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Two new species of *Guimaraesiella* Eichler, 1949 (Phthiraptera: Ischnocera: Philopteridae) from Tristan da Cunha finches

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Abstract

We describe *Guimaraesiella* (*Guimaraesiella*) *inaccessibilis* **sp. nov.** from the Inaccessible Island finch, *Nesospiza acunhae* Cabanis, 1873 (Passeriformes: Thraupidae), and *Guimaraesiella* (*Guimaraesiella*) *aedon* **sp. nov.** from the Nightingale Island finch, *Nesospiza questi* Lowe, 1923. Considering that the conservation status of both host species is "vulnerable", it can be assumed that *G.* (*G.*) *inaccessibilis* and *G.* (*G.*) *aedon* are also vulnerable.

Key words: Phthiraptera, Ischnocera, Philopteridae, *Guimaraesiella*, new species, Tristan da Cunha, Thraupidae, *Nesospiza*, finch

Introduction

The louse fauna of the remote archipelago of Tristan da Cunha in the South Atlantic is dominated by genera that occur on seabirds (Clay 1957; Hänel & Palma 2007). The only louse previously reported from passerines is an unidentified female *Brueelia* Kéler, 1936 from the Tristan thrush, *Turdus eremita gordoni* (Stenhouse, 1929) (Clay 1957; Hänel & Palma 2007). Here, we describe two species of chewing lice belonging to the genus *Guimaraesiella* Eichler, 1949 from two species of *Nesospiza*, both endemic and threatened finches of the Tristan da Cunha archipelago. Within *Guimaraesiella*, the new species belong to a group that is common on Neotropical passerines.

Material and methods

The specimens examined are deposited at the Natural History Museum, London, United Kingdom (NHML). Host taxonomy follows Clements *et al.* (2021). Terminology of setal, structural, and genital characters, and abbreviations thereof, follow Gustafsson & Bush (2017), including: *ads = anterior dorsal seta*; *ames = anterior mesosomal seta*; *dsms = dorsal submarginal seta*; *pmes = posterior mesosomal seta*; *pst1–2 = parameral setae 1–2*; *vms = vulval marginal seta*; *vos = vulval oblique seta*; *vss = vulval submarginal seta*. Measurements are given in millimetres for the following dimensions: TL = total length (along midline); HL = head length (along midline); HW = head width (at temples); PRW = prothoracic width; PTW = pterothoracic width; AW = abdominal width (at fifth segment).

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Systematics

PHTHIRAPTERA Haeckel, 1896

Phthiraptera Haeckel 1896: 703.

Ischnocera Kellogg, 1896

Ischnocera Kellogg, 1896: 63.

Philopteridae Burmeister, 1838

Philopteridae Burmeister, 1838: 422.

