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

KNUT ROGNES
University of Stavanger, Faculty of Arts and Education, Department of Early Childhood Education, NO–4036 Stavanger, Norway.
E-mail: knut@rognes.no or knut.rognes@uis.no

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Knut Rognes
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Abstract

The Oriental species of the *Bengalia peuhi* species-group are revised and their male genitalia illustrated by means of digital colour photography. A key to males is presented, complete synonymies are given for all the species and their geographical distribution reconsidered. The 13 Oriental species making up the group are: *Bengalia emarginata* Malloch, 1927 (China, Laos, Malaysia, Nepal, Philippines, Singapore, Taiwan, Thailand, Vietnam); *B. emarginatoides* **sp. nov.** (India, Sri Lanka); *B. emdeniella* (Lehrer, 2005), **comb. nov.** (China); *B. fani* Feng & Wei, 1998 (China); *B. inermis* Malloch, 1927 (Philippines); *B. latro* de Meijere, 1910 (Indonesia); *B. lyneborgi* James, 1966 (Philippines); *B. pseudovaricolor* Kurahashi & Tumrasvin, 1979 (Thailand); *B. surcoufi* Senior-White, 1923 (India, Nepal, Pakistan, Vietnam); *B. taksina* (Lehrer, 2005), **comb. nov.** (Laos, Malaysia, Nepal, Thailand, Vietnam); *B. unicolor* Séguy, 1946 (Pakistan); *B. varicolor* (Fabricius, 1805) (China, India, Indonesia, Japan, Laos, Malaysia, Pakistan, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam); and *B. weii* **sp. nov.** (China). A lectotype is designated for *Bengalia latro* to fix the interpretation of the name. *Bengalia bezzii* Senior-White, 1923 is established as a junior synonym of *Musca varicolor* Fabricius, 1805, **syn. nov.** *Bengalia chromatella* Séguy, 1946 and *Bengalia pallidicoxa* Séguy, 1946 are treated as junior synonyms of *Musca varicolor* Fabricius, 1805, **syn. nov.** *Afridigalia bezziella* Lehrer, 2005 is established as a junior synonym of *Bengalia emarginata* Malloch, 1927, **syn. nov.** *Afridigalia pinatuba* Lehrer, 2005 and *Ashokiana ramsdalei* Lehrer, 2005 are established as junior synonyms of *Bengalia inermis* Malloch, 1927, **syn. nov.** *Ashokiana ramsdalei* and *Afridigalia laguna* Lehrer, 2005 are both based on a holotype with a partly destroyed aedeagus. *Afridigalia tenggeria* Lehrer, 2006 is established as a junior synonym of *Bengalia latro* de Meijere, 1910, **syn. nov.** *Afridigalia thaisia* Lehrer, 2008 is established as a junior synonym of *Afridigalia taksina* Lehrer, 2005, **syn. nov.** The Afrotropical *Afridigalia walkeriana* Lehrer, 2005 is established as a junior synonym of *Bengalia depressa* Walker, 1858, **syn. nov.** The Afrotropical *Afridigalia zouloupyga* Lehrer, 2006 is established as a junior synonym of *Bengalia floccosa* Wulp, 1885, **syn. nov.** *Afridigalia arawakia* Lehrer, 2006 is established as a junior synonym of *Bengalia peuhi* Villeneuve, 1914, **syn. nov.** *Bengalia taiwanensis* Fan, 1965, not a member of the *peuhi* species-group, is established as a junior synonym of *Bengalia fuscipennis* Bezzi, 1913, **syn. nov.** Sri Lanka is deleted from the distributional range of this species. New morphological terms are introduced for the description of the aedeagus. The ovipositor is described for *Bengalia emarginata* and *Bengalia lyneborgi*. A preliminary phylogenetic analysis is performed using NONA and Pee-Wee.

Key words: Diptera, Calliphoridae, *Bengalia*, revision, new species, new synonyms, Oriental Region, phylogeny

Introduction

Bengalia Robineau-Desvoidy, 1830 is mainly an Afrotropical and Oriental genus of large yellowish or brownish flies, but has recently also been discovered in Australia (Farrow & Dear 1978). It is currently classified in a separate tribe Bengaliini (alongside Auchmeromyiini) within the subfamily Bengaliinae of Calliphoridae (Rognes 1998). After a careful evaluation of the taxonomic publications on this genus I consider it to consist of about 60 species worldwide (a catalogue manuscript in unfinished stage is available on request). The genus has recently received detailed attention in a book "Bengaliidae du Monde" by Lehrer (2005; reviewed by Rognes 2006), and several later papers of which a few are relevant here (Lehrer 2006a–b, 2008).

The flies feed on pale-coloured prey (ant pupae, insect larvae, termites) which they snatch from ants carrying it. They rest on vegetation above or on a stone or the ground nearby an ant trail, and ambush the ants snatching the prey carried by them. They then use their enlarged proboscis to mascerate the prey and suck out their contents. Embryonated eggs are laid in heaps of moist soil freshly dug out by termites and hatch almost immediately. For details of prey catching, feeding behaviour and reproductive habits, see the accounts by Jacobson (1910), Bequaert (1922), Altson (1932), Cuthbertson (1933) and Maschwitz and Schönegge (1980). There has been confusion for a considerable time concerning the interpretation of several old names associated with this genus, especially the names *varicolor*, dating from *Musca varicolor* Fabricius, 1805, and *latro*, dating from *Bengalia latro* de Meijere, 1910. The confusion also involves the names *Bengalia bezzii* Senior-White, 1923 and *Bengalia emarginata* Malloch, 1927. The confusion relates both to how many species are involved with these names and how to correctly apply the names. Below follows a short outline of the views held by various students of the genus.

Confusion affecting the names *B. varicolor, B. latro, B. bezzii* and *B. emarginata*

Some authors have considered the names *B. varicolor* and *B. latro* to denote the same species. Thus when Senior-White (1923a) described *Bengalia bezzii* on the basis of one male and two female specimens from Suduganga, Sri Lanka, he also keyed and illustrated the genitalia of several other species, including two species he named *B. varicolor* and *B. latro*. He hesitated in synonymising *B. latro* under *B. varicolor*, although stated that he was of the opinion "that such will ultimately prove to be the case" (Senior-White 1923a: 308).

Senior-White (1924) reported to have found an "indubitable" male of *varicolor* leading him to sink *B. latro* as a synonym of *B. varicolor*. Senior-White *et al*. (1940) followed suit and synonymised not only *B. latro*, but also *B. emarginata* under *B. varicolor*. The last was listed as a valid species different from Senior-White's *B. bezzii*. James (1977) followed Senior-White *et al*. (1940) and gave a separate entry for *B. varicolor* in his Oriental catalogue, listing *B. latro* and *B. emarginata* as junior synonyms. He similarly treated *B. bezzii* as a separate species which was given a separate entry in the catalogue. De Jong (2000: 111, 244) followed James (1977) and also synonymised *B. latro* under *B. varicolor* in his account of the Diptera described by de Meijere.

On the other hand, another group of workers considered *B. latro* and *B. bezzii* to denote the same species and applied the name *B. varicolor* to a different species. Their view had its origin in the opinion of Malloch (1927: 412) who considered that Senior-White had "… misidentified *latro* and redescribed it as *bezzii*, …". Malloch's view carried much weight since he had a syntype of *B. latro* at hand (now in USNM, more on this type below) and because he presented good illustrations of the genitalia of what he considered to be this species. Fan (1965, 1992, 1997) for the Chinese fauna and Kano and Shinonaga (1968) for the Japanese fauna followed the opinion expressed in Malloch's paper. Fan (1965, 1992), like Kano and Shinonaga (1968), used *B. latro* as the valid name for the species, with *B. bezzii* as a synonym, but Fan (1997) and later students of the Japanese and Oriental fauna such as Tumrasvin *et al*. (1979), Kurahashi *et al*. (1997), and Kurahashi and Chowanadisai (2001) treated *B. bezzii* as the valid name. Feng *et al*. (1998) in the work "Flies of China"

reverted to *B. latro* as the valid name for this species, and treated *B. bezzii* as a synonym. All these authors used the name *B. varicolor* to denote another, separate, species. Malloch (1927: 412) found it probable that his understanding of *latro* was the same as *varicolor* Fabricius, but thought it "extremely difficult, if not impossible, to decide this question …". As we will see, he was not far off the mark.

A third point of view was presented by Verves (2005) who claimed that both Malloch (1927) and Fan (1965, 1992) had misidentified *B. latro*, and that the species before them was not the true *B. latro* but *B. bezzii*, implying that the true *B. latro* was a species unknown both to them and to others. Verves gave separate entries for *B. latro* and *B. varicolor*, in addition to one for *B. bezzii*. He thus gave separate status to all three nominal species: *B. bezzii*, *B. latro* and *B. varicolor*, and assumed that three, rather than two, separate taxa were involved. No types were studied to validate his opinion. Verves, furthermore, listed *B. emarginata* as a good species, thus rejecting the synonymy of it under *B. varicolor* as done by Senior-White *et al*. (1940). Verves (mistakenly) thought that their (erroneous) use of the name *B. varicolor* applied to *B. emarginata*.

Lehrer (2005) ignored both the name *Bengalia latro*, for no apparent reason, and the name *Musca varicolor* on the ground of an inaccurate claim that both the type and the sex was unknown (Lehrer 2005: 16, 18; cf. Rognes 2006). Lehrer (2005: 18) even listed *Musca varicolor* among taxa "mis en synonymies incertaines ou désignées, sans base scientifique, comme espèces valides". Note, in passing, that Lehrer has taken an extremist view of old Diptera collections and expressed "fermement" his "scepticism sur l'authenticité des «collections» historiques de Linnaeus, Fabricius, Fallen, De Geer, Siebke, Ringdahl, Zetterstedt, Rondani etc. …" (Lehrer 2006b: 1).

Confusion regarding literary source of the name *B. latro*

Apart from the nomenclatural and taxonomic confusion there is even confusion in some basic reference works as to the literary source of de Meijere's name *Bengalia latro*. Bezzi (1913) correctly referred to the paper of de Meijere in volume 53 [as "… LIII, 1910, … p. 336"] of *Tijdschrift voor Entomologie* as the source of *B. latro*. Hennig (1941: 180) cited the reference for *B. latro* as "de Meijere 1910, Tijd. Ent. 53, p. 328", but this is the first page of the paper of Jacobson (1910) and no reference to *B. latro* exists on that page. James (1977: 530) cited the source correctly in the catalogue proper ("*latro* de Meijere, 1910, Tijdschr. Ent. 53:336 (♂♀)."), but in the Selected bibliography (p. 739) neither of the two 1910 entries for de Meijere covered the paper where *B. latro* was described. The first entry "[Meijere, J. C. H. de] 1910a … *Tijdschr. Ent.* **53**: 58–194 …" has the correct volume number of the journal, but the page on which *B. latro* is described (p. 336) is not within the boundaries of this reference. The second entry "[Meijere, J. C. H. de] 1910b …" is from another journal. Interestingly, a third entry in the bibliography of the Oriental catalogue (p. 739), i.e., "[Meijere, J. C. H. de] 1911 ... *Tijdschr. Ent.* **54**: 258–432 …" names the correct journal and encompasses the correct page number, but of course does not contain the original description of *B. latro*, since both the year and volume number are wrong. Verves (2005: 239), nonetheless, cited the source for *B. latro* as "De Meijere, 1911: 336" and in the bibliography (Verves 2005: 282) cited the de Meijere 1911 paper "Studien ueber sudostasiatischen Dipteren. VI. *Tijdschrift voor Entomologie*, **54**: 258–432, pls. 18–22" as if that was the paper where *B. latro* was described. It appears, then, that Verves did not see the original paper from 1910 (and neither the one from 1911), and he may have constructed a likely reference from the (apparently) contradictory 1910 and 1911 references (as to volume and page numbers) found in the Selected bibliography of the Oriental catalogue from 1977. It may also not have occurred to him that the Selected bibliography perhaps did not contain references to all de Meijere's species listed in the catalogue.

Concerning the biology of *B. latro* Senior-White *et al*. (1940: 102) cited "… de Meijère (Tijd. v. Ent. liii, p. 328, 1910)" implying erroneously that it was de Meijere who wrote about the behaviour of *B. latro* snatching prey from ants. But it was Jacobson (1910) who reported upon the behaviour of *B. latro*, not de Meijere, Jacobson's paper being the one starting on p. 328.

Need for revision

In view of this confusion it seems a necessity to review all the Oriental species of the *Bengalia peuhi* species-group, of which both the Afrotropical and Oriental members have a pair of discal setae on the fifth abdominal tergite.

The purpose of the present paper is thus (1) to revise and diagnose all the Oriental species in the *peuhi* species-group mostly on the basis of male genital features; (2) to establish complete synonymies and a sound nomenclature based on the name-bearing types; (3) to explore in considerable detail the morphology of the aedeagus of all the *Bengalia* species under study and to document it from several angles of view with the aid of digital photography; (4) to introduce new descriptive terms for the aedeagus; (5) to analyse phylogenetic relationships among the species; and (6) to update the current knowledge of the geographical distribution of the species, which, in view of the nomenclatural and taxonomic confusion, is outdated.

Methods

Acronyms for collections.

BMNH	The Natural History Museum, London, United Kingdom.
BPBM	Bishop Museum, Honolulu, Hawaii, USA.
CDPCAG	Centre for Disease Prevention and Control, Anshun City, Guizhou, China.
ETHZ	Eidgenössische Technische Hochschule Zürich, Institut für Pflanzenwissenschaften, Entomologische Sammlung, Zürich, Switzerland.
KR	Private collection of Knut Rognes, Stavanger, Norway (ultimately to be transferred to the Oxford University Museum of Natural History, Oxford, United Kingdom).
MNHN	Muséum national d'Histoire Naturelle, Paris, France.
MSNM	Museo Civico di Storia Naturale, Milano, Italy.
NHRM	Naturhistoriska riksmuseet, Stockholm, Sweden.
NMNS	National Museum of Nature and Science, Tokyo, Japan.
RMNH	Nationaal Natuurhistorisch Museum Naturalis [formerly Rijksmuseum van Natuurlijke Historie], Leiden, Netherlands.
SDEI	Senckenberg Deutsches Entomologisches Institut, Müncheberg, Germany.
SMNS	Staatliches Museum für Naturkunde Stuttgart, Stuttgart, Germany.
TAU	Department of Zoology, Tel Aviv University, Tel Aviv, Israel.
USNM	Department of Entomology, Smithsonian Institution, National Museum of Natural History, Washington, DC, USA.
WSUP	M.T. James Entomological Collection, Department of Entomology, Washington State University, Pullman, Washington, USA.
ZMAN	Zoological Museum Amsterdam, University of Amsterdam, Amsterdam, Netherlands.
ZMUC	Zoological Museum, Natural History Museum of Denmark, University of Copenhagen, Copenhagen, Denmark.

Abbreviations. *acr*—acrostichal setae; *dc*—dorsocentral setae; *h*—humeral setae; *ia*—intra-alar setae; *kepst*—katepisternal setae; *npl*—notopleural setae; *ph*—posthumeral setae; *prst*—presutural setae; a—anterior; *ad*—antero-dorsal; *av*—antero-ventral; *p*—posterior; *pv*—postero-ventral; *v*—ventral; ST—abdominal sternites; T—abdominal tergites.

Dissection. The abdomen was broken off and macerated in hot / boiling10% aqueous KOH for two minutes (sometimes repeated), then rinsed and partly dissected in water. The genital parts were kept in ethanol for a while and then transferred to glycerol, where final dissections were performed. The genitalia were kept

in glycerol without going through further heating. I have not employed glycerol-jelly as a mounting medium, since this substance must be melted before it can be used for embedding the study object, a procedure that requires additional heating and risk of overheating and bubble formation. The use of ordinary glycerol led to difficulties in keeping preparations stable in the desired position. However, patient use of concavity slides with coverslip, salt-trays, flat micro slides with or without coverslip ultimately proved successful in keeping the genitalia nicely balanced during photography. This method involved no additional heating, no stiff jelly-like substance and no compression or distortion, in short the genitalia remained as far as possible in the state they were in when dissected out.

Lehrer's method of preparing the genitalia, which he does not describe, seems to involve treatment with glycerol jelly or a similar substance (the genitalia he has prepared and which I have studied are embedded in some stiff jelly-like substance which did not permit any movement of the genital parts in relation to each other). This apparently permits positioning the genitalia in a fixed position for as long as one would wish, but apparently does not permit other views than lateral view; at least he does not present other views.

Further, comparison of his drawings of the distiphallus of, e.g., *B. varicolor* (as "*bezzi*", an error for *bezzii*), *B. latro* (as *tenggeria*) and *B. inermis* (as *laguna*, *nusantara*, *pinatuba* or *ramsdalei*) with my own digital images of the same species, makes it evident that the 'antlers' (see below for explanation of this and other terms) have stretched out considerably and lost some of their curvature. This may be an artifact resulting from heating in the embedding substance he has used. In some of his preparations the outer limits of the stiff embedding substance are very difficult to separate visually from the actual borders of the sclerotised tissue (e.g., the ST5 flap of the holotype of *Ashokiana ramsdalei* Lehrer, Fig. 78).

Photography. In view of the exceedingly complex nature of the aedeagus in *Bengalia* I found it impractical to document its structure by means of line drawings, mainly because of the difficulty of keeping the objects in the same position for the extended periods of time necessary to accomplish the artwork. Therefore, digital colour photography was the method of choice for documentation. Even if very difficult and often requiring repeated attempts, it turned out to be possible to maintain the object in the desired position for the time necessary to obtain satisfactory exposures.

Photography involved three separate methods, all taking advantage of an Olympus E-410 / E-420 digital camera body with a 10 Mpx Live MOS sensor (17.3 x 13mm). Except for single shots of flat objects such as labels, series of about 10–50 shots were usually taken of objects at different levels of focus. The focus knob was turned manually on the stereomicroscope or microscope in methods 1 and 2, below, or on the Manfrotto focussing rail in method 3. The jpeg image files were subsequently fed into Helicon Focus Light software (http://www.heliconsoft.com/heliconfocus.html) to create a single image of uniform sharpness. The final images were subsequently edited in Adobe Photoshop Elements ver. 6.0.

The three photographic setups employed were as follows. (1) Camera mounted on a LM-Scope photo adapter on a Wild M8 stereomicroscope equipped with an HV phototube (http://www.lmscope.com/produkt22/produkte.shtml). (2) Camera, equipped with an old Olympus OM2 Zuiko 50mm f 1:1.8 lens, held by means of a tripod 1–2cm above the top of a 6.3x eyepiece (high eye-point for spectacle users) of an old student microscope (Ernst Leitz, Wetzlar) with a 10x objective lens. The aedeagus of the *Bengalia* species matched the size of the camera sensor, i.e., almost filled the viewing screen of the camera. Unfortunately, the lighting system of the microscope was of low quality, resulting in backgrounds of varying colour in the images. Note that the original Olympus Digital 14–42mm 1:3.5–5.6 zoom lens was useless for this afocal mount system, so all images of the distiphallus were made by the aforementioned method. (3) Camera equipped with a Vivitar Series 1:1 105mm f 1:2.5 macro telephoto lens mounted on an old Olympus OM2 25mm extension tube. This setup made it possible to fill the camera sensor with an object measuring as little as 13.5 x 10mm. This was used to take shots of the whole fly (e.g., of *Bengalia weii*, Fig. 172) and many labels.

Synonymy. I have examined all papers relevant to this study, and in the systematic section given a complete synonymy for each species according to my interpretation of the names used by various authors, in most cases based on a re-study of their specimens. The entries are listed chronologically and many are given

long and rather detailed annotations, an important part of the study. The complete synonymies highlight the almost total confusion, both taxonomic and nomenclatural, that has existed up to now for many of the more commonly used names.

In each entry of the synonymy the country of origin of the specimens examined by the cited author(s) is listed. The distribution of the species is based on such records, but mostly on specimens that I have examined. Records which authors have cited from the literature have usually not been accepted.

In the "Material examined" section material has been listed according to the collection where it is housed. This will make it easier to pin-point the background information on the specimens (including important label data) discussed in the annotations.

Phylogenetic analysis. The 13 Oriental taxa of the *Bengalia peuhi* species-group plus the Afrotropical taxa *B. cuthbertsoni* Zumpt, 1956 and *B. floccosa* Wulp, 1885 were coded for 19 characters, of which 12 were multistate. The data matrix, characters and character states are given in Appendix 2. The matrix was analysed with the parsimony programs NONA and Pee-Wee (Goloboff 1993, 1993–1997). All characters were treated as unordered and only unambiguous support for clades was considered (option *amb-*). An exact search was performed in NONA (*whennig; mswap+;*) and, forcing the group of Oriental species to be monophyletic, five of the eight most parsimonious trees found were retained, all of length 57 steps, with ensemble consistency index of 0.75, and ensemble retention index of 0.77. The strict consensus is shown in Fig. 216. The support of the clades (Bremer support) was calculated in NONA (*hold 10 000; bsupport 40;*) and the values entered in Fig. 216. The five trees were read into Pee-Wee, and their total fit (weight) measured. The fits were 151.0, 151.0, 150.0, 150.5, and 151.5 (k=3), respectively. The last tree had the highest fit, irrespective of the setting of the concavity constant (k), and the same tree was found by exact search in Pee-Wee. This tree is shown in Fig. 217 with unambiguous character state changes mapped on to the branches. Trees were output and printed through WinClada (Nixon 2002) and printouts photographed for further treatment in Photoshop Elements.

Oriental Region. I have followed Delfinado and Hardy (1977) as regards the boundaries of the Oriental Region.

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). For lists of generic synonyms, see James (1977), Pont (1980) and Rognes (2006).

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).

Description and diagnosis of the Oriental species of the *Bengalia peuhi* species-group

All the members of the *Bengalia peuhi* species-group (= Afridigaliinae of Lehrer 2005, cf. Rognes 2006) have a pair of discal setae on the fifth abdominal tergite (T5). In the Oriental Region all other *Bengalia* species lack such setae. The cerci are strong, slightly diverging and curved, and the distal piece of the surstylus is simple and roughly triangular in dorsal view. The distiphallus has a distal pair of 'antlers' (see below for discussion of aedeagal morphology and descriptive terms), and often a pair of 'dorsolateral wings'. The fore tibia usually has some rather small spine-like setae on the ventral side of the proximal half. The hind tibia usually has an anteroventral fringe of long delicate setae on its distal half or more. The greater ampulla is oval with its longest axis almost vertical. The group has both Afrotropical and Oriental members.

The wholly Afrotropical *Bengalia spinifemorata* species-group (Maraviolinae of Lehrer 2005) may be its monophyletic sister group, at least uniquely sharing the presence of discal setae on T5.

Below follows a description of the features common to the Oriental members of the *B. peuhi* species-group.

Head. Male and female frons very broad, about a third of the width of the head. Ground colour yellow, except frontal vitta which is light brown and fronto-orbital plate which is greyish brown. Frontal vitta with black setulae. 5–8 frontal setae on each side, one reclinate orbital seta (prevertical) in front of the well developed outer and inner verticals. Males without proclinate orbital setae, except in *B. fani* (although one paralectotype male of *B. latro* exceptionally has two proclinate orbitals). Females with 2–3 pairs of proclinate orbital setae. Fronto-orbital plate narrow. Fronto-orbital plate, parafacial and area above vibrissa with black setulae. A shifting greyish colour is present at the junction of the parafacial and the fronto-orbital plate. Occiput and genal dilation with yellow vestiture. Lunula bare or setose. Scape and pedicel reddish brown, first flagellomere dark, except for base proximal to level of insertion of arista, about 5x longer than wide. Tip of first flagellomere not reaching level of vibrissa. Arista long plumose. Anterior margin of clypeus reddish and not projecting beyond lower facial margin. Palpus yellow with a bundle of shorter setae at tip, 1–3 long setae below in distal half and a row of 4–5 very long setae at its base.

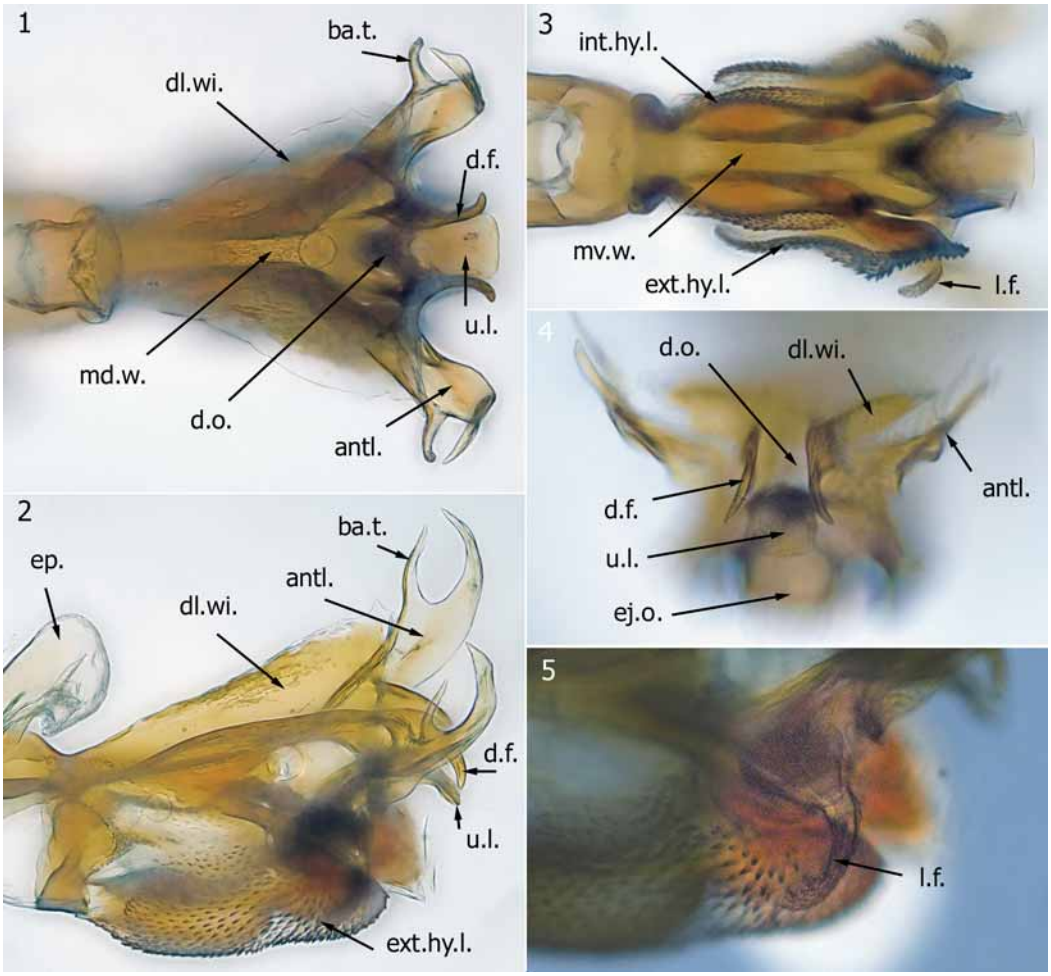
Thorax. Brownish yellow, with pale brownish dusting; in some lights with much paler lateral areas. Darker mid-dorsal part with narrow dark vittae just inside of the *dc* rows of setae and along middle. Setulae of scutum black, except on anterior surface of the humeral callus where they are yellow. 0+1 *acr* (just in front of scutellum); 1–3 + 4 *dc* (the hindmost *prst dc* much stronger than other *prst dc*; postsutural *dc* becoming stronger posteriorly); 1 strong seta present on each side very far forward on scutum just inside the anteromedial corner of the humeral callus; 1 *prst*; 2 *h*; 1 *ph*; 0+1 *ia*; 3 scutellar marginals, no discals; 2 *npl* (close together). Pleuron yellow with irregularly darkened parts and covered with yellowish dusting. Proepisternal depression bare. Strong proepisternal (anterior) and proepimeral (posterior) setae. A few black setulae above the proepimeral seta. Anterior spiracle yellow. Anepisternum with 5–6 strong marginals, covered with black ground setulae in hind and upper part. Anepimeron either with only yellow ground setulae, or with mostly yellow ground setulae with varying amounts of black ones usually in a bundle on the upper part, or with mostly black ground setulae. No difference between the sexes as regards the anepimeral vestiture. Lesser ampulla blackish in anterior half, with whitish dusting. 1+1 *kepst* setae. Meron with about 6–8 meral setae. No coxopleural streak. Katatergite bare. Anatergite with only pale ground vestiture, no black setulae below lower calypter. Metakatepisternum with pale setulae. Metasternal area with pale and black setulae. Postalar wall pale setulose. Prosternum pale setulose.

Wing. Tegula, basicosta and subcostal sclerite yellow; wing veins all yellow; costa haired below all the way to junction with R_{4+5}. Lower calypter with inner margin converging with long axis of fly, more than twice as long as upper. Halter yellow.

Legs. *Males*. Yellow, sometimes femora darkened. Fore tibia with 3 *ad*, 1 *pv*, and a group of short spine-like setae in varying numbers and strength on the ventral surface of the proximal half. Sometimes there is a fringe of long and thin *pv* setae at the distal end. Mid tibia with 1 *ad*, 2 *p*, and sometimes with a distal *pv* fringe of long and thin setae. Mid femur with a *pv* ctenidium consisting of a varying number of very short flattened spine-like setae distally. Hind tibia with 1 *av*, 2 *ad*, and often with fringe of long and thin *av*, *v*, and *pv* setae in distal half or more. Sometimes the fringe is very weak or altogether absent. Hind femur with thin and long *av* and *pv* setae and sometimes even thinner densely set setae among the main setae on the *av*, *v* and *pv* side. Hind coxa with pale ground setulae on posterior surface. *Females*. Similar to males, but no fringes on any legs. Mid tibia also with a *v* seta. Mid femur without ctenidium. Hind tibia with 2 smaller *av* setae proximal to the strong distal *av*. Hind femur with shorter *av* and *pv* setae and without the long thin densely set setae on the ventral side.

Abdomen. Tergites brownish yellow; dusted white in shifting pattern; with black hind margins of varying width, from 1/6 to 1/2 of tergite length. Excavation at base of T1+2 ending far from hind margin. T1+2 with a bundle of 2–5 strong lateral discal setae; lateral marginals much weaker. T3 with 1–2 lateral marginal setae

and 0–1 lateral discal seta on each side. T4 with 2–3 lateral marginals on each side, 2 median marginal setae, and no lateral discals. T5 with a full row of about 6 strong marginal setae and 1 pair of median discal setae. In males epandrium dark blackish brown dulled by thin layer of dusting.



FIGURES 1–5. *Bengalia flocccosa* (Wulp), male (from Kenya, in KR). Distiphallus. **1**. Dorsal view. **2**. Left lateral view (a little from above). **3**. Ventral view. **4**. Tip from in front. **5**. Enlarged view of area around anterior part of external hypophallic lobe showing lateral finger. Abbreviations, see section "Aedeagus, glossary of terms", in text.

Male genitalia. The ST5 flap varies greatly among the species and has diagnostic value. This has been known for a long time, but the sclerite varies among individuals and can even be asymmetrically developed so it should be used in conjunction with other features for safe identification of species. The cerci and surstyli are very uniform throughout the group. The cerci consist of basal setose parts and distal bare, strongly sclerotised and dark, shining and slightly curved prongs. The surstylus consists of two parts, distal ("surstylus part 1" of Rognes 2006) and proximal ("surstylus part 2" of Rognes 2006). The latter is without setae, but with microtrichia. The distal part of surstylus ("surstylus" in the following) is triangular and its shape best seen in posterior view. In most species it is bare on the underside, but in a few species (*B. varicolor*, *B. latro*) the underside is covered by a carpet of long densely set thin pale setae. The bacilliform sclerite also consists of two parts – an upper part ("surstylus part 3" of Rognes 2006) and a lower part which is short, simple and rod-like ("bacilliform sclerite" of Rognes 2006). The upper bacilliform sclerite part ("bacilliform sclerite" in the following) is very uniform throughout the species and carries a short upturned tooth-like projection which varies slightly in length and acuteness among the species. The pregonite has a large external non-setose clear sclerotised fold projecting beyond the tip of the pregonite proper (in the Afrotropical *B. cuthbertsoni*, there are two such folds). The postgonite is without a basal seta. Its tip has a small projection and often there is a small

seta just proximad of the tip. Along the main shaft there are numerous small sensillae. A small apodeme is present at the base of the postgonite (= "Gelenkfortsatz" = "basal apodeme of gonostylus") joining it to the base of the basiphallus. The phallapodeme is laterally compressed with a long central strong sclerotisation. The two arms connecting its base to the base of the pregonites are very long compared to other calliphorids. The ejaculatory sclerite is small and triangular.

Aedeagus, glossary of terms. The aedeagus of *Bengalia* species is a very complex structure and is described below. Since this paper deals with the Oriental members of the *B. peuhi* species-group, not all the variation that is present in the group as a whole, or in the entire genus, is dealt with here. A glossary is presented with definitions of new descriptive terms used in the systematic section of the paper. I find these terms more instructive, simpler and more useful than the terms used by Lehrer (2005). Figures 1–5 (*B. floccosa* from Kenya) are labelled with the abbreviations for the terms. Note that this is exactly the same species as used by Lehrer (2005: fig. 4, as *Afridigalia adrianponti* Lehrer, 2005) to explain his own terminology. My terms can directly be compared to his by comparing his figure with mine.

The relational terms employed are independent of the actual position of the aedeagus relative to the rest of the body, whether in rest, when exerted, during copulation, etc. *Anterior, distal* and *forward* all refer to a direction toward the opening of the ejaculatory duct at the opposite end of the aedeagus than the epiphallus (to the right in Figs. 1–3). *Posterior, proximal* and *backward* refer to a direction towards the end of the aedeagus carrying the epiphallus (to the left in Figs. 1–3). *Dorsal* (upper) refers to the same side of the aedeagus as the insertion of the epiphallus, *ventral* (lower) to the opposite side. *Horizontal* refers to a plane parallel with the long axis of aedeagus, and at right angles to the plane (the sagittal plane) dividing the aedeagus in right and left symmetric halves. *Upwards* refers to a direction at right angle to the dorsal side (up in Fig. 2). *Down* or *downwards* refer to a direction at right angles to the ventral side (down in Fig. 2).

The antlers (*antl*.) (= "apophyses posterieures du paraphallus" of Lehrer [2005: 14, fig. 4i]; sometimes called the "apophyses latérales postérieures") are large paired processes near the distal end of the mid-dorsal wall (*md.w.*) of the distiphallus, one on each side of the base of the mid-dorsal upper lip (*u.l.*), sometimes with a basal tooth (*ba.t.*), a dorsally projecting process laterally near its base. At the upper end of each antler there are minute processes in varying numbers, like tines or points of a deer's antler. The antlers are usually shallowly grooved on the distal side. They are broad in profile view and strongly curved upwards and backwards towards the base of the distiphallus in *B. inermis*, *B. latro* and *B. varicolor*; less curved in *B. weii*; much narrower and directed almost directly upwards in *B. emarginata* and *B. emarginatoides*; and narrow and directed upwards and slightly forwards in *B. emdeniella*, *B. pseudovaricolor, B. surcoufi*, *B. taksina* and *B. unicolor*; in the latter species the antlers are very long with a slight bend at middle (Figs. 139, 140).

The external (distal) and internal (proximal) hypophallic lobes (*ext.hy.l.* and *int.hy.l.*) (= "lobes anterieurs hypophalliques" of Lehrer [2005: 14, fig. 4d], and "lobes proximaux hypophalliques" of Lehrer [2005: 14, fig. 4c]) are two, often parallel denticulate folds on each side of the midventral wall of distiphallus. The external hypophallic lobe may show various differentiations such as distal folds (i.e., grooves along a vertical axis in its distal part); a shelf**,** i.e., an upper projecting process that is strongly denticulate, usually horizontal (= parallel with dorsal and ventral walls of distiphallus), but sometimes oblique (= sloping towards anterior end of distiphallus) and situated just behind the lateral finger (*l.f.*, see below); and sometimes a ventral projection of its lower distal end. This projection is termed ventral finger (*v.f.* Figs. 57, 87, 111) and may take various forms: acutely triangular (*B. emdeniella*, *B. fani*, *B. pseudovaricolor, B. taksina*); just an inconspicuous bulge; or strongly projecting (*B. latro, B. inermis*); and be denticulate to various extents. The internal hypophallic lobes may converge towards each other more or less definitely, or strongly so, e.g., in *B. fani*. They usually fuse with the midventral wall a little distance beyond the middle of the latter, at least the denticulations end at that level. In *B. fani* the inner lobes continue as two ventral, broad and diverging sclerotised bands toward the tip of the enormously prolonged distal half of the distiphallus.

The dorsolateral wing (*dl.wi.*) is a horizontal (*B. emdeniella, B. fani, B. lyneborgi, B. pseudovaricolor, B. surcoufi, B. taksina*), or a more or less upright and flaring longitudinal wing originating on each side of the mid-dorsal wall. Distally its upper (lateral) edge is fused with the lateral part of the base of the antler. The

angle of the dorsolateral wing in relation to the mid-dorsal wall is best evaluated in anterior view of distiphallus.

The epiphallus is a thin-walled, usually completely unsclerotised structure with a slight swelling distally. In some specimens it is partly sclerotised along its stalk.

The lateral finger (*l.f.*) is a process of variable size, finger-like, curved or straight, usually denticulate all around, which is situated just in front of the upper projecting shelf of the external hypophallic lobe. It originates from the anterior lower end of the vertical sclerotised sheet (see next) whose upper end starts at the confluence of dorsolateral wing (*dl.wi.*), the base of the antlers (*antl.*) and the lateral part of the mid-dorsal upper lip (*u.l.*) on each side.

The vertical sclerotised sheet is found on each side of the distal half of distiphallus. In some species (e.g., *B. emdeniella, B. lyneborgi, B. pseudovaricolor, B. surcoufi* and *B. taksina*) it is a prominent vertical sheet, in other species it is much more difficult to make out and define. It has an anterior edge, very conspicuous but mostly smooth in, e.g., *B. emdeniella, B. lyneborgi* and *B. taksina*, but serrated in *B. emarginata, B. emarginatoides* and *B. weii*. The sheet is produced ventrally into the denticulate lateral finger (*l.f.*) which varies in size and is often bent laterally at a right angle. Dorsally and distally the sheet is contiguous with parts of the antlers and the outer edge of the upper lip. In *B. fani* it seems to have been incorporated into the enormously expanded distal parts of the mid-dorsal wall and is confluent with it.

The ejaculatory opening (*ej.o.*) is an opening below the upper lip and just above the lower lip, sometimes a little behind the upper lip edge. It is the discharge opening for sperm and accessory gland secretions, as the sperm duct inside the aedeagus can be followed all the way to the opening.

The lower lip is the distal termination of the midventral wall (see next), usually visible in profile view of aedeagus. It may or may not be strongly sclerotised. It is sometimes visible as two sclerotised halves, with a separating line, and a weak sclerotisation at the tip.

The mid-dorsal wall (*md.w.*) is the mid-dorsal fully sclerotised wall of distiphallus, between dorsolateral wings. It terminates distally in the upper lip.

The midventral wall (*mv.w.*) is the fully sclerotised midventral wall of distiphallus, situated between the external and internal hypophallic lobes on each side. It is straight or variously curved in profile view, and strengthened laterally. In transverse section it is convex with the convexity facing down. It terminates distally in the lower lip. At the level of the distal end of the internal hypophallic lobe there is often a distinct transverse marking across the midventral wall (Fig. 86).

The parastomal sclerites (Figs. 47, 110, 117, *pst.scl.*) are sclerotised bilateral structures between upper and lower lips, on each side of ejaculatory opening in *B. emdeniella, B. pseudovaricolor, B. surcoufi* and *B. taksina*. Except in *B. surcoufi* they originate dorsally in the Y-shaped sclerite in the floor of dorsal opening. Lehrer (2005: in key on p. 25, couplet 18) called them "[s]tyles" (in *B. emdeniella* and *B. taksina*), as if they were the same as the "styles" in *B. floccosa* (as *B. adrianponti*, Lehrer 2005: 14, fig. 4k). What Lehrer called "styles" in the latter species are the same as the upper lip (see below for a discussion of this structure). Lehrer's ambiguous term stands in the way of a clear understanding of the aedeagal morphology and cannot be accepted. In *B. surcoufi* the parastomal sclerites are shaped as short lateral strongly sclerotised swellings on each side of the ejaculatory opening (Fig. 128).

The dorsal opening (*d.o.*) is a moderate-sized triangular window (in *B. lyneborgi* a very long opening almost for the whole length of the dorsal wall) mid-dorsally at base of dorsal surface of upper lip, at level of base of antlers. Its function is obscure. I thought at first it might be involved with discharge of accessory gland secretions, but I have not been able to follow any internal duct leading from the sperm duct within the aedeagus to the dorsal opening.

The Y-shaped sclerite is a T- or Y-shaped sclerite in floor of dorsal opening, the stalk of the Y or T directed towards basiphallus, the distal part transverse ("T") or broadly V-shaped ("Y") at base of upper lip.

The upper lip (*u.l.*) is the distal part of mid-dorsal wall of distiphallus. In the Oriental species the upper lip is either reduced to a transverse flat shelf not projecting beyond the base of the antlers (e.g., *B. emdeniella, B. pseudovaricolor, B. taksina*), or present as a slightly projecting and flat shelf either with an almost transverse

distal edge (e.g., *B. emarginata*, *B. emarginatoides*, *B. unicolor*), or as a large projecting shelf which is convex above (e.g., *B. inermis*, *B. latro*, *B. varicolor*) or quite flat (e.g., *B. unicolor*, *B. weii*) seen from in front, and almost semicircular in dorsal view. In *B. lyneborgi* it is shaped as a long narrow forwardly and upwardly projecting process. In *B. fani* it is a broad transverse oval structure partly constricted off from the more basal parts of the mid-dorsal wall. Lehrer (2005: 14, fig. 4k) denotes the upper lip as "styles" (in plural, thus believing it to be a paired structure, which it is not) and describes it as follows (p. 15): "De l'intérieur marchent les styles (k), deux tubes de longueurs variables et parfois lourdement d'être observés". It appears that Lehrer has not seen the distiphallus nor the structure he has labelled "k" in his fig. 4 in any other view than profile view. That the upper lip proceeds from "l'intérieur" of the distiphallus and that it in any manner can be construed as bilateral or as tubes is just incorrect.

Guide system. The antlers and the upper lip have a shape that would seem to enable them to guide secretions that emerge from the ejaculatory opening, i.e., sperm and accessory gland secretions. The secretions that pass out of the ejaculatory opening below the upper lip may be led laterally and dorsally to the outside of the upper lip (and lateral to the distal fingers in *B. floccosa*) on to the anterior surface of the grooved antlers. The base of the antler has a strong dorsally projecting tooth in some species (*B. inermis*, *B. latro*, *B. varicolor*, *B. weii*). In some species this tooth is very small or even asymmetrically developed (*B. unicolor*) and even absent in some specimens. The position of the tooth suggests that it forms part of the guiding system.

Perhaps the system works like in other calliphorids: the sperm is delivered first, and the accessory gland secretions led via the guide system to some specific parts of the female genital tract (cf. Merritt 1989; Rognes 1991; Merritt *et al*. 1994).

Female genitalia. The ovipositor has been studied in two species only (*B. emarginata*, *B. lyneborgi*) which I am quite confident have been correctly identified because of their association with males. Usually female material is scarce and cannot be identified as yet with certainty. I have also refrained from dissecting available female material of *B. fani*, *B. latro* and *B. varicolor* because I no longer trust my dissecting skills and might destroy precious material.

A remarkable feature is the pair of large elliptical swellings of the pleural membrane on each side of ST8 (Fig. 213). They are strengthened by pairs of sclerotised ridges. The swellings fill out the emarginations on each side of ST8, which is very narrow at middle in both species (Figs. 211, 214). During copulation it is likely that the underside of the distal part of the surstylus is applied against these balloon-like swellings, and that the tips of the cerci are applied against the anterior end of ST8 (cf. Lewis & Pollock 1975).

No sclerotised structures built to fit the male guide system have been found in the internal female genital tract.

Notes on the Afrotropical species of the *Bengalia peuhi* species-group

***Bengalia floccosa* subgroup**. In the Afrotropical species *B. floccosa* and *B. cuthbertsoni*, on the aedeagus, which I have examined closely (*cuthbertsoni* specimen in ZMUC, cf. Rognes 2006: 468), each dorsolateral wing carries a distal strongly sclerotised projection, here termed the distal finger (Figs 1, 2, 4, *d.f.*), which proceeds forwards on the inside of the base of the antlers. The distal finger is absent from all the Oriental species of the *B. peuhi* species-group, and its presence seems to be a synapomorphy defining an Afrotropical subgroup of the *B. peuhi* species-group, which I here introduce as the *B. floccosa* subgroup, consisting of *B. tibiaria* Villeneuve, 1926, *B. cuthbertsoni*, *B. depressa* Walker, 1858 (= *walkeriana* Lehrer, 2005, **syn. nov.**), *B. floccosa* (= *adrianponti*, *falsimonia* Lehrer, 2005 and *zouloupyga* Lehrer, 2006a, **syn. nov.**), *B. gaillardi* Surcouf & Guyon, 1912 (= *lubana* Lehrer, 2005 and *sanaga* Lehrer, 2005), and *B. roubaudi* Rickenbach, Hamon & Mouchet, 1960. In *B. floccosa* the distal finger projects forwards and curves downwards lateral to the upper lip (Figs. 1, 2, 4, *d.f.*). In *B. cuthbertsoni* each process curves outwards almost horizontally above a broad upper lip from its insertion at the anterior end of the dorsolateral wing. In *B. floccosa* the upper lip is a narrow but flat (from side to side), almost square median structure that is curving downwards above the

ejaculatory opening in lateral view (Figs. 1, 2, 4, *u.l.*). In *B. cuthbertsoni* it is much broader than in *B. floccosa*, horizontal in lateral view and from in front, and semicircular in dorsal view, slightly concave below.

The upper lip and distal finger are clearly recognisable in Lehrer's figures of *B. floccosa* (Lehrer 2005: 14, fig. 4k and j, as *adrianponti*; Lehrer 2005: 27, fig. 8C, as *adrianponti*; Lehrer 2005: 41, fig. 15C, as *falsimonia*; Lehrer 2006a: 6, fig. 3C, as *zouloupyga*), *B. cuthbertsoni* (Lehrer 2005: 32, fig. 11C), *B. gaillardi* (Lehrer 2005: 44, fig. 17C as *gaillardi*; Lehrer 2005: 68, fig. 29C, as *sanaga*; Lehrer 2005: 51, fig 20C, as *lubana*, but not shown very clearly in this drawing), *B. tibiaria* (Lehrer 2005: 74, fig. 32C), *B. depressa* (Lehrer 2005: 77, fig. 33C, as *walkeriana*), and also in *B. roubaudi* (cf. Rickenbach, Hamon & Mouchet 1960: 156, fig. 1; Lehrer 2005: 66, fig. 28C), although the details to the right in Lehrer's figure are not easy to make out.

In all these figures of the profile view of the distiphallus the upper lip is the leftmost process and the distal finger the rightmost one in the lower part of the figures. The distal finger is termed "apophyses terminales du paraphallus" in the legend (Lehrer 2005: 14, fig. 4j) and described as follows (p. 15): "Les parois symétriques du paraphallus forment au bout terminal une apophyse sous forme de stylet (j)".

In profile view of the distiphallus of both *B. cuthbertsoni* (in the ZMUC specimen examined; also Lehrer 2005: 32, fig. 11C) and *B. tibiaria* (Lehrer 2005: 74, fig. 32C) the distal finger is halfway exposed in front of the vertical sclerotisation passing between the lateral edge of the upper lip and the base of the antler. This is not the case in *B. gaillardi*, *B. depressa* or *B. roubaudi* to judge from Lehrer's figures. This fact suggests that *B. cuthbertsoni* may be a junior synonym of *B. tibiaria*, but the matter requires closer attention, for *B. tibiaria* seems to lack a basal tooth according to Lehrer's figure (32C).

The remaining Afrotropical species of the *B. peuhi* species-group lack the distal finger according to Lehrer's (2005) figures.

***Bengalia peuhi* subgroup**. *Bengalia peuhi* Villeneuve, 1914 (= *elgonia* Lehrer, 2005, *olapana* Lehrer, 2005 and *arawakia* Lehrer, 2006a, **syn. nov.**) and *B. minor* Malloch, 1927 seem to form another Afrotropical subgroup of the *B. peuhi* species-group, which I here introduce as the *B. peuhi* subgroup. The genitalia are figured by Lehrer (2005) and Malloch (1927). Both species have a prominent upper lip, a small lateral finger, a rounded anteroventral corner of the external hypophallic lobes, and long thin antlers. The latter are denticulate at the tip in *B. peuhi*.

***Incertae sedis*.** Three remaining Afrotropical species in the *Bengalia peuhi* species-group, i.e., *Kenypyga bantuphalla* Lehrer, 2005, *Shakaniella wyatti* Lehrer, 2005, and *Tsunamia yorubana* Lehrer, 2005, are difficult to evaluate since they are figured only in lateral view. I leave them unplaced until they are better known.

Key to males of the Oriental *Bengalia peuhi* species-group

1 Fronto-orbital plate with 2–3 pairs of proclinate orbital setae, the hindmost pair more or less lateroclinate; distal half of distiphallus enormously prolonged and supported on underside by diverging sclerotised lamellae; distiphallus without dorsolateral wings; inner hypophallic lobes strongly converging midventrally; external hypophallic lobes ending in long sharply pointed ventral fingers; distiphallus with short pointed antlers, with a pair of long delicate denticulate lateral fingers projecting downwards from a shield-like apical dorsal surface, and with a transversely oval upper lip (Figs. 54, 56, 57, 61, 62) ..... 4. *Bengalia fani* Feng & Wei

\- Fronto-orbital plate without proclinate orbital setae (very rare exceptions); distiphallus with or without dorsolateral wings; distal half of distiphallus not prolonged 2

2 Anepimeron with yellow setulae only, no black setulae at all 3

\- At least some black setulae (as few as 2–3, usually many more) on anepimeron 5

3 ST5 flap with lateral edges converging gradually distally, a shallow V-shaped emargination present in distal edge (Fig. 168). Fore tibia with a few strong ventral spine-like setae in proximal half, shorter than tibial diameter (Fig. 186) ..... 13. *Bengalia weii* **sp. nov.**

\- ST5 flap with parallel lateral edges, no or at most a very weak distal emargination (Figs. 71, 146) 4

4 No short ventral spine-like setae in basal half of fore tibia (careful observation needed) (Fig. 177) .....

..... 5. *Bengalia inermis* Malloch

- Fore tibia with at least two strong ventral spine-like setae in basal half, much stronger than the other small spine-like setae (Fig. 183) ..... 11. *Bengalia unicolor* Séguy

5 Upper lip of aedeagus shaped as a long narrow strongly sclerotised pointed and partly upturned process (Figs. 98–100). ST5 flap almost square with rounded distal corners, hind margin usually with a broad depression of varying depth in middle (Fig. 105). Fore tibia with several strong ventral spine-like setae a little above middle, the strongest a little longer than tibial diameter (Fig. 179). Anepimeron with few (up to 10–12) black setulae. Narrow black bands on yellow abdominal tergites. Hind tibial fringe weak .....7. *Bengalia lyneborgi* James

- Upper lip of aedeagus broad or non-projecting, never a narrow pointed tooth-like structure. ST5 flap different 6

6 ST5 flap with an even or almost even, hind border, at most a small nick in the middle part (Figs. 90, 155), never a deep excavation. Fore tibia in basal half with row of small ventral spine-like setae of which the distal ones are slightly longer than the others (Figs. 178, 184, 185). Distiphallus with a strongly projecting upper lip, its anterior edge convex in dorsal view and strongly concave on the underside as seen from in front 7

- ST5 flap with a more or less deep excavation in posterior border (Figs. 12, 15, 19, 23, 35, 37, 38, 40, 42, 50, 116, 127, 136). Fore tibia varied 8

7 ST5 flap as in Fig. 90, concave laterally, proximal half usually a little narrower but sometimes about as broad as distal half, distal margin almost straight or (rarely) slightly sinuous with very broad and very shallow bay at middle. Never a nick in the middle. Mid tibia with weak fringe distally, longest fringe setae on posteroventral side 1.5–2.0x tibial diameter (Fig. 191). Hind tibia strongly fringed on anteroventral side (Fig. 203). Distiphallus with both lateral and ventral fingers strong; anterior end of midventral wall level with anterior end of dorsolateral wings in profile view (Figs. 84, 86, 87, 91, 92) .....6. *Bengalia latro* de Meijere

- ST5 flap as in Fig. 155, concave laterally, much narrower in basal than distal half, posterolateral corners usually rather acute, distal margin slightly convex and usually (but not always) with a small pronounced notch at middle (Fig. 155). No posteroventral fringe distally on mid tibia, setae in this region shorter than diameter of mid tibia (Fig. 197). Hind tibia with a weak *av* fringe (Fig. 209). Distiphallus with lateral and ventral fingers small; anterior end of midventral wall level with middle of dorsolateral wings in profile view (Figs. 149, 150, 152, 156, 157), resembling a strongly receding lower jaw..... 12. *Bengalia varicolor* (Fabricius)

8 Hind tibia with a row of 3–5 long thin setae on anteroventral surface of apical half in addition to the strong *av* seta, but without typical fringe (Figs. 205, 206). Mid tibia also without distal fringe, all setae shorter than tibial diameter (Figs. 193, 194). Fore tibia varied..... 9

- Fringe on hind tibia usually pronounced, with numerous setae beside the *av* row, also invading the *v* and *pv* side (Figs. 199, 200, 207). Mid tibia varied. Fore tibia proximally with a ventral row of very small equally sized spine-like setae (Figs. 173–175, 182) 10

9 Fore tibia without spine-like setae proximally on ventral side (Fig. 180). ST5 flap with slightly convex lateral edges (Fig. 116). Strikingly narrow frons. Anepimeron almost entirely with black setulae, many reaching katepisternum, a few yellow setulae in lower hind part only. Aedeagus with no projecting upper lip (Fig. 109). [Aedeagus very similar to that of *Bengalia taksina*] ..... 8. *Bengalia pseudovaricolor* Kurahashi & Tumrasvin, 1979

- Fore tibia with two rather long spine-like setae a little shorter than tibial diameter proximally on ventral side (Fig. 181). ST5 flap with concave lateral edges (Fig. 127). Anepimeron mostly clothed with yellow setulae, a small bundle of black setulae (3–15) on upper part just below lesser ampulla. Aedeagus with projecting upper lip (Figs. 119, 122) .....9. *Bengalia surcoufi* Senior-White

10 Anepimeron with numerous black setulae almost all over posterior half, some small black setulae reaching katepisternum. Strongly developed fringes on all tibiae (Figs. 173, 174, 187, 199). ST5 flap with distal emargination of varying depth (Figs. 12, 35, 40). Distiphallus distally in dorsal view with a broad projecting transverse lip (Figs. 6, 26) 11

- Anepimeron with a small bundle of black setulae in upper third or half, no black setulae reaching katepisternum. Fringes on tibiae usually less strongly developed. ST5 flap elongate with deep distal excavation and diverging, slightly convex sides (Figs. 50, 136). Distiphallus without projecting upper lip (Figs. 47, 130)..... 12

11 ST5 flap rounded with a rounded distal emargination; distally on each side a small but conspicuous concavity (Figs. 12, 15, 19, 23) which is somewhat depressed below the remaining surface of the flap, like a broad gutter. Upper lip of distiphallus transverse in dorsal view (Fig. 6). Outer edge of upper lip slightly inside of base of antlers as seen in anterior view (Fig. 14). Upper part of anterior edge of vertical sclerotised sheet serrated and right-angled in profile view (Fig. 8). Edge connecting lip and base of antler strongly curved in lateral view (Fig. 9) .....
..... 1. *Bengalia emarginata* Malloch

- ST5 flap more elongate with rounded sides and with a variably sized distal emargination (Figs. 35, 37, 38, 40, 42); no concavity distally on each side and no edge area depressed below general flap surface on distal half of the external side, latter evenly rounded. Upper lip of distiphallus very slightly convex in dorsal view (Fig. 26). Outer edge of upper lip outside of base of antlers as seen in anterior view (Fig. 34). Anterior edge of vertical sclerotised sheet a straight serrated line in profile view (Fig. 33). Edge connecting lip and base of antler straight in lateral view (Fig. 28) ..... 2. *Bengalia emarginatoides* **sp. nov.**

12 Aedeagus with parastomal sclerites curving forwards in profile view (concavity towards distal end), and with a forward projection at middle (Fig. 132). Frons narrow. Mid tibia without prolonged posteroventral setae in distal part (Fig. 195). Fringe on hind tibia not very dense, covering slightly more than distal half of anteroventral surface, hardly invading ventral and posteroventral surface, the posteroventral fringe setae hardly longer than tibial diameter (Fig. 207) .....10. *Bengalia taksina* (Lehrer)

- Aedeagus with parastomal sclerites curving downwards in profile view (concavity towards ventral side) (Fig. 47). Mid tibia with somewhat prolonged posteroventral setae in distal part, twice the diameter of tibia (Fig. 188). Fringe on hind tibia rather dense (Fig. 200), situated on distal two-thirds or more of anteroventral surface, prominent also on ventral and posteroventral surface, the posteroventral fringe setae twice the tibial diameter or more..... .....3. *Bengalia emdeniella* (Lehrer)

1. *Bengalia emarginata* Malloch, 1927

Figs. 6–25, 173, 187, 199, 211–213.

Holotype male, Singapore (BMNH), by original designation. For details see Type material below.

Bengalia latro: Bezzi, 1913: 78. Misidentification, not *latro* de Meijere. Taiwan (Tainan). Examined.

Note. Bezzi wrote about *latro*: "Ich rechne zu dieser javanischen Art einige Exemplare aus Tainan, Formosa (H. Sauter) in der Sammlung des Herrn Dr. J. Escher-Kündig aus Zürich …". This refers to two males in ETHZ which I have examined, see below under Material examined. Malloch (1927: 414) received one of the specimens from Bezzi subsequent to the publication of Bezzi's paper and thought it was the same as his own *emarginata*.

Bengalia latro: Surcouf, 1920: 39. Misidentification, not *latro* de Meijere. A male identified as *latro* by Surcouf has been examined (see Note). Taiwan (Toyenmongai).

Note. A specimen in MSNM which also served as holotype for the nominal species *Afridigalia bezziella* Lehrer, 2005 (given an entry below), carries a handwritten determination label (with three ruled lines inside a black frame) reading "Bengalia latro / De Meijere" (Fig. 24) which very likely is written by Surcouf. I think this is a specimen that was before Surcouf (1920: 39), singly or with others, when he referred to and described some features of a species he named "*B. latro*". It has the same type of label and the same handwriting as on Bezzi's specimen of *Bengalia bezzii* from Trichinopoly, which Surcouf compared with the type of *Musca varicolor* (see annotations to the synonymy of *Bengalia varicolor* below).

This specimen, possibly originally part of the MNHN collections, may have been given to Bezzi from Surcouf as a return favour for letting him study Bezzi's collection for his "Muscidæ testaceæ" studies.

There is no evidence that Surcouf (1920) studied type material of *latro* de Meijere (he did not mention RMNH or ZMAN among the collections he had access to). But he studied material in MNHN and it is possible that his determinations are the basis for the arrangement in the MNHN collections. Four of six specimens still in MNHN under "*latro*" belong to *emarginata*, the other two to *emarginatoides*; none of these specimens carry any label written by Surcouf, however. See entry under Séguy (1946) below.

For more details on the communication between Bezzi and Surcouf, see entry for Bezzi (1913) in the synonymy of *Bengalia varicolor*, below.

Bengalia emarginata Malloch, 1927: 412, fig. 15 (ST5 flap). Holotype male, by original designation, Singapore (BMNH). Examined.

Bengalia latro: Hennig, 1941: 180. Misidentification, not *latro* de Meijere. Taiwan. Examined.

Bengalia varicolor: Hennig, 1941: 80 (in part; but see also treatment of *Bengalia varicolor* below). Misidentification, not *varicolor* Fabricius. Taiwan. Examined.

Bengalia latro: Séguy, 1946: 83. Misidentification, not *latro* de Meijere. Taiwan, Laos. Examined.

Note. Kurahashi & Chowanadisai (2001: 201) assumed, by putting Séguy's *latro* reference in their synonymy of *bezzii*, that Séguy's specimens were actually *bezzii*, but that is an error. I have examined all six "*latro*" specimens present in MNHN, and none are *bezzii* (and none are *latro* de Meijere). One male and 2 females from Taiwan and 1 male from Laos (both localities published by Séguy 1946) belong to *emarginata* Malloch, whereas 2 males from Sri Lanka (not published by Séguy 1946) belong to *emarginatoides*; see treatment of that species, below.

Bengalia emarginata: Fan, 1965: 193, fig. 750. China (Fujian, Guangxi, Hainan).

Bengalia emarginata: James, 1977: 530. Catalogue entry as [erroneous] synonym under *Bengalia varicolor* (Fabricius).
Bengalia emarginata: Tumrasvin *et al*., 1979: 259, Plate 1 fig. 1 (ST5 flap), Plate 2 fig. 17 (aedeagus in profile), Plate 3 fig. 27 (cerci, surstyli, epandrium in profile), Plate 4 fig. 39 (cerci, surstyli, dorsal view). Thailand.
Bengalia emarginata: Fan, 1992: 532, fig. 1109i. China (Fujian, Guangxi, Hainan).
Bengalia emarginata: Kurahashi & Thapa, 1994: 217, fig. 8b (ST5 flap). Nepal.
Bengalia emarginata: Fan, 1997: 452, fig. 140i. China (Fujian, Guangdong, Guangxi, Hainan).
Bengalia emarginata: Feng *et al*., 1998: 1378, fig. 2818Jv (ST5 flap). China (Fujian, Guangxi, Hainan, Yunnan), Taiwan.
Bengalia emarginata: Kurahashi & Chowanadisai, 2001: 202. Laos, Vietnam.
Afridigalia bezziella Lehrer, 2005: 29. Holotype male, by original designation, Taiwan (Toyenmongai) (MSNM). Examined. **Syn. nov.**
Note. ST5 flap (fig. 10A) with small concavity and shallow gutter in distal half of both lateral edges**.**
Bengalia emarginata: Verves, 2005: 238. Catalogue entry.
Afridigalia bezziella: Lehrer, 2006a: 7. Taiwan.
Afridigalia emarginata: Lehrer 2006a: 7. Specimen from Taiwan only**.** Examined.
Bengalia emarginata: Heo *et al*., 2008: 263. Malaysia (Malaya). Not examined.

Diagnosis. *Male*. Length 12–14mm. Frons at vertex / head width ratio: 0.325–0.342 (mean 0.333, n=6). Fronto-orbital plate without proclinate orbital setae. Lunula setose in most specimens. Anepimeron with numerous black setulae on almost all of upper half, a few black setulae reaching katepisternum. Fore tibia in basal half with a ventral row of even and very short spine-like setae (Fig. 173). Mid tibia with a prominent *pv* fringe distally, its longest setae about 3x as long as tibial diameter. Hind tibia with dense fringe of long thin setae on *av*, *v* and *pv* side occupying almost the whole length of the tibia, except for the basal 1/5.

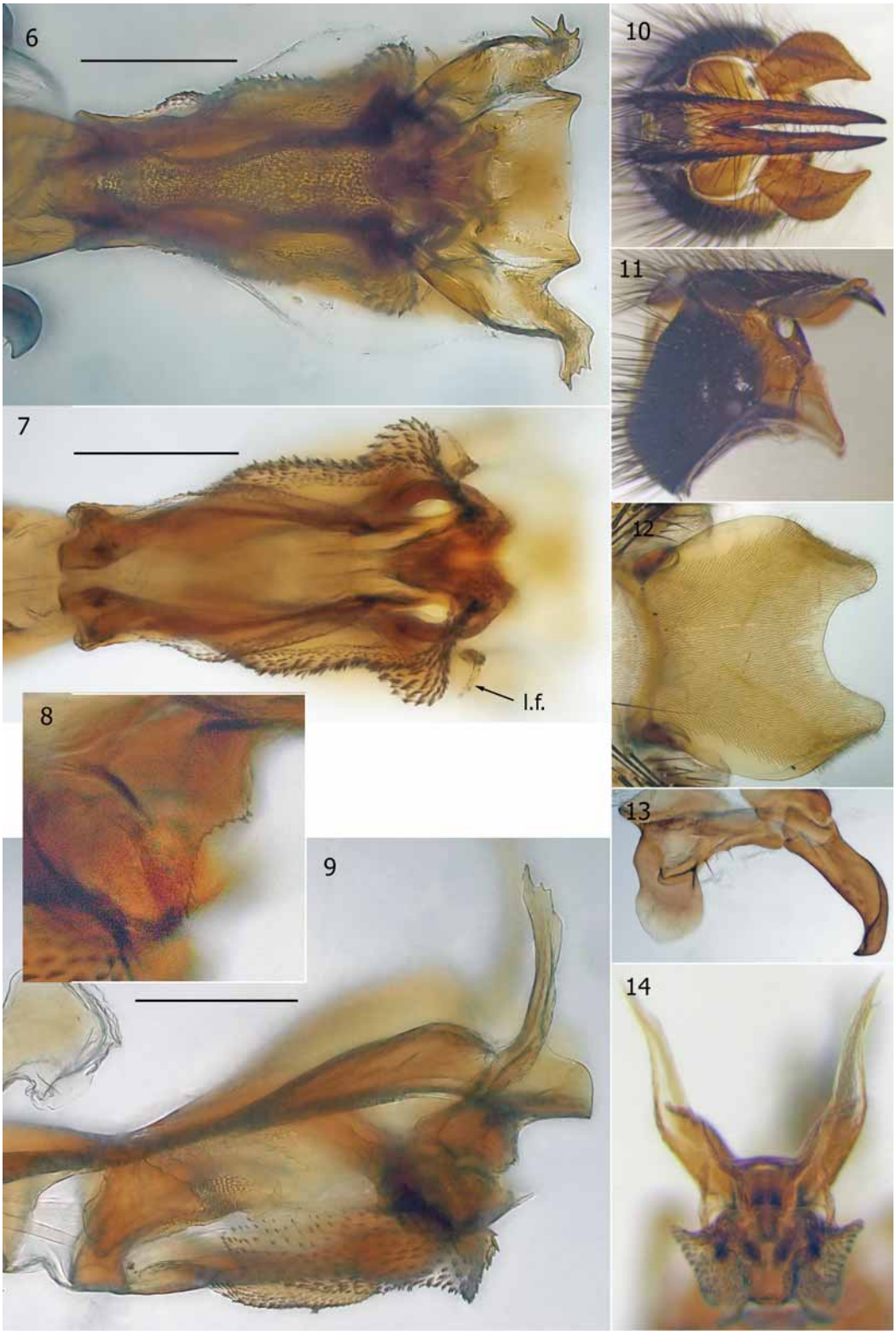
ST5 flap (Figs. 12, 15, 19, 23) with rounded outline, slightly broader than long, with a distal emargination and small concavities on the distal half of the lateral margins. The latter bent downwards to some extent, forming a kind of shallow gutter on each side, and best observed edge-on. The gutter is more densely microtrichiose than the remainder of the flap.

Cerci broad and strong in dorsal aspect, curved distally in lateral view. Lateral edge straight in dorsal view, with no narrowing at the junction of the basal (fused) and distal (free) parts (Fig. 10). [In *B. emarginatoides* the cerci are conspicuously narrowed in this region and the distal parts much narrower.] Surstylus without vestiture below. Process of bacilliform sclerite with a base about as long as the free upturned point (Fig. 11) [in *B. emarginatoides* with a longer base than point (Fig. 31)].

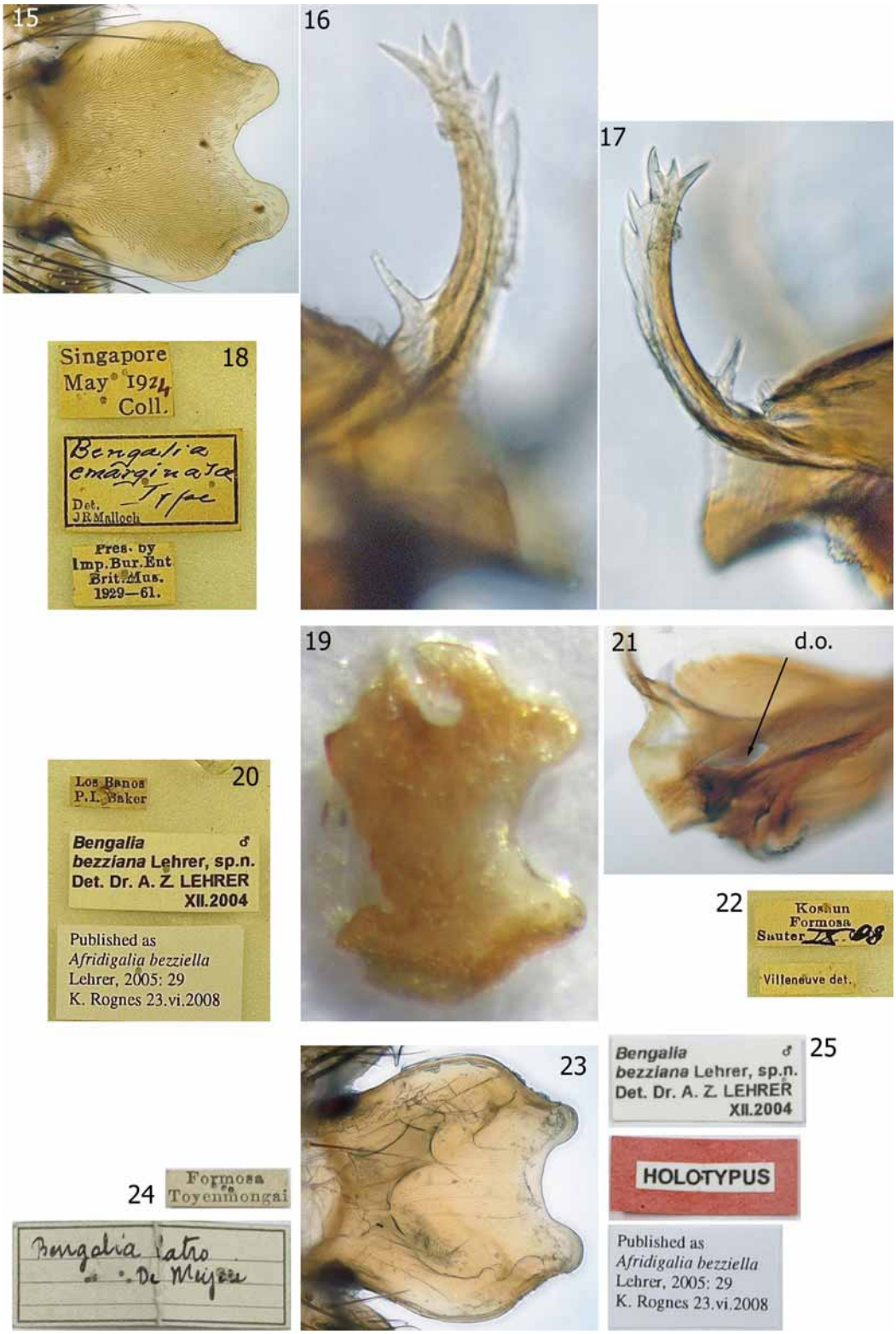
Distiphallus with prominent dorsolateral wings. Antlers very narrow and directed dorsally, with 2–6 points at tip. Basal tooth present or absent (Figs. 9, 16, 17). In dorsal view the upper lip is projecting beyond the base of the antlers and its distal edge transverse. The lip is flat as seen from in front, and narrower than or equal to distance between bases of antlers (Figs. 6, 14). [In *B. emarginatoides* the lip is much broader and its lateral ends are lateral to the antler bases (Figs. 26, 34).] In profile view the lateral wall of the upper lip at its junction with the base of the antler has an almost vertical anterior border and an angular upper corner (Fig. 9). [In *B. emarginatoides* the corresponding area is different, the lateral wall of the upper lip being evenly oblique.] Lateral finger very small and tiny, in ventral view of distiphallus not passing beyond the lateral-most parts of the folded distal part of the external hypophallic lobe (Fig. 7, *l.f.*). Anterior edge of vertical sclerotised sheet with a right-angled serrated protrusion a little above lateral finger (Fig. 8). [In *B. emarginatoides* the anterior edge is serrated but not produced into a right angle, rather quite even all the way to the lateral finger (Fig. 33).] Internal hypophallic lobes slightly converging towards anterior end. External hypophallic lobe folded distally and here produced ventrally into a spatulate ventral finger curving downwards and forwards towards the midline.

Female. Length 13–15mm (n=5). Frons at vertex / head width ratio: 0.338–0.350 (mean 0.344, n=5). 1–2 pairs of proclinate orbital setae. Anepimeron with numerous black setulae in upper part, a few black setulae among yellow ones reaching katepisternum. ST2 long, with a pair of strong marginal spine-like setae; ST3 very short and even broader than ST2, with a row of about 4 short strong marginal spine-like setae though of somewhat variable strength; ST4 still broad, but longer than ST3 and with row of 4–6 strong marginal spine-like setae; ST5 triangular, about as broad as long, blunt distally, and usually with a pair of spine-like setae near tip (Fig. 212). Ovipositor as in Figs. 211, 213.

Distribution. China (Fujian, Guangdong, Guangxi, Guizhou, Hainan, Yunnan), Laos, Malaysia, Nepal, Philippines, Singapore, Taiwan, Thailand, Vietnam.



FIGURES 6–14. *Bengalia emarginata* Malloch, male (from specimen labelled "Koshun, Formosa, Sauter IX 08" in SDEI). **6**. Distiphallus, dorsal view. **7**. Distiphallus, ventral view. **8**. Anterior edge of vertical sclerotised sheet, showing angular shape and serrations. **9**. Distiphallus, left lateral view. **10**. Cerci and surstyli, dorsal view. **11**. Cerci and surstyli, left lateral view. **12**. ST5 flap. **13**. Pre- and postgonites. **14**. Distiphallus from in front. Scale = 0.25mm (Figures 6, 7, 9). Abbreviation: *l.f.* = lateral finger.



FIGURES 15–25. *Bengalia emarginata* Malloch, male (15–18 from holotype in BMNH; 19, 20 from specimen labelled "Los Banos / P.I. Baker" in MSNM; 21, 22 from specimen labelled "Koshun, Formosa, Sauter IX. 08" in SDEI; 23–25 from holotype of *Afridigalia bezziella* Lehrer in BMNH). **15**. ST5 flap. **16**. Left antler. **17**. Right antler. **18**. Labels. **19**. ST5 flap. **20**. Labels (three, original on top). **21**. Distiphallus, oblique view from right, showing dorsal opening. **22**. Original labels (two). **23**. ST5 flap. **24**. Original labels (two). **25**. Labels (three). Abbreviation: *d.o*. = dorsal opening.

Material examined. Type material. *Bengalia emarginata* Malloch, 1927. **Holotype** male, in BMNH, labelled: (1) "Holo- / type" [printed on circular label with red margin]; (2) "Singapore / May 1924 / Coll." [printed, except "24" which is handwritten]; (3) "Bengalia / emarginata / Type / Det. / J.R.Malloch" [handwritten except two last lines; label framed with black line]; (4) "Pres. By / Imp.Bur.Ent / Brit. Mus. / 1929 – 61" [printed, label with text facing down]; (5) "Abdomen and dissected / genitalia on separate pin / K. Rognes 3.vii.2008" [printed] (Fig. 18). Right hind leg loose in box at reception, accident with left hind tibia. Both glued on to the plastic stage carrying the specimen. Dissected by K. R. Abdominal T1–5 glued to card on separate pin, genitalia in glycerol in glass vial on this second pin. Second pin labelled "HOLOTYPE / Singapore May 1924 / Bengalia emarginata / Malloch, 1927 / Abdomen dissected by / K. Rognes 3.vii.2008" [printed]. The ST5 flap (Fig. 15) is clearly shaped as the one figured by Lehrer for his *bezziella* (Lehrer, 2005: 31, fig. 10A). Distally on the lateral edge there is a small concavity, as seen directly from above, which is shaped like a slight depression (shallow gutter), as seen directly from the side or from in front edge-on, and which has a large amount of microtrichiae. Lehrer, who did not study the type of *emarginata*, must have been misled by Malloch's inaccurate drawing of the ST5 flap (Malloch, 1927: fig. 15), which shows a completely even lateral edge. Lehrer therefore has re-described Malloch's *emarginata* as *bezziella* Lehrer and misidentified specimens of *emarginatoides* as *emarginata* (see below). In the aedeagus both antlers of the holotype have a small tooth at base, and five tags at the tip (Figs. 16, 17), the left antler also with a suggestion of a sixth tag. The anterior serrated edge of vertical sclerotised sheet angulated (Fig. 17, lower right).

Afridigalia bezziella Lehrer, 2005. **Holotype** male, in MSNM, labelled: (1) "Formosa / Toyenmongai"; (2) "Bengalia latro / De Meijere" [black-rimmed label with three thin ruled black lines in Surcouf's handwriting]; (3) "latro" [printed museum label]; (4) "*Bengalia* ♂ / *bezziana* [sic] Lehrer, sp.n. / Det. Dr. A. Z. LEHRER / XII.2004" [printed]; (5) "*Bengalia* ♂ / *bezziana* [sic] Lehrer, sp.n. / Det. Dr. A. Z. LEHRER / XII.2004" [printed]; (6) "HOLOTYPUS" [black print on white label, latter glued to larger red label]; (7) "Published as / *Afridigalia bezziella* / Lehrer, 2005: 29 / K. Rognes 23.vi.2008" [printed] (Figs. 24, 25); (8) My determination label (*emarginata* Malloch). Dissected by Lehrer. I have transferred the genital parts in glycerol from original large opaque plastic vial to a glass microvial pinned below the specimen. The specimen was partly destroyed in the mail at reception (but not the genitalia in the plastic vial). I have glued the wings, abdomen and both fore legs (without tarsi), one mid leg (without tarsus) and one hind leg to a card on a separate pin labelled "From holotype of / *Afridigalia bezziella* Lehrer, 2005 / Labelled as / *Bengalia bezziana* Lehrer n. sp. / Crushed in accident in mail / K. Rognes 23.vi.2008". In the aedeagus the right antler is broken midway but the left is intact (figured by Lehrer). The genitalia are embedded in glycerol jelly which has not dissolved in glycerol and which creates lines and artifacts in the microscope. The ST5 flap (Fig. 23) and other genital features clearly identifies the holotype as conspecific with the holotype of *Bengalia emarginata* Malloch.

Other material. BMNH: 1 male labelled (1) "Formosa I / Sauter Rlle" [black ink handwriting]; (2) "det. Baranoff" [printed]; (3) "coll. Oldenberg" [print]; (4) "Bengalia / varicolor / Fbr." [blue ink handwriting]; (5) "In exchange / Deuts. Ent. Inst. / B.M.1939-70" [printed]; (6) "*Afridigalia* ♂ / *emarginata* (Malloch) / Det. Dr. A. Z. LEHRER / 2004" [print]; (7) "*Afridigalia* ♂ / *emarginata* (Malloch) / Det. Dr. A. Z. LEHRER / 2004" [print]; (8) My determination label (*emarginata* Malloch). "Rlle" must be same as Rolle in "gekft von Rolle" see below under specimens from ETHZ. I have transferred the genital capsule plus the ST5 and ST5 flap to a glass microvial. In the distiphallus both antlers are lost and on the right side the loss of the antler also involves the vertical sclerotised sheet so that its anterior border is absent. On the left side this sheet is visible. The upper lip and its sidewalls are also intact. This specimen has been published by Lehrer (2006a: 7) as "*Afridigalia emarginata*", but Lehrer's concept of this nominal species = *emarginatoides* sp. nov. He listed it together with material of the latter species from "Ceylan" and "Inde". However, the specimen does not belong to *emarginatoides* but is a typical true *emarginata* Malloch (= *bezziella* Lehrer), as indicated by the broad cerci, the right-angled denticulate anterior border of the vertical sclerotised sheet, by the upper lip being narrower than distance between base of antlers, and the shape of the ST5 flap, which is identical with all the SDEI specimens cited below. Lehrer (2006a: 7) reports another specimen from Taiwan in BMNH, apparently

with almost identical original labels, which he has identified as *Afridigalia bezziella* Lehrer (= *B. emarginata* Malloch), probably correctly, since it fits in with the known distribution of this species. I have not seen that specimen. **CDPCAG**: 1 male labelled (1) "Center for Disease Prevention and Control, Anshun City, Guizhou, China / Laogaocun Village, Guanling County, Guizhou, 700m / coll. Wei Lianmeng *et al*. leg / 20 March 2008" [In Chinese]; (2) "C068 … [Chinese name for *B. emarginata*] / *Bengalia emarginata* / Malloch, / 1927 ♂" [male symbol in red]; (3) My determination label (*emarginata* Malloch). Dissected by Wei Lianmeng, genitalia in alcohol in plastic vessel with lid, numbered "108". **ETHZ**: 1 male labelled (1) "Tainan / Formosa" [handwritten on white paper with blue crossed lines 5mm apart]; (2) "Bengalia / latro / ♂ Meij." [handwritten on old brown paper]; (3) upper side: "Bengalia / latro / ♂ Meig. [sic]" [handwritten on same type of paper as label no. 1]; reverse side: "13230?" [handwritten in pencil, referring to number in the museum journal for the Escher-Kündig collection]; (4) My determination label (*emarginata* Malloch). • 1 male labelled (1) "Tainan / Formosa" [handwritten on white paper with printed blue crossed lines 5mm apart]; (2) "Bengalia / latro / ♂ Meig. [sic]" [handwritten on same type of paper as label no. 1]; (3) "13231" [handwritten in ink on small label, typical of specimens in the Escher-Kündig collection, referring to number in the museum journal for this collection]; (4) My determination label (*emarginata* Malloch). Dissected by K. R. According to the ETHZ museum journal both specimens were bought from a person named Rolle ("gekft von Rolle"; cf. entry page for 1912 / 9, reference nos. 13230 and 13231, in museum journal). The specimens are obviously the ones Bezzi (1913: 78) wrote about under *Bengalia latro*: "Ich rechne zu dieser javanischen Art einige Exemplare aus Tainan, Formosa (H. Sauter) in der Sammlung des Herrn Dr. J. Escher-Kündig aus Zürich …". **MNHN**: 1 male labelled (1) "LAOS / Na Leu [handwritten] / le 17-III 1918 [handwritten, except "le" and "191"] / R. Vitalis de Salvaza [printed]"; (2) My determination label (*emarginata* Malloch). The specimen has been dissected by K. R. and carries one leg and the abdominal tergites glued to a card below the specimen. The genitalia are kept in a glass microvial pinned below the card. • 1 male labelled (1) "Formosa / Sauter" [printed]; (2) "Kosempo / 908. II" [printed, except "II" which is handwritten]; (3) "Bengalia / latro / de Meijere" [handwritten]; (4) "J. VILLENEUVE det." [printed]; (5) My determination label (*emarginata* Malloch). • 1 female labelled (1) "Formosa / Sauter" [printed]; (2) "Polisha / 908. III." [printed]; (3) "J. VILLENEUVE det." [printed]; (4) My determination label (*emarginata* Malloch). 2 pairs of proclinate orbitals. • 1 female labelled (1) "MUSEUM PARIS [printed] / Formose [handwritten] / Coll. E. SÉGUY 1919" [printed]; (2) My determination label (*emarginata* Malloch). 1 pair of proclinate orbitals. **MSNM**: 1 male labelled (1) "Los Banos / P.I.Baker"; (2) "*Bengalia* ♂ / *bezziana* [sic] Lehrer, sp. n./ Det. Dr. A. Z. LEHRER / XII.2004"; (3) "Published as / *Afridigalia bezziella* / Lehrer, 2005: 29 / K. Rognes 23.vi.2008" (Figs. 19, 20); (4) My determination label (*emarginata* Malloch). "P. I. Baker" translates to: Philippine Islands, Baker leg. Specimen has been dissected and published by Lehrer (2005: 30), as *Afridigalia bezziella*. Both fore tarsi, left mid leg, right hind leg and four distal tarsomeres of left hind leg are lost. All abdominal tergites are *in situ*. The main part of the ST5 flap is glued to a piece of card on the pin (Fig. 19). Other genital parts in glycerol have been transferred by K. R. from original big plastic vial to glass vial on pin. Antlers of aedeagus are broken at base, but aedeagal upper lip, other genital features (e.g., narrow antlers) and shape of ST5 flap (Fig. 19) are clearly identifiable as belonging to the species *Bengalia emarginata* Malloch**.** First record from the Philippines. **SDEI** (most of the specimens have previously been published by Hennig (1941) as *latro* and / or *varicolor*, and all have been given my determination label (*emarginata* Malloch): 1 male labelled (1) "Anping / Formosa / H. Sauter V. 12" [printed, except "V. 12" which is handwritten]. • 1 female labelled (1) "Chip-Chip / Formosa / H. Sauter 09" [printed, except "09" which is handwritten]; (2) "Villeneuve det." [printed]. • 1 female labelled (1) "Formosa / Sauter" [handwritten]; (2) "coll. Oldenberg" [printed]; (3) "det. Baranoff" [printed]; (4) "Bengalia / varicolor / Fabr." [handwritten]. • 4 females labelled (1) "Formosa I / Sauter" [handwritten]; (2) "coll. Oldenberg" [printed]; (3) "det. Baranoff" [printed]; (4) "Bengalia / varicolor / Fabr." [handwritten]. • 1 male labelled (1) "Fuhosho / Formosa / H. Sauter / VII 09" [printed, except "VII 09" which is handwritten]; (2) "Bengalia / latro de Meij. / Villeneuve det." [handwritten, except "Villeneuve det."]. Dissected by K. R. Abdominal T1–5 glued to card on pin, genitalia in glycerol in vial on pin. I had an accident with the head, it is now glued to same card as the abdomen. • 1 male labelled (1)

"Fuhosho / Formosa / H. Sauter / VII 09" [printed, except "VII 09" which is handwritten]; (2) "Villeneuve det." [printed]. • 1 male labelled (1) "Fuhosho / Formosa / H. Sauter / VII 09" [printed, except "VII 09" which is handwritten]. • 1 female labelled (1) "Fuhosho / Formosa / H. Sauter / VII 09" [printed, except "VII 09" which is handwritten]; (2) "Villeneuve det." [printed]. • 1 male labelled (1) "Gebiet des Sh'sha /stammes (Formosa) / H. Sauter V.-VI.1912" [printed]; (2) "Townsend det." [printed]. • 1 male labelled (1) "Kankau (Formosa) / H. Sauter / VII."; (2) "coll. Oldenberg" [printed]; (3) "Townsend det." [printed]. • 1 male labelled (1) "Kankau (Formosa) / H. Sauter / VII."; (2) "Townsend det." [printed]. • 1 male labelled (1) "Kankau (Koshun) / Formosa / H. Sauter / V.1912" [printed; "V" is handwritten, the original printed "IV" is crossed out]; (2) "coll. Oldenberg" [printed]; (3) "Townsend det." [printed]; (4) "Bengalia / latro Meij." [handwritten]. • 1 male labelled (1) "Kankau (Koshun) / Formosa / H. Sauter … 1912" [printed, "IV" crossed out]; (2) "7.VII." [printed]; (3) "Townsend det." [printed]; (4) "Bengalia / latro Mj. ♂ / Det CHTT" [handwritten, except last line which is printed]. • 4 males labelled (1) "Kankau (Koshun) / Formosa / H. Sauter … 1912" [printed, "V" crossed out]; (2) "7.VII." [printed]; (3) "Townsend det." [printed]. • 1 male labelled (1) "Kankau (Koshun) / Formosa / H. Sauter … 1912" [printed, "V" crossed out]; (2) "7.VII." [printed]. • 1 female labelled (1) "Kankau (Koshun) / Formosa / H. Sauter 1912" [printed]; (2) "7.VII." [printed]; (3) "Bengalia / latro Mj. ♀ / Det CHTT" [handwritten, except last line which is printed]. • 1 female labelled (1) "Kankau (Koshun) / Formosa / H. Sauter 1912" [printed]; (2) "7.VII." [printed]; (3) "Townsend det." [printed]. • 1 female labelled (1) "Kankau (Formosa) / H. Sauter VII. 1912" [printed]; "coll. Oldenberg" [printed]; "det. Baranoff" [printed]; (4) "Bengalia / varicolor / Fabr." [handwritten]. • 1 female labelled (1) "Kanshirei / Formosa / H. Sauter VIII 08" [printed, except "VIII 08" which is handwritten]; (2) "Villeneuve det." [printed]. • 1 female labelled (1) "Kosempo / Formosa / Sauter XI 08" [printed, except "XI 08" which is handwritten]; (2) "Villeneuve det." [printed]. • 1 female labelled (1) "Kosempo / Formosa / Sauter VII 09" [printed, except "VII" which is handwritten]; (2) "Villeneuve det." [printed]. • 1 male labelled (1) "Kosempo / Formosa / H. Sauter V.12" [printed, except "V.12" which is handwritten]; (2) Red label with handwritten "Tachin" on upper side, handwritten "Muscidae" (crossed out) on reverse side; (3) "Townsend det." [printed]. • 1 male labelled (1) "Koshun / Formosa / Sauter IX. 08" [printed, except "IX. 08" which is handwritten]; (2) "Villeneuve det." [printed]. Dissected by K. R. (Figs. 21, 22). T1–5 glued to card on pin, dissected parts in glycerol in glass vial on pin. • 1 female labelled (1) "Koshun / Formosa / Sauter VII 08" [printed, except "VII 08" which is handwritten]; (2) "Bengalia / latro Meij. / Villeneuve det. [handwritten, but not by Villeneuve ?]. • 2 females labelled (1) "Koshun / Formosa / Sauter VII 08" [printed, except "VII 08" which is handwritten]; (2) "Villeneuve det." [printed]. • 1 male labelled (1) "Sokutsu / Formosa / H. Sauter VI 1912" [printed, except "I" in "VI" which is handwritten]; (2) "Townsend det." [printed]. • 1 female labelled (1) "Sokutsu / Formosa / H. Sauter VI 1912" [printed, except "I" in "VI" which is handwritten]; (2) "Townsend det." [printed]. • 1 female labelled (1) "Sokutsu / Formosa / H. Sauter VI 1912" [printed, except "I" in "VI" which is handwritten]; (2) "det. Baranoff" [printed]; (3) "Bengalia / varicolor / Fabr." [handwritten]. • 1 male labelled (1) "IX Taihorinsho / Formosa / H. Sauter 09" [printed, except "IX" and "09" which are handwritten]; (2) "Villeneuve det." [printed]. • 1 female labelled (1) "Taihorinsho / Formosa / H. Sauter XI 10" [printed, except "XI 10" which is handwritten]; (2) "Bengalia / latro / de Meij." [handwritten in Villeneuve's hand]; (3) "Villeneuve det." [printed]; (4) "G. pr. 406 / 16.v.2008 / K. Rognes". Dissected by K. R. Abdominal T1–5 glued to card on pin; spermathecae and common oviduct in glycerol in vial on pin, ST1–5 and ovipositor on microscope slide no. 406. • 2 females labelled (1) "Tappani / Formosa / H. Sauter XI. 09" [printed, except "XI. 09" which is handwritten]; (2) "Villeneuve det." [printed]. **SMNS**: 1 male and 1 female labelled (1) "Tainan / Formosa" [handwritten]; (2) "Bengalia / latro de Meij." [Villeneuve's handwriting]; (3) "Sammlung / E. Engel" [printed on reverse side of label]; (4) My determination label (*emarginata* Malloch). This male has the genitalia exerted. • 1 male labelled (1) "Tainan / Formosa" [handwritten]; (2) "Bengalia / latro de Meij. / det. D^{r}. Villeneuve" [Villeneuve's handwriting, except last line which is printed]; (3) "Sammlung / E. Engel" [printed on reverse side of label]; (4) My determination label (*emarginata* Malloch). This male is undissected.

2. *Bengalia emarginatoides* sp. nov.
Figs. 26–43, 174.

Holotype male, Sri Lanka (SDEI), here designated. For details see Type material below.

Bengalia latro: Senior-White, 1923a: 307, Plate IX. Misidentification, not *latro* de Meijere. Sri Lanka ("…jungle area of Ceylon, …Colombo …").

Note. Senior-White (1923a) mentions and keys four species with discal setae on T5, i.e., his new species *bezzii* and *surcoufi* and "*latro*" de Meijere and "*varicolor*" Fabricius, and illustrates the ST5 flap for all except "*varicolor*". He says he was unable to recognise the latter and refrained "from bringing *latro* under it, though I am of the opinion that such will ultimately prove to be the case". He figures the genitalia of a species he identified as "*latro*", most likely on the basis of one of the specimens from "the jungle area of Ceylon" in his own collection. The illustration of the ST5 flap shows a rather deep excavation of the hind border. He keys "*latro*" as having the hind tibia "shaggily fringed", as opposed to *bezzii* and *surcoufi* which were "not shaggily fringed". In fact, *emarginatoides* has a very densely fringed hind tibia, similar to the one illustrated for *emarginata* (Fig. 199), compared to *bezzii* (Fig. 209, now = *varicolor* Fabricius) and *surcoufi* (Fig. 206).

Bengalia varicolor: Senior-White, 1923b: 37. Misidentification, not *varicolor* Fabricius. India (Kerala, "… mile 10—14, Cochin Forest Tramway …").

Note. Senior-White's record here is of a female (in the "Calcutta collection") which "… is almost certainly this species. I still await the discovery of a ♂ indubitably of this species to discover whether de Meijere's *latro* is valid or merely a colour variety of the Fabrician species" (Senior-White 1923b: 37). Not seen.

Bengalia latro: Senior-White, 1923b: 37. Misidentification, not *latro* de Meijere. India (Kerala, "Parambikulam (Cochin)").

Note. Senior-White's record here is of "… 1♂ 2♀ from Parambikulam (Cochin) …". I have not seen this material (in the "Calcutta collection"), but since he gives data on his recently described species *surcoufi* and *bezzii*, both listed on the same page, it very likely belongs to *emarginatoides* [not present in BMNH, Nigel Wyatt, pers. comm., February 2009].

Bengalia varicolor: Senior-White, 1924: 106. Misidentification, not *varicolor* Fabricius. Sri Lanka.

Note. Senior-White (1924: 106) writes concerning "**Bengalia varicolor** F": "The discovery of an indubitable ♂ of this species enables me to sink de Meijere's *latro* here, the genitalia proving to be identical. The National Collection contains, a ♂ from Kandy, vi.02, (Green); … A ♂ from India, (Bombay N.H.S.); has the abdomen all yellowish." In the next sentence he mentions three females from "Los Banos, Philippines, 1913, (Baker)…".

It is not clear from the text which of the two males (Kandy or Bombay) he considers to be an "indubitable" male of *varicolor*. However, the Kandy male (now in BMNH) which I have examined, carries a label reading: "Bengalia varicolor / F. (= latro Meij.) / R. SW det. 1923." [handwritten by Senior-White in pencil] (Fig. 43), and, since it has a rather deep excavation in the hind border of the ST5 flap (Fig. 42), I take this to indicate that this is the very specimen that induced him to propose the (erroneous) synonymy. It is a specimen of *emarginatoides*. For more details on this specimen, see below under paratypes in BMNH.

Bengalia varicolor: Senior-White, 1926: 139. Misidentification, not *varicolor* Fabricius. Sri Lanka.

Note. For a description of his "*varicolor*" Senior-White (1926: 139) refers to his 1923a paper under "*latro* Meij." thus confirming the decision reached in 1924 (see previous entry).

Senior-White (1926: 137) now keys only three species with discal setae on T5, i.e., *bezzii*, *surcoufi* and "*varicolor*". This time it is "*varicolor*" that is "shaggily fringed", as opposed to the other two species, which are separated on the shape of the ST5 flap (termed an "[a]ccessory forceps"), in *bezzii* a "plain edged plate", in *surcoufi* "bilobed."

Senior-White (1926) lists the species as distributed also in "South India", probably because this is the type locality of *varicolor*, but possibly also because of the Parambikulam specimens of "*latro*" or the Cochin Forest Tramway specimens of "*varicolor*" cited earlier by Senior-White (1923b: 37). When stating (p. 139) that the species is known from the "the Philippines", he is apparently referring to the three females from "Los Banos" already mentioned in his 1924 paper (see previous entry). The identity of this material cannot be decided.

Bengalia varicolor: Senior-White *et al.*, 1940: 101. Misidentification, not *varicolor* Fabricius. Sri Lanka.

Note. Senior-White *et al.* (1940: 85), like Senior-White (1926), key only three species with discal setae on T5, i.e., *bezzii*, *surcoufi* and "*varicolor*". The "*latro*" figures in Senior-White (1923a) have been reproduced in Senior-White *et al.* (1940: 102, fig. 51), but given a new legend identifying the species as "*varicolor*", in accordance with the opinion reached in 1924 ("the genitalia proving to be identical"), and maintained in his 1926 paper. Again, the record from "Philippine Islands" is most likely based on the three females from "Los Banos" mentioned in his 1924 paper (see previous entry).

Bengalia fuscipennis: Séguy, 1946: 83. Record from "Ceylan: Kandy, 15–28 mai 1901 (M. Maindron)". Misidentification, not *fuscipennis* Bezzi. Sri Lanka.

Note. There are three specimens under "*Bengalia fuscipennis*" in the general collection in MNHN, Paris. One from

"Ceylan … Kandy" is listed by Séguy and is a misidentified male of *emarginatoides*. The two other specimens, not listed by Séguy (1946), are a male and a female of *fuscipennis* Bezzi from Taiwan (not a member of the *B. peuhi* species-group), correctly identified by Villeneuve (both examined).

In the Oriental catalogue James (1977: 529) lists *fuscipennis* Bezzi, 1913: 75 from "Ceylon", in addition to the type locality "Formosa". Most likely this record is based on the misidentified male of *emarginatoides* cited above and published as *fuscipennis* by Séguy. I have found no other sources listing *fuscipennis* from "Ceylon". Sri Lanka should therefore be deleted from the geographical range of *fuscipennis* as it is based on a misidentified specimen.

So far it appears that *fuscipennis* is only known from the type locality (Taiwan). Fan (1965: 194) described a nominal species *taiwanensis* which I believe is the same as *fuscipennis*, since the male syntype of *fuscipennis* (in ETHZ, examined) fits exactly with the figures and descriptions by Fan (1965, 1992, 1997) and Feng *et al*. (1998) of *Bengalia taiwanensis* Fan, **syn. nov.** This nominal species is also reported from the Guangdong province of China (Feng *et al*. 1998).

Bengalia varicolor: Séguy, 1946: 85, only fig. 1b (as *variicolor*). Misidentification, not *varicolor* Fabricius. Sri Lanka.

Note. Two males of *emarginatoides* from Sri Lanka were found in the general collection in Paris under "*Bengalia latro*", although there are no Sri Lanka localities among those listed by Séguy (1946: 83) under that name. According to the labels both were captured in "Ceylan … Kandy" by M. Maindron 15–28 May 1901. One of them is labelled "varicolor / F." in Séguy's hand. I have dissected it. The ST5 flap (Fig. 40) was exposed in the undissected specimen and matches fig. 1b on p. 85 fairly well, although the distal excavation is not as deep as in the figure and the tips do not curve inwards. I assume nevertheless that Séguy's fig. 1b is made from this specimen.

Bengalia emarginata: Maschwitz & Schönegge, 1980: 2. Misidentification, not *emarginata* Malloch. Sri Lanka (Anuradhapura).

Note. A specimen collected by Maschwitz and cited as *emarginata* by Maschwitz & Schönegge (1980) is in SMNS and has been misidentified as *emarginata* by B. Herting. Examined.

Afridigalia emarginata: Lehrer, 2005: 36. India (Tamil Nadu). Misidentification, not *emarginata* Malloch.

Note. Lehrer's (2005) treatment was based on 5 males and 4 females from South India, Nilgiri Hills (Devala), in BPBM, identified by Kurahashi as *emarginata*, but never published by him to my knowledge. Not examined.

Lehrer (2005) was the first to recognise that two species were actually involved here—in the present work named *emarginata* Malloch and *emarginatoides* sp. nov.—but he did not study the type of *emarginata* and therefore got the names wrong. He was obviously misled by Malloch's inaccurate drawing of the ST5 flap (Malloch 1927: fig. 15) which shows (incorrectly) a completely even and non-undulating lateral edge distally, similar to Lehrer's figure of the ST5 flap of his "*emarginata*" (Lehrer 2005: fig. 13A). On this basis Lehrer misidentified the specimens from India in BPBM as *emarginata* and described the species with a small inward and downward bulge in the distal half of the lateral edges of the ST5 flap (the true *emarginata* Malloch) as new species *Afridigalia bezziella*.

Afridigalia emarginata: Lehrer, 2006a: 7. Records from Sri Lanka and India only. Misidentification, not *emarginata* Malloch. Examined.

Note.The Taiwan specimen of "*emarginata*" also listed in Lehrer (2006a: 7) is the true *emarginata* Malloch (= *bezziella* Lehrer) (BMNH, examined). See entry in the synonymy of the species *Bengalia emarginata* treated above.

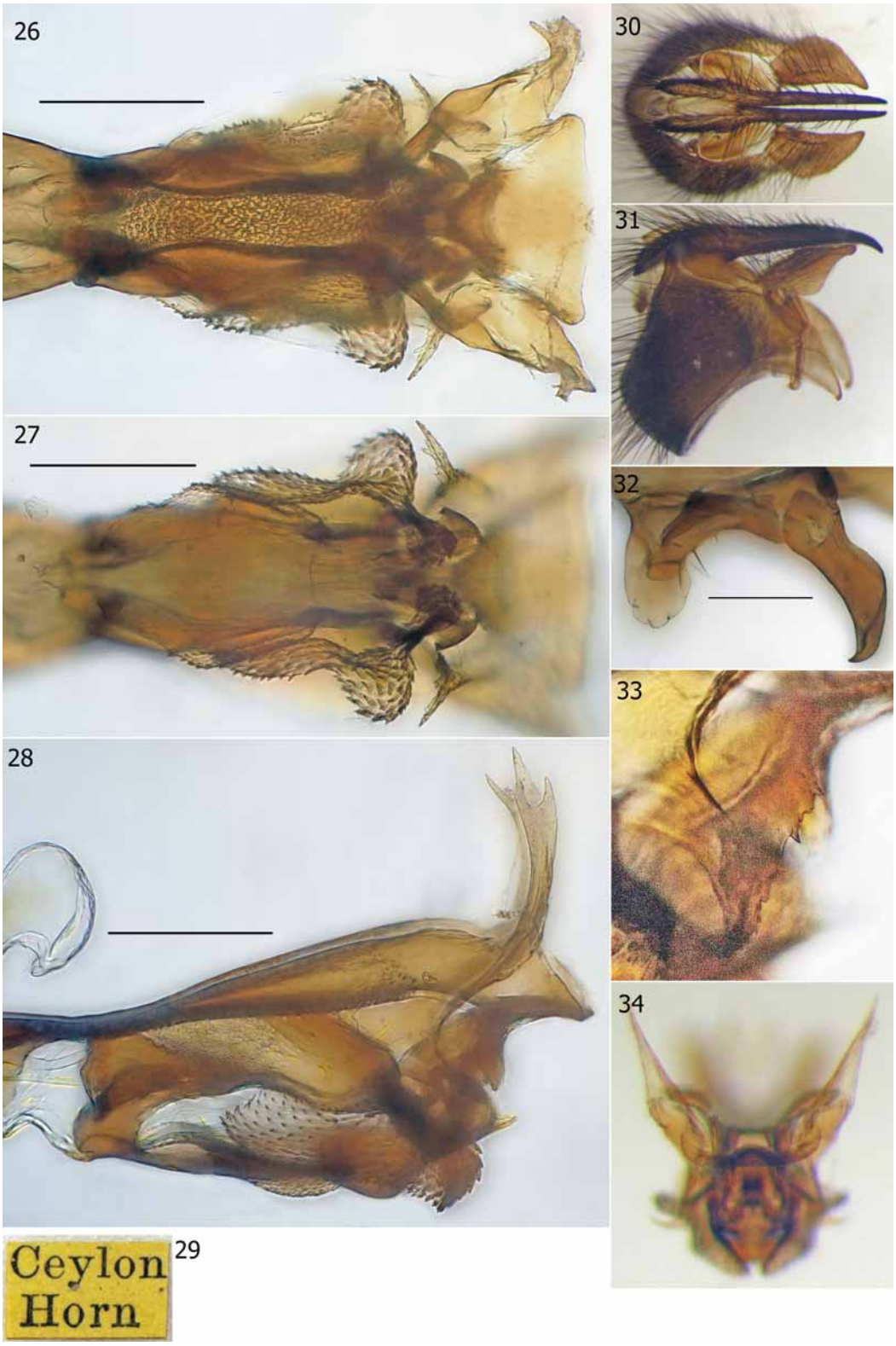
Etymology. The specific epithet "*emarginatoides*" is derived from the stem of "*emarginata*" with the addition of the Latin suffix "*-oides*" (meaning like, resembling, in the form of) referring to the similarity of the two species.

Diagnosis. *Male*. Length 13mm. Frons at vertex / head width ratio: 0.296–0.325 (mean 0.310, n=9). *Bengalia emarginatoides* is extremely similar to *B. emarginata* and most of the diagnostic characters listed for that species also apply to this one. However, apart from the slightly narrower frons, it differs from *B. emarginata* in certain features of the male genitalia.

ST5 flap (Figs. 35, 37, 38, 40, 42) has a rounded outline, but is a little longer than broad and is completely flat as seen edge on. It has a distal emargination which varies in depth (very shallow in material from India), but the lateral edge is even and without inward bulges or depressions on the distal half.

Cerci (Figs. 30, 31) are conspicuously narrowed in the distal free part compared to the basal part, so that the lateral edge, when seen in dorsal view, is not straight but has an inwardly directed shallow angle slightly behind the middle (Fig. 30). Interestingly, the same kind of constriction is present in Senior-White's figure of the cerci in dorsal aspect (Senior-White, 1923a: Plate IX, lower half; Senior-White *et al*., 1940: 102, fig. 51, right hand figure).

Basal part of the bacilliform sclerite process is a little longer than the point itself (Fig. 31), thus longer than in *B. emarginata*.



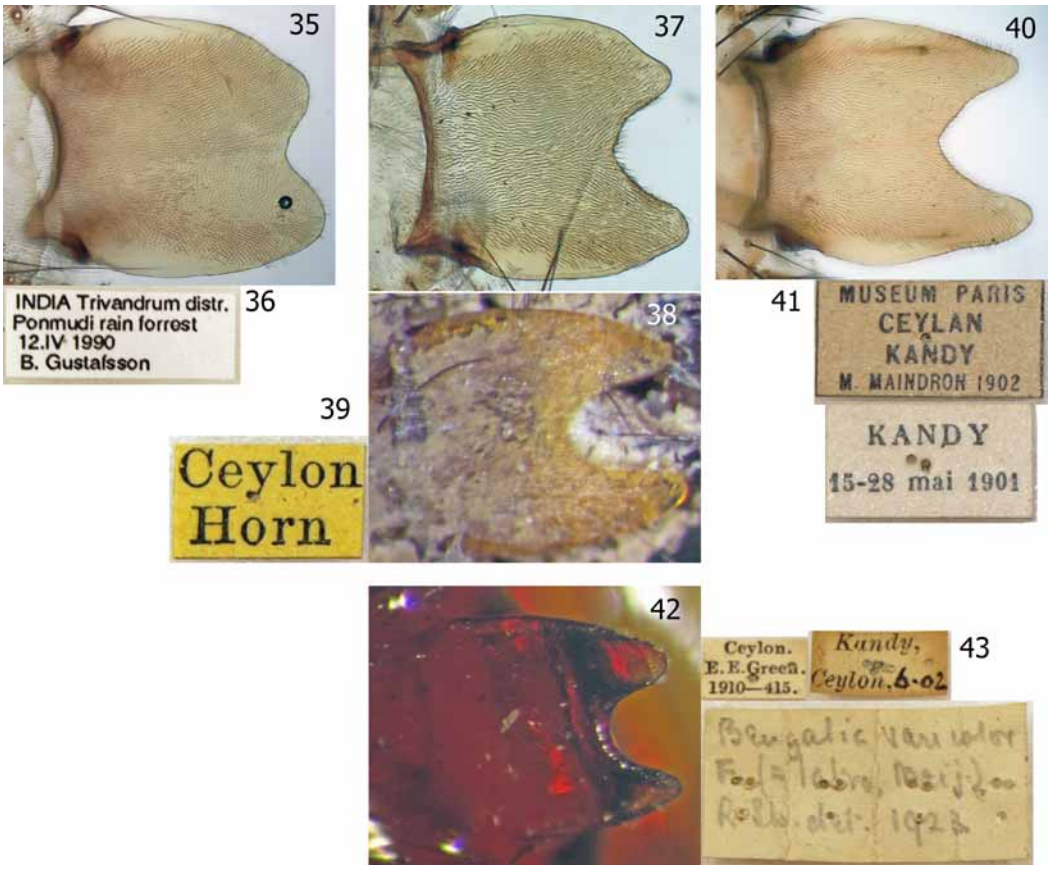
FIGURES 26–34. *Bengalia emarginatoides* **sp. nov.**, male (from holotype in SDEI). **26**. Distiphallus, dorsal view. **27**. Distiphallus, ventral view. **28**. Distiphallus, left lateral view. **29**. Original label. **30**. Cerci and surstyli, dorsal view. **31**. Cerci and surstyli, left lateral view. **32**. Pre- and postgonites. **33**. Anterior edge of vertical sclerotised sheet, showing linear shape and serrations. **34**. Distiphallus from in front. Scale = 0.25mm (Figures 26, 27, 28, 32).

In the distiphallus the antlers have a lower number of points at the tip (two in the holotype). The anterior edge of the upper lip is broader than distance between the base of the antlers (Figs. 26, 34). In profile view of

the distiphallus the lateralmost part of the upper lip has an evenly oblique edge (Fig. 28), whereas in *B. emarginata* it first arises vertically before it turns backwards. The internal hypophallic lobes are converging more conspicuously than in *B. emarginata*. The lateral finger appears to be slightly longer than the one in *B. emarginata* (Figs. 26, 27). The anterior serrated edge of the vertical sclerotised sheet is even and not produced into a right angle (Fig. 33).

Female. Unknown. The female should, however, be easily identified from material collected for example in Sri Lanka, where only two species in the *B. peuhi* species-group occur, *B. varicolor* (= *bezzii*) and *B. emarginatoides*. The latter species should have the same kind of vestiture on the anepimeron in the female as in the male (i.e., black setulae reaching the katepisternum), thus different from that of the true *B. varicolor* (= *bezzii*).

Distribution. India (Kerala, Tamil Nadu), Sri Lanka.



FIGURES 35–43. *Bengalia emarginatoides* **sp. nov.**, male (35, 36 from paratype in NHRM; 37 from holotype in SDEI; 38, 39 from paratype in SDEI; 40, 41 from dissected paratype in MNHN; 42, 43 from paratype in BMNH, Green leg.). **35**. ST5 flap (microscope image). **36**. Original label. **37**. ST5 flap (microscope image). **38**. ST5 flap (stereomicroscope image of dried specimen). **39**. Original label. **40**. ST5 flap (microscope image). **41**. Original labels (two). **42**. ST5 flap (stereomicroscope image of Canada balsam mount). **43**. Original locality labels (two), plus Senior-White's hand-written label in pencil.

Type material. Holotype male, in SDEI, labelled: (1) "Ceylon / Horn" [printed on yellow paper; Walther Horn is the collector]; (2) "Townsend det."; (3) My red holotype label (*emarginatoides* n. sp.). Dissected by K. R. T1–5 glued to card on pin. The left fore leg glued to another card on pin. Genitalia in glycerol in microvial on pin (Figs. 26–34, 37). **Paratypes. BMNH**: 1 male labelled (1) "Ceylon. / E. E. Green. / 1910—415 [printed]"; (2) "Kandy / Ceylon, 6-02" [printed, except the numbers which are handwritten]; (3) "Bengalia varicolor / F. (= latro Meij.) / R. SW det. 1923." [handwritten in Senior-White's hand in pencil; text following the word "varicolor" "indéchiffrable" according to Lehrer (2006a: 7)] (Fig. 43); (4) "*Afridigalia* ♂ / *emarginata* (Malloch) / Det. Dr. A. Z. Lehrer / 2005"; (5) "*Afridigalia* ♂ / *emarginata* (Malloch) / Det. Dr. A.

Z. Lehrer / 2005"; (6) My red paratype label (*emarginatoides* n. sp.). The specimen carries the genital capsule and a few abdominal sternites including the ST5 flap mounted in darkened Canada balsam on a clear plastic stage below the specimen (itself staged on a piece of the same clear plastic) (Figs. 42, 43). • 1 male labelled (1) "Kanthalla [= Kantalai] / Ceylon / 31 .vii. 1890 / Lt. Col. Yerbury / 92.192"; (2) "*Afridigalia* ♂ / *emarginata* (Malloch) / Det. Dr. A. Z. Lehrer / 2005"; (3) My red paratype label (*emarginatoides* n. sp.). Dissected by Lehrer. Dissected genitalia transferred to glass microvial from Lehrer's large plastic vial by K. R. • 1 male labelled (1) "Naraikkadu, 2500'–3000' / Tinnevelly Dt. [= Tirunelveli district] / South India. 12.III.36" [Tamil Nadu]; (2) "*Afridigalia* ♂ / *emarginata* (Malloch) / Det. Dr. A. Z. Lehrer / 2005"; (3) My red paratype label (*emarginatoides* n. sp.). **MNHN**: 1 male labelled (1) "MUSEUM PARIS / CEYLAN / KANDY / M. MAINDRON 1902" [printed]; (2) "KANDY / 15–28 mai 1901" [printed]; (3) "varicolor / F." [black ink in Séguy's hand]; (4) My red paratype label (*emarginatoides* n. sp.). Placed under "*Bengalia latro*" in the General collection. Dissected by K. R. (Fig. 40, 41). • 1 male labelled (1) "CEYLAN / M. MAINDRON" [printed]; (2) "KANDY / 15–28 mai 1901" [printed]; (3) "MUSEUM PARIS / COTE DE MALABAR / MAHÉ / M. MAINDRON 1902" [printed]; (4) My red paratype label (*emarginatoides* n. sp.). The presence of label (3) must be due to an error, since Mahé is on the Malabar Coast, in Kerala, India, thus contradicting label (1). I assume this specimen is from Kandy also. Placed under "*Bengalia latro*" in the General collection. Left undissected. • 1 male labelled (1) "CEYLAN / M. MAINDRON" [printed]; (2) "KANDY / 15–28 mai 1901" [printed]; (3) "MUSEUM PARIS / CEYLAN / KANDY / M. MAINDRON 1902" [printed]; (4) My red paratype label (*emarginatoides* n. sp.). Placed under "*Bengalia fuscipennis*" in the General collection. Left undissected. **NHRM:** 1 male labelled (1) "INDIA, Trivandrum district / Ponmudi rain forest / 12.IV.1990 / B. Gustafson" [printed] [Kerala]; (2) "Bengalia ♂ / emarginata / Malloch, 1927 / Det. H. Kurahashi" [printed]; (3) "NRM Sthlm / Loan 1712/08" [printed green label] (Figs. 35, 36); (4) My red paratype label (*emarginatoides* n. sp.). Dissected by K. R. **SDEI:** 1 male with same original labels as holotype. My red paratype label (*emarginatoides* n. sp.). Not dissected (Figs. 38, 39). This specimen has a very deep ST5 flap excavation, deeper than in the holotype, almost reaching halfway to base, and thus approaching the depth of the excavation in the illustration by Senior-White (1923a: Plate IX) (as *latro*). **SMNS:** 1 male labelled (1) "Bengalia / emarginata Malloch / B. Herting det." [Herting's handwriting, except last line]; (2) "Ceylon / Maschwitz leg." [Herting's handwriting]; (3) My red paratype label (*emarginatoides* n. sp.). The ST5 flap is quite typical: pale yellow colour with a distal, deep excavation similar to the one shown in Fig. 38, no depression along lateral edges whether seen from the side or above.

3. *Bengalia emdeniella* (Lehrer, 2005), comb. nov.
Figs. 44–53, 175, 188, 200.

Holotype male, China (Fujian, Yenpingfu) (BMNH), by original designation. For details see Type material below.

The synonymy below (and, consequently, the distribution) is tentative as far as many of the Chinese provinces are concerned. In view of the fact that a new species from Yunnan (see *B. weii* below) is based on specimens which all carried a "*Bengalia varicolor*" determination label, it is to be expected that several other records of "*varicolor*" from China by Chinese authors may actually refer to specimens belonging to *B. weii* or even other, undescribed species, rather than to *B. emdeniella*.

Bengalia varicolor: Fan, 1965: 193, figs. 753–755. Misidentification, not *varicolor* Fabricius. China (Guangdong, Hainan, Jiangxi, Sichuan, Yunnan, Zhejiang).

Note. The vertical sclerotised sheet in the aedeagus of *varicolor* as interpreted by Fan (1965: fig. 755; repeated in later Chinese publications), and by Lehrer (2005, as *fanzideliana*) is very narrow (dorsoventrally) in lateral view, but has a slight emargination along the anterior edge as in the *emdeniella* holotype. The narrowness may be due to foreshortening due to perspective of an aedeagus perhaps being figured from a dried state, and I consider it as the same species as *emdeniella* (see next entries). In addition the vertical sclerotised sheet appears fused with the mid-dorsal wall of the aedeagus, just as is the case in *emdeniella* holotype.

Fan included Taiwan citing Hennig (1941), but Hennig's specimens identified as *varicolor* belong mostly to *emarginata* Malloch (and a few to *varicolor* Fabricius).

FIGURES 44–52. *Bengalia emdeniella* (Lehrer), male (from holotype of *Afridigalia emdeniella* Lehrer in BMNH). **44**. Distiphallus, dorsal view. **45**. Distiphallus, ventral view. **46**. Pre- and postgonites of right side. **47**. Distiphallus, left lateral view (upper arrow points to anterior edge of upper lip, lower arrow points to ventral finger). **48**. Cerci and surstyli, dorsal view. **49**. Cerci and surstyli, left lateral view. **50**. ST5 flap. **51**. Distiphallus from in front (slightly oblique view). **52**. Lateral finger of left side. Scale = 0.25mm (Figure 47). Abbreviations: *l.f.* = lateral finger; *pst.scl*. = parastomal sclerite.

FIGURE 53. *Bengalia emdeniella* (Lehrer), male (from holotype of *Afridigalia emdeniella* Lehrer in BMNH). Labels.

Bengalia varicolor: Fan, 1992: 532, figs. 1108a, 1108i, 1108m. Misidentification, not *varicolor* Fabricius. China (Guangdong, Hainan, Jiangxi, Sichuan, Yunnan, Zhejiang).
Note. Fan again included Taiwan citing Hennig (1941), but Hennig's specimens identified as *varicolor* belong mostly to *emarginata* Malloch (and a few to *varicolor* Fabricius).

