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Research article

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**Four new species of *Brueelia* Kéler, 1936
(Phthiraptera: Ischnocera) from African hosts,
with a redescription of *Nirmus bicurvatus* Piaget, 1880**

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Abstract. Four new species of *Brueelia* Kéler, 1936 are described and illustrated. All of them parasitize African endemic host species in the families Passeridae, Ploceidae, and Estrildidae (Passeriformes). They are: *Brueelia pofadderensis* sp. nov. ex *Passer melanurus damarensis* Reichenow, 1902 and *P. m. vicinus* Clancey, 1958; *B. semiscalaris* sp. nov. ex *Granatina granatina* (Linnaeus, 1758); *B. sima* sp. nov. ex *Malimbus nitens* (Gray, 1831); *B. tersichore* sp. nov. ex *Euplectes jacksoni* (Sharpe, 1891) and *E. progne delamerei* (Shelley, 1903). In addition, *Brueelia bicurvata* (Piaget, 1880) is redescribed and reillustrated from non-type material. A summary of all published records of lice in the *Brueelia* complex from Africa since 1980 is provided. We also estimate the unknown diversity of African species of *Brueelia* based on an index of host specificity calculated for each host family independently. The unknown diversity is estimated to be over 1000 species of *Brueelia* from African hosts, compared to the <50 species in this genus currently recorded from Africa.

Keywords. Phthiraptera, new species, *Brueelia* complex, species diversity, host specificity.

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Introduction

The chewing lice of African songbirds have long been poorly known (Ledger 1980; Gustafsson & Bush 2015; Light *et al.* 2016; Takano *et al.* 2017, 2018). In particular, very few species of lice belonging to the *Brueelia* complex (sensu Gustafsson & Bush 2017) have ever been reported from Africa. In his summary of the chewing lice known from sub-Saharan Africa, Ledger (1980) listed only 3 species of *Meropoecus* Eichler, 1940, 36 species of *Brueelia* Kéler, 1936 and 16 species of *Sturnidoecus* Eichler, 1944 (note that Ledger overlooked the many African species of *Sturnidoecus* described in Ansari 1968). Of these, only 25 species have been recorded from birds that breed in sub-Saharan Africa; the remaining lice in the list in Ledger (1980) concern species known from hosts that migrate to Africa from Eurasia. In at least some cases, this list includes species of lice that have never been recorded in sub-Saharan Africa, but which occur on hosts that migrate to this region.

In recent decades, many new records of lice in the *Brueelia* complex have been published from African countries (e.g., Balakrishnan & Sorenson 2006; Sychra *et al.* 2010a, 2010b; Najer *et al.* 2012; Gustafsson & Bush 2015, 2017; Bush *et al.* 2016; Light *et al.* 2016; Takano *et al.* 2017, 2018; Gustafsson *et al.* 2018). However, in many of these reports, lice of the *Brueelia* complex have not been identified to species level, and few new species of lice in this complex have been described from Africa since 1980 (Fig. 1; Appendix). Data from several published phylogenies that include African lice of the *Brueelia* complex (Bush *et al.* 2016; Light *et al.* 2016; Takano *et al.* 2017, 2018) and from a morphological survey (D.R. Gustafsson and S.E. Bush, unpublished data) show that the diversity of lice in this complex is very high in Africa, and a vast number of species remain undescribed. The lack of descriptions, illustrations and identification keys for African lice of the *Brueelia* complex limits our understanding of the biogeography and evolution of these lice and their host associations.

Here, we provide descriptions of four new species of *Brueelia* from Africa, as well as a redescription of *Nirmus bicurvatus* Piaget, 1880. All five species treated here are from host species that are endemic to Africa, and all five hosts belong to families that are very speciose in this region.

Material and methods

All material examined is deposited as slide-mounted specimens at the Natural History Museum, London (NHML). Specimens were examined in an Olympus CX31 microscope. Illustrations were drawn by hand, using a drawing tube fitted to the microscope. Line drawings were scanned, collated and edited in GIMP (www.gimp.org). Grey lines in all illustrations denote the approximate extent of dark pigmentation; note that these patterns typically differ slightly between specimens of the same species, and sometimes between sides of the same specimen.

Measurements were made from photographs in Quick Photo Micro ver. 3.1 (Promicra, Prague, Czech Republic) and are given for the following dimensions (in mm):

- AW = abdominal width (at segment V)
- HL = head length (at midline)
- HW = head width (at temples)
- PRW = prothoracic width (at posterior end)
- PTW = pterothoracic width (at posterior end)
- TL = total length (at midline)

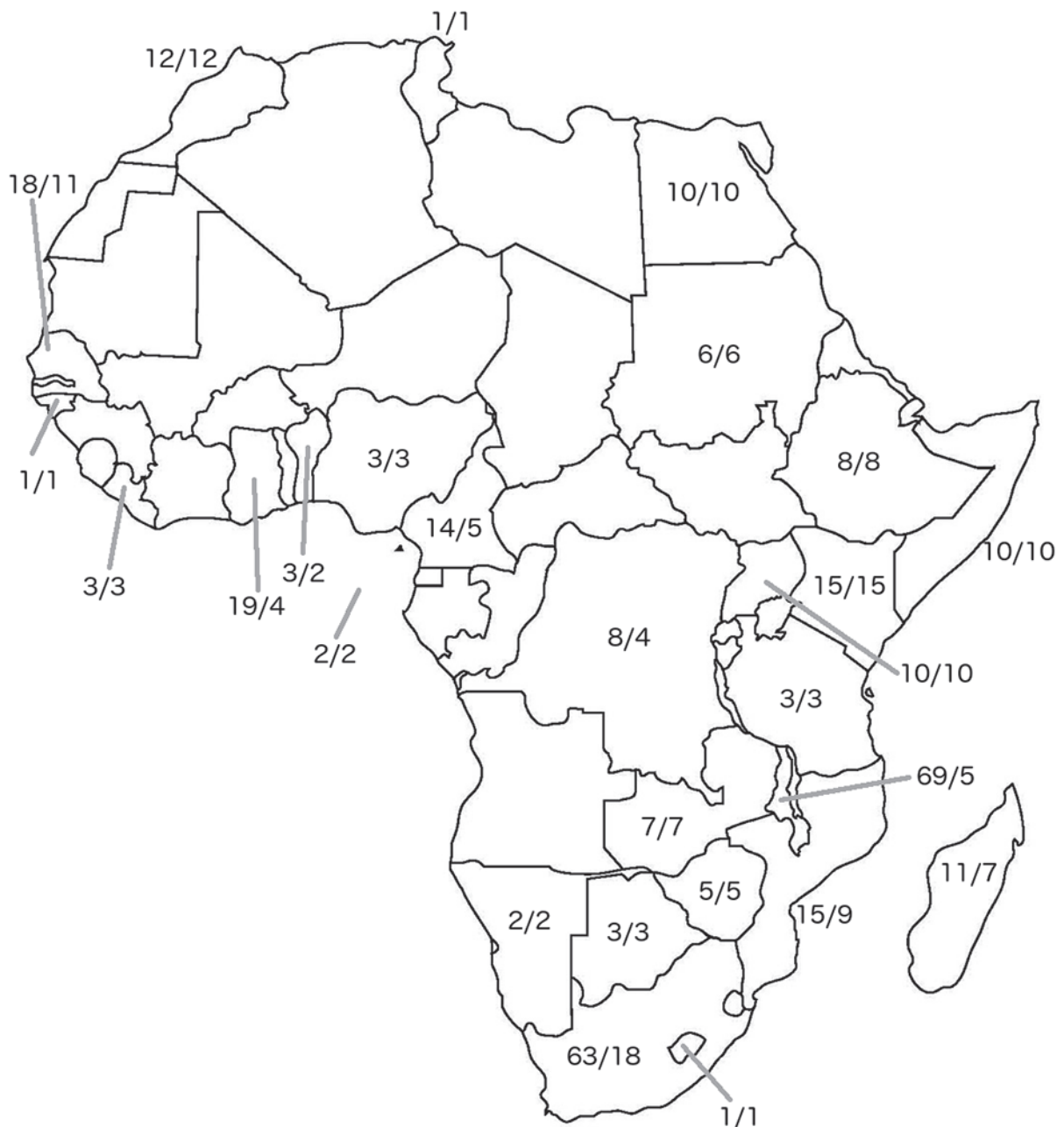


Fig. 1. Map of Africa, showing the number of species of chewing lice in the *Brueelia* complex reported from each country since Ledger (1980), including the records published herein. The first number represents the total number of records of host–louse associations reported for each country, disregarding that some records from different host species may refer to the same louse species. The second number represents the number of louse species identified to species level. Countries with no records of lice of the *Brueelia* complex since 1980 are unmarked. References to lice in the *Brueelia* complex known from each country can be found in the Appendix. Note that as no precise collection locality is given on older slides, records for Sudan and South Sudan are here presented together. The numbers ‘2/2’ in the Gulf of Guinea refer to São Tomé and Príncipe, which is not visible on the map. The islands of Réunion (France) and St. Helena (United Kingdom) are also not visible on the map; both have 1 record of a louse of the *Brueelia* complex in the time period, in both cases identified to species level. In addition to the records shown here, one species was recorded from “Northern Africa” and one from “Congo”, with no more detailed locality given on the slide labels.

The terminology of chaetotaxy and morphological structures follows Gustafsson & Bush (2017), and includes:

| | | |
|---------------|---|---------------------------------|
| <i>aps</i> | = | accessory post-spiracular setae |
| <i>ps</i> | = | paratergal setae |
| <i>psps</i> | = | principal post-spiracular setae |
| <i>pst1–2</i> | = | parameral setae 1–2 |
| <i>pts</i> | = | post-temporal seta |
| <i>sts</i> | = | sternal setae |
| <i>tps</i> | = | tergal posterior setae |
| <i>vms</i> | = | vulval marginal setae |
| <i>vos</i> | = | vulval oblique setae |
| <i>vss</i> | = | vulval submarginal setae |

Counts of *vos* include the distal *vos* typically situated median to the *vss*. Setal characters are given in italics.

Host taxonomy follows Clements *et al.* (2018).

An index of specificity (IS) was calculated for all host families from which *Brueelia* are known in Africa, following Valim & Weckstein (2013). Two estimates were calculated: one based only on the IS of identified species of *Brueelia*, and one on the IS of identified species of *Brueelia* plus unidentified species recorded from Africa (see Appendix). The latter IS was calculated under the assumption that all unidentified species listed as ‘*Brueelia* sp.’ in the Appendix are accurately assigned to genus, which is likely not the case for many specimens.

Results

The index of specificity was calculated for the genus *Brueelia* in Africa, following Valim & Weckstein (2013); from this index, two estimates of the diversity of this genus in Africa were calculated (Table 1). In Table 1, an IS of 1 means that all species of *Brueelia* are host-specific within this host family. In host families for which $IS > 1$, each host species is on average parasitized by more than one species of *Brueelia*; for instance, different host subspecies being parasitized by different species of *Brueelia* would give an $IS > 1$. An $IS < 1$ indicates that at least some *Brueelia* species parasitizing hosts in this family are not host-specific, but occur on more than one host species.

In almost all host families, the IS of *Brueelia* is 1, suggesting that *Brueelia* are generally host-specific. For nine host families, $IS < 1$; however, in most of these cases, the species of *Brueelia* parasitizing hosts in this family have been poorly described, and some of these cases may represent misidentifications. Only one host family, Corvidae, has an $IS > 1$.

Our two calculations of IS are based of different sets of reported taxa, and thus the two estimates of diversity of *Brueelia* are slightly different. However, both estimates suggest that well over 1000 species of *Brueelia* may occur in Africa. Only 30 species of *Brueelia* have been recorded from Africa since 1980 (Appendix). Using the IS estimate that includes unidentified specimens of *Brueelia* suggests that only 2.24% of the African diversity of *Brueelia* is currently known; using the more conservative IS estimate, and ignoring unidentified *Brueelia*, this number is 2.64%.

Table 1 (continued on next page). Estimate of the known and unknown diversity of *Brueelia* Kéler, 1936 in Africa based on an index of host specificity, following Valim & Weckstein (2013). Host taxonomy and species numbers follow Clements *et al.* (2018); louse numbers follow Gustafsson & Bush (2017) and Gustafsson *et al.* (2018). Host numbers in the African fauna includes residents, wintering migrants, introduced species and vagrants, following Lepage (2018). IS is the ‘index of specificity’ of Valim & Weckstein (2013), and represents #*Brueelia* species/host species of *Brueelia*. Estimates have been rounded off to the closest whole number. The second estimate includes the specimens listed as ‘*Brueelia* sp.’ in the Appendix, recorded from Africa after 1980 but not identified to species. Species are included in this estimate under the assumption that all species listed as ‘*Brueelia* sp.’ in the Appendix belong to the genus *Brueelia*; most likely, this is incorrect in some cases, and the numbers given are thus probably overestimates. The following host families (# African species in parentheses) are presently not known to be parasitized by any species of *Brueelia*, and are therefore not included in the list below: Aegithalidae (1), Bernieridae (11), Buphagidae* (2), Calyptomenidae (8), Campephagidae* (14), Certhiidae (2), Chaetopidae(2), Cinclidae(1), Eurylaimidae*(1), Hirundinidae*(42), Hyliotidae(4), Hypocoliidae(1), Modulatricidae(3), Nicatoridae(3), Oriolidae*(9), Panuridae (1), Pellorneidae* (8), Philepittidae (4), Phylloscopidae (20), Picathartidae (2), Pittidae (2), Promeropidae (2), Stenostiridae (6), Tichodromidae (1), Vireonidae (1). Species in many of these families (marked with *) are known to be parasitized by other genera in the *Brueelia* complex (e.g., *Indocephalanetes* Gustafsson & Bush, 2017, on hosts in the Campephagidae), which may replace *Brueelia* on these hosts.

| Host family | Known world fauna | | | | African fauna | | | | Including unidentified after 1980 | | | | | |
|----------------------|-------------------|-------------------------|----------------------------------|------|---------------|---|-------------------------|----------------------------------|-----------------------------------|---|-------------------------|----------------------------------|------|-----|
| | Bird species | <i>Brueelia</i> species | Host species for <i>Brueelia</i> | IS | Bird species | Estimate of African <i>Brueelia</i> species | <i>Brueelia</i> species | Host species for <i>Brueelia</i> | IS | Estimate of African <i>Brueelia</i> species | <i>Brueelia</i> species | Host species for <i>Brueelia</i> | IS | |
| Passeriformes | | | | | | | | | | | | | | |
| Acrocephalidae | 61 | 1 | 1 | 1 | 33 | 33 | 1 | 1 | 1 | 1 | 33 | 1 | 1 | 33 |
| Alaudidae | 97 | 4 | 5 | 0.80 | 80 | 64 | 5 | 6 | 0.83 | 67 | 6 | 6 | 0.83 | 67 |
| Cisticolidae | 145 | 1 | 1 | 1 | 131 | 131 | 6 | 6 | 1 | 131 | 6 | 6 | 1 | 131 |
| Corvidae | 128 | 4 | 3 | 1.33 | 20 | 27 | 4 | 3 | 1.33 | 27 | 4 | 3 | 1.33 | 27 |
| Dicruridae | 25 | 1 | 1 | 1 | 9 | 9 | 2 | 2 | 1 | 9 | 2 | 2 | 1 | 9 |
| Emberizidae | 44 | 3 | 6 | 0.50 | 27 | 14 | 6 | 9 | 0.67 | 18 | 6 | 9 | 0.67 | 18 |
| Estrildidae | 140 | 5 | 5 | 1 | 83 | 83 | 13 | 13 | 1 | 83 | 13 | 13 | 1 | 83 |
| Fringillidae | 225 | 14 | 14 | 1 | 65 | 65 | 17 | 17 | 1 | 65 | 17 | 17 | 1 | 65 |
| Laniidae | 33 | 6 | 6 | 1 | 24 | 24 | 6 | 6 | 1 | 24 | 6 | 6 | 1 | 24 |
| Leiothrichidae | 146 | 5 | 5 | 1 | 23 | 23 | 5 | 5 | 1 | 23 | 5 | 5 | 1 | 23 |
| Locustellidae | 61 | 1 | 1 | 1 | 18 | 18 | 1 | 1 | 1 | 18 | 1 | 1 | 1 | 18 |
| Macrosphenidae | 21 | 0 | 0 | 0 | 18 | 0 | 1 | 1 | 1 | 18 | 1 | 1 | 1 | 18 |
| Malaconotidae | 50 | 0 | 0 | 0 | 50 | 0 | 2 | 2 | 1 | 50 | 2 | 2 | 1 | 50 |
| Monarchidae | 99 | 0 | 0 | 0 | 12 | 0 | 1 | 1 | 1 | 12 | 1 | 1 | 1 | 12 |

Table 1 (continued). Estimate of the known and unknown diversity of *Brueelia* Kéler, 1936 in Africa based on an index of host specificity, following Valim & Weckstein (2013).

| Host family | Known world fauna | | | | African fauna | | | | Including unidentified after 1980 | | | |
|----------------------------------|-------------------|-------------------------|----------------------------------|------|---------------|---|----------------------------------|------|---|----------------------------------|------|---|
| | Bird species | <i>Brueelia</i> species | Host species for <i>Brueelia</i> | IS | Bird species | Estimate of African <i>Brueelia</i> species | Host species for <i>Brueelia</i> | IS | Estimate of African <i>Brueelia</i> species | Host species for <i>Brueelia</i> | IS | Estimate of African <i>Brueelia</i> species |
| Passeriformes (continued) | | | | | | | | | | | | |
| Motacillidae | 67 | 5 | 7 | 0.71 | 43 | 31 | 7 | 0.78 | 33 | 9 | 0.78 | 33 |
| Muscicapidae | 317 | 2 | 2 | 1 | 158 | 158 | 4 | 1 | 158 | 4 | 1 | 158 |
| Nectariniidae | 139 | 1 | 1 | 1 | 93 | 93 | 2 | 1 | 93 | 2 | 1 | 93 |
| Paridae | 63 | 7 | 7 | 1 | 19 | 19 | 7 | 1 | 19 | 7 | 1 | 19 |
| Passeridae | 42 | 5 | 7 | 0.71 | 28 | 20 | 10 | 0.83 | 23 | 12 | 0.83 | 23 |
| Ploceidae | 116 | 5 | 6 | 0.83 | 113 | 94 | 13 | 0.93 | 105 | 14 | 0.93 | 105 |
| Prunellidae | 13 | 2 | 2 | 1 | 2 | 2 | 2 | 1 | 2 | 2 | 1 | 2 |
| Pycnonotidae | 143 | 3 | 3 | 1 | 74 | 74 | 10 | 1 | 74 | 10 | 1 | 74 |
| Regulidae | 6 | 1 | 1 | 1 | 3 | 3 | 1 | 1 | 3 | 1 | 1 | 3 |
| Remizidae | 11 | 2 | 2 | 1 | 7 | 7 | 2 | 1 | 7 | 2 | 1 | 7 |
| Scotocercidae | 36 | 1 | 1 | 1 | 6 | 6 | 1 | 1 | 6 | 1 | 1 | 6 |
| Sittidae | 27 | 5 | 5 | 1 | 2 | 2 | 5 | 1 | 2 | 5 | 1 | 2 |
| Sturnidae | 122 | 15 | 16 | 0.94 | 53 | 50 | 19 | 0.95 | 50 | 20 | 0.95 | 50 |
| Sylviidae | 33 | 4 | 5 | 0.80 | 30 | 24 | 5 | 0.83 | 25 | 6 | 0.83 | 25 |
| Troglodytidae | 85 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Turdidae | 170 | 7 | 9 | 0.78 | 33 | 26 | 8 | 0.80 | 26 | 10 | 0.80 | 26 |
| Vangidae | 39 | 0 | 0 | 0 | 31 | 0 | 1 | 1 | 31 | 1 | 1 | 31 |
| Viduidae | 20 | 1 | 1 | 1 | 20 | 20 | 4 | 1 | 20 | 4 | 1 | 20 |
| Zosteropidae | 130 | 0 | 0 | 0 | 25 | 0 | 1 | 1 | 25 | 1 | 1 | 25 |
| Piciformes | | | | | | | | | | | | |
| Lybiidae | 41 | 0 | 0 | 0 | 41 | 0 | 1 | 1 | 41 | 1 | 1 | 41 |
| Picidae | 232 | 3 | 7 | 0.43 | 35 | 15 | 3 | 0.43 | 15 | 7 | 0.43 | 15 |
| Total | 3127 | 115 | 131 | | 1410 | 1136 | 177 | | 1337 | 193 | | 1337 |

Order Phthiraptera Haeckel, 1896
Suborder Ischnocera Kellogg, 1896
Family Philopteridae Burmeister, 1838
Brueelia complex sensu Gustafsson & Bush 2017

Genus *Brueelia* Kéler, 1936

Philopterus Nitzsch, 1818: 288 partim.
Nirmus Nitzsch, 1818: 291 partim.
Degeeriella Neumann, 1906: 60 partim.
Brueelia Kéler, 1936: 257.
Painjunirmus Ansari, 1947: 285.
Allobrueelia Eichler, 1951: 36 partim.
Nigronirmus Złotorzycka, 1964: 248.
Spironirmus Złotorzycka, 1964: 261.
Serinirmus Soler Cruz *et al.*, 1987: 244.

