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THE FEATHER MITES (ACARINA) OF THE PSOPHIIDAE (AVES) 1

BY W. T. ATYEO 2 and J. GAUD 3

ABSTRACT: The three species species of South American Psophiidae (Trumpeters) share a common acarofauna: *Analloptes psophiae* (Trouessart and Neumann), *Ceratothrix corniger* (Trouessart and Neumann), and two new taxa, *Atrichotibia fistella* and *Mastigodiscus bucolis*. All taxa are illustrated and the new taxa described.


Members of two closely related pterolichid genera can be restricted to one genus of cranes (Gruidae). In Africa, *Apatelacaraus brachychaetatus* (Gaud) and *Doleracarus tetrachaetus* (Gaud) occur on both species of the Crested Cranes (*Balearica Brisson*); in North America, *Geranolichus canadensis* Atyeo and Windingstad and *Gruoli­chus wodashae* Atyeo and Windingstad are found on the flight feathers of the Sandhill Crane [*Grus canadensis* (L.)] (Gaud, 1968; Atyeo and Gaud, 1980; Atyeo and Windingstad, 1979). We have discovered another example of related taxa on a gruiform genus; two new pterolichid taxa related to the aforementioned gruid fauna are restricted to the trumpeters (Psophiidae) of South America.

The three species of trumpeters are social, non-migratory birds found in Venezuela, the Guianas and the Amazon Valley (Van Tyne and Berger, 1976). They are weak-winged birds “That travel about the forest floors in flocks of a hundred or more” (Austin and Singer, 1961). All trumpeter species have a common feather mite fauna consisting of three species of Pterolichidae (Pterolichoidea) and one species of Xolalgidae (Analgoidea). Two of these mite species, described by Trouessart and Neumann (1888), will be illustrated, and two species, each representing a new pterolichid genus, will be described and illustrated.

The mites for this study were taken from museum study skins so the sites in which they occur are not known. Judging from the numbers of specimens, the Pterolichidae probably occupy the

1. Research supported by the National Science Foundation (DEB-7924299).
2. Department of Entomology, University of Georgia, Athens, Georgia 30602, USA.
3. Laboratoire de Parasitologie, Faculté de Médecine, 06034 Nice-cedex, France.

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exposed surfaces of flight and/or tail feathers and the Xolalgidae are probably restricted to the protected areas of the body and/or wing coverts.

The terminology in the descriptive sections follows ATYEO and GAUD (1966); the scales on the illustrations are in micrometers. Primary types will be deposited in the American Museum of Natural History; secondary types will be deposited in the American Museum, the University of Georgia, and the collection of J. GAUD.

The new genera Mastigodiscus and Atrichotibia are related to taxa associated with cranes (Gruidae), Geranolichus Gaud, Apatelacarus Atyeo and Gaud, and Doleracarus Atyeo and Gaud. For each, epimerites I are joined, legs are subequal in lengths, legs III are well separated from legs IV, seta ba is distal to solenidion ω I on the anterior legs, and setae sci are closer to sce than to the opposite member of the pair. The males have the genital organ positioned between setae c 2 (posterior genitals ?) and c 3 (coxal IVs ?); females have the genital discs posterior to setae c 1 (anterior genitals).

Mastigodiscus and Atrichotibia are separated from related taxa by the presence of whiplike processes on some or all of the ambulacra (Fig. 5). In Mastigodiscus the processes occur on pretarsi I and II and in Atrichotibia the processes occur on all legs. These two genera are separated from each other by other character states among which are the type of genital organ (compare Figs. 3, 4), by the presence or absence of setae kT III, IV, positions of hysterosomal setae, and by the position of the female sperm pore (Figs. 7, 8).

**PTEROLICHIIDAE**

**Mastigodiscus** new genus

**TYPES SPECIES:** Mastigodiscus bucolis, new species.

**DERIVATION:** From mastix, -igos (Gr., whip) + diskos (Gr., circular plate); masculine. The name refers to the whiplike process on the ambulacrum (see Fig. 5).

**DIAGNOSIS:** Pterolichid mites with epimerites I V-shaped; two internal vertical setae; setae kT III, IV present; internal scapular setae closer to homolog than to opposite member of pair; setae cG I, II, l 1 spiculiform; setae sh dagger-shaped; ambulacra I, II each with distal whiplike process (Fig. 5). Males with idiosoma posteriorly cleft; cleft with interlobar membranes not extending beyond terminal setae; setae d 4 distant from cleft; genital organ large, positioned between setae c 2, c 3; anal disc flange with circular pattern. Female with sperm pore dorsoterminal; setae d 3, l 3, d 4, l 4 spiculiform, distant from setae l 2; legs IV extending to terminus.

**REMARKS:** Asymmetrically developed processes on some or all of the ambulacra are (evidently) adaptations to the feather structure of trumpeters. These are not unique, as similar asymmetries are known in an undescribed taxon from the gruiform family Aramidae (limpkins); however, the mites from Aramus have small protuberances rather than well-developed whiplike processes.

**Mastigodiscus bucolis** n. sp.

(Figs. 1-3, 6-7)

It is unlikely that another species of this genus will be discovered as Mastigodiscus bucolis appears to be restricted to the three species of Psophiiidae. Thus, the description will be short and will emphasize differences between M. bucolis and the related Atrichotibia fistella, n. g., n. sp.

**Male** (holotype). Length, including gnathosoma, 278 μm; width, 116 μm. Prodorsal shield not extending laterally to level of setae l 1. Hysterosoma with interlobar membrane anterior to insertions of setae pai; setae pai, d 5, l 5 approximate; measurements: d 1: d 1, 65 μm; d 2: d 2, 39 μm; l 2: l 2, 67 μm; d 4: d 4, 41 μm. Venter with robust genital organ at level of trochanters IV; setae c 1, c 2 small. Legs subequal; lengths (excluding pretarsi) I, 106 μm; II, 100 μm; III, 96 μm; IV, 102 μm.
Figs. 1-3: *Mastigodiscus bucolis*, n. g., n. sp., male.
1. — Ventral aspect. 2. — Dorsal idiosoma. 3. — Genitoanal region.

Figs. 4-5: *Atrichotibia fistella*, n. g., n. sp., male.
4. — Genitoanal region. 5. — Pretarsus I.

Scale A, Figs. 1, 2; scale B, Figs. 3, 4. Setae: a, anal; c 1-3, centrals; cx 1, 3, coxals; d 1-5, l 1-5, dorsal and lateral hysterosomals; h, humerals; pae, pai, external and internal postanals; sh, subhumerals.
Female. Length, including gnathosoma, 401 μm; width, 158 μm. Hysterosoma with spiculiform setae d 3, d 4, l 3, l 4 clustered, distant from setae l 2; spermopore dorsoterminal; measurements: hysterosomal shield length, 264 μm; d 1 : d 1, 78 μm; d 2 : d 2, 61 μm; l 2 : l 2, 82 μm; level l 2 : d 3, 78 μm; level d 3 : d 4, 73 μm; level of d 3 to terminus, 80 μm. Legs I-III subequal; lengths (excluding pretarsi): I, 139 μm; II, 131 μm; III, 137 μm; IV, 155 μm.

Type data. From Psophia v. viridis Spix, 1825: σ holotype, 4 σ♂, 3 ♂♂ paratypes, Baião, Rio Tocantins, Pará, Brazil, December 4, 1931, A. M. OLLALA (AMNH 430241, YSU 2275); 1 ♂ paratype, Rio Tapajós, Pará, Brazil, July 29, 1931, A. M. OLLALA (AMNH 288168, YSU 2274); 4 σ♂ paratypes, São Carlos (= San Carlos), Mato Grosso, Brazil, August 2, 1943, L. A. PAKER (AMNH 208886, YSU 2276). From Psophia c. crepitans L., 1758: 13 σ♂, 5 ♂♂ paratypes, Tumatumari, Rio Potaro, Guyana, July 23, 1913, L. E. MILLER, F. X. Igleseder (AMNH 125284, YSU 2268).

Other material. From Psophia leucoptera Spix, 1825: 4 σ♂, 6 ♂♂, Boca del Río Urubamba, Cuzco, Peru, October 1, 1927, OLALLA and Sons (AMNH 239679, YSU 2272; AMNH 239682, YSU 2273) [This is a fraudulent locality, labels forged by the OLALLAS (Vaurie, 1972 : 34)].

Remarks. The specific epithet is derived from bu- (L., prefix meaning large) + colis (L., penis).

**Atrichotibia** new genus

**Type-species**: *Atrichotibia fistella*, new species.

**Derivation**: From a (Gr., without) + trichos (Gr., hair) + tibia (L., tibia); feminine; the name refers to tibial setae on legs III and IV being absent.

**Diagnosis**: Pterolichid mites with epimerites I Y-shaped; one internal vertical setae; setae kT III, IV absent; internal scapular setae closer to homolog than to opposite member of pair; setae cG I, II, l 1 spiculiform; setae sh acuminate, thickened; ambulacra I-IV each with distal, whip-like process. Males with idiosoma posteriorly cleft; cleft with interlobar membranes extending beyond terminal setae; setae d 4 near terminal cleft margins; genital organ small, tubular, positioned between setae c 2, c 3; anal disc flange with radiating striae. Female with external spermduct; setae d 3, l 3, d 4 setiform, not clustered near terminus; legs IV extending to level of setae d 4, l 3.

*Atrichotibia fistella* n. sp.

(Figs. 4, 5, 8)

As with the previous monotypical genus, it is doubted that another species of *Atrichotibia* will be discovered. The genital organ of this taxon is a type that has not been previously observed in feather mites; the external portion is a thin-walled tube and there is no observable aedeagal structure.

Male (holotype). Similar to *Mastigodiscus bucolis* (Figs. 1, 2). Length, including gnathosoma and lamellae, 278 μm; width, 108 μm. Prodorsal shield extending laterally to level of setae l 1. Hysterosoma with interlobar membrane extending posterior to setae pai; setae pai, d 5, l 5 separated; measurements: d 1 : d 1, 59 μm; d 2 : d 2, 55 μm; l 2 : l 2, 57 μm; d 4 : d 4, 18 μm. Venter with small, truncated genital organ; setae c l, c 2 small. Legs I larger than II-IV; lengths (excluding pretarsi): I, 100 μm; II, 86 μm; III, 78 μm; IV, 77 μm.

Female. Length, including gnathosoma, 409 μm; width, 143 μm. Hysterosoma with setae l 4 spiculiform, pai bifurcate; setae d 2 midway between l 2, d 4; terminal external spermduct; measurements: hysterosomal shield length, 269 μm; d 1 : d 1, 74 μm; d 2 : d 2, 73 μm; l 2 : l 2, 75 μm; level l 2 : d 3, 39 μm; level of d 3 to terminus, 129 μm. Legs II-IV subequal;
Figs. 6, 7: Mastigodiscus bucolis, n. g., n. sp., female.
6. - Ventral aspect. 7. - Dorsal idiosoma.

Fig. 8: Atrichotibia fistella, n. g., n. sp., female, dorsal idiosoma.

Setae: cx 1, 3, 4, coxals; d 1-5, l 1-5, dorsal and lateral hysterosomals; h, humerals; pae, pai, external and internal post-anals; sh, subhumerals.
lengths (excluding pretarsi) : I, 120 μm; II, 104 μm; III, 100 μm; IV, 100 μm.

Type data. From Psophia v. viridis Spix, 1825 : σ holotype, 1 σ, 4 ♀ ♀ paratypes, São Carlos (= San Carlos), Mato Grosso, Brazil, August 2, 1943, L. A. PARKER (AMNH 408886, YSU 2276); 4 ♀ ♀ paratypes, Buião, Rio Tocantins, Pará, Brazil, December 4, 1931, A. M. OLALLA (AMNH 430241, YSU 2275); 1 a, 6 ♀ ♀ paratypes, Rio Tapajós, Pará, Brazil, July 29, 1931, A. M. ULALLA (AMNH 125284, YSU 2268 ; AMNH 125283, YSU 2269).

Other material. From Psophia leucoptera Spix, 1825 : 7 σ♂, 5 ♀♀, Boca del Rio Urubamba, Cuzco, Peru, October 1, 1927, OLALLA and Sons (AMNH 239679, YSU 2272 ; AMNH 239682, YSU 2273) [This is a fraudulent locality, labels forged by the OLALLAS (VAURIE, 1972 : 34)].

Remarks. The specific epithet fistella (L., small pipe, tube) refers to the small parallel-sided genital organ.

Ceratothrix corniger (Trouessart and Neumann) (Figs. 9-12)
Ptero/ichus corniger TROUESSART and NEUMANN, 1888 : 339, pl. XXII, fig. 5a, b.
P. (Eupterolichus) corniger : CANESTRINI and KRAMER, 1899 : 43.
Ceratothrix corniger : TROUESSART, 1915 : 214

In Ceratothrix corniger, the only species assigned to the genus, sexual dimorphism is obvious for some characters, subtle for others. Differences in the development of setae, legs I, and epimerites I can be easily observed by comparing the figures. Considering that the idiosomata are approximately the same sizes for both sexes, note that female gnathosoma is two times larger than the male gnathosoma. Both are normally developed, and the size differential can be exemplified by the lengths of the chelicera and movable digits: for the female, 123 μm and 35 μm, for the male, 61 μm and 17 μm.

We were not able to distinguish dimorphism in the immatures. The larvae and nymphs have the same setal development as do the females.

Type data. From Psophia crepitans L. (= P. agami), Brazil.

Material examined. Many specimens from the three species of Psophia with the collecting data as in Mastigodiscus bucolis and Atrichotibia fistella.

XOLALGIDAE

Analoptes psophiae (Trouessart and Neumann) (Figs. 13-16)
Pteraloptes psophiae : CANESTRINI and KRAMER, 1899 : 105.

The three genera of Pterolichidae previously discussed are monotypic and are known only from the Psophiidae. Species of Analoptes are associated with many groups of birds, Bucerotidae, Rallidae, Aramidae, Threskiornithidae, Ciconiidae, Fregatidae, Picidae, Tