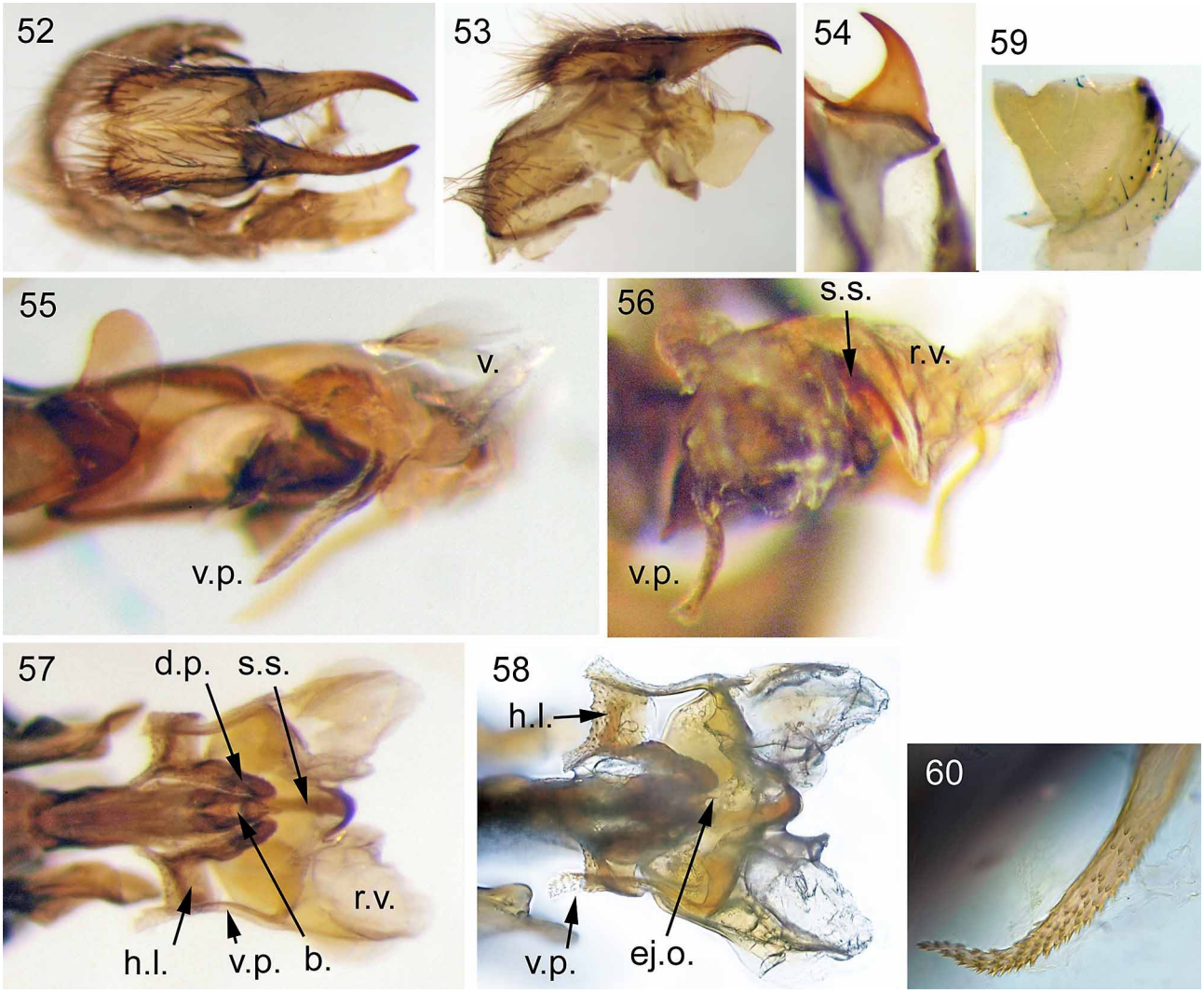
Note. Lehrer (2005: 173) miscited the label text and renders the locality as "Muelushui".

Diagnosis. *Male*. Length: 10.5 mm (from Lehrer 2005: 173). Frons at vertex / head width ratio: unknown (head lacking from holotype and only specimen)**.** ST5 flap very different from other *B. spinifemorata* species-group members in that the hind margin is almost straight with a slight notch at middle. Surstylus triangular with an inwardly directed process in upper anterior corner. Bacilliform sclerite process forming a massive hook. Semicircular sclerotisation with apical triangular expansion, its apical margin strongly concave. The veil a double, mainly horizontal structure, on each side of the apex of the semicircular sclerotisation. Veil process curved, distally flattened and denticulate. Hypophallic lobe broader than long with a very small posterior projection posteriorly. Dentate process long.

