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A new subgenus and eight new species of *Guimaraesiella* Eichler, 1949 (Phthiraptera: Ischnocera: Philopteridae: *Brueelia*-complex)

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Abstract

The species of the chewing louse genus *Guimaraesiella* Eichler, 1949 parasitic on drongos (Dicruridae) are reviewed and placed in the new subgenus *Dicrurobates*, which is described herein together with eight new species, including one species from non-dicrurid hosts. The new species are: *Guimaraesiella* (*Dicrurobates*) *carbonivora* **n. sp.** from *Dicrurus bracteatus carbonarius* Bonaparte, 1850; *Guimaraesiella* (*Dicrurobates*) *latitemporalis* **n. sp.** from *Dicrurus hottentottus brevirostris* (Cabanis, 1851) and *Dicrurus hottentottus* ssp. (Linnaeus, 1766); *Guimaraesiella* (*Dicrurobates*) *lurida* **n. sp**. from *Dicrurus leucophaeus* Vieillot, 1817; *Guimaraesiella* (*Dicrurobates*) *luzonica* **n. sp.** from *Dicrurus balicassius* (Linnaeus, 1766); *Guimaraesiella* (*Dicrurobates*) *nana* **n. sp.** from *Dicrurus hottentottus samarensis* Vaurie, 1947; *Guimaraesiella* (*Dicrurobates*) *regis* **n. sp.** from *Dicrurus annectans* (Hodgson, 1836), *Dicrurus paradiseus paradiseus* (Linnaeus, 1766) and *Dicrurus paradiseus rangoonensis* (Gould, 13836); *Guimaraesiella* (*Dicrurobates*) *transvaalensis* **n. sp.** from *Dicrurus adsimilis apivorus* Clancey, 1976; and *Guimaraesiella* (*Dicrurobates*) *campanula* **n. sp.** from *Oriolus larvatus rolleti* Salvadori, 1864 and *Prionops plumatus poliocephalus* (Stanley, 1814). Also, *Guimaraesiella* (*Dicrurobates*) *sexmaculata* (Piaget, 1880) and *Guimaraesiella* (*Dicrurobates*) *dicruri* (Ansari, 1955) are redescribed and illustrated. A key to identify adults of all 10 species included in the subgenus is provided.

Key words: Phthiraptera, Ischnocera, Philopteridae, *Guimaraesiella*, *Dicrurobates*, lice, new subgenus, new species, Dicruridae

Introduction

The chewing louse genus, *Guimaraesiella* Eichler, 1949, belongs to the *Brueelia*-complex, a large group of louse genera primarily parasitising passeriform hosts (Gustafsson & Bush 2017). *Guimaraesiella* comprises over 60 named species parasitising birds belonging to at least 33 families globally distributed (Gustafsson & Bush 2017; Gustafsson *et al*. 2019a,b). However, a large number of species still remain to be described and named, especially from hosts inhabiting the Old World tropics.

A molecular phylogeny of the lice included in the *Brueelia*-complex (Bush *et al.* 2016) indicated that the species of *Guimaraesiella* found on drongos (Dicruridae) were monophyletic with high support (Bush *et al.* 2016: 743, fig. 3c, clade C). Although the exact position of this clade within *Guimaraesiella* was not well supported by molecular data, morphological characters place this clade firmly within *Guimaraesiella*. The lice in this clade have several shared morphological characters that are unique within *Guimaraesiella*, justifying their inclusion in a separate subgenus within this genus. Here, we provide a description of that subgenus, as well as redescriptions of two known species and descriptions of eight new species belonging to this taxon.

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Material and methods

The material examined is deposited in the Natural History Museum, London, United Kingdom (NHML), the Bernice Pauahi Bishop Museum, Honolulu, Hawaii, United States (BPBM), the U.S.A. National Museum of Natural History (USNM), and the Price Institute for Parasite Research, University of Utah, Salt Lake City, United States (PIPR).

Specimens were examined and measured with a Nikon Eclipse E600 microscope (Nikon, Belmont, California, United States) fitted with an Olympus DP25 (Olympus, Center Valley, Pennsylvania, United States) and digital measuring software (ImageJ 1.48v, Wayne Rasband, https://imagej.nih.gov/). Illustrations were drawn by hand, using a drawing tube fitted to the same microscope. Line drawings were scanned, collated and edited in GIMP (www.gimp.org). All illustrations are from specimens from the type host species or subspecies, unless otherwise noted.

Host taxonomy follows Clements *et al.* (2019). Terminology of setal, structural, and genital characters, and abbreviations thereof, follow Gustafsson & Bush (2017), and include: *ads = anterior dorsal seta*; *ames = anterior mesosomal setae*; *aps = accessory post-spiracular setae*; *as3 = anterior seta 3*; *dsms = dorsal submarginal seta*; *mms = marginal mesometanotal setae*; *mts3 = marginal temporal seta 3*; *pmes = posterior mesosomal setae*; *pns = post-nodal setae*; *ps = paratergal setae*; *psps = principal postspiracular setae*; *pst1–2 = parameral setae 1–2*; *s4 = sensillus 4*; *ss = sutural setae*; *vms = vulval marginal setae*; *vos = vulval oblique setae*; *vss = vulval submarginal setae*. These setae are labelled in Figs 1, 3, 5–7.

Measurements are given in millimeters for the following dimensions: TL = total length (along midline); HL = head length (along midline); HW = head width (at temples); PRW = prothoracic width; PTW = pterothoracic width; AW = abdominal width (at fifth segment).

Systematics

PHTHIRAPTERA Haeckel, 1896: 703.

Ischnocera Kellogg, 1896: 63.

Philopteridae Burmeister, 1838: 422.

***Brueelia*-complex**

Guimaraesiella Eichler, 1949

Brueelia Kéler, 1936: 257 (*in part*).
Guimaraesiella Eichler, 1949: 11.
Xobugirado Eichler, 1949: 13.
Allobrueelia Eichler, 1951: 36 (*in part*).
Allobrueelia Eichler, 1952: 74 (near-verbatim redescription).
Allonirmus Złotorzycka, 1964: 263.
Nitzschnirmus Mey & Barker, 2014: 101.
Callaenirmus Mey, 2017: 92.
Philemoniellus Mey, 2017: 145.

Type species. *Docophorus subalbicans* Piaget, 1885: 6 [= *Guimaraesiella papuana* (Giebel, 1879): 475], by original designation.

Guimaraesiella (*Dicrurobates*) Gustafsson & Bush, new subgenus

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Brueelia Kéler, 1936: 257 (*in part*).
Brueelia "clade C" Bush *et al.* 2016: 743, fig. 3c.

Type species: *Brueelia dicruri* Ansari, 1955 ex *Dicrurus macrocercus albirictus* (Hodgson, 1836).

Diagnosis. The subgenus *Guimaraesiella* (*Dicrurobates*) shares the following characters with the nominate subgenus: dorsal preantennal suture present; marginal carina interrupted at least medianly; *pns* and *s4* present; *as3* absent; psps present on tergopleurites IV–VII; setal rows absent on all tergopleurites in both sexes; *ss* present on tergopleurites II–VIII in both sexes; *aps* present on male tergopleurite VII; parameral heads folded medianly; gonopore open distally. However, species included in *Guimaraesiella* (*Dicrurobates*) can be separated from those in the nominate subgenus by two characters of the male genitalia: (1) gonopore positioned terminally in species of *Guimaraesiella* (*Guimaraesiella*), but subterminally in species of *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 5, 12, 19); (2) rugose nodi present in species of *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 5, 12, 19), but absent in species of *Guimaraesiella* (*Guimaraesiella*). Both these characters are found in at least some species included in the subgenera *Guimaraesiella* (*Mohoaticus*) Mey, 2017 and *Guimaraesiella* (*Cicchinella*) Gustafsson *et al*., 2019a (*gombakensis* and *tenella* species groups). Hence, *Guimaraesiella* (*Dicrurobates*) may be closer to one or both of these subgenera than to *Guimaraesiella* sensu stricto. Notably, in the phylogeny of Bush *et al*. (2016: 742, fig. 3(b), clade A-5), the subgenus *Guimaraesiella* (*Cicchinella*) was not placed close to the nominate subgenus; however, no member of the subgenus *Guimaraesiella* (*Mohoaticus*) was represented in that phylogeny, and relationships among the deeper nodes within *Guimaraesiella* sensu lato were poorly resolved.

Species of *Guimaraesiella* (*Dicrurobates*) can be separated from species of *Guimaraesiella* (*Cicchinella*) with rugose nodi by the following characters: (1) female subgenital plate with cross-piece in *Guimaraesiella* (*Cicchinella*) (*gombakensis* and *tenella* species groups), but without cross-piece in *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 7, 14, 21); (2) male gonopore ventral, near center of mesosome in *Guimaraesiella* (*Cicchinella*) (both species groups), but subterminal in *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 5, 12, 19); (3) ventral sclerite absent in *Guimaraesiella* (*Cicchinella*) (*gombakensis* species group), but present in *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 5, 12, 19); (4) parameral heads with corrugated section in *Guimaraesiella* (*Cicchinella*) (both species groups), but without such corrugation in *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 6, 13, 20); (5) dorsal preantennal suture completely separating dorsal anterior plate in *Guimaraesiella* (*Cicchinella*) (*tenella* species group), but not separating the dorsal anterior plate in *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 3, 10, 17).

Species of *Guimaraesiella* (*Mohoaticus*) can be separated from *Guimaraesiella* (*Dicrurobates*) by the following characters: (1) dorsal preantennal suture not medially continuous median to *ads* and dorsal anterior plate continuous with roof of head in *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 3, 10, 17), but suture medially continuous median to *ads* and dorsal anterior plate separated from roof of head in *Guimaraesiella* (*Mohoaticus*); (2) mesosomal lobes with straight or bulging lateral margins and rugose nodi either poorly delimited or on bulge in *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 5, 12, 19), but with deeply sinuous lateral margins and rugose nodi clearly delimited ventrally by a noticeable ridge in *Guimaraesiella* (*Mohoaticus*); (3) gonopore smooth anteriorly in *Guimaraesiella* (*Dicrurobates*) (e.g. Figs 5, 12, 19), but serrated anteriorly in *Guimaraesiella* (*Mohoaticus*).

Description. ***Both sexes.*** Head shape variable, but preantennal area typically long and roughly trapezoidal, with flattened frons (e.g. Figs 3, 10, 17). Marginal carina broad, with irregular inner margins, interrupted medianly but not laterally (except in species where dorsal preantennal suture reaches lateral margins of head); frons hyaline, continuous with dorsal preantennal suture which reaches at least *dsms*, and may reach *ads* and lateral margins of head; ventral anterior plate present; temporal and occipital carinae not visible; antennae sexually monomorphic; temples gently rounded. Head chaetotaxy as in e.g. Figs 3, 10, 17; *as3* absent; *mts3* only temporal macrosetae.

Prothorax rectangular; *psps* on postero-lateral corners. Pterothorax roughly pentagonal, with lateral margins divergent and posterior margin either rounded or convergent to median point; *mms* moderately separated medianly. Meso- and metasterna not fused, each with 1 seta on each side on postero-lateral corners (e.g. Figs 1–2, 8–9, 15–16).

Male tergopleurites II–IX+X and female tergopleurites II–VIII divided medianly; ventral sections of tergopleurites generally slender. Sternal plates rectangular, not approaching ventral sections of tergopleurites; accessory sternal plates absent (e.g. Figs 1–2, 8–9, 15–16).

Male. Abdominal chaetotaxy sparse, differing slightly between species. Subgenital plate roughly triangular, lateral margins typically irregular (e.g. Figs 1, 8, 15). Genitalia: basal apodeme rectangular, with rounded anterior end, often constricted at mid-length (e.g. Figs 4, 11, 18). Proximal mesosome variable, typically quadratic or rectangular, narrow compared to distal mesosome; ventral sclerite present, variable between species; mesosomal lobes gener-

ally wider than proximal mesosome, with distinct bulging nodi lateral to gonopore; these nodi are typically at least partially rugose; 2 *ames* sensilla and 2 *pmes* sensilla on each side (e.g. Figs 5, 12, 19). Parameral heads variable (e.g. Figs 6, 13, 20). Parameral blades tapering only distally, may be slightly elongated distal to mesosome; *pst1* sensillus located proximal to *pst2*; *pst2* microseta, near distal end of paramere (e.g. Figs 4, 6, 11, 13, 18, 20).

Female. Abdominal chaetotaxy sparse, differing slightly among species. Subgenital plate broad in anterior half, narrowing in posterior half; lateral margins of posterior half often irregular; subgenital plate does not reach vulval margin, but expands distally into lateral submarginal bulges; few *vms* and *vss* on each side; *vos* follow lateral margins of subgenital plate, with at least 1 distal *vos* separated from other *vos* by a gap, and distal most *vos* typically situated on or near distal margin of subgenital plate, near *vss* (e.g. Figs 7, 14, 21).

Host distribution. Species of Dicruridae, Oriolidae and Vangidae.

Geographical range. Afrotropical, Indo-Malayan and Australo-Papuan regions; presumably present outside these regions wherever drongos occur.

Etymology. The name *Dicrurobates* is formed by the host genus *Dicrurus* Vieillot, 1816—from Greek "*dikros*" = "forked", and "*oura*" = "tail"—combined with "*bates*", Greek for "one who walks on something".

Included species

Guimaraesiella (*Dicrurobates*) *sexmaculata* (Piaget, 1880) [in *Nirmus*].
Type host: *Dicrurus remifer* (Temminck, 1823)

Guimaraesiella (*Dicrurobates*) *dicruri* (Ansari, 1955) [in *Brueelia*].
Type host: *Dicrurus macrocercus albirictus* (Hodgson, 1836)

Guimaraesiella (*Dicrurobates*) *carbonivora* **new species**
Type host: *Dicrurus bracteatus carbonarius* Bonaparte, 1850

Guimaraesiella (*Dicrurobates*) *latitemporalis* **new species**
Type host: *Dicrurus hottentottus brevirostris* (Cabanis, 1851)

Guimaraesiella (*Dicrurobates*) *lurida* **new species**
Type host: *Dicrurus leucophaeus* Vieillot, 1817

Guimaraesiella (*Dicrurobates*) *luzonica* **new species**
Type host: *Dicrurus balicassius* (Linnaeus, 1766)

Guimaraesiella (*Dicrurobates*) *nana* **new species**
Type host: *Dicrurus hottentottus samarensis* Vaurie, 1947

Guimaraesiella (*Dicrurobates*) *regis* **new species**
Type host: *Dicrurus annectans* (Hodgson, 1836)

Guimaraesiella (*Dicrurobates*) *transvaalensis* **new species**
Type host: *Dicrurus adsimilis apivorus* Clancey, 1976

Guimaraesiella (*Dicrurobates*) *campanula* **new species**
Type host: *Oriolus larvatus rolleti* Salvadori, 1864

Guimaraesiella (*Dicrurobates*) *sexmaculata* (Piaget, 1880)

(Figs 1–7)

Nirmus sexmaculatus Piaget, 1880: 666.
Degeeriella sexmaculata (Piaget, 1880); Harrison 1916: 123.
Bruëlia [sic] *sexmaculata* (Piaget, 1880); Hopkins & Clay 1952: 61.
Brueelia sexmaculata (Piaget, 1880); Price *et al*. 2003: 158.
Guimaraesiella sexmaculata (Piaget, 1880); Gustafsson & Bush 2017: 222, 352.

Type host. *Dicrurus remifer* (Temminck, 1823)—lesser racket-tailed drongo.

Other hosts. *Dicrurus remifer peracensis* (Baker, 1918)—lesser racket-tailed drongo. *Dicrurus aeneus aeneus* Vieillot, 1817—bronzed drongo.

Type locality. Unknown.

Description. ***Both sexes.*** Head shape and chaetotaxy as in Fig. 3. Lateral margins of preantennal area slightly convex; frons flattened; temples rounded; marginal carina broad, irregular, narrowing anteriorly; dorsal preantennal suture reaches *dsms*, *ads* and lateral margins of head; ventral anterior plate small, semi-circular; coni small; gular plate as in Fig. 3. Thoracic and abdominal segments as in Figs 1–2.

Male. Thoracic and abdominal chaetotaxy as in Fig. 1; *aps* absent on tergopleurite IV, but present on tergopleurites V–VII. Genitalia as in Figs 4–6: basal apodeme slender, rectangular, with rounded anterior end and slight constriction at mid-length (Fig. 4). Ventral sclerite narrow, widening distally, and reaching beyond anterior margin of mesosome; proximal mesosome broadly quadratic, short; mesosomal lobes broad, rounded triangular; rugose area not forming distinct bulging nodi; 2 *ames* sensilla on each side near antero-lateral corners of mesosomal lobes; 2 *pmes* sensilla on each side of gonopore near rugose area; gonopore small, with broad marginal thickening (Fig. 5). Parameral heads irregular with broad parameral blades, tapering distally (Figs 5–6). Measurements: Ex *Dicrurus remifer peracensis* (n = 1): TL = 1.51; HL = 0.41; HW = 0.33; PRW = 0.22; PTW = 0.30; AW = 0.43. Ex *Dicrurus aeneus aeneus* (n = 1): TL = 1.51; HL = 0.39; HW = 0.32; PRW = 0.21; PTW = 0.30; AW = 0.42.

Female. Thoracic and abdominal chaetotaxy as in Fig. 2; *psps* present on tergopleurite VIII. Subgenital plate as in Fig. 7, with slight lateral submarginal bulges; vulval margin gently rounded, with 2–3 long slender *vms* on each side, and 5–6 short, thorn-like *vss* on each side; 4–6 long, slender *vos* on each side; distal 2 *vos* anterior to *vms* (Fig. 7). Measurements: Ex *Dicrurus remifer peracensis* (n = 1): TL = 1.98; HL = 0.46; HW = 0.40; PRW = 0.25; PTW = 0.36; AW = 0.54. Ex *Dicrurus aeneus aeneus* (n = 2): TL = 1.76–1.79; HL = 0.42; HW = 0.35; PRW = 0.22; PTW = 0.33; AW = 0.51–0.52.

Type material. Ex *Dicrurus remifer*: **Syntypes**: 2♂, 3♀, Piaget Collection, 1395–1396 (NHML) [one slide in this series contains a different species of *Guimaraesiella*].

Non-type material. Ex *Dicrurus aeneus aeneus*: 1♂, 2♀, Myanmar, R. Meinertzhagen, 13523 (NHML).

Ex *D. remifer peracensis*: 1♂, Khao Soi Dao Tai, elev. 4800 ft, Chanthaburi Province, Thailand, 7 Mar. 1966, MAPS-4208 (NHML); 1♀, Khao Soi Dao Tai, elev. 2500 ft, Chanthaburi Province, Thailand, 21 Mar. 1968, MAPS-4609 (NHML).