Bengalia varicolor: Fan, 1997: 451, figs. 139a, 139m, 139i. Misidentification, not *varicolor* Fabricius. China (Fujian, Guangdong, Hainan, Jiangxi, Sichuan, Xizang, Yunnan, Zhejiang).
Note. Fan again included Taiwan, but this time without citing Hennig (1941). However, the localities listed for Taiwan (Fan 1997: 452, lines 1–2), i.e., Anping, Hengchun [formerly Koshun], Sokutsu, Tainan (all in Chinese script) are those listed by Hennig (1941) under *varicolor.* [I consulted Chiu et al. (1984) for comparison of the Japanese and Chinese names for these localities].

Bengalia varicolor: Feng *et al.*, 1998: 1381, fig. 2825Jv. Misidentification, not *varicolor* Fabricius. China (Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Sichuan, Xizang, Yunnan, Zhejiang).
Note. Feng *et al.*, included Taiwan, but again, most likely on the basis of Hennig (1941).

Afridigalia emdeniella Lehrer, 2005: 38. Holotype male, by original designation, China (Fujian: Yenpingfu) (BMNH). Examined.

Afridigalia fanzideliana Lehrer, 2005: 42. Unavailable (no type designation). See Rognes (2006: 457) for details. [China]

Bengalia varicolor: Verves, 2005: 240, in part. Misidentification, not *varicolor* Fabricius. Catalogue entry for China.

Diagnosis. *Male*. Length**:** 15mm (from Lehrer 2005). Frons at vertex / head width ratio: 0.295 (n=1) (measured on photograph). Fronto-orbital plate without proclinate orbital setae. Anepimeron with about 20–25 black setulae on upper part of posterior half, below lesser ampulla. Fore tibia in basal half with a row of small spine-like setae of about the same size (Fig. 175). Mid tibia with a fringe of somewhat prolonged thin posteroventral setae in distal part, longest setae about twice the tibial diameter.

Fringe on hind tibia rather dense and long, situated on distal two-thirds or more of anteroventral surface, prominent also on ventral and posteroventral surface, the posteroventral fringe setae twice the tibial diameter or more.

ST5 flap (Fig. 50) longer than broad, with a deep marginal excavation almost reaching halfway to its base, and with diverging lateral edges.

Cerci strongly curved in lateral view. Surstylus without vestiture on underside. Process of bacilliform sclerite with a long point.

Distiphallus short and high, almost triangular in profile view. Projecting dorsolateral wings absent; mid-dorsal wall broad, fused with vertical sclerotised sheet (Figs. 47, 51). Antlers rather short and projecting upwards and forwards, grooved on anterior side. No basal tooth present. Upper lip (Fig. 47, upper arrow) not projecting beyond base of antlers in dorsal view. [The mid-dorsal wall is ruptured along the midline in the only available genital preparation, rupture seen in Figs. 47, 51]. Lateral finger large (Figs. 45, 51, 52), spinose distally. Vertical sclerotised sheet very conspicuous and its anterior edge smooth, slightly concave, as seen in lateral view. Internal hypophallic lobes strongly converging as seen in ventral view. External hypophallic lobes folded in anterior part, presenting a forwardly facing wall, which is well sclerotised laterally, and which has a sharply angled, protruding and almost pointed ventral finger (Fig. 47, lower arrow). Parastomal sclerites originate close together below upper lip, both long and hook-shaped, with concavity facing downwards and

backwards (Fig. 47) and also inwards (Figs. 45, 51). Each parastomal sclerite has a small dorsal projection basally (Fig. 51).

Female. Unknown.

Distribution. China (Fujian, Guangdong, Guangxi, Hainan, Jiangxi, Sichuan, Xizang, Yunnan, Zhejiang).

Material examined. Type material. *Afridigalia emdeniella* Lehrer, 2005. **Holotype** male, in BMNH, labelled (1) "Pres. By / Com.Inst.Ent. / B.M.1954-110." [printed]; (2) "Suenson" [printed]; (3) "COM. INST: ENT: / COLL. NO. 11715" [printed]; (4) "China" [printed]; (5) "SP.NOV." [handwritten]; (6) "YENPINGFU / Fukian Prov. / E. Suenson / 16 MAY 1935" [printed large label]; (7) "Bengalia / varicolor F. / van Emden det 1953" [handwritten, except "van Emden det 195" which is printed]; (8) "*Bengalia* ♂ / *emdeniella* Lehrer n. sp. / HOLOTYPUS / Det. Dr. A. Z. LEHRER / 2004" [printed]; (9) "HOLOTYPUS" [red printed label]; (10) "*Bengalia* ♂ / *emdeniella* Lehrer n. sp. / HOLOTYPUS / Det. Dr. A. Z. LEHRER / 2004" [printed]; (11) "Published as / *Afridigalia emdeniella* / Lehrer, 2005: 38 / K. Rognes 23.v.2008" [printed]. The specimen is in good condition, one fore leg glued to card on pin. Dissected by Lehrer. Genitalia transferred to glass microvial from original large opaque plastic vial by K. R. Lehrer (2005) renders the type locality as "Yenpingen" but that is an error (cf. Fig. 53).

4. *Bengalia fani* Feng & Wei, 1998

Figs. 54–63, 176, 189, 201.

Holotype male, China (Guizhou Province, Anshun, Ganpu tree farm) (CDPCAG), by original designation. For details see Type material below.

Bengalia fani Feng & Wei *in* Feng *et al*., 1998: 1378, figs. 2820Jv (ST5 flap), 2820L1 (genital capsule in profile view), 2820R (distiphallus in dorsal view). Holotype male, by original designation, China (Guizhou) (CDPCAG). Examined.

Diagnosis. *Male*. Length: 10–12mm. Frons at vertex / head width ratio: 0.363–0.375, mean 0.368 (n=4). Easily recognised in the male sex by the presence of 2–3 proclinate orbital setae (the hindmost one directed a little laterally) on each side in front of the reclinate prevertical seta. Lunula bare. Anepimeron with a tuft of 10–25 long black thin setae on upper part of posterior half. Fore tibia with two very closely set ventral rows of small spine-like setae of same size in basal half (Fig. 176). Mid tibia without fringe distally, any prolonged setae shorter than tibial diameter. Hind tibia with an anteroventral fringe of long setae on about distal half. The fringe varies in density, and usually extends on the posteroventral side. Femora are very dark, except sometimes the front one.

Abdomen rather dark and the black marginal bands occupy about the hindmost third of the tergites. The anterior yellow parts of the tergites very dark in some lights and covered with microtomentum giving a shifting pattern.

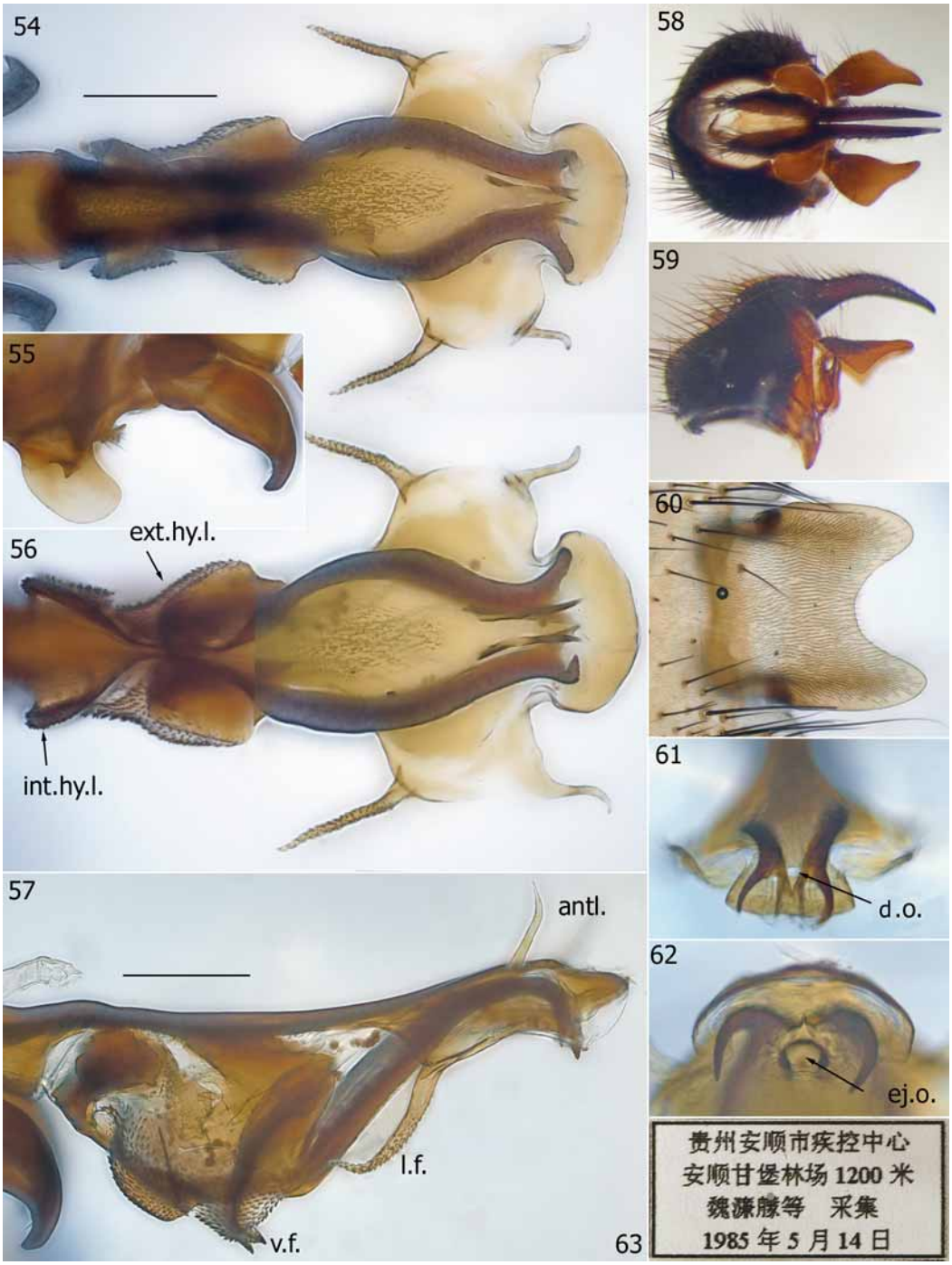
ST5 flap (Fig. 60) about as long as broad, a deep distal excavation present, lateral edges curved but roughly parallel.

Cerci strongly curved in profile view (Fig. 59). The surstyli placed rather low on the epandrium (Fig. 59).

Distiphallus with an extremely prolonged distal half. Antler narrow and pointed. Lateral finger very long and denticulate on more than distal half. Internal hypophallic lobes very strongly converging, almost touching midventrally, distally widening out and transforming into two broad strongly sclerotised ventral bands which continue almost to the tip of the distiphallus. The distance between the bands increases towards the middle and then decreases again. External hypophallic lobe folded distally, presenting a forward-facing wall. Ventral finger sharply triangular, projecting and pointed. Vertical sclerotised sheet fused with mid-dorsal wall forming a lateral sheet carrying the antlers and lateral fingers. Upper lip shaped like a transverse oval. Characteristic structures are present encircling the ejaculatory opening (Figs. 56, 61, 62).

The figure in Feng *et al.* (1998: 1379, fig. 2820L1) shows the antler and lateral finger both to project ventrally on one side of the distiphallus. This was also the condition of the holotype when I received it for examination. This is an artifact caused by the dried condition of the distiphallus.

***Female*.** Length: 10.5–12mm (n=2). Frons at vertex / head width ratio: 0.371–0.375, mean 0.373 (n=2). ST2–4 each with a pair of strong marginal setae, with some short black ground setae along hind margin and with yellow ground setulae on disc. ST3 and ST4 also with black ground vestiture in broad bands along sides. ST5 much longer than broad at base, without strong marginal setae, with black ground setae all over. ST3 shorter than other sternites, which are of about the same length.



FIGURES 54–63. *Bengalia fani* Feng & Wei, male (from holotype in CDPCAG). **54**. Distiphallus, dorsal view. **55**. Pre- and postgonites. **56**. Distiphallus, ventral view. **57**. Distiphallus, left lateral view. **58**. Cerci and surstyli, dorsal view. **59**. Cerci and surstyli, left lateral view. **60**. ST5 flap. **61**. Upper lip area, anterodorsal view. **62**. Upper lip area, anteroventral view. **63**. Original locality label. Scale = 0.25mm (Figures 54, 57). Abbreviations: *antl.* = antlers; *d.o.* = dorsal opening; *ej.o.* = ejaculatory opening; *ext.hy.l.* = external hypophallic lobe; *int.hy.l.* = internal hypophallic lobe.

Description. An English translation of the Chinese original description is given in Appendix 1.

Distribution. China (Guizhou, Yunnan).

Type material. *Bengalia fani* Feng & Wei *in* Feng *et al*., 1998. **Holotype** male, in CDPCAG, labelled (1) "Centre for Disease Prevention and Control of Anshun City, Guizhou / Ganpu Tree Farm, 1200m / Wei Lianmeng *et al*. leg. / 14 May 1985" [in Chinese, print on white label] (Fig. 63); (2) "C032 … [Chinese name for *B. fani*] / *Bengalia fani* Feng / *et* Wei, 1996" [print on white label]; (3) "♂ / Holotype" [handwritten on red label]. The specimen is in good condition. Right mid leg is lacking, left mid leg glued to card on pin below specimen. Dissected by K. R. Abdominal tergites T1–5 glued to card. Dissected parts in glycerol in glass microvial on pin below labels.

Other material. **CDPCAG**: 1 male labelled (1) "Centre for Disease Prevention and Control of Anshun City, Guizhou / Ganpu Tree Farm, 1200m / Wei Lianmeng *et al*. leg. / 16 October 1990" [in Chinese, print on white label]; (2) "C032 … [Chinese name for *B. fani*] / *Bengalia fani* Feng / *et* Wei, 1996 ♂" [print on white label, male symbol in red]. • 1 female labelled (1) "Centre for Disease Prevention and Control of Anshun City, Guizhou / Ganpu Tree Farm, 1200m / Wei Lianmeng *et al*. leg. / 30 May 1993" [in Chinese, print on white label, parts of date handwritten]; (2) "C032 … [Chinese name for *B. fani*] / *Bengalia fani* Feng / *et* Wei, 1996 ♀" [print on white label, female symbol in red]. • 1 male labelled (1) "Centre for Disease Prevention and Control of Anshun City, Guizhou / Jiaozishan Hill 1400m / Wei Lianmeng *et al*. leg. / 21 July 1991" [in Chinese, print on white label, parts of date handwritten]; (2) "C032 … [Chinese name for *B. fani*] / *Bengalia fani* Feng / *et* Wei, 1996 ♂" [print on white label, male symbol in red]. • 1 male labelled (1) "Centre for Disease Prevention and Control of Anshun City, Guizhou / Jiuhuashan Hill, Ninggu, Anshun City 1200m / Wei Lianmeng *et al*. leg. / 20 July 2008" [in Chinese, print on white label]; (2) "C032 … [Chinese name for *B. fani*] / *Bengalia fani* Feng / *et* Wei, 1996 ♂" [print on white label, male symbol in red]. • 1 female labelled (1) "Centre for Disease Prevention and Control of Anshun City, Guizhou / Jichang, Anshun City 1200m / Wei Lianmeng *et al*. leg. / 6 April 2008" [in Chinese, print on white label]; (2) "C032 … [Chinese name for *B. fani*] / *Bengalia fani* Feng / *et* Wei, 1996 ♀" [print on white label, female symbol in red].

Material not examined. Dr. Wei Lianmeng (pers. comm. in e-mail 15 January 2009) reports to have collected 1 male and 1 female of *B. fani* also in Yunnan province (Jīzú Shān, 2200–2700m 6–8 August 1994, Wei Lianmeng & Liu Meihua leg.) apart from several other localities in Guizhou province.

5. *Bengalia inermis* Malloch, 1927

Figs. 64–82, 177, 190, 202.

Holotype male, Philippines (Luzon, Mt. Makiling) (BMNH), by original designation. For details see Type material below.

"7. *Bengalia* sp. *incerta* ♂.": Bezzi, 1913: 78 (as "sp. *incerta* Nr. 2." in key p. 74). "Ein Männchen aus Los Banos, Philippinen, in meiner Sammlung, von Prof. Baker erhalten …". Examined.

Note. This refers to a male specimen in MSNM which subsequently served as the holotype of *Afridigalia laguna* Lehrer. As detailed below, it carries a label in Bezzi's hand reading "*Bengalia inermis* n. sp." *Bengalia inermis* was described by Malloch in 1927 from a single "Type" from Mt. Maquiling, Philippines, thus a holotype was designated. The *laguna* holotype is therefore not a syntype of *inermis* (even though it carries a printed label reading "inermis SYNTYPUS"). Malloch (1927: 414) mentions it and thinks that this particular specimen in coll. Bezzi might belong to the same taxon as his own *inermis* ("[T]his may be the species "sp. incerta No. 2" of Bezzi's paper on the genus…"). He may have corresponded about it with Bezzi, and Bezzi as a result possibly wrote the name on a label in his own hand and put it on the specimen in anticipation of Malloch's paper (Bezzi died in 1927 and is mentioned as "the late Dr. M. Bezzi" in Malloch's paper, p. 412). This might explain the presence of a n. sp. label in Bezzi's hand on a specimen of a species Bezzi did not describe himself.

Bengalia inermis Malloch, 1927: 400 (key), 413 (main entry). Holotype male, by original designation, Philippines (Mt. Makiling) (BMNH). Examined.

Bengalia inermis: James, 1977: 529. Catalogue entry.

Bengalia inermis: Kurahashi & Magpayo, 2000: 42. Philippines (Luzon, Mindanao, Palawan).

Afridigalia laguna Lehrer, 2005: 48. Holotype male, by original designation, Philippines (Luzon, Los Baños) (MSNM).

Examined. For details of the specimen, see below. See also "7. *Bengalia* sp. *incerta* ♂" entry above. Discussed and put into synonymy by Rognes (2006: 464).

Afridigalia nusantara Lehrer, 2005: 58. Holotype male, by original designation, Philippines (Luzon, Mt. Makiling) (BPBM). Not examined. Discussed and put into synonymy by Rognes (2006: 464).

Afridigalia pinatuba Lehrer, 2005: 63. Holotype male, by original designation, Philippines (BMNH). Not examined. **Syn. nov.**

Note. The anepimeron is described as having only yellow setulae. There is nothing in Lehrer's description and figures of *pinatuba* that indicate that it differs from *inermis*.

Ashokiana ramsdalei Lehrer, 2005: 78. Holotype male, by original designation, Philippines (Luzon, Camarines Sur, Mt. Iriga) (BPBM). Examined. **Syn. nov.** For details of the specimen, see below.

Bengalia inermis: Verves, 2005: 239. Catalogue entry.

Diagnosis. A bright yellow species. *Male*. Length: 13mm. Frons at vertex / head width ratio: 0.283–0.292 (mean 0.285, n=4). Lunula bare. Fronto-orbital plate without proclinate orbital setae. Anepimeron with yellow setulae only. Legs yellow. Fore tibia without spine-like setae on ventral side (Fig. 177). Mid tibia with a fringe of long thin *pv* setae in distal half, longest setae 1.5–2.0x tibial diameter (Fig. 190). Hind tibia with a dense fringe of long *av*, *v* and *pv* setae on distal two-thirds (Fig. 202). Abdomen almost all yellow with narrow (1/6) black marginal bands. ST5 flap (Figs. 71, 78) almost square, with the hind edge straight or slightly concave.

Cerci slightly curved distally. Surstylus without vestiture below. The triangular projection of the bacilliform sclerite short and blunt.

Distiphallus with prominent dorsolateral wings and broad, backwardly curved antlers. Basal tooth strong. Tip of antlers with 2–5 tines. Upper lip projecting beyond base of antlers, distal edge convex in dorsal view, underside concave as seen from in front (Fig. 73). Lateral finger small (Figs. 66, 72). Ventral finger strongly projecting below midventral wall in profile view, its anterior edge smooth, without denticles (Figs. 67, 72). Internal hypophallic lobes only slightly converging in ventral view, distal part of outer hypophallic lobe moderately folded with a distinct shelf (Fig. 66).

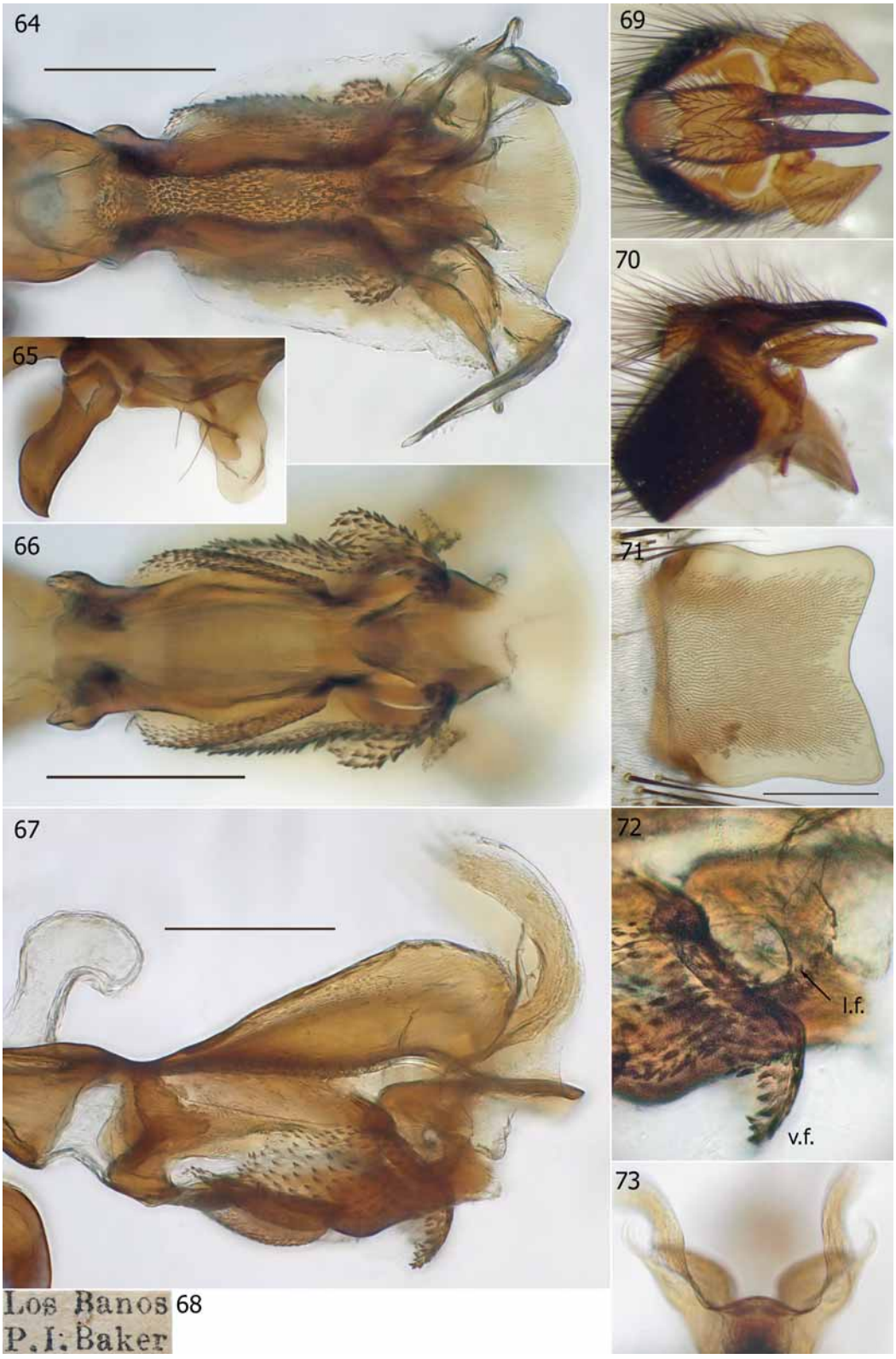
Female. Unknown to me.

Distribution. Philippines.

Material examined. Type material. *Bengalia inermis* Malloch, 1927. **Holotype** male, in BMNH, labelled (1) "Holo- / type" [printed on circular label with broad red margin]; (2) "Mt. Makiling / Luzon, Baker" [printed]; (3) "Brit. Mus. / 1923 – 423" [first line printed, second handwritten]; (4) "Bengalia / inermis / Type / Det. / J R Malloch" [first three lines handwritten in Malloch's hand, last two lines printed]; (5) "See slide / collection." [printed]. Label on slide, in BMNH, reads: "Bengalia / inermis Mall / Holotype / BM: 1923: 423 / [black line across label] / mounted / 25 – 7 – 38 J. SMART" [label handwritten, except "Holotype" which is printed on circular white label with broad red margin glued to main label, and "J SMART" which is printed; also black printed line all around label].

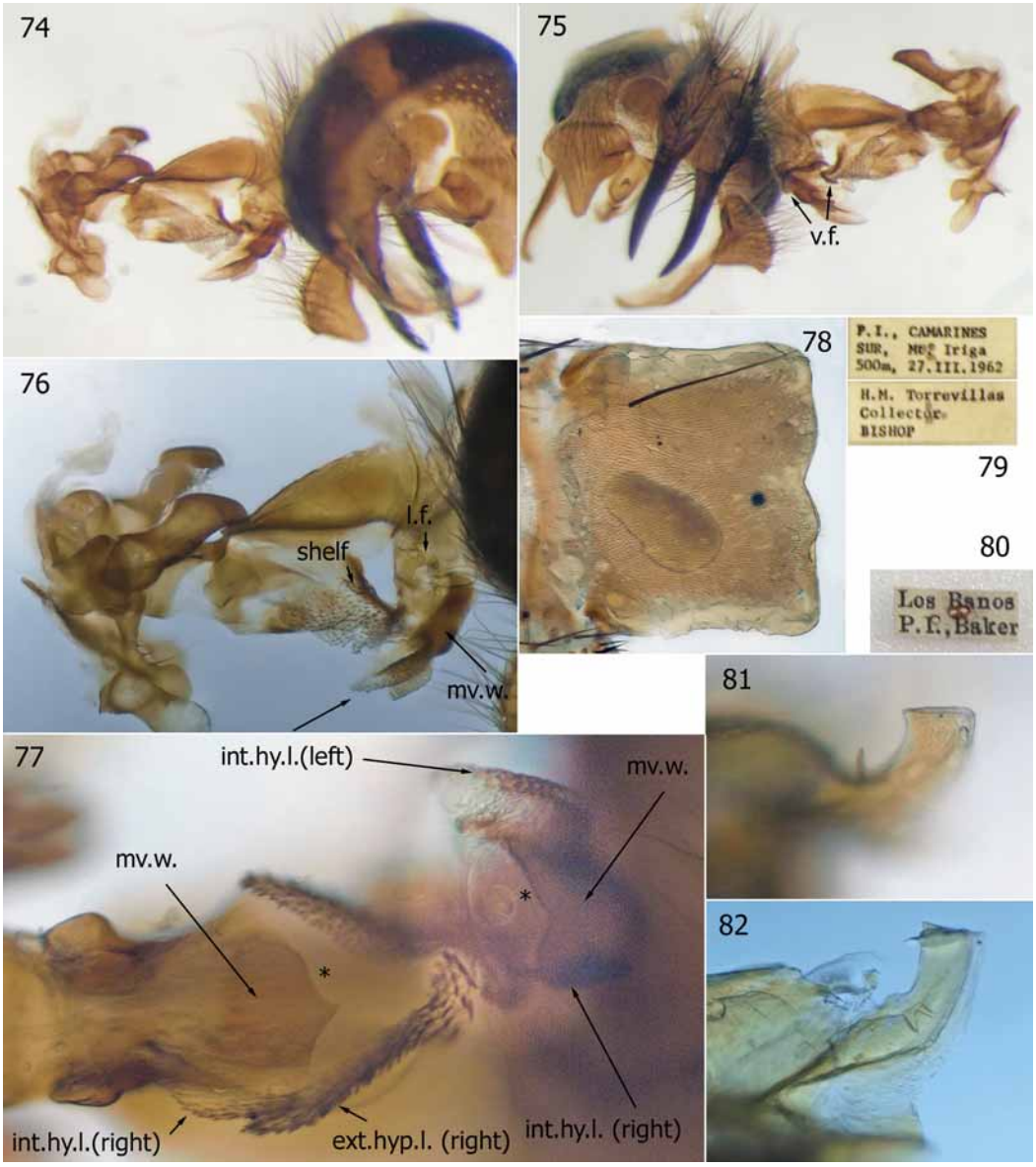
Afridigalia laguna Lehrer, 2005. **Holotype** male, in MSNM, labelled (1) "Los Banos / P. I. Baker" [printed; note two pinholes (Fig. 80)]; (2) "76" [handwritten number]; (3) "Bengalia sp. nov. / peut être ♂ de / B. javana Macq." [black-rimmed label with three thin ruled black lines in Surcouf's handwriting]; (4) "Bengalia / inermis / n. sp." [black ink in Bezzi's handwriting]; (5) "inermis / SYNTYPUS" [printed museum label]; (6) "Bengalia ♂ / laguna Lehrer sp.n. / Det. Dr. A. Z. LEHRER / XII.2005" [printed]; (7) "Bengalia ♂ / laguna Lehrer sp.n. / Det. Dr. A. Z. LEHRER / XII.2005" [printed]; (8) "HOLOTYPUS" [black print on white label, latter glued to larger red label]; (9) "Published as / *Afridigalia laguna* / Lehrer 2005: 48 / K. Rognes 23.vi.2008" [printed]; (10) My determination label (*inermis* Malloch).

Note. The specimen was badly damaged in the mail at reception, but the genitalia, which were kept in a big plastic vial, arrived safely. I have glued head, wings, abdomen, one fore femur, one mid leg and two hind legs to a card on a separate pin labelled "From holotype of / *Afridigalia laguna* Lehrer, 2005 / Specimen crushed in accident / in mail". Genital parts in glycerol have been transferred from original big plastic vial to glass microvial on pin where it is placed between labels (9) and (10). The ST5 flap is partly destroyed (as shown in Lehrer's fig. 19A). In the aedeagus both antlers are broken off halfway (Figs 81, 82), basal tooth



FIGURES 64–73. *Bengalia inermis* Malloch, male (Philippines, in SDEI). **64**. Distiphallus, dorsal view. **65**. Pre- and postgonites. **66**. Distiphallus, ventral view. **67**. Distiphallus, left lateral view. **68**. Original label. **69**. Cerci and surstyli, dorsal view. **70**. Cerci and surstyli, left lateral view. **71**. ST5 flap. **72**. Lateral finger and ventral finger (enlarged view). **73**. Distiphallus from in front. Scale = 0.25mm (Figures 64, 66, 67, 71). Abbreviations: *l.f.* = lateral finger; *v.f.* = ventral finger.

broken at base on right side, left basal tooth intact. The ventral finger is bent stronger than usual towards base of aedeagus. Upper lip is intact. In his key to species Lehrer (2005: 23) defines the species on the assumption that the "Apophyses latérales postérieures [= antlers] sont large, courtes, ayant le bout taillé en biais ... ", whereas they are clearly broken, a fact also suggested by Lehrer's fig. 19C. *Afridigalia laguna* is therefore clearly based on an artifact. Lehrer seems not to have understood that the antlers are not in their pristine state. Without ever mentioning *B. inermis* as a valid species in his book, Lehrer nevertheless notes that the "… ptéropleures [= anepimeron] sont brunes avec de poils jaunes…" and he is the only witness to the fact that the fore tibiae are "... exceptionnellement, sans ctenidium proximo-ventral" [fore tibiae both destroyed in mail], exactly the reason why Malloch named his species *inermis* (= latin for *unarmed*).



FIGURES 74–82. *Bengalia inermis* Malloch, male (74–79 from holotype of *Ashokiana ramsdalei* Lehrer in BPBM; 80–82 from holotype of *Afridigalia laguna* Lehrer in MSNM). **74**. Aedeagus and epandrial complex, glued together artificially, aedeagus seen from left side (see text for explanation). **75**. Same from opposite angle, aedeagus seen from right side. **76**. Distiphallus, left lateral view. **77**. Distiphallus, ventral view. **78**. ST5 flap. **79**. Labels. **80**. Label. **81**. Left antler of distiphallus. **82**. Right antler of distiphallus. Abbreviations: * = line of rupture of midventral wall; *ext.hy.l.* = external hypophallic lobe*; int.hy.l.* = internal hypophallic lobe; *l.f.* = lateral finger; *mv.w.* = midventral wall; *shelf* = shelf area of external hypophallic lobe; *v.f.* = ventral finger. (See text for detailed explanation.)

Ashokiana ramsdalei Lehrer, 2005. **Holotype** male, in BPBM, labelled: (1) "H. M. Torrevillas / Collector / BISHOP" [printed]; (2) "P. I. CAMARINES / SUR, Mt. Iriga (500m, 27.III.1962" [printed]; (3) "HOLOTYPE" [printed white label glued to larger red label] / "17040" [pencil writing on red part of label]; (4) "Ashokiana ♂ / ramsdalei Lehrer n. sp. / Det. Dr. A.Z. Lehrer / 2004" [printed]; (5) "Ashokiana ♂ / ramsdalei Lehrer n. sp. / Det. Dr. A.Z. Lehrer / 2004" [printed]; (6) My determination label (*inermis* Malloch). Dissected by Lehrer.

Note. The abdomen is intact except for the genitalia and ST5 flap which have been removed, probably by Lehrer. The epandrial complex (bacilliform sclerite present on one side only, other side lost), aedeagus with pre- and postgonites plus the basal part of the phallapodeme (i.e., the long-legged intermedium piece), and the ST5 flap were stored in a plastic vial at reception of the holotype in the mail. I have transferred the genitalia to glycerol in a glass microvial pinned below the specimen.

The holotype has a rather peculiar aedeagus according to the detailed figure by Lehrer (2005: 78, fig. 34C). Rather than reflecting a separate species and genus, however, I have to conclude that the peculiar structure is simply an artifact resulting from an effort (most likely on the part of Lehrer himself) to pry loose the aedeagus from the epandrium to which it has apparently been glued by accident. This effort has partly destroyed the distiphallus by rupturing its midventral wall. The explanation, as I see it, follows below.

When received by me the aedeagus was glued with its apex to the side of the epandrium near the anal membrane, apparently because of some accident from treatment with glycerol jelly or some other substance (no details are given by Lehrer) (Figs. 74, 75). It was impossible to disconnect the aedeagus from the epandrium by heating the joined complex carefully in a water bath at near boiling point. Nevertheless, it was perfectly possible to study most of the aedeagus. The upper lip could not be observed, but the antlers were clearly visible.

Seen from the left side (Fig 76), the distiphallus matches perfectly the drawing by Lehrer (2005: 78, fig. 34C). Other angles of view revealed that the peculiar structure of the distiphallus, which led Lehrer to establish the nominal genus *Ashokiana* (Lehrer, 2005: 22, 78), is simply an artifact resulting from a failed effort to pry loose the aedeagus from the epandrial complex. Evidently pressure has been applied to the basal part of the aedeagus with the attached pre- and postgonites in the hope that the aedeagus might come loose. In the process the ventral wall of the distiphallus has simply ruptured in the middle (between * * in Fig. 77). The basal third of the mid-ventral wall (*mv.w.*) has remained unharmed but displays a distal termination edge which is angular in ventral view. The peculiar appendix described by Lehrer in the key to *Ashokiana* on p. 22 ["[d]istiphallus a une structure particulière dans sa partie antéro-inférieure, formée d'une portion supérieure membraneuse et pourvue d'épines récurrentes et d'une portion inférieure plus ou moins sclérifiée et sous forme d'auge"] is the combined distal two-thirds of the midventral wall (*mv.w.*) plus parts of the hypophallic lobes that have been torn away from and forming an angle with the remainder of the distiphallus as seen in lateral view. Seen from the ventral side the free edge of the projecting appendix has an angular excavation of exactly the same shape as the distal edge of the basal part of the ventral wall, together revealing exactly where the rupture has occurred (between * * in Fig 77). The "portion supérieure membraneuse et pourvue d'épines récurrentes" is simply the torn away internal hypophallic lobes (*int.hy.l.*), and the "portion inférieure plus ou moins sclérifiée et sous forme d'auge" is the distal two-thirds of the midventral wall (*mv.w.*). Comparing fig. 19C (*inermis* Malloch, as *laguna* Lehrer) and fig. 34C (*inermis* Malloch, as *ramsdalei* Lehrer) in Lehrer (2005) one can immediately convince oneself of this fact. Close inspection reveals that the membranous part is a bilateral structure as expected, and on the right side it is broken closer to the "auge" than on the other, so that a considerable part of the internal hypophallic lobe remains *in situ* on the right side (*int.hy.l.(right)*) to the lower left in Fig. 77). On the left side the whole internal hypophallic lobe (*int.hy.l.(left)*) is torn away from its natural position. Similarly, a close look at the distal part of the ventral wall ["… sclérifiée et sous forme d'auge"] reveals that it is quite similar to the one in a normal *inermis* distiphallus in ventral view. The pressure applied to the distiphallus has also caused a vertical rupture in the middle of the external hypophallic lobe on the right side, resulting in a posterior displacement of the lateral finger and shelf area away from the proximal parts of the lobe (Fig. 75). There has also been a rupture in the lateral wall on the left side resulting in an

artificially large distance between the shelf area (*shelf*) of the external hypophallic lobe and the lateral finger (*l.f.*) (Fig. 76). This is represented by a large clear area in Lehrer's fig. 34C (Lehrer 2005: 78). Finally, the removal of the distal parts of the mid-ventral wall from its normal position has displaced the distal parts of the remaining external hypophallic lobes, including the ventral finger (*v.f.*), towards the midline so as to fill the gap (Figs. 75, 77).

In view of Lehrer's careful reproduction of the *Ashokiana* distiphallus it is surprising that he was not aware of the fact that it had already been partly destroyed when he made his drawing. It is equally surprising that Lehrer did not report on the condition of the genitalia of his type specimen (fusion of the epandrial complex with the tip of aedeagus, the rupture of the mid-ventral wall of latter, etc.) and that he failed to understand the true reason behind the peculiar shape of the aedeagus of his *ramsdalei* holotype.

The holotype of *ramsdalei* can safely be assigned to *inermis* on account of the shape of the ventral finger (long, curved and denticulate on posterior side only), small curved lateral finger, broad antlers terminating in several small points and with a strong and long basal tooth and broad dorsolateral wings. The shape of the ST5 flap, the chaetotaxy of the legs, only yellow setulae on anepimeron, bright yellow body colour and narrow marginal bands on abdominal tergites support this assignment.

Other material. **SDEI**: 1 male labelled (1) "Los Banos / P. I. Baker" [printed; note one pinhole only]; (2) My determination label (*inermis* Malloch). Dissected by K. R. Abdominal T1–5 glued to card on pin, genitalia in glycerol in vial on pin. Genitalia shown in Figs. 64–73.

6. *Bengalia latro* de Meijere, 1910

Figs. 83–97, 178, 191, 203.

Lectotype male, Indonesia (Java, Semarang) (ZMAN), here designated. For details see Type material below.

Bengalia latro Jacobson, 1910: 330. *Nomen nudum*. Java.

Bengalia latro de Meijere, 1910: 336. Lectotype male, here designated, Indonesia (Java: Semarang) (ZMAN). Examined.

Bengalia latro: Malloch, 1927: 412. Undissected and unillustrated male from Java and female from Sumatra (both Jacobson leg.) only. [Other specimens belong to *lyneborgi* James or *varicolor* Fabricius, see below under those species].

Bengalia varicolor: James, 1977, in part. Catalogue entry for Java only. Misidentification, not *varicolor* Fabricius.

Bengalia latro: James, 1977: 530. Catalogue entry as [erroneous] synonym under *Bengalia varicolor* (Fabricius).