Type species

Brueelia rossittensis Kéler, 1936: 257 (= *Nirmus brachythorax* Giebel, 1874: 134) by original designation.

Remarks

Clay (1954) discussed the use of the *post-spiracular sensillum* in determining homology in the abdominal chaetotaxy of Ischnocera. She stated that in *Brueelia*, these sensilla are known from segments III–VII, whereas in all other groups of ischnoceran lice, they are never found posterior to segment V. Gustafsson & Bush (2017) included these sensilla in their illustrations, but neglected to discuss their importance in the text. Based on our investigation of several hundred species of lice in the *Brueelia* complex, it seems that these sensilla occur on segments II–III only in the following genera: *Brueelia*, *Teinomordeus* Gustafsson & Bush, 2017, *Acronirmus* Eichler, 1953 and *Sychraella* Gustafsson & Bush, 2017. In all other genera of the *Brueelia* complex, these sensilla only occur on segments IV–V. However, they are typically very hard to see, especially in species with reduced tergopleurites.

Gustafsson & Bush (2017) also neglected to explicitly state that it is the position of post-spiracular setae in relationship to this sensillum that determines whether they are *psps* or *aps*. Any setae positioned laterally to the sensillum are *aps*, whereas any setae situated immediately median to this sensillum are *psps*. Note that *aps* and *psps* on the first abdominal segment bearing post-spiracular setae (often segment V or VI in *Brueelia*) may be similar in length. Moreover, in some species of, e.g., *Olivinirmus* Złotorzycka, 1964 there may be more than one *psps* per side on some segments. To our knowledge, no species in the *Brueelia* complex has more than one *aps* per side on any segment.

Several of the species here belong to a group of pied *Brueelia* species found mainly on African hosts in the families Ploceidae, Estrildidae and Paridae. The only species of this group known from hosts outside Africa is *Brueelia plocea* (Lakshminarayana, 1968), from India. We have seen many additional species in this group, all from African hosts; however, suitable hosts in the same genera are found in South Asia. We here refer to this group as the “African pied *Brueelia*” group, to distinguish it from the New World *ornatissima* group, which have similar pigmentation patterns. This group comprises the following species: *Brueelia plocea* (Lakshminarayana, 1968); *B. queleae* Sychra & Barlev in Sychra *et al.*, 2010a; *B. cantans* Sychra in Sychra *et al.*, 2010b; *B. aguilarae* Gustafsson & Bush, 2017; *B. mpumalagensis* Gustafsson *et al.*, 2018; *B. semiscalaris* sp. nov.; *B. terspichore* sp. nov.; *B. sima* sp. nov.

The main characteristic of this group is the striking pigmentation pattern. This varies slightly between species, but typically includes having dark pigmentation on the anterior and posterior margins of sternites III–VI, the female tergopleurite IX+X, along the lateral margins of the abdomen, around the distal section of femora I–III and on the subgenital plates. The dark areas are generally at least dark brown, but may appear black in some species; both sternal and subgenital plates typically have distinct translucent fenestrae in both sexes.

In the phylogeny of Bush *et al.* (2016), members of this group (e.g., *Brueelia queleae* and *Brueelia* sp. (= *B. mpumalangensis*) ex *Melaniparus niger*) were placed in different parts of the tree, suggesting that they do not form a natural group; however, these placements received no statistical support. Apart from pigmentation patterns, the morphological characters of this group are also very diverse, suggesting that the division of this group in the phylogeny of Bush *et al.* (2016) may be correct.

Nevertheless, for the purposes of identification and keying, we consider the ‘African pied *Brueelia*’ group a useful grouping to help sort out the vast diversity of species of *Brueelia* on African hosts. As more species of *Brueelia* from African hosts become known, the relationships of the species in this informal group may have to be revised, and the group may be found to be artificial. We provide a key to the described species in this group below.

Key to the ‘African pied *Brueelia*’

Note that the dorsal abdominal setae in the original illustration of *Brueelia plocea* have been translocated to the ventral side (Lakshminarayana 1968). No dorsal setae are given in the original description (*ibid.*: table II), but multiple setae are illustrated on some segments; we interpret all setae on these segments except the *sts* as dorsal setae. The female of *B. plocea* is undescribed.

- | | |
|--|--|
| 1. Male | 2 |
| – Female | 9 |
| 2. <i>Accessory post-spiracular setae</i> present on tergopleurite V (Fig. 9) | 3 |
| – <i>Accessory post-spiracular setae</i> absent on tergopleurite V (Fig. 23) | 6 |
| 3. <i>Tergal posterior setae</i> present on tergopleurites V–VI | 4 |
| – <i>Tergal posterior setae</i> absent on tergopleurites V–VI (Fig. 9) | 5 |
| 4. Frons rounded; <i>aps</i> present on tergopleurite IV | |
| <i>Brueelia queleae</i> Sychra & Barlev in Sychra <i>et al.</i> , 2010a | |
| – Frons flattened; <i>aps</i> absent on tergopleurite IV | <i>Brueelia cantans</i> Sychra in Sychra <i>et al.</i> , 2010b |
| 5. <i>Tergal posterior setae</i> present on tergopleurite VII (Fig. 9); dark pigmentation of subgenital plate limited to anterior margin (Figs 9, 40) | <i>Brueelia semiscalaris</i> sp. nov. |
| – <i>Tergal posterior setae</i> absent on tergopleurite VII; dark pigmentation of subgenital plate extensive along lateral margins, reaching distal end of subgenital plate | <i>Brueelia aguilarae</i> Gustafsson & Bush, 2017 |
| 6. Preantennal head narrowly rounded | <i>Brueelia plocea</i> (Lakshminarayana, 1968) |
| – Preantennal head broad, frons either rounded or flattened (Fig. 25) | 7 |
| 7. <i>Tergal posterior setae</i> present on tergopleurite VI (Fig. 23) (absent in single examined specimen from <i>E. p. delamerei</i>); 2 <i>ps</i> on each side of abdominal segment IV (Fig. 23) | <i>Brueelia terpsichore</i> sp. nov. |
| – <i>Tergal posterior setae</i> absent on tergopleurite VI (Fig. 30); 1 <i>ps</i> on each side of abdominal segment IV (Fig. 30) | 8 |

8. Preantennal area roughly trapezoidal, with flattened frons (Fig. 32); *tps* present on tergopleurite VII (Fig. 30) *Brueelia sima* sp. nov.
 – Preantennal area roughly semioval, with rounded frons; *tps* absent on tergopleurite VII
 *Brueelia mpumalangensis* Gustafsson *et al.*, 2018
9. Frons rounded 10
 – Frons flattened (Fig. 31) 11
10. Subgenital plate largely translucent, with lateral areas of dark pigmentation clearly separated from anterior band of dark pigmentation *Brueelia queleae* Sychra & Barlev in Sychra *et al.*, 2010a
 – Subgenital plate largely dark, with lateral and anterior sections of dark pigmentation fused
 *Brueelia mpumalangensis* Gustafsson *et al.*, 2018
11. *Pleural setae* present on abdominal segment IV (Fig. 10) 12
 – *Pleural setae* absent on abdominal segment IV (Fig. 31) *Brueelia sima* sp. nov.
12. Subgenital plate with largely dark pigmentation apart from a central more or less T-shaped translucent fenestra (sections of this fenestra may be interrupted as in Fig. 29) 13
 – Subgenital plate largely translucent, but with central arched section of dark pigmentation connected to anterior band of dark pigmentation as in Figs 15, 39 *Brueelia semiscalaris* sp. nov.
13. Vulval margin with distinct median point *Brueelia aguilarae* Gustafsson & Bush, 2017
 – Vulval margin without distinct median point (Fig. 29) 14
14. Subgenital plate almost entirely dark, with translucent areas small and isolated from each other (Figs 29, 41) *Brueelia terpsichore* sp. nov.
 – Subgenital plate with clear central T-shaped translucent fenestrum
 *Brueelia cantans* Sychra in Sychra *et al.*, 2010b

Brueelia pofadderensis sp. nov.

[urn:lsid:zoobank.org:act:374AAEBC-FB7D-455F-86A9-D3BC2360AD78](https://doi.org/10.3896/BI.2018.374AAEBC-FB7D-455F-86A9-D3BC2360AD78)

Figs 2–8, 37–38

Type host

Passer melanurus damarensis Reichenow, 1902 – Cape sparrow (Passeridae).

Type locality

Pofadder, Cape Province, South Africa.

Other hosts

Passer melanurus vicinus Clancey, 1958.

Diagnosis

Brueelia pofadderensis sp. nov. is a fairly typical species of *Brueelia* from hosts in the genus *Passer* Brisson, 1760. This informal group of *Brueelia* parasitizing *Passer* spp. is characterized by long, slender heads with convex lateral margins of the preantennal area, elongated parameres and the presence of *aps* but not *psps* on the male tergopleurite V. We have seen several undescribed species of this group (D.R. Gustafsson and S.E. Bush, in prep.), but the only described species in this group is *Brueelia cyclothorax* (Burmeister, 1838) (including *N. subtilis* Nitzsch in Giebel, 1874 and *B. obligata* Eichler, 1954). No adequate illustrations or descriptions of *B. cyclothorax* have been published, but partial illustrations

were published by Eichler (1954) and Złotorzycka (1964, 1977). Note that the illustration in Eichler (1954) of the female abdomen mixes dorsal and ventral setae and characters on the same side. The frons in his illustrations are also incorrectly illustrated, as the hyaline margin has collapsed in his specimens.

Brueelia pofadderensis sp. nov. can be separated from *B. cyclothorax* by the following characters: abdominal segment III in both sexes without *ps* in *B. pofadderensis* sp. nov. (Figs 2–3), but with 1 *ps* on each side in *B. cyclothorax*; male tergopleurite IV without *aps* in *B. pofadderensis* sp. nov. (Fig. 2), but with *aps* in *B. cyclothorax*; antero-lateral corners of mesosomal lobes blunt in *B. pofadderensis* sp. nov. (Figs 5–6), but acute in *B. cyclothorax*; distal section of mesosome almost square-shaped in *B. pofadderensis* sp. nov. (Figs 5–6), but with more convergent lateral margins in *B. cyclothorax*; parameres more elongated in *B. cyclothorax* than in *B. pofadderensis* sp. nov. (Fig. 7).

Etymology

The specific epithet is derived from the type locality.

Material examined

Holotype

SOUTH AFRICA • ♂, ex *Passer melanurus damarensis*; Cape Province, Pofadder; May 1949; R. Meinertzhagen leg.; NHML 19050.

Paratypes

SOUTH AFRICA • 3 ♂♂; same data as for holotype; NHML 19050.

UNKNOWN COUNTRY • 1 ♂, 1 ♀, ex *Passer melanurus demarensis*; locality unknown; Mar. 1913; J. Waterston Collection, formerly South Africa Museum; British Museum; NHML 1930-232.

Other material

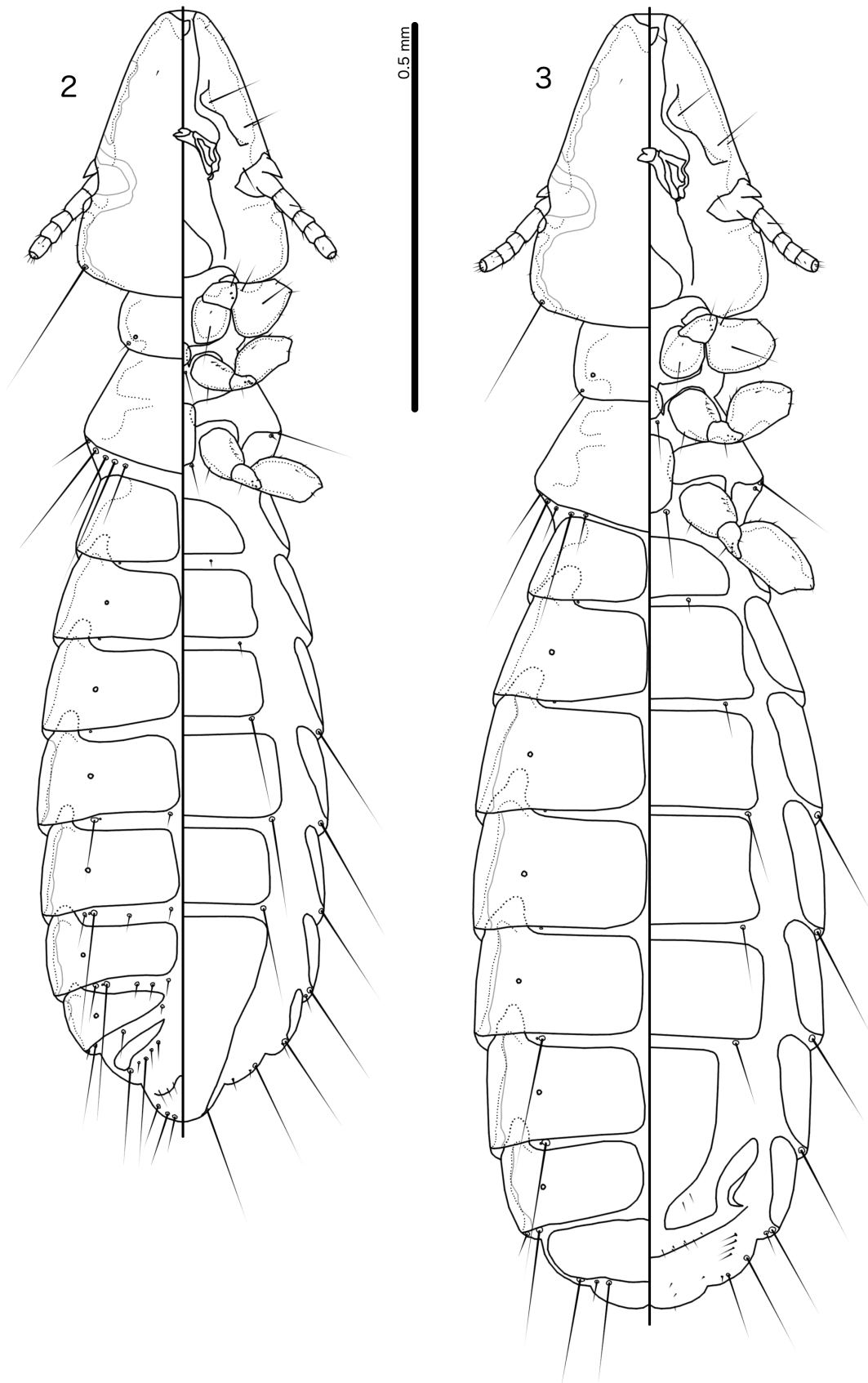
SOUTH AFRICA • 1 ♂, 1 ♀, ex *Passer melanurus vicinus*; West Transvaal, Potchefstroom; May 1953; British Museum; NHML 1955-660 • 2 ♂♂, 1 ♀, ex *Passer melanurus vicinus*; Transvaal, Ventersdorp; 12 Jul. 1954; H.E. Paterson leg.; British Museum; NHML 1955-660.

Description

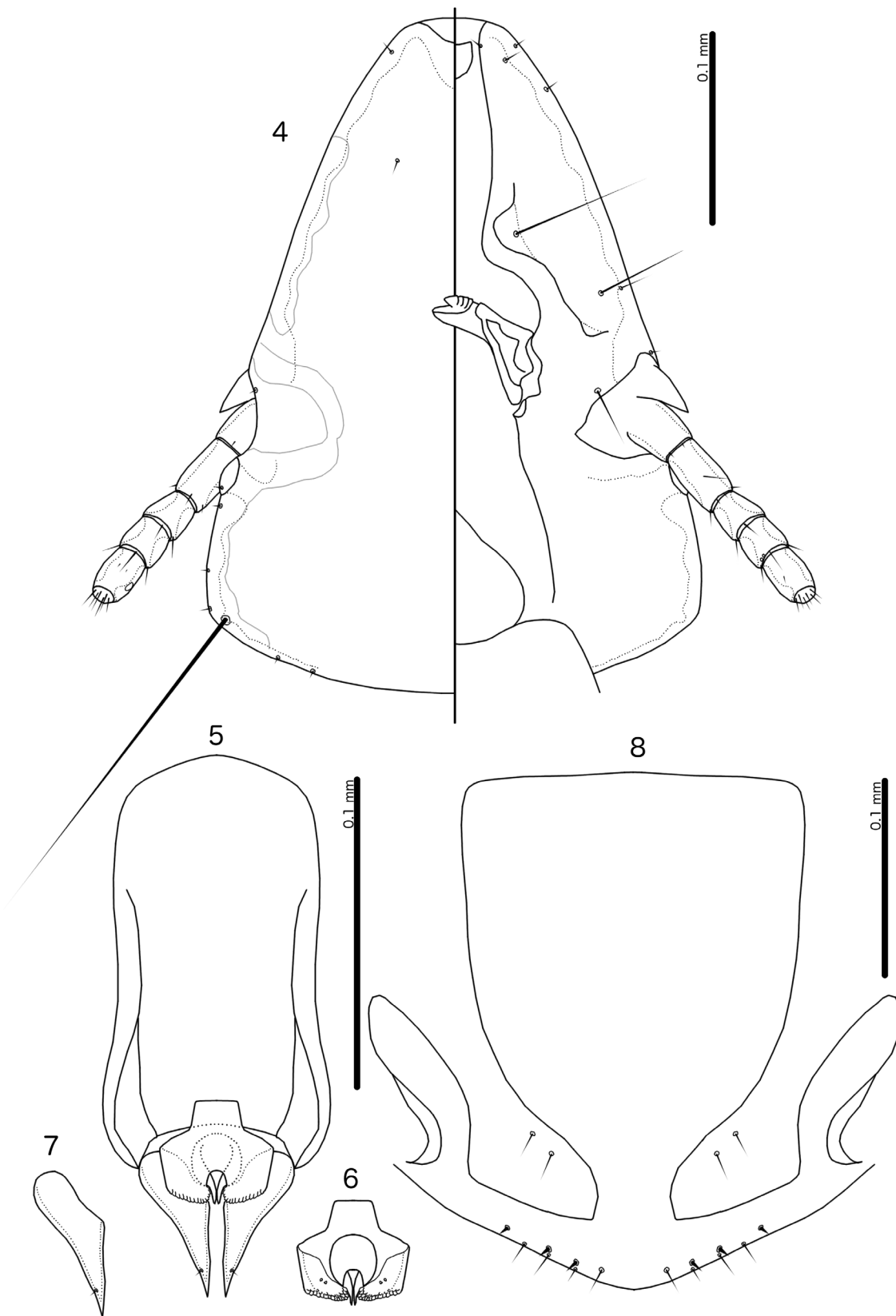
Head slenderly rounded, dome-shaped (Fig. 4), lateral margins of preantennal area convex, frons slightly convex. Marginal carina narrow, with shallowly undulating median margins, displaced and widened at oculus. Ventral anterior plate large, with flat to shallowly concave anterior margin. Head chaetotaxy and pigmentation patterns as in Fig. 4; head sensilla and *pts* not visible in examined specimens. Pre- and postocular nodi of similar size. Marginal temporal carina slender, with undulating median margin. Gular plate broad, lanceolate. Thoracic and abdominal segments and pigmentation patterns as in Figs 2–3, 37–38.