Guimaraesiella (*Dicrurobates*) *dicruri* (Ansari, 1955)

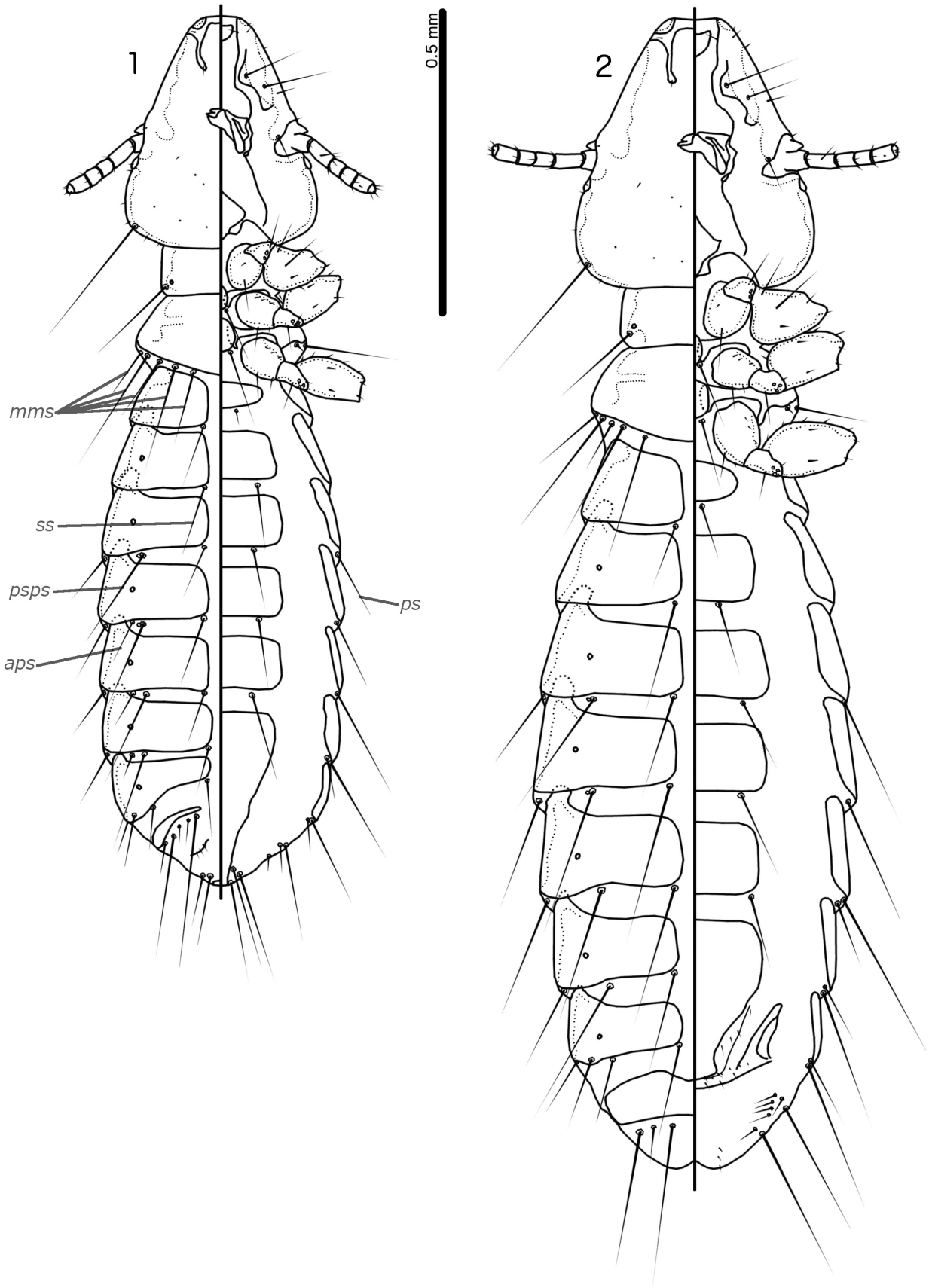
(Figs 8–14)

Bruelia [sic] *dicruri* Ansari, 1955: 53.
Bruëlia [sic] *dicruri* Ansari, 1956: 395. Junior primary homonym.
Brueelia dicruri (Ansari, 1955); Price *et al*. 2003: 154.
Guimaraesiella dicruri (Ansari, 1955); Gustafsson & Bush 2017: 221, 356.
Guimaraesiella dicruri (Ansari, 1955); Gustafsson *et al*. 2019a: 453.

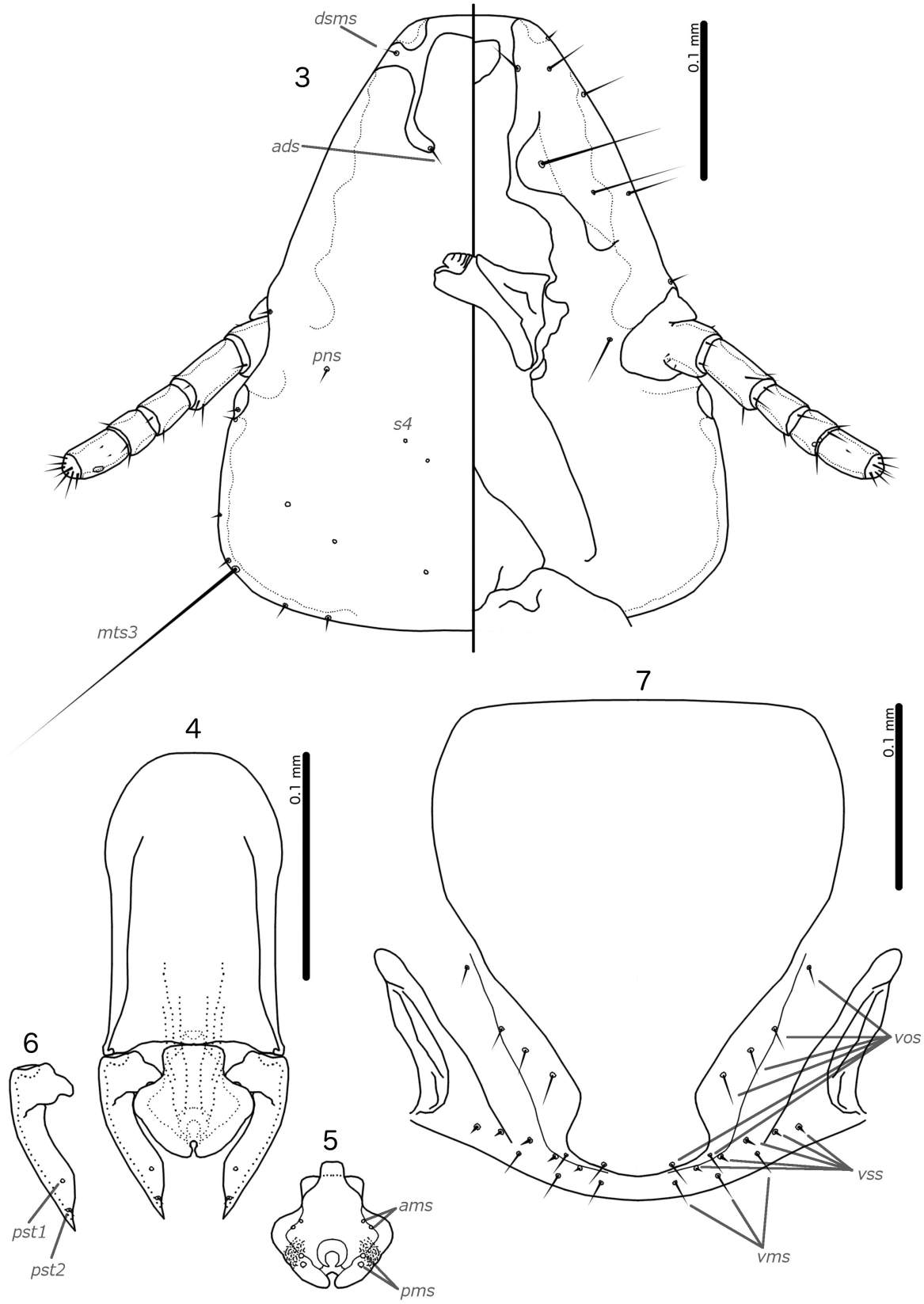
Type host. *Dicrurus macrocercus albirictus* (Hodgson, 1836)—black drongo.

Other hosts. *Dicrurus macrocercus thai* Kloss, 1921—black drongo. *Dicrurus macrocercus macrocercus* Vieillot, 1817—black drongo. *Dicrurus caerulescens caerulescens* (Linnaeus, 1758)—white-bellied drongo.

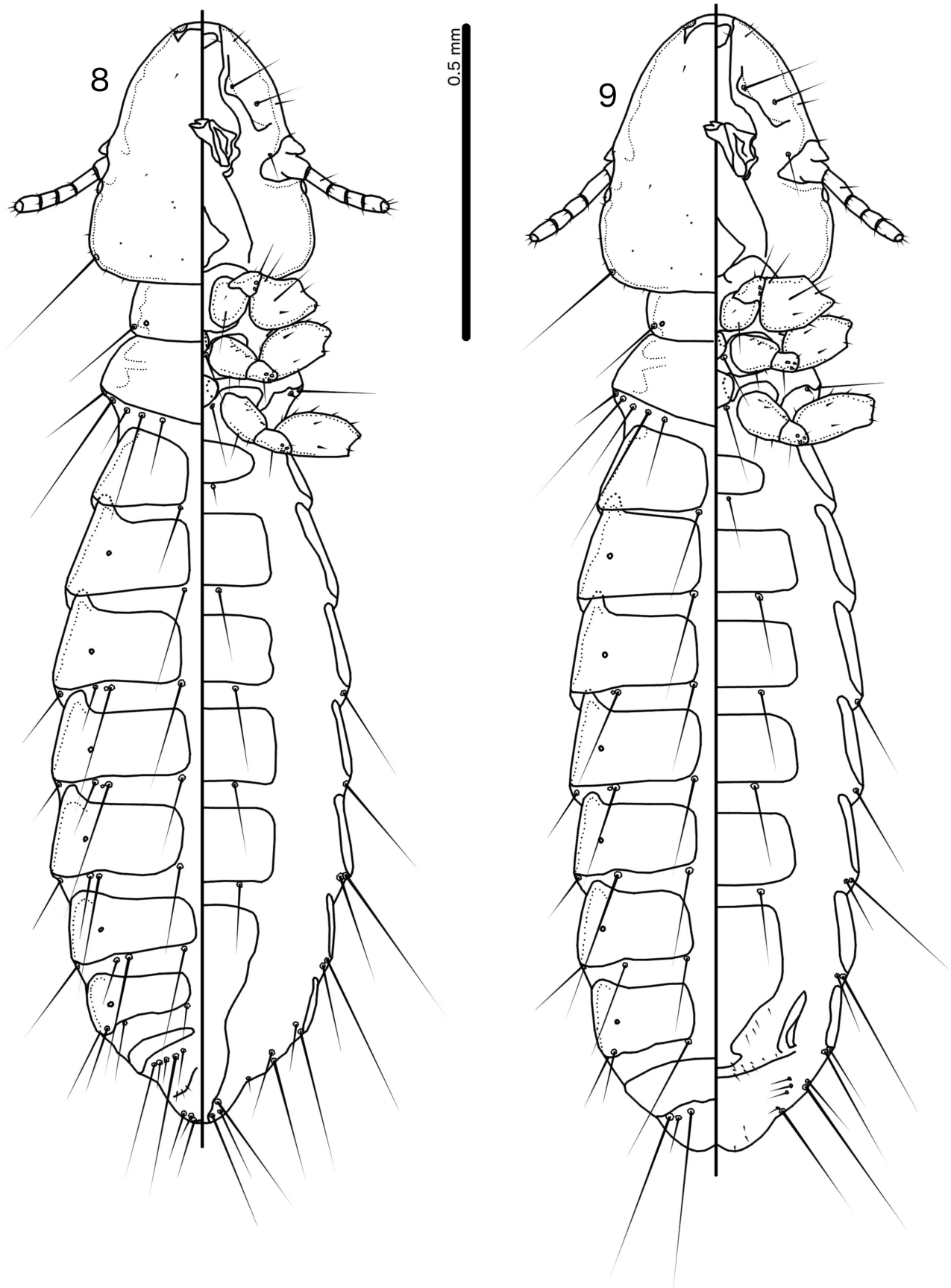
Type locality. Pakistan.



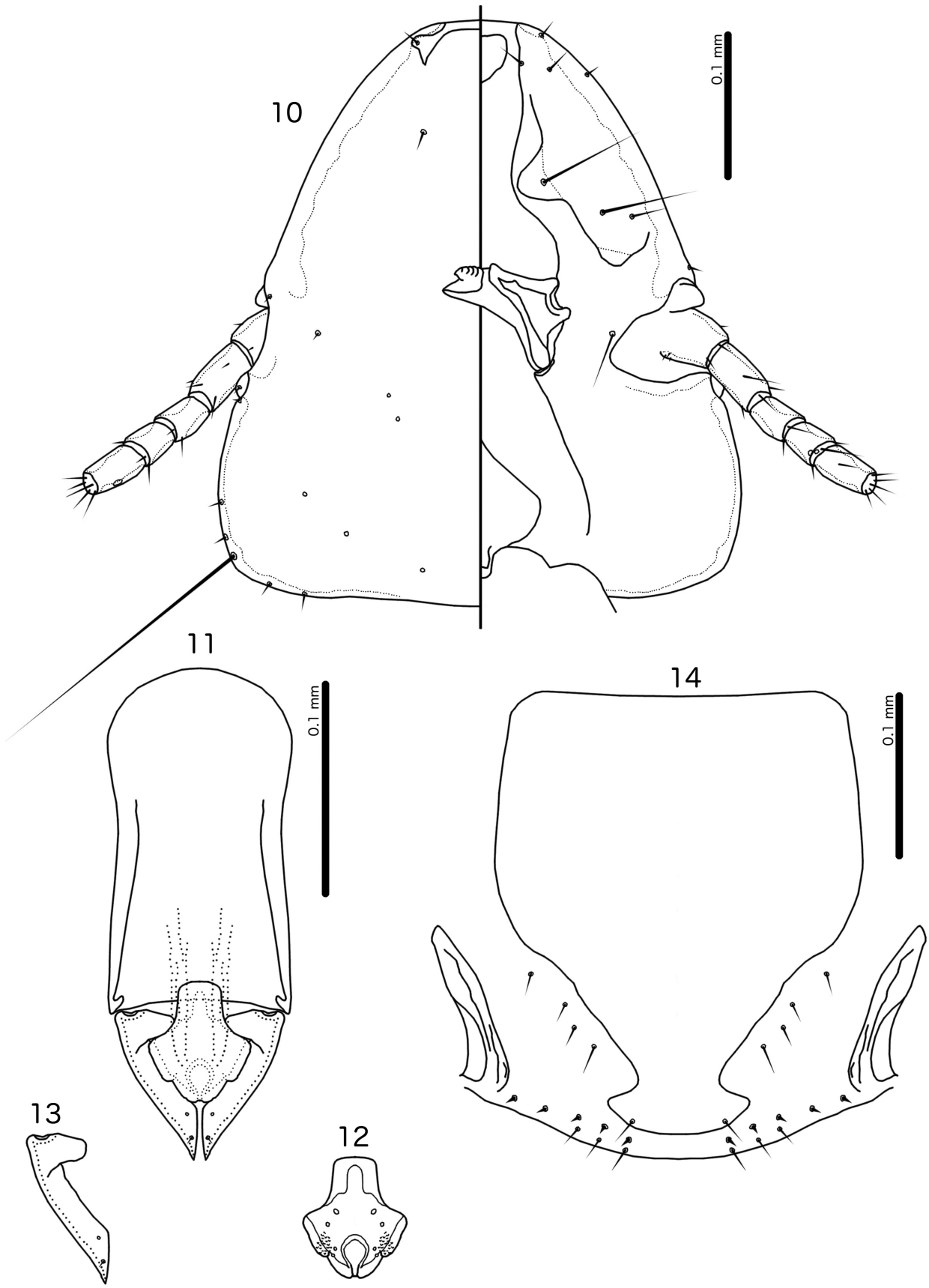
FIGURES 1–2. *Guimaraesiella* (*Dicrurobates*) *sexmaculata* (Piaget, 1880). **1,** male habitus, dorsal and ventral views. **2,** female habitus, dorsal and ventral views. Abbreviations: *aps = accessory post-spiracular seta; mms = marginal mesometanotal setae; ps = paratergal seta; psps = principal post-spiracular seta; ss = sutural seta*.



FIGURES 3–7. *Guimaraesiella* (*Dicrurobates*) *sexmaculata* (Piaget, 1880). **3,** male head, dorsal and ventral views. **4,** male genitalia, dorsal view. **5,** male mesosome, ventral view. **6,** male paramere, dorsal view. **7,** female subgenital plate and vulval margin, ventral view. Abbreviations: *ads = anterior dorsal seta; ames = anterior mesosomal setae; dsms = dorsal submarginal seta; mts3 = marginal temporal seta 3; pmes = posterior mesosomal s*etae; *pns = post-nodal seta*; *pst1–2 = parameral setae 1–2; s4 = sensillus 4; vms = vulval marginal setae; vos = vulval oblique setae; vss = vulval submarginal setae*.



FIGURES 8–9. *Guimaraesiella* (*Dicrurobates*) *dicruri* (Ansari, 1955). 8**,** male habitus, dorsal and ventral views. **9,** female habitus, dorsal and ventral views.



FIGURES 10–14. *Guimaraesiella* (*Dicrurobates*) *dicruri* (Ansari, 1955). **10,** male head, dorsal and ventral views. **11,** male genitalia, dorsal view. **12,** male mesosome, ventral view. **13,** male paramere, dorsal view. **14,** female subgenital plate and vulval margin, ventral view.

Description. ***Both sexes.*** Head shape and chaetotaxy as in Fig. 10. Lateral margins of preantennal area convex, frons rounded to slightly flattened; marginal carina slender; dorsal preantennal suture reaches *dsms* but does not extend much towards *ads*, and does not reach lateral margins of head; ventral anterior plate small, rounded triangular; coni short; temples rounded; gular plate rounded laterally with median point (Fig. 10). Thoracic and abdominal segments as in Figs 8–9.

Male. Thoracic and abdominal chaetotaxy as in Fig. 8; *aps* present on tergopleurites IV–VII. Genitalia as in Figs 11–13: basal apodeme roughly rectangular, not much constricted at mid-length, with rounded anterior end (Fig. 11). Proximal mesosome square; ventral sclerite with slender anterior end, not reaching proximal margin of mesosome; mesosomal lobes anteriorly angular; rugose nodi extensive; 2 *ames* sensilla on each side near anterolateral corner of mesosomal lobes; 2 *pmes* sensilla on each side of gonopore, near rugose nodi; gonopore oval, with slender marginal thickening (Fig. 12). Parameral heads as in Fig. 13. Parameral blades tapering only distal to mesosome (Figs 11, 13). Measurements: Ex *Dicrurus macrocercus albirictus* (n = 5, except AW, where n = 3): TL = 1.51–1.72; HL = 0.39–0.41; HW = 0.33–0.35; PRW = 0.20–0.22; PTW = 0.29–0.32; AW = 0.40–0.46. Ex *Dicrurus caerulescens caerulescens* (n = 5): TL = 1.44–1.61; HL = 0.38–0.39; HW = 0.32–0.33; PRW = 0.19–0.21; PTW = 0.29–0.31; AW = 0.40–0.45.

Female. Thoracic and abdominal chaetotaxy as in Fig. 9; *psps* absent on tergopleurite VIII in material from type host, *Dicrurus macrocercus thai* and *D. caerulescens*, but present on one side of tergopleurite VIII in some females from *D. macrocercus macrocercus*. Subgenital plate roughly square anteriorly+, with slight lateral submarginal bulges (Fig. 14); vulval margin gently rounded, somewhat flattened medianly, with 2–4 short, slender *vms* on each side and 5–6 short, thorn-like *vss* on each side; 4–7 short, slender *vos* on each side; distal 1 *vos* near *vss* (Fig. 14). Measurements: Ex *Dicrurus macrocercus albirictus* (n = 8, except AW, where n = 6): TL = 1.72–1.84; HL = 0.40–0.43; HW = 0.34–0.36; PRW = 0.21–0.22; PTW = 0.32–0.34; AW = 0.38–0.47. Ex *Dicrurus macrocercus macrocercus* (n = 9, except AW, where n = 8): TL =1.65–1.94; HL = 0.39–0.45; HW = 0.33–0.38; PRW = 0.20–0.23; PTW = 0.30–0.35; AW = 0.40–0.48. Ex *Dicrurus macrocercus thai* (n = 2): TL = 1.69–1.84; HL = 0.40–0.42; HW = 0.35–0.38; PRW = 0.21–0.23; PTW = 0.32–0.36; AW = 0.45–0.46. Ex *Dicrurus caerulescens caerulescens* (n = 7, except TL, where n = 5, and AW where n = 6): TL = 1.66–1.87; HL = 0.36–0.41; HW = 0.31–0.34; PRW = 0.19–0.21; PTW = 0.30–0.34; AW = 0.40–0.53.

Type material. Presumed lost by Naz *et al.* (2020), who could not locate any type specimen of *B. dicruri* in their search for material studied by M.A.R. Ansari.

Non-type material. Ex *Dicrurus macrocercus albirictus*: 5♂, 9♀, Nepal, Mar. 1937, R. Meinertzhagen, 9266 (NHML).

Ex *D. macrocercus macrocercus*: 9♀, Bombay, [Maharashtra, India], Feb. 1937, R. Meinertzhagen, 8446 (NHML). Ex *D. macrocercus thai*: 2♀, Paknompho [?], Nakhon Sawan Province, Thailand, 4 Mar. 1953, R.E. Elbel, RE-1671, RT-B-17601 (BPBM). Ex *D. caerulescens caerulescens*: 11♂, 6♀, Nepal, Mar. 1937, R. Meinertzhagen, 9288 (NHML).