Bengalia latro: de Jong, 2000: 111, 244. Account of type depositories and status.

Bengalia latro: Verves, 2005: 239. Catalogue entry.

Afridigalia tenggeria Lehrer, 2006a: 3. Holotype male, by original designation, Indonesia (Java: Tengger Mts, Nungkodjadjar, 4000 ft) (BMNH). Examined. **Syn. nov.**

Diagnosis. A species often with somewhat darkened scutum, pleura, and abdomen; latter sometimes with rather broad black marginal bands. *Male*. Length: 7–13mm (mean 10.1mm, n=7). Frons at vertex / head width ratio: 0.317–0.358 (mean 0.336, n=13). Lunula bare. Frontal vitta usually bright yellow anteriorly, often contrasting strongly with darker hind part. Fronto-orbital plate usually without proclinate orbital setae, but a paralectotype male (ZMAN…0118.11) has two proclinate orbital setae on each side, about 2/3 as long as the reclinate prevertical seta. The other males sometimes have a few of the orbital hairs outside of the frontal setae somewhat enlarged but never as strong. Legs yellow, femora often darkened, especially on anterior side. Anepimeron with a bundle of about 25 black setulae among the yellow ground vestiture, all well separated from the katepisternum.

Fore tibia (Fig. 178) with 7–8 small ventral spine-like setae in proximal half, 2–3 larger than the others; prolonged ground setulae forming a slight fringe distally on ventral side, the setae longer than tibial diameter. Mid tibia with *pv* fringe distally, fringe setulae much longer than tibial diameter (Fig. 191). Hind tibia with fringe of long densely set *av, v* and (to a lesser extent) *pv* setae at distal half or two-thirds (Fig. 203).

ST5 flap (Fig. 90) with a usually straight or very slightly convex posterior border as seen from above, with concave lateral edges and broadly rounded distal corners. Never a nick in the hind edge. Basal part as broad as or slightly narrower than distal half.

Cerci narrow in dorsal view, curved in lateral view. Surstylus with a dense cover of pale setulae on ventral side (Fig. 83). Triangular projection of bacilliform sclerite pointed.

FIGURES 83–92. *Bengalia latro* de Meijere, male (83–91 from lectotype in ZMAN; 92 from paralectotype in RMNH). **83**. Cerci and surstyli, anteroventral view. **84**. Distiphallus, dorsal view. **85**. Pre- and postgonites. **86**. Distiphallus, ventral view. **87**. Distiphallus, left lateral view. **88**. Cerci and surstyli, dorsal view. **89**. Cerci and surstyli, left lateral view. **90**. ST5 flap. **91**. Area around lateral and ventral fingers, enlarged view. **92**. Distiphallus from in front. Scale = 0.25mm (Figures 84, 86, 87). Abbreviations: *l.f.* = lateral finger; *v.f.* = ventral finger.

FIGURES 93–97. *Bengalia latro* de Meijere, male (93–95 from lectotype in ZMAN, 96–97 from paralectotype in RMNH). **93**. Oblique anterodorsal view of tip of distiphallus. **94**. Oblique anterior view of tip of distiphallus. **95**. Original plus syntype labels. **96**. Anterior view of distiphallus. **97**. Original labels. Abbreviations: *d.o.* = dorsal opening; *ej.o.* = ejaculatory opening; *u.l.* = upper lip.

Distiphallus with prominent dorsolateral wings and broad, backwardly curving antlers with 2–3 tines at tip. Basal tooth strong. Upper lip projecting beyond base of antlers, distal edge convex in dorsal view, underside strongly concave as seen from in front (Figs. 87, 96). Lateral finger very conspicuous: long, thick, slightly curved, denticulate on all sides and projecting far beyond lateral edges of the hypophallic lobes (Figs. 84, 86, 91, 92). Ventral finger a narrow process in lateral view, projecting well below midventral wall, its anterior edge smooth, without denticles (Figs. 87, 91, 92). Inner and outer hypophallic lobes parallel, not converging with their counterparts. Outer hypophallic lobe with a conspicuous shelf (Figs. 86, 87, 91). Anterior end of midventral wall level with distal end of dorsolateral wings (thus much farther forward than in *varicolor.*

Female. Length: 7–11mm (mean 9.4mm, n=4). Frons at vertex / head width ratio: 0.333–0.350 (mean 0.342, n=6). ST2 as long as wide with 2 well separated strong (though short) erect marginals, sometimes with 2 smaller, one outside each (4 in all). ST3 very short with 2 strong erect marginals as distant as the strong ones on ST2, and sometimes with 1–2 smaller on their inside. ST4 twice as long as ST3 with 6 strong mostly erect marginals in groups of three. The middle in each group stronger than the others, and erect, but sometimes the smaller setae are not developed. ST5 about as long as ST2, broadly triangular, hind end narrower than front end, broadly rounded, with two strong marginals.

Distribution. Indonesia (Java, also Sumatra [female specimen below]).

Material examined. Type material. *Bengalia latro* de Meijere, 1910. This species was described on the basis of an unknown number of male and female specimens captured in "Semarang, Januar, November; Gunung Ungaran, October, Jacobson leg.; Semarang, Dezember, Drescher leg.". All the localities are in Java, Indonesia. The syntypes present in RMNH and ZMAN, their labels, and their depository have been reported by de Jong (2000: 111). In addition there are two overlooked male syntypes present in USNM. All material has been examined and is detailed below. To fix the identity of the name *Bengalia latro* de Meijere, I have selected and labelled a lectotype. I have labelled all the remaining type material with red paralectotype labels. All the original syntypes of *B. latro* are conspecific, except for one female in RMNH which lacks a pair of

discal setae on T5. Its abdominal sternites are shaped quite differently and have a different vestiture compared to the other syntypic females. It is obviously another species than *latro*.

Lectotype male, here designated, in ZMAN, labelled (1) "E. JACOBSON / Samarang. Java / Nov. 1909" [printed]; (2) "13/57" [printed]; (3) "Bengalia / latro / de Meijere, 1910 / ZMAN type DIPT.0118.12" [printed on red museum label]; (4) My red lectotype label (*latro* de Meijere) (Fig. 95). Dissected by K. R. Abdominal tergites glued to card on pin. Genitalia in glycerol in glass microvial on separate pin with similar lectotype label. **Paralectotypes. RMNH**: 1 male and 1 female labelled (1) "Java I. '06 / Semarang. / Jacobson." [printed, except "I. '06" which is handwritten]; (2) "Bengalia / latro / det. de Meijere." [handwritten in de Meijere's hand, except third line which is printed] (Fig. 97). Male dissected by K. R. • 1 female labelled (1) "Semarang / Jacobson" [handwritten]; (2) "Bengalia / latro. / det. de Meijere. / Cotype" [handwritten, except third line which is printed]; (3) "Bengalia sp. (f) / not *latro* de Meijere / T5 without discal setae / ST2-5 very different / from *latro* / K. Rognes det. 2009". This female lacks a pair of discal setae on T5 and is definitely not *latro*. It is also much larger than the other syntypic females and the ST2–5 are completely different in shape and setosity. • 1 male labelled (1) "Java / Jacobson" [handwritten]; (2) "Mus. Leiden" [printed], (3) "Bengalia / latro / det. de Meijere." [handwritten in de Meijere's hand, except third line which is printed]. **USNM**: 1 male labelled (1) "Java I. '06 / Semarang. / Jacobson." [printed, except "I. '06" which is handwritten]; (2) "SYNTYPE / Bengalia / latro / De Meijere 1910 / N. E. Woodley '94" [red label, handwritten except "N. E. Woodley" which is printed]; (3) "Bengalia / latro / de Meij. / det. de Meijere" [handwritten, upright script, not de Meijere's]; (4) "B. latro is in synonymy with / varicolor in James (1977) / but this specimen is / not that species. NEW '94" [white handwritten label in N. E. Woodley's hand]; (5) "USNM / 2046748" [printed on white label]. Flap of ST5 intact and visible. Genital capsule removed and glued to card below specimen, above labels [aedeagus broken, but cerci, surstyli, pre- and postgonites visible]. • 1 male labelled (1) "E. Jacobson / Samarang. Java / Nov. 1909" [printed]; (2) "13/58" [printed]; (3) "Bengalia / latro de Meij." [handwritten folded white label in de Meijere's hand, handwriting compared with same writing on RMNH specimens]; (4) "USNM / 2046748" [printed on white label]. I had an accident with this specimen, and the left mid leg was knocked off and the tarsus lost. The leg has been glued to a card below the specimen above the labels. This male, still undissected but with the ST5 flap visible, and the female from Sumatra 1925 (see below) were studied by Malloch (1927: 410–412), but the genitalia he figured, including the ST5 flap, were not from any of these specimens. See treatment of *Bengalia varicolor* Fabricius, 1805, below. **ZMAN**: 1 female labelled (1) "Semarang / Drescher. /12.1905" [printed, except "12" and "05" which are handwritten]; (2) "Bengalia / latro / de Meijere, 1910 / ZMAN type DIPT.0118.1" [printed on red museum label]. • 3 males and 3 females labelled (1) "Java I. '06 / Semarang. / Jacobson" [printed, except "I. '06" which is handwritten]; (2) "Bengalia / latro / de Meijere, 1910 / ZMAN type DIPT.0118.2–4 [for the males] 5–7 [for the females]" [printed on red museum label]. • 4 males labelled (1) "E. Jacobson / Samarang. Java / Nov. 1909" [printed]; (2) "13/56", "13/46", "13/48", "13/52", respectively; the one with the "13/56" label also carries a small label reading "♂" [printed]; (3) "Bengalia / latro / de Meijere, 1910 / ZMAN type DIPT.0118.8–11" [printed on red museum label]. One of these males (…0118.11) has two proclinate orbital setae on each side.

Afridigalia tenggeria Lehrer, 2006a. **Holotype** male, in BMNH**,** labelled (1) "WEST JAVA: / Tengger Mts. / Nungkodjadjar. / 4000'. V.1938 / B.M.1962-651" [printed]; (2) "*Afridigalia* ♂ / *tenggeria* n. sp / HOLOTYPUS / Det. Dr.A.Z.Lehrer / 2005" [printed pink label]; (3) "*Afridigalia* ♂ / *tenggeria* n. sp / HOLOTYPUS / Det. Dr.A.Z.Lehrer / 2005" [printed pink even larger label]; (4) My determination label (*latro* de Meijere). The specimen was somewhat damaged in the mail at reception. On the left side the fore and mid legs lack the tarsus. On the right side the mid leg lacks the tibia and tarsus. The right hind leg with three tarsomeres intact was loose in the box together with four tarsal fragments. The abdomen had been dissected and has spots of glue. The ST5 flap and the genitalia were in glycerol in a large plastic vial. The distiphallus had the left antler broken at base. I have transferred the genitalia to a smaller glass microvial with glycerol and placed the vial below label (1).

Other material. USNM: 1 female labelled (1) "Fort de Kock / (Sumatra) 920m / 1925 / leg. E. Jacobson." [printed]; (2) "Bengalia / latro / de Meij. / det. E. Jacobson" [handwritten, similar to writing on male from Java '06 in USNM, above; possibly Jacobson's?]; (3) My determination label (*latro* de Meijere). This female was studied by Malloch (1927: 410–412).

7. *Bengalia lyneborgi* James, 1966

Figs. 98–108, 179, 192, 204, 214, 215.

Holotype male, Philippines (Palawan) (ZMUC), by original designation. For details see Type material below.

Bengalia latro: Malloch, 1927: 412, "… several specimens from Mt. Maquiling, Los Banos, Baguio, and Cuernos Mts., Philippine Islands (*C. F. Baker*) …" only. Misidentifications, not *latro* de Meijere.

Note. I am basing this synonymy on the examination of 3 male and 5 female specimens from Los Banos, Mt. Makiling, Cuernos Mts. (all Philippine Islands), all Baker leg. in USNM (for details, see below). Although only a female from Cuernos Mts. carries a *latro* determination label by Malloch, it is likely that this determination label refers to all the Philippine specimens collected by C. F. Baker and seen by Malloch. For more details, see entry for Malloch in the synonymy of *Bengalia varicolor* Fabricius, below.

Bengalia lyneborgi James, 1966: 467. Holotype male, by original designation, Philippines (Palawan, Brooke's Point, Uring Uring, 22 August 1961) (ZMUC). Only photographs of ST5 flap examined.

Bengalia lyneborgi: James, 1977: 529. Catalogue entry.

Bengalia varicolor: Rueda, 1985: 347. Misidentification, not *varicolor* Fabricius. Philippines.

Note. Not examined, but Rueda's illustrations of the ST5 flap (fig. 17) and the aedeagus in dorsal view leave no doubt about the identity of his material.

Bengalia lyneborgi: Rognes, 1997: 64 (fig. 24). [Tip of ovipositor.]

Bengalia lyneborgi: Kurahashi & Magpayo, 2000: 47. Philippines (Culion Is., Luzon, Mindanao, Negros, Palawan).

Afridigalia jamesi Lehrer, 2005: 45. Holotype male, by original designation, Philippines (Palawan, Uring Uring, Brooke's Point) (WSUP). Not examined, but discussed by Rognes (2006: 465–466).

Afridigalia lyneborgi: Lehrer, 2005: 52. Philippines.

Afridigalia nicolasia Lehrer, 2005: 56. Holotype male, by original designation, Philippines (Busuanga Is., 4km N San Nicolas) (BPBM). Not examined, but discussed by Rognes (2006: 465–466).

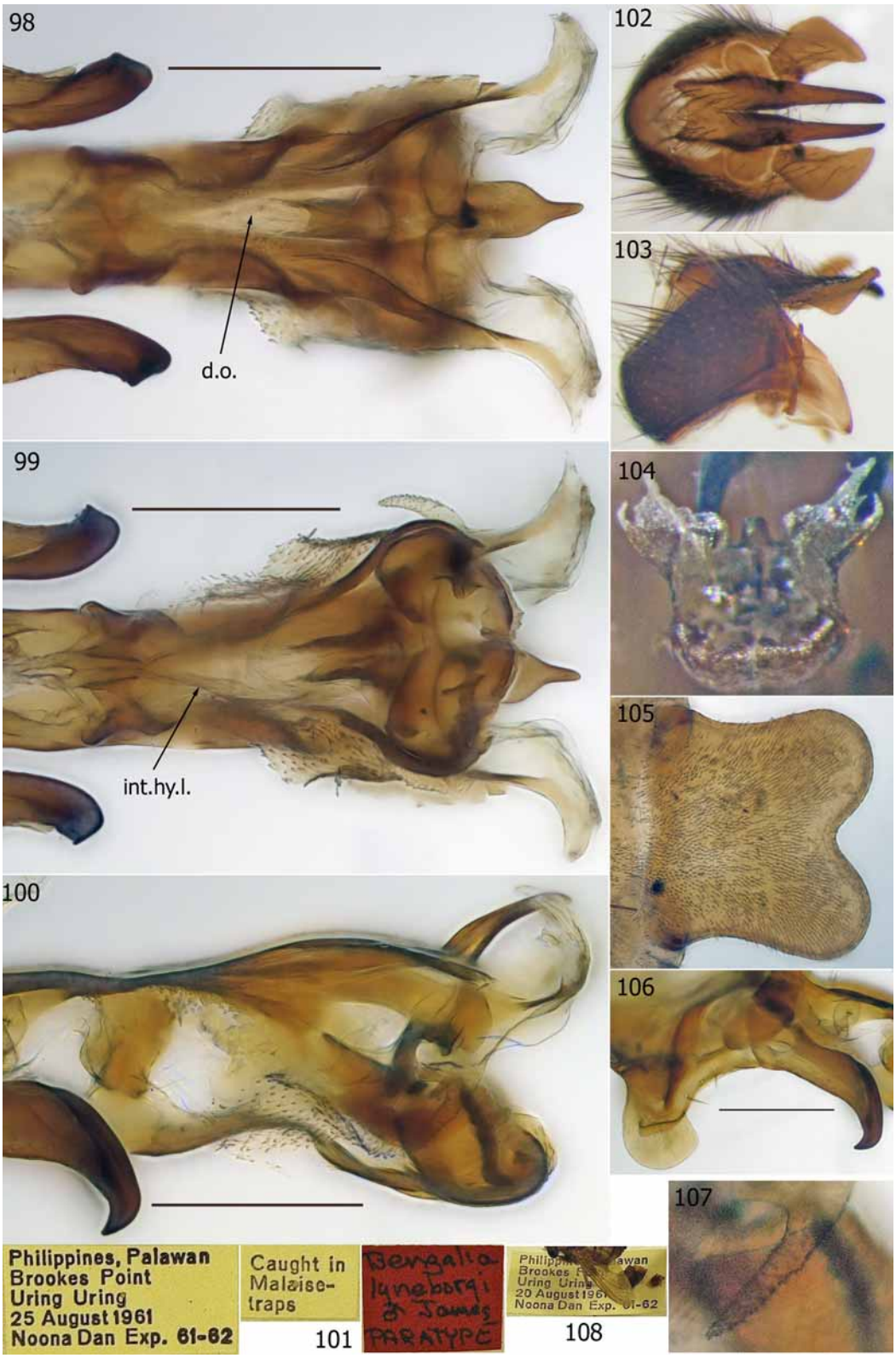
Bengalia lyneborgi: Verves, 2005: 239. Catalogue entry.

Diagnosis. *Male***.** Length: 10–11mm (n=4). Frons at vertex / head width ratio: 0.308–0.329 (mean 0.316, n=7). Lunula bare. Fronto-orbital plate without proclinate orbital setae. Anepimeron with a small tuft of 8–15 black setulae. Fore tibia with a bundle of strong spine-like setae on proximal half of ventral surface, the largest seta slightly longer than tibial diameter (Fig. 179). Mid tibia without elongated *pv* or other setulae distally, only short ground setulae present, much shorter than diameter of tibia (Fig. 192). Hind tibia with long *av* setae in a not very dense fringe occupying a little more than distal half, no long setae in fringe on v or *pv* side, only a few short erect setulae (Fig. 204).

ST5 flap (Fig. 105) almost square with a hind border which varies from almost straight with a slight emargination only, to a type with a quite deep emargination, the bottom of which forms a right angle.

Cerci (Figs. 102, 103) with a depression in middle as seen in profile. Surstylus without vestiture below. The dorsal projection of the bacilliform sclerite is rather long and blunt.

Distiphallus with a strongly sclerotised upper lip in the form of a narrow, elongate and slightly upturned process (Figs. 98–100). Mid-dorsal wall perforated by a long dorsal opening along most of its length (Fig. 98, *d.o.*). Dorsolateral wings projecting horizontally. Antlers hardly sclerotised, short, slightly upturned and grooved on dorsal side, with small irregular processes basally and distally at the front wall of the groove. Lateral finger long and strong, projecting from a prominent vertical sclerotised sheet (Figs. 99, 100, 107). No ventral finger found. External hypophallic lobe inconspicuous, slightly folded in middle and weakly denticulate. Internal hypophallic lobes strongly reduced, without denticles, originating as very low folds close together near base of distiphallus and diverging towards middle and then disappearing. From within the distiphallus two strong sclerotisations curve outwards and forwards, enclosing between them two balloon-like structures with a complex system of internal sclerotisations on each side at the distal end of the ventral part of the distiphallus (Figs. 99, 100).



FIGURES 98–108. *Bengalia lyneborgi* James, male (98–103, 106–107 from paratype in ZMUC "… Uring Uring 25 August 1961 …"; 104, 108 from paratype in ZMUC "… Uring Uring 20 August 1961 …"; 105 from non-paratype in ZMUC "… Uring Uring 17 August 1961 …"). **98**. Distiphallus, dorsal view. **99**. Distiphallus, ventral view. **100**. Distiphallus, left lateral view. **101**. Three original labels. **102**. Cerci and surstyli, dorsal view. **103**. Cerci and surstyli, left lateral view. **104**. Tip of distiphallus, from in front. **105**. ST5 flap. **106**. Pre- and postgonites. **107**. Lateral finger. **108**. Label. Scale = 0.25mm (Figures 98, 99, 100, 106). Abbreviation: *int.hy.l.* = internal hypophallic lobe; *d.o.* = dorsal opening.

Female. Length: 9–10mm (n=5). Frons at vertex / head width ratio: 0.308–0.342 (mean 0.324, n=6). ST1–5 and ovipositor as shown Figs. 214, 215. A pair of strong marginals on ST2–4. ST5 elongate oval.

Distribution. Philippines.

Material examined. Type material. *Bengalia lyneborgi* James, 1966. **Holotype** male, Philippines (Palawan, Brooke's Point, Uring Uring, 22 August 1961) (ZMUC). Only photographs of ST5 flap examined. ST5 flap about as shown in Fig. 105.

Paratypes (all ZMUC). 1 male labelled (1) "Philippines, Palawan / Brookes Point /Uring Uring / 19 August 1961 / Noona Dan Exp. 61–62" [printed]; (2) "Caught in / Malaise- / traps" [printed]; (3) "Bengalia / lyneborgi / ♂ James / PARATYPE" [red handwritten label]. • 1 male labelled (1) "Philippines, Palawan / Brookes Point / Uring Uring / 20 August 1961 / Noona Dan Exp. 61–62" [printed] (dried genitalia on label) (Figs 104, 108); (2) "Caught in / Malaise- / traps" [printed]; (3) "Bengalia / lyneborgi / ♂ James / PARATYPE" [red handwritten label]. • 1 male labelled (1) "Philippines, Palawan / Brookes Point / Uring Uring / 25 August 1961 / Noona Dan Exp. 61–62" [printed]; (2) "Caught in / Malaise- / traps" [printed]; (3) "Bengalia / lyneborgi / ♂ James / PARATYPE" [red handwritten label] (4) "Dissected / January 2006 / By Knut Rognes" [printed]. Abdominal tergites glued to card on pin, genitalia in glass microvial on pin (Figs. 98–103, 106–107). • 1 female labelled (1) "Philippines, Palawan / Brookes Point / Uring Uring / 25 August 1961 / Noona Dan Exp. 61–62" [printed]; (2) "Caught in / Malaise- / traps" [printed]; (3) "Bengalia / lyneborgi / ♀ James / PARATYPE" [red handwritten label]; (4) "G. pr. 336 / K. Rognes det. 92." [handwritten, except "K. Rognes det." which is printed]. Dissected by K. R.; spermathecae and common oviduct in glycerol in vial on pin; abdominal tergites T1–5 glued to card on pin; ovipositor on slide G. pr. 336 (Figs. 214, 215). • 1 male labelled (1) "Philippines. Palawan / Mantalingajan / Pinigisan 600 m / 8 Sept. 1961 / Noona Dan Exp. 61–62"; (2) "Bengalia / lyneborgi / ♂ James / PARATYPE" [red handwritten label]. Not dissected.

Other material. USNM (all given my determination label (*lyneborgi* James)): 1 female labelled (1) "Los Banos / P. I. Baker" [printed]; (2) "♀" (printed in red); (3) "USNM / 2047114" [printed]. • 1 female labelled (1) "Los Banos / P. I. Baker" [printed]; (2) "23392" [handwritten]; (3) "USNM / 2047114" [printed]. • 1 male labelled (1) "Los Banos / P. I. Baker" [printed]; (2) "23392" [handwritten]; (3) "♂" (printed in red); (4) card with genitalia (capsule and aedeagus complex) glued to one end; (5) "USNM / 2047114" [printed]. ST5 flap, *in situ* on abdominal tip, square with shallow excavation distally. • 1 female labelled (1) "Cuernos Mts / Negros, Baker" [printed]; (2) "USNM / 2047114" [printed]. • 1 female labelled (1) "Cuernos Mts / Negros, Baker [printed]; (2) "Ochromyia / latro / de Meij. [handwritten] / Det. J. R. Malloch" [printed] [folded label]; (3) "USNM / 2047114" [printed]. • 1 male labelled (1) "Los Banos / P. I. Baker" [printed]; (2) "995" [handwritten]; (3) card with right mid leg, right hind leg and dried genital capsule glued to one end; (4) "♂" [printed in red]; (5) "USNM / 2047114" [printed]. ST5 flap, *in situ* on abdominal tip, square with quite deep V-shaped incision distally. • 1 male labelled (1) "Mt. Makiling / Luzon, Baker" [printed]; (2) "USNM / 2047114" [printed]. Dried abdominal tergites folded over one end of upper label, genital capsule glued to other end; abdominal sternites including ST5 flap not present. I have removed the genital capsule from label, boiled it in KOH, dissected the genitalia, and put all parts into a glass microvial with glycerol on the pin. • 1 female labelled (1) "Mt. Makiling / Luzon, Baker" [printed]; (2) "USNM / 2047114" [printed]. **ZMUC**: 1 male labelled (1) "Philippines, Palawan / Brookes Point / Uring Uring / 17 August 1961 / Noona Dan Exp. 61–62" [printed]; (2) "Bengalia ♂ / lyneborgi / James, 1966 / Det. H. Kurahashi" [printed]. Dissected by K. R. (Fig. 105).

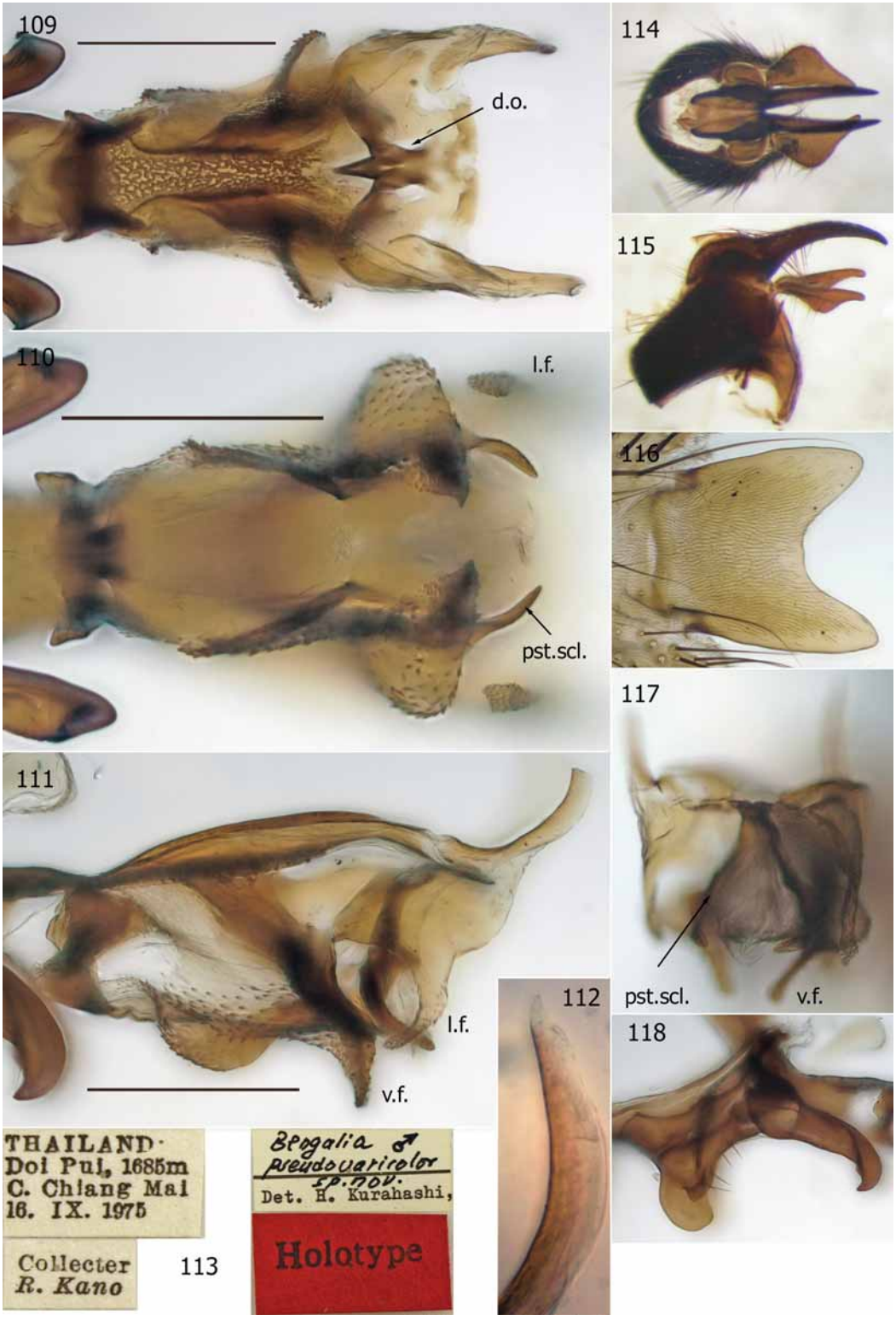
8. *Bengalia pseudovaricolor* Kurahashi & Tumrasvin, 1979

Figs. 109–118, 180, 193, 205.

Holotype male, Thailand (NMNS), by original designation. For details see Type material below.

Bengalia pseudovaricolor Kurahashi & Tumrasvin, 1979: 300. Holotype male, by original designation, Thailand (Doi Pui, 1685m, C. Chiangmai) (NMNS). Examined.

Bengalia pseudovaricolor: Verves, 2005: 240. Catalogue entry.



FIGURES 109–118. *Bengalia pseudovaricolor* Kurahashi & Tumrasvin, male (holotype in NMNS). **109**. Distiphallus, dorsal view. **110**. Distiphallus, ventral view. **111**. Distiphallus, left lateral view (left antler broken at tip). **112**. Distiphallus, unbroken right antler. **113**. Four original labels. **114**. Cerci and surstyli, dorsal view. **115**. Cerci and surstyli, left lateral view. **116**. ST5 flap. **117**. Tip of distiphallus from in front. **118**. Pre- and postgonites, left side. Scale = 0.25mm (Figures 109, 110, 111). Abbreviations: *d.o.* = dorsal opening; *l.f.* = lateral finger; *pst.scl.* = parastomal sclerite; *v.f.* = ventral finger.

Diagnosis. *Male***.** Length: 11mm. Frons at vertex / head width ratio: 0.280 (n=1). Lunula bare. Fronto-orbital plate without proclinate orbital setae. Anepimeron mostly covered with densely set black ground setulae, many reaching katepisternum. Only very few yellow ground setulae in lower hind part (close examination necessary). Femora darkened along upper side, fore femur also on anterior side, mid femur darkened all around. Fore tibia without ventral spine-like setae (Fig. 180). Mid tibia without fringe (Fig. 193). Hind tibia without fringe, only a row of 4–6 thin *av* setae (Fig. 205).

ST5 flap (Fig. 116) broad, slightly asymmetric, with diverging lateral edges, and a deep excavation in hind edge.

Cerci strongly curved in profile view (Fig. 115). Surstylus bare below. Distiphallus with horizontal dorsolateral wings. Antlers simple, with no basal tooth. Upper lip not projecting beyond base of antlers. Distal edge of upper lip straight in dorsal view. Vertical sclerotised sheet prominent, with a depression in the anterior edge above the lateral finger. External hypophallic lobe folded in anterior part and forming an almost transverse forwardly facing wall with a strongly projecting and pointed ventral finger. Internal hypophallic lobes converging. Parastomal sclerites (Figs. 110, 111, 117) long, originating close together just below upper lip, curved, with concavity forwards, a small forward projection present slightly below middle.

Female. Unknown. I expect the female of *B. pseudovaricolor* to be recognisable (and separable from the female of *B. taksina*) based on a relatively narrow frons and the mostly black vestiture on the anepimeron reaching katepisternum (like the males).

Distribution. Thailand.

Material examined. Type material. *Bengalia pseudovaricolor* Kurahashi & Tumrasvin, 1979. **Holotype** male, in NMNS, labelled (1) "THAILAND / Doi Pui, 1685m / C. Chiang Mai / 16. IX. 1975" [printed]; (2) "Collecter [sic] / *R. Kano*" [printed]; (3) "Bengalia ♂ / pseudovaricolor / sp. nov. / Det. H. Kurahashi," [handwritten, except last line which is printed; a black line below second line]; (4) "Holotype" [printed on red label] (Fig. 113).

9. *Bengalia surcoufi* Senior-White, 1923

Figs. 119–129, 181, 194, 206.

Holotype male, India (BMNH), by original designation. For details see Type material below.

Bengalia surcoufi Senior-White, 1923a: 302 (key), 306 (main entry), Plate II (fig. 11, fore tibia; fig. 12, mid femur), Plate VIII (male genitalia). Holotype male, by original designation, India, West Bengal, Darjiling district, Mungpoo, 24.iii.1920 (BMNH). Examined.

Note. Mungpoo is spelled variously as Mangpu, Mangphu, Mugpu, and Mongpu on maps.

Bengalia surcoufi: Senior-White, 1923b: 37. India.

Note. Senior-White here records one female from Shillong [Meghalaya] and one female from Matheran [Maharashtra] which "are probably this species, but again I hesitate to distinguish definitely in the female sex between this species and my *bezzii*, as separation rests only on colour". Not seen.

Bengalia surcoufi: Senior-White, 1924: 106. Specimens from India (Khasia Hills [Meghalaya] (1♂ 1♀, as "a pair") and Charapani Tehsil [?]) (1♂). Not seen.

Note. Senior-White also lists "two ♂ from Dehra Dun [Uttar Pradesh], xi.07, (Thomson); one of which is noted by Surcouf as 'probably *varicolor* F.' …". I have been able to examine a specimen which fits these data, although it lacks a Senior-White determination label to the effect that he identified it as *surcoufi*. It is a specimen of *bezzii* Senior-White (= *varicolor* Fabricius) exactly as Surcouf noted on the label. More details are given in the synonymy of *Bengalia varicolor*, below.

Bengalia surcoufi: Senior-White, 1926: 139. India (Khasia Hills [Meghalaya] (cited as "Khasia Hills in Assam"), and Matheran [Maharashtra] (cited as "Western Ghats (Matheran)").

Note. He also repeats the locality "Dehra Dun" [Uttar Pradesh], but this record may be dubious (see previous entry).

Bengalia surcoufi: Senior-White *et al*., 1940: 101. India ("the Himalayas (foot-hills), Assam Hills, Western Ghats").

Bengalia surcoufi: James, 1977: 530. Catalogue entry.

Bengalia surcoufi: Kurahashi & Thapa, 1994: 218. Nepal.

Bengalia surcoufi: Kurahashi & Chowanadisai, 2001: 203. Vietnam.

Bengalia surcoufi: Kurahashi & Afzal, 2002: 221. Pakistan.

Afridigalia surcoufi : Lehrer, 2005: 69. India (Himachal Pradesh, Tamil Nadu, West Bengal).

Note. I have re-examined most of Lehrer's material, except two males from Tamil Nadu ("S. India, Burliyar, 300 ft., Coonoor Ghaut …" and "S. India, Naraikkadu, 2500-3000 ft., Tinnevelly [= Tirunelveli] …").

Bengalia surcoufi: Verves, 2005: 240. Catalogue entry.

Diagnosis. *Male*. Length: 8–10mm (n=3). Frons at vertex / head width ratio: 0.317–0.342 (mean 0.330, n=5). Lunula bare. Fronto-orbital plate without proclinate orbital setae. Anepimeron mostly clothed with yellow setulae, a small bundle of black setulae (3–15) on upper part just below lesser ampulla, numerous yellow ground setulae present in lower part, no black setulae reaching katepisternum. Fore tibia with two spine-like setae longer than the others, both a little shorter than tibial diameter (Fig. 181). Mid tibia without fringe of thin setae, all distal elongate setae shorter than tibial diameter (Fig.194). Hind tibia with a row of 3–5 long thin setae on *av* surface of apical half in addition to the strong *av* seta, but without typical fringe (Fig. 206).

ST5 flap broad, with concave lateral edges (Fig. 127) and a distal excavation.

Cerci almost straight in profile view, curved near tip. Surstyli with swollen tip (Fig. 126), bare below.

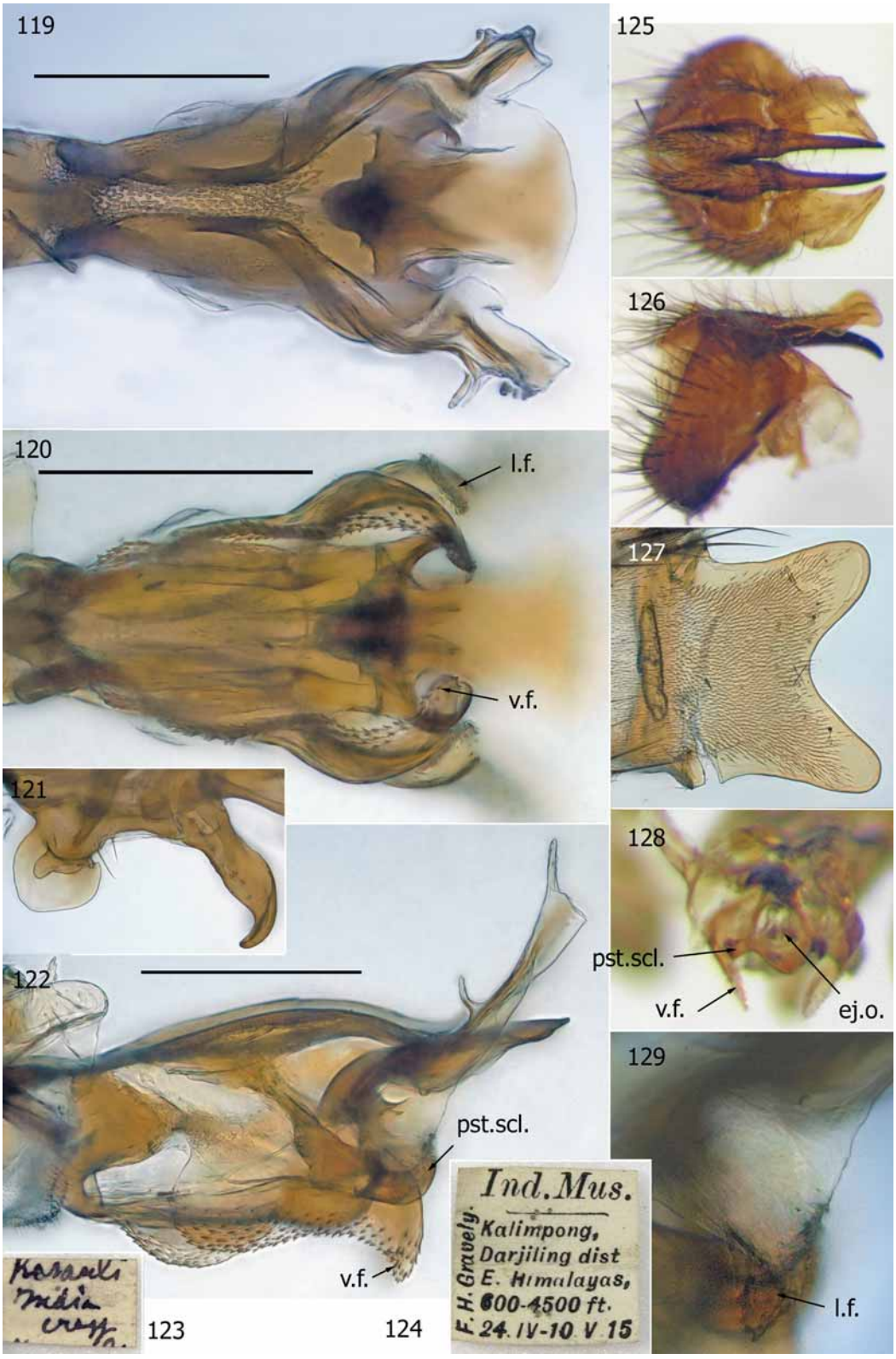
Distiphallus with horizontal dorsolateral wings. Antlers simple, with small basal tooth. Upper lip projecting beyond base of antlers, its anterior edge convex in dorsal view. Vertical sclerotised sheet prominent, with a straight unserrated anterior edge, and a short thick lateral finger (Fig. 129). External hypophallic lobe not folded distally, terminating below in a weakly projecting almost rounded ventral finger. Internal hypophallic lobes parallel. Parastomal sclerite a narrow and horizontal sclerite projecting forwards lateral to the ejaculatory opening (Fig. 128), in dorsal view curved (Figs. 120, 122), distally strongly sclerotised.