Female. Unknown.

Discussion. *B. wangariae* is known only from the holotype.

Distribution. Democratic Republic of Congo (Katanga).



FIGURES 52–60. **52–59**. *Bengalia wangariae* (Lehrer), male (from holotype of *Maraviola wangariae* Lehrer in MRAC). **60**. *Bengalia fani* Feng & Wei, male (from holotype of *Bengalia fani* Feng & Wei in CDPCAG). **52**. Cerci and surstylus, dorsal view. **53**. Cerci and surstyli, left lateral view. **54**. Process of bacilliform sclerite. **55**. Distiphallus, left lateral view. **56**. Distiphallus, oblique apical view. **57**. Distiphallus, ventral view. **58**. Distiphallus, ventral view (compound microscope). **59**. ST5 flap (much of left half lacking). **60**. Lateral finger (compound microscope, enlarged).

FIGURE 61. *Bengalia wangariae* (Lehrer), male. Labels from holotype of *Maraviola wangariae* Lehrer in MRAC.

Material examined. Type material. *Maraviola wangariae* Lehrer, 2005. **Holotype** male, in MRAC, labelled as follows: (1) MUSÉE DU CONGO / Katanga : Muelushi / 11- 1931 / H. J. Brédo [printed except last word in line 2 and all of line 3 which are handwritten]; (2) R. DET. / 6933 / F. [printed except last line which is handwritten]; (3) HOLOTYPE [printed on red label]; (4) *Maraviola* ♂ / *wangariae* Lehrer n.sp. / Det. Dr.A. Z. LEHRER / 2004 [printed; pinhole at middle]; (5) *Maraviola* ♂ / *wangariae* Lehrer n.sp. / Det. Dr.A. Z. LEHRER / 2004 [printed; pinhole near right end] (Fig. 61). Note. The head was absent from the holotype when received on loan. Dissected by Lehrer. Three genital "units" were found in tube on pin: (1) epandrium with cerci and one surstylus; (2) fragment of ST5 with flap; (3) aedeagus, pre- and postgonites, two bacilliform sclerites on each side, and the phallapodeme which were all attached to the hypandrium in one piece. Right surstylus lost, ejaculatory sclerite lost. ST5 flap not complete. Epandrium partly torn. Veil of distiphallus partly disrupted / torn on the left side.

Arguments brought forth by Lehrer & Wei (2010) for assigning *B. fani* to the *B. spinifemorata*-group and their merits

Lehrer & Wei (2010) list six arguments (their items a–f) concerning the genitalia which they consider in favour of an assignment of *B. fani* with the *spinifemorata* group. I will examine them in sequence.

(a) This concerns the interpretation of the ST5 flap. Whatever disagreement might exist on this problem, it has no relevance on the systematic position of *B. fani*.

(b) This concerns my opinion about the position of the distal part of the surstylus relative to the cerci, which has no bearing upon the problem at hand.

(c) This concerns my view that the distiphallus is strongly prolonged. Lehrer & Wei consider this state normal for a member of the *B. spinifemorata* group, but agree that it differs from other members of the *B. peuhi* species group. I tend to view it as very prolonged also compared to the distiphallus of the members of the *B. spinifemorata* group. This is a subjective matter and in my opinion has no relevance to the problem of the systematic position of *B. fani*.

(d) Under this item in their list Lehrer & Wei state that there is no antler, no finger and no lip in the structure of the distiphallus as described by me. Rather they state that the structures denoted by me as antlers in *B. fani* are "*les apophyses postérieures de l'acrophallus*", and that the lateral fingers in *B. fani* (very long) are "*les apophyses antérieures de l'acrophallus*".

The terms "*apophyses postérieures de l'acrophallus*" and "*apophyses antérieures de l'acrophallus*", and even "*acrophallus*", are newcomers in the *Bengalia* literature and not defined by Lehrer (2005) or by Lehrer & Wei (2010), and this fact makes it difficult to understand exactly what the authors mean. However, by presenting the figures of *Bengalia seniorwhitei* (Lehrer) (as "*Maraviola erithreana* Lehrer") (their fig. 4) and *Bengalia fani* (as "*Anshuniana fani*") (their fig. 2) they may have had the intention not only to identify the long lateral finger in *B. fani* with the long "*apophyses latérales postérieures du distiphallus*" of the "Maraviolinae" (my veil process), but also to identify the antler in *B. fani* with the "*juxta*" or the "*apophyses apicales postérieures du distiphallus*" of the same "Maraviolinae" (my veil).

However, in my opinion the veil and veil process in the *B. spinifemorata* group cannot in any way be homologised with or regarded as "the same" as the structures I have denoted as antler and lateral finger in *B. fani*. The antler is here a simple thin, smooth, tapering and pointed process with a circular cross-section which is situated far behind (proximad of) the apex of the distiphallus, farther behind than in any other *B. peuhi* species-group member. Further, its base is separated from the base of the lateral finger in lateral view by a wide gap (Rognes 2009b: 32, figs. 54, 55, 57); wider, in fact, than in any other *B. peuhi* species-group member, and wider than the gap given in Lehrer & Wei's simple drawing of the distiphallus of *B. fani* (Lehrer & Wei 2010: 24, fig. 2C). The *veil* in the *B. spinifemorata* group is an apically situated flat, transverse, membranous and almost transparent weakly sclerotised sheet, which ventrally at its base is directly continuous on each side of the distiphallus with the veil process. Only a very superficial examination of the distiphallus in some *B. spinifemorata* group species, and in lateral view only, may give the (false) impression that there is a similar gap between the bases of the veil and the veil process in lateral view (evident in Lehrer & Wei's fig. 4 of *B. seniorwhitei*, as "*M. erithreana*"). In addition, the *B. fani* antler and lateral finger are both situated far behind (proximad of) the opening of the ejaculatory duct (*ej.o.*) and far behind the apex of the distiphallus, whereas the veil and veil process in the *B. spinifemorata* species-group are situated morphologically far in front of (distad of) the opening of the ejaculatory duct, at the apex of the distiphallus. As I pointed out above, it is doubtful that one can homologise any parts present beyond the ejaculatory duct opening in the *B. spinifemorata* species-group with any structures at all of the distiphallus in the *B. peuhi* species-group.

Lehrer & Wei conclude this item with a claim that the lateral fingers (*l.f.*) in *B. fani* are not denticulate ("*denticulées*"), but rather "*pourvues de cils microscopiques*" [provided with microscopic hairs], not characterised further. A microscope image of the lateral finger of the holotype of *B. fani* (Fig. 60) clearly shows that it is covered with small denticles, exactly like the ones on for example the hypophallic lobes.

(e) In the fifth item in their list, they claim that there are no internal and external hypophallic lobes in the aedeagus of *B. fani*, my claim to the opposite being based on artifacts "*produits par la superposition optique des plans sur les photos de Rognes*" [produced by optical superposition of surfaces in Rognes' photographs]. Rather they

maintain that my figures show a single structure on each side. I do not understand how this simple morphological fact can be misunderstood. I can only refer the reader to my photographs (Rognes 2009b: 32 fig. 56) where the double structure on each side is clearly shown in ventral view. The external lobe is broken on one side.

(f) Their last item concerns only the term for some sclerotisations, which Lehrer wants to denote "*styles*", near the opening of the ejaculatory duct in *B. fani*. This, again, has no relevance for the problem under scrutiny since no similar sclerotisations (an apparent autapomorphy for *B. fani*) have been demonstrated to be present in the *B. spinifemorata* group.

In summary, Lehrer & Wei (2010) arguments for their assignment of *B. fani* to the *B. spinifemorata* species-group do not withstand careful scrutiny.

Systematic position of *Bengalia fani*

If *B. fani* really belongs in the *B. spinifemorata* species-group then one would expect it to share synapomorphic features with the members of this group. Below is a list of characters which very likely are synapomorphic for the species making up the *Bengalia spinifemorata* species-group.

1. Anepimeron covered only with yellow setulae, even though occasionally a few black setulae may be found in the uppermost part.
2. Fore femur with 2–3 very strong spine-like setae on the middle of the posteroventral side (also found in *B. fuscipennis* Bezzi and *B. escheri* Bezzi, cf. Rognes 2009b; and *B. bantuphalla* (Lehrer), **comb. nov**., personal examination) (Fig. 9).
3. Fore tibia with a short row of 4–6 strong spine-like setae in the basal third of the ventral surface; the lowest one is the largest, being hardly as long as the width of the tibia, and they diminish gradually in size upwards (also found in *B. lyneborgi* James, a member of the *B. peuhi* species-group) (Fig. 9).
4. Abdomen almost all yellow, without or usually with very narrow marginal dark bands.
5. Surstyli usually with complex shape, in contrast to the simple triangular flat surstylus of the *B. peuhi* species-group.
6. Distiphallus with a beak at the anterior end of the ventral surface, and, proceeding dorsally and anteriorly from its posterodorsal part, a sagittal semicircular sclerotisation, which displays various differentiations such as ventrally directed process(es) halfway, and an apical triangular expansion among some species.
7. Opening of ejaculatory duct at tip of beak, far behind apex of distiphallus.
8. Apex of distiphallus carrying a transverse very weakly sclerotised veil of complex build, fused with a posteroventrally or ventrally directed veil process on each side.
9. Hypophallic lobe with its broadest aspect directed ventrally or anteroventrally.
10. Dentate process present.

None of the above states are shared by *B. fani*, so I can find no justification to assign *B. fani* to the *B. spinifemorata* species-group. On the other hand the *Bengalia peuhi* species-group are characterised by the following synapomorphies (cf. Rognes 2009b).

1. Presence of fringe of long, densely set setae on the anteroventral, ventral and posteroventral side of the hind tibia.
2. Cerci narrow in distal half, with two almost bare, shining dark brown prongs each of which is longer than basal part.
3. Presence of antlers on the distiphallus.

All of the above states are shared by *B. fani*, which demonstrates that a position in the *B. peuhi* species-group is well founded.

Further, within the *B. peuhi* species-group *B. fani* forms a monophyletic subgroup with *B. emdeniella* Lehrer, *B. pseudovaricolor* Kurahashi & Tumrasvin and *B. taksina* Lehrer. The phylogenetic analysis (Rognes 2009b: 67) showed that this group is also well founded, supported by three other synapomorphic features, as follows.

4. Ventral finger acutely triangular, pointed.
5. Internal hypophalic lobes definitely converging seen from below.
6. Fore tibia with a regular row of very small even sized spine-like setae.

The associated cladograms (Rognes 2009b: 69 fig. 216, 70 fig. 217) show the systematic relationship of *B. fani* in graphic form.

Lehrer & Wei (2010: 23) criticized the grouping *fani* + (*emdeniella* + *pseudovaricolor* + *taksina*) for being a "*sous-groupe fantaisiste et hétéromorphe*" [fanciful and heterogenous subgroup], being defined by "*deux caractères imaginaires* [two imaginary characters] («ventral finger acutely triangular, pointed» et «internal hypophallic lobes definitely converging seen from below»)" and one character said to be "*non-spécifique* («fore tibia with a regular row of very small even sized spine-like setae»)".

"[*A*]*fin de convaincre les spécialistes*" [in order to convince specialists] and to clarify "*cette absurdité*" [this absurdity] of my claim that the ventral finger is acutely triangular and pointed in the four species that I grouped together Lehrer & Wei (2010: 25) present "*les genitalia d'*Afridigalia emdeniella *Lehrer (fig. 3)* …". Their figure 3, shown on p. 25, illustrates, according to the legend, the genitalia of "*Afridigalia emdeniella* Lehrer", indeed a member of this group. The figure shows the ventral finger to be rounded and not triangular and pointed, making my statement about *B. emdeniella* (Lehrer) and the species I group with it appear truly imaginary. However, contrary to what is stated in the legend, the figure does not show the genitalia of *B. emdeniella*. Rather, it is an exact copy of a figure published by Lehrer (2005: 37, fig. 13) of the genitalia of a species he there named "*Afridigalia emarginata* (Malloch)", the valid name of which is *B. emarginatoides* Rognes (cf. Rognes 2009b). The true figures of the *B. emdeniella* holotype given by Lehrer (2005: 39, fig. 14C) and Rognes (2009b: 29, fig. 47) show the triangular, acutely pointed tip of its ventral finger.

That the internal hypophallic lobes are in fact converging as seen from below is evident from my illustrations (Rognes 2009b: 32 fig. 56, 57), which Lehrer & Wei (2010: 22, fig. 1) have reproduced without permission.