Guimaraesiella (*Dicrurobates*) *carbonivora* Gustafsson & Bush, new species

(Figs 15–21)

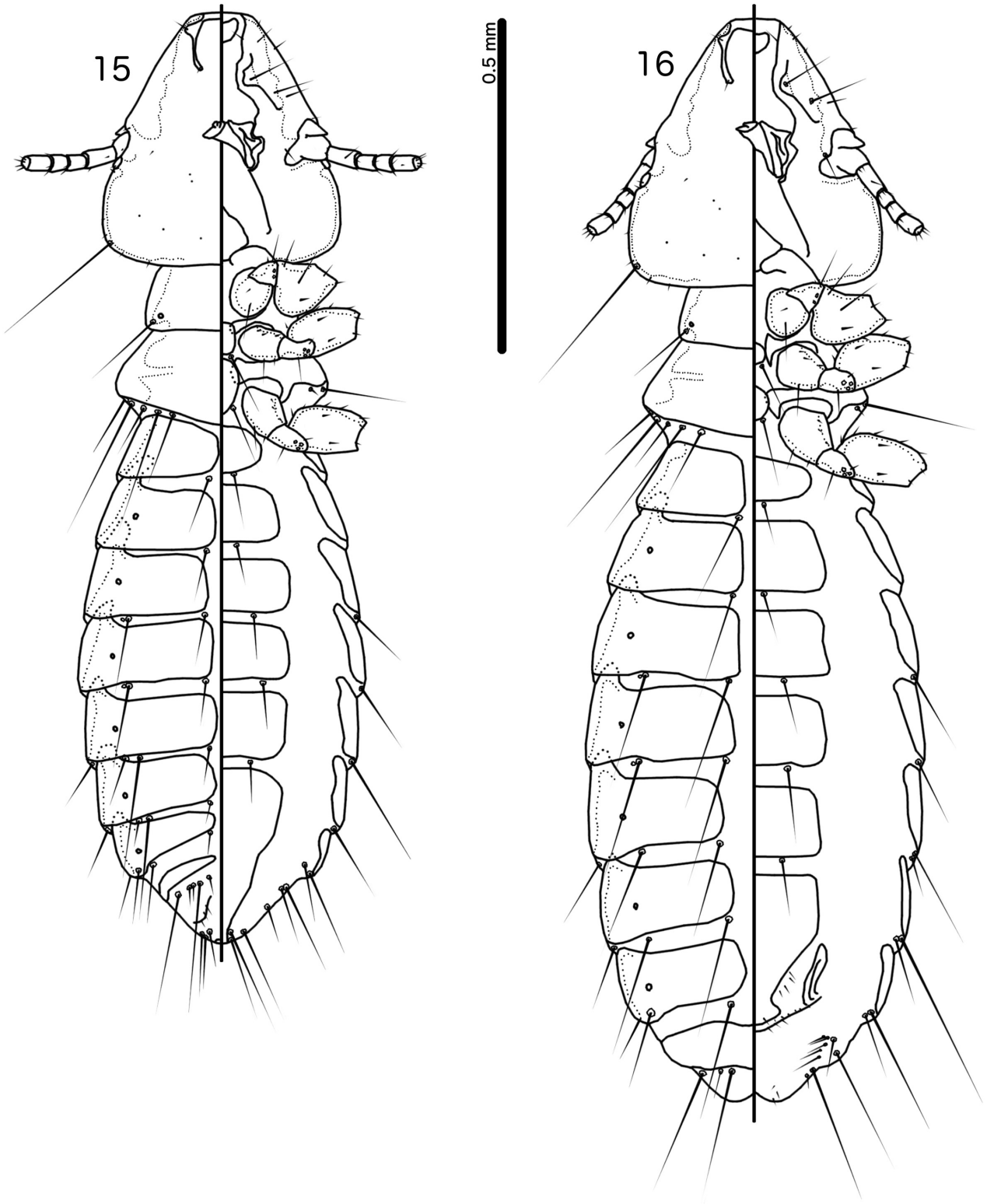
urn:lsid:zoobank.org:act:2EA95391-439C-4AF9-9451-B23AF0BF54BF

Type host. *Dicrurus bracteatus carbonarius* Bonaparte, 1850—spangled drongo.

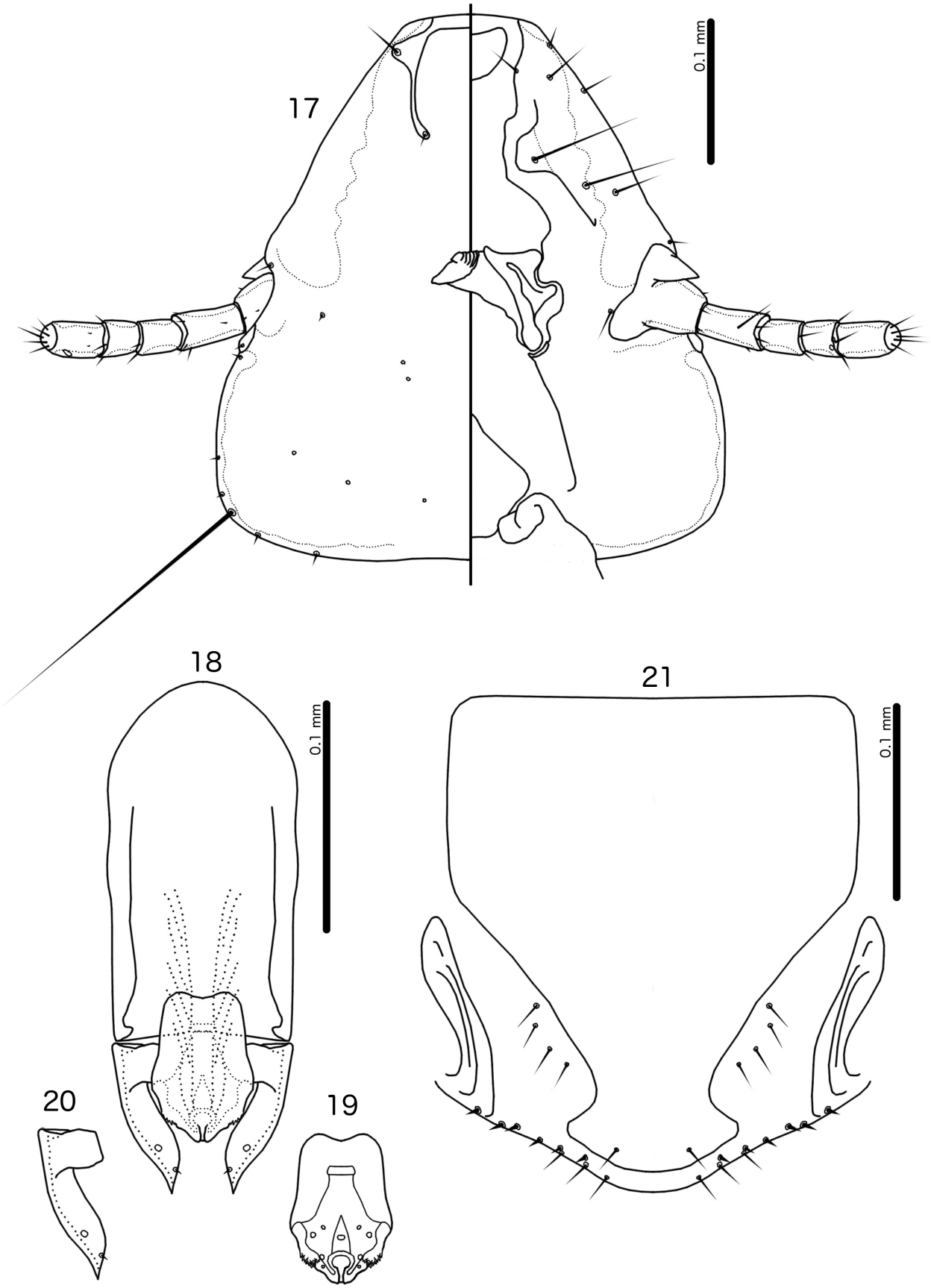
Type locality. Embi Lakes, Popondetta, Northern Province, Papua New Guinea.

Diagnosis. *Guimaraesiella* (*Di.*) *carbonivora* is morphologically closest to *Guimaraesiella* (*Di.*) *latitemporalis* **n. sp.** (see below), but they can be separated by the following male genitalic characters: (1) proximal margin of mesosome concave in *Guimaraesiella* (*Di.*) *carbonivora*, but straight in *Guimaraesiella* (*Di.*) *latitemporalis*; (2) ventral sclerite reaches anterior margin of mesosome in *Guimaraesiella* (*Di.*) *latitemporalis*, but not in *Guimaraesiella* (*Di.*) *carbonivora*; (3) additional ventral sclerite short and pointed anteriorly in *Guimaraesiella* (*Di.*) *carbonivora*, but long with irregular anterior end in *Guimaraesiella* (*Di.*) *latitemporalis*; (4) rugose area of mesosomal lobes restricted to sublateral bulges in *Guimaraesiella* (*Di.*) *carbonivora*, but forming medianly continuous arch in *Guimaraesiella* (*Di.*) *latitemporalis* (Figs 19, 26). Also, these two species differ by *aps* being absent on male tergopleurites IV–V and female tergopleurite VIII in *Guimaraesiella* (*Di.*) *carbonivora* (Figs 15–16), but present on these tergopleurites in *Guimaraesiella* (*Di.*) *latitemporalis* (Figs 22–23).

Description. ***Both sexes.*** Head and chaetotaxy as in Fig. 17, with lateral margins of preantennal area slightly convex, frons broadly flattened; marginal carina irregular, broad but narrowing considerably anteriorly; dorsal preantennal suture reaches *dsms* and *ads*, nears but does not reach lateral margins of head; ventral anterior plate semicircular; coni long, slender; temples rounded; gular plate pentagonal, pointed anteriorly (Fig. 17). Thoracic and abdominal segments as in Figs 15–16.



FIGURES 15–16. *Guimaraesiella* (*Dicrurobates*) *carbonivora* **new species. 15,** male habitus, dorsal and ventral views. **16,** female habitus, dorsal and ventral views.



FIGURES 17–21. *Guimaraesiella* (*Dicrurobates*) *carbonivora* **new species. 17,** male head, dorsal and ventral views. **18,** male genitalia, dorsal view. **19,** male mesosome, ventral view. **20,** male paramere, dorsal view. **21,** female subgenital plate and vulval margin, ventral view.

Male. Thoracic and abdominal chaetotaxy as in Fig.15; *aps* absent on tergopleurites IV–V, but present on tergopleurites VI–VII. Genitalia as in Figs 18–20: basal apodeme rectangular with rounded anterior end, not constricted laterally (Fig. 18). Proximal mesosome about as broad as distal mesosome, with concave anterior margin; ventral sclerite with irregular lateral margins, not reaching anterior margin of mesosome; mesosomal lobes broad, with sinuous lateral margins; rugose nodi slight; 2 *ames* sensilla on each side near antero-lateral corners of mesosomal lobes; 2 *pmes* sensilla on each side of gonopore, near rugose nodi; gonopore roughly circular, with slender marginal thickenings (Fig. 19). Parameral heads rectangular (Fig. 20). Parameral blades slightly curved, broad, tapering only distally (Figs 18, 20). Measurements: Ex *Dicrurus bracteatus carbonarius* (n = 33, except TL and AW, where n = 30): TL = 1.17–1.45 (1.32); HL = 0.33–0.39 (0.36); HW = 0.28–0.36 (0.32); PRW = 0.18–1.22 (0.20); PTW = 0.26–0.32 (0.29); AW = 0.35–0.47 (0.40).

Female. Thoracic and abdominal chaetotaxy as in Fig. 16; *psps* absent on tergopleurite VIII. Subgenital plate broadly rectangular anteriorly; lateral submarginal bulges small. Vulval margin bulging distinctly medianly, with 3–4 long, slender *vms* on each side, and 4–7 short, thorn-like *vss* on each side; 3–6 long, slender *vos* on each side; distal 1 *vos* anterior to *vss* (Fig. 21). Measurements: Ex *Dicrurus bracteatus carbonarius* (n = 44, except TL and PRW where n = 43, and AW where n = 39): TL = 1.38–1.67 (1.56); HL = 0.36–0.42 (0.39); HW = 0.32–0.38 (0.35); PRW = 0.18–0.23 (0.21); PTW = 0.28–0.34 (0.32); AW = 0.40–0.51 (0.45).

Etymology. The species epithet derives from "*carbo*" Latin for "coal", and "*vorare*" Latin for "to devour", referring to the name and dark plumage of the host subspecies.

Type material. Ex *Dicrurus bracteatus carbonarius* [as *D. hottentottus*]: **Holotype** ♂, Embi Lakes, elev. 300 ft, vicinity of Popondetta, Northern Province, Papua New Guinea, 25 Oct. 1963, H. Clissold, BBM-NG-29328 (BPBM). **Paratypes:** 1♂, 2♀, same data as holotype (BPBM); 4♂, 1♀, Jumbora Plantation, elev. 25 m, Popondetta, Northern District, Papua New Guinea, 20 May 1966, P.J. Shanahan, BBMN-NG-24932 (BPBM); 3♂, 17♀, Amboga River, elev. 200 ft, vicinity of Popondetta, Northern Province, Papua New Guinea, 9 Oct. 1963, H. Clissold, BBM-NG-29930 (BPBM).

Non-type material. Ex *Dicrurus bracteatus carbonarius* [as *D. hottentottus*]: 2♂, 4♀, Oriomo River, elev. 20 ft, Western District, Papua New Guinea, 23 Feb. 1964, H. Clissold, BBM-NG-29651 (BPBM); 3♀, same locality, 14 Feb. 1964, H. Clissold, BBM-NG-29507 (BPBM). 1♀, same locality, 4 Feb. 1964, H. Clissold, BBM-NG-29394 (BPBM); 1♀, Daru Island, elev. 10 ft, Western District, Papua New Guinea, 7 Mar. 1964, H. Clissold, BBM-NG-50138 (BPBM) [slide also contains unidentified *Rallicola* male]; 6♂, 1♀, May River, elev. 200 ft, West Sepik District, Papua New Guinea, 5 Jun. 1963, P. Temple, BBM-NG-22639 (BPBM); 1♂, 10 km W of Pulolo, elev. 780 m, Morobe District, Papua New Guinea, 5 Aug. 1967, P.H. Colman, BBM-NG-54190 (BPBM); 4♂, 2♀, same data except BBM-NG-54189 (BPBM). 2♂, 4♀, same data except BBM-NG-51370 (BPBM); 1♀, Mt. Missim, elev. 1800 m, vicinity of Wau, Morobe District, Papua New Guinea, 22 May 1966, O.R. Wilkes, BBM-NG-52099 (BPBM); 1♂, 2♀, Bupu River, Sitium Village, elev. 100 ft, 12 miles NE of Lae, Morobe District, Papua New Guinea, 17 Apr. 1970, A.B. Mirza, BBM-NG-98630 (BPBM); 1♀, same data except BBM-NG-98628 (BPBM). 3♀, same locality, 16 Apr. 1970, A.B. Mirza, BBM-NG-98617 (BPBM); 12♂, 17♀, same locality, 30 Sep. 1970, F.J. Radovsky, BBM-NG-99182 (BPBM); 3♂, 12♀, same locality, 29 Sep. 1970, A.B. Mirza, BBM-NG-99178 (BPBM); 2♂, 9♀, Biak, elev. 200 ft, Biak Island, Geelvink Bay, [Papua Province] Indonesia [as Netherlands New Guinea], 17 Mar. 1963, P. Temple, BBM-NG-22504 (BPBM); 2♀, Oransbari, elev. 10 ft, Western New Guinea District, Indonesia [as New Guinea], 1 Feb. 1963, M.C. Thompson, BBM-NG-22391 (BPBM); 4♂, 14♀, same locality, 28 Jan. 1963, M.C. Thompson, BBM-NG-22335 (BPBM); 2♀, same locality, 1 Dec. 1962, L.P. Richards, BBM-NG-22168 (BPBM); 1♂, 1♀, Bulolo, [Morobe District], Papua New Guinea, 18 Feb. 1962, H. Clissold, HC-16 (NHML); 3♂, 3♀, same locality, 8 Feb. 1962, G. Monteith, S-194 (NHML).

Hosts uncertain. As "No specimen, prob. *Dicrurus hottentottus*" [= *D. bracteatus carbonarius*]: 1♂, 2♀, Wanamowi, elev. 400 ft, West Sepik District, Papua New Guinea, 11 Jun. 1963, P. Temple, BBM-NG-22664 (BPBM); 7♂, 10♀, Jumbora Plantation, Popondetta, Northern District, Papua New Guinea, 26 Oct. 1963, H. Clissold, BBM-NG-29345 (BPBM); 1♂, same locality, elev. 2000 ft, 26 ep. 1963, H. Clissold, BBM-NG-29696 (BPBM); 2♂, 4♀, Oriomo River, elev. 20 ft, Western District, Papua New Guinea, 4 Feb. 1964, H. Clissold, BBM-NG-29395 (BPBM); 6♀, Daru Island, elev. 10 ft, Western District, Papua New Guinea, 8 Mar. 1964, H. Clissold, BBM-NG-50144 (BPBM); 1♂, 5♀, Soputa River, elev. 200 ft, Northern Province, Papua New Guinea, 29 Sep. 1963, H. Clissold, BBM-NG-29734 (BPBM); 2♀, same locality, 30 Sep.–1 Oct. 1963, H. Clissold, BBM-NG-29754 (BPBM); 1♀, same locality, 29 Sep. 1963, H. Clissold, BBM-NG-29770 (BPBM); 1♀, Popondetta, elev. 200 ft, Northern

Province, Papua New Guinea, 25 Sep. 1963, H. Clissold, BBM-NG-29676 (BPBM); 1♀, same data, BBM-NG-29676 (BPBM).

Guimaraesiella (*Dicrurobates*) *latitemporalis* Gustafsson & Bush, new species

(Figs 22–28)

urn:lsid:zoobank.org:act:80062BAA-25A9-4246-8AB9-D6885DE09F66

Type host. *Dicrurus hottentottus brevirostris* (Cabanis, 1851)—hair-crested drongo.

Other host. *Dicrurus hottentottus* ssp. (Linnaeus, 1766)—hair-crested drongo.

Type locality. Ban Nong Wai, Na Phung, Dan Sai District, Loei Province, Thailand.

Diagnosis. *Guimaraesiella* (*Dicrurobates*) *latitemporalis* is morphologically closest to *Guimaraesiella* (*Di.*) *carbonivora*. To distinguish these two species, see above, under the Diagnosis of the latter species.

Description. ***Both sexes.*** Head shape and chaetotaxy as in Fig. 24. Lateral margins of preantennal area slightly convex, frons broadly flattened, slightly concave medianly; marginal carina broad, irregular; dorsal preantennal suture reaches *dsms* and *ads*, but not lateral margins of head; ventral anterior plate broad, roughly trapezoidal; coni broad but short; temples rounded, much wider than preantennal head; gular plate broadly rhombic (Fig. 24). Thoracic and abdominal segments as in Figs 22–23.