***Brueelia*-complex (*sensu* Gustafsson & Bush 2017)**

***Guimaraesiella* Eichler, 1949**

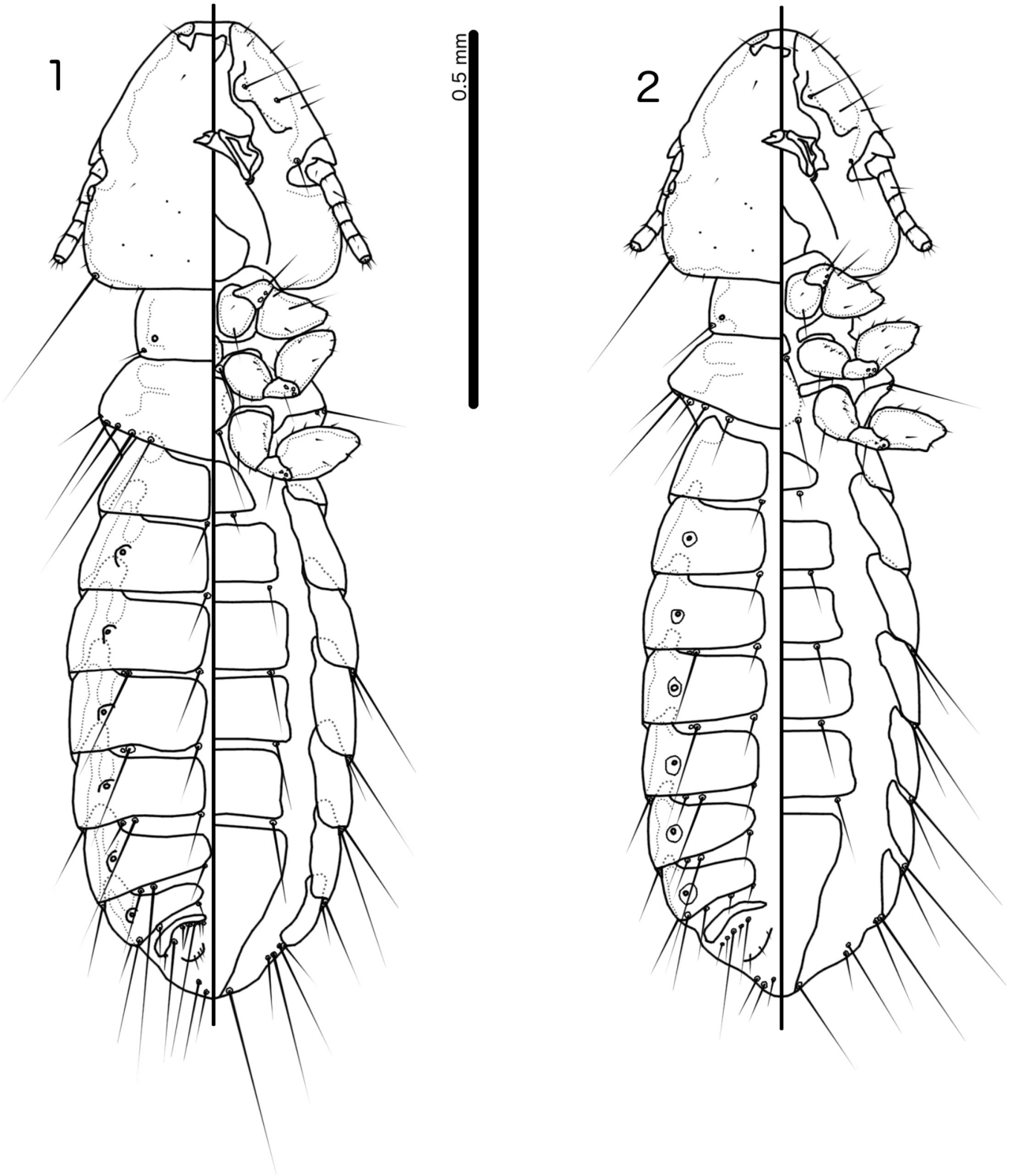
Docophorus Nitzsch, 1818: 289 (*in partim*).
Nirmus Nitzsch, 1818: 291 (*in partim*).
Degeeriella Neumann, 1906: 60 (*in partim*).
Brueelia Kéler, 1936: 257 (*in partim*).
Guimaraesiella Eichler, 1949: 11.
Xobugirado Eichler, 1949: 13.
Allobrueelia Eichler, 1951: 36 (*in partim*).
Allobrueelia Eichler, 1952: 74 (near-verbatim redescription).
Maculinirmus Złotorzycka, 1964: 247 (*in partim*).
Olivinirmus Złotorzycka, 1964: 246 (*in partim*).
Allonirmus Złotorzycka, 1964: 263.
Nitzschnirmus Mey & Barker, 2014: 101.
Callaenirmus Mey, 2017: 92.
Philemoniellus Mey, 2017: 145.

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

Remarks: The two species described herein belong to a tentative group of lice here called the "*interposita* species group". Members of this group can be identified by the following combination of characters: head generally dome-shaped, but may have slightly flattened frons, never extended anteriorly as in *Guimaraesiella papuana* (Giebel, 1879) (Gustafsson & Bush, 2017, fig. 356); dorsal anterior plate continuous posteriorly with main head plate; antennae sexually monomorphic; female subgenital plate with at least partial cross-piece, often submarginal in lateral ends; male genitalia typical for *Guimaraesiella* (see Gustafsson & Bush 2017, figs 6–10, 358), without rugose nodi or thickenings on the mesosomal lobes, but also without a ventral sclerite. Most of the species in this group occur on thraupid hosts.