I conclude that Lehrer & Wei (2010) have contributed nothing of substance regarding the systematic relationship of *B. fani*.

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References

Bezzi, M. (1911) Miodarii superiori raccolti dal signor C. W. Howard nell'Africa australe orientale. *Bollettino del Laboratorio di Zoologia Generale e Agraria della R. Scuola Superiore d'Agricoltura. Portici*, 6 [1912], 45–104.

Bezzi, M. (1912) Report on a collection of Bombyliidae (Diptera) from Central Africa, with description of new species. *Transactions of the Royal Entomological Society of London*, 59 [1911.—Part IV. (Jan.)], 605–656.

Bezzi, M. (1913) Einige Bemerkungen über die Dipterengattungen *Auchmeromyia* und *Bengalia*. *Entomologische Mitteilungen*, 2, 70–78.

Cuthbertson, A. (1933) The habits and life histories of some Diptera in southern Rhodesia. *Proceedings of the Rhodesia Scientific Association*, 32, 81–111 + 4 pls.

Duponchel, P. (1842) Bengalie. *In*: Orbigny, C.V.D. d' (ed.), *Dictionnaire Universel d'Histoire Naturelle*. Tome deuxième. C. Renard, Paris, p. 542.

Note. For bibliographic details on the *Dictionnaire* and the type designations therein, see Evenhuis & Thompson (1990).

Evenhuis, N.L. & Thompson, F.C. (1990) Type designations of genus-group names of Diptera given in d'Orbigny's *Dictionnaire Universel d'Histoire Naturelle*. *Bishop Museum Occasional Papers*, 30, 226–258.

Evenhuis, N.L., O'Hara, J.E., Pape, T. & Pont, A.C. (2010) Nomenclatural studies toward a world list of Diptera genus-group names. Part I: André-Jean-Baptiste Robineau-Desvoidy. *Zootaxa*, 2373, 1–265.

Feng, Y., Chen, H.-w. & Xue, W.-q. (1998) Calliphoridae. *In*: Xue W.-q. & Chao C.-m. (eds), *Flies of China*. Vol. 2. Liaoning Science and Technology Press, Shenyang [1996], pp. 1366–1517. [In Chinese, with English summaries of new species.]

International Commission on Zoological Nomenclature (1999a) *International Code of Zoological Nomenclature. Fourth edition adopted by the International Union of Biological Sciences*. International Trust for Zoological Nomenclature, London. xxix + 306 pp.

International Commission on Zoological Nomenclature (1999b) Declaration 44 – Amendment of Article 74.7.3. In: *International Code of Zoological Nomenclature. Fourth edition adopted by the International Union of Biological Sciences*. International Trust for Zoological Nomenclature, London. xxix + 306 pp. [Available at http://iczn.org/content/declaration-44-amendment-article-7473; accessed 15 September 2010].

James, M.T. (1977) Family Calliphoridae. *In*: Delfinado, M.D. & Hardy, D.E. (eds), *A catalog of the Diptera of the Oriental Region*. Volume III Suborder Cyclorrhapha (excluding Division Aschiza). University Press of Hawaii, Honolulu, pp. 526–556.

Kurahashi, H. & Kirk-Spriggs, A.H. (2006) The Calliphoridae of Namibia (Diptera: Oestroidea). *Zootaxa*, 1322, 1–131.

Lehrer, A.Z. (2005) *Bengaliidae du Monde (Insecta, Diptera)*. Pensoft Publishers, Sofia, Moscow, 192 pp.

Lehrer, A.Z. (2006) Un genre nouveau de la sous-famille Gangelomyinae (Diptera, Bengaliidae). *Fragmenta dipterologica*, 3, 13. [Received as paper copy at the Smithsonian Institution, Natural History Library, Washington D.C., USA, on 8 September 2006].

Lehrer, A.Z. (2010). Le rapt intellectuel comme méthode taxonomique de Knut Rognes pour la famille Bengaliidae (Diptera). *Fragmenta dipterologica*, 24, 24–30. [Received as paper copy at the Smithsonian Institution, Natural History Library, Washington D.C., USA, on 20 April 2010].

Lehrer, A.Z (2011) Deux nouvaux Bengaliides de la faune du Malawi (Diptera, Bengaliidae). *Fragmenta dipterologica*, 28, 7–11. [Issue 28 was received as a pdf file from the author on 2 March 2011].