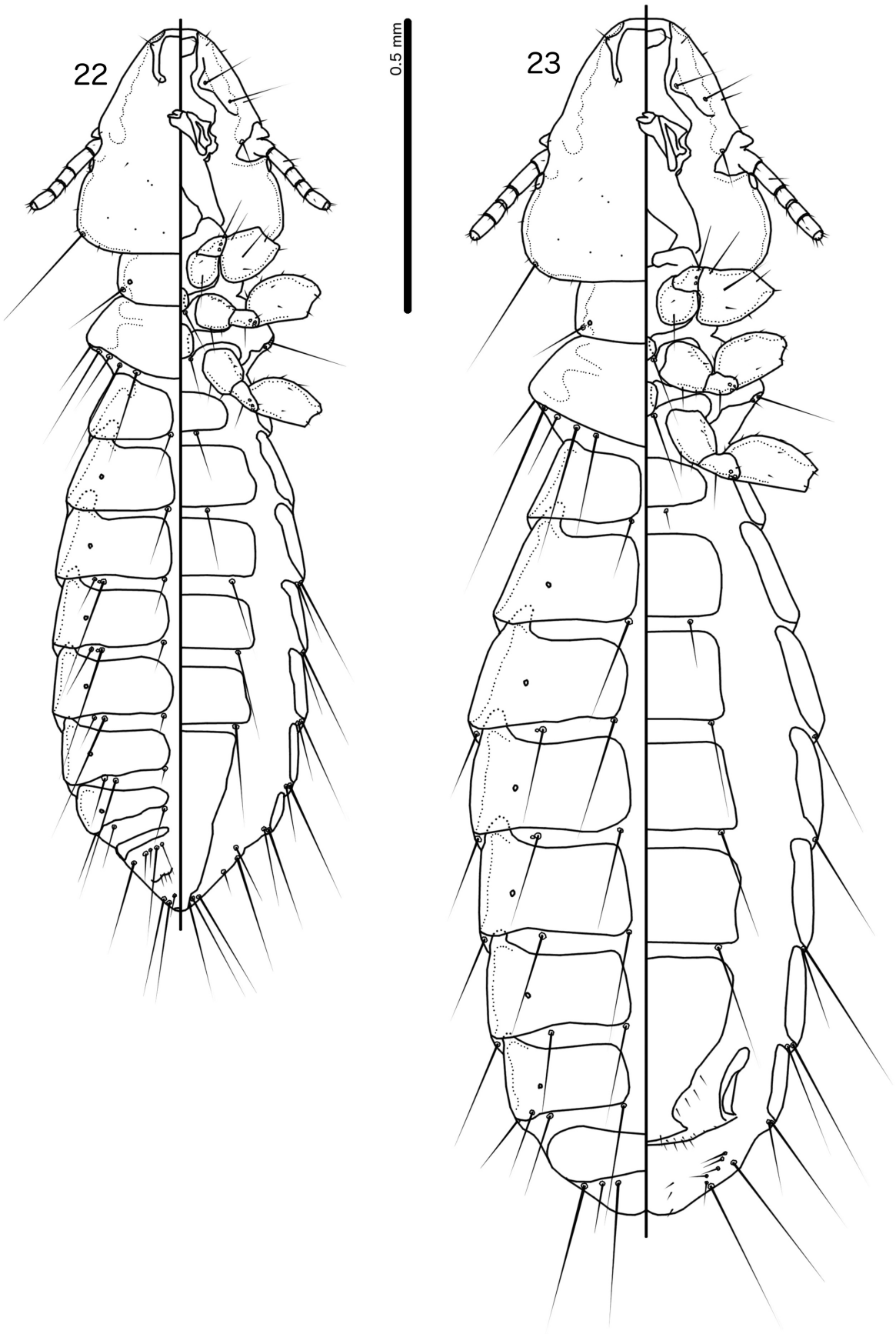
Male. Thoracic and abdominal chaetotaxy as in Fig. 22; *aps* present on tergopleurites IV–VII. Genitalia as in Figs 25–27: basal apodeme rounded rectangular, with slight constriction at mid-length (Fig. 25). Proximal mesosome broad, trapezoidal; ventral sclerite broad anteriorly, narrowing distally, reaching anterior margin of mesosome; secondary plate with irregular anterior end; mesosomal lobes broad; rugose nodi prominent, connected medianly by wrinkled or rugose band anterior to gonopore; 2 *ames* sensilla on each side near antero-lateral corners of mesosomal lobes; 2 *pmes* sensilla on each side lateral to gonopore, near rugose nodi; gonopore broader than long, with slender marginal thickening widening somewhat distally (Fig. 26). Parameral heads irregularly triangular, and blades broad, tapering only distally (Figs 25, 27). Measurements: Ex *Dicrurus hottentottus brevirostris* (n = 17): TL = 1.40–1.64 (1.49); HL = 0.36–0.40 (0.38); HW = 0.33–0.38 (0.35); PRW = 0.19–0.23 (0.21); PTW = 0.29–0.35 (0.31); AW = 0.39–0.51 (0.43). Ex *Dicrurus hottentottus* (n = 8, except AW, where n = 7): TL = 1.36–1.59; HL = 0.37–0.40; HW = 0.33–0.37; PRW = 0.19–0.23; PTW = 0.30–0.35; AW = 0.42–0.50.

Female. Thoracic and abdominal chaetotaxy as in Fig. 23; *psps* present on tergopleurite VIII. Subgenital plate roughly trapezoidal, with irregular lateral margins; lateral submarginal bulges triangular, wide (Fig. 28). Vulval margin flattened medianly, with 3–6 short, slender *vms* on each side, and 5–9 short, thorn-like *vss* on each side; 4–6 short, slender *vos* on each side; distal 1–2 *vos* anterior to *vss* (Fig. 28). Measurements: Ex *Dicrurus hottentottus brevirostris* (n = 21): TL = 1.57–1.94 (1.73); HL = 0.38–0.44 (0.40); HW = 0.36–0.42 (0.37); PRW = 0.21–0.25 (0.22); PTW = 0.32–0.36 (0.34); AW = 0.44–0.56 (0.48). Ex *Dicrurus hottentottus* (n = 8, except TL, where n = 7): TL = 1.58–2.00; HL = 0.38–0.44; HW = 0.35–0.42; PRW = 0.20–0.25; PTW = 0.33–0.39; AW = 0.49–0.59.

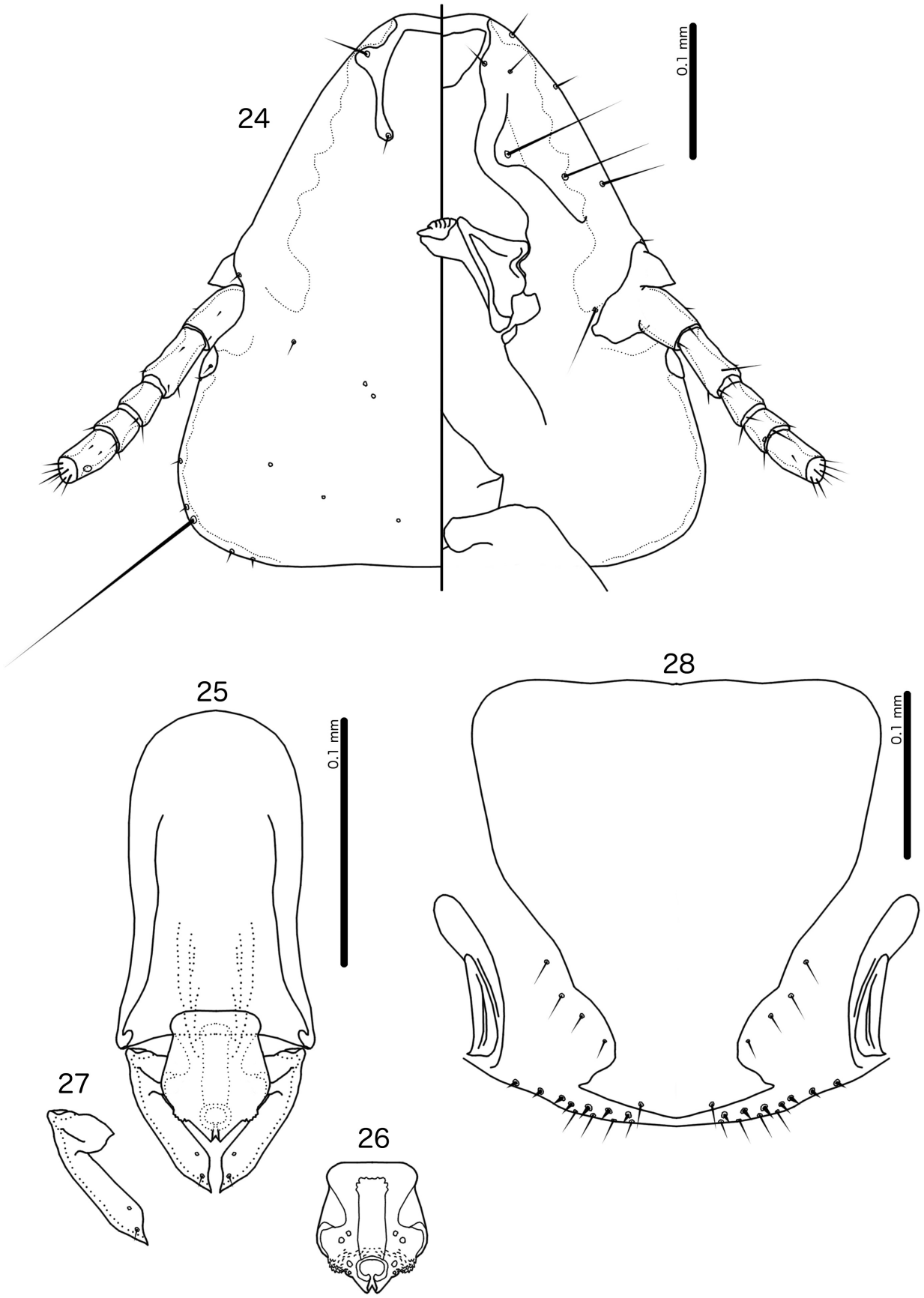
Etymology. The species epithet is formed by "*latus"* Latin for "broad", and "*tempus*" Latin for "temples", referring to the wide postantennal area of this species.

Type material. Ex *Dicrurus hottentottus brevirostris*: **Holotype** ♂, Ban Nong Wai, Na Phung, Dan Sai District, Loei Province, Thailand, 16 Nov. 1954, R.E. Elbel, RE-4264, RT-B-21025 (NHML). **Paratypes:** 1♂, 3♀, Jingxin County, Guanxi Province, China, 24 Sep. 2004, S.E. Bush, P-208, ATP-2004-78, PIPR#56–57 (PIPR); 1♂, 2♀, same locality and collector, 26 Sep. 2004, P-267, ATP-2004-93, PIPR#58 (PIPR); 1♂, 1♀, same locality and collector, 30 Sep. 2004, P-391, AN-447, PIPR#59 (PIPR); 1♀, same locality and collector, 6 Oct. 2004, P-603, ATP-2004-179, PIPR#60 (PIPR); 7♂, 7♀, same locality and collector, 7 Oct. 2004, P-604, ATP-2004-180, PIPR#61–65 (PIPR); 1♀, same locality and collector, 8 Oct. 2004, P-629, GC-2004-40, PIPR#66 (PIPR); 2♂, 2♀, same data, P-641, ATP-2004-193, PIPR#55, 85 (PIPR).

Non-type material. Ex *Dicrurus hottentottus*: 2♂, 1♀, Phu Phan Mountains, Sakon Nakhon Province, Thailand, 14 Jun. 1954, R.E. Elbel & B. Lekagul, RE-3696, B-30883 (PIPR); 1♂, 3♀, same data (NHML); 1♂, Khlong Khlung, Kamphaeng Phet Province, Thailand, 20 Apr. 1953, R.E. Elbel & H.G. Deignan, RE-2462, RT-B-21032 (NHML); 2♂, 1♀, Wat Phai Lom, Thailand, 24 Nov. 1970, WE-813 (NHML); 1♂, 1♀, Doi Pha Hom Pok, Chieng Mai Province, Thailand, 10 Oct. 1965, MAPS-2213 (NHML); 1♂, 1♀, Pangla, Lampang Province, Thailand, 5 Feb. 1953, R.E. Elbel & H.G. Deignan, RE-2244, RT-B-17754 (NHML); 1♂, 1♀, Pang Nam Un, Bun Yun, Nan Province, Thailand, 20 Jan. 1953, R.E. Elbel & H.G. Deignan, RE-2101, RT-B-17718 (NHML); 1♂, 1♀, Ban Pha



FIGURES 22–23. *Guimaraesiella* (*Dicrurobates*) *latitemporalis* **new species. 22,** male habitus, dorsal and ventral views. **23,** female habitus, dorsal and ventral views.



FIGURES 24–28. *Guimaraesiella* (*Dicrurobates*) *latitemporalis* **new species. 24,** male head, dorsal and ventral views. **25,** male genitalia, dorsal view. **26,** male mesosome, ventral view. **27,** male paramere, dorsal view. **28,** female subgenital plate and vulval margin, ventral view.

Hanh, Nan Province, Thailand, 30 Nov. 1961, Y-80 (NHML); 1♀, Wat Phai Lom, Thailand, 10 Feb. 1970, XE-106, 050-37514 (USNM); 1♂, D[ehra] Dun [India?], L. Harrison Collection, BM 1934-570 (NHML).

Ex *Dicrurus hottentottus brevirostris*: 3♂, 3♀, Pang Nam Un, Bun Yun, Nan Province, Thailand, 20 Jan. 1953, R.E. Elbel & H.G. Deignan, RE-2101, RT-B-17718 (BPBM); 1♂, 1♀, Pangla, Lampang Province, Thailand, 5 Feb. 1953, R.E. Elbel & H.G. Deignan, RE-2244, RT-B-17754 (BPBM).

Remarks. In the phylogeny of Bush *et al.* (2016), *Guimaraesiella latitemporalis* was represented by two specimens from the type host, as well as one specimen from *Liocichla phoenicea* (Gould, 1837), but we have not examined any other *Guimaraesiella* from *L. phoenicea*. Although no data are available on whether the two host species occur in the same mixed-species foraging flocks, other species of *Dicrurus* and *Liocichla* are known to flock together (Chen & Hsieh 2002), which may provide opportunities for lice to exchange hosts. We do not include *L. phoenicea* as a host of *G. latitemporalis* until more samples confirm that this host-louse association is natural and regular.

Guimaraesiella (*Dicrurobates*) *lurida* Gustafsson & Bush, new species

(Figs 29–35)

urn:lsid:zoobank.org:act:F85A70C6-AD91-4314-9CD1-4815A6E78A72

Type host. *Dicrurus leucophaeus* Vieillot, 1817—ashy drongo.

Type locality. Chiang Saen, Chieng Rai Province, Thailand.

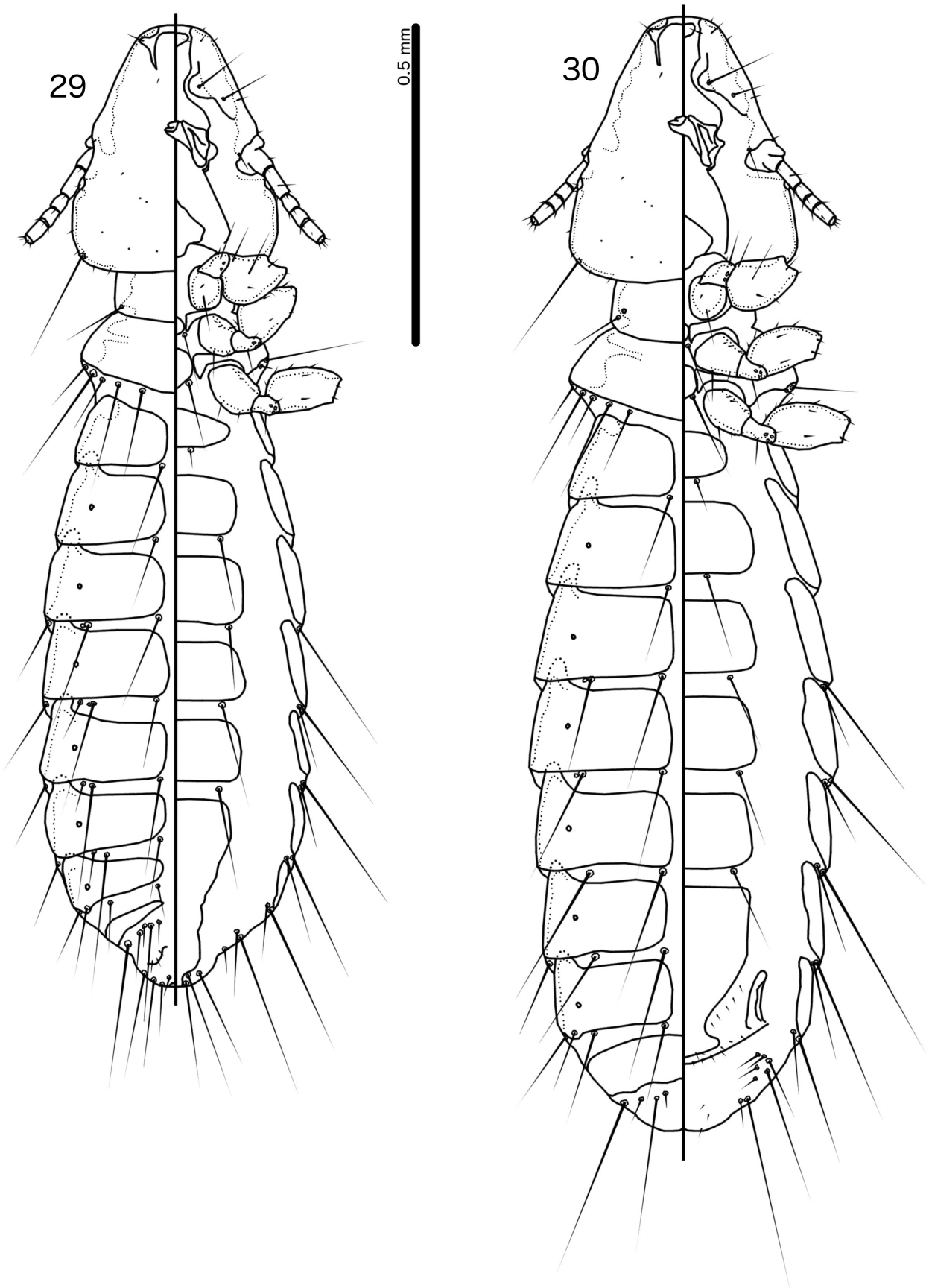
Diagnosis. *Guimaraesiella* (*Dicrurobates*) *lurida* is morphologically closest to *Guimaraesiella* (*Di.*) *regis* **n. sp.** (see below), but these two species can be separated by the following characters: (1) the dorsal preantennal suture reaches lateral margin of head in *Guimaraesiella* (*Di.*) *regis* (Fig. 52), but not in *Guimaraesiella* (*Di.*) *lurida* (Fig. 31); (2) the ventral anterior plate is wider than long in *Guimaraesiella* (*Di.*) *lurida* (Fig. 31), but longer than wide in *Guimaraesiella* (*Di.*) *regis* (Fig. 52); (3) *aps* is present on female tergopleurite VIII in *Guimaraesiella* (*Di.*) *lurida* (Fig. 30), but absent in *Guimaraesiella* (*Di.*) *regis* (Fig. 51); (4) the anterior margin of the proximal mesosome is concave in *Guimaraesiella* (*Di.*) *lurida* (Fig. 33), but is straight in *Guimaraesiella* (*Di.*) *regis* (Fig. 54); (5) the ventral sclerite tapers markedly anteriorly, with the anterior end about a third as wide as the proximal mesosome at its widest point in *Guimaraesiella* (*Di.*) *lurida* (Fig. 33), but it tapers less markedly, with the narrowest point about half as wide as the proximal mesosome in *Guimaraesiella* (*Di.*) *regis* (Fig. 54).

For differences between *Guimaraesiella* (*Di.*) *lurida* and the other morphologically close species—*Guimaraesiella* (*Di.*) *nana* **n. sp.** and *Guimaraesiella* (*Di.*) *luzonica* **n. sp.—**see under the Diagnosis of each of these species.

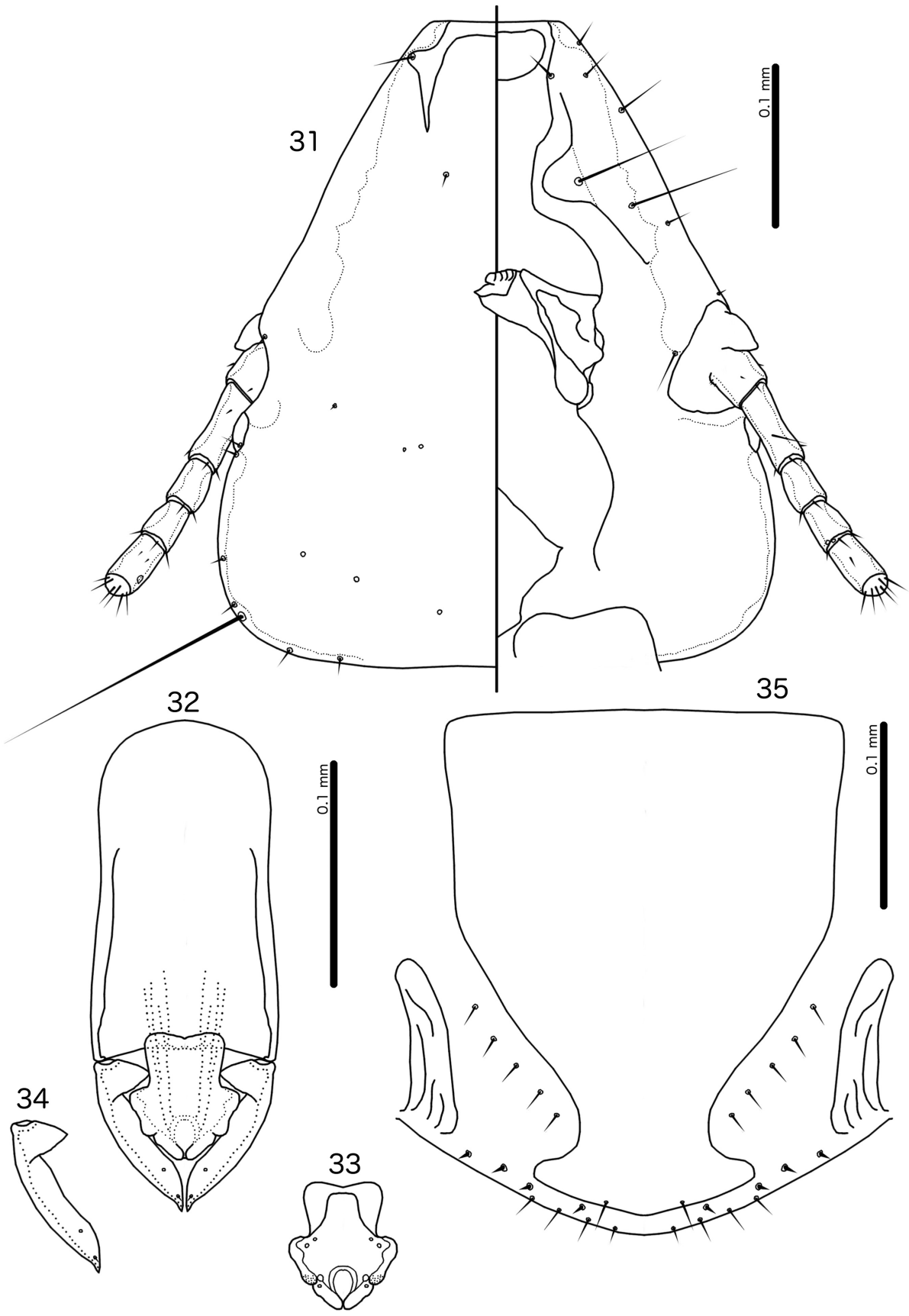
Description. ***Both sexes.*** Head shape and chaetotaxy as in Fig. 31. Lateral margins of preantennal area straight to slightly convex, frons broadly flattened; marginal carina broad, irregular, narrowing anteriorly; dorsal preantennal suture reaches *dsms* and extends toward but does not reach *ads*, and does not reach lateral margins of head; ventral anterior plate broad, but short, roughly, semi-circular; coni broad but short, temples rounded; gular plate rhombic with anterior and lateral points (Fig. 31). Thoracic and abdominal segments as in Figs 29–30.