The "*interposita* species group" includes at least the following species: *Guimaraesiella interposita* (Kellogg, 1899), *G. melanococa* (Carriker, 1903), *G. ptiliogonis* (Carriker, 1903), *G. abbasi* (Carriker, 1956), *G. rhamphocelii* (Cicchino, 1983), *G. schistacea* (Cicchino, 1983) and *G. atricapilla* (Cicchino, 1983). *Guimaraesiella taulis* (Eichler [in Niethammer], 1956) probably belongs to this group as well, but the only known female is too poorly preserved to confirm its status. *Guimaraesiella granatensis* (Soler-Cruz, Rodríguez, Florido-Navío & Muñoz-Parra, 1987) may also belong to this group, but we have not examined any material of this species, and the original species description is not detailed enough to determine its position. However, not all *Guimaraesiella* from thraupid hosts belong to the *interposita* group. For instance, *Guimaraesiella cubana* (Cicchino, 1983) does not belong to this group, but to a group of *Guimaraesiella* more commonly found on mimid hosts.

Since there was no species of the *Guimaraesiella interposita* species group included in the phylogeny of the *Brueelia*-complex by Bush *et al*. (2016), its position within *Guimaraesiella* is unknown. The species in the group are similar to the "core *Guimaraesiella*" (*sensu* Gustafsson *et al*. 2019), and many species are superficially similar to species of *Guimaraesiella* found on thrushes (Turdidae). Notably, both species described here lack the anterior extension of the ventral sclerite in the male mesosome that is characteristic of the "core *Guimaraesiella*".



FIGURES 1–2. Male habitus, dorsal and ventral views. **1,** *Guimaraesiella* (*Guimaraesiella*) *inaccessibilis* **sp. nov. 2,** *Guimaraesiella* (*Guimaraesiella*) *aedon* **sp. nov.**

***Guimaraesiella* (*Guimaraesiella*) *inaccessibilis* sp. nov.**
(Figs 1, 4, 6–8)

Type host: *Nesospiza acunhae* Cabanis, 1873—Inaccessible Island finch.

Type locality: Inaccessible Island, Tristan da Cunha Archipelago, South Atlantic.

Diagnosis. The only other member of the *Guimaraesiella interposita* species group in which the dorsal preantennal suture does not reach the *ads* is *G. aedon* **sp. nov.** *Guimaraesiella inaccessibilis* can be separated from *G. aedon* by the following characters: head proportionately longer and broader in *G. inaccessibilis* (Fig. 4) than in *G. aedon* (Fig. 5); proximal mesosome about as long as broad in *G. inaccessibilis* (Fig. 6), but broader than long in *G. aedon* (Fig. 9); mesosomal lobes with lateral ridge in *G. aedon* (Fig. 10), but no such ridge present in *G. inaccessibilis* (Fig. 7); abdomen of *G. inaccessibilis* with even yellow pigmentation, but abdomen on *G. aedon* with medium-brown pigmentation of sternal and subgenital plates, and dark-brown pigmentation on lateral sections of tergopleurites.

Description

Male. Head flat-dome shaped (Fig. 4), frons slightly flattened, lateral margins of preantennal area convex. Dorsal preantennal suture reaches *dsms* but does not reach *ads* or lateral margins of head. Head chaetotaxy as in Fig. 4. Thoracic and abdominal segments and chaetotaxy as in Fig. 1. Tergopleurites, sternal, and subgenital plates of even yellow pigmentation, darkening only laterally where ventral and dorsal sections of tergopleurites overlap. Male genitalia as in Figs 6–8. Basal apodeme widening proximally (Fig. 6). Proximal mesosome about as wide as long, widening slightly anteriorly (Fig. 7). Mesosomal lobes triangular, with near-right angles in anterior ends; no ridge near lateral margin; 2 *ames* and 3 *pmes* microsetae on each side forming near-continuous lines. Gonopore broad proximally, narrowly open distally; wide rugose area follows proximal margin of gonopore, but does not reach lateral margins of mesosome. Parameral heads large, irregular (Fig. 8). Parameral blades slender, tapering; *pst1* sensillum, near median margin; *pst2* microseta, central. Measurements (n = 2): TL = 1.32–1.53; HL = 0.38; HW = 0.35–0.36; PRW = 0.21–0.23; PTW = 0.33–0.34; AW = 0.38–0.47.

Female. Unknown.

Etymology: The species epithet is derived from the type locality: Latin "*inaccessibilis*" for "not accessible".

Type material. Ex ***Nesospiza acunhae*: Holotype** ♂, Inaccessible Island, Tristan da Cunha Archipelago, South Atlantic, Oct./Nov. 1988, Peter G. Ryan, L-2 (NHML). **Paratype:** 1♂, same data as holotype (NHML).

***Guimaraesiella* (*Guimaraesiella*) *aedon* sp. nov.**
(Figs 2–3, 5, 9–12)

Type host: *Nesospiza questi* Lowe, 1923—Nightingale Island finch.

Type locality: Nightingale Island, Tristan da Cunha Archipelago, South Atlantic.

Diagnosis. See under *G. inaccessibilis*, above.

Description

Both sexes. Head flat-dome shaped (Fig. 5), frons slightly flattened, lateral margins of preantennal area convex. Dorsal preantennal suture reaches *dsms* but does not reach *ads* or lateral margins of head. Head chaetotaxy as in Fig. 5. Thoracic and abdominal segments as in Figs 2–3.

Male. Thoracic and abdominal chaetotaxy as in Fig. 2. Male genitalia as in Figs 9–11. Basal apodeme widening slightly anteriorly (Fig. 9). Proximal mesosome shorter than wide (Fig. 10). Mesosomal lobes with near-parallel lateral margins in proximal end, converging distally; small ridge near lateral margins; 2 *ames* sensilla on each side near ridge; 1 *pmes* sensillum and 2 *pmes* microsetae on each side lateral to gonopore. Gonopore wide proximally, narrowly open distally; wide rugose area follows proximal margin of gonopore, reaching lateral margins of

mesosome. Parameral heads large, irregular (Fig. 11). Parameral blades short, slender; *pst1* sensilla, near median margin; *pst2* microseta, central. Measurements (n = 2): TL = 1.22–1.25; HL = 0.34; HW = 0.31–0.32; PRW = 0.19; PTW = 0.27–0.29; AW = 0.36–0.37.