Male

Thoracic and abdominal chaetotaxy as in Fig. 2; 1–2 *tps* on tergopleurite VI. Basal apodeme broad, with shallowly concave lateral margins (Fig. 5). Proximal mesosome broadly trapezoidal, widening slightly distally (Fig. 6). Mesosomal lobes wide, angular, with extensive rugose area along distal margin. Gonopore oval, slightly longer than wide. Penile arms reach beyond distal margin of mesosome. Parameres slender, elongated distally (Fig. 7); *pst1–2* as in Fig. 7. Measurements ex *P. m. damarensis* (n = 5): TL = 1.30–1.40; HL = 0.34–0.35; HW = 0.26–0.27; PRW = 0.16–0.18; PTW = 0.27; AW = 0.35–0.38. Measurements ex *P. m. vicinus* (n = 3): TL = 1.39–1.51; HL = 0.34–0.36; HW = 0.26–0.30; PRW = 0.16–0.19; PTW = 0.27–0.31; AW = 0.36–0.41.



Figs 2–3. *Brueelia pofadderensis* sp. nov. ex *Passer melanurus damarensis* Reichenow, 1902. **2.** ♂, holotype (NHML 19050), habitus, dorsal and ventral views. **3.** ♀, habitus, dorsal and ventral views.



Figs 4–8. *Brueelia pofadderensis* sp. nov. ex *Passer melanurus damarensis* Reichenow, 1902. 4–7. ♂, holotype (NHML 19050). 4. Head, dorsal and ventral views. 5. Genitalia, dorsal view. 6. Mesosome, ventral view. 7. Paramere, dorsal view. 8. ♀, subgenital plate and vulval margin, ventral view.

Female

Thoracic and abdominal chaetotaxy as in Fig. 3. Subgenital plate rounded trapezoidal, with moderately wide connection to cross piece (Fig. 8). Vulval margin convergent to rounded median point, in specimen from type host subspecies with 2–3 short, slender *vms* and 3 short, thorn-like *vss* on each side; 3 short, slender *vos* on each side of subgenital plate; distal 1 *vos* median to *vss*. In material from *P. m. vicinus*, with 4 short, slender *vms* and 3–5 short, thorn-like *vss* on each side of vulval margin, and 2–3 short, slender *vos* on each side of subgenital plate, with distal 1 *vos* situated median to *vss*. Measurements ex *P. m. damarensis* (n = 1): TL = 1.66; HL = 0.40; HW = 0.30; PRW = 0.20; PTW = 0.31; AW = 0.46. Measurements ex *P. m. vicinus* (n = 2): TL = 1.69–1.81; HL = 0.37–0.40; HW = 0.29–0.34; PRW = 0.17–0.21; PTW = 0.29–0.33; AW = 0.40–0.47.

Remarks

Specimens from the Transvaal host subspecies, *Passer melanurus vicinus*, differ from the specimens from the type host subspecies by having proportionately shorter and more rounded preantennal heads, in size and in the female genital chaetotaxy; the latter character may be different only due to the small number of specimens examined. The male genitalia and abdominal chaetotaxy are essentially similar between the two populations. We presently do not consider these differences substantial enough to warrant the erection of a new taxon for the specimens from Transvaal, but note that in some other cases, different host subspecies are parasitized by different species of *Brueelia* (D.R. Gustafsson and S.E. Bush, in prep.).

***Brueelia semiscalaris* sp. nov.**

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Figs 9–15, 39–40

Type host

Granatina granatina (Linnaeus, 1766) – violet-eared waxbill (Estrildidae).

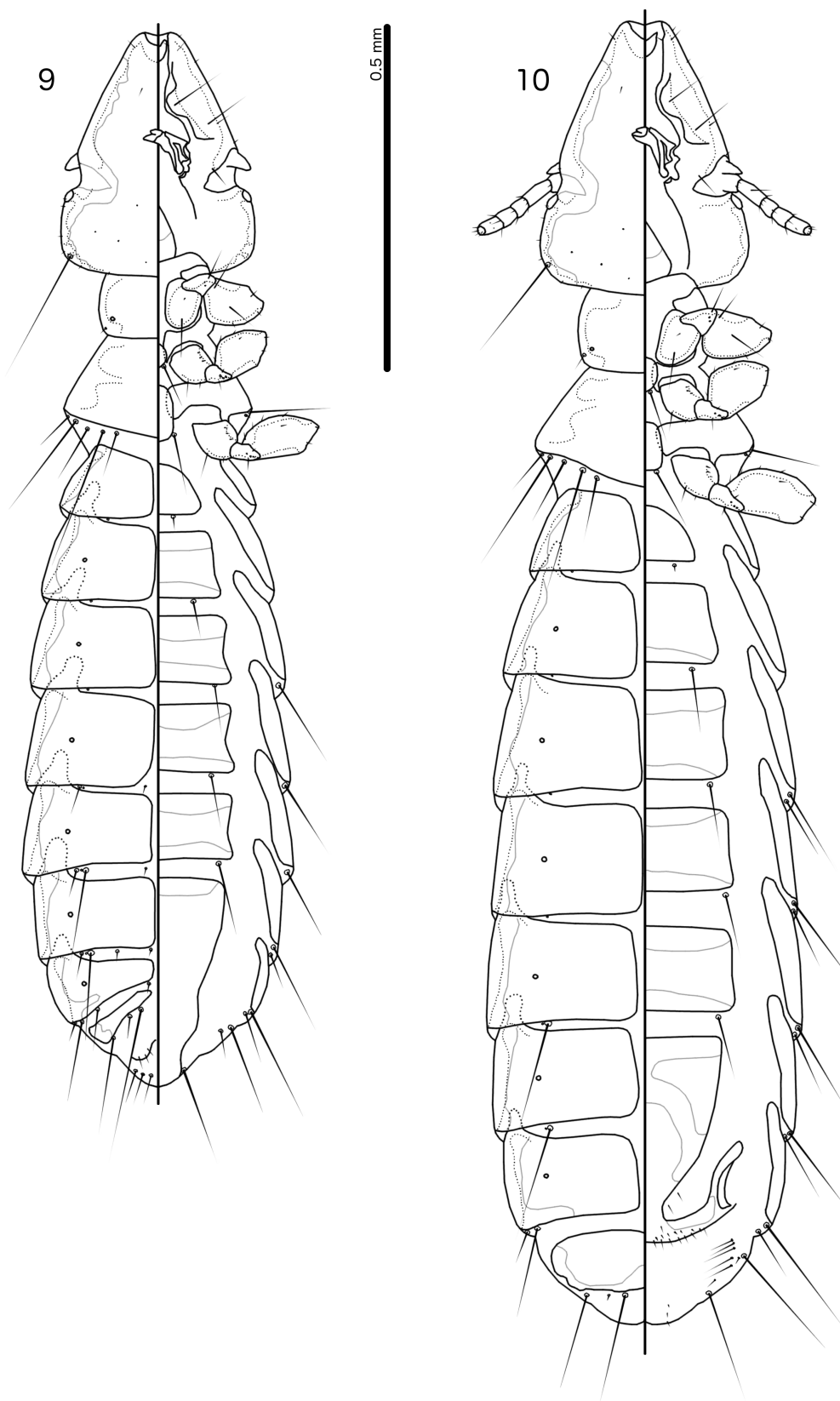
Type locality

Mahalapye, Botswana.

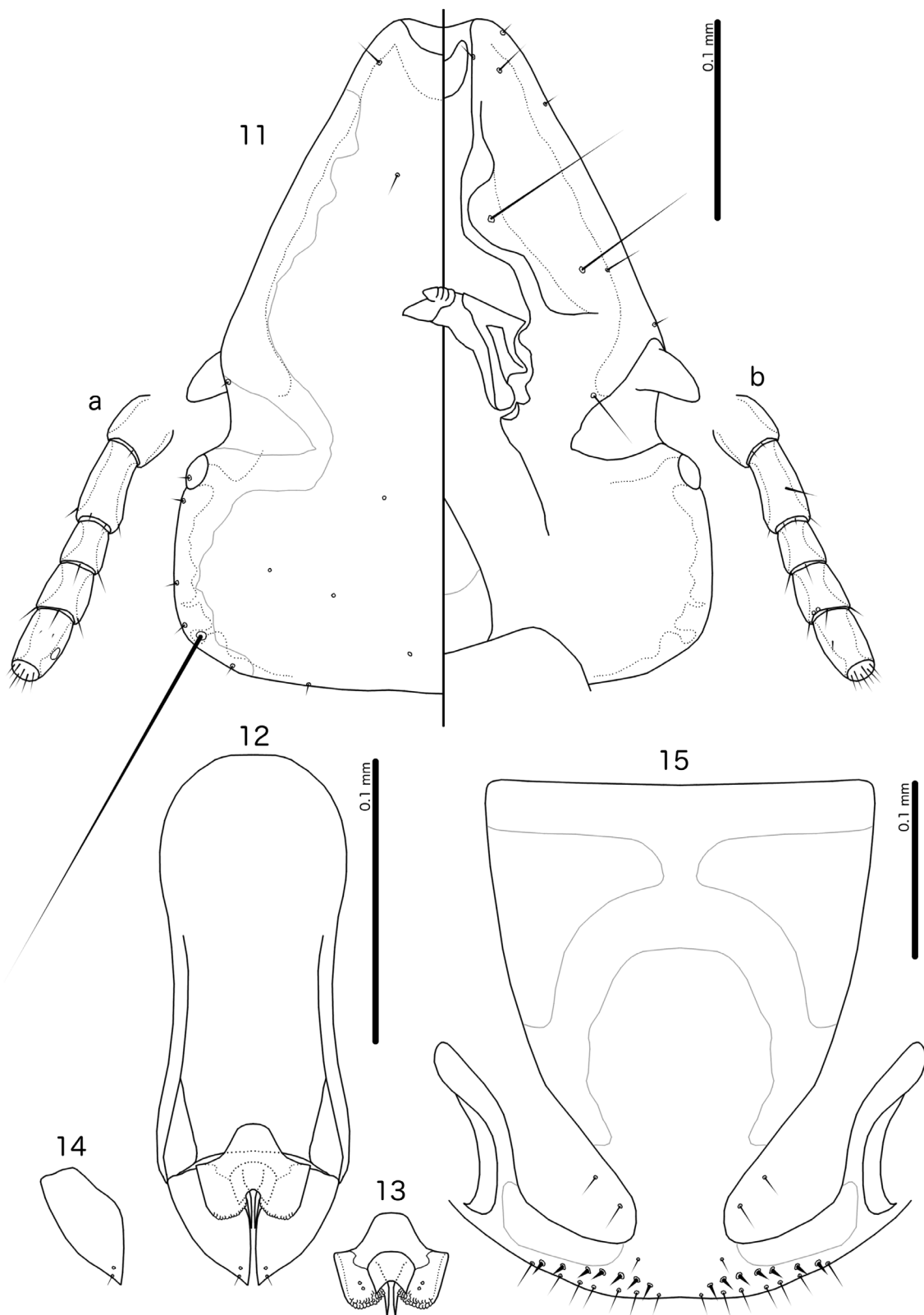
Diagnosis

Brueelia semiscalaris sp. nov. belongs to the “African pied *Brueelia*” group (see above), but is the palest described member of this group. Within this group, *B. semiscalaris* sp. nov. is most similar to *B. aguilarae* Gustafsson & Bush, 2017, with which it shares the following characters: head relatively slender (Fig. 11), with flattened frons and only slightly convex lateral margins of the preantennal area; mesosome with nearly parallel lateral margins and somewhat angular postero-lateral corners (Fig. 13); *aps* absent on male tergopleurite IV (Fig. 9); *tps* absent on male tergopleurites V–VI (Fig. 9); *ps* present on female abdominal segment IV (Fig. 10).

Brueelia semiscalaris sp. nov. can be separated from *B. aguilarae* by the following characters: *tps* present on male tergopleurite VII in *B. semiscalaris* sp. nov. (Fig. 9), but absent in *B. aguilarae*; parameres broad and roughly oval in *B. semiscalaris* sp. nov. (Fig. 14), but slender and elongated in *B. aguilarae*; proximal mesosome with convex lateral margins in *B. aguilarae*, but with concave lateral margins in *B. semiscalaris* sp. nov. (Fig. 13); gonopore about as long as wide and penile arms reaching beyond distal margin of mesosome in *B. semiscalaris* sp. nov. (Fig. 13), but gonopore very short and penile arms not reaching posterior margin of mesosome in *B. aguilarae*; female subgenital plate with central translucent, T-shaped fenestra in *B. aguilarae*, but with arched central dark pigmentation in *B. semiscalaris* sp. nov.



Figs 9–10. *Brueelia semiscalaris* sp. nov. ex *Granatina granatina* (Linnaeus, 1766). **9.** ♂, holotype (NHML 1956-561), habitus, dorsal and ventral views. Antennae distorted in original, and not illustrated. **10.** ♀, habitus, dorsal and ventral views.



Figs 11–15. *Brueelia semiscalaris* sp. nov. ex *Granatina granatina* (Linnaeus, 1766). **11–14.** ♂, holotype (NHML 1956-561). **11.** Head, dorsal and ventral views; **a–b.** Antennae from ♀, dorsal and ventral views. **12.** Genitalia, dorsal view. **13.** Mesosome, ventral view. **14.** Paramere, dorsal view. **15.** ♀, subgenital plate and vulval margin, ventral view.

(Figs 15, 39); vulval margin with flattened median section in *B. semiscalaris* sp. nov. (Fig. 15), but with median point in *B. aguilarae*.

Etymology

The specific epithet is derived from the Latin ‘*semi*’ for ‘partial, incomplete’ and ‘*scalaris*’ for ‘ladder’, referring to the pigmentation pattern of the abdomen.

Type material

Holotype

BOTSWANA • ♂; Bechuanaland (= Botswana), Mahalapye; 21 Dec. 1955; British Museum; NHML 1956-561.

Paratype

BOTSWANA • ♀; same data as for holotype.

Description

Head rounded trapezoidal (Fig. 11), lateral margins of preantennal area slightly convex proximally and slightly concave distally, frons concave. Marginal carina moderate, deeply displaced and much widened at osculum, with almost even median margin. Ventral anterior plate large, with deeply concave anterior margin. Head chaetotaxy and pigmentation patterns as in Fig. 11. Preantennal nodi elongated. Preocular nodi much larger than postocular nodi. Marginal temporal carina moderate in width, with undulating median margin. Gular plate slender, lanceolate. Thoracic and abdominal segments and pigmentation patterns as in Figs 9–10, 39–40.

Male

Antennae folded ventrally in single examined male and cannot be illustrated accurately. Seemingly similar to female antennae (Fig. 11a–b) in shape and proportions, but paler. Thoracic and abdominal chaetotaxy as in Fig. 9; *aps* present on tergopleurite V; *tps* present on tergopleurite VII. Proximal basal plate almost entirely translucent, exact extent hard to ascertain; here illustrated tentatively (Fig. 12); slender with concave lateral margins. Proximal mesosome rounded trapezoidal, rather broad (Fig. 13). Mesosomal lobes with nearly parallel lateral margins and somewhat angular postero-lateral corners; rugose area extensive at distal end. Gonopore arched, about as wide as long. Penile arms long, reaching beyond distal margin of mesosome. Parameres broadly oval, not much elongated distally, with *pst1–2* as in Fig. 14. Measurements (n = 1): TL = 1.51; HL = 0.35; HW = 0.28; PRW = 0.18; PTW = 0.28; AW = 0.38.

Female

Thoracic and abdominal chaetotaxy as in Fig. 10; *ps* present on abdominal segment IV. Subgenital plate rounded triangular, with broad connection to cross piece and unique pigmentation pattern (Fig. 15). Vulval margin flattened, median section somewhat concave, with 6–7 short, slender *vms* and 7–8 short, thorn-like *vss* on each side; 3 short, slender *vos* on each side of subgenital plate; distal 1 *vos* just anterior to *vss*. Measurements (n = 1): TL = 1.91; HL = 0.40; HW = 0.31; PRW = 0.20; PTW = 0.32; AW = 0.46.

Brueelia bicurvata (Piaget, 1880)

Figs 16–22

Nirmus bicurvatus Piaget, 1880: 159, pl. 13, fig. 8.

Degeeriella bicurvata – Harrison 1916: 109.

Brueelia bicurvata – Hopkins & Clay 1952: 53. — Gustafsson & Bush 2017: 38.

Type host

Vidua paradisaea (Linnaeus, 1758) – long-tailed paradise whydah (Ploceidae).

Type locality

Original material from the Leiden Museum, but no type locality given by Piaget (1880).

Material examined

ZAMBIA • 2 ♂♂, 2 ♀♀, ex *Vidua paradisaea obtusa*; North Rhodesia [= Zambia], Luanshya; 26 May 1955; British Museum; NHML 1955-486, ML/121.

Description

Head rounded trapezoidal (Fig. 18), lateral margins of preantennal area slightly convex proximally, but slightly concave distally, frons broadly flattened to slightly concave. Marginal carina slender, deeply displaced and much widened at osculum, and with median margin slightly undulating. Ventral anterior plate oblong, with rounded posterior margin. Head chaetotaxy and pigmentation pattern as in Fig. 18. Preantennal nodi elongated. Preocular nodi larger than postocular nodi. Marginal temporal carina slender, with slightly undulating median margin. Gular plate slenderly lanceolate. Thoracic and abdominal segments and pigmentation patterns as in Figs 16–17.

Male

Male subgenital plate does not reach terminal end of abdomen (Fig. 16). Thoracic and abdominal chaetotaxy as in Fig. 16. Basal apodeme broad, with concave lateral margins (Fig. 19). Proximal mesosome broad, convergent to median point, and with lateral extensions, making entire structure somewhat arrow-shaped (Fig. 20). Mesosomal lobes long and broad, with almost parallel lateral margins, rounded postero-lateral corners, and extensive rugose area along distal margin. Gonopore roughly semi-oval, about as long as wide. Penile arms long, reaching beyond distal margin of mesosome. Parameres long and broad, distal section elongated, with *pstl*-2 as in Fig. 21. Measurements (n = 2): TL = 1.48–1.51; HL = 0.36; HW = 0.30; PRW = 0.20; PTW = 0.29–0.31; AW = 0.40–0.41.

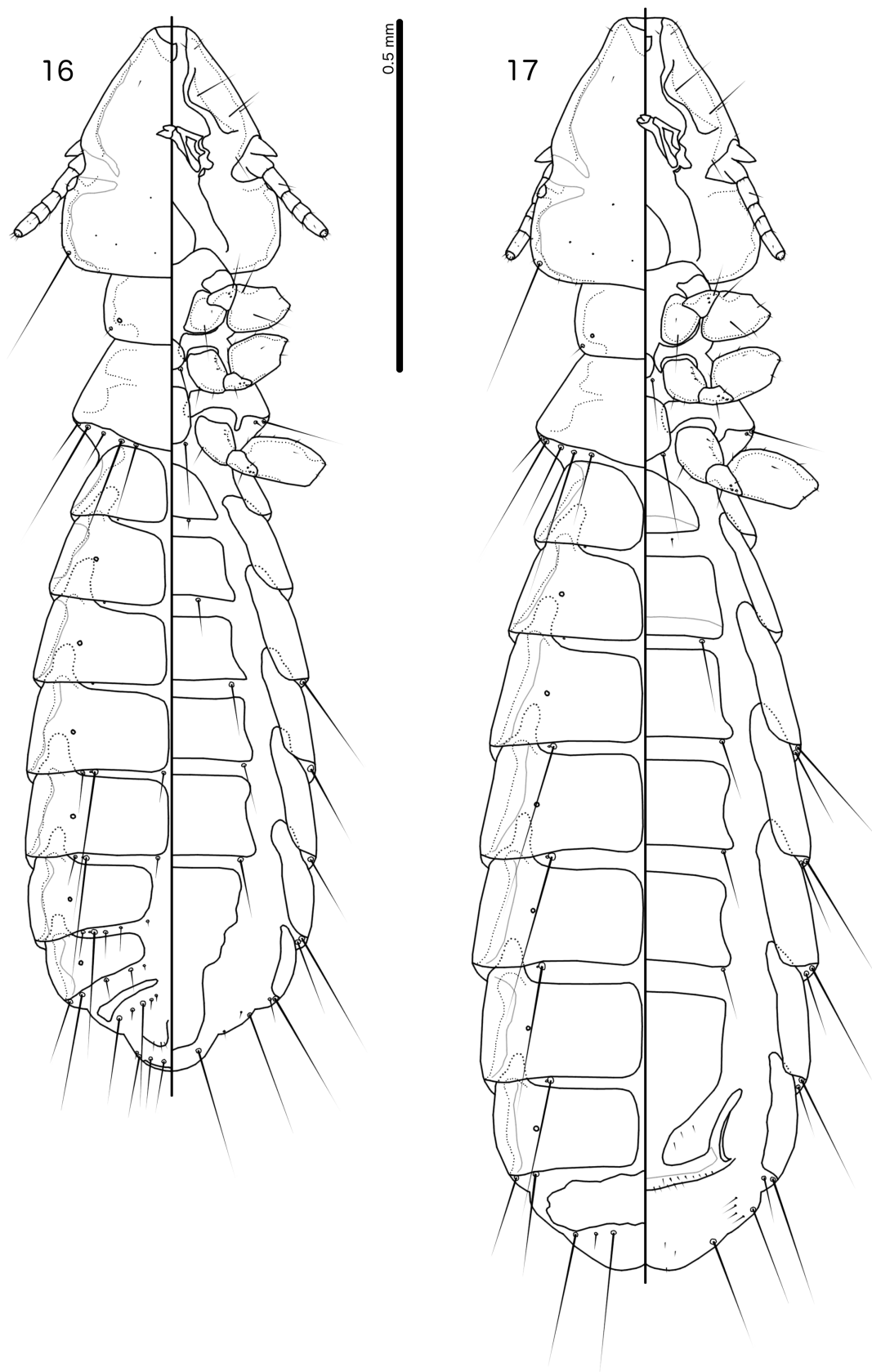
Female

Thoracic and abdominal chaetotaxy as in Fig. 17; *psps* present on tergopleurites IV–VII. Subgenital plate shaped as in Fig. 22, with broad connection to cross piece. Vulval margin somewhat convergent to median point, with 3–5 short, slender *vms* and 5–8 short, thorn-like *vss* on each side; 2–4 short, slender *vos* on each side of subgenital plate; distal 1 *vos* median to *vss*. Measurements (n = 2): TL = 1.76–1.81; HL = 0.37–0.39; HW = 0.31–0.34; PRW = 0.20–0.21; PTW = 0.30–0.33; AW = 0.44–0.47.

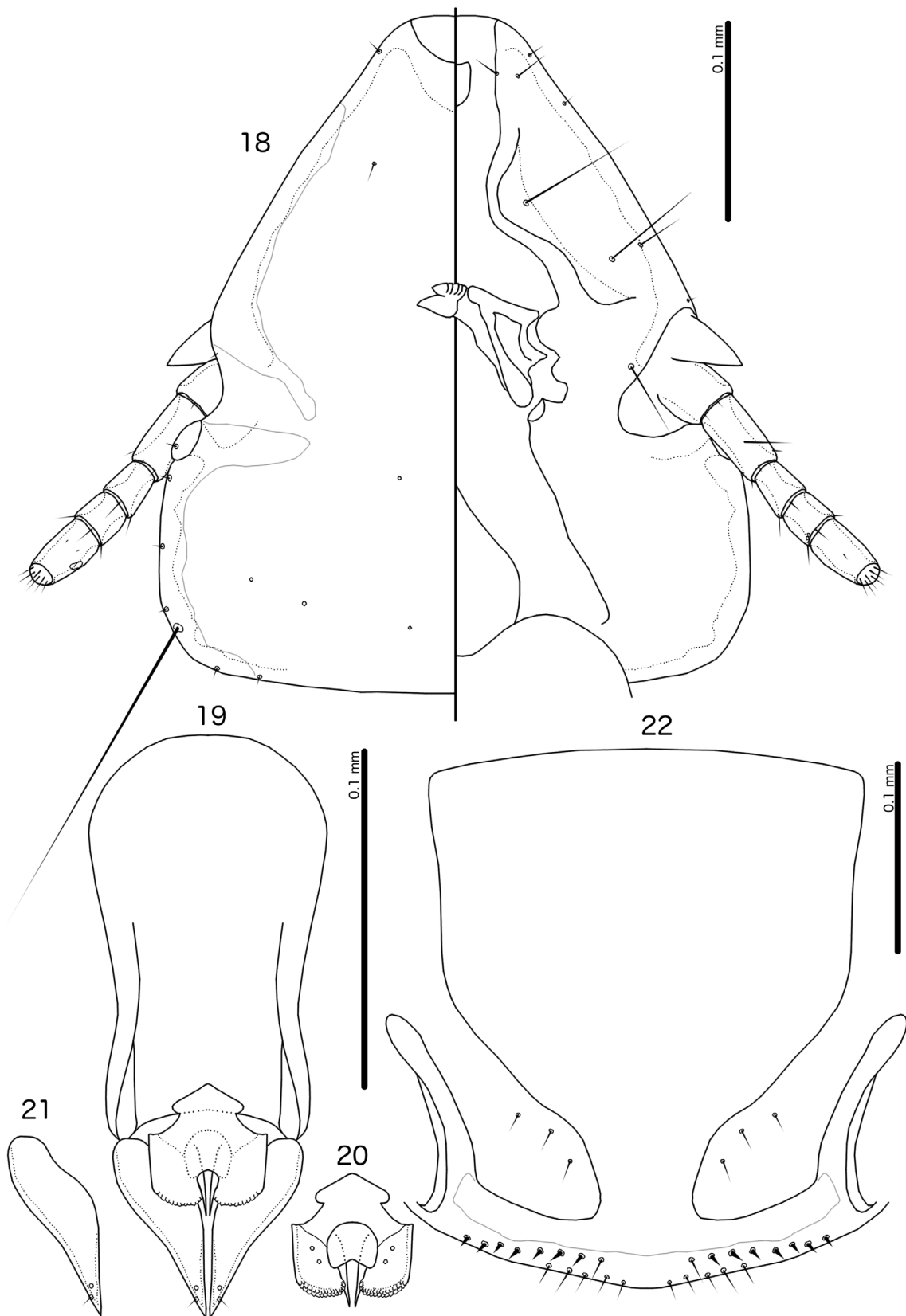
Remarks

The presence of *psps* on the female tergopleurites IV–V is unusual in *Brueelia*. No examples of females with *psps* on these segments were included in the list of variation in abdominal chaetotaxy of *Brueelia* published by Gustafsson & Bush (2017: table 3). We know of no other species of *Brueelia* in which *psps* are present on the female tergopleurite IV, but *psps* are present on the female tergopleurite V in several species of *Brueelia* found on icterid hosts (Cicchino & Castro 1996). Carriker (1963) illustrated setae on female tergopleurites III–VII in the position of *psps* in *B. mirabile* Carriker, 1963, but did not illustrate any *sts*. It is therefore doubtful whether these setae represent *psps* or *sts* translocated to the dorsal side; we have not examined Carriker's material. In females of most genera in the *Brueelia* complex, *psps* are absent on tergopleurites IV–V, and the general absence of these setae in *Brueelia* (except in *B. bicurvata*) is unusual for the complex (Gustafsson & Bush 2017: table 2).

A specimen of *Brueelia* from *Vidua macroura* was included in the phylogeny of Bush *et al.* (2016), but its placement as sister to the remaining *Brueelia* s. str. received no statistical support. As *psps* are



Figs 16–17. *Brueelia bicurvata* (Piaget, 1880) ex *Vidua paradisaea* (Linnaeus, 1758) (NHML 1955-486, ML/121). **16.** ♂, habitus, dorsal and ventral views. **17.** ♀, habitus, dorsal and ventral views.



Figs 18–22. *Brueelia bicurvata* (Piaget, 1880) ex *Vidua paradisaea* (Linnaeus, 1758) (NHML 1955-486, ML/121). **18.** ♂, head, dorsal and ventral views. **19.** ♂, genitalia, dorsal view. **20.** ♂, mesosome, ventral view. **21.** ♂, paramere, dorsal view. **22.** ♀, subgenital plate and vulval margin, ventral view.

commonly found on female tergopleurites IV–V in many other genera of the *Brueelia* complex (see Gustafsson & Bush 2017), it is possible that this represents the ancestral condition in the *Brueelia* complex, and that this placement as sister to the remaining *Brueelia* is correct.

Notably, these setae are present in both *Formicaphagus* Carriker, 1957 (see Price & Clayton 1996) and *Formicaticola* Carriker, 1957 (see Price & Clayton 1995), two of the genera most closely related to the *Brueelia* complex in the phylogeny of Bush *et al.* (2016). In the closest relative, *Neopsittaconirmus* Conci, 1942, the distribution of *psps* varies, e.g., present on III–VII in *N. albus* (Le Souëf & Bullen, 1902) (Price & Emerson 1978), but present only on IV–V in many species (Guimarães 1974) and only on IV in *N. gracilis* Guimarães, 1974 (see also Sychra 2005).

***Brueelia terpsichore* sp. nov.**

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Figs 23–29, 41–42

Type host

Euplectes jacksoni (Sharpe, 1891) – Jackson’s widowbird (Ploceidae).

Type locality

Kenya.

Other host

Euplectes progne delamerei (Shelley, 1903) – long-tailed widowbird.

Diagnosis

Brueelia terpsichore sp. nov. belongs to the informal ‘African pied *Brueelia*’ group (see above). Within this group, *B. terpsichore* sp. nov. is not particularly similar to any species. The extensive dark pigmentation of the sternites and subgenital plates of both sexes, the abdominal chaetotaxy, and the head shape suggests that *B. aguilarae* may be the closest relative of *B. terpsichore* sp. nov. These two species can be separated by the following characters: *tps* present on male tergopleurites VI–VIII in *B. terpsichore* sp. nov. (Fig. 23), but absent in *B. aguilarae*; male abdominal segment IV with 2 *ps* on each side in *B. terpsichore* sp. nov. (Fig. 23), but with 1 *ps* on each side in *B. aguilarae*; *aps* absent on male tergopleurite V in *B. terpsichore* sp. nov. (Fig. 23), but present in *B. aguilarae*; proximal mesosome broadly rounded in *B. aguilarae*, but trapezoidal in *B. terpsichore* sp. nov. (Fig. 27); translucent fenestra of female subgenital plate T-shaped in *B. aguilarae*, but divided into smaller, isolated fenestrae in *B. terpsichore* sp. nov. (Figs 29, 41; note that there is some variation between specimens in this species); vulval margin gently rounded in *B. terpsichore* sp. nov. (Fig. 29), but convergent to median point in *B. aguilarae*.

Etymology

The specific epithet is in honor of the Greek muse Terpsichore, goddess of dance; ultimately from the Greek ‘*terpo*’ for ‘I delight’ and ‘*khoros*’ for ‘dance’. This refers to the peculiar lekking behaviour of the type host, which includes the construction of a small stage on which the male dances by jumping high into the air and singing to attract females (Andersson 1989, 1991).

Material examined

Holotype

KENYA • ♂, ex *Euplectes jacksoni* (as *Drepanoplectes jacksoni*); Kenya; Jan. 1936; R. Meinertzhagen leg.; NHML 6084 (lower male on slide).

Paratypes

KENYA • 2 ♂♂, 10 ♀♀; same data as for holotype; NHML 6081, 6082, 6084 (not lower male on slide), 6210.

Other material

KENYA • 1 ♂, 1 ♀, ex *Euplectes progne delamerei* (as *Drepanoplectes progne delamerei*); Kenya; Jan. 1936; R. Meinertzhagen leg.; NHML 6714.

Description

Head rounded trapezoidal (Fig. 25), lateral margins of preantennal area slightly convex or almost straight, frons broadly flattened. Marginal carina broad, deeply displaced and much widened at osculum, with undulating median margin. Ventral anterior plate not visible. Head chaetotaxy and pigmentation pattern as in Fig. 25. Preantennal nodi large, bulging. Pre- and postocular nodi large. Marginal temporal carina broad, with distinctly undulating median margin. Gular plate slender, lanceolate. Thoracic and abdominal segments and pigmentation patterns as in Figs 23–24, 41–42.

Male

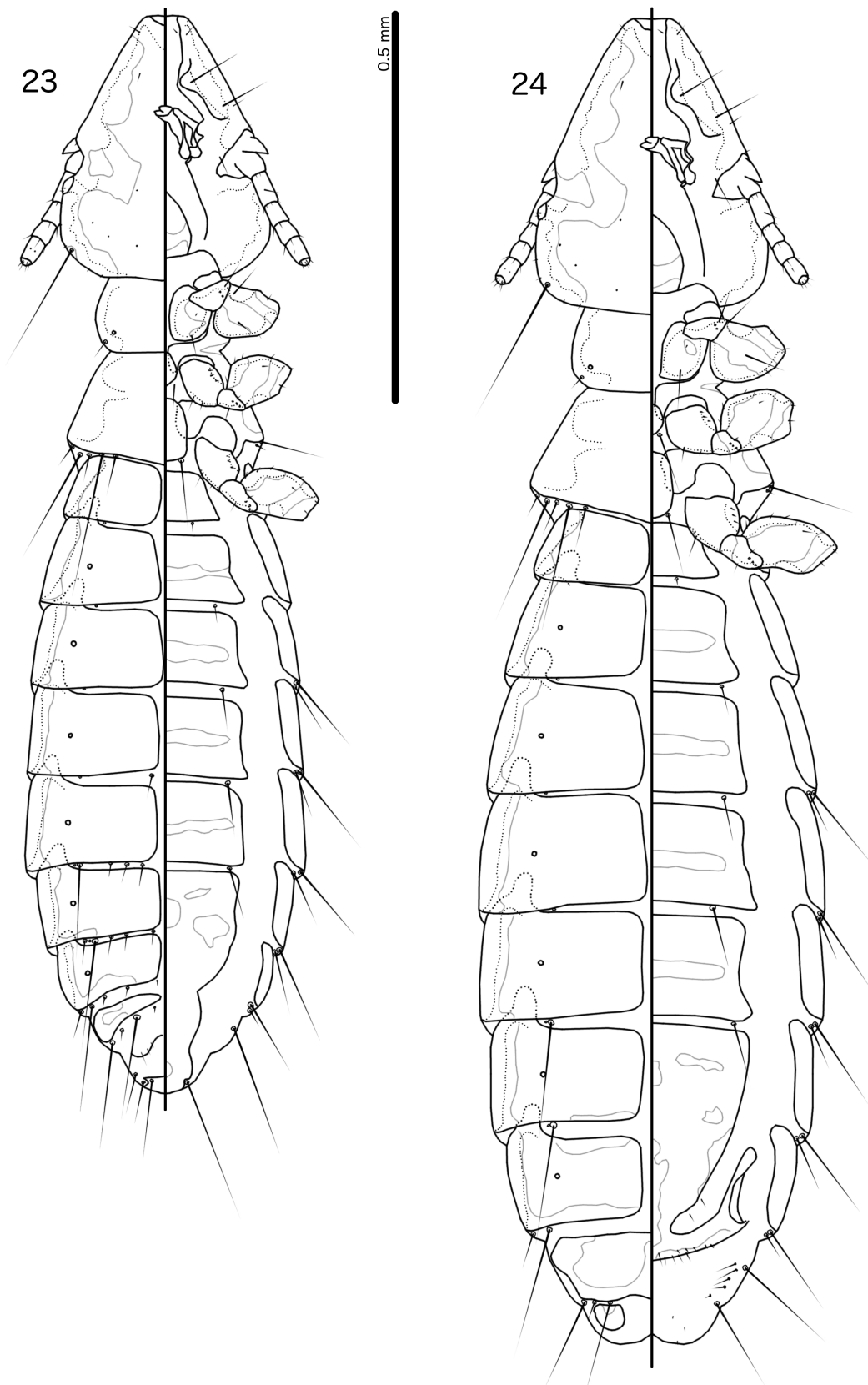
Thoracic and abdominal chaetotaxy as in Fig. 23. Anterior section of basal apodeme not pigmented and cannot be seen clearly in examined specimens; illustration here is approximate (Fig. 26). Proximal mesosome rounded trapezoidal, widening distally, with concave lateral margins (Fig. 27). Mesosomal lobes relatively slender, rounded distally, with rugose area limited to distal margin. Gonopore crescent-shaped, slightly wider than long. Penile arms short, not reaching beyond distal margin of mesosome. Parameres elongated, tapering gently (Fig. 28); *pst1–2* as in Fig. 28. Measurements ex *Euplectes jacksoni* (n = 3): TL = 1.42–1.48; HL = 0.33–0.34; HW = 0.26–0.28; PRW = 0.19; PTW = 0.26–0.27; AW = 0.36–0.37. Measurements ex *E. progne delamerei* (n = 1): TL = 1.44; HL = 0.34; HW = 0.26; PRW = 0.19; PTW = 0.27; AW = 0.35.

Female

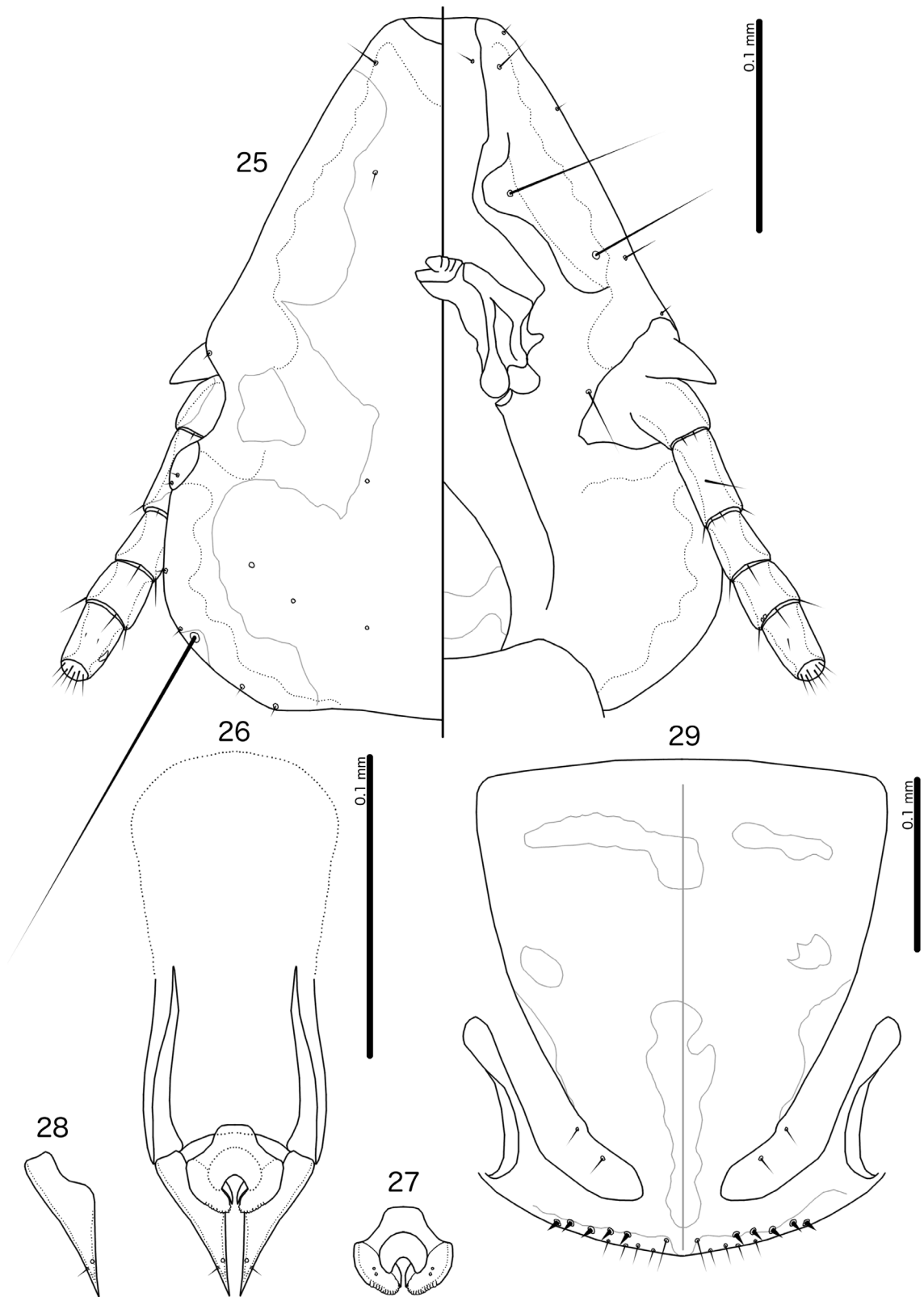
Thoracic and abdominal chaetotaxy as in Fig. 24. Pigmentation pattern of subgenital plate differing slightly between specimens; two variants shown in Fig. 29 (separated by grey line), one with antero-lateral fenestra connected to antero-median fenestra and one with these fenestrae unconnected. Antero-median fenestra generally pale brown in pigmentation, may extend posteriorly to approach postero-median fenestra (not shown). Exact shape of postero-lateral fenestrae and translucent lateral borders of distal subgenital plate also differ between specimens. Subgenital plate rounded triangular, with moderate connection to cross piece. Vulval margin gently rounded, with 3–5 short, slender *vms* and 4–6 short, thorn-like *vss* on each side; 2–3 short, slender *vos* on each side of subgenital plate; distal 1 *vos* median to *vss*. Material from both host species with same vulval chaetotaxy. Measurements ex *Euplectes jacksoni* (n = 10): TL = 1.58–1.73 (1.66); HL = 0.36–0.38 (0.37); HW = 0.28–0.31 (0.30); PRW = 0.19–0.22 (0.21); PTW = 0.28–0.31 (0.30); AW = 0.40–0.44 (0.42). Measurements ex *E. progne delamerei* (n = 1): TL = 1.73; HL = 0.37; HW = 0.30; PRW = 0.21; PTW = 0.31; AW = 0.40.