Lehrer, A.Z. & Freidberg, A. (2008) Deux espèces éthiopiennes du genre *Maraviola* Lehrer, 2005 (Diptera, Bengaliidae). *Fragmenta dipterologica*, 18, 1–4. [Received as paper copy at the Smithsonian Institution, Natural History Library, Washington D.C., USA, on 22 April 2008].

Lehrer, A.Z. & Wei, L.-m. (2010). Un nouveau genre oriental de la famille Bengaliidae (Diptera). *Bulletin de la Société Entomologique de Mulhouse*, 66, 21–25.

Malloch, J.R. (1927) LV.—Exotic Muscaridæ (Diptera).—XX. *Annals and Magazine of Natural History* (9) 20, 385–424.

Malloch, J.R. (1929) IX.—Exotic Muscaridæ (Diptera).—XXVI. *Annals and Magazine of Natural History* (10) 4, 97–120.

Pont, A.C. (1980) 90. Family Calliphoridae. *In*: Crosskey, R.W. (ed.), *Catalogue of the Diptera of the Afrotropical Region*. British Museum (Natural History), London, pp. 779–800.

Robineau-Desvoidy, J.B. (1830) Essai sur les Myodaires. *Mémoires présentés par divers Savan[t]s à l'Académie royale des Sciences de l'Institut de France, et imprimés par son ordre: sciences mathématiques et physiques*, Sér. 2, 2, 1–813.

Rognes, K. (1997) The Calliphoridae (blowflies) (Diptera: Oestroidea) are not a monophyletic group. *Cladistics*, 13, 27–66.

Rognes, K. (2006) Bengalomania – A review of Andy Z. Lehrer's book on *Bengalia* Robineau-Desvoidy, 1830 and related works (Diptera, Calliphoridae). *Studia dipterologica*, 12 [2005], 443–471.

Rognes, K. (2009a) The identity of *Pollenoides kuyanianus* Matsumura, 1916 (Diptera: Calliphoridae: Bengaliinae). *Insecta Matsumurana, New Series*, 65, 93–100.

Rognes, K. (2009b) Revision of the Oriental species of the *Bengalia peuhi* species-group (Diptera, Calliphoridae). *Zootaxa*, 2251, 1–76.

Senior-White, R.A. (1923) The Muscidæ testaceæ of the Oriental Region. (With descriptions of those found within Indian limits.) *Spolia zeylanica*, 12, 294–314 + pls. I–XI.

Senior-White, R.A., Aubertin, D. & Smart, J. (1940) *The fauna of British India, including the remainder of the Oriental Region*. Diptera. Vol. VI. Calliphoridæ. Taylor & Francis, London, xiii + 288 pp.

Smith, K.G.V, Crosskey, R.W. & Pont, A.C. (1980) Bibliography of cited literature. *In*: Crosskey, R.W. (ed.), *Catalogue of the Diptera of the Afrotropical Region*. British Museum (Natural History), London, pp. 889–1196.

Surcouf, J.M.R. (1920) Révision des Muscidæ testaceæ. *Nouvelles Archives du Muséum d'Histoire Naturelle de Paris*, (5) 6 ['1914', '1919'], 27–124.

Note. According to information in a letter from Surcouf to Austen (cf. Senior-White 1923: 313) this work was completed at the outbreak of WWI, but was not published until 1920. Smith, Crosskey & Pont (1980: 1154) cited notes from the same letter on a BMNH copy to the effect that the actual publication date was "c. May 1920". They also explained that "[t]he journal cover has two printed dates, '1914', and the statement 'Ce fascicule a été publié en Décembre 1919'.".

Villeneuve, J. (1913) Description d'une espèce nouvelle du genre *Bengalia* Rob.-Desv. [Dipt.]. *Bulletin de la Société entomologique de France*, 1913, 153–154.

Zumpt, F. (1956) Calliphoridae (Diptera Cyclorrhapha) Part 1: Calliphorini and Chrysomyiini. *Exploration du Parc National Albert Mission G. F. de Witte (1933–1935)*, 87, 1–200.

Zumpt, F. (1959) Chapter XXV Diptera (Brachycera): Calliphoridae. *In*: Hanström, B., Brinck, P. & Rudebeck, G. (eds.), *South African Animal Life, Results of the Lund University Expedition in 1950–1951*, 6, 427–440.