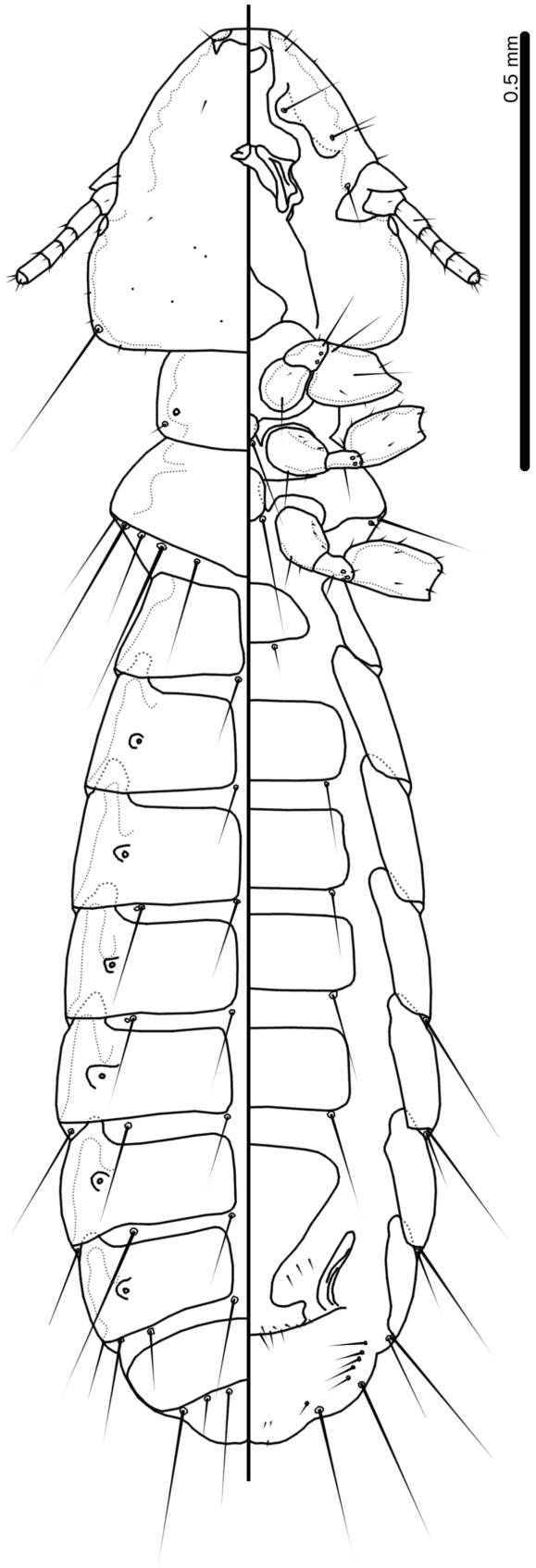
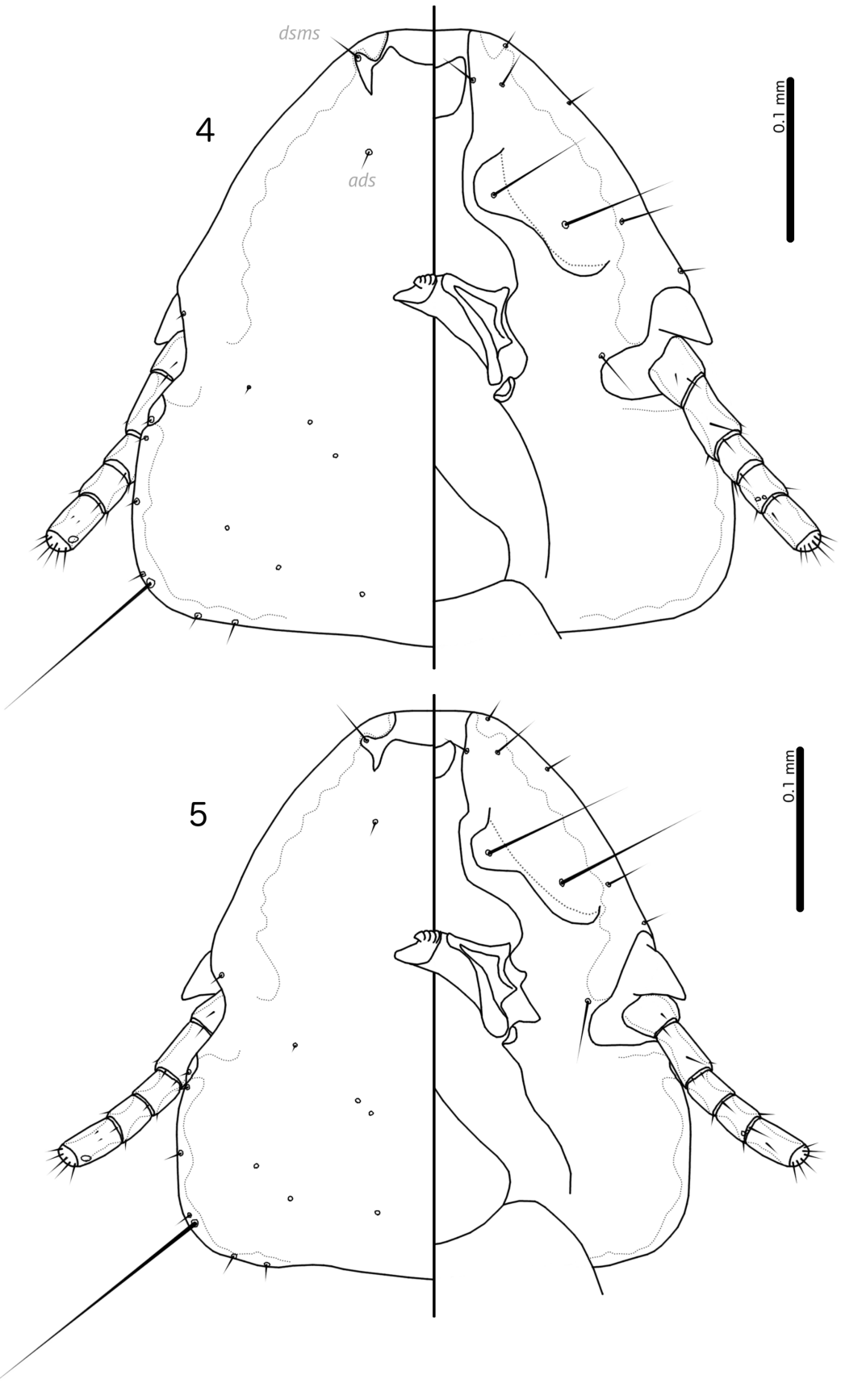