Remarks

No significant differences have been found between specimens from the two host species, except that the single examined male from *Euplectes progne delamerei* lacks *tps* on tergopleurite VI. These are present in all specimens from the type host; however, the number varies between 1 and 2. As only one male from *E. p. delamerei* was examined, we presently do not attach any significance to this difference, as the *psps* on this segment is also missing on one side. The absence of these setae may thus be due to individual variation.



Figs 23–24. *Brueelia terpsichore* sp. nov. ex *Euplectes jacksoni* (Sharpe, 1891). **23.** ♂, holotype (NHML 6084), habitus, dorsal and ventral views. **24.** ♀, habitus, dorsal and ventral views.



Figs 25–29. *Brueelia terpsichore* sp. nov. ex *Euplectes jacksoni* (Sharpe, 1891). 25–28. ♂, holotype (NHML 6084). 25. Head, dorsal and ventral views. 26. Genitalia, dorsal view. 27. Mesosome, ventral view. 28. Paramere, dorsal view. 29. ♀, subgenital plate and vulval margin, ventral view.

Brueelia sima sp. nov.

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Figs 30–36, 43–44

Type host

Malimbus nitens (Gray, 1831) – blue-billed malimbe (Ploceidae).

Type locality

Batouri, Cameroon.

Diagnosis

Brueelia sima sp. nov. is part of the informal ‘African pied *Brueelia*’ group (see above). Within this group, *B. sima* sp. nov. does not appear to be particularly similar to any other species, but the head shape and proportions are most reminiscent of those in *B. cantans* Sychra in Sychra *et al.*, 2010. These two species can be separated by the following characters: in *B. cantans*, *aps* and *tps* are present on male tergopleurites V–VI, but they are absent in *B. sima* sp. nov. (Fig. 30); multiple *tps* are present on male tergopleurite VII in *B. cantans*, but only a single *tps* is present on this segment in males of *B. sima* sp. nov. (Fig. 30); the mesosome has angular postero-lateral corners in *B. cantans*, but has rounded postero-lateral corners in *B. sima* sp. nov. (Fig. 34); parameres less elongated in *B. sima* sp. nov. (Fig. 35) than in *B. cantans*; the female subgenital plate with an anterior transversal fenestra, interrupted medianly, and with a large central fenestra separated from the anterior transversal fenestra in *B. sima* sp. nov. (Figs 36, 43), but with all these fenestrae continuous in *B. cantans*.

Etymology

The specific epithet is derived from the Latin ‘*simus*’ for ‘snub-nosed’, referring to the relatively short and broad preantennal area of this species.

Type material

Holotype

CAMEROON • ♂; French Cameroons [= Cameroon], Batouri; 15 May 1959; J. Mouchet leg.; British Museum; NHML 1960-295.

Paratype

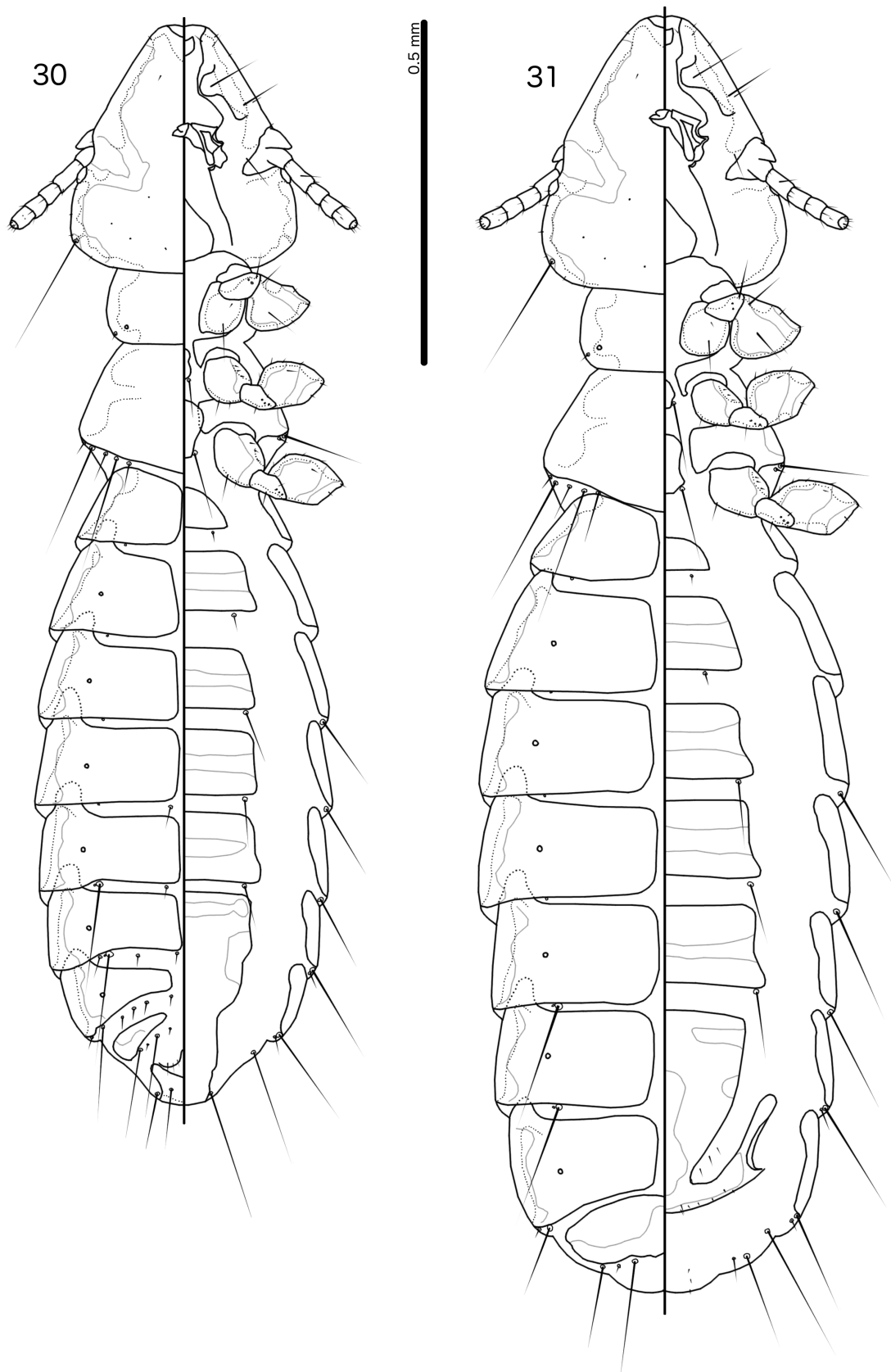
CAMEROON • ♀; same data as for holotype; NHML 1960-295.

Description

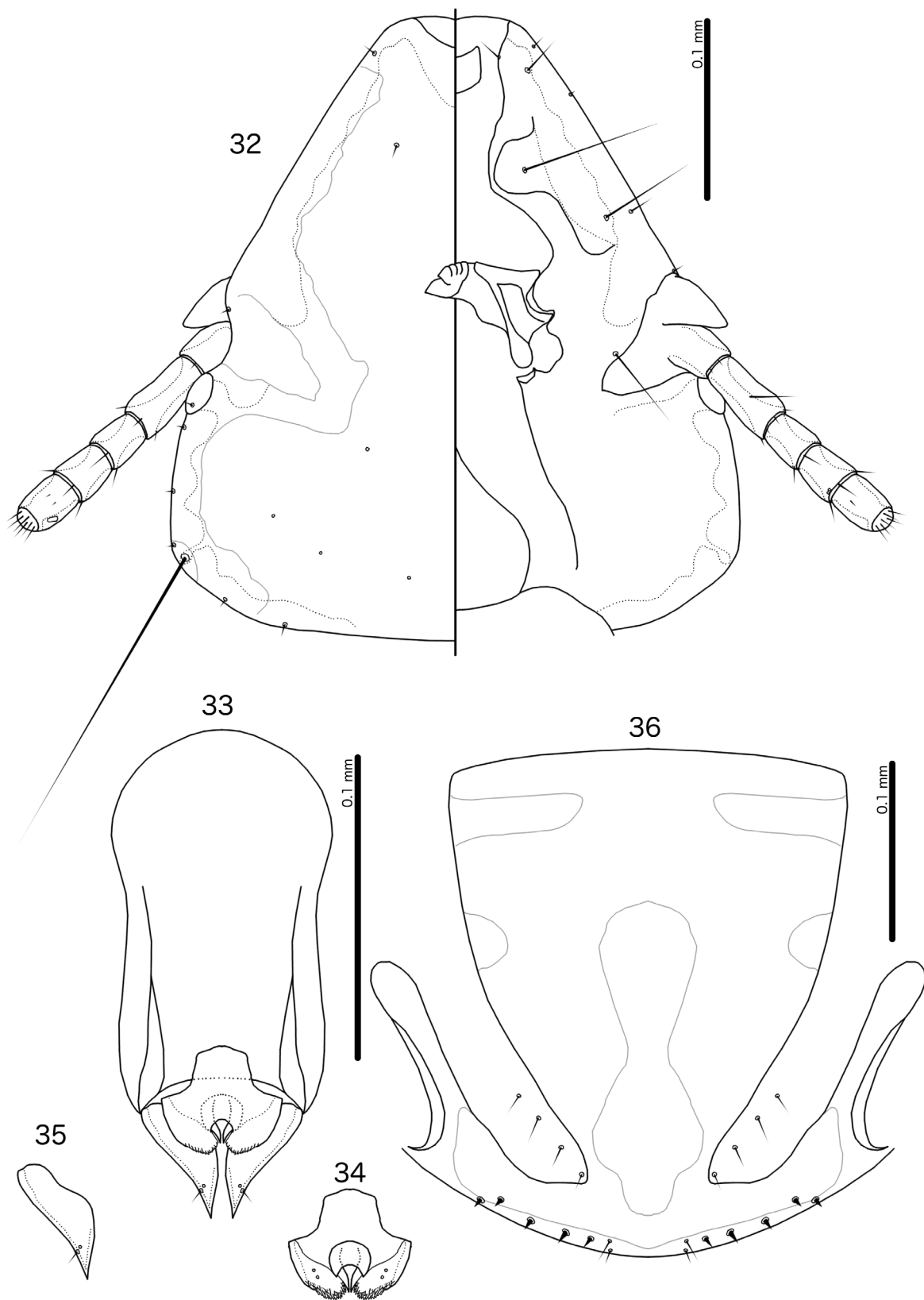
Head rounded trapezoidal (Fig. 32), lateral margins of preantennal area slightly convex, frons broadly flattened. Marginal carina broad, deeply displaced and much widened at osculum, and with undulating median margin. Ventral anterior plate broad, shield-shaped. Head chaetotaxy and pigmentation pattern as in Fig. 32. Preantennal nodi bulging, elongated. Preocular nodi much larger than postocular nodi. Marginal temporal carina broad, with distinctly undulating median margin. Gular plate broad, with concave antero-lateral margins. Thoracic and abdominal segments and pigmentation patterns as in Figs 30–31, 43–44.

Male

Thoracic and abdominal chaetotaxy as in Fig. 30. Basal apodeme broad, lateral margins concave (Fig. 33). Proximal mesosome roughly trapezoidal, widening slightly distally, and with anterior margin convergent to median point (Fig. 34). Mesosomal lobes broad, rounded distally, with extensive rugose area at distal end. Gonopore crescent-shaped, slightly wider than long. Penile arms short, not reaching



Figs 30–31. *Brueelia sima* sp. nov. ex *Malimbus nitens* (Gray, 1831). **30.** ♂, holotype (NHML 1960-295), habitus, dorsal and ventral views. **31.** ♀, habitus, dorsal and ventral views.



Figs 32–36. *Brueelia sima* sp. nov. ex *Malimbus nitens* (Gray, 1831). **32–35.** ♂, holotype (NHML 1960-295). **32.** Head, dorsal and ventral views. **33.** Genitalia, dorsal view. **34.** Mesosome, ventral view. **35.** Paramere, dorsal view. **36.** ♀, subgenital plate and vulval margin, ventral view.

beyond distal margin of mesosome. Parameres broad, not much elongated distally; *pst1*–2 as in Fig. 35. Measurements (n = 1): TL = 1.56; HL = 0.36; HW = 0.32; PRW = 0.23; PTW = 0.31; AW = 0.43.

Female

Thoracic and abdominal chaetotaxy as in Fig. 31. Pigmentation pattern of subgenital plate as in Fig. 36; note that transition between brown and translucent areas of subgenital plate is gradual, and exact borders of translucent fenestra here approximate. Subgenital plate rounded triangular (Fig. 36), with broad connection to cross piece. Vulval margin gently rounded, with 1 short, slender *vms* and 4–5 short, thorn-like *vss* on each side; 3–6 short, slender *vos* on each side of subgenital plate; distal 1 *vos* median to *vss*. Measurements (n = 1): TL = 1.80; HL = 0.39; HW = 0.35; PRW = 0.24; PTW = 0.35; AW = 0.53.

Remarks

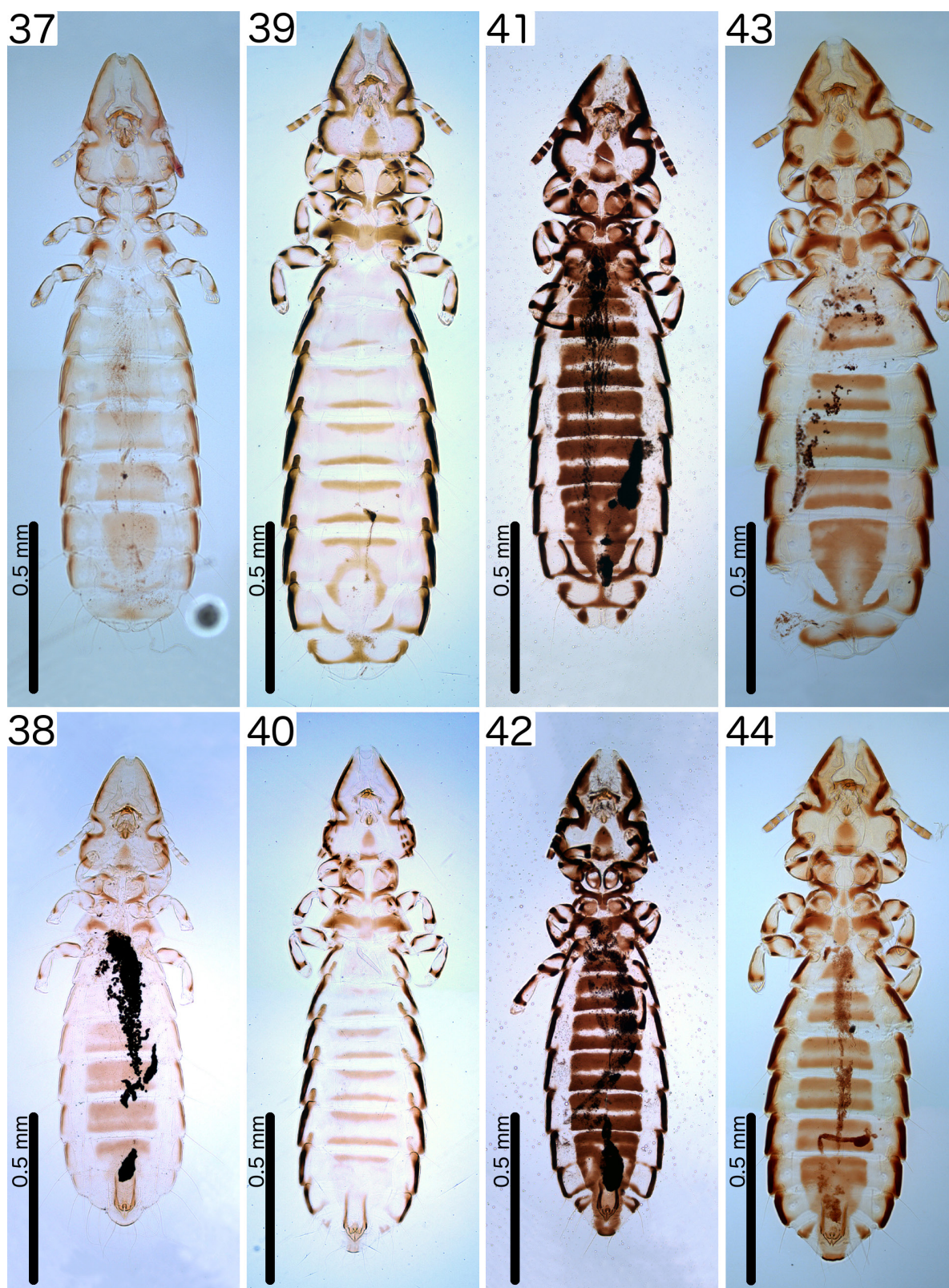
The abdomen of the single examined female is partially disrupted due to mounting; however, one side of every segment is undistorted. We have here illustrated the abdomen tentatively, based on the undistorted sides. However, the gonapophysal setae on segments VIII–X are absent on both sides of the specimen and are not illustrated here. These setae are present in all other species of the *Brueelia* complex, and when more specimens of *B. sima* sp. nov. are examined, it is likely that these setae will be found.

Discussion

The genetic data published by Bush *et al.* (2016), Light *et al.* (2016) and Takano *et al.* (2017, 2018) suggest that many of the *Brueelia* complex louse records from Africa represent distinct species, most of which appear to be host-specific. However, the vast majority of the species of chewing lice on African birds remain undescribed. We estimate that the potential *Brueelia* fauna of African passeriforms and piciforms comprises well over 1000 species (Table 1). The actual number of *Brueelia* recorded from Africa (including this report) is below 50 species. It is thus fair to say that the *Brueelia* fauna of Africa is almost entirely unknown, with less than 5% of the potential species described so far. These numbers are even worse when other genera in the *Brueelia* complex are included (data not shown).