Male. Thoracic and abdominal chaetotaxy as in Fig. 29; *aps* absent on tergopleurite IV, but present on tergopleurites V–VII. Genitalia as in Figs 32–34: basal apodeme slightly trapezoidal, narrowing anteriorly with rounded anterior end and slight or no constriction at mid-length (Fig. 32). Proximal mesosome broad, widening anteriorly, with concave proximal margin; ventral sclerite narrowing markedly in anterior end; mesosomal lobes roughly triangular, with sinuous lateral margins; rugose nodi small; 2 *ames* sensilla on each side near antero-lateral corners of mesosomal lobes; 2 *pmes* sensilla on each side of gonopore, near rugose nodi; gonopore oval, with slender marginal thickening (Fig. 33). Parameral heads roughly triangular and blades broad, tapering distally (Figs 32, 34). Measurements: Ex *Dicrurus leucophaeus* (n = 7): TL = 1.52–1.65; HL = 0.37–0.40; HW = 0.31–0.34; PRW = 0.20–0.22; PTW = 0.30–0.32; AW = 0.43–0.50.

Female. Thoracic and abdominal chaetotaxy as in Fig. 35; *psps* present on tergopleurite VIII. Subgenital plate roughly rectangular, with concave lateral margins in distal half; lateral submarginal bulges broad, rounded; vulval margin rounded, with 3–4 short, slender *vms* on each side, and 4–5 short, thorn-like *vss* on each side; 3–6 short, slender *vos* on each side; distal 1 *vos* anterior to *vss* (Fig. 35). Measurements: Ex *Dicrurus leucophaeus* (n = 11): TL = 1.67–1.89 (1.79); HL = 0.41–0.43 (0.42); HW = 0.35–0.38 (0.36); PRW = 0.21–0.24 (0.23); PTW = 0.33–0.36 (0.34); AW = 0.45–0.52 (0.49).



FIGURES 29–30. *Guimaraesiella* (*Dicrurobates*) *lurida* **new species. 29,** male habitus, dorsal and ventral views. **30,** female habitus, dorsal and ventral views.



FIGURES 31–35. *Guimaraesiella* (*Dicrurobates*) *lurida* **new species. 31,** male head, dorsal and ventral views. **32,** male genitalia, dorsal view. **33,** male mesosome, ventral view. **34,** male paramere, dorsal view. **35,** female subgenital plate and vulval margin, ventral view.

Etymology. The species epithet derives from "*luridus*" Latin for "wan, pale", referring to the comparatively pale tergal and sternal plates of the species.

Type material. Ex *Dicrurus leucophaeus*: **Holotype** ♂, Chiang Saen, Chieng Rai Province, Thailand, 25 Jan. 1965, H.E. McClure, SE-1890 (NHML). **Paratypes:** 1♀, same data as holotype (NHML); 2♂, 2♀, Pang Nam Un, Bun Yun, Nan Province, Thailand, 18 Jan. 1953, R.E. Elbel & H.G. Deignan, RE-2089, RT-B-12206 (NHML); 1♂, 1♀, Chiang Saeh Kao, Chiang Rai Province, Thailand, 17 Feb. 1953, R.E. Elbel & H.G. Deignan, RE-2287, RT-B-17791 (NHML); 1♂, 1♀, same data (BPBM); 1♂, 1♀, Pang Nam Un, Bun Yun, Nan Province, Thailand, 26 Jan. 1953, R.E. Elbel & H.G. Deignan, RE-2209, RT-B-17733 (BPBM); 1♂, 1♀, Hin Laem, Tha Khanun, Kanchanaburi Province, Thailand, 13 Nov. 1952, R.E. Elbel & H.G. Deignan, RE-1500, RT-B-13044 (BPBM); 4♀, Chiang Saen Kao, Chiang Rai Province, Thailand, 17 Feb. 1953, R.E. Elbel & H.G. Deignan, RE-2287, RT-B-17791 (USNM).

Remarks. *Guimaraesiella lurida* was represented in the phylogeny of Bush *et al*. (2016) by one specimen from the type host and by one specimen from *Geokichla citrina*. Although both of these host species are known to participate in mixed-species foraging flocks (Sridhar & Sankar 2008) with opportunities for louse exchanges in the wild, all other lice from *G. citrina* we have examined belong to other groups within *Guimaraesiella*. Therefore, we do not regard *G. citrina* as a natural and regular host of *Guimaraesiella lurida* until further specimens from this host confirm this host-louse association.

Guimaraesiella (*Dicrurobates*) *luzonica* Gustafsson & Bush, new species

(Figs 36–42)

urn:lsid:zoobank.org:act:B9CF3683-E3AF-47F1-9DFF-E1F9DA488255

Type host. *Dicrurus balicassius* (Linnaeus, 1766)—balicassiao.

Type locality. Luzon, Philippines.

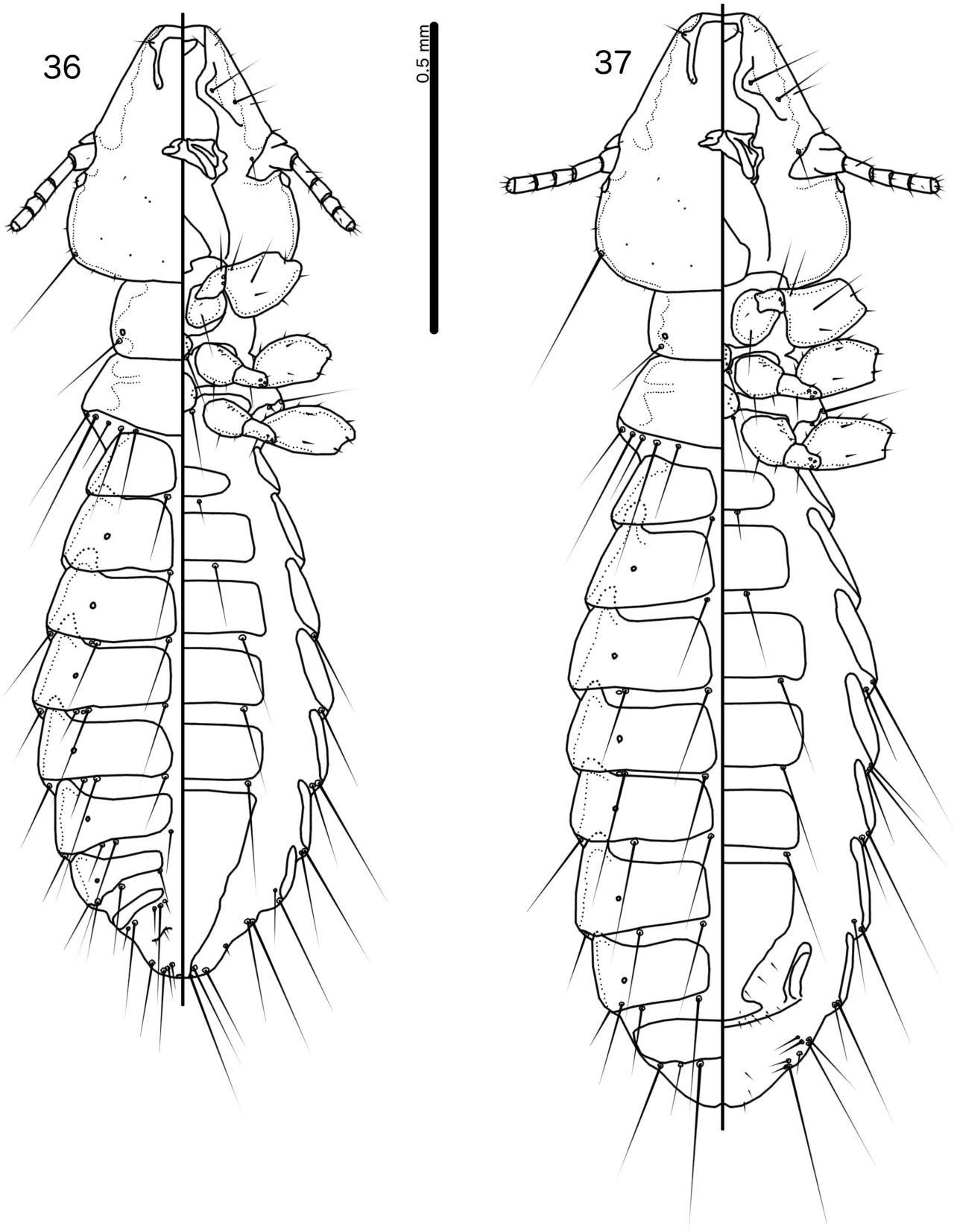
Diagnosis. *Guimaraesiella* (*Dicrurobates*) *luzonica* is morphologically closest to *Guimaraesiella* (*Di.*) *lurida* and *Guimaraesiella* (*Di.*) *sexmaculata*. However, it can be separated from *Guimaraesiella* (*Di.*) *sexmaculata* by characters of the head (Figs 3, 38), the mesosome of the male genitalia (Figs 5, 40), and the shape of the female subgenital plate (Figs 7, 42). Also, *Guimaraesiella* (*Di.*) *luzonica* can be separated from *Guimaraesiella* (*Di.*) *lurida* by the following characters: (1) dorsal preantennal suture reaches *ads* in *Guimaraesiella* (*Di*). *luzonica* (Fig. 38), but does not reach *ads* in *Guimaraesiella* (*Di.*) *lurida* (Fig. 31); (2) basal apodeme constricted at mid-length in *Guimaraesiella* (*Di.*) *luzonica* (Fig. 39), but not constricted in *Guimaraesiella* (*Di.*) *lurida* (Fig. 32); (3) proximal mesosome narrowing anteriorly, with anterior margin more or less straight in *Guimaraesiella* (*Di.*) *luzonica* (Fig. 40), but widening anteriorly and with concave anterior margin in *Guimaraesiella* (*Di.*) *lurida* (Fig. 33); (4) rugose areas of mesosomal lobes extensive in *Guimaraesiella* (*Di.*) *luzonica* (Fig. 40), but restricted to sublateral bulges in *Guimaraesiella* (*Di.*) *lurida* (Fig. 33).

Description. ***Both sexes.*** Head shape and chaetotaxy as in Fig. 38. Lateral margins of preantennal area more or less straight, frons broadly flattened; marginal carina irregular, broad but narrowing anteriorly; preantennal suture reaches *dsms* and *ads*, but only approaches the lateral margins of head without reaching it; ventral anterior plate small, roughly crescent-shaped; coni slender; temples rounded; gular plate rounded triangular (Fig. 38). Thoracic and abdominal segments as in Figs 36–37.

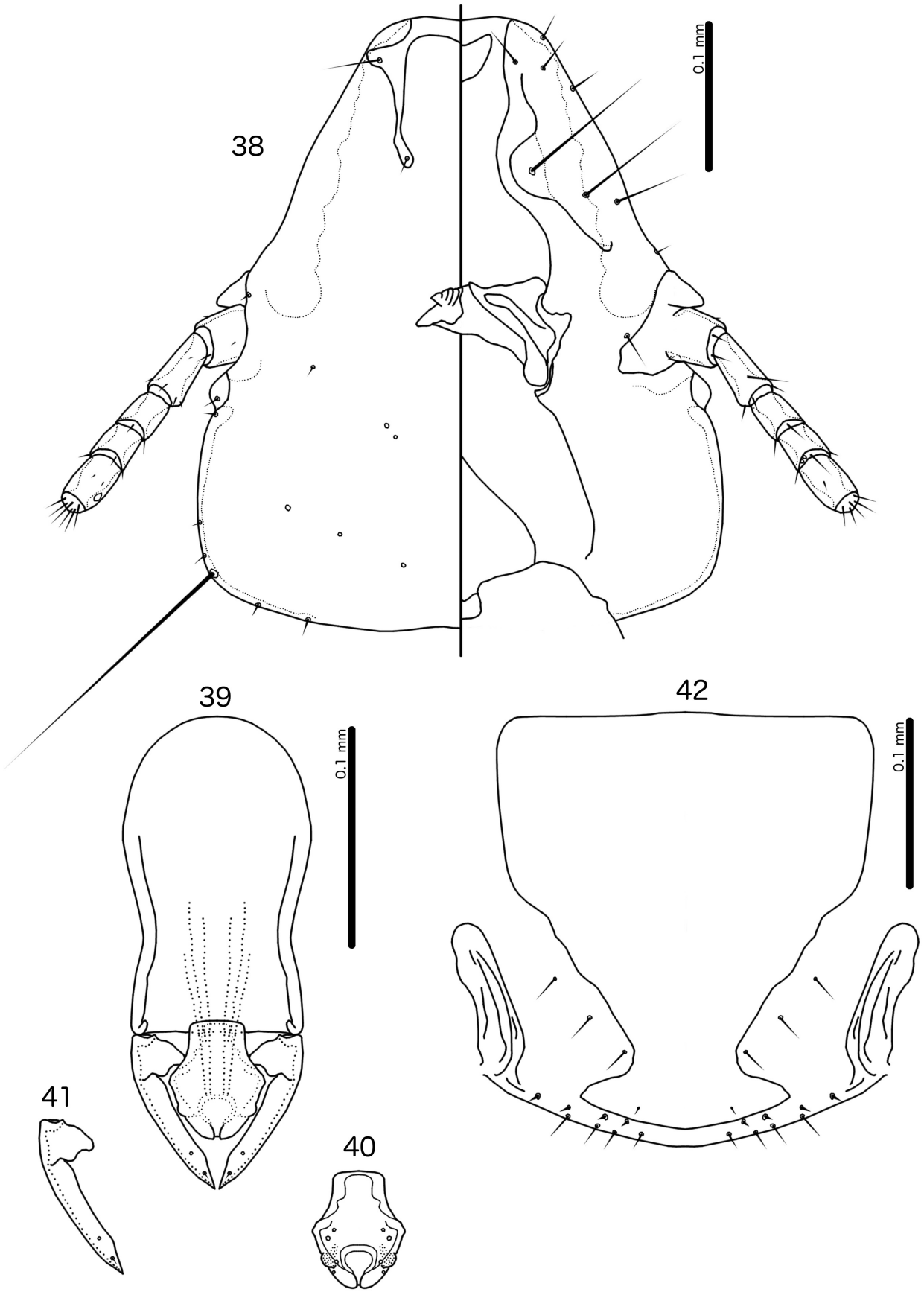
Male. Thoracic and abdominal chaetotaxy as in Fig. 36; *aps* absent on tergopleurite IV but present on tergopleurites V–VII. Genitalia as in Figs 39–41: basal apodeme rounded anteriorly, much constricted at mid-length (Fig. 39). Proximal mesosome trapezoidal, with slightly concave lateral margins; ventral sclerite broad, with irregular lateral margins; anterior end almost reaches proximal margin of mesosome; mesosomal lobes slight, triangular; rugose nodi extensive; 2 *ames* sensilla on each side near antero-lateral corners of mesosomal lobes; 2 *pmes* sensilla on each side postero-lateral to gonopore, near rugose nodi; distal *pmes* may be on lateral margin of mesosome; gonopore broader than long, with broad marginal thickenings (Fig. 40). Parameral heads roughly triangular (Fig. 41). Parameral blades slender, tapering only distally (Figs 39, 41). Measurements: Ex *Dicrurus balicassius* (n = 1): TL = 1.48; HL = 0.41; HW = 0.36; PRW = 0.23; PTW = 0.31; AW = 0.45.

Female. Thoracic and abdominal chaetotaxy as in Fig. 37; *psps* present on tergopleurite VIII. Subgenital plate roughly rectangular anteriorly; lateral submarginal bulges pointed; vulval margin gently rounded, with 3–4 short, slender *vms* on each side and 3–4 short, thorn-like *vss* on each side; 3–4 slender *vos* on each side; distal 1 *vos* an-

terior to *vss*, much shorter than other *vos* (Fig. 42). Measurements: Ex *Dicrurus balicassius* (n = 1; AW measured at segment VI due to distortion in specimen): TL = 1.68; HL = 0.43; HW = 0.38; PRW = 0.24; PTW = 0.33; AW = 0.47.



FIGURES 36–37. *Guimaraesiella* (*Dicrurobates*) *luzonica* **new species. 36,** male habitus, dorsal and ventral views. **37,** female habitus, dorsal and ventral views.



FIGURES 38–42. *Guimaraesiella* (*Dicrurobates*) *luzonica* **new species. 38,** male head, dorsal and ventral views. **39,** male genitalia, dorsal view. **40,** male mesosome, ventral view. **41,** male paramere, dorsal view. **42,** female subgenital plate and vulval margin, ventral view.

Etymology. The species epithet is a noun in apposition derived from the type locality.

Type material. Ex *Dicrurus balicassius*: **Holotype** ♂, Luzon, Philippines, 12 Aug. 1964, H.E. McClure, H-0024 (NHML). **Paratype** 1♀, same data as holotype (NHML).

***Guimaraesiella* (*Dicrurobates*) *nana* Gustafsson & Bush, new species**
(Figs 43–49)
urn:lsid:zoobank.org:act:DB544115-6FA9-42F0-BF19-F6AC47C3F120

Type host. *Dicrurus hottentottus samarensis* Vaurie, 1947—hair-crested drongo.

Type locality. Mount Lobi Range, Tambis Burauen, Leyte Island, Philippines.

Diagnosis. *Guimaraesiella* (*Dicrurobates*) *nana* is morphologically closest to *Guimaraesiella* (*Di.*) *lurida* and *Guimaraesiella* (*Di.*) *regis* **n. sp.** (see below). However, it can be separated from *Guimaraesiella* (*Di.*) *lurida* by the following characters: (1) dorsal preantennal suture reaching *ads* in *Guimaraesiella* (*Di.*) *nana* (Fig. 45), but not in *Guimaraesiella* (*Di.*) *lurida* (Fig. 31); (2) *aps* present in male tergopleurite V and female tergopleurite VIII in *Guimaraesiella* (*Di.*) *lurida* (Figs 29–30), but absent on these segments in *Guimaraesiella* (*Di.*) *nana* (Figs 43–44); (3) proximal mesosome with more or less straight anterior margin and anteriorly rounded ventral sclerite in *Guimaraesiella* (*Di.*) *nana* (Fig. 47), but wide, with markedly concave anterior margin and anteriorly flat ventral sclerite in *Guimaraesiella* (*Di.*) *lurida* (Fig. 33).