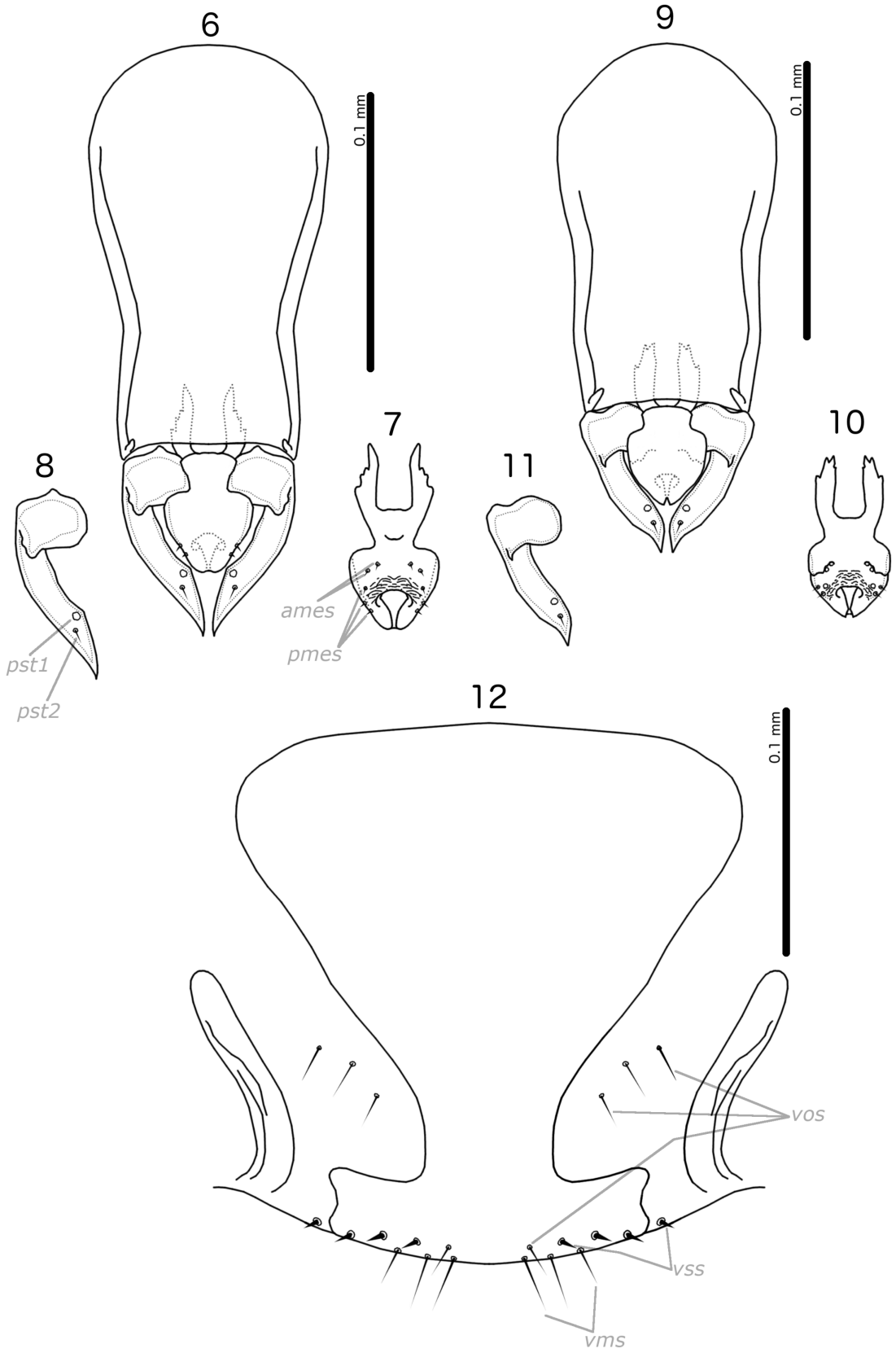