Female. Unknown.

Distribution. India (Himachal Pradesh, ?Maharashtra [a female specimen only], Meghalaya, Tamil Nadu, West Bengal), Nepal, Pakistan, Vietnam.

Material examined. Type material. *Bengalia surcoufi* Senior-White, 1923a. All the 3 original syntypes are staged and the pins are heavily corroded. The collector is G. E. Shaw according to Senior-White (1923a: 307), but this is not stated on any labels. All are in BMNH. **Holotype** male, labelled (1) "3" [handwriting on stage card]; (2) "TYPE." [red handwriting]; (3) "Holo- / type" [printed on circular white label with broad red margin]; (4) "INDIA: / Sikkim. / Mungpoo. / 3800 ft. / 24. iii.1920" [handwritten, except first line which is printed]; (5) "Bengalia / surcoufi, S.-W. / det. R. Senior White." [handwritten, except last line which is printed]; (6) "Purchd. from / R. Senior White / B.M.1938-460" [printed]; (7) "*Afridigalia* ♂ / *surcoufi* (S.W.) / Det. Dr. A.Z.LEHRER / 2004" [printed]; (8) "*Afridigalia* ♂ / *surcoufi* (S.W.) / Det. Dr. A.Z.LEHRER / 2004" [printed]. The last abdominal segments have been removed. Genital slide in BMNH labelled "Bengalia / surcoufi / S.-W. / ♂ genitalia. / Type. / 3.V.22." [handwritten]. **Paratypes.** 1 male labelled: (1) "1." [handwriting on stage card]; (2) "Para- / type" [printed on circular white label with broad yellow margin]; (3) "COTYPE" [red handwriting]; (4) "INDIA: / Sikkim. / Mungpoo. / 1700 ft. / 14.vi.1920" [handwritten, except first line which is printed]; (5) "Purchd. from / R.Senior White / B.M.1938-460" [printed]; (6) "Bengalia / surcoufi, S.-W. / det. R.Senior White." [handwritten, except last line which is printed]. Right hind, left mid and left fore legs lost. Right fore tibia lost. Not dissected. The ST5 flap is visible, although the abdominal tip is rather mouldy. • 1 male labelled: (1) "2" [handwriting on stage card]; (2) "Para- / type" [printed on circular white label with broad yellow margin]; (3) "COTYPE" [red handwriting]; (4) "INDIA: / Sikkim. / 3800 ' / Mungpoo. / 6.iv.1920." [handwritten, except first line which is printed]; (5) "Purchd. from / R. Senior White / B.M.1938-460" [printed]; (6) "Bengalia / surcoufi, S.-W. / det. R.Senior White." [handwritten, except last line which is printed]. Left fore leg lost. Not dissected. The ST5 flap is visible.

Other material. MSNM: 1 male labelled (1) "Kasanli [Himachal Pradesh] / India / Cragg" [handwritten, Fig. 123]; (2) " … coufi" [white printed museum label similar to others from MSNM, but posterior half only, anterior half lost]; (3) "*Bengalia* ♂ / *surcoufi* Senior-White / Det. Dr. A. Z. LEHRER / XII.2004" [printed on white label]; (4) My determination label (*surcoufi* Senior-White). The specimen is in good condition with all legs intact. The genital capsule has been removed from the abdomen. The ST5 flap and the T6 are in place and



FIGURES 119–129. *Bengalia surcoufi* Senior-White, male (119–122, 124, 127–129 from "Kalimpong" specimen; 123, 125, 126 from "Kasanli" specimen; both in MSNM). **119**. Distiphallus, dorsal view. **120**. Distiphallus, ventral view. **121**. Pre- and postgonites. **122**. Distiphallus, left lateral view. **123**. Original label. **124**. Original label. **125**. Cerci and surstyli, dorsal view. **126**. Cerci and surstyli, left lateral view. **127**. ST5 flap. **128**. Tip of distiphallus from in front. **129**. Vertical sclerotised sheet, with lateral finger. Scale = 0.25mm (Figures 119, 120, 122). Abbreviations: *ej.o*. = ejaculatory opening; *l.f*. = lateral finger; *pst.scl*. = parastomal sclerite; *v.f*. = ventral finger.

unharmed. Below the specimen there is present on the pin a white card label with three transverse black stripes at base near the pin. At the tip of this card there are some shining remains of glue, and the distiphallus is still sticking to the glue by its right antler. Judging from the extent of the glue there must once have been more genital parts attached to it. In a large plastic vial were some dry genital remains: an intact genital capsule with epandrium, cerci and surstyli, incl. bacilliform sclerites, but no aedeagal parts. In addition there was some unidentifiable debris in the vial: a few fibres and some flat pieces of unknown nature, and part of an insect leg (black) which does not belong to the specimen on the pin. Everything has now been placed in glycerol in a glass vial. This specimen appears to have been used by Lehrer (2005) for the illustration in his fig. 30B of the cerci and surstyli in profile view. Lehrer (2005: 71) miscites the label locality as "Kasanki". • 1 male labelled (1) "Ind. Mus. / [long black printed line] / Kalimpong [West Bengal], / Darjiling dist / E. Himalayas, / 600–4500 ft. / 24.IV – 10.V.15 / F. H. Gravely [transverse text along the left margin of label]" [yellowish label with black print]; (2) "surcoufi" [white museum label with black print]; (3) "*Bengalia* ♂ / *surcoufi* Senior-White / Det. Dr. A. Z. LEHRER / XII.2004" [printed on white label, pinned at middle]; (4) "*Bengalia* ♂ / *surcoufi* Senior-White / Det. Dr. A. Z. LEHRER / XII.2004" [printed on white label, pinned near right hand edge]; (5) My determination label (*surcoufi* Senior-White). The specimen was mostly destroyed in the mail at reception. The large Lehrer type plastic vial had come loose in transit. On the pin is only the thorax and head, both in good shape. Both fore legs are *in situ* and in good shape, except that the right fore leg lacks the tarsus. Both mid legs have broken off. The right hind leg is in good shape and *in situ*, but lacks the three distal-most tarsomeres. Loose in the box were two wings, the abdomen [which had the genital capsule and the whole ST5 removed], the left hind leg [lacking the distal-most four tarsomeres], right mid leg [tarsus lost], left mid femur, left mid tibia. These parts have now been glued onto a piece of stiff paper. In the large plastic vial were the following already dissected genital parts in glycerol: ST5 + ST5 flap [a small part of ST5 broken off and present as a separate piece]; hypandrium + pre- and postgonites on both sides + phallapodeme + aedeagus [tip of right antler and its basal tooth broken off] in one piece; epandrium + two cerci + basal parts of both surstyli + bacilliform sclerites [both pieces on one side, lowermost piece lost on the other]; one loose distal surstylar piece, the other distal surstylar piece lost. The ejaculatory sclerite is absent. All the genital parts have now been placed in glycerol in a smaller glass microvial. This specimen appears to have been used by Lehrer (2005) for the illustrations in his fig. 30A, C–E.

10. *Bengalia taksina* (Lehrer, 2005), comb. nov.
Figs. 130–138, 182, 195, 207.

Holotype male, Thailand (BMNH), by original designation. For details see Type material below.

Bengalia varicolor: James, 1977: 530, in part. Misidentification, not *varicolor* Fabricius. Catalogue entry for Laos, Malaya, Vietnam.

Bengalia varicolor: Inder Singh *et al.*, 1979: 8. Misidentification, not *varicolor* Fabricius. Malaysia (Bukit Mandul, 20km S Kuala Lumpur, "1.XI.1975").

Note. Tentative synonymy. I have not seen the material from Malaysia, but I assume that Kurahashi considers the Malaysia material to be the same as the Thailand material (mis)identified as *varicolor* by Tumrasvin *et al*. (1979).

Bengalia varicolor: Tumrasvin *et al*., 1979: 261, Plate 1 fig. 6 (ST5 flap), Plate 2 fig. 22 (aedeagus in profile), Plate 3 fig. 34 (cerci, surstyli, epandrium in profile), Plate 4 fig. 45 (cerci, surstyli, dorsal view). Misidentification, not *varicolor* Fabricius. Thailand.

Note. Not examined, but fig. 22 in Tumrasvin *et al*. (1979) fits exactly the concept of *taksina*.

Bengalia varicolor: Kurahashi & Thapa, 1994: 219. Misidentification, not *varicolor* Fabricius. Nepal.

Note. Tentative synonymy. I have not seen material from Nepal, but I assume Kurahashi considers the Nepal material to be the same as the Thailand material misidentified as *varicolor* by Tumrasvin *et al*. (1979). The ST5 flap (Kurahashi & Thapa 1994: fig. 8a) is also similar.

Bengalia varicolor: Kurahashi *et al*., 1997: 43. Misidentification, not *varicolor* Fabricius. Malaysia (Bukit Mamdul [sic], 20km S Kuala Lumpur).

Note. This record seems to be the same as the one reported by Inder Singh *et al*. 1979: 8, even though the date of capture is now reported as 1 Oct. 1975 (error?); cf. entry above. Material not seen.

Bengalia varicolor: Kurahashi & Chowanadisai, 2001: 203. Misidentification, not *varicolor* Fabricius. Vietnam.

Note. I have examined 3 males (1 male dissected) from Vietnam listed by Kurahashi & Chowanadisai as *varicolor*, and 1 female from Laos and 1 female from Vietnam (identified by Kurahashi as *varicolor*, but not published by Kurahashi & Chowanadisai, see below).

Afridigalia taksina Lehrer, 2005: 71. Holotype male, by original designation, Thailand (Doi Chom Chang, nr. Chiengmai) (BMNH). Examined.

Bengalia varicolor: Verves, 2005: 240, in part. Misidentification, not *varicolor* Fabricius. Catalogue entry for Thailand, Laos, Vietnam.

Afridigalia thaisia Lehrer, 2008: 28. Holotype male, by original designation, Thailand (Soppong, 8km S Rt 1095, near Ban Nam Rim) (TAU). Not examined. **Syn. nov.**

Note. Lehrer does not state what features led him to describe *thaisia* as a species different from *taksina*. The ST5 flap of *thaisia* differs from the one in *taksina* both by being slightly asymmetric and rather short. I do not consider the asymmetry as sufficient reason for regarding it as a separate species. The ST5 flap in *pseudovaricolor* is also slightly asymmetric, just as in some of the specimens of *taksina* from Vietnam, and also in other species. The shortness must be treated as within an expected range of variation.

Bengalia varicolor: Heo *et al*., 2008: 263. Misidentification, not *varicolor* Fabricius. Malaysia (Malaya).

Note. Tentative synonymy. I have not seen this material but I assume their concept of *varicolor* is the same as the one of, e.g., Kurahashi *et al*. (1997) (cf. above), a paper cited in their work.

Diagnosis. *Male*. Length: 8–13mm (n=4). Frons at vertex / head width ratio: 0.275–0.286 (mean 0.282, n=4). Lunula bare. Fronto-orbital plate without proclinate orbital setae. 1–2 *prst dc* in front of main *prst dc*. Anepimeron with a small bundle of black ground setulae in upper two-fifths, none reaching katepisternum; densely set yellow ground setulae in the three-fifths below it; lowermost black setulae widely separated from katepisternum. All femora darkened. Fore tibia with 4–5 small and inconspicuous ventral spine-like setae in basal half (Fig. 182) [difficult to observe since 2 of 3 specimens had the fore tibia and femur closely appressed]. Mid tibia without fringe distally (Fig. 195). Hind tibia with conspicuous *av* fringe (Fig. 207) with short erect setae also on *v* side.

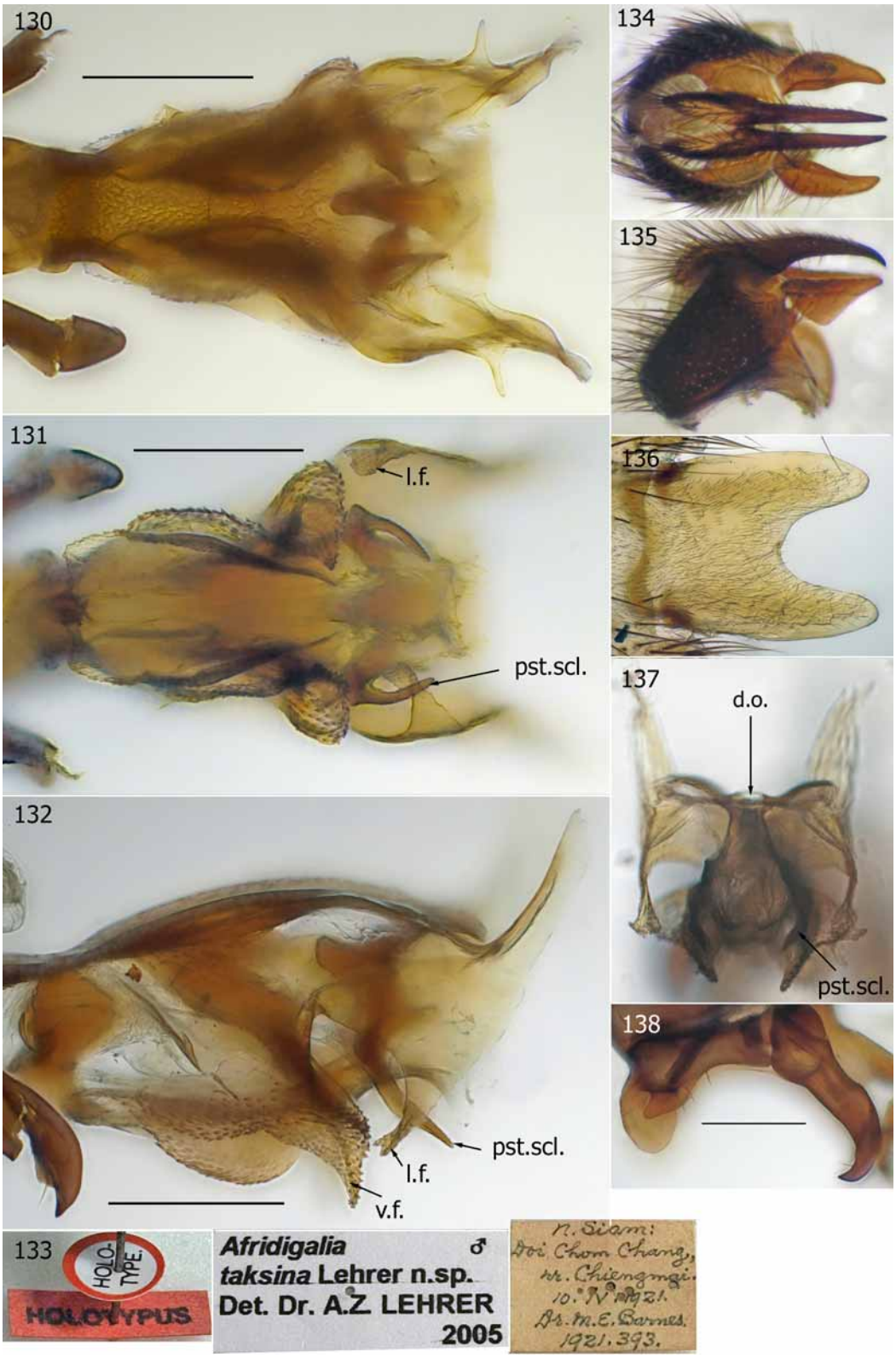
ST5 flap (Fig. 136) with lateral edges not diverging as much as in *pseudovaricolor*, distal excavation somewhat deeper. Slightly asymmetric, strongly so in a small Vietnam male in BPBM.

Cerci curved in lateral view (Fig. 134). Surstyli bare below.

Distiphallus with horizontal dorsolateral wings. Antlers simple, with a very small basal tooth, sometimes minute. Upper lip not projecting beyond base of antlers. Distal edge of upper lip straight in dorsal view. Vertical sclerotised sheet prominent, without (holotypes of *taksina* and *thaisia*) or with (Vietnam male dissected) a depression in the anterior edge above the lateral finger; the latter is bent laterally at the tip. External hypophallic lobe folded in anterior part and forming an almost transverse forwardly facing wall with a strongly projecting pointed ventral finger. Internal hypophallic lobes strongly converging. Parastomal sclerites (Figs. 131, 132, 137) long, originating close together just below upper lip, curved, with concavity facing forwards, a small forward projection present slightly above middle.

Female. Length: 12mm (n=1). Frons at vertex / head width ratio: 0.283–0.300 (mean 0.292, n=2), thus quite narrow for a female. Anepimeron with a small bundle of black ground setulae in upper third, none reaching katepisternum; densely set yellow ground setulae in the two-thirds below it; lowermost black setulae widely separated from katepisternum. ST2, ST3, ST4 each with a pair of strong erect marginal setae. ST5 broad distally without marginal setae.

Discussion. *Bengalia taksina* is obviously very closely related to *B. pseudovaricolor*, both having a very narrow frons and a similar distiphallus in the male. The ST5 flap in *B. taksina* differs slightly from the one in *B. pseudovaricolor*, but may not be diagnostic when more specimens are studied. The latter species has no ventral spine-like setae on fore tibia (despite the description by Kurahashi & Tumrasvin to the contrary), whereas *B. taksina* has a few inconspicuous ones. The best characters to distinguish the two species seem to be the presence of a conspicuous fringe on the hind tibia in the male *B. taksina*, and the large number of long yellow ground setulae below the bundle of black ones on the anepimeron. In *B. pseudovaricolor* there are almost no yellow setulae on the anepimeron, only black ones, and the black setulae reach down to the katepisternum. Judging from the conditions in *B. emarginata*, this feature should work also for females.



FIGURES 130–138. *Bengalia taksina* (Lehrer), male (130–136 from holotype of *Afridigalia taksina* Lehrer in BMNH; 137, 138 from dissected "VIET NAM …" specimen in BPBM). **130**. Distiphallus, dorsal view. **131**. Distiphallus, ventral view. **132**. Distiphallus, left lateral view. **133**. Labels on holotype. **134**. Cerci and surstyli, dorsal view. **135**. Cerci and surstyli, left lateral view. **136**. ST5 flap. **137**. Tip of distiphallus, from in front. **138**. Pre- and postgonites. Scale = 0.25mm (Figures 130, 131, 132, 138). Abbreviations: *d.o*. = dorsal opening; *l.f*. = lateral finger; *pst.scl*. = parastomal sclerite (arrow points to its lower end); *v.f*. = ventral finger.

Distribution. Laos, Malaysia, Nepal, Thailand, Vietnam.

Material examined. Type material. *Afridigalia taksina* Lehrer, 2005. **Holotype** male, in BMNH, labelled (1) "HOLO- / TYPE" [printed on round white label with red margin] (2) "HOLOTYPUS" [printed on red label]; (3) "N. Siam: / Doi Chom Chang, / nr. Chiangmai. / 10.IV.1921. / Dr. M. E. Barnes / 1921.393." [handwritten on yellowish label]; (4) "*Afridigalia* ♂ / *taksina* Lehrer n. sp. / Det. Dr. A.Z. LEHRER / 2005" [printed] (Fig. 133). Dissected by Lehrer; dissected parts transferred from large opaque plastic vial to glass microvial by K. R.

Other material. BPBM: 3 males labelled (1) "VIET NAM: Dalat / 6 km S., 1400–1500m / 9.VI—7.VII.1961" [printed]; (2) "N. R. Spencer / Collector" [printed]; (3) "Bengalia ♂ / varicolor / (Fab., 1805) / Det. H. Kurahashi" [printed]; (4) My determination label (*taksina* Lehrer). One of the males dissected by K. R. T1–5 glued to card on pin; ST1–5 and dissected genitalia in glass microvial; ST5 flap lost by accident. • 1 female labelled: (1) "LAOS: / Vientiane Prov. / Ban Van Eue / 15.III.1966" [printed]; (2) "Malaise Trap" [printed]; (3) "Native Collector / BISHOP MUS." [printed]; (4) "Bengalia ♀ / varicolor / (Fab., 1805) / Det. H. Kurahashi" [printed]; (5) My determination label (*taksina* Lehrer). [Not published by Kurahashi & Chowanadisai (2001)]. • 1 female labelled (1) "VIET NAM. Dak Song / 76 km SW of / BanMe Thuot, 870m / 19–21.V.1960" [printed]; (2) "L. W. Quate / Collector" [printed]; (3) "Bengalia ♀ / varicolor / (Fab., 1805) / Det. H. Kurahashi" [printed]; (4) My determination label (*taksina* Lehrer). Dissected by Kurahashi. Abdomen with ovipositor in glass vial on pin with cork stopper. [Not published by Kurahashi & Chowanadisai (2001)].

11. *Bengalia unicolor* Séguy, 1946

Figs. 139–148, 183, 196, 208.

Holotype male, Pakistan (MNHN), by monotypy. For details see Type material below.

Bengalia unicolor Séguy, 1946: 85. Holotype male, fixed by monotypy, Pakistan (Karachi) (MNHN). Examined.

Note. Séguy did not explicitly state that he based his species on one specimen only, nor did he use the word "Holotype" or "Type" or similar expression in the published text, but only one specimen is present in MNHN fitting the information that Séguy published about the material before him, and I take the specimen to be a holotype fixed by monotypy. The specimens bears a Séguy "TYPE" label (Fig. 143). Séguy (1946: fig. 1a) illustrated the ST5 flap.

Bengalia unicolor: James, 1977: 530. Catalogue entry.

Bengalia unicolor: Kurahashi & Afzal, 2002: 221. Pakistan (Baluchistan, Khuzdar). Single female specimen, not seen by me.

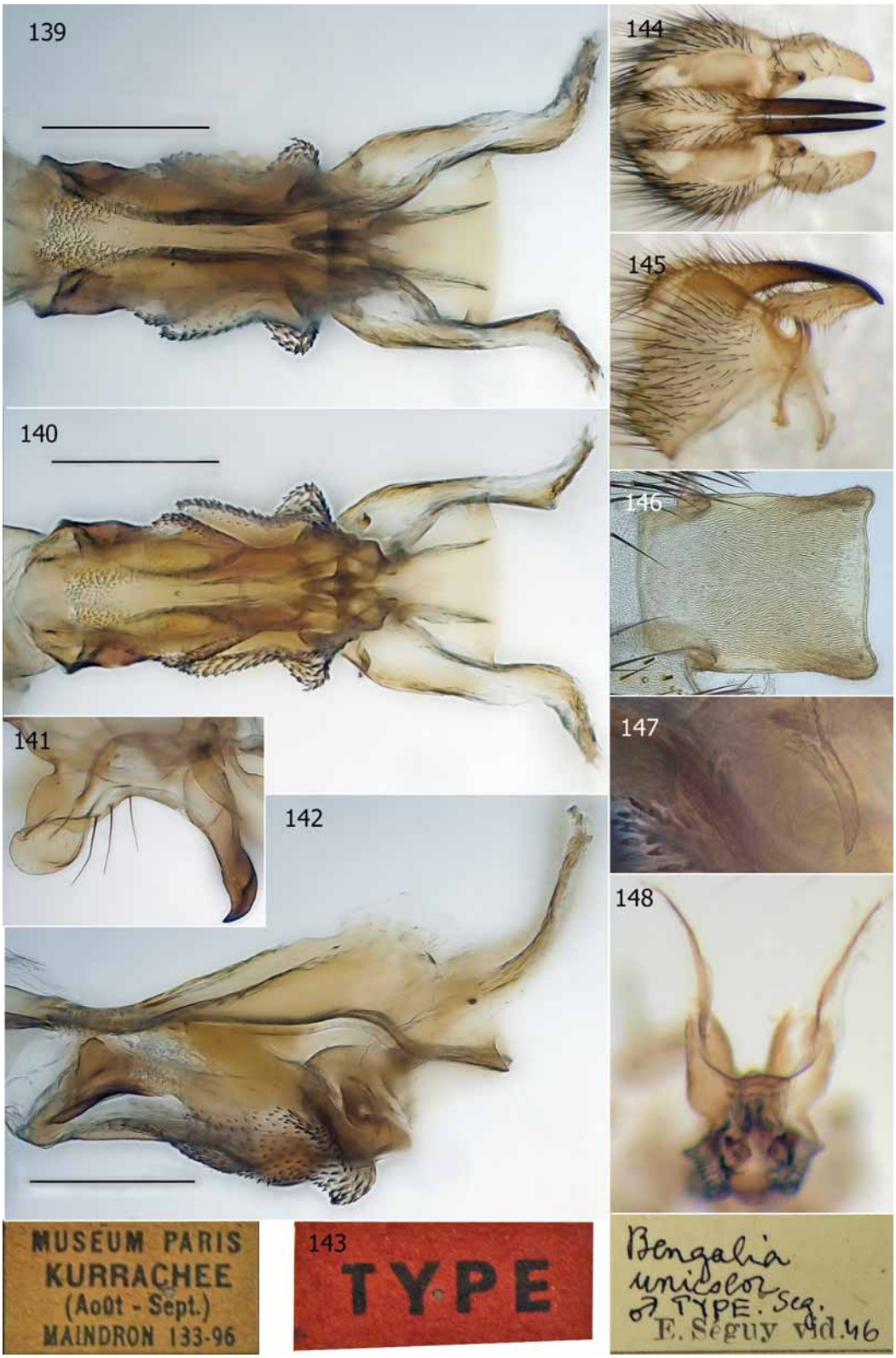
Note. Kurahashi & Afzal cite the holotype male in MNHN to be among "Type material examined". But their citation of the museum depository is preceded by a question mark ("… ? (MNHN).") which seems to indicate that they did not examine the specimen, but only suggested that it was possibly housed in that museum.

Bengalia unicolor: Verves, 2005: 240. Catalogue entry.

Diagnosis. *Male*. Length: 11.5mm. Frons at vertex / head width ratio: 0.321 (n=1). Lunula with a pair of setulae. Anepimeron with long thin yellow setulae only, no black setulae. Fore tibia with a number of ventral spine-like setae in basal half, at least two of these much stronger than the other spine-like setae and about as long as tibial diameter (Fig. 183). A distinct fringe distally on mid tibia, setae about twice as long as tibial diameter (Fig. 196). Hind tibia also with a strong fringe, occupying distal three fourths of the tibia (Fig. 208). Basal segment of hind tarsus with an *av* row of delicate setae a little longer than segment diameter. Mid femur with the *pv* ctenidium of short stubby spine-like setae continuing mediad slightly beyond middle of femur; about 15–18 spine-like setae in all, 4–5 longer *pv* setae basad.

ST5 flap rectangular, slightly longer than broad (Fig. 146), the distal corners are somewhat bent dorsally so they appear slightly too short in the figure.

Cerci strongly curved in lateral view. Surstylus narrow, blunt distally, bare below. Process of the bacilliform sclerite strongly pointed.



FIGURES 139–148. *Bengalia unicolor* Séguy, male (from holotype in MNHN). **139**. Distiphallus, dorsal view. **140**. Distiphallus, ventral view. **141**. Pre- and postgonites. **142**. Distiphallus, left lateral view. **143**. Three original labels. **144**. Cerci and surstyli, dorsal view. **145**. Cerci and surstyli, left lateral view. **146**. ST5 flap. **147**. Lateral finger, enlarged. **148**. Distiphallus from in front. Scale = 0.25mm (Figures 139, 140, 142).

Distiphallus with almost vertical dorsolateral wings (Fig. 148) and narrow antlers proceeding dorsad and slightly forward, bent at middle. Antlers with a couple of tines at tip. Dorsal opening small, at the base of the

upper lip (Fig. 139). Upper lip projecting beyond base of antlers, distal edge almost straight in dorsal view. Two dark lines apparent in dorsal and ventral views of upper lip (Figs. 140, 141) mark the insertion from below of two supporting vertical walls. These are seen in lateral view as triangular flanges, very weakly sclerotised, the anterior edge (almost invisible in Fig. 142) passing from tip of lip to a point lateral to the ejaculatory opening. Lateral finger thin, slightly curved and smooth, a few denticles at tip only (Fig. 147). Internal hypophallic lobes converging. External hypophallic lobes folded distally and end in two spatula-like projections proceeding forwards and ventrally (Figs. 140, 142). Strongly sclerotised flaps on each side of the ejaculatory opening (Figs. 140, 142, 148).

*Female***.** Unknown.

Distribution. Pakistan.

Material examined. Type material. *Bengalia unicolor* Séguy, 1946. **Holotype** male, in MNHN, labelled (1) "MUSEUM PARIS / KURRACHEE [= Karachi] / (Août – Sept.) / MAINDRON 133-96" [yellow label with black print]; (2) "TYPE" [red label with black print]; (3) "Bengalia / unicolor / ♂ TYPE. Seg. / E. Séguy vid. 46" [white label in Séguy's black handwriting, except "E. Séguy vid." which is printed; a printed black line present along the lower edge of label]. Dissected by K. R. The specimen is somewhat teneral as evident from the protruding ptilinium and the slightly wrinkled abdomen. The abdomen had large black spots on each side of the anterior half of T4, slightly intruding on T3, but they disappeared after boiling in KOH. T1+2 had a very faint and narrow band, and T3 and T4 a broader black marginal band, but no black bands remained in the dissected abdomen. T1–5 (as a unit), ST1–5 including ST5 flap (as a unit), and genitalia are kept in glycerol in a glass vial on the pin.

12. *Bengalia varicolor* (Fabricius, 1805)

Figs. 149–161, 184, 185, 197, 209.

Holotype male, India (Tamil Nadu) (ZMUC), by monotypy. For details see Type material below.

Musca varicolor Fabricius, 1805: 296. Holotype male, fixed by monotypy, India (Tamil Nadu province, Tarangambadi [as "Habitat Tranquebariae" (Fig. 161)]) (ZMUC). Examined and dissected.

Note. Zimsen (1964) recorded only one specimen from the Sehested and Tønder Lund collection in ZMUC, and I regard it as highly unlikely that more than one specimen was ever before Fabricius. Thus I treat it as a holotype and not a lectotype. It fits well with the original description (Figs. 159, 161).

Bengalia varicolor: Bezzi, 1913: 78, "… ich habe vor mir ein Männchen aus Trichinopoly [now Tiruchchirāpalli in Tamil Nadu], Südindien, 1911 (F. Cajus)." India.

Note. This specimen in Bezzi's collection carries a handwritten determination label (with three ruled lines inside a black frame) reading: "B. varicolor ♂, comparée au type" ("au" not "avec", as rendered by Lehrer 2005: 29). The handwriting is definitely not by Bezzi, but most likely by Surcouf. Surcouf (1920: 36) writes that he is in the possession of "quatre exemplaires de *Bengalia* provenant de Trichinopoly et de Madras ..." and even though he also writes that "… ces exemplaires ont été nommés *B. jejuna* par P[r] Bezzi …", Bezzi himself (1913: 74, 78) mentions only two specimens from Trichinopoly, both Caius leg., one under *jejuna*, and one under *varicolor*. [The remaining two Surcouf specimens may be the types of *chromatella* Séguy, 1946 and *pallidicoxa* Séguy, 1946 in MNHN, see below]. I suggest that Bezzi received these specimens from Surcouf, perhaps as a return favour for allowing him to examine Bezzi's collection (Surcouf 1920: 27, 31, 45) for his monograph on the "Muscidæ Testaceæ". Surcouf (1920: 27, 31, 39) also states that he examined material sent to him "... du Musée de Copenhague, dont le directeur W. LUNDBECK a bien voulu nous communiquer les types precieux de FABRICIUS et de WIEDEMANN, ...". This makes it very likely that (1) Surcouf studied the type of *Musca varicolor* Fabricius, and (2) that it was Surcouf who compared the Trichinopoly specimen now in Bezzi's collection with the Fabrician type and subsequently wrote a determination label to this effect in French. However, we can of course never be certain as to exactly which features of the Trichinopoly specimen he found to agree with the *varicolor* type, as he never communicated any thoughts he might have had on this matter. In any case he was spot on in the interpretation of the Fabrician species.

This specimen is one of the three that Lehrer (2005: 28–29) examined for his treatment of *bezzii* Senior-White, but his figures of the genitalia (figs. 9A–E) must have been prepared from one of the two specimens from Laos, as the Bezzi specimen, which was compared with the type by Surcouf, only has the dried genitalia exerted and Lehrer's drawings cannot have been made from that specimen. In addition Lehrer draws the ST5 flap without a nick at middle

and such a nick is present in Bezzi's Trichinopoly specimen in MSNM. Bezzi (1913: 74) describes the ST5 flap: "… untere Lamelle breit und stumpf". This fits very well with this specimen.

Bengalia variicolor [sic]: Villeneuve, 1914: 255, "… *B. variicolor* F. … que j'ai reçue en 7 exemplaires capturés dans l'île Formose. – *B. variicolor* ♂ ... l'écaille préanale, étalée en arriere, est non ou étroitement échancrée". Taiwan.

Note. I have seen a male from "Koshun / Formosa / Sauter VII 08" (in SDEI) identified by Villeneuve as "*Bengalia / varicolor* F. / Villeneuve det." (in Villeneuve's handwriting) which possibly is one of these 7 specimens. I have dissected it. It has a ST5 flap that fits the given description and external and genital features indicate without any doubt that it belongs to *varicolor*. So Villeneuve's identification of this particular specimen was correct.

Bengalia varicolor: Surcouf, 1920: 39.

Bengalia bezzii Senior-White, 1923a: 306. Holotype male, fixed by original designation, Sri Lanka (Suduganga) (BMNH). Genitalia in Canada balsam on separate slide. Examined. **Syn. nov.**

Bengalia bezzii: Senior-White, 1923b: 37. India (Bihar).

Note. Senior-White states to have identified from "… the Pusa collection a ♂ from Pusa … 3 ♂ from Chapra … a ♂ from Dumraon …". Not seen.

Bengalia bezzii: Senior-White, 1924: 105. India (Bombay, Sidapur, Chhat in Punjab), Pakistan (Cherat). Not seen.

Bengalia surcoufi: Senior-White, 1924: 106. India (specimen from Dehra Dun [Uttar Pradesh] only). Misidentification, not *surcoufi* Senior-White.

Note. Senior-White mentions to have identified as *surcoufi* "… two ♂ from Dehra Dun, xi.07, (Thomson); one of which is noted by Surcouf as 'probably *varicolor* F.'; …". This may be the specimen re-identified by Lehrer (2006a: 7) as *bezzii*. I have been able to examine this specimen and it is labelled (1) "Dehra Dun. / U.P. / India / Nov. 1907. / Lt.-Col. F. W. Thomson / I.M.S. / 1908—21." [printed]; (2) "Probablement B. varicolor Fab." [handwritten in Surcouf's hand]; (3) "*Afridigalia* ♂ / *bezzi* [sic] (Senior-White) / Det. Dr. A.Z.Lehrer / 2005" [printed]. The genitalia have been dissected by Lehrer. I have transferred them to a glass microvial. ST5 flap is of usual shape, but without a nick in the hind margin.

Again, Surcouf has identified the specimen correctly as *varicolor*, having previously seen the Fabrician type (see above). However, it is very strange that Senior-White has misidentified his own *bezzii* (= *varicolor*) as his own *surcoufi*, in view of the widely different ST5 flaps. But it should be noted that there is no direct evidence (e.g., from a determination label) that it is the same specimen that Senior-White (1924: 106) mentions under *surcoufi*.

Bengalia bezzii: Senior-White, 1926: 139. India, Pakistan, Sri Lanka.

Bengalia latro: Malloch, 1927: 410, figs. 17a, 17b, 17c. Specimens from India (Coimbatore) only. Misidentification, not *latro* de Meijere. [Specimens from the Philippines belong to *lyneborgi* James, see above under that species; also below.]

Note. The ST5 flap shown in fig. 17c and the aedeagus figured in fig. 17b are definitely not from any specimen(s) of *latro*. The male Java specimen from 1909 mentioned by Malloch, which is one of two overlooked syntypes of *latro* de Meijere in USNM, has of course been examined by Malloch, but is not dissected and therefore cannot be the source for his figs. 17a and 17b. On inspection the ST5 flap of the Java 1909 specimen has a much broader base than the one shown in fig. 17c, an even and gently curved hind edge without a notch in the middle and with rounded distal corners as usual in *latro*. The general shape and the indentation present in the hind margin of the ST5 flap in Malloch's fig. 17c suggests that this figure most likely has been made from one of the Coimbatore specimens, of which Malloch says he had a large series before him. Almost all the USNM specimens from Coimbatore, which I have examined, some or all of which may have been seen by Malloch, have such a notch in ST5 flap clearly visible without dissection and resemble his fig. 17c by having a narrow base and less rounded distal corners. All belong to *bezzii* Senior-White (now = *varicolor* Fabricius).

The source for figs. 17a and 17b, which show dissected genitalia, is obscure, the problem being that none of the Coimbatore specimens in USNM that Malloch might have seen have been dissected (one male has subsequently been dissected by me, see below for details).

It should be mentioned that Malloch also refers to specimens of his "*latro*" from Philippine Islands. I received from USNM several specimens of *Bengalia lyneborgi* James from the Philippines of which some must have been seen by Malloch. A female carried an identification label reading "Ochromyia / latro / de Meij. / Det. J.R. Malloch". Some of the males had been dissected (dry genitalia were glued to labels or cards). But the aedeagus of these dissected males does not fit figure 17b at all. Several very characteristic features of the *lyneborgi* aedeagus should have been present in the drawing had this species served as basis for the figures, particularly the large bulge at the ventral part of the distal aedeagal opening so typical of *lyneborgi* in profile view, and the central strong pointed hook/tooth (the upper lip) above the distal aedeagal opening.

From these considerations I conclude that figs. 17a, b have been made from the same Coimbatore specimen that served as basis for fig. 17c, i.e., from a dissected specimen of *bezzii*, now possibly lost or returned to Mr. Y. Ramachandra Rao who sent him "a large series of specimens from Coimbatore".

James (1966: 471) was also of the opinion that Malloch's interpretation of *latro* was the same as *bezzii*.

Bengalia bezzii: Senior-White, 1930: 70. India ("Chakhadapore, Chota Nagpur" [Madhya Pradesh]) (1 female). Not seen.

Bengalia varicolor: Townsend, 1931: 371. Description of the examined male type of *Musca varicolor* Fabricius.

Bengalia bezzii: Senior-White *et al*., 1940: 99. Records from Ceylon and India only.

Note. The record of "*bezzii*" from Philippines in Senior-White *et al*. is based only on the dissected holotype of *Bengalia inermis* Malloch, synonymised erroneously under *bezzii*. The latter species (now *varicolor*) is not known from the Philippines (Kurahashi & Magpayo 2000).

Bengalia varicolor: Hennig, 1941: 180, in part. Two males and three females Villeneuve det. and Baranoff det. in SDEI, see below under Material examined. Taiwan.

Bengalia chromatella Séguy, 1946: 84. Holotype female, fixed by monotypy, India (Tamil Nadu, Chennai [= Madras]) (MNHN). Examined. **Syn. nov.**

Note. A modest number of black setulae present on the anepimeron. A pair of black setae on ST2–4. The specimen is possibly from Surcouf's collection, cf. his statement to the effect that he is in the possession of "quatre exemplaires de *Bengalia* provenant de Trichinopoly et de Madras ..." (Surcouf 1920: 36). The three others, all from Trichinopoly, are two specimens in MSNM and the holotype of *pallidicoxa* Séguy, see below.

Bengalia pallidicoxa Séguy, 1946: 84. Holotype female, fixed by monotypy, India (Tamil Nadu, Tiruchchirāpalli [as "Trichinopoly"]) (MNHN). Examined. **Syn. nov.**

Note. This specimen is possibly also from the same series as the Bezzi (1913) specimen of *varicolor*, above, as it carries an identical locality label. A modest number of black setulae on anepimeron. A pair of black setae on ST2–4, otherwise only yellow ground setulae. [Séguy (1946) always cites Caius's name with the initial "P.", whereas Bezzi (1913) and Surcouf (1920: 53) cite the name with the initial "F.". All the labels I have seen with the Caius name on it also have an unmistakable "F." as the single initial. I take "F. Caius" as the correct name.]

Musca varicolor: Zimsen, 1964: 489. Entry no.770 in list of Fabrician types of Diptera in ZMUC.

Bengalia latro: Fan, 1965: 191, fig. 752. Misidentification, not *latro* de Meijere. China (Hainan, Zhejiang).

Note. Fan's fig. 752, clearly shows a nick in the hind margin, which is never present in the ST5 flap of *latro*. Fan included Taiwan citing Hennig (1941), but Hennig's records of "*latro*" from Taiwan are all based on misidentified specimens of *emarginata*.

Bengalia bezzii: James, 1966: 469, fig. 5. India (Coimbatore).

Bengalia latro: Kurahashi, 1967: 257, fig. 1. Misidentification, not *latro* de Meijere. Japan (Ryukyu Is.).

Note. Kurahashi's fig. 1 on p. 258 clearly shows a nick in the hind margin, never present in the ST5 flap of *latro*. [There is an error of omission in the description of the tibiae on p. 258, compare with the corresponding text in Kano & Shinonaga, 1968: 100, which has the complete text].

Bengalia latro: Kano & Shinonaga, 1968: 99, Plate XVI fig. 31. Misidentification, not *latro* de Meijere. Japan (Ryukyu Is).

Note. The ST5 flap is shown without a conspicuous indentation in the hind margin, a feature shown occasionally in *varicolor*, and which makes the ST5 flap very similar to the one in *latro*, but the aedeagus figured is definitely not from *latro*.

Bengalia bezzii: James, 1977: 528. Catalogue entry.

Bengalia chromatella: James, 1977: 528. Catalogue entry.

Bengalia pallidicoxa: James, 1977: 529. Catalogue entry.

Bengalia varicolor: James, 1977: 530. Catalogue entry. Applies only to type locality of *Musca varicolor* Fabricius.

Bengalia bezzii: Tumrasvin *et al*., 1979: 260, Plate 1 fig. 4 (ST5 flap), Plate 2 fig. 23 (aedeagus in profile), Plate 3 fig. 31 (epandrium, cerci and surstyli in profile), Plate 4 fig. 44 (cerci, surstyli, dorsal view) [legend to this figure by error (some luck!) given as "Bengalia varicolor" on p. 267]. Thailand.

Note. Tumrasvin *et al*. illustrated a very important feature, namely the very dense vestiture on the underside of the distal section of the surstylus (Plate 3 fig. 31), but did not mention this feature anywhere in the text.

Bengalia latro: Maschwitz & Schönegge, 1980. Misidentification, not *latro* de Meijere. Sri Lanka (Anuradhapura).

Note. One of Maschwitz & Schönegge's specimens is in SMNS. See below for details.

Bengalia latro: Fan, 1992: 532, fig. 1107i. Misidentification, not *latro* de Meijere. China (Hainan, Sichuan, Zhejiang).

Note. Fan again included Taiwan citing Hennig (1941), but Hennig's records of "*latro*" from Taiwan are all based on misidentified specimens of *emarginata*.

Musca varicolor: Thompson & Pont, 1994: 131. Entry in database of *Musca* names, given the annotation "Calliphoridae, *Bengalia varicolor* Fabricius".

Bengalia bezzii: Kurahashi & Thapa, 1994: 216. [In key only, no records from Nepal.]

Bengalia bezzii: Kurahashi *et al*., 1997: 40. Malaysia (Malaya).

Bengalia bezzii: Fan 1997: 449, figs. 138e, 138i. China (Fujian, Guangdong, Hainan, Sichuan, Zhejiang), Taiwan.

Bengalia latro: Feng *et al*., 1998: 1380, fig. 2822Jv. Misidentification, not *latro* de Meijere. China (Guangdong, Guizhou, Hainan, Sichuan, Yunnan, Zhejiang), Taiwan.

Note. Feng *et al*.'s fig. 2822Jv clearly shows an indentation in the hind margin of the ST5 flap, a feature never

observed in *latro*.

Bengalia bezzii: Kurahashi & Chowanadisai, 2001: 201.Vietnam.

Bengalia bezzii: Kurahashi & Afzal, 2002: 220. Pakistan.

Afridigalia bezzi [sic]: Lehrer, 2005: 28. India, Laos.

Note. For a discussion of the specimens examined by Lehrer, see above under entry for Bezzi (1913).

Bengalia bezzii: Verves, 2005: 238. Catalogue entry.

Bengalia chromatella: Verves, 2005: 238. Catalogue entry.

Bengalia pallidocoxa [sic]: Verves, 2005: 239. Catalogue entry.

Bengalia varicolor: Verves, 2005: 240. Catalogue entry. Applies only to locality listed as "India: … Tamil Nadu", which must be referring to the type locality of *Musca varicolor.*

Bengalia bezzi [sic]: Rognes, 2006: 460, 464, 465, 468. Thailand.

Afridigalia bezzi [sic]: Lehrer, 2006a: 6. Material identified from India (numerous localities cited: Coimbatore, Jeypore, Nilgiri Hills, Anamalaia Hills, Dehra Dun, Delhi Canton, Jubblepore, Tulsi, Luchnow), Indonesia (Java), Japan (Ryukyu Is.), Laos, Malaysia, Singapore [listed in error among Indian localities by Lehrer (2006a)], Taiwan.

Note. A male from Dehra Dun in BMNH re-examined. For details and comments, see above under entry for "*Bengalia surcoufi*: Senior White 1924", and under Material examined below.

Diagnosis. *Male*. Length 9–11mm (n=14). Frons at vertex / head width ratio: 0.317–0.358 (mean 0.333, n=14). Fronto-orbital plate without proclinate orbital setae. Lunula bare. Anepimeron mostly clothed with yellow hairs, less than 12–15 (down to 1–2) black setulae in a bundle on the upper posterior part, elsewhere with yellow setulae only. Fore tibia with a number of small ventral spine-like setae in basal half, two of them stronger than the others, but not as long as tibial diameter (Figs. 184, 185). No *pv* fringe distally on mid tibia, setae in this region shorter than diameter of mid tibia (Fig. 197). Hind tibia usually with a weak *av* fringe (Fig. 209), though occasionally elongated and erect setulae may extend on to *v* and *pv* side.

ST5 flap concave laterally, much narrower in basal than distal half, posterolateral corners usually rather acute, distal margin slightly convex and usually (but not always) with a small pronounced notch at middle (Fig. 155).

Cerci curved in lateral view (Fig. 153). Surstylus with a dense cover of yellow setulae on underside (Fig. 158). Process of the bacilliform sclerite squarish with a pointed tip.

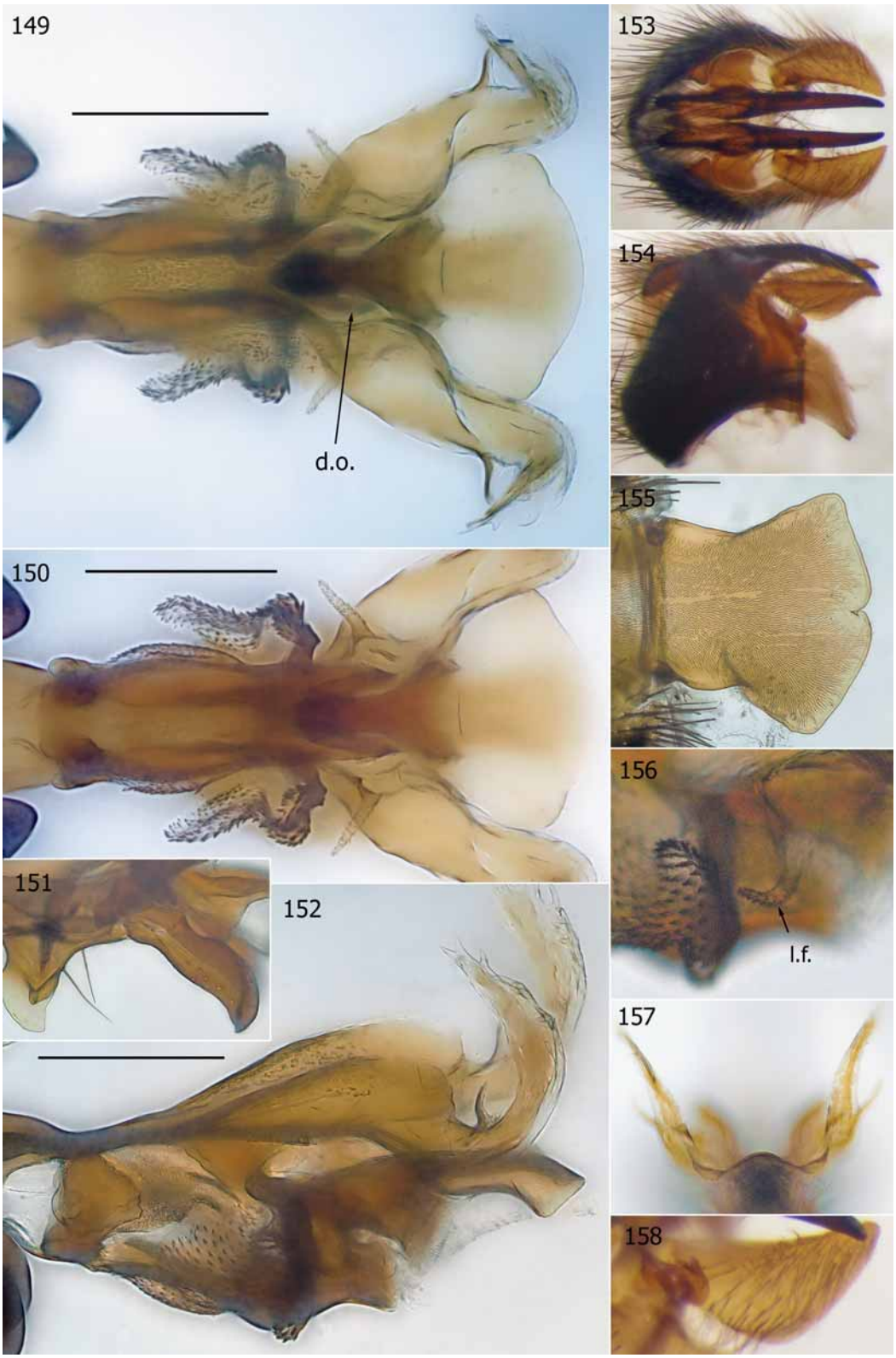
Distiphallus with prominent upturned dorsolateral wings (Figs. 152, 157) and broad backwardly curved antlers, with a strong basal tooth (Figs. 149, 152). Upper lip large, strengthened in middle, distal edge convex in dorsal view, and lip concave below as seen from in front (Fig. 157). Lateral finger small and hardly projecting beyond lateralmost point of external hypophallic lobe (Fig. 150). Internal hypophallic lobes not converging. External hypophallic lobe short, folded in its distal part, a shelf present (Fig. 156). Ventral finger a rounded structure in lateral view (Figs. 152, 156) not or hardly projecting beyond midventral wall of distiphallus. Anterior end of midventral wall level with middle of dorsolateral wings in profile view (Fig. 152), thus giving the distiphallus a strongly "receding lower jaw" impression.

*Female***.** Length 9–10mm (n=5). Frons at vertex / head width ratio: 0.317–0.350 (mean 0.340, n=5). ST2–4 with strong erect marginal setae. Ovipositor and spermathecae figured by Kano & Shinonaga (1968, as *B. latro*). A female from Taiwan has very few black setulae on anepimeron, 0 on left, 1 on right side (SDEI: "Tainan / Formosa…").

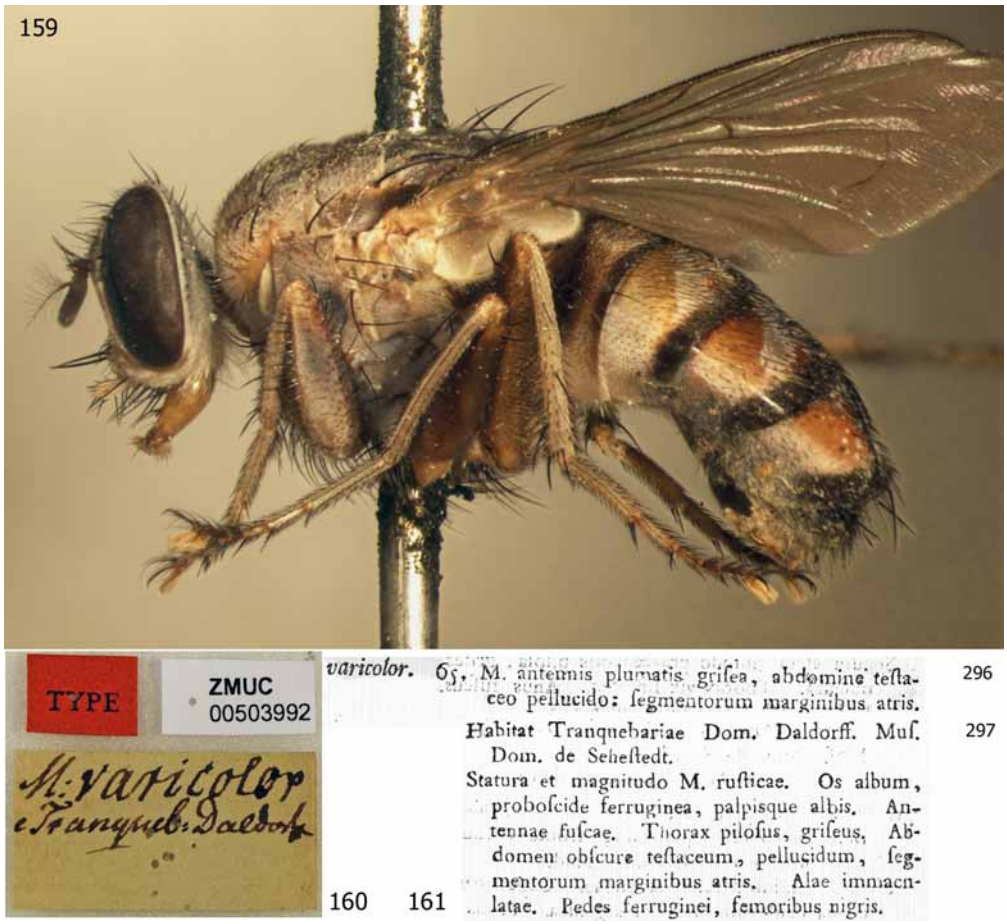
Distribution. China (Fujian, Guangdong, Guizhou, Hainan, Sichuan, Yunnan, Zhejiang), India, Indonesia (Java), Japan (Ryukyu Is.), Laos, Malaysia, Pakistan, Singapore, Sri Lanka, Taiwan, Thailand, Vietnam.

Material examined. Type material. *Musca varicolor* Fabricius, 1805. **Holotype** male, in ZMUC, labelled (1) "M: varicolor / e Tranqueb: Daldorff" [in black script] (Fig. 160); (2) "TYPE" [red label, black print], (3) "ZMUC / 00503992" [white label, black print]. Dissected by K. R. *Musca varicolor* was described by Fabricius (1805: 296) from "Habitat Tranquebariae Dom. Daldorff Mus. Dom. de Sehestedt" (Fig. 161). A single male, regarded as holotype, is present in the Sehested and Tønder Lund collection in ZMUC as indicated by Zimsen (1964: 489) and Thompson & Pont (1994: 131). It has previously been examined by Surcouf (1920; see above) and Townsend (1931: 371). It is in good condition (Fig. 159) and fits the description (Fig. 161). It lacks the fore right tibia and tarsus and the right first flagellomere, including the arista. Some dorsal abdominal setae are also lacking, and parts of the erect pale vestiture on the abdominal

sternites are rubbed off. The pin is rather thick and the fly is very low on the pin. Tranquebar is the present day city of Tarangambadi in the province of Tamil Nadu in India.



FIGURES 149–158. *Bengalia varicolor* (Fabricius), male (from holotype of *Musca varicolor* Fabricius in ZMUC). **149**. Distiphallus, dorsal view. **150**. Distiphallus, ventral view. **151**. Pre- and postgonites. **152**. Distiphallus, left lateral view. **153**. Cerci and surstyli, dorsal view. **154**. Cerci and surstyli, left lateral view. **155**. ST5 flap. **156**. Lateral finger, enlarged. **157**. Upper lip and antlers, from in front. **158**. surstylus, from below. Scale = 0.25mm (Figures 149, 150, 152). Abbreviations: *d.o.* = dorsal opening; *l.f.* = lateral finger.



FIGURES 159–161. *Bengalia varicolor* (Fabricius), male (from holotype of *Musca varicolor* Fabricius in ZMUC). **159**. Fly habitus, left lateral view. **160**. Three labels, including the original in Fabricius's hand. **161**. Original description from Fabricius (1805: 296–297).

Bengalia bezzii Senior-White, 1923. **Holotype** male, in BMNH [staged], labelled (1) "Holo-type" [printed on circular white label with red rim]; (2) "CEYLON: / Suduganga / 20.i.1920 / among grass" [handwritten, except first two lines which are printed]; (3) "Bengalia / bezzii, S.-W. / det.R.Senior White" [handwritten, except last line which is printed]; (4) "TYPE." [red handwriting]; (5) "Purchd. from / R.Senior White / B.M.1938-460." [printed]; (6) "genitalia / on slide" [handwritten]. Slide (also in BMNH) is labelled "Bengalia / bezzii S.-W. / ♂ genitalia. / 30.iv.22 Type" [handwritten]. **Paratypes** (all in BMNH): 1 female [staged] labelled (1) "Para-type" [printed on circular white label with yellow rim]; (2) "COTYPE" [red handwriting]; (3) "CEYLON: / Suduganga / 7.xii.1921 / among grass" [handwritten, except first two lines which are printed]; (4) "Bengalia / bezzii, S.-W. / det R.Senior White" [handwritten, except last line which is printed]; (5) "Purchd. from / R.Senior White / B.M.1938-460." [printed]. • 1 female [staged], labelled (1) "Para-type" [printed on circular white label with yellow rim]; (2) "COTYPE" [red handwriting]; (3) "CEYLON: / Suduganga / 10.xi.1918 / In garden" [handwritten, except first two lines which are printed]; (4) "Bengalia / bezzii, S.-W. / det R.Senior White" [handwritten, except last line which is printed]; (5) "Purchd. from / R.Senior White / B.M.1938-460." [printed].

Bengalia chromatella Séguy, 1946. **Holotype** female, in MNHN [staged], labelled (1) "Cragg / Guindy / Madras." [printed]; (2) "TYPE" [printed on red label]; (3) "Bengalia sp. incerta nº 2 Bezzi / probablement v. de varicolor" [handwritten in Surcouf's hand]; (3) "Bengalia / chromatella / ♀ Seg. TYPE / E. Séguy vid. 46" [handwritten in Séguy's hand, except "E. Séguy vid." which is printed].

Bengalia pallidicoxa Séguy, 1946. **Holotype** female, in MNHN, labelled (1) "INDE MÉRIDIONALE / TRICHINOPOLY / F. CAIUS 1911" [printed on yellowish label]; (2) "TYPE" [printed on red label]; (3)

"Bengalia / pallidicoxa / ♀ TYPE Séguy / E. Séguy vid. 46" [handwritten in Séguy's hand, except "E. Séguy vid." which is printed].

Other material. BMNH: 1 male labelled (1) "Dehra Dun. / U.P. [Uttar Pradesh] / India / Nov. 1907. / Lt.-Col. F. W. Thomson / I.M.S. / 1908—21." [printed]; (2) "Probablement B. varicolor Fab." [handwritten in Surcouf's hand]; (3) "*Afridigalia* ♂ / *bezzi* [sic] (Senior-White) / Det. Dr. A. Z. Lehrer / 2005" [printed]; (4) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). The genitalia have been dissected by Lehrer. I have transferred them to a glass microvial. ST5 flap of usual shape, but without nick in hind margin. Again, Surcouf has identified the specimen correctly, having previously seen the Fabrician type (see above). **CDPCAG**: 1 male labelled (1) "Center for Disease Prevention and Control Anshun City, Guizhou / Longgong, Anshun City, 1200 m / Wei Lianmeng et al leg. / 19 September 1991" [In Chinese]; (2) "C080 … [Chinese name for *B. bezzii*] / *Bengalia bezzii* / Senior-White, 1923 / ♂" [print on white label, male symbol in red]; (3) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). • 1 male labelled (1) "Entomological Institute of Guizhou University, Guizhou, China / Yunnan, Xiaguan, Erhai / 1959 m / Yang Zaihua leg. / 24 August 2006" [In Chinese]; (2) "C080 … [Chinese name for *B. bezzii*] / *Bengalia bezzii* / Senior-White, 1923 / ♂" [In Chinese, male symbol in red]; (3) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). Dissected by Wei Lianmeng, genitalia in alcohol in plastic vessel with lid, numbered "190". **MSNM**: 1 male labelled: (1) "INDE MÉRIDIONALE / TRICHINOPOLY / F. CAIUS 1911" [printed on yellowish label]; (2) "B. varicolor ♂. / comparée au type." [handwritten in Surcouf's hand; label with black frame and three thin black ruled lines]; (3) "varicolor" [printed museum label]; (4) "*Bengalia* ♂ / *bezzi* [sic] Senior-White / Det. Dr. A.Z.LEHRER / XII.2004" [printed]; (5) "*Bengalia* ♂ / *bezzi* [sic] Senior-White / Det. Dr. A.Z.LEHRER / XII.2004" [printed]; (6) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). The eyes, mouthparts and much of the front part of thorax have been eaten away. The right mid leg and also the tibia and tarsus on the left mid leg are lost. The genitalia are in an exerted position and the cerci, surstyli, aedeagus and ST5 flap are all clearly visible and in a well preserved condition. **NHRM**: 1 male labelled (1) "INDIA Kottayam / Malaise trap / 26–29.III.1990 / B. Gustafson" [printed]; (2) "Bengalia ♂ / bezzii / Sen.-White, 1923 / Det. H. Kurahashi" [printed]; (3) "NRM STHLM / Loan 1707/08 [printed on green label]; (4) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). Kottayam is in Kerala. All legs missing except right hind femur and tibia. **SDEI:** 1 male labelled (1) "Kankau (Koshun) / Formosa / H. Sauter 1912" [printed]; (2) "7. VII." [printed]; (3) "coll. Oldenberg" [printed]; (4) "det. Baranoff" [printed]; (5) "Bengalia / varicolor / Fabr." [handwritten]; (6) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). ST5 flap visible. • 1 male labelled (1) "Koshun / Formosa / Sauter VII 08" [printed, except "VII 08" which is handwritten]; (2) "Bengalia / varicolor F. / Villeneuve det." [handwritten in Villeneuve's hand, except last line which is printed]; (3) "Villeneuve det." [printed]; (4) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). Dissected by K. R. Abdominal T1–5 glued to card on pin, genitalia in glycerol in vial on pin. Both males have a very weakly developed fringe on hind tibia. • 1 female labelled (1) "Kankau (Formosa) / H. Sauter VII. 1912" [printed]; (2) "Townsend det." [printed]; (3) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). • 1 female labelled (1) "Kankau (Koshun) / Formosa / H. Sauter 1912" [printed]; (2) "7. VII." [printed]; (3) "coll. Oldenberg" [printed]; (4) "det. Baranoff" [printed]; (5) "Bengalia / varicolor / Fabr." [handwritten]; (5) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). • 1 female labelled (1) "Tainan / Formosa" [handwritten in weak ink]; (2) "Sauter / 4. 1910" [handwritten]; (3) "coll. Oldenberg" [printed]; (4) "det. Baranoff" [printed]; (5) "Bengalia / varicolor / Fabr." [handwritten]; (6) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). Lunula bare. **SMNS:** 1 male labelled (1) "Bengalia / latro Meij. / B. Herting det." [handwritten, except last line which is printed]; (2) "Ceylon / Maschwitz" [handwritten in Herting's hand]; (3) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). A very dark specimen. Thorax and abdomen dark grey, also femora, but humeral and postalar callus yellow. Tibia, tarsi and ST1–3 yellow. About 15 black setulae on anepimeron. Appears to have been dried from alcohol. ST5 flap without nick. **USNM:** 1 male labelled (1) "11.vii.17 / COIMBATORE / Praying on / ant pupae / ISAAC COLL." [handwritten, except lines 2 and 5 which are printed]; (2) "B. bezzii. S.W. / White det. 1925" [handwritten, except last line]; (3) "USNM / 2047114" [printed]; (4) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). • 5 males and 1 female labelled (1) "COIMBATORE /

Wetlands / Resting in grass / A. A. COLL: 1.XI.21" [handwritten, except lines 1 and 4 which are printed]; (2) "USNM / 2047114" [printed]; (3) My determination labels (*varicolor* Fabr. = *bezzii* S.-W.). • 2 males labelled (1) "COIMBATORE / resting on grass / 2.XI.21 / A. A. COLL:" [handwritten, except lines 1 and 4 which are printed]; (2) "USNM / 2047114" [printed]; (3) My determination labels (*varicolor* Fabr. = *bezzii* S.-W.). One male dissected by K. R. **ZMUC**: 1 male labelled (1) "THAILAND, Chieng Mai Province / Doi Inthanon N. P.: Huai Sai / Luang 10–1100 m, 14.x.1981 / Zool. Mus. Copenhagen leg." [printed]; (2) "Bengalia ♂ / bezzii / Sen.-White, 1923 / Det. H. Kurahashi" [printed]; (3) "Dissected / January 2006 / by Knut Rognes" [printed]; (4) My determination label (*varicolor* Fabr. = *bezzii* S.-W.). Genitalia in vial on pin, T1–5 glued to card on pin.

13. *Bengalia weii* sp. nov.
Figs. 162–172, 186, 198, 210.

Holotype male, China (Yunnan province: Xishuangbanna tropical rain forest, Menglun) (CDPCAG), here designated. For details see Type material below.

Etymology. The species-group name "weii" is a proper noun in the genitive case, derived from the surname of the collector Dr. Wei Lianmeng, CDPCAG.

Diagnosis. *Male*. Length: 11mm (n=1). Frons at vertex / head width ratio: 0.338–0.342 (mean 0.340, n=2). Fronto-orbital plate without proclinate orbital setae. Lunula bare. Anepimeron only with yellow setulae, no black setulae at all. Fore tibia with a group of 7–8 short ventral spine-like setae in proximal half of which 1–2 are longer than the others; the longest spine-like seta shorter than diameter of tibia and situated about in the middle of the group; distally with slight v and *pv* fringe, longest setae about as long as tibial diameter (Fig. 186). Mid tibia with a *v* and *pv* fringe in distal 2/5, longest setae in fringe 1.5–2.0x diameter of tibia (Fig. 198). Hind tibia with a delicate *av*, *v*, and *pv* fringe in distal half (Fig. 210).

The ST5 flap is very characteristic, with lateral edges converging slowly distally, a V-shaped depression present in distal edge (Fig. 168).

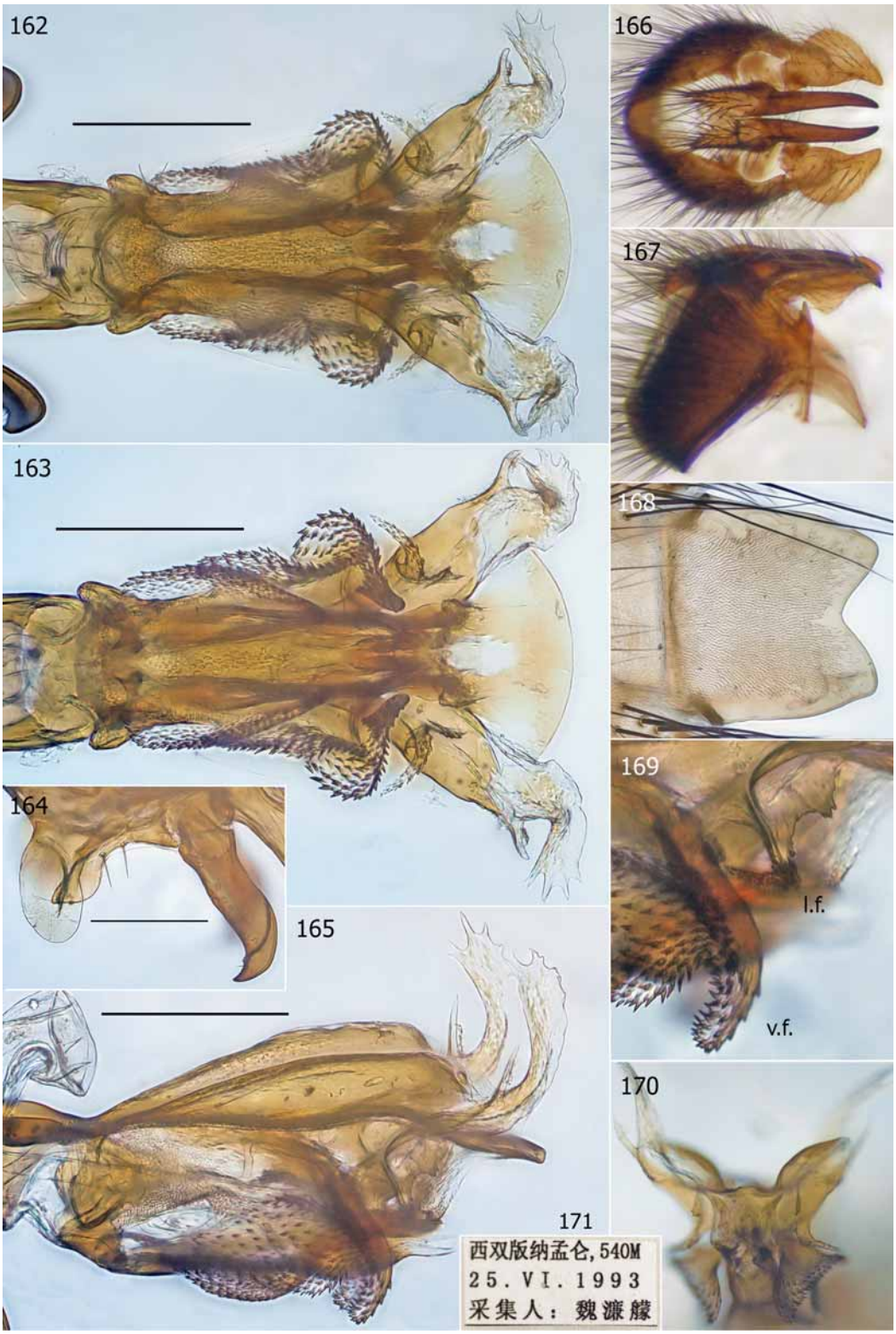
Cerci slightly curved in profile view (Fig. 167). Surstylus almost bare below, a few pale scattered setulae present close to apex. Process of bacilliform sclerite with a strong base and short tip.

Distiphallus with rather low dorsolateral wings and broad antlers; latter curving backwards and with several small tines at tip (Figs. 162, 163, 165). Basal tooth strong. In dorsal view upper lip strongly convex with a weak central sclerotisation; in lateral view projecting far beyond base of antlers (Fig. 165). Lateral finger small, not projecting beyond lateral edge of external hypophallic lobe in ventral view (Figs. 162, 163). Above the base of the lateral finger, the anterior edge of the vertical sclerotised sheet has a right-angled toothed projection (Fig. 169). Internal hypophallic lobes converging in their distal part. External hypophallic lobe short, folded distally, presenting a forwardly directed transverse wall. Ventral finger proceeds downwards, inwards and forwards, in lateral view projecting well beyond lower edge of midventral wall; its front edge is slightly denticulate (Fig. 169).

Female. Length: 11mm (n=1). Frons at vertex / head width ratio: 41/120 = 0.342 (n=1). ST2, ST3 and ST4 with a pair of widely set marginals, on ST4 one of the pair is absent.

Description. Measurements, see Diagnosis above.

Male. **Head**. Yellow ground colour, except for frontal vitta which is light brown and fronto-orbital plate which is greyish brown. Frontal vitta with black ground setulae in anterior two-thirds, in holotype lacking along the posterior half of the frontal row of setae. 5–6 frontal setae on each side, one reclinate seta in front of the well developed outer and inner verticals. No proclinate orbital setae. Fronto-orbital plate narrow. Fronto-orbital plate, parafacial and area above vibrissae with black setulae, weak on the parafacial. A shifting greyish spot at the junction of the parafacial and the fronto-orbital plate and outside of the two foremost frontal setae. Occiput and genal dilations with yellow ground vestiture, except for a few inconspicuous black setulae just outside the subvibrissal setae (absent in paratype male). Ocellar triangle with a single pair of weak ocellars.



FIGURES 162–171. *Bengalia weii* **sp. nov.,** male (from holotype in CDPCAG). **162**. Distiphallus, dorsal view. **163**. Distiphallus, ventral view. **164**. Pre- and postgonites, left lateral view. **165**. Distiphallus, left lateral view. **166**. Cerci and surstyli, dorsal view. **167**. Cerci and surstyli, left lateral view. **168**. ST5 flap. **169**. Lateral finger and ventral finger, enlarged. **170**. Distiphallus from in front. **171**. Label. Scale = 0.25mm (Figures 162–165). Abbreviations: *l.f.* = lateral finger; *v.f.* = ventral finger.

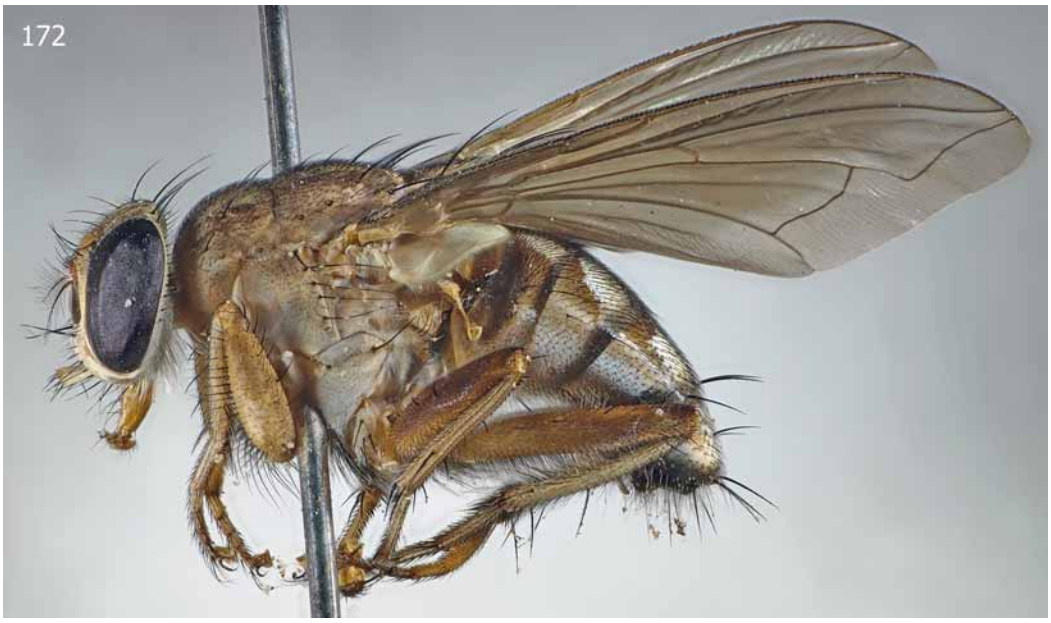


FIGURE 172. *Bengalia weii* **sp. nov.,** male (from holotype in CDPCAG). Fly habitus, left lateral view.

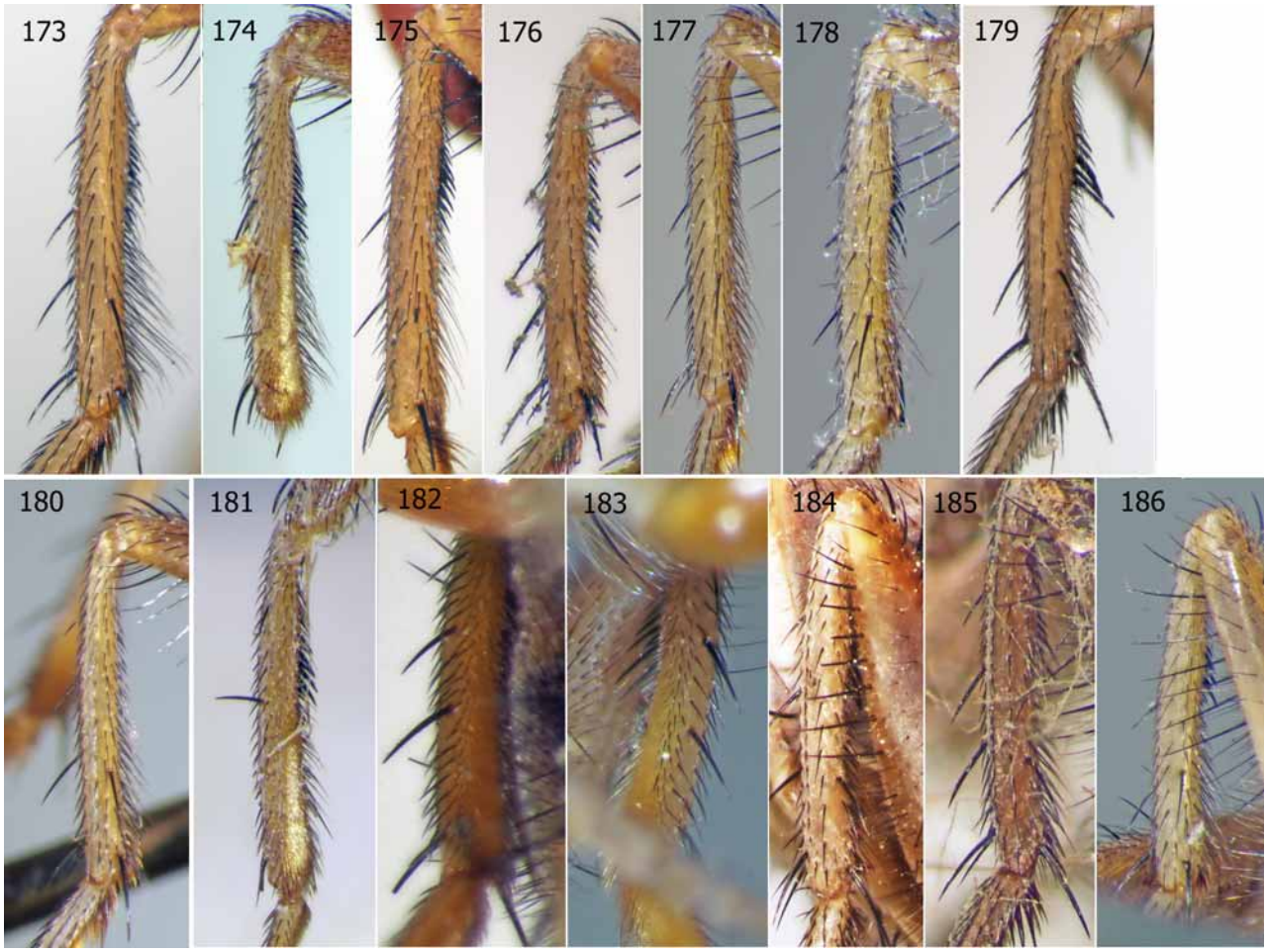
1 pair of weak postocellars of about the same size; the pair is situated on the uppermost part of the occiput a little behind an imaginary line connecting the inner verticals. Lunula bare. Scape and pedicel reddish brown, first flagellomere dark, except proximal to level of insertion of arista, about 5x longer than wide. Tip of first flagellomere not reaching level of vibrissa. Arista long plumose. Anterior margin of clypeus reddish and not projecting beyond lower facial margin. Palpus yellow with a bundle of very short setae at tip, 2–4 long setae below in distal half, and a row of 3–5 very long setae on a sclerite at its base.