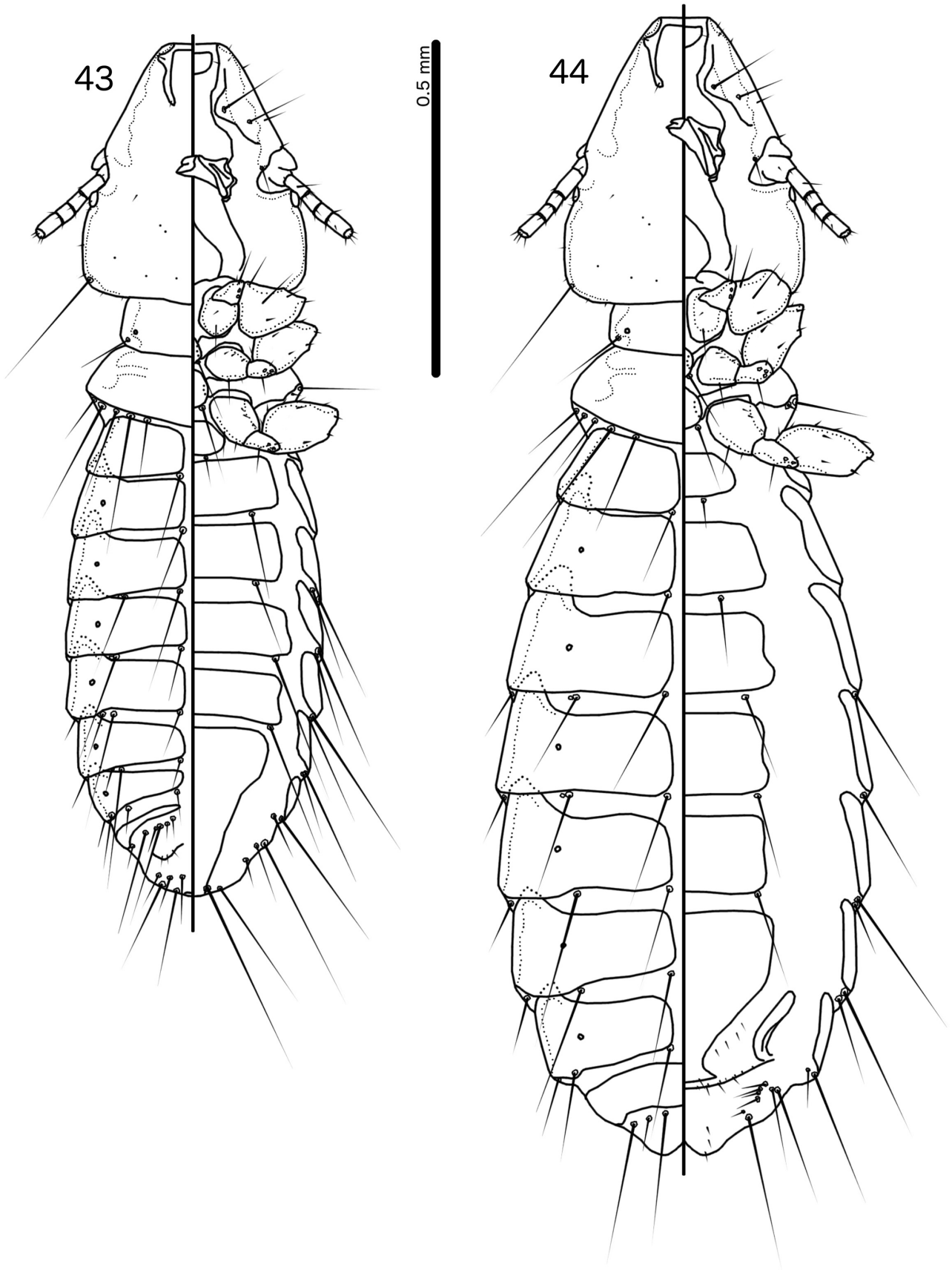
Also, *Guimaraesiella* (*Dicrurobates*) *nana* can be separated from *Guimaraesiella* (*Di.*) *regis* by the following characters: (1) dorsal preantennal suture reaches the lateral margins of head in *Guimaraesiella* (*Di.*) *regis* (Fig. 52), but not in *Guimaraesiella* (*Di.*) *nana* (Fig. 45); (2) ventral anterior plate broader than long in *Guimaraesiella* (*Di.*) *nana* (Fig. 45), but longer than broad in *Guimaraesiella* (*Di.*) *regis* (Fig. 52); (3) *aps* absent on male tergopleurite V in *Guimaraesiella* (*Di.*) *nana* (Fig. 43), but present on this tergopleurite in *Guimaraesiella* (*Di.*) *regis* (Fig. 50); (4) male abdominal segment IV with 2 *ps* on each side in *Guimaraesiella* (*Di.*) *nana* (Fig. 43), but with 1 *ps* on each side in *Guimaraesiella* (*Di.*) *regis* (Fig. 50); (5) mesosome similar but more slender in *Guimaraesiella* (*Di.*) *nana* (Fig. 47) than in *Guimaraesiella* (*Di.*) *regis* (Fig. 54). Females can be separated by the shape of the head (Figs 44. 51) and the subgenital plate (Figs 49, 56).

Description. ***Both sexes.*** Head shape and chaetotaxy as in Fig. 45. Lateral margins of preantennal head straight to slightly convex, frons broadly flattened; marginal carina broad, irregular; dorsal preantennal suture reaches *dsms* and *ads*, but not lateral margin of head; ventral preantennal plate large, broadly crescent-shaped; coni broad, long; temples rounded; gular plate broadly rhombic with anterior and lateral points (Fig. 45). Thoracic and abdominal segments as in Figs 43–44.

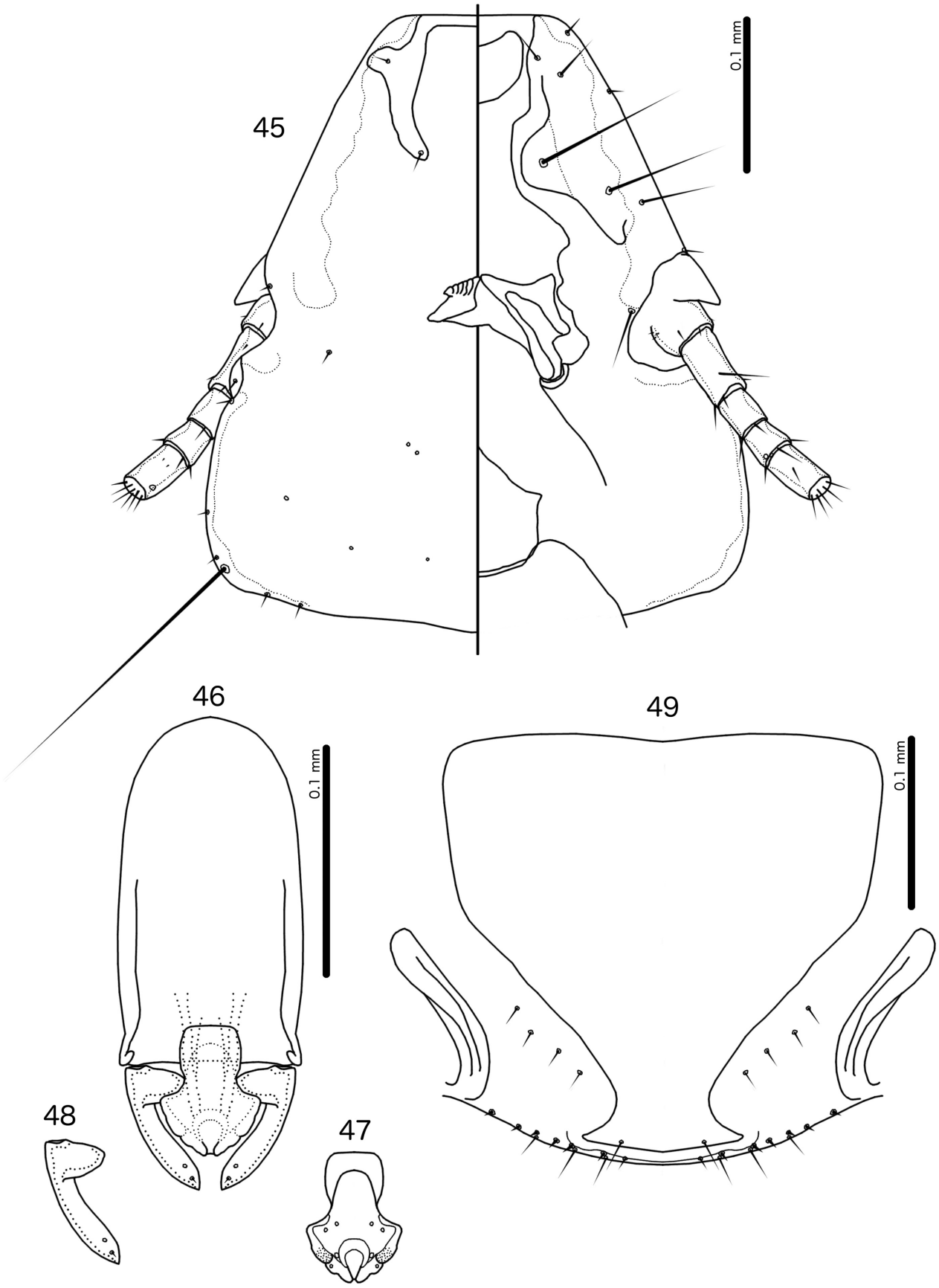
Male. Thoracic and abdominal chaetotaxy as in Fig. 43; *aps* absent on tergopleurites IV–V, but present on tergopleurites VI–VII. Genitalia as in Figs 46–48: basal apodeme oval, not constricted at mid-length, and with rounded anterior end (Fig. 46). Proximal mesosome broad, narrowing distally, and with convex lateral margins; ventral sclerite broadly rounded, not reaching anterior margin of mesosome; mesosomal lobes roughly triangular, with prominent but only slightly rugose lateral nodi; 2 *ames* sensilla on each side near anterior margin of mesosomal lobes; 2 *pmes* sensilla on each side of gonopore, near rugose nodi; gonopore obovoid, with broad marginal thickening. Parameral heads rounded, subtriangular (Fig. 48). Parameral blades slender, tapering only distally (Figs 46, 48). Measurements: Ex *Dicrurus hottentottus samarensis* (n = 11, except TL, where n = 9): TL = 1.22–1.48; HL = 0.29–0.40 (0.37); HW = 0.31–0.36 (0.34); PRW = 0.20–0.23 (0.22); PTW = 0.29–0.32 (0.31); AW = 0.40–0.47 (0.43).

Female. Thoracic and abdominal chaetotaxy as in Fig. 44; *psps* absent on tergopleurite VIII. Subgenital plate slightly trapezoidal in anterior section; lateral submarginal bulges slender, pointed; vulval margin gently rounded, with 3–4 slender *vms* on each side, the most median *vms* much shorter than other *vms*; 5–7 short, thorn-like *vss* on each side; 5–6 short, slender *vos* on each side; distal 1 *vos* anterior to *vss*, much longer than other *vos* (Fig. 49). Measurements: Ex *Dicrurus hottentottus samarensis* (n = 29, except TL, where n = 23, and AW, where n = 28): TL = 1.40–1.78 (1.58); HL = 0.38–0.43 (0.41); HW = 0.33–0.40 (0.36); PRW = 0.20–0.24 (0.22); PTW = 0.24–0.36 (0.30); AW = 0.41–0.57 (0.49).

Etymology. The species epithet derives from "*nanus*" Latin for "dwarf", referring to the relatively small size of this species compared to other members of *Guimaraesiella* (*Dicrurobates*).



FIGURES 43–44. *Guimaraesiella* (*Dicrurobates*) *nana* **new species. 43,** male habitus, dorsal and ventral views. **44,** female habitus, dorsal and ventral views.



FIGURES 45–49. *Guimaraesiella* (*Dicrurobates*) *nana* **new species. 45,** male head, dorsal and ventral views. **46,** male genitalia, dorsal view. **47,** male mesosome, ventral view. **48,** male paramere, dorsal view. **49,** female subgenital plate and vulval margin, ventral view.

Type material. Ex *Dicrurus hottentottus samarensis* [as *D. hottentottus striatus*]: **Holotype** ♂, Mount Lobi Range, Tambis Burauen, Leyte Island, Philippines, 3 May 1964, D.S. Rabor, B-90 (BPBM). **Paratypes:** 4♂, 18♀, same data as holotype (BPBM); 2♂, 3♀, same data, B-90 (BPBM); 1♂, 13♀, same data, B-77 (BPBM); 3♂, 3♀, same data (BPBM).

Guimaraesiella (*Dicrurobates*) *regis* Gustafsson & Bush, new species

(Figs 50–56)

urn:lsid:zoobank.org:act:62D4FBCE-212D-4154-9C48-83EEA1030B96

Type host: *Dicrurus annectans* (Hodgson, 1836)—crow-billed drongo.

Other hosts. *Dicrurus paradiseus paradiseus* (Linnaeus, 1766)—greater racket-tailed drongo. *Dicrurus paradiseus rangoonensis* (Gould, 1836)—greater racket-tailed drongo.

Type locality. Muang Thung Nui, Satun Province, Thailand.

Diagnosis. *Guimaraesiella* (*Dicrurobates*) *regis* is morphologically closest to *Guimaraesiella* (*Di.*) *nana*, but they can be separated by the following characters: (1) dorsal preantennal suture reaches lateral margins or head in *Guimaraesiella* (*Di.*) *regis* (Fig. 52), but not in *Guimaraesiella* (*Di.*) *nana* (Fig. 45); (2) *aps* present on male tergopleurite V in *Guimaraesiella* (*Di.*) *regis* (Fig. 50), but absent on this tergopleurite in *Guimaraesiella* (*Di.*) *nana* (Fig. 43); (3) mesosome more slender in *Guimaraesiella* (*Di.*) *nana* (Fig. 47) than in *Guimaraesiella* (*Di.*) *regis* (Fig. 54); (4) male abdominal segment IV with 2 *ps* on each side in *Guimaraesiella* (*Di.*) *nana* (Fig. 43), but with 1 *ps* on each side in *Guimaraesiella* (*Di.*) *regis* (Fig. 50). Females can be separated by the shape of the head and of the subgenital plate (Figs 35, 42).

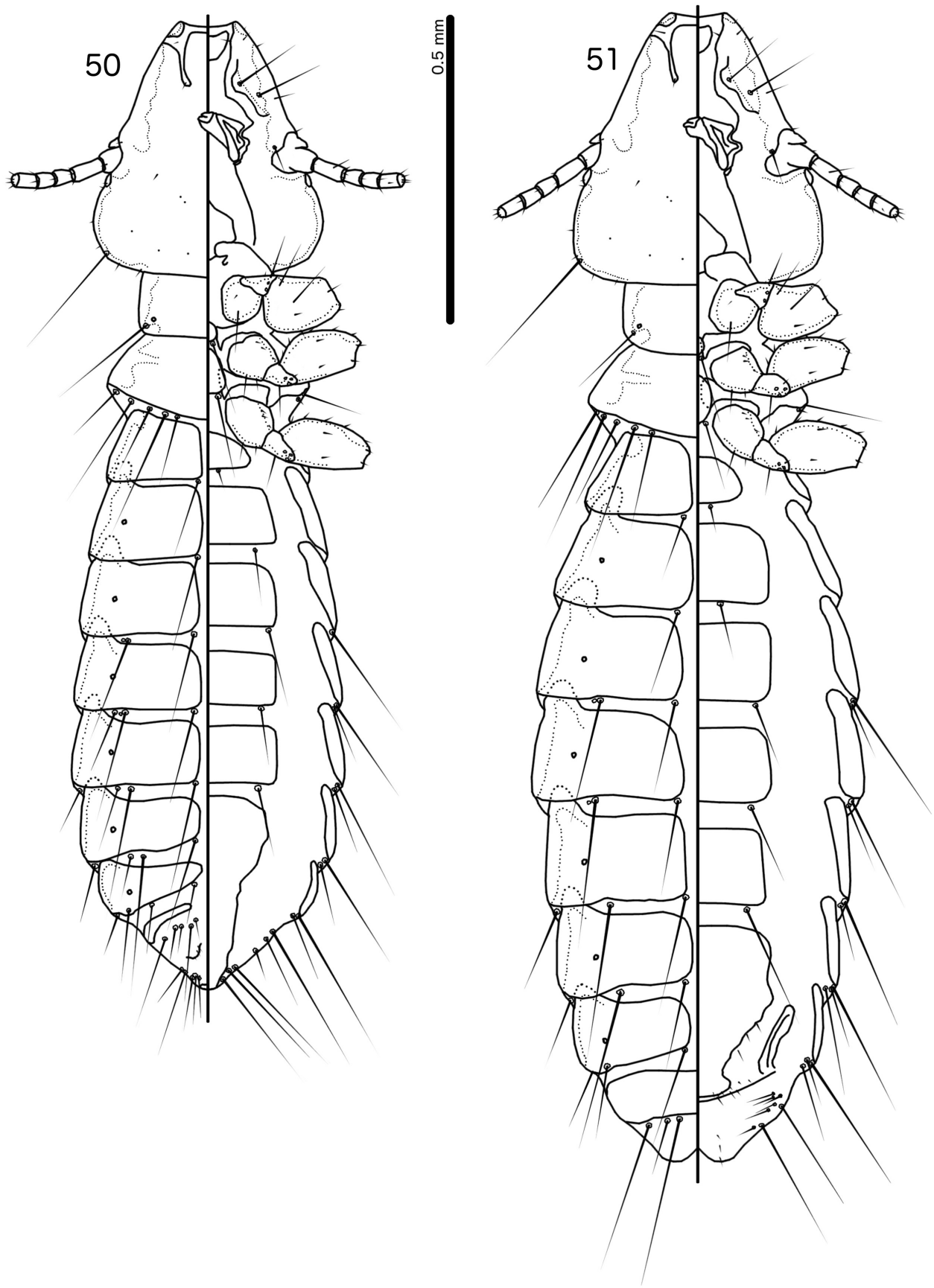
Description. ***Both sexes.*** Head shape and chaetotaxy as in Fig. 52. Lateral margins of preantennal head straight to slightly convex, frons broadly flattened to concave; marginal carina broad, irregular, narrowing anteriorly; dorsal preantennal suture reaches *dsms*, *ads*, and lateral margins of head; ventral anterior plate long, with deeply concave anterior margin; coni short, broad; temples rounded; gular plate as in Fig. 52. Thoracic and abdominal segments as in Figs 50–51.

Male. Thoracic and abdominal chaetotaxy as in Fig. 50; *aps* typically absent on tergopleurite IV, but present on tergopleurites V–VII. Genitalia as in Figs 53–55: basal apodeme rectangular, with rounded anterior end and slight or no constriction at mid-length (Fig. 53). Proximal mesosome broad, narrowing distally, with convex lateral margins (Fig. 54); ventral sclerite broadly trapezoidal, lateral margins slightly convex, not reaching anterior margin of mesosome; mesosomal lobes wide, roughly triangular; rugose nodi prominent; 2 *ames* sensilla on each side near anterolateral corners of mesosomal lobes; 2 *pmes* sensilla on each side of gonopore, near rugose nodi; gonopore round, with broad marginal thickening (Fig. 54). Parameral heads rounded subtriangular (Fig. 55). Parameral blades broad, tapering only distally (Figs 53, 55). Measurements: Ex *Dicrurus annectans* (n = 4): TL = 1.56; HL = 0.40–0.41; HW = 0.35–0.36; PRW = 0.22; PTW = 0.30–0.32; AW = 0.42–0.46. Ex *Dicrurus paradiseus paradiseus* (n = 3): TL = 1.58–1.65; HL = 0.39–0.42; HW = 0.35–0.37; PRW = 0.22–0.23; PTW = 0.31–0.32; AW = 0.46–0.49. Ex *Dicrurus paradiseus rangoonensis* (n = 1): TL = 1.63; HL = 0.41; HW = 0.36; PRW = 0.23; PTW = 0.33; AW = 0.48.