FIGURE 3. *Guimaraesiella* (*Guimaraesiella*) *aedon* **sp. nov.** Female habitus, dorsal and ventral views.



FIGURES 4–5. Male heads, dorsal and ventral views. **4,** *Guimaraesiella* (*Guimaraesiella*) *inaccessibilis* **sp. nov. 5,** *Guimaraesiella* (*Guimaraesiella*) *aedon* **sp. nov.** Abbreviations: *ads = anterior dorsal seta*; *dsms = dorsal submarginal seta.*



FIGURES 6–12. Male and female genitalia. *Guimaraesiella* (*Guimaraesiella*) *inaccessibilis* **sp. nov. 6,** male genitalia, dorsal view. **7,** male mesosome, ventral view. **8,** male paramere, dorsal view. *Guimaraesiella* (*Guimaraesiella*) *aedon* **sp. nov. 9,** male genitalia, dorsal view. **10,** male mesosome, ventral view. **11,** male paramere, dorsal view. **12,** female subgenital plate and vulval margin, ventral view. Abbreviations: *ames = anterior mesosomal seta*; *pmes = posterior mesosomal seta*; *pst1–2 = parameral setae 1–2*; *vms = vulval marginal seta*; *vos = vulval oblique seta*; *vss = vulval submarginal seta*.

Female. Thoracic and abdominal chaetotaxy as in Fig. 3. Subgenital plate broadly connected to partial cross-piece (Fig. 12). Vulval margin gently rounded (Fig. 12), with 2–3 long, slender *vms* on each side, and 3–5 short, thorn-like *vss* on each side; 5 long, slender *vos* on each side; distal 1 *vos* median to *vss*. Measurements (n = 2, except PTW, where n = 1): TL = 1.59–1.62; HL = 0.37; HW = 0.35–0.36; PRW = 0.22–0.24; PTW = 0.32; AW = 0.42–0.47.

Etymology: The specific name is derived from Greek "*aëdon*" for "nightingale", referring to the type locality as well as the common name of the type host.

Type material. Ex ***Nesospiza questi*****: Holotype** ♂, Nightingale Island, Tristan da Cunha Archipelago, South Atlantic, Oct./Nov. 1988, Peter G. Ryan, N2/3 (NHML). **Paratypes:** 1♂, 2♀, same data as holotype (NHML).

Discussion

The known hosts of both *Guimaraesiella inaccessibilis* and *G. aedon* are listed as "vulnerable" (BirdLife International, 2012a,b; see also Ryan 2008) and the lice occurring on these hosts are likely to be vulnerable as well. *Guimaraesiella inaccessibilis* and *G. aedon* are thus the latest in a growing list of lice known from rare or threatened hosts (*e.g.* Pérez & Palma 2001; Gustafsson & Olsson 2012; Leonardi & Palma 2013; Rózsa & Vas 2014; Gustafsson *et al.* 2015, 2021). At least 12 species of lice have probably become extinct in recent years (Mey 2005), and many more are found on endangered hosts (Rózsa & Vas 2014). Louse extinctions will likely become a greater issue in the future as habitat loss and fragmentation pushes host populations below the threshold needed to sustain their louse fauna (Bush *et al.* 2013). The preservation of the parasitic fauna on endangered hosts should be taken into account when planning the preservation of the host (Whiteman & Parker 2005; Dunn *et al*. 2009; Pérez *et al*. 2013; Rózsa & Vas 2014; Gustafsson *et al*. 2021).

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