Thorax. Brownish yellow dorsally, with pale brownish dusting; in some lights with much paler lateral areas, these encompassing lateral edge of scutellum, lateral area of dorsum carrying the *ia*, *sa*, *prst* and *ph* setae and the humeral callus. Darker mid-dorsal part with narrow dark vittae just inside of the *dc* rows of setae. Ground setulae of scutum black, except on anterior surface of the humeral callus where they are yellow. 0+1 *acr* (just in front of scutellum); 1+4 *dc* (postsutural *dc* becoming stronger backwards); 0+1 *ia*, 1 *prst*; 1 *ph*; 2 *h*; 1 strong setae (*dc*?) present on each side very far forward on scutum just inside the anteromedial corner of the humeral callus; 3 scutellar marginals, no discals. 2 *npl* (close together). Pleura yellow with irregularly darkened parts and covered with yellowish dusting. Proepisternal depression bare. Proepisternal (anterior) and 1 proepimeral (posterior) setae. A few black setulae above the proepimeral seta. Anterior spiracle yellow. Anepisternum with 5–6 strong marginals, covered with black ground setulae in hind and upper part. Long pale setae behind marginal row of strong setae. Anepimeron with yellow ground vestiture only, no black setulae. Lesser ampulla blackish in anterior half with whitish dusting. Katepisternum with yellow ground vestiture except in the upper part between the 1+1 *kepst* setae where some small black setulae may be present. In extreme lower end of the katepisternum strong setae present in front of mid coxa. Meron with about 6–8 meral setae. No coxopleural streak. Katatergite bare. Anatergite with only pale ground vestiture, no black setulae below lower calypter. Metakatepisternum with pale setulae. Metasternal area with pale and black setae. Postalar wall pale setose. Prosternum pale setose.

Wing. Tegula, basicosta and subcostal sclerite yellow; wing veins all yellow; costa hairy below all the way to junction with R_{4+5}. Lower calypter with inner margin converging with long axis of fly, more than twice as long as upper. Both calypteres with white fringe hairs, except the inner half of the upper calypter where they are brownish. Halter yellow.

Legs. Tarsi yellow, coxae and trochanters yellow. Fore tibia with 3 *ad*, 1 *pv*; *ad*, *d*, and *pv* preapicals in increasing size; slight *v* and *pv* fringe, longest fringe setae about as long as tibial diameter; tibia yellow. In proximal third is a group of 7–8 short spine-like setae of which 1–2 are longer than the others. The longest

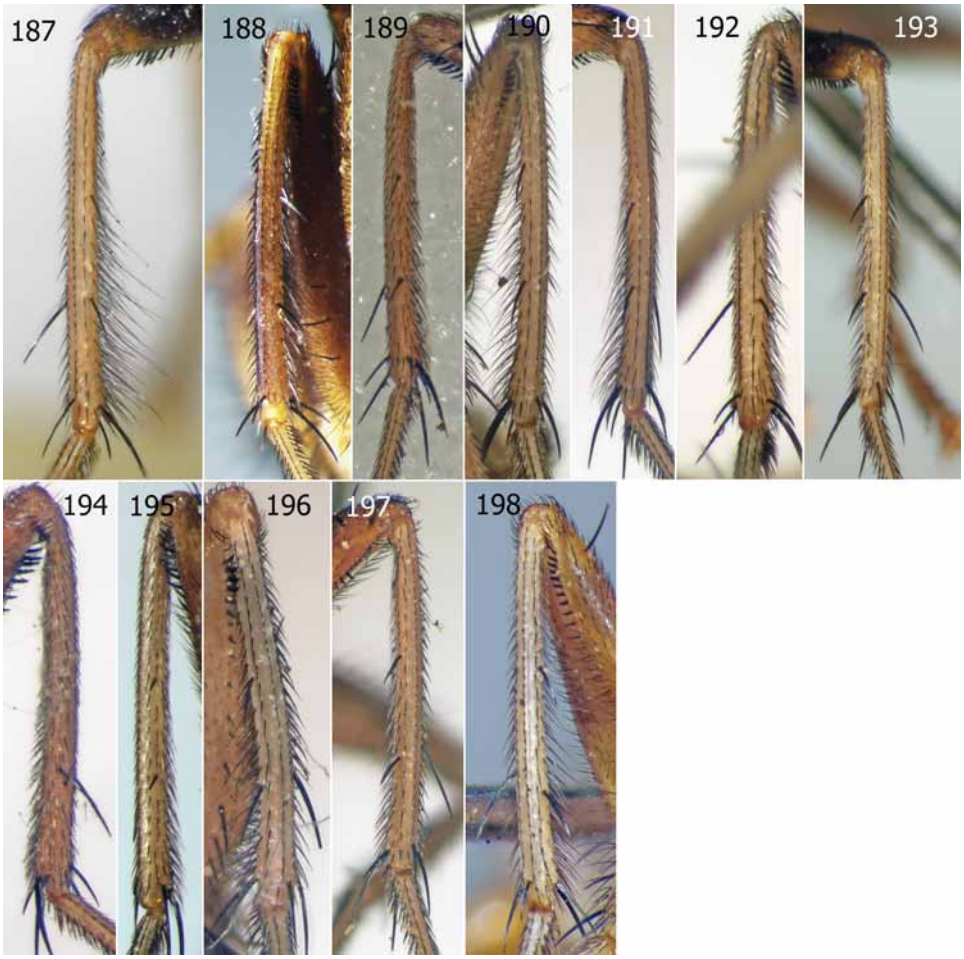
spine-like seta is shorter than diameter of tibia and situated about in the middle of the group of spine-like setae. Fore femur yellow with *pv* setae of different size: 8–9 distal ones strong, situated in distal half; proximal *pv* setae weak and thin; *d* row of 6 weak setae, *ad* row of 7 weak setae. Mid tibia yellow with 1 *ad*, 2 *p*; *v* and *pv* fringe in distal 2/5, longest setae in fringe 1.5–2.0x diameter of tibia. Mid femur yellow with some darkening on *a* side; 2 strong *a* at middle, 2 *a* preapicals; 2 *p* preapicals; row of *pv* setae delicate and weak; *pv* ctenidium with 8 short flattened spine-like setae in distal 2/5. Hind tibia yellow with 1 *av* at distal sixth, 2 *ad* of which the strongest at middle; fringe of long thin *av, v,* and *pv* setae in distal half; *ad* and *d* preapicals. Hind femur yellow with some darkening on *a* side; 4–5 widely spaced *ad* setae; dense vestiture of thin long setulae on *av, v* and *pv* side, these setulae about 3/4 of femoral diameter; rows of long thin weak *av* and *pv* setae about as long as femoral diameter. Hind coxa with pale ground setulae on posterior surface.



FIGURES 173–186. *Bengalia peuhi* species-group, male fore tibia. **173**. *B. emarginata* Malloch (holotype). **174**. *B. emarginatoides* **sp. nov.** (BMNH, paratype, "Kandy, Ceylon …"). **175**. *B. emdeniella* (Lehrer) (holotype). **176**. *B. fani* Feng & Wei (holotype). **177**. *B. inermis* Malloch (SDEI, "Los Banos"). **178**. *B. latro* de Meijere (ZMAN, paralectotype ... 0118.11). **179**. *B. lyneborgi* James (ZMUC, paratype "… Mantalingajan …"). **180**. *B. pseudovaricolor* Kurahashi & Tumrasvin (holotype). **181**. *B. surcoufi* Senior-White (holotype). **182**. *B. taksina* (Lehrer) (holotype of *Afridigalia taksina* Lehrer). **183**. *B. unicolor* Séguy (holotype). **184**. *B. varicolor* (Fabricius) (holotype of *Musca varicolor* Fabricius). **185**. *B. varicolor* (Fabricius) (holotype of *Bengalia bezzii* Senior-White). **186**. *B. weii* **sp. nov.** (paratype).

Abdomen. Tergites brownish yellow; dusted white in shifting pattern; with narrow black hind margins about 1/5 to 1/6 of tergite length, at middle marginal bands drawn out into pointed triangles pointing forward. Hind margin of basal excavation of T1+2 very far from hind margin. T1+2 with a bundle of 2–5 strong lateral discals; lateral marginals much weaker. T3 with 1–2 lateral marginals and 1 lateral discal setae on each side. T4 with 2 lateral, and 2 median marginals, latter closer together than lateral marginals, large gap between

medial and lateral marginals; no lateral discals on T4. T5 with 6 strong marginal setae and 1 pair of discal setae, latter slight more distant than the mid marginals of T4. ST1–3 yellow. ST4 yellow but darkened in hind part. ST5 darkened at base and laterally, area close to flap and flap yellow. Ground vestiture yellow. ST2 with a pair of long median marginals. ST3 with a pair of shorter median marginals plus weaker marginals on each side. ST4 with a pair of median marginals. ST5 flap shaped as in Fig. 168. Epandrium dark blackish brown dulled by thin layer of dust.



FIGURES 187–198. *Bengalia peuhi* species-group, male mid tibia. **187**. *B. emarginata* Malloch (holotype). **188**. *B. emdeniella* (Lehrer) (holotype). **189**. *B. fani* Feng & Wei (holotype). **190**. *B. inermis* Malloch (SDEI, "Los Banos"). **191**. *B. latro* de Meijere (USNM, paralectotype with red syntype label). **192**. *B. lyneborgi* James (ZMUC, paratype "… Mantalingajan …"). **193**. *B. pseudovaricolor* Kurahashi & Tumrasvin (holotype). **194**. *B. surcoufi* Senior-White (BMNH, paratype 1, 14.vi.1920). **195**. *B. taksina* (Lehrer) (BPBM, undissected). **196**. *B. unicolor* Séguy (holotype). **197**. *B. varicolor* (Fabricius) (CDPCAG, Guizhou, Longgong, Anshun City). **198**. *B. weii* **sp. nov.** (paratype).

Male genitalia. See under Diagnosis, above.

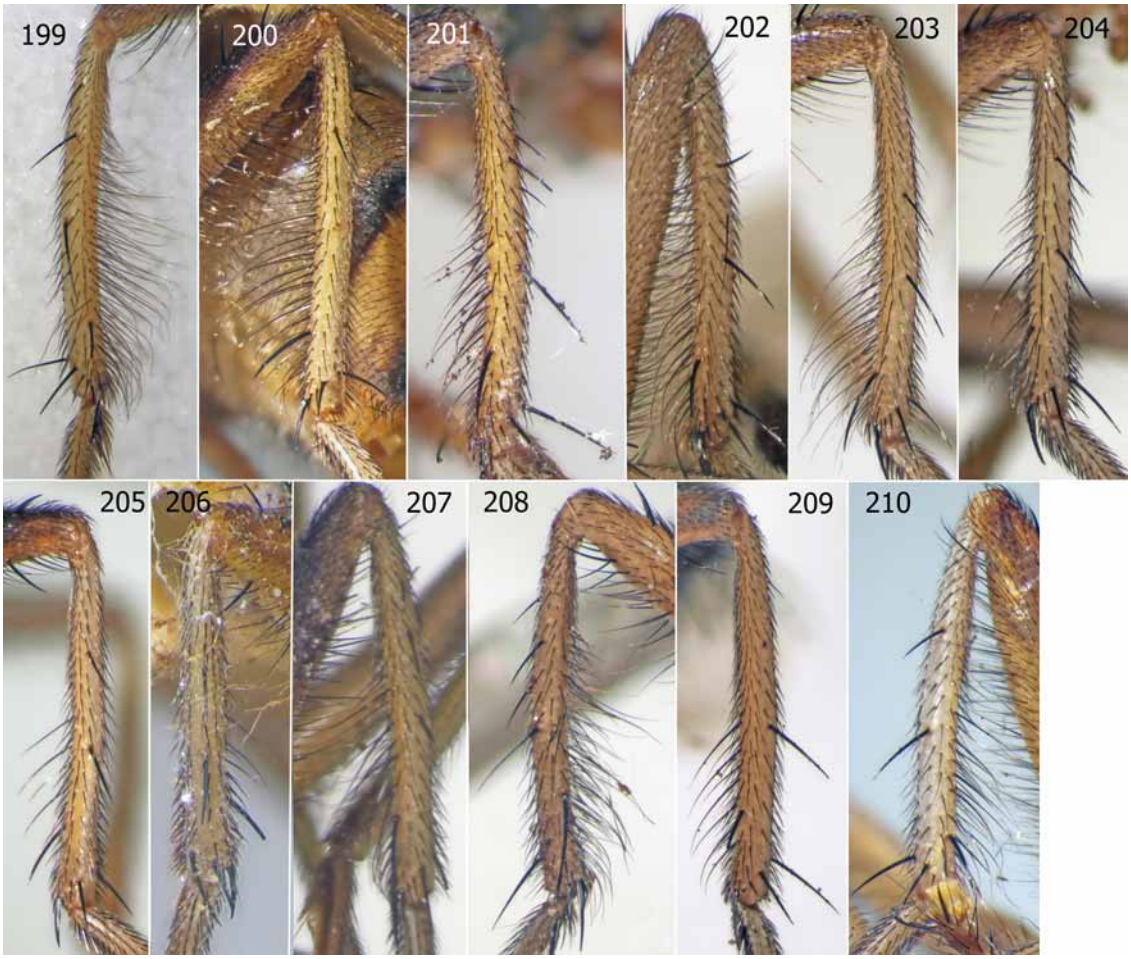
Female. Similar to male, except as follows. Legs: no fringes on any legs. Mid tibia with a *v* seta. Hind tibia with 2 smaller *av* setae above the strong distal *av.* Abdomen: T1–5 as in male, but T3 without lateral discals. ST1–5 (those visible) yellow. ST2, ST3 and ST4 with a pair of widely set marginals, on ST4 one of the pair is absent. ST1 and ST2 with yellow ground vestiture. ST2 with some black setulae in extreme posterolateral corners. ST3–5 with black ground vestiture laterally.

Biology. Captured in tropical rain forest.

Distribution. China (Yunnan).

Material examined. Type material. All types are in CDPCAG. **Holotype** male, labelled (1) "Xishuangbanna, Menglun 540m / 25. VI. 1993 / Wei Lianmeng leg." [In Chinese] (Fig. 171); (2) "C083 …

[Chinese name for *Bengalia varicolor*] / *Bengalia varicolor* / (Fabricius, 1805) ♂" [male symbol in red]; (3) My red holotype label (*weii* n. sp.). Dissected by K. R. Abdominal T1–5, right mid leg and right hind leg glued to card on pin, genitalia in glycerol in vial on pin. **Paratypes.** 1 male labelled: (1) "Center for Disease Prevention and Control, Anshun City, Guizhou, China / Xishuangbanna 700m / Wei Lianmeng *et al.* leg. / 25 June 1993" [In Chinese]; (2) "C083 … [Chinese name for *Bengalia varicolor*] / *Bengalia varicolor* / (Fabricius, 1805) ♂" [male symbol in red]; (3) My red paratype label (*weii* n. sp.). Dissected by Wei Lianmeng; genital capsule and some sternites removed, genitalia not present; drawings of genitalia received in digital form 16 January 2009. • 1 female labelled: (1) "Xishuangbanna, Menglun 540m / 25. VI. 1993 / Wei Lianmeng leg." [In Chinese]; (2) "C083 … [Chinese name for *Bengalia varicolor*] / *Bengalia varicolor* / (Fabricius, 1805) ♀" [female symbol in red]; (3) My red paratype label (*weii* n. sp.).



FIGURES 199–210. *Bengalia peuhi* species-group, male hind tibia. **199**. *B. emarginata* Malloch (holotype). **200**. *B. emdeniella* (Lehrer) (holotype). **201**. *B. fani* Feng & Wei (holotype). **202**. *B. inermis* Malloch (SDEI, "Los Banos"). **203**. *B. latro* de Meijere (USNM, paralectotype with red syntype label). **204**. *B. lyneborgi* James (ZMUC, paratype "… Mantalingajan …"). **205**. *B. pseudovaricolor* Kurahashi & Tumrasvin (holotype). **206**. *B. surcoufi* Senior-White (holotype). **207**. *B. taksina* (Lehrer) (holotype of *Afridigalia taksina* Lehrer). **208**. *B. unicolor* Séguy (holotype). **209**. *B. varicolor* (Fabricius) (CDPCAG, Guizhou, Longgong, Anshun City). **210**. *B. weii* **sp. nov.** (paratype).

Phylogenetic analysis of the *Bengalia peuhi* species-group

The *Bengalia peuhi* species-group (Afridigaliinae of Lehrer 2005) is probably monophyletic on account of the presence of distinct antlers directed more or less dorsally from the anterolateral corners of the mid-dorsal wall of the distiphallus. The exclusively Afrotropical *Bengalia spinifemorata* species-group (Maraviolinae of

Lehrer 2005), also with a quite distinct aedeagus, may be its sister group, these groups together possibly making up a monophyletic clade within *Bengalia* defined by the presence of discal setae on T5.

The knowledge of the distiphallus of the *B. spinifemorata* group is at present insufficient to make out the exact homologies of the various processes, which implies that no features can be coded and entered into the data matrix with any confidence. The very long ventral and posteriorly directed process present in all the species according to the figures presented by Lehrer (2005) may be the homologue of the lateral finger in the distiphallus of the *B. peuhi* species-group, and in several species there seems to be present an equivalent of the antlers.

For a study of the interrelationship of the Oriental species of the *B. peuhi* species-group, both the two Afrotropical subgroups of the *B. peuhi* species-group (i.e., the *B. floccosa* subgroup and *B. peuhi* subgroup, cf. above), the *B. spinifemorata* species-group and even *Bengalia* species without discal setae on T5 would be the preferred choice for an outgroup.

However, in view of the insufficient knowledge of these potential outgroups, I have settled for an analysis where the Afrotropical *B. floccosa* subgroup (see above for a discussion of its composition) was chosen as an outgroup, and the Oriental species constrained to be a monophyletic group. The cladograms in Figs. 216 and 217 are therefore very preliminary. The species-groups excluded from the present study may connect to the cladograms along the branch connecting the monophyletic *B. floccosa* subgroup (represented by the clade *B. floccosa* + *B. cuthbertsoni*) with the Oriental *B. peuhi*-group species.

The following monophyletic subgroups emerged from the analysis (Bremer supports in parenthesis) (Fig. 217). Below each group are listed the autapomorphies (and character state transformations) defining it.

lyneborgi + *surcoufi* + (*fani* + (*emdeniella* + *pseudovaricolor* + *taksina*)) (1)
dorsolateral wings flat, horizontal (1: 0>1);
vertical sclerotised sheet conspicuous with straight anterior border (4: 0>1)

fani + (*emdeniella* + *pseudovaricolor* + *taksina*) (2)
ventral finger acutely triangular, pointed (2: 0,3>2)
internal hypophallic lobes definitely converging seen from below (11: 0>1)
fore tibia with a regular row of very small even sized spine-like setae (16: 2>1)

emdeniella + *pseudovaricolor* + *taksina* (2)
upper lip not projecting beyond base of antlers (0: 1>0)
parastomal sclerite a long vertical rod (E- or J-shaped) (13: 0>1)

(*weii* + (*inermis* + (*latro* + *varicolor*))) + (*unicolor* + (*emarginata* + *emarginatoides*)) (0)
lateral finger small (5: 1>0)
anepimeron with yellow vestiture only (17: 1>0)

unicolor + (*emarginata* + *emarginatoides*) (2)
distal edge of upper lip straight in dorsal view (7: 2>3)
lunula setose (18: 0>1)

emarginata + *emarginatoides* (2)
fore tibia with a regular row of very small even sized spine-like setae (16: 2>1)
anepimeron with black setulae in upper bundle reaching katepisternum (17:0>2)

weii + (*inermis* + (*latro* + *varicolor*)) (0)
antlers broad, curved with strong tooth at base (3: 0>1)

inermis + (*latro* + *varicolor*) (0)

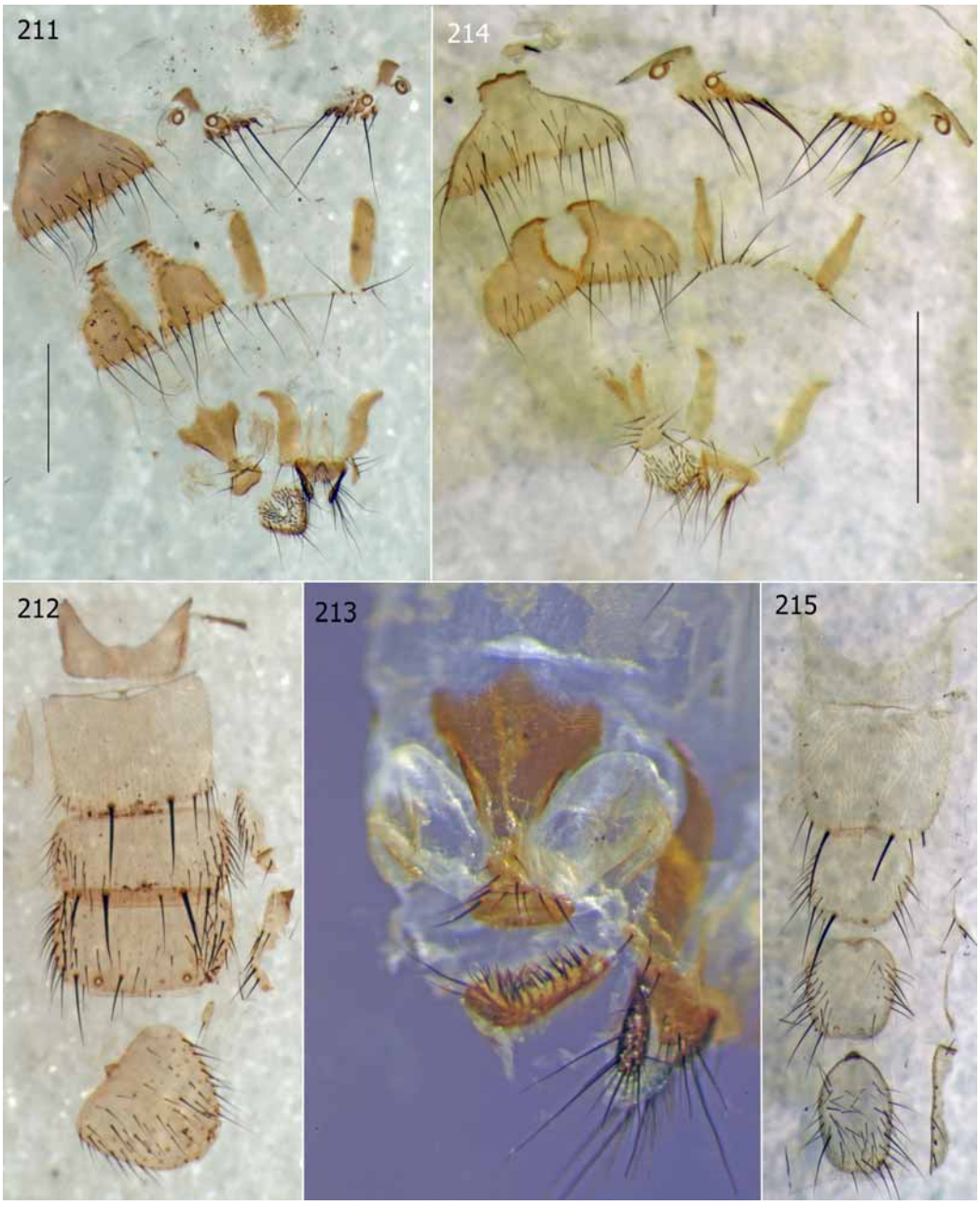
upper lip convex, curved upwards in middle as seen from in front (12: 0>1)

latro + *varicolor* (0)

ST5 flap narrow basally, broad distally; no distal emargination or a minute incision only (*latro*, *varicolor*) (8: 0>6)

surstylus densely pale setulose below (15: 0>1)

anepimeron with yellow setulae and a bundle of black setulae in upper part (17: 0>1)



FIGURES 211–215. ST1–5 and ovipositor. (211–213, *B. emarginata* Malloch, G. pr. 406, Taihorinsho, Formosa, SDEI; 214, 215, *B. lyneborgi* James, G. pr. 336, "… Brookes Point, Uring, Uring 25 August 1961 …" paratype, ZMUC). **211**, **214**. Ovipositor, flat mounts. **212**, **215**. ST1–5. **213**. Area around ST8 (from dissection, in alcohol).

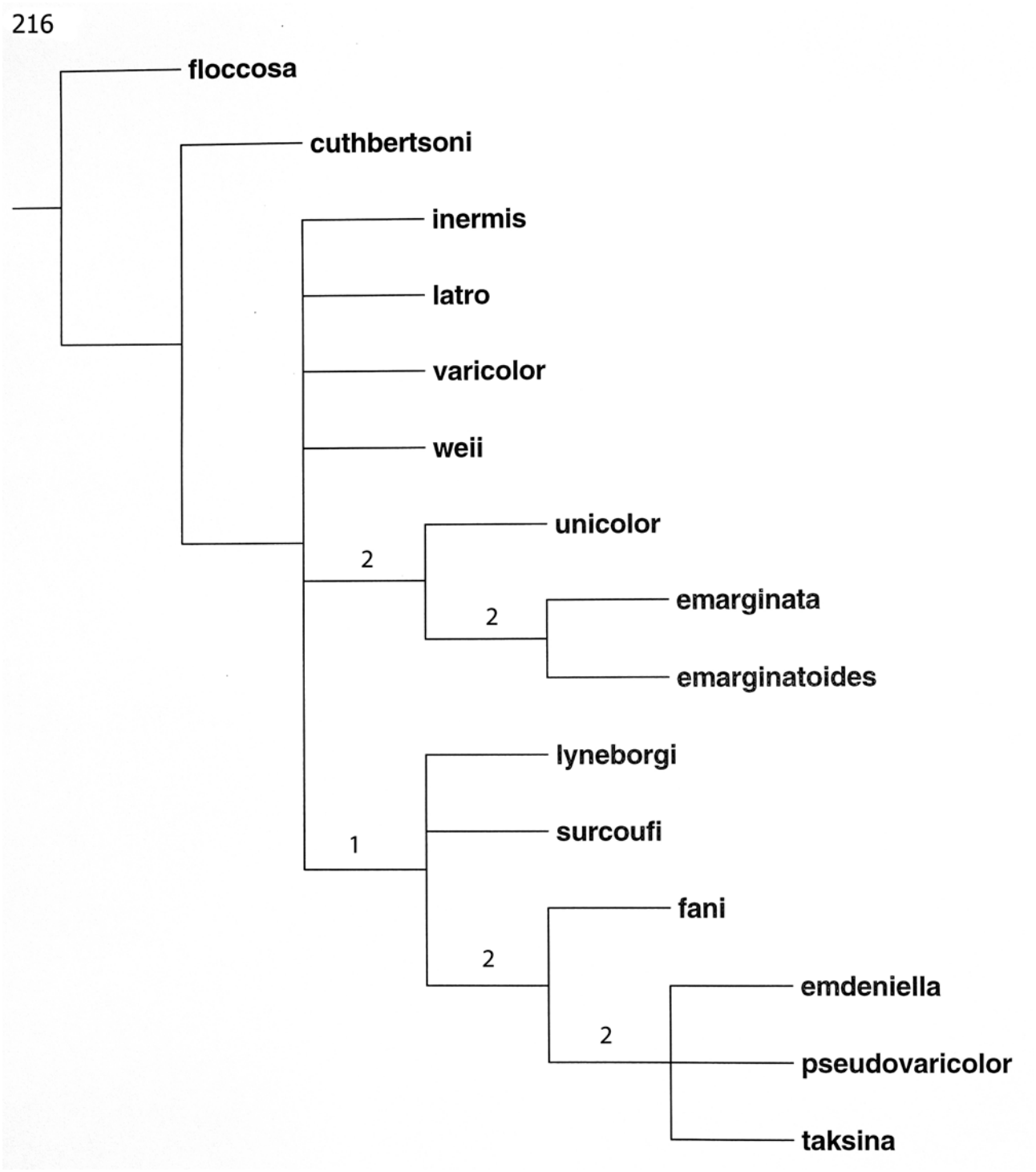


FIGURE 216. Strict consensus cladogram of the five most parsimonious trees found in NONA with *B. flocccosa* + *B. cuthbertsoni* as outgroup. Numbers above branches are Bremer supports. Output from WinClada.

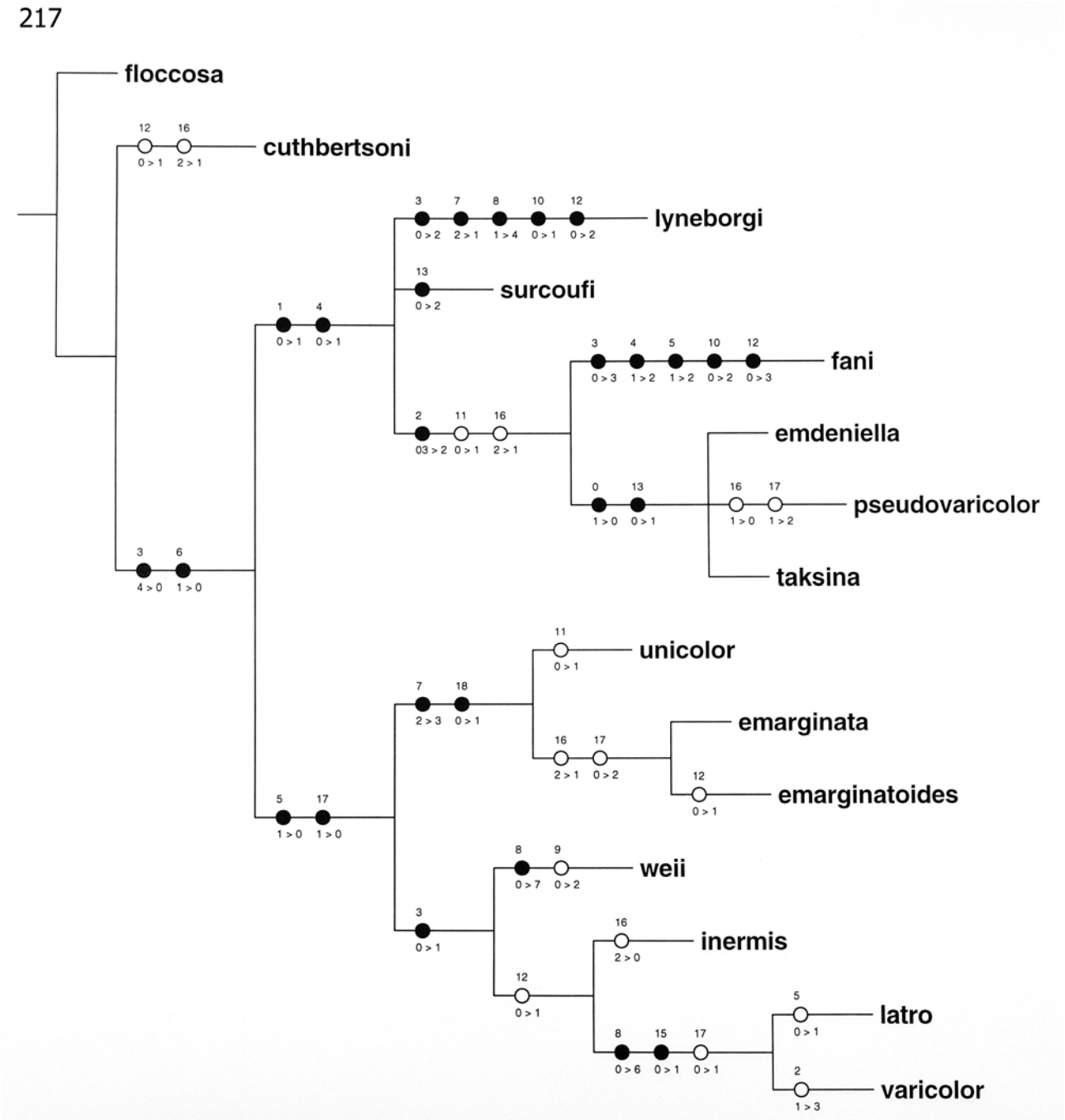


FIGURE 217. The single tree among the 5 most parsimonious trees found in NONA that had the highest fit in Pee-Wee. Numbers above hash marks refer to characters, those below are state transformations. Circles (filled or open) mark unambiguous apomorphic changes, open circles mark changes to homoplasious states (hash mark setting "only discontinuous states mapped as homoplasies). Fit (k=3) 150.7, length 57 steps, CI 0.75, RI 0.77. Output from WinClada.

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Appendix 1. Translation of the Chinese original description of *Bengalia fani* Feng & Wei.

The following is a translation by Ms. Shuai Wang, Shenyang, China, of the Chinese original description of *Bengalia fani* Feng & Wei *in* Feng *et al*. (1998: 1378–1380) (slightly emended by K. R. and reproduced with permission).

"*Bengalia* (*Eubengalia*) *fani* Feng et Wei, 1998

Description: Male. Body length 12mm, yellowish-brown. Head: eye bare; frons about 1/3 width of head, fronto-orbital with 5–6 pairs of frontal setae, with a pair of proclinate and upper orbital setae; frontal vitta dark yellow, lateral margins parallel; antenna dark brown, postpedicel about 2.5 times as long as pedicel, arista plumose; parafacial yellow, with black setae, with a large and conspicuous black patch at the level of the antennal base; gena yellow in the front half, and black in hind half, gena, postgena and occiput with yellow hair; epistoma with vibrissa, palpus and proboscis yellow.

Thorax: with shifting patches, and two broad black vittae before the transverse suture, postpronotal lobe and postalar callus yellow, other part of thorax brownish black; *acr* 0+1, *dc* 2+4, posthumeral seta 1, presutural seta 1, *ia* 0+2, supraalar setae 2, prealar seta 1 (about equal to length of posterior notopleural seta); scutellum yellow, marginal setae 3; anterior spiracle light yellow, posterior spiracle yellow brown, anepisternum with about 20 black setae on the upper central of front part, the upper part of anepimeron with tuft of long black hairs, other hairs long yellow, katepisternal setae 1+1.

Wing: base brownish yellow, slightly transparent, basicosta yellow, subcostal sclerite bare; basal part of R_{4+5} vein with black setae on both surfaces all the way to the r-m crossvein, apex of M_{1+2} obtuse-angled shape, calypters and halter yellow.

Leg: mid and hind femur with blue black metallic luster, other parts of legs yellow to dark yellow; basal half of fore tibia with 2 rows of irregular small black spine-like setae (12–14) on ventral surface, with 3 *ad* and 1 *pv*; mid femur with a row of *pv* spine-like setae (12) on the distal 1/3, with a row of 5–6 *pv* setae on the middle third, with four long bristles and some small hairs on the basal 1/6, mid tibia with 1 *ad*, 2 *p*; hind femur with a row of thin and long bristles on ventral surface (about 10), hind tibia with rows of *av* and *pv* on the distal 2/3, with 2 *ad*. [Note added by K. R.: A strong *av* seta present at distal fifth.]

Abdomen with shifting patches, tergites 1–4 with median vittae, syntergites 1+2 and tergites 3–5 with 1-2 lateral marginals on each side, the tergite 4 with a pair of median marginal bristles, the tergite 5 with row of complete marginal bristles and a pair of discal setae, posterior margin of sternites 2–5 yellow; posterior margin of the ST5 flap cupped, the widest gap about 4.7/10 width of the flap, cerci slightly bend in profile, becoming cuspidal apically, posterior margin of surstylus curved.

Female. Unknown.

Holotype: male, P.R.China: Guizhou Province, Anshun (Ganbao Forestry Centre, 1200 m), 14.V.1985, collected by Lianmeng Wei.

Remarks.— This species resembles *Bengalia pseudovaricolor* Kurahashi *et* Tumrasvin, 1979 from Thailand, but differs from the latter in *dc* 1+4, the femora dark brown mostly, mid femur with 5–6 *pv* spine-like setae distally, hind tibia with *av* rows only on the distal half; male terminalia different, too.

Zoology: the specimen collected from tussock in shrubbery, fly speedy (Lian-meng Wei, 1992). "

[Latter reference is to a private letter from Wei Lianmeng to Feng Yan, not to a paper supposedly written by Wei Lianmeng (pers. comm.).]

Appendix 2. Characters and states used for the phylogenetic analysis.

Character 0—upper lip (aedeagus)
0: not projecting beyond base of antlers
1: projecting beyond base of antlers

Character 1—dorsolateral wings (aedeagus)
0: upright and flaring
1: flat, horizontal

Character 2—ventral finger (aedeagus)
0: absent
1: narrow, bare or almost bare in front

2: acutely triangular, pointed
3: weakly projecting, rounded
4: projecting inwards, forwards and downwards, spatula like

Character 3—antlers (aedeagus)
0: long, narrow, sometimes with small tooth near base
1: broad curved, with strong tooth at base
2: very short, transparent
3: thin, narrow process
4: basal tooth strong, forming a pincer with narrow antler tip

Character 4—vertical sclerotised sheet (aedeagus)
0: inconspicuous
1: conspicuous, with straight anterior border
2: confluent with and in same plane as mid-dorsal wall

Character 5—lateral finger (aedeagus)
0: small
1: large
2: very long and narrow

Character 6—distal finger (aedeagus)
0: absent
1: present

Character 7—shape from above of projecting upper lip (aedeagus)
0: narrow, square
1: long pointed process
2: broad, convex distally
3: broad, straight distally
4: transverse oval hood, constricted from dorsal wall

Character 8—ST5 flap shape
0: square with sharpish distal corners, without or very slight distal emargination (*inermis*, *unicolor*)
1: elongate with very deep emargination (*emdeniella*, *fani*, *pseudovaricolor*, *surcoufi*, *taksina*)
2: circular with distal emargination and small concavity on each side distally (*emarginata*)
3: elongate-oval with distal emargination of variable depth (*emarginatoides*)
4: square with rounded distal corners, distal emargination of variable depth (*lyneborgi*)
5: parallel or somewhat diverging lateral edges, half-circular distal emargination, distal edges oblique (*cuthbertsoni*, *floccosa*) (cf. Lehrer 2005: figs. 8E, 11A)
6: narrow basally, broad distally; no distal emargination or a minute incision only (*latro*, *varicolor*)
7: elongate with slightly converging lateral edges, rounded distal corners and shallow angled emargination distally (*weii*)

Character 9—edge above lateral finger (aedeagus)
0: unserrated
1: serrated, straight
2: serrated, angled

Character 10—dorsal opening (aedeagus)
0: triangular
1: very long narrow slit
2: absent?

Character 11—internal hypophallic lobes from below (aedeagus)
0: not or only slightly converging
1: definitely converging

Character 12—shape of upper lip from in front (aedeagus)
0: flat

1: convex, curved upwards in middle
2: point
3: apical transverse oval hood (*fani*)

Character 13—parastomal sclerite (aedeagus)
0: absent
1: long, vertical rod (E- or J-shaped)
2: short, lateral swelling

Character 14—mid tibial fringe
0: absent
1: present

Character 15—surstylus vestiture below
0: bare or some widespread setulae only (*inermis*, *weii*)
1: densely pale setulose

Character 16—fore tibial ventral spine-like setae
0: absent
1: regular row of very small and even sized spine-like setae
2: irregular row of small spine-like setae, some at least twice as strong as others

Character 17—anepimeron vestiture
0: yellow setulae only
1: yellow plus small bundle of black setulae in upper part
2: black setulae in upper bundle reaching katepisternum

Character 18—lunula
0: bare
1: setose

Data matrix

			11111	1111
	01234	56789	01234	5678
floccosa	10040	11050	00000	0210
cuthbertsoni	10340	11250	00100	0110
emarginata	10400	00322	00001	0121
emarginatoides	10400	00331	00101	0121
emdeniella	01201	10–10	01010	0110
fani	11232	20410	21300	0110
inermis	10110	00200	00100	0000
latro	10110	10260	00101	1210
lyneborgi	11021	10140	10200	0210
pseudovaricolor	01201	10–10	01010	0020
surcoufi	11301	10210	00000	0110
taksina	01201	10–10	01010	0110
unicolor	10400	00300	01001	0201
varicolor	10310	00260	00100	1210
weii	10110	00272	00001	0200