For instance, 305 bird species that could potentially be parasitized by lice of the *Brueelia* complex (i.e., Passeriformes, Trogoniformes, Meropidae, Picidae) are listed as resident in South Africa by Sinclair *et al.* (2014). Chewing lice of the *Brueelia* complex have been reported from 51 of these potential host species since 1980, but only 18 of these reports are identified to species level (Appendix). Assuming that most of the lice of the *Brueelia* complex in South Africa are host-specific, and that most of the resident host species are infested with at least one louse species of the *Brueelia* complex, this suggests that the number of such species in South Africa may be underestimated by a factor of ten. The number of species of the *Brueelia* complex in all of Africa is most likely even more badly underestimated. The entirety of sub-Saharan West Africa has only 31 identified records of lice in the *Brueelia* complex (Appendix), but the region is home to over 560 species of potential host species (Borrow & Demey 2014). Note that these numbers do not include migrants to these regions, and the number of potential host species is therefore much higher if non-resident bird species are included.

In addition, many passeriform birds are parasitized by more than one species of chewing lice of the *Brueelia* complex (Gustafsson & Bush 2017). Moreover, there are indications that some host species are infested with different species of lice in the same genus in different parts of its range (e.g., *Brueelia* spp. on different subspecies of *Plocepasser mahali* (Smith, 1836); Gustafsson & Bush, in prep.). In some cases, multiple *Brueelia* species occur on the same host even in the absence of different host subspecies (e.g., *B. zohrae* Ansari, 1956 and *B. moreli* Ansari, 1957, both on *Ptilostomus afer* (Linnaeus, 1766)). By contrast, some species of lice in the *Brueelia* complex occur on multiple host species (e.g., Balakrishnan & Sorenson 2006; Bush *et al.* 2016), sometimes including host species from different families. Notably, four of the new genera described by Gustafsson & Bush (2017) are presently known only from African



Figs 37–44. Habitus photos of the species of *Brueelia* described as new herein, showing overall pigmentation patterns. **37.** *B. pofadderensis* sp. nov., ♀. **38.** *B. pofadderensis* sp. nov., ♂. **39.** *B. semiscalaris* sp. nov., ♀. **40.** *B. semiscalaris* sp. nov., ♂. **41.** *B. terpsichore* sp. nov., ♀. **42.** *B. terpsichore* sp. nov., ♂. **43.** *B. sima* sp. nov., ♀. **44.** *B. sima* sp. nov., ♂. All photographs are to scale.

endemic host groups. The undescribed diversity and host associations of African lice in the *Brueelia* complex may thus outweigh the known diversity significantly.

To a large extent, the lack of identifications to species level in these reports is due to the fact that very few chewing lice in the *Brueelia* complex have even been described from Africa. There is thus no framework of descriptions and illustrations with which to compare collected specimens. Here, we describe four new species of *Brueelia* from African hosts and redescribe one species. Three of these species belong to an apparently widely distributed informal group, characterised by their striking pigmentation patterns; a key to this informal group is provided. We hope that, together with those recently published by Gustafsson & Bush (2015, 2017) and Gustafsson *et al.* (2018), the descriptions, illustrations and key characters presented here will make future identifications and descriptions of African species of *Brueelia* easier, and help us better understand the biodiversity and evolutionary history of the *Brueelia* complex.

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References

- Andersson S. 1989. Sexual selection and cues for female choice in leks of Jackson's widowbird *Euplectes jacksoni*. *Behavioral Ecology and Sociobiology* 25: 403–410.
- Andersson S. 1991. Bowers on the savanna: display courts and mate choice in a lekking widowbird. *Behavioral Ecology* 2: 210–218.
- Ansari R.A.M. 1947. Mallophaga (Ischnocera) infesting birds in the Punjab (India). *Proceedings of the National Institute of Science India* 13: 253–303.
- Ansari R.A.M. 1968. A review of the biting lice of the genus *Sturnidoecus* Elchler [sic], 1944 (Phlopteridae: Mallophaga) found on the bird family Sturnidae (Passeriformes). *Pakistani Journal of Health* 17: 1–40.
- Balakrishnan C.N. & Sorenson M.D. 2006. Dispersal ecology versus host specialization as determinants of ectoparasite distribution in brood parasitic indigobirds and their estrildid finch hosts. *Molecular Ecology* 16: 217–229. <https://doi.org/10.1111/j.1365-294x.2006.03142.x>
- Borrow N. & Demey R. 2014. *Birds of Western Africa*. Christopher Helm, London.
- Bush S.E., Weckstein J.D., Gustafsson D.R., Allen J., DiBlasi E., Shreve S.M., Boldt R., Skeen H.R. & Johnson K.P. 2016. Unlocking the black box of feather louse diversity: A molecular phylogeny of the hyper-diverse genus *Brueelia*. *Molecular Phylogenetics and Evolution* 94: 737–751. <https://doi.org/10.1016/j.ympev.2015.09.015>
- Carriker Jr M.A. 1963. Neotropical Mallophaga (Insecta) miscellany no. 13. *Revista Brasileira de Biologia* 23: 293–316.
- Cicchino A.C. & Castro D.C. 1996. Revisión preliminar de las especies del género *Brueelia* Kéler, 1936 (Phthiraptera, Philopteridae) parásitas de Icterinae (Aves, Passeriformes, Fringillidae). *Graellsia* 52: 3–30. <https://doi.org/10.3989/graellsia.1996.v52.i0.373>

- Clay T. 1954. The post-spiracular seta and sensillus in the Mallophaga (Insecta). *Annals and Magazine of Natural History, Series 12* 7 (81): 716–718. <https://doi.org/10.1080/00222935408651780>
- Clements J.F., Schulenberg T.S., Iliff M.J., Roberson D., Fredericks T.A., Sullivan B.L. & Wood C.L. 2018. The eBird/Clements checklist of birds of the world: v. 2018. Available from <http://www.birds.cornell.edu/clementschecklist/download/> [accessed 29 Oct. 2018].
- Eichler W. 1951. Die Federling die Drosseln. *Bedeutung der Vogelwelt in Forschung und Praxis. Vorträge der I. Ornithologische Tagung der DDR am 21–22 Oktober 1950 in Leipzig* 3: 29–47.
- Eichler W. 1954. Deutsche Federlinge. I. Genus *Brueelia*. *Nachrichten des Naturwissenschaftliche Museums Aschaffenburg* 42: 59–66.
- Giebel C. 1874. *Insecta Epizoica*. Otto Wigand, Leipzig.
- Guimarães L.R. 1974. Ischnocera (Mallophaga) infesting parrots (Psittaciformes) I. Genera *Neopsittaconirmus* Conci, 1942, and *Psittaconirmus* Harrison, 1915. *Arquivos de Zoologica* 25: 121–201.
- Gustafsson D.R. & Bush S.E. 2015. Four new species of *Brueelia* Kéler, 1936 (Phthiraptera: Ischnocera: Philopteridae) from African songbirds (Passeriformes: Sturnidae and Laniidae). *Zootaxa* 4013: 503–518. <https://doi.org/10.11646/zootaxa.4013.4.2>
- Gustafsson D.R. & Bush S.E. 2017. Morphological revision of the hyperdiverse *Brueelia*-complex (Insecta: Phthiraptera: Ischnocera: Philopteridae) with new taxa, checklists and generic key. *Zootaxa* 4313: 1–443. <https://doi.org/10.11646/zootaxa.4313.1.1>
- Gustafsson D.R., Chu X., Bush S.E. & Zou F. 2018. Ten new species of *Brueelia* Kéler, 1936 (Phthiraptera: Ischnocera: Philopteridae) from nuthatches (Aves: Passeriformes: Sittidae), tits and chickadees (Paridae), and goldcrests (Regulidae). *Acta Parasitologica* 63: 527–557. <https://doi.org/10.1515/ap-2018-0063>
- Harrison L. 1916. The genera and species of Mallophaga. *Parasitology* 9: 1–156.
- Hopkins G.H. & Clay T. 1952. *A Check List of the Genera and Species of Mallophaga*. British Museum (Natural History), London.
- Johnson K.P., Adams R.J. & Clayton D.H. 2002. The phylogeny of the louse genus *Brueelia* does not reflect host phylogeny. *Biological Journal of the Linnean Society* 77: 233–247. <https://doi.org/10.1046/j.1095-8312.2002.00107.x>
- Kéler S. von 1936. Über einige Mallophagen aus Rossitten. *Arbeiten in morphologische und taxonomische Entomologie von Berlin-Dahlem* 3: 256–264.
- Lakshminarayana K.V. 1968. Mallophaga Indica. II. A new species of Philopteridae on *Ploceus philippinus burmannicus* Ticehurst from India. *Oriental Insects* 2: 97–102.
- Ledger J.A. 1980. The arthropod parasites of vertebrates in Africa south of the Sahara. Volume IV. Phthiraptera (Insecta). *Publications of the South African Institute for Medical Research* 56: 1–327.
- Lepage D. 2018. Avibase – Bird checklists of the world: Africa. In: Web page Avibase – the world bird database. Available from <https://avibase.bsc-eoc.org/checklist.jsp?region=AFR&list=clements> [accessed 3 Dec. 2018].
- Light J.E., Nessner C.E., Gustafsson D.R., Wise S.R. & Voelker G. 2016. Remarkable levels of avian louse (Insecta: Phthiraptera) diversity in the Congo Basin. *Zoologica Scripta* 45: 538–551. <https://doi.org/10.1111/zsc.12170>
- Mey E. 2017. Neue Gattungen und Arten aus dem *Brueelia*-Komplex (Insecta, Phthiraptera, Ischnocera, Philopteridae s.l.) *Rudolstädter naturhistorische Schriften* 22: 85–215.

- Najer T., Sychra O., Literák I., Procházka P., Capek M. & Koubek P. 2012. Chewing lice (Phthiraptera) from wild birds in Senegal, with descriptions of three new species of the genera *Brueelia* and *Philopteroides*. *Acta Parasitologica* 57: 90–98. <https://doi.org/10.2478/s11686-012-0005-x>
- Neumann L.G. 1906. Notes sur les Mallophages. *Bulletin de la Société zoologique de France* 31: 54–60.
- Nitzsch C.L. 1818. Die Familien und Gattungen der Thierinsekten (Insecta Epizoica); als prodromus einer Naturgeschichte derselben. *Magazin der Entomologie* 3: 261–316.
- Piaget E. 1880. *Les Pédiculines. Essai Monographique*. Two volumes. E.J. Brill, Leiden.
- Price R.D. & Clayton D.H. 1995. Review of *Formicariicola* (Phthiraptera: Philopteridae) from ground antbirds (Passeriformes: Formicariidae). *Annals of the Entomological Society of America* 88: 718–721.
- Price R.D. & Clayton D.H. 1996. Revision of the chewing louse genus *Formicaphagus* (Phthiraptera: Philopteridae) from Neotropical antbirds and gnateaters (Aves: Passeriformes). *Journal of the Kansas Entomological Society* 69: 346–356.
- Price R.D. & Emerson K.C. 1978. The *Neopsittaconirmus* (Mallophaga: Philopteridae) from *Cacatua* (Aves: Psittaciformes). *Pacific Insects* 18: 33–36.
- Sinclair I., Hockey P., Tarboton W. & Ryan P. 2014. *The Larger Illustrated Guide to Birds of Southern Africa*. Third edition. Struik Nature, Cape Town.
- Soler Cruz M.D., Benítez Rodríguez R., Florido-Navío A. & Muñoz Parra S. 1987. Some Mallophaga (Brueeliinae) from birds of the family Fringillidae. *Acta Parasitologica Polonica* 31: 241–246.
- Sychra O. 2005. Morphological variation of *Neopsittaconirmus gracilis* (Phthiraptera, Ischnocera) from budgerigar, *Melopsittacus undulatus*. *Biologia (Bratislava)* 60: 137–142.
- Sychra O., Barlev E.M., Literák I., Capek M., Koubek P. & Procházka P. 2010a. The chewing lice (Phthiraptera) of red-billed quelea (*Quelea quelea*) in Senegal, with a description of a new species. *African Entomology* 18: 17–22. <https://doi.org/10.4001/003.018.0103>
- Sychra O., Literák I., Najer T., Capek M., Koubek P. & Procházka P. 2010b. Chewing lice (Insecta: Phthiraptera) from estrildid finches (Aves: Passeriformes: Estrildidae) and louse-flies (Insecta: Diptera: Hippoboscidae) from birds in Senegal, with descriptions of three new species of the genus *Brueelia*. *Zootaxa* 2714: 59–68.
- Takano O.M., Mitchell P.S., Gustafsson D.R., Adite A., Voelker G. & Light J.E. 2017. An assessment of host associations, geographic distributions, and genetic diversity of avian chewing lice (Insecta: Phthiraptera) from Benin. *Journal of Parasitology* 103: 152–160. <https://doi.org/10.1645/16-137>
- Takano O.M., Voelker G., Gustafsson D.R. & Light J.E. 2018. Molecular phylogeny and novel host associations of avian chewing lice (Insecta: Phthiraptera) from South Africa. *Systematic Entomology*. <https://doi.org/10.1111/syen.12319>
- Tendeiro J. 1989. Nouvelle observations sur les genres *Meropoecus* Eichler 1940 et *Splendoroffula* Th. Clay et Menertzhagen [sic], 1941 (Mallophaga, Ischnocera). *Garcia de Orta, Séries Zoologia* 15: 99–104.
- Tendeiro J. & Mendes L.F. 1994. Sobre a fauna terrestre e ribeirinha de República Democrática de São Tomé e Príncipe. Malófagos. II. Espécies encontradas e notas adicionais sobre a fauna malofágica de São Tomé e Príncipe. *Garcia de Orta, Séries Zoologia* 20: 113–130.
- Valim M.P. & Weckstein J.D. 2013. A drop in the bucket of the megadiverse chewing louse genus *Myrsidea* (Phthiraptera, Amblycera, Menoponidae): ten new species from Amazonian Brazil. *Folia Parasitologica* 60: 377–400. <https://doi.org/10.14411/fp.2013.040>

Williams N.S. 1981. The *Brueelia* (Mallophaga: Philopteridae) of the Meropidae (Aves: Coraciiformes). *Journal of the Kansas Entomological Society* 54: 510–518.

Złotorzycka J. 1964. Mallophaga parasitizing Passeriformes and Pici. II. Brueeliinae. *Acta Parasitologica Polonica* 12: 239–282.

Złotorzycka J. 1977. Wszóły – Mallophaga, Zeszyt 4. Nadrodzina Philopteroidea: rodzina Philopteridae. *Klucze do Ozaczania Owasów Polski* 15: 1–124.

Złotorzycka J., Madrzejewska M. & Kopij G. 1999. A preliminary study on Mallophaga in South African birds. *Polskie Pismo Entomologiczne* 68: 9–21.

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Appendix (continued on next 15 pages). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger (1980). Louse taxonomy follows Gustafsson & Bush (2017); however, many of the specimens identified only to genus level have not been examined, and may in fact belong to a different genus than listed below. For brevity, louse subgenera have been excluded, and host subspecies are included only if reported in the original publication. Host taxonomy follows Clements *et al.* (2018).

| Host species | Louse species | Country | Reference |
|--|--|--------------|---|
| Cuculiformes | | | |
| Cuculidae | | | |
| <i>Coua caerulea</i> | <i>Couata angulata</i> (Piaget, 1880) | Madagascar | Gustafsson & Bush 2017 |
| | <i>Koanirmus koaphilus</i> Mey, 2017 | Madagascar | Mey 2017 |
| <i>Coua cristata pyropyga</i> Grandidier, 1867 | <i>Couata dodekopter</i> Gustafsson & Bush, 2017 | Madagascar | Gustafsson & Bush 2017 |
| <i>Coua serriana</i> Pucheran, 1845 | <i>Couata goniodes</i> (Piaget, 1880) | Madagascar | Gustafsson & Bush 2017 |
| | <i>Tesonirmus teso</i> Mey, 2017 | Madagascar | Mey 2017 |
| <i>Coua</i> sp. | <i>Couata angulata</i> (Piaget, 1880) | Madagascar | Mey 2017 |
| Piciformes | | | |
| Lybiidae | | | |
| <i>Buccanodon duchaillui</i> (Cassin, 1856) | <i>Gnimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Tricholaema leucomelas</i> (Boddaert, 1783) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| Picidae | | | |
| <i>Dendropicos goertae</i> (Müller, 1776) | <i>Brueelia goertae</i> Dalglish, 1971 | Cameroon | Gustafsson & Bush 2017 |
| Coraciiformes | | | |
| Brachypteraciidae | | | |
| <i>Brachypteracias leptosomus</i> (Lesson, 1833) | <i>Buerelius longiceps</i> (Piaget, 1880) | Madagascar | Bush <i>et al.</i> 2016; Gustafsson & Bush 2017 |
| | <i>Buerelius subsimus</i> Clay & Tandan, 1967 | Madagascar | Gustafsson & Bush 2017 |
| Meropidae | | | |
| <i>Merops albicollis</i> Vieillot, 1817 | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Cameroon | Williams 1981; Gustafsson & Bush 2017 |
| | | Ghana | Bush <i>et al.</i> 2016; Gustafsson & Bush 2017 |
| | | Sierra Leone | Williams 1981; Gustafsson & Bush 2017 |

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|---|---|--------------------|---|
| <i>Merops apiaster</i> Linnaeus, 1758 | <i>Meropoecus meropis</i> (Denny, 1842) | Egypt | Gustafsson & Bush 2017 |
| | | Morocco | Gustafsson & Bush 2017 |
| | | South Africa | Gustafsson & Bush 2017 |
| | | Uganda | Gustafsson & Bush 2017 |
| | <i>Meropsiella apiastri</i> (Denny, 1842) | Egypt | Williams 1981 |
| | | Malawi | Bush <i>et al.</i> 2016; Gustafsson & Bush 2017 |
| | | Morocco | Gustafsson & Bush 2017 |
| | | South Africa | Gustafsson & Bush 2017 |
| | | Sudan ¹ | Gustafsson & Bush 2017 |
| | | Uganda | Williams 1981; Gustafsson & Bush 2017 |
| <i>Merops bullocki</i> Vieillot, 1817 | <i>Meropoecus emersoni</i> Tendeiro, 1961 | Zambia | Gustafsson & Bush 2017 |
| | | Ghana | Gustafsson & Bush 2017 |
| | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Senegal | Najer <i>et al.</i> 2012 |
| | | Ghana | Williams 1981; Gustafsson & Bush 2017 |
| | | Senegal | Najer <i>et al.</i> 2012 |
| <i>Merops bullockoides</i> (Smith, 1834) | <i>Meropoecus mossambicensis</i> Tendeiro, 1989 | Mozambique | Tendeiro 1989 |
| | <i>Meropsiella bullockoda</i> (Williams, 1981) | Kenya | Williams 1981; Gustafsson & Bush 2017 |
| | | Mozambique | Williams 1981; Gustafsson & Bush 2017 |
| | | South Africa | Williams 1981 |
| | | Zambia | Williams 1981 |
| <i>Merops gularis</i> gularis Shaw, 1798 | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Ghana | Bush <i>et al.</i> 2016; Gustafsson & Bush 2017 |
| <i>Merops hirundineus</i> Lichtenstein, 1793 | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Mozambique | Williams 1981 |
| | | Tanzania | Williams 1981; Gustafsson & Bush 2017 |
| | | Zimbabwe | Williams 1981; Gustafsson & Bush 2017 |
| <i>Merops nubicooides</i> De Murs & Pucherans, 1846 | <i>Meropoecus eichleri</i> Tendeiro, 1989 | Mozambique | Tendeiro 1989 |
| | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Zimbabwe | Williams 1981; Gustafsson & Bush 2017 |

¹ Almost all specimens from Sudan were collected by Richard Meimertzhagen, who was stationed in Kenya. It thus seems likely that at least some of these specimens were collected in what is today South Sudan; however, the only locality information given on the slides is “Sudan”.