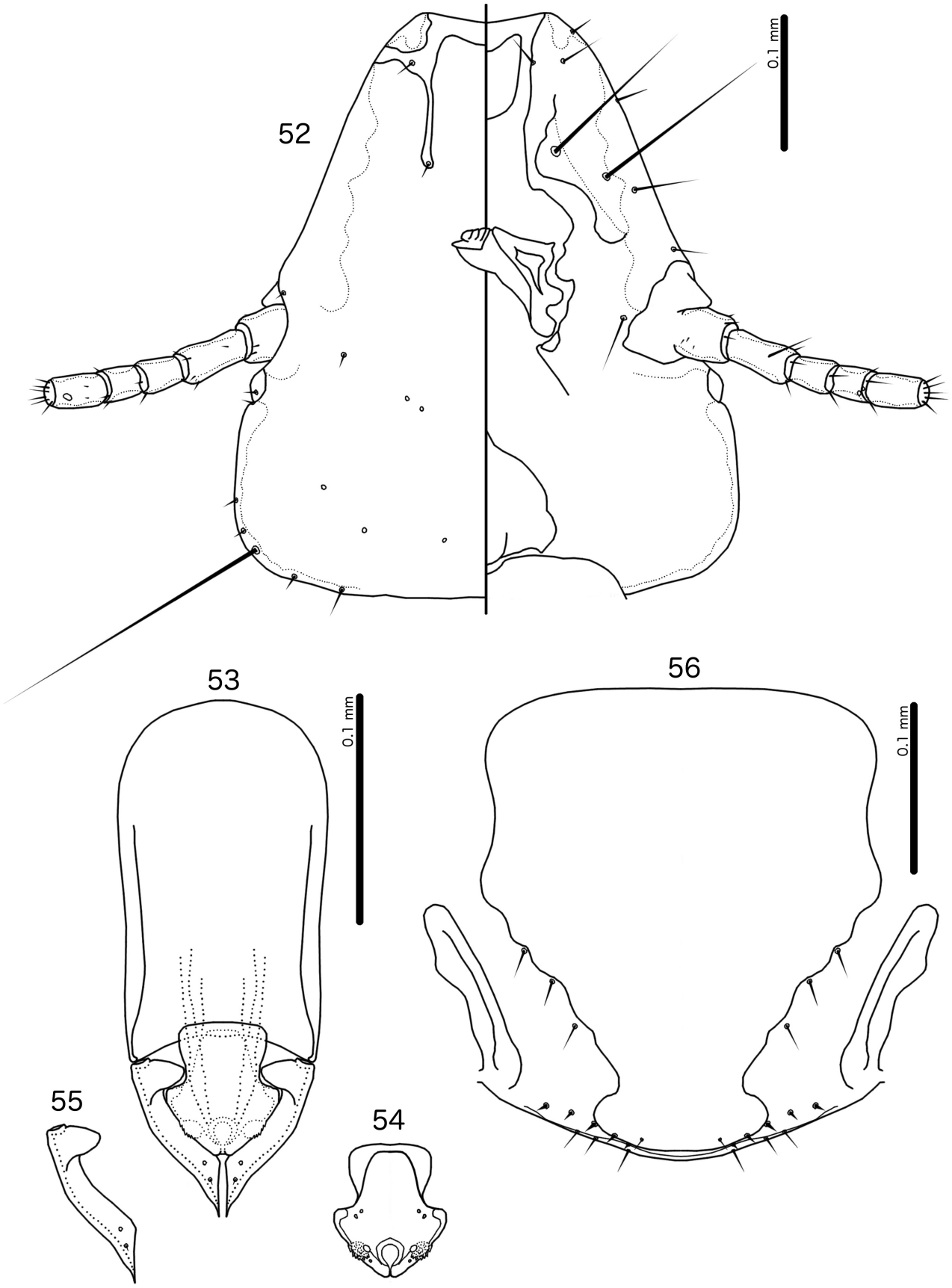
Female. Thoracic and abdominal chaetotaxy as in Fig. 51; *psps* absent from tergopleurite VIII. Subgenital plate with concave lateral margins in anterior section and irregular medio-lateral margins; lateral submarginal bulges rounded, not wide; vulval margin gently rounded, with 2–4 short, slender *vms* on each side and 5–7 short, thorn-like *vss* on each side; 4–6 slender *vos* on each side; distal 1 *vos* median to *vss*, much shorter than other *vos* (Fig. 56). Measurements: Ex *Dicrurus annectans* (n = 9): TL = 1.74–2.22; HL = 0.42–0.44; HW = 0.38–0.41; PRW = 0.22–0.24; PTW = 0.32–0.37; AW = 0.45–0.52. Ex *Dicrurus paradiseus paradiseus* (n = 10, except TL and AW, where = 9): TL = 1.69–1.99; HL = 0.41–0.48 (0.45); HW = 0.37–0.42 (0.39); PRW = 0.22–0.26 (0.24); PTW = 0.32–0.37 (0.35); AW = 0.47–0.55. Ex *Dicrurus paradiseus rangoonensis* (n = 4): TL = 1.80–1.85; HL = 0.42–0.44; HW = 0.37–0.39; PRW = 0.23–0.24; PTW = 0.35–0.37; AW = 0.49–0.53.

Etymology. The species epithet derives from "*rex*" Latin for "king", referring to the large head of this species.

Type material. Ex *Dicrurus annectans*: **Holotype** ♂, Muang Thung Nui, Satun Province, Thailand, 23 Sep. 1963, W. Songprakob & W.S. Laong, WS-525 (NHML). **Paratypes:** 1♂, 2♀, same data as holotype (NHML); 3♂, 7♀, same data as holotype (PIPR).



FIGURES 50–51. *Guimaraesiella* (*Dicrurobates*) *regis* **new species. 50,** male habitus, dorsal and ventral views. **51,** female habitus, dorsal and ventral views.



FIGURES 52–56. *Guimaraesiella* (*Dicrurobates*) *regis* **new species. 52,** male head, dorsal and ventral views. **53,** male genitalia, dorsal view. **54,** male mesosome, ventral view. **55,** male paramere, dorsal view. **56,** female subgenital plate and vulval margin, ventral view.

Non-type material. Ex *Dicrurus paradiseus paradiseus*: 1♂, 9♀, Thadinang, Pak Phayun District, Phattalung Province, Thailand, 27 Jul. 1962, W. Songprakob, RE-6343 (PIPR); 2♂, 2♀, Khao Soi Dao Tai, Chanthaburi Province, Thailand, Apr. 1966 (NHML).

Ex *Dicrurus paradiseus rangoonensis* [some as *D. paradiseus malabaricus*]: 1♂, 2♀, Phu Lom Lo Mountains, Kok Sathon, Dan Sai District, Loei Province, Thailand, 17 Feb. 1955, R.E. Elbel, RE-4680, RT-B-31210 (BPBM); 1♀, Pang Nam Un, Bun Yun, Nan Province, Thailand, 17 Jan. 1953, R.E. Elbel & H.G. Deignan, RE-2095, RT-B-17712 (BPBM); 2♀, Khlong Khlung, Kamphaeng Phet Province, Thailand, 27 Apr. 1953, R.E. Elbel & H.G. Deignan, RE-2487, RT-B-21051 (BPBM).

Remarks. *Dicrurus annectans* and *D. paradiseus* are closely related, as shown in the phylogeny of Pasquet *et al*. (2007), where *D. annectans* is nested inside *D. paradiseus*.

Guimaraesiella (*Dicrurobates*) *transvaalensis* Gustafsson & Bush, new species

(Figs 57–63)

urn:lsid:zoobank.org:act:9FBC0176-0186-4B22-8C05-50E252E2EE11

Type host. *Dicrurus adsimilis apivorus* Clancey, 1976—fork-tailed drongo.

Type locality. Potchefstroom, North West Province, South Africa.

Diagnosis. *Guimaraesiella* (*Dicrurobates*) *transvaalensis* is morphologically closest to *Guimaraesiella* (*Di.*) *dicruri*, but they can be separated by the following characters: (1) dorsal preantennal suture reaches *ads* in *Guimaraesiella* (*Di.*) *transvaalensis* (Fig. 59), but not in *Guimaraesiella* (*Di.*) *dicruri* (Fig. 10); (2) *aps* present on male tergopleurite IV in *Guimaraesiella* (*Di.*) *dicruri* (Fig. 8), but absent in *Guimaraesiella* (*Di.*) *transvaalensis* (Fig. 57); (3) ventral sclerite less than half as long as proximal mesosome in *Guimaraesiella* (*Di.*) *transvaalensis* (Fig. 61), but more than half as long as proximal mesosome in *Guimaraesiella* (*Di.*) *dicruri* (Fig. 12).

Description. ***Both sexes.*** Head shape and chaetotaxy as in Fig. 59. Lateral margins of preantennal area slightly convex, frons broadly flattened; marginal carina broad, irregular; dorsal preantennal suture reaching *dsms* and *ads*, but does not reach lateral margins of head; ventral anterior plate longer than broad, with concave anterior margin; coni long, broad; temples rounded; gular plate with lateral points (Fig. 59). Thoracic and abdominal segments as in Figs 57–58.

Male. Thoracic and abdominal chaetotaxy as in Fig. 57; *aps* absent on tergopleurite IV, but present on tergopleurites V–VII. Genitalia as in Figs 60–62: basal apodeme slender and rectangular, with rounded anterior end and slightly widened posterior end (Fig. 60). Proximal mesosome broad, long, rectangular; ventral sclerite slender, short, not reaching more than half the length of the proximal mesosome; mesosomal lobes slender, blunt anteriorly; rugose nodi prominent, but do not extend median of bulging area; 2 *ames* sensilla submedianly on each side anterior to gonopore; 2 *pmes* sensilla on each side lateral to gonopore, near rugose nodi; gonopore oval, with broad marginal thickening. Parameral heads irregular (Fig. 62). Parameral blades broad, tapering only distally (Figs 60, 62). Measurements: Ex *Dicrurus adsimilis apivorus* (n = 3): TL = 1.53–1.59; HL = 0.37–0.38; HW = 0.32–0.33; PRW = 0.21; PTW = 0.30–0.31; AW = 0.40–0.42.

Female. Thoracic and abdominal chaetotaxy as in Fig. 58; *psps* absent on tergopleurite VIII. Subgenital plate broadly trapezoidal in anterior section; lateral submarginal bulges wide; vulval margin convergent to blunt median point, with 2–3 long, slender *vms* on each side, and 3–4 short, thorn-like *vss* on each side; 4–6 long, slender *vos* on each side; distal 1 *vos* median to *vss* (Fig. 63). Measurements: Ex *Dicrurus adsimilis apivorus* (n = 3): TL = 1.72–1.95; HL = 0.38–0.42; HW = 0.34–0.36; PRW = 0.22–0.24; PTW = 0.32–0.36; AW = 0.41–0.50.

Etymology. The species epithet is a noun in apposition derived from the type locality.

Type material. Ex *Dicrurus adsimilis apivorus*: Holotype ♂, Potchefstroom, North West Province [as W. Transvaal], South Africa, 8 Feb. 1953, Brit. Mus. 1954-474 (NHML). **Paratypes:** 1♀, same data as holotype (NHML); 2♂, 2♀, Mabelikwa, North Transvaal, South Africa, 6 Jan. 1957, F. Zumpt, Brit. Mus. 1957-434 (NHML).

Guimaraesiella (*Dicrurobates*) *campanula* Gustafsson & Bush, new species

(Figs 64–71)

urn:lsid:zoobank.org:act:41304C59-A370-41C5-B850-819B076D7847

Type host. *Oriolus larvatus rolleti* Salvadori, 1864—Africa black-headed oriole (Oriolidae).

Other host: *Prionops plumatus poliocephalus* (Stanley, 1814)—white helmet-shrike (Vangidae)

Type locality. Walamba, Zambia.

Diagnosis. *Guimaraesiella* (*Dicrurobates*) *campanula* is morphologically closest to *Guimaraesiella* (*Di.*) *transvaalensis*, but they can be separated by the following characters: (1) male tergopleurite VIII with 1 *tps* on each side in *Guimaraesiella* (*Di.*) *transvaalensis* (Fig. 57), but without *tps* in *Guimaraesiella* (*Di.*) *campanula* (Fig. 64); (2) female abdominal segment VI with 3 *ps* on each side in *Guimaraesiella* (*Di.*) *campanula* (Fig. 65), but 2 *ps* on each side in *Guimaraesiella* (*Di.*) *transvaalensis* (Fig. 58); (3) proximal mesosome tapering distally in *Guimaraesiella* (*Di.*) *campanula* (Figs 69–70), but not tapering in *Guimaraesiella* (*Di.*) *transvaalensis* (Fig.61).

Description. ***Both sexes.*** Head shape and chaetotaxy as in Fig. 66. Lateral margins of preantennal head highly convex, frons rounded to slightly flattened; marginal carina of moderate, more or less even, width, interrupted submedianly; dorsal preantennal suture reaches *dsms* but not lateral head margins; posterior extent of suture differing among specimens, with suture typically present around aperture of *ads*, but in some specimens part of the anterior section of the suture extends towards *ads*, varying between sides of the head of same specimens; ventral anterior plate crescent-shaped; preantennal nodi slender, bulging; pre- and postocular nodi small; marginal temporal carina slender, more or less regular; gular plate rhombic with anterior and lateral points (Fig. 66). Thoracic and abdominal segments as in Figs 64–65.

Male. Thoracic and abdominal chaetotaxy as in Fig. 64; 3 ps on each side of abdominal segment VI. Genitalia as in Figs 67–70: basal apodeme widening distally (Fig. 67). Proximal mesosome tapering distally; lateral margins rounded but not flaring conspicuously in specimens from type host (Fig. 69), but flaring in specimens from *Prionops plumatus poliocephalus* (Fig. 70). Ventral sclerite elongated, trapezoidal, reaching near anterior margin of mesosome, thickened in specimens from the type host (Fig. 69), but in specimens from *P. plumatus poliocephalus* this sclerite is shorter, rounded anteriorly and not thickened in the anterior end (Fig. 70). Mesosomal lobe rounded, triangular, distal margin rounded (Fig. 69); rugose nodi moderate; 2 *ames* sensilla on each side near anterior ends of mesosomal lobes; 2 *pmes* microsetae on each side on lateral margins of mesosomal lobes; gonopore somewhat oval, with slender marginal thickenings (Figs 69, 70). Parameral heads as in Fig. 68. Parameral blades broad, tapering only distally (Figs 67–68); blades shorter in specimens from *P. plumatus poliocephalus* (not illustrated) than in specimens from the type host. Measurements: Ex *Oriolus larvatus rolleti* (n = 3): TL = 1.42–1.52; HL = 0.35–0.36; HW = 0.30–0.31; PRW = 0.18–0.20; PTW = 0.28–0.29; AW = 0.39–0.43. Ex *Prionops plumatus poliocephalus* (n = 2): TL = 1.60–1.61; HL = 0.40; HW = 0.34; PRW = 0.23; PTW = 0.32–0.33; AW = 0.43–0.46.

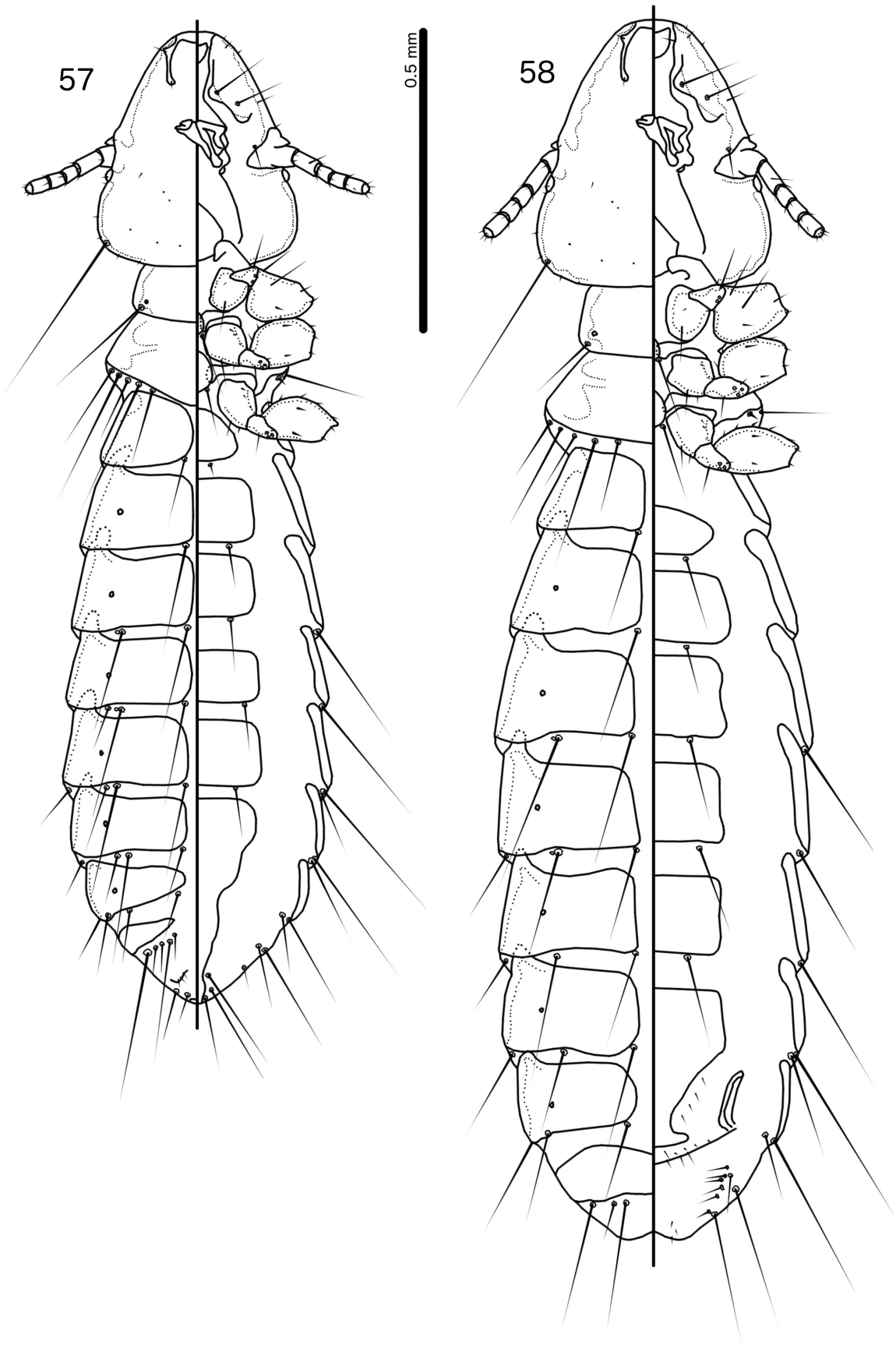
Female. Thoracic and abdominal chaetotaxy as in Fig. 65; abdominal segments VI–VII with 3 *ps* on each side; psps absent on tergopleurite VIII (Fig. 65). Subgenital plate with lateral margins of anterior section concave to roughly flat; vulval margin rounded, with median section flattened; 2–4 short, slender *vms* and 3–4 short, stout *vss* on each side; 4 short, slender *vos* on each side of submarginal plate; distal 1 *vos* median to *vss* (Fig. 71). Vulval chaetotaxy of single female from *P. plumatus poliocephalus* overlaps with those of two females from type host, except in that it has 6 *vos* on each side, of which 2 are median to *vss*. Measurements: Ex *Oriolus larvatus rolleti* (n = 2): TL = 1.71–1.83; HL = 0.40–0.43; HW = 0.34–0.37; PRW = 0.21–0.22; PTW = 0.33–0.34; AW = 0.47–0.49. Ex *Prionops plumatus poliocephalus* (n = 1): TL = 1.70; HL = 0.41; HW = 0.34; PRW = 0.23; PTW = 0.33; AW = 0.51.

Etymology. The species epithet is derived from "*campana*" Latin for bell, in the diminutive form, referring to the bell-shaped head of this species.

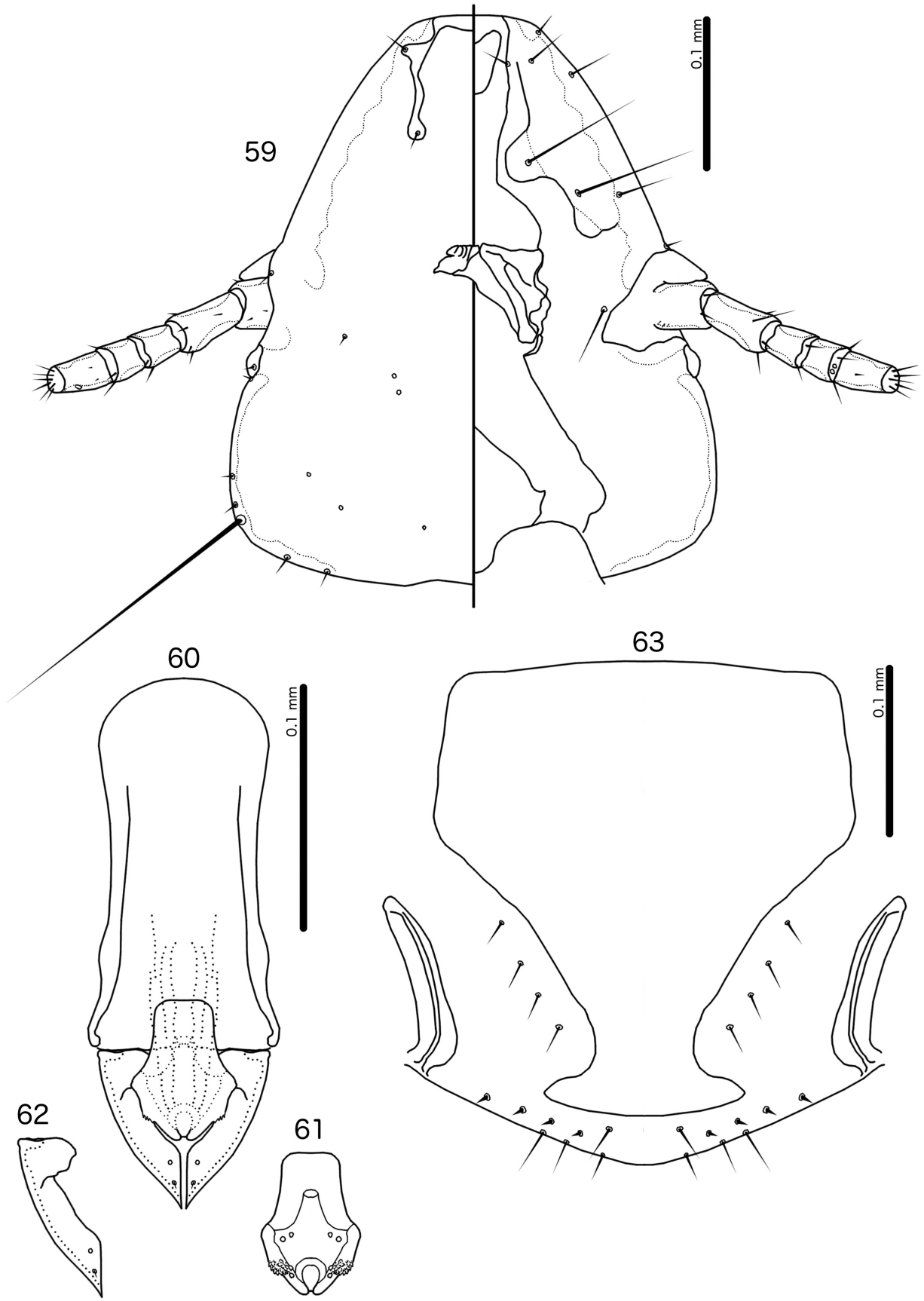
Type material. Ex *Oriolus larvatus rolleti*: **Holotype** ♂**,** Walamba, Zambia [as North Rhodesia], 13 Sep. [year not noted], ML/97, Brit. Mus. 1954-137 (NHML). [marked with black dot on slide]. **Paratypes:** 2♂, 2♀, same data as holotype (NHML).

Non-type material. Ex *Prionops plumatus poliocephalus* [some as *P. plumatus angolica*]: 1♂, Luanshya, Zambia [as N. Rhodesia], 3 Jul. 1955, ML/123, Brit. Mus. 1956-310 (NHML). 1♂, 1♀, same locality, 22 Sep. 1955, E.L. Haydock, ML/25, Brit. Mus. 1952-149 (NHML).

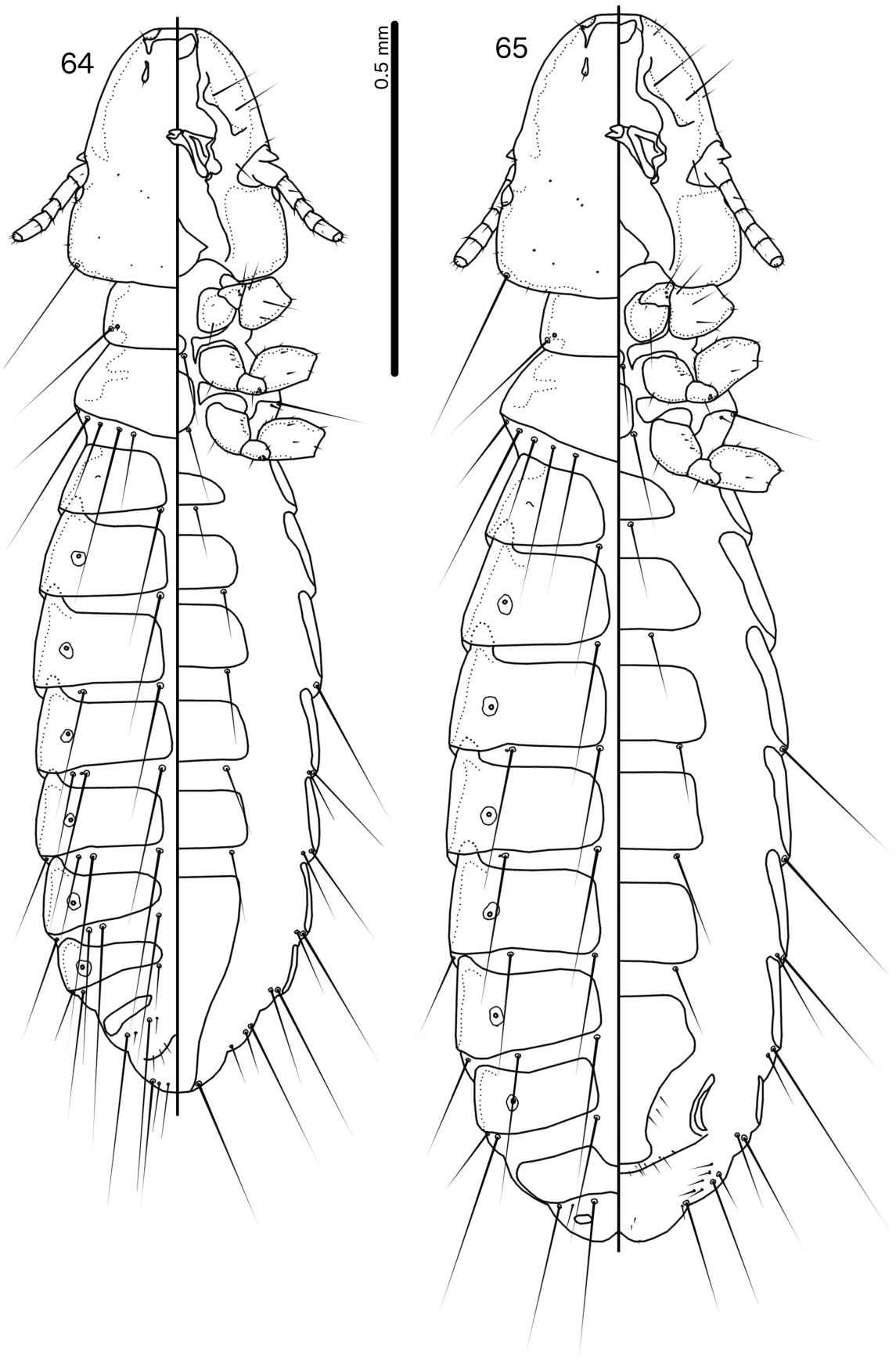
Remarks. Lice from *Prionops plumatus poliocephalus* have the same head shape as those from the type host, and are morphologically very similar. Only one of the males examined from this host has clearly visible genitalia, which differ in the shape of the mesosome in specimens from the type host (see Figs 69–70). It is possible that the populations of *Guimaraesiella* (*Dicrurobates*) from these two hosts represent different species. However, as most of the lice from *P. plumatus poliocephalus* are poorly preserved, we prefer to consider them as conspecific with those from the type host until more specimens can be examined.



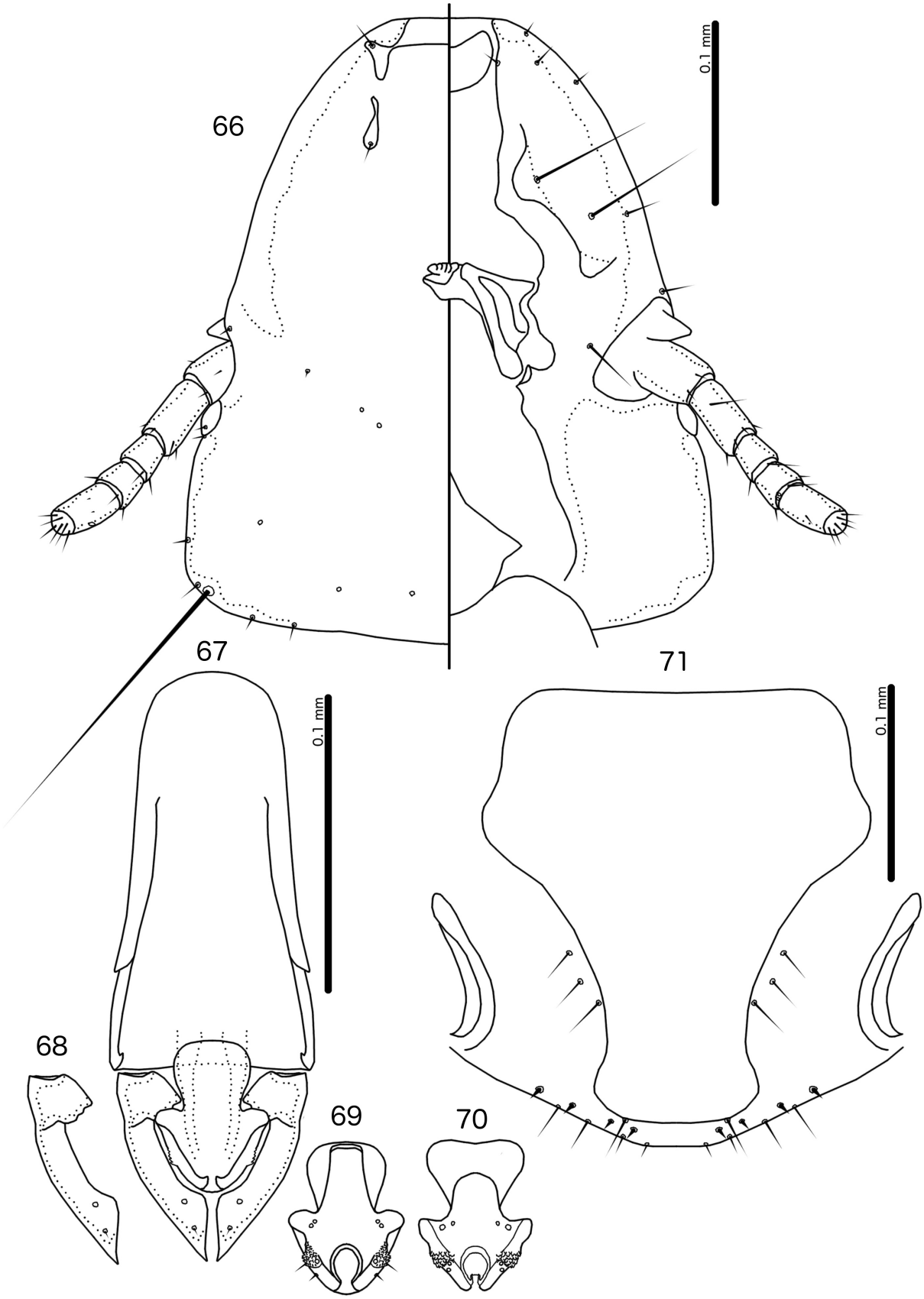
FIGURES 57–58. *Guimaraesiella* (*Dicrurobates*) *transvaalensis* **new species. 57,** male habitus, dorsal and ventral views. **58,** female habitus, dorsal and ventral views.



FIGURES 59–63. *Guimaraesiella* (*Dicrurobates*) *transvaalensis* **new species. 59,** male head, dorsal and ventral views. **60,** male genitalia, dorsal view. **61,** male mesosome, ventral view. **62,** male paramere, dorsal view. **63,** female subgenital plate and vulval margin, ventral view.



FIGURES 64–65. *Guimaraesiella* (*Dicrurobates*) *campanula* **new species. 64,** male habitus, dorsal and ventral views. **65,** female habitus, dorsal and ventral views.



FIGURES 66–71. *Guimaraesiella* (*Dicrurobates*) *campanula* **new species. 66,** male head, dorsal and ventral views. **67,** male genitalia, dorsal view. **68,** male paramere, dorsal view. **69,** male mesosome, ventral view. **70,** male mesosome, ventral view. **71,** female subgenital plate and vulval margin, ventral view. *Note*: Fig. 70 is based on material from *Prionops plumatus poliocephalus*.

Discussion

Species from hosts in the Dicruridae

Eleven of the 25 species of *Dicrurus* currently considered valid (see Clements *at el.* 2019; Table 1) are now known to be parasitised by species of *Guimaraesiella*, including the seven new species described from drongos above. The geographical distribution of *Guimaraesiella* (*Dicrurobates*) spans the geographical distribution of their hosts, from South Africa through India and China to the Philippines and New Guinea. In many cases, species of *Dicrurobates* appear to be specific to host species level, with the same species of louse parasitising host subspecies which are geographically separated. However, two different species of *Dicrurobates* occur on different subspecies of *Dicrurus hottentottus* in areas geographically separated. Conversely, in two cases (*Guimaraesiella* (*Di*.) *sexmaculata* and *Guimaraesiella* (*Di.*) *dicruri*), the same species of louse parasitises more than one host species in the same region. Thus, it would appear that biogeography contributes to the structuring of host distribution in this group of lice; however, the material examined for this study is patchy, and more data for species from India, Indonesia and most of Africa are needed.

The host distribution of species of *Guimaraesiella* (*Dicrurobates*) spans the phylogeny of their main host family, Dicruridae (Pasquet *et al*. 2007). Relationships among the five clades of *Guimaraesiella* (*Dicrurobates*) included in the phylogeny of Bush *et al.* (2016: 743, fig. 3c, clade C) mirror those of their dicrurid hosts (Pasquet *et al*. 2007). However, since the diversity of this group of louse species was not well represented in the Bush *et al.* (2016) study, future molecular research is needed to elucidate the true relationships among these species.

Species from non-dicrurid hosts

Unlike all other species placed in the subgenus *Dicrurobates*, *Guimaraesiella* (*Di.*) *campanula* is based on material from an oriole (Oriolidae) and a helmet-shrike (Vangidae). In their phylogeny, Bush *et al*. (2016) included specimens of *Guimaraesiella* spp. from a few species of Oriolidae and one of Vangidae. However, their positions in the phylogenetic tree are clearly distant from those of lice from dicrurid hosts. Therefore, it is likely that the host associations of *Guimaraesiella* (*Di.*) *campanula* originated from contact within mixed-species foraging flocks involving drongos (McClure 1967; Herremans & Herremans-Tonnoeyr 1997; Chen & Hsieh 2002; Kotagama & Goodale 2004; Thomson & Ferguson 2007; Sridhar & Sankar 2008). In particular, both *Dicrurus adsimilis* and *Prionops plumatus* are known to participate in mixed-species feeding flocks (Herremans & Herremans-Tonnoeyr 1997; Harris & Franklin 2000), and *P. plumatus* was listed by Herremans & Herremans-Tonnoeyr (1997) as one of the species used by *D. adsimilis* as "prey beaters".

Transfer of lice among birds during their communal feeding has previously been suggested as a possibility for cuckoo lice (Brooke & Nakamura 1998) and may explain the presence of same species of *Priceiella* Gustafsson & Bush, 2017 parasitising distantly related host species in the same area (Gustafsson *et al*. 2018). In addition, many species of drongos have been implicated in kleptoparasitism (Hino 1998; Satischandra *et al*. 2007; Flower 2011), which may increase chances of host contact and transfer of lice to unrelated species.

An alternative explanation to the unusual host associations of *Guimaraesiella* (*Di.*) *campanula* is that its regular, natural host is a drongo, with a successful host-switch of this louse species to its known hosts occurring in the not-too-distant past. Only two species of drongos occur in Zambia (Clements *et al*. 2019), where the material of *Guimaraesiella* (*Di.*) *campanula* was collected: *Dicrurus adsimilis* and *Dicrurus ludwigii* (A. Smith, 1834). Zambian populations of these drongo species should be searched for lice to help elucidate the host associations of this louse species. Lastly, we need to mention the possibility of a contamination of the specimens here described as *Guimaraesiella* (*Di.*) *campanula* by human agency. However, the fact that besides the types series, there are three independent records (two in this paper and one in Bush *et al* 2016: 743, fig. 3c) of this louse from *Prionops plumatus*, makes this possibility unlikely.

Key to identify species of *Guimaraesiella* (*Dicrurobates*)

Note*:* This key is mostly based on male characters. Female-only samples can be identified with some degree of accuracy on head shape, extent of dorsal preantennal plate and shape of the subgenital plate, as setal patterns often overlap between species.

1. Dorsal preantennal suture does not reach *ads* (Figs 10, 31) 2
1'. Dorsal preantennal suture reaches *ads* (e.g. Figs 3, 17), but may be interrupted on at least one side of head, as in Fig. 66 3
2. (1) Preantennal head dome-shaped, with slender marginal carina and dorsal preantennal suture not extending more than half-way between *dsms* and *ads* (Fig. 10); *aps* present on male tergopleurite IV (Fig. 8); *aps* absent on female tergopleurite VIII (Fig. 9) . . . . . *Guimaraesiella* (*Dicrurobates*) *dicruri*
2'. Preantennal head roughly trapezoidal, with broad marginal carina and dorsal preantennal suture extending more than half-way between *dsms* and *ads* (Fig. 31); *aps* absent on male tergopleurite IV (Fig. 29); *aps* present on female tergopleurite VIII (Fig. 30) . . . . . *Guimaraesiella* (*Dicrurobates*) *lurida*
3. (1.) Mesosome slightly tapering on anterior end, with an additional sclerite associated with gonopore (Figs 19, 26) 4
3'. Mesosome markedly tapering on anterior end (e.g. Figs. 5, 33, 47), without additional sclerite associated with gonopore . . 5
4. (3.) Mesosome with ventral sclerite reaching the anterior margin, and additional sclerite long, roughly rectangular, with irregular anterior end (Fig. 26); *aps* present on male tergopleurites IV–V (Fig. 22); *aps* present on female tergopleurite VIII (Fig. 23) . . . . . *Guimaraesiella* (*Dicrurobates*) *latitemporalis*
4'. Mesosome with ventral sclerite not reaching the anterior margin, and additional sclerite short, roughly triangular (Fig. 19); *aps* absent from male tergopleurites IV–V (Fig. 15); *aps* absent from female tergopleurite VIII (Fig. 16) . . . . . *Guimaraesiella* (*Dicrurobates*) *carbonivora*
5. (3.) Mesosome with ventral sclerite extending beyond the anterior margin (Fig. 5) . . . . . *Guimaraesiella* (*Dicrurobates*) *sexmaculata*
5'. Mesosome with ventral sclerite not extending beyond the anterior margin, or reaching close to anterior margin (Figs 47, 54) 6
6. (5.) Proximal mesosome widening markedly on anterior end (Figs 47, 54) 7
6'. Proximal mesosome not widening on anterior end (Figs 40, 61) 10
7. (6.) Lateral margins of preantennal area roughly straight, with pronounced antero-lateral corners (Figs 45, 52) 8
7'. Lateral margins of preantennal area convex, with rounded antero-lateral corners (Fig. 66) 9
8. (7.) Dorsal preantennal suture reaches lateral margin of head, and ventral anterior plate longer than wide (Fig. 52); male tergopleurite V with *aps* (Fig. 50); mesosome as in Fig. 54 . . . . . *Guimaraesiella* (*Dicrurobates*) *regis*
8'. Dorsal preantennal suture does not reach lateral margins of head, and ventral anterior plate as long as wide, or shorter than wide (Fig. 45); male tergopleurite V without *aps* (Fig. 43); mesosome as in Fig. 47 . . . . . *Guimaraesiella* (*Dicrurobates*) *nana*
9. (7.) Mesosome with ventral sclerite almost reaching the anterior margin, as in Fig. 69 [on *Oriolus larvatus rolleti* . . . . . *Guimaraesiella* (*Dicrurobates*) *campanula*
9'. Mesosome with ventral sclerite reaching about half-way to the anterior margin, as in Fig. 70 [on *Prionops plumatus poliocephalus*] . . . . . *Guimaraesiella* (*Dicrurobates*) *campanula*
10. (6.) Proximal mesosome greatly overlapping basal apodeme (Fig. 60); ventral sclerite not reaching the anterior margin of mesosome (Fig. 61); female tergopleurite VIII without *aps* (Fig. 58). . . . . *Guimaraesiella* (*Dicrurobates*) *transvaalensis*
10'. Proximal mesosome slightly overlapping basal apodeme (Fig. 39); ventral sclerite reaching anterior margin of mesosome (Fig. 40); female tergopleurite VIII with *aps* (Fig. 37) . . . . . *Guimaraesiella* (*Dicrurobates*) *luzonica*

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