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|--|--|--------------|---|
| <i>Merops nubicus</i> Gmelin, 1788 | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Sudan | Williams 1981; Gustafsson & Bush 2017 |
| <i>Merops oreobates</i> (Sharpe, 1892) | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Kenya | Williams 1981; Gustafsson & Bush 2017 |
| <i>Merops orientalis cleopatra</i> Nicoll, 1910 | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Egypt | Gustafsson & Bush 2017 |
| <i>Merops orientalis viridissimus</i> Swainson, 1837 | <i>Meropoecus debeauxi</i> Conci, 1941 | Nigeria | Gustafsson & Bush 2017 |
| <i>Merops persicus persicus</i> Pallas, 1773 | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Sudan | Williams 1981; Gustafsson & Bush 2017 |
| | <i>Meropoecus meropis</i> (Denny, 1842) | Egypt | Gustafsson & Bush 2017 |
| <i>Merops pusillus cyanostictus</i> Cabanis, 1869 | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Kenya | Williams 1981; Gustafsson & Bush 2017 |
| <i>Merops pusillus meridionalis</i> (Sharpe, 1892) | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Somalia | Gustafsson & Bush 2017 |
| | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Malawi | Bush <i>et al.</i> 2016; Gustafsson & Bush 2017 |
| <i>Merops pusillus pusillus</i> Müller, 1776 | <i>Meropoecus debeauxi</i> Conci, 1941 | South Africa | Gustafsson & Bush 2017 |
| | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Nigeria | Gustafsson & Bush 2017 |
| | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Sierra Leone | Gustafsson & Bush 2017 |
| <i>Merops revoilii</i> Oustalet, 1882 | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Mozambique | Williams 1981 |
| | <i>Meropoecus debeauxi</i> Conci, 1941 | Somalia | Gustafsson & Bush 2017 |
| <i>Merops variegatus lorringi</i> (Mearns, 1915) | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Somalia | Williams 1981; Gustafsson & Bush 2017 |
| <i>Merops variegatus variegatus</i> Vieillot, 1817 | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Uganda | Gustafsson & Bush 2017 |
| | <i>Meropsiella erythropteri</i> (Piaget, 1885) | Uganda | Williams 1981 |
| Passeriformes | | | |
| Acrocephalidae | | | |
| <i>Iduna similis</i> Richmond, 1897 | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| Alaudidae | | | |
| <i>Alauda arvensis cantarella</i> Bonaparte, 1850 | <i>Brueelia parviguttata</i> (Blagoveshtchensky, 1940) | Morocco | Gustafsson & Bush 2017 |
| <i>Mirafra africana</i> Smith, 1836 | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| Bernieridae | | | |
| <i>Bernieria madagascariensis</i> (Gmelin, 1789) | <i>Guimaraesiella</i> sp. | Madagascar | Bush <i>et al.</i> 2016 |
| <i>Randia pseudozosterops</i> Delacour & Berlioz, 1931 | <i>Aratricerca</i> sp. | Madagascar | Bush <i>et al.</i> 2016 |
| <i>Xanthomixis cinereiceps</i> Sharpe, 1881 | <i>Guimaraesiella</i> sp. | Madagascar | Bush <i>et al.</i> 2016 |

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|--|---|--------------|---------------------------|
| Buphagidae | | | |
| <i>Buphagus africanus</i> Linnaeus, 1766 | <i>Buphagoecus husaini</i> (Ansari, 1968) | Kenya | Gustafsson & Bush 2017 |
| <i>Buphagus erythrorhynchus</i> (Stanley, 1814) | <i>Buphagoecus prominens</i> (Ansari, 1968) | Ethiopia | Gustafsson & Bush 2017 |
| Campephagidae | | | |
| <i>Coracina pectoralis</i> Jardine & Selby, 1828 | <i>Indocephalanetes</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Cyanograucaculus azureus</i> (Cassin, 1852) | <i>Indocephalanetes</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| <i>Lobotos oriolinus</i> Bates, 1909 | <i>Indocephalanetes lobocupatrix</i> Gustafsson & Bush, 2017 | “Congo” | Gustafsson & Bush 2017 |
| Cisticolidae | | | |
| <i>Apalis flavida</i> (Strickland, 1852) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Calamonastes fasciolatus</i> (Smith, 1847) | <i>Sturmidoecus</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Camaroptera brachyura</i> (Vieillot, 1820) | <i>Guimaraesiella</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Cisticola fuvicapilla</i> (Vieillot, 1817) | <i>Sturmidoecus</i> sp. | Senegal | Najer <i>et al.</i> 2012 |
| <i>Cisticola lais</i> (Hartlaub & Finsch, 1870) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Cisticola natalensis</i> (Smith, 1843) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Prinia erythroptera</i> (Jardine, 1849) | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Prinia maculosa</i> (Boddaert, 1783) | <i>Sturmidoecus</i> sp. | Senegal | Najer <i>et al.</i> 2012 |
| <i>Prinia subflava</i> (Gmelin, 1789) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| | <i>Brueelia priniae</i> Najer & Sychra in Najer <i>et al.</i> , 2012 | Senegal | Najer <i>et al.</i> 2012 |
| Corvidae | | | |
| <i>Corvus albicollis</i> Latham, 1790 | <i>Corvonirmus leucocephalus</i> (Nitzsch in Giebel, 1866) | Kenya | Gustafsson & Bush 2017 |
| | | Lesotho | Gustafsson & Bush 2017 |
| | | Nigeria | Gustafsson & Bush 2017 |
| | | Tanzania | Gustafsson & Bush 2017 |
| | | Uganda | Gustafsson & Bush 2017 |

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|---|---|-------------------|-------------------------|
| <i>Corvus albus</i> Müller, 1776 | <i>Corvonirmus</i> sp.? | Ghana | Bush <i>et al.</i> 2016 |
| | <i>Corvonirmus quadrangularis</i> (Rudow, 1869) | Botswana | Gustafsson & Bush 2017 |
| | | Kenya | Gustafsson & Bush 2017 |
| | | Liberia | Gustafsson & Bush 2017 |
| | | Mozambique | Gustafsson & Bush 2017 |
| | | Namibia | Gustafsson & Bush 2017 |
| | | South Africa | Gustafsson & Bush 2017 |
| | | Sudan | Gustafsson & Bush 2017 |
| | | Tanzania | Gustafsson & Bush 2017 |
| | | Uganda | Gustafsson & Bush 2017 |
| | | Sudan | Gustafsson & Bush 2017 |
| <i>Corvus capensis capensis</i> Lichtenstein, 1823 | <i>Hecatrishula bipunctata</i> (Rudow, 1870) | | Gustafsson & Bush 2017 |
| | <i>Corvonirmus variegatus</i> (Ansari, 1957) | South Africa | Gustafsson & Bush 2017 |
| | <i>Hecatrishula nawabi</i> (Ansari, 1957) | Namibia | Gustafsson & Bush 2017 |
| <i>Corvus capensis kordofanensis</i> Laubmann, 1919 | <i>Corvonirmus variegatus</i> (Ansari, 1957) | Ethiopia | Gustafsson & Bush 2017 |
| | | Somalia | Gustafsson & Bush 2017 |
| <i>Corvus corax tingitanus</i> Irby, 1874 | <i>Corvonirmus argulus</i> (Burmeister, 1838) | Egypt | Gustafsson & Bush 2017 |
| | | Morocco | Gustafsson & Bush 2017 |
| | | “Northern Africa” | Gustafsson & Bush 2017 |
| <i>Corvus cornix pallescens</i> (Madarasz, 1904) | <i>Corvonirmus uncinus</i> (Burmeister, 1838) | Egypt | Gustafsson & Bush 2017 |
| <i>Corvus rhipidurus</i> Hartert, 1918 | <i>Corvonirmus theresae</i> (Ansari, 1957) | Ethiopia | Gustafsson & Bush 2017 |
| | | Kenya | Gustafsson & Bush 2017 |
| | | Uganda | Gustafsson & Bush 2017 |
| <i>Garrulus glandarius whitakeri</i> Hartert, 1903 | <i>Olivinirmus glandarii</i> (Denny, 1842) | Morocco | Gustafsson & Bush 2017 |
| <i>Ptilostomus afer</i> (Linnaeus, 1766) | <i>Brueelia moreli</i> Ansari, 1957 | Senegal | Gustafsson & Bush 2017 |
| | <i>Brueelia zohrae</i> Ansari, 1956 | Uganda | Gustafsson & Bush 2017 |
| | | Guinea-Bissau | Gustafsson & Bush 2017 |
| | | Sudan | Gustafsson & Bush 2017 |
| <i>Pica pica mauritanica</i> Malherbe, 1845 | <i>Brueelia</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| | <i>Olivinirmus agadirensis</i> Mey, 2017 | Morocco | Mey 2017 |

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Lost species | Country | Reference |
|--|---|-----------------------|------------------------------|
| <i>Pyrrhocorax pyrrhocorax barbarus</i> Vaurie, 1954 | <i>Hecatrishula docilis</i> (Ansari, 1956) | Morocco | Gustafsson & Bush 2017 |
| <i>Zavattariornis stresemanni</i> Moltoni, 1938 | <i>Brueelia zavattariornis</i> Ansari, 1956 | Ethiopia | Gustafsson & Bush 2017 |
| Dicruridae | | | |
| <i>Dicrurus adsimilis</i> (Bechstein, 1794) | <i>Brueelia</i> sp. | Senegal | Najer <i>et al.</i> 2012 |
| <i>Dicrurus modestus</i> Hartlaub, 1849 | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | <i>Guimaraesiella</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| Emberizidae | | | |
| <i>Emberiza cabanisi</i> (Reichenow, 1875) | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Emberiza flaviventris</i> Stephens, 1815 | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Emberiza tahapisi</i> Smith, 1836 | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| Estrildidae | | | |
| <i>Amadina fasciata</i> (Gmelin, 1789) | <i>Mirandofures fasciata</i> (Sychra in Sychra <i>et al.</i> , 2010b) | Senegal | Sychra <i>et al.</i> 2010b |
| <i>Amandava subflava</i> (Vieillot, 1819) | <i>Brueelia</i> sp. | Cameroon | Balakrishnan & Sorenson 2006 |
| <i>Coccopygia melanotis</i> (Temminck, 1823) | <i>Mirandofures</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Cryptospiza reichenovii</i> (Hartlaub, 1874) | <i>Mirandofures</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Estrilda astrild</i> (Linnaeus, 1758) | <i>Mirandofures astrildae</i> (Tendeiro & Mendes, 1994) | São Tomé and Príncipe | Tendeiro & Mendes 1994 |
| <i>Estrilda erythronotus</i> (Vieillot, 1817) | <i>Mirandofures</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Euodice cantans</i> (Gmelin, 1789) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Granatina granatina</i> (Linnaeus, 1758) | <i>Brueelia cantans</i> Sychra in Sychra <i>et al.</i> , 2010b <i>Brueelia semiscalaris</i> sp. nov. | Senegal | Sychra <i>et al.</i> 2010b |
| <i>Hypargos niveoguttatus</i> Peters, 1868 | <i>Brueelia</i> sp. | Botswana | This report |
| <i>Lagonosticta rara</i> (Antinori, 1864) | <i>Mirandofures</i> sp. <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | <i>Brueelia</i> sp. | Cameroon | Balakrishnan & Sorenson 2006 |

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|---|---|-----------------------|---|
| <i>Lagonosticta rhodopareia</i> (Heuglin, 1868) | <i>Mirandofures</i> sp. | Mozambique | Bush <i>et al.</i> 2016 |
| <i>Lagonosticta rubricata</i> (Lichtenstein, 1823) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Lagonosticta rufopicta</i> (Fraser, 1843) | <i>Brueelia</i> sp. | Cameroon | Balakrishnan & Sorenson 2006 |
| <i>Lagonosticta senegala</i> (Linnaeus, 1766) | <i>Brueelia senegala</i> Sychra in Sychra <i>et al.</i> , 2010b | Cameroon | Balakrishnan & Sorenson 2006 |
| <i>Lonchura cucullata</i> (Swainson, 1837) | <i>Mirandofures lonchurae</i> (Tendeiro & Mendes, 1994) | Senegal | Sychra <i>et al.</i> 2010b |
| | | Benin | Takano <i>et al.</i> 2017 |
| | | São Tomé and Príncipe | Tendeiro & Mendes 1994 |
| <i>Pytilia afra</i> (Gmelin, 1789) | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Pytilia hypogrammica</i> Sharpe, 1870 | <i>Sturmidoecus</i> sp. | Cameroon | Balakrishnan & Sorenson 2006 |
| <i>Pytilia melba</i> (Linnaeus, 1758) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Uraeginthus angolensis</i> (Linnaeus, 1758) | <i>Mirandofures</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| Fringillidae | | | |
| <i>Crithagra gularis</i> (Smith, 1836) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Crithagra mozambica</i> (Müller, 1776) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Fringilla coelebs africana</i> Levaillant, 1850 | <i>Brueelia kluzi</i> Balát, 1955 | Morocco | Gustafsson & Bush 2017 |
| <i>Serinus canicollis</i> (Swainson, 1838) | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | | South Africa | Takano <i>et al.</i> 2018 |
| Hirundinidae | | | |
| <i>Cecropis abyssinica puella</i> (Temminck & Schlegel, 1845) | <i>Acronirmus gracilis</i> (Burmeister, 1838) | Ghana | Gustafsson & Bush 2017 |
| <i>Cecropis abyssinica unitatis</i> (Sclater & Mackworth-Preed, 1942) | <i>Acronirmus gracilis</i> (Burmeister, 1838) | Kenya | Gustafsson & Bush 2017 |
| <i>Cecropis senegalensis saturator</i> (Bannermann, 1923) | <i>Acronirmus gracilis</i> (Burmeister, 1838) | Kenya | Gustafsson & Bush 2017 |
| <i>Delichon urbicum urbicum</i> (Linnaeus, 1758) | <i>Acronirmus gracilis</i> (Burmeister, 1838) | Malawi | Bush <i>et al.</i> 2016; Gustafsson & Bush 2017 |
| <i>Hirundo aethiopicus amadoni</i> White, 1956 | <i>Acronirmus gracilis</i> (Burmeister, 1838) | Morocco | Gustafsson & Bush 2017 |
| | | Somalia | Gustafsson & Bush 2017 |

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|--|--|--------------|------------------------------|
| <i>Hirundo angolensis</i> Bocage, 1868 | <i>Acronirmus gracilis</i> (Burmeister, 1838) | Zambia | Gustafsson & Bush 2017 |
| <i>Hirundo rustica rustica</i> Linnaeus, 1758 | <i>Acronirmus gracilis</i> (Burmeister, 1838) | Morocco | Gustafsson & Bush 2017 |
| <i>Hirundo rustica savignii</i> Stephens, 1817 | <i>Acronirmus gracilis</i> (Burmeister, 1838) | Egypt | Gustafsson & Bush 2017 |
| Lanidae ² | | | |
| <i>Corvinella melanoleuca</i> (Jardine, 1831) | <i>Brueelia rigbyi</i> Gustafsson & Bush, 2015 | South Africa | Gustafsson & Bush 2015, 2017 |
| <i>Corvinella melanoleuca expressa</i> Clancey, 1961 | <i>Sturnidoecus australafricanus</i> Gustafsson & Bush, 2017 | South Africa | Gustafsson & Bush 2017 |
| <i>Eurocephalus rueppelli</i> Bonaparte, 1853 | <i>Teinomordeus enteloseus</i> Gustafsson & Bush, 2017 | Somalia | Gustafsson & Bush 2017 |
| | | Ethiopia | Gustafsson & Bush 2017 |
| Leiothrichidae | | | |
| <i>Turdoides aylmeri aylmeri</i> (Shelley, 1885) | <i>Pricetiella brueliodes</i> (Ansari, 1956) | Somalia | Gustafsson & Bush 2017 |
| <i>Turdoides fulva acaciae</i> (Lichtenstein, 1823) | <i>Brueelia magnini</i> Ansari, 1956 | Sudan | Gustafsson & Bush 2017 |
| <i>Turdoides hartlaubii</i> (Bocage, 1868) | <i>Pricetiella nivea</i> (Ansari, 1956) | Zimbabwe | Gustafsson & Bush 2017 |
| <i>Turdoides tenebrosa</i> (Hartlaub, 1883) | <i>Pricetiella koka</i> Gustafsson & Bush, 2017 | Ethiopia | Gustafsson & Bush 2017 |
| Locustellidae | | | |
| <i>Bradypterus cinnamomeus</i> (Rüppell, 1840) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| Macrophenidae | | | |
| <i>Sylvietta rufescens</i> (Vieillot, 1817) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| Malaconotidae | | | |
| <i>Dryoscopus cubla</i> (Shaw, 1809) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | | Mozambique | Bush <i>et al.</i> 2016 |
| <i>Laniarius aethiopicus</i> (Gmelin, 1789) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Laniarius bar-barus</i> (Linnaeus, 1758) | <i>Brueelia</i> sp. | Senegal | Näjer <i>et al.</i> 2012 |

² Gustafsson & Bush (2017) reported *Brueelia eruciata* (Burmeister, 1838) from a South African *Lanius collurio* Linnaeus, 1758. This report is in error, and represents an undescribed species of *Brueelia* from *Lanius collurio* Linnaeus, 1766.

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|---|---|----------------------------------|---------------------------|
| <i>Laniarius erythrogaster</i> (Cretzschmar, 1829) | <i>Titanomessor sexloba</i> Gustafsson & Bush, 2017 | Uganda | Gustafsson & Bush 2017 |
| <i>Laniarius ferrugineus</i> (Gmelin, 1788) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | | South Africa | Takano <i>et al.</i> 2018 |
| <i>Laniarius fuelleborni</i> (Reichenow, 1900) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Malaconotus blanchoti</i> Stephens, 1826 | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | <i>Sturnidoecus</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Nilais afer</i> (Latham, 1801) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Tchagra australis</i> (Smith, 1836) | <i>Sturnidoecus wittei</i> Tendeiro, 1963 | South Africa | Takano <i>et al.</i> 2018 |
| | | Zimbabwe | Gustafsson & Bush 2017 |
| <i>Tchagra senegalus</i> (Linnaeus, 1766) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Tchagra senegalus armenus</i> (Oberholser, 1906) | <i>Sturnidoecus wittei</i> Tendeiro, 1963 | Democratic Republic of the Congo | Gustafsson & Bush 2017 |
| | | Mozambique | Gustafsson & Bush 2017 |
| | | Zambia | Gustafsson & Bush 2017 |
| <i>Tchagra senegalus habessinica</i> (Hemprich & Ehrenberg, 1833) | <i>Sturnidoecus wittei</i> Tendeiro, 1963 | Ethiopia | Gustafsson & Bush 2017 |
| <i>Tchagra senegalus kalahari</i> (Roberts, 1932) | <i>Sturnidoecus wittei</i> Tendeiro, 1963 | Zimbabwe | Gustafsson & Bush 2017 |
| <i>Tchagra senegalus orientalis</i> (Cabanis, 1869) | <i>Sturnidoecus wittei</i> Tendeiro, 1963 | Mozambique | Gustafsson & Bush 2017 |
| <i>Tchagra tchagra natalensis</i> (Reichenow, 1903) | <i>Sturnidoecus wittei</i> Tendeiro, 1963 | Mozambique | Gustafsson & Bush 2017 |
| <i>Telophorus sulfureopectus</i> (Lesson, 1831) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| Monarchidae | | | |
| <i>Terpsiphone viridis</i> (Statius Müller, 1776) | <i>Brueelia</i> sp. | Senegal | Najer <i>et al.</i> 2012 |
| | | South Africa | Takano <i>et al.</i> 2018 |
| Motacillidae | | | |
| <i>Anthus</i> sp. | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Anthus trivialis trivialis</i> (Linnaeus, 1758) | <i>Brueelia ferianci</i> Balát, 1955 | Morocco | Gustafsson & Bush 2017 |
| <i>Macronyx capensis</i> (Linnaeus, 1766) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Motacilla capensis</i> Linnaeus, 1766 | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|---|--|--------------|---------------------------|
| <i>Motacilla flava</i> Linnaeus, 1758 | <i>Brueelia kratochvili</i> Balát, 1958 | Egypt | Gustafsson & Bush 2017 |
| Muscicapidae | | | |
| <i>Copsychus albospectularis</i> (Eydoux & Gervais, 1836) | <i>Guimaraesiella</i> sp. | Madagascar | Bush <i>et al.</i> 2016 |
| <i>Cossypha anomala</i> (Shelley, 1893) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Cossypha caffra</i> (Linnaeus, 1771) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Cossypha heuglini</i> Hartlaub, 1866 | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Melaenornis silens</i> (Shaw, 1809) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Muscicapa striata</i> (Pallas, 1764) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Myrmecocichla arnotti</i> (Tristram, 1869) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Pogonochila stellata</i> (Vieillot, 1818) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Pseudalethe fuelleborni</i> (Reithenow, 1900) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Sheppardia sharpei</i> (Shelley, 1903) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| Nectariniidae | | | |
| <i>Chalcomitra senegalensis</i> (Linnaeus, 1766) | <i>Brueelia chalcomitrae</i> Najer & Sychra in Najer <i>et al.</i> , 2012 | Senegal | Najer <i>et al.</i> 2012 |
| <i>Cinnyris chabybaeus</i> (Linnaeus, 1766) | <i>Sturmidoecus</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Nectarinia famosa</i> (Linnaeus, 1766) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| Nicatoridae | | | |
| <i>Nicator chloris</i> (Valenciennes, 1826) | <i>Guimaraesiella</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| Oriolidae | | | |
| <i>Oriolus auratus</i> Vieillot, 1817 | <i>Maculinirmus</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Oriolus larvatus</i> Lichtenstein, 1823 | <i>Maculinirmus</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Oriolus oriolus</i> (Linnaeus, 1758) | <i>Maculinirmus mundus</i> (Nitzsch [in Giebel], 1866) | Egypt | Gustafsson & Bush 2017 |

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|--|--|---|--|
| Paridae | | | |
| <i>Melaniparus niger</i> (Vieillot, 1818) | <i>Brueelia mpumalagensis</i> Gustafsson <i>et al.</i> , 2018 <i>Brueelia</i> sp. ³ | South Africa Malawi | Gustafsson <i>et al.</i> 2018 Bush <i>et al.</i> 2016 |
| <i>Parus major excelsus</i> Buvty, 1857 | <i>Brueelia picea</i> Gustafsson <i>et al.</i> , 2018 | South Africa Morocco | Johnson <i>et al.</i> 2002; Bush <i>et al.</i> 2016; Takano <i>et al.</i> 2018 Gustafsson <i>et al.</i> 2018 |
| Passeridae | | | |
| <i>Gymnoris superciliosus</i> Blyth, 1845 <i>Passer diffusus</i> (Smith, 1836) | <i>Brueelia</i> sp. <i>Brueelia</i> sp. <i>Guimaraesiella</i> sp. | Malawi South Africa South Africa | Bush <i>et al.</i> 2016 Takano <i>et al.</i> 2018 Takano <i>et al.</i> 2018 |
| <i>Passer domesticus</i> (Linnaeus, 1758) | <i>Brueelia cyclothorax</i> (Burmeister, 1838) <i>Rostrinirmus ruficeps</i> (Nitzsch [in Giebel], 1866) | South Africa Réunion Egypt | Gustafsson & Bush 2017 Gustafsson & Bush 2017 |
| <i>Passer griseus</i> (Vieillot, 1817) | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Passer melanurus</i> (Statius Müller, 1776) | <i>Brueelia</i> sp. <i>Rostrinirmus</i> sp. | South Africa South Africa | Takano <i>et al.</i> 2018 Bush <i>et al.</i> 2016; Takano <i>et al.</i> 2018 |
| <i>Passer melanurus damarensis</i> Reichenow, 1902 | <i>Brueelia pofadderensis</i> sp. nov. | South Africa | This report |
| <i>Petronia petronia barbata</i> Erlanger, 1899 <i>Plocepasser mahali</i> (Smith, 1836) | <i>Brueelia alexandrii</i> Eichler, 1953 <i>Brueelia</i> sp. | South Africa Tunisia South Africa | Gustafsson & Bush 2017 Takano <i>et al.</i> 2018 |
| Platysteiridae | | | |
| <i>Batis capensis</i> (Linnaeus, 1766) <i>Batis soror</i> Reichenow, 1903 <i>Platysteira cyanea</i> (Müller, 1776) | <i>Guimaraesiella</i> sp. <i>Guimaraesiella</i> sp. <i>Guimaraesiella</i> sp. | Malawi Mozambique Malawi | Bush <i>et al.</i> 2016 Bush <i>et al.</i> 2016 Bush <i>et al.</i> 2016 |
| Ploceidae | | | |
| <i>Amblyospiza albifrons</i> (Vigors, 1831) <i>Anaplectes rubriceps</i> (Sundevall, 1850) | <i>Sturnidoecus</i> cf. <i>basilewskyi</i> Tendeiro, 1963 <i>Brueelia</i> sp. | Benin Malawi | Takano <i>et al.</i> 2017 Bush <i>et al.</i> 2016 |

³ These specimens have been examined, and are conspecific with *B. mpumalagensis* Gustafsson *et al.* 2018, which had not been formally described at the time these phylogenies were published.

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|--|---|----------------------------------|--|
| <i>Euplectes albonotatus</i> (Cassin, 1848) | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Euplectes ardens</i> (Boddaert, 1783) | <i>Sturnidoecus</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | <i>Sturnidoecus</i> sp. | Mozambique | Bush <i>et al.</i> 2016 |
| | | Benin | Takano <i>et al.</i> 2017 |
| | | Malawi | Bush <i>et al.</i> 2016 |
| | | Mozambique | Bush <i>et al.</i> 2016 |
| <i>Euplectes franciscanus</i> (Isert, 1879) | <i>Brueelia aguilarae</i> Gustafsson & Bush, 2017 | Somalia | Gustafsson & Bush 2017 |
| <i>Euplectes hordeaceus</i> (Linnaeus, 1758) | <i>Sturnidoecus mon</i> Gustafsson & Bush, 2017 | Ghana | Gustafsson & Bush 2017 |
| <i>Euplectes jacksoni</i> (Sharpe, 1891) | <i>Brueelia terpsichore</i> sp. nov. | Kenya | This report |
| <i>Euplectes progne delamerei</i> (Shelley, 1903) | <i>Brueelia terpsichore</i> sp. nov. | Kenya | This report |
| <i>Malimbus nitens</i> (Gray, 1831) | <i>Brueelia sima</i> sp. nov. | Cameroun | This report |
| | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Plocepasser rufoscapulatus</i> Büttikofer, 1888 | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Ploceus capensis</i> (Linnaeus, 1766) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Ploceus cucullatus</i> (Müller, 1776) | <i>Brueelia</i> sp. | South Africa | Bush <i>et al.</i> 2016; Takano <i>et al.</i> 2018 |
| <i>Ploceus cucullatus bohndorffi</i> Reichenow, 1887 | <i>Sturnidoecus basilewskyi</i> Tendeiro, 1963 | Democratic Republic of the Congo | Gustafsson & Bush 2017 |
| <i>Ploceus cucullatus cucullatus</i> (Müller, 1776) | <i>Sturnidoecus basilewskyi</i> Tendeiro, 1963 | Cameroun | Gustafsson & Bush 2017 |
| | | Senegal | Gustafsson & Bush 2017 |
| <i>Ploceus cucullatus nigriceps</i> (Layard, 1867) | <i>Sturnidoecus basilewskyi</i> Tendeiro, 1963 | Mozambique | Gustafsson & Bush 2017 |
| <i>Ploceus melanocephalus</i> (Linnaeus, 1758) | <i>Sturnidoecus textoris</i> Tendeiro, 1964 | Democratic Republic of the Congo | Gustafsson & Bush 2017 |
| <i>Ploceus ocellaris</i> Smith, 1839 | <i>Sturnidoecus</i> sp. | Mozambique | Bush <i>et al.</i> 2016 |
| <i>Ploceus velatus</i> Viellot, 1819 | <i>Brueelia</i> sp. | South Africa | Johnson <i>et al.</i> 2002; Bush <i>et al.</i> 2016; Takano <i>et al.</i> 2018 |
| | <i>Sturnidoecus</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | | South Africa | Takano <i>et al.</i> 2018 |

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|--|---|----------------------------------|---|
| <i>Ploceus xanthops</i> (Hartlaub, 1862) | <i>Sturnidoecus xanthops</i> Tendeiro, 1963 | Democratic Republic of the Congo | Gustafsson & Bush 2017 |
| <i>Quelea quelea</i> (Linnaeus, 1758) | <i>Sturnidoecus</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| | <i>Brueelia quelea</i> Sychra & Bartlev in Sychra <i>et al.</i> , 2010a | Malawi | Bush <i>et al.</i> 2016; Gustafsson & Bush 2017 |
| <i>Quelea quelea quelea</i> (Linnaeus, 1758) | <i>Sturnidoecus</i> sp. | Senegal | Sychra <i>et al.</i> 2010a |
| | | South Africa | Takano <i>et al.</i> 2018 |
| <i>Quelea quelea lathamii</i> (Smith, 1836) | <i>Sturnidoecus somnodraco</i> Gustafsson & Bush, 2017 | Malawi | Bush <i>et al.</i> 2016 |
| <i>Sporopipes squamifrons</i> (Smith, 1836) | <i>Sturnidoecus somnodraco</i> Gustafsson & Bush, 2017 | Senegal | Gustafsson & Bush 2017 |
| <i>Bleda notatus</i> (Cassin, 1856) ⁴ | <i>Brueelia</i> sp. | Malawi | Gustafsson & Bush 2017 |
| | | South Africa | Takano <i>et al.</i> 2018 |
| Pycnonotidae | | | |
| <i>Arizelocichla milanensis</i> (Shelley, 1894) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Bleda canicapillus</i> (Hartlaub, 1854) | <i>Guimaraesiella</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| <i>Bleda eximius</i> (Hartlaub, 1855) | <i>Guimaraesiella</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| <i>Bleda notatus</i> (Cassin, 1856) ⁴ | <i>Brueelia</i> sp. | Democratic Republic of the Congo | Light <i>et al.</i> 2016 |
| <i>Bleda syndactylus</i> (Swainson, 1837) | <i>Brueelia</i> sp. | Democratic Republic of the Congo | Light <i>et al.</i> 2016 |
| <i>Chlorocichla flaviventris</i> (Smith, 1834) | <i>Guimaraesiella</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| | | South Africa | Takano <i>et al.</i> 2018 |
| <i>Criniger barbatus</i> (Temminck, 1821) | <i>Guimaraesiella</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| <i>Eurillas latirostris</i> (Strickland, 1844) | <i>Brueelia</i> sp. | Democratic Republic of the Congo | Light <i>et al.</i> 2016 |
| <i>Eurillas virens</i> (Cassin, 1857) | <i>Guimaraesiella</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| | | Malawi | Bush <i>et al.</i> 2016 |

⁴The host was recorded as *Bleda ugandae* van Someren, 1915, which was treated as a synonym of *B. notatus* (Cassin, 1856) by Clements *et al.* (2018).

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|--|---|----------------------------------|---|
| <i>Phyllastrephus albigularis</i> (Sharpe, 1881) | <i>Guimaraesiella</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| <i>Phyllastrephus flavostriatus</i> (Sharpe, 1876) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Phyllastrephus icterinus</i> (Bonaparte, 1850) | <i>Brueelia</i> sp. | Democratic Republic of the Congo | Light <i>et al.</i> 2016 |
| <i>Pycnonotus barbatus</i> (Desfontaines, 1789) | <i>Brueelia</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| <i>Pycnonotus nigricans</i> (Vieillot, 1818) | <i>Brueelia pseudognatha</i> Gustafsson & Bush, 2017 | Malawi | Bush <i>et al.</i> 2016 |
| <i>Pycnonotus tricolor</i> (Hartlaub, 1862) | <i>Brueelia</i> sp. ⁵ | South Africa | Gustafsson & Bush 2017; Takano <i>et al.</i> 2018 |
| <i>Stelgidillas gracilirostris</i> Strickland, 1844 | <i>Brueelia</i> sp. | South Africa | Johnson <i>et al.</i> 2002; Bush <i>et al.</i> 2016 |
| | <i>Guimaraesiella</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| | | Malawi | Bush <i>et al.</i> 2016 |
| Sturnidae | | | |
| <i>Acridotheres tristis tristis</i> (Linnaeus, 1766) | <i>Brueelia chayanh</i> Ansari, 1955 | St. Helena | Gustafsson & Bush 2017 |
| <i>Cinnyricinclus leucogaster</i> (Boddaert, 1783) | <i>Sturnidoecus</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Cinnyricinclus leucogaster verreauxi</i> (Bocage, 1870) | <i>Sturnidoecus porphyrogenitus</i> Gustafsson & Bush, 2017 | Mozambique | Gustafsson & Bush 2017 |
| <i>Cretophora cinerea</i> (Meuschen, 1787) | <i>Brueelia coryliventer</i> Gustafsson & Bush, 2015 | Kenya | Gustafsson & Bush 2015, 2017 |
| <i>Lamprotornis australis</i> (Smith, 1836) | <i>Sturnidoecus afzali</i> Ansari, 1968 | Kenya | Gustafsson & Bush 2017 |
| <i>Lamprotornis bicolor</i> Gmelin, 1789 | <i>Brueelia clara</i> Gustafsson & Bush, 2015 | Namibia | Gustafsson & Bush 2015, 2017 |
| <i>Lamprotornis chalybaeus chalybaeus</i> Hemprich & Ehrenberg, 1828 | “ <i>Brueelinae</i> ” | South Africa | Zlotorzycska <i>et al.</i> 1999 |
| | <i>Sturnidoecus eichleri</i> Ansari, 1968 | Ethiopia | Gustafsson & Bush 2017 |
| <i>Lamprotornis chalybaeus nordmanni</i> (Hartert & Neumann, 1914) | <i>Sturnidoecus eichleri</i> Ansari, 1968 | Kenya | Gustafsson & Bush 2017 |
| <i>Lamprotornis chloropterus</i> Swainson, 1838 | <i>Sturnidoecus</i> sp. | South Africa | Gustafsson & Bush 2017 |
| <i>Lamprotornis iris</i> (Oustalet, 1879) | <i>Sturnidoecus distinguendus</i> Ansari, 1968 | Malawi | Bush <i>et al.</i> 2016 |
| | | Uganda | Gustafsson & Bush 2017 |

⁵ This specimen has been examined and is conspecific with *B. pseudognatha* Gustafsson & Bush, 2017, which had not been formally described at the time this phylogeny was published.

Appendix (continued). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|--|---|--------------|--|
| <i>Lamprotornis meevesi</i> (Wahlberg, 1856) | <i>Sturnidoecus parvifrons</i> Ansari, 1968 | Botswana | Gustafsson & Bush 2017 |
| | | Mozambique | Gustafsson & Bush 2017 |
| | | Zambia | Gustafsson & Bush 2017 |
| | | Zimbabwe | Gustafsson & Bush 2017 |
| <i>Lamprotornis nitens</i> (Linnaeus, 1766) | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| <i>Lamprotornis purpureus</i> (Statius Müller, 1776) | <i>Sturnidoecus senegalensis</i> (Rudow, 1869) | South Africa | Gustafsson & Bush 2017; Takano <i>et al.</i> 2018 |
| | <i>Brueelia</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| | <i>Sturnidoecus</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| <i>Lamprotornis splendidus bairlandensis</i> (Neumann, 1920) | <i>Sturnidoecus meinertzhageni</i> Ansari, 1968 | Zambia | Gustafsson & Bush 2017 |
| <i>Lamprotornis splendidus splendidus</i> (Vieillot, 1822) | <i>Sturnidoecus meinertzhageni</i> Ansari, 1968 | Cameroon | Gustafsson & Bush 2017 |
| <i>Lamprotornis superbus</i> (Rüppell, 1845) | <i>Sturnidoecus theresae</i> Ansari, 1968 | Uganda | Gustafsson & Bush 2017 |
| <i>Neocichla gutturalis</i> (Bocage, 1871) | <i>Brueelia</i> sp. | Somalia | Gustafsson & Bush 2017 |
| | <i>Sturnidoecus</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Onychognathus blythii</i> (Hartlaub, 1859) | <i>Sturnidoecus clayae</i> Ansari, 1968 | Malawi | Bush <i>et al.</i> 2016 |
| <i>Onychognathus morio</i> (Linnaeus, 1766) | <i>Sturnidoecus clayae</i> Ansari, 1968 | Somalia | Gustafsson & Bush 2017 |
| <i>Onychognathus tenuirostris</i> (Rüppell, 1836) | <i>Sturnidoecus zahrae</i> Ansari, 1968 | Kenya | Gustafsson & Bush 2017 |
| <i>Onychognathus tenuirostris theresae</i> Meinertzhagen, 1937 | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Speculipastor bicolor</i> Reichenow, 1879 | <i>Sturnidoecus illustris</i> Ansari, 1968 | Kenya | Gustafsson & Bush 2017 |
| <i>Spreeo albicapillus albicapillus</i> Blyth, 1856 | <i>Sturnidoecus opeca</i> Ansari, 1968 | Kenya | Gustafsson & Bush 2017 |
| | <i>Brueelia tkachi</i> Gustafsson & Bush, 2015 | South Africa | Gustafsson & Bush 2017 |
| | | Somalia | Gustafsson & Bush 2015, 2017 |
| Sylviidae | | | |
| <i>Sylvia subcaeruleum</i> (Vieillot, 1817) | <i>Brueelia</i> sp. | South Africa | Johnson <i>et al.</i> 2002; Bush <i>et al.</i> 2016; Takano <i>et al.</i> 2018 |

Appendix (concluded). Species of chewing lice in the *Brueelia* complex (sensu Gustafsson & Bush 2017) reported from Africa since Ledger 1980.

| Host species | Louse species | Country | Reference |
|--|---|--------------|------------------------------|
| Turdidae | | | |
| <i>Geokichla gurneyi</i> (Hartlaub, 1864) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Neocossyphus poensis</i> (Strickland, 1844) | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Turdus libonyana</i> (Smith, 1836) | <i>Sturnidoecus</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Turdus merula syriacus</i> Hemprich & Ehrenberg, 1833 | <i>Guimaraesiella amsel</i> (Eichler, 1951) | Morocco | Gustafsson & Bush 2017 |
| <i>Turdus olivaceus pondoensis</i> Reichenow, 1917 | <i>Guimaraesiella ilmasae</i> (Ansari, 1956) | South Africa | Gustafsson & Bush 2017 |
| <i>Turdus pelios</i> Bonaparte, 1850 | <i>Guimaraesiella turdinulae</i> (Ansari, 1956) | Senegal | Najer <i>et al.</i> 2012 |
| <i>Turdus philomelos</i> Brehm, 1831 | <i>Sturnidoecus</i> sp. | Ghana | Bush <i>et al.</i> 2016 |
| <i>Turdus smithi</i> Bonaparte, 1850 | <i>Guimaraesiella turdinulae</i> (Ansari, 1956) | Egypt | Gustafsson & Bush 2017 |
| | <i>Brueelia</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| Vangidae | | | |
| <i>Prionops plumatus</i> (Shaw, 1809) | <i>Brueelia</i> sp. | Senegal | Najer <i>et al.</i> 2012 |
| | <i>Guimaraesiella</i> sp. | Malawi | Bush <i>et al.</i> 2016 |
| <i>Vanga curvirostris</i> (Linnaeus, 1766) | <i>Guimaraesiella</i> sp. | South Africa | Takano <i>et al.</i> 2018 |
| | | Malawi | Bush <i>et al.</i> 2016 |
| Viduidae | | | |
| <i>Vidua camerunensis</i> Grote, 1922 | <i>Brueelia</i> sp. | Cameroon | Balakrishnan & Sorenson 2006 |
| <i>Vidua macroura</i> (Pallas, 1764) | <i>Sturnidoecus</i> sp. | Cameroon | Balakrishnan & Sorenson 2006 |
| | <i>Brueelia</i> sp. | Cameroon | Balakrishnan & Sorenson 2006 |
| | | Malawi | Bush <i>et al.</i> 2016 |
| <i>Vidua paradisaea</i> (Linnaeus, 1758) | <i>Brueelia bicurvata</i> (Piaget, 1880) | South Africa | Takano <i>et al.</i> 2018 |
| <i>Vidua wilsoni</i> (Hartert, 1901) | <i>Brueelia</i> sp. | Zambia | This report |
| | | Cameroon | Balakrishnan & Sorenson 2006 |
| Zosteropidae | | | |
| <i>Zosterops senegalensis</i> Bonaparte, 1850 | <i>Brueelia</i> sp. | Malawi | Bush <i>et al.</i> 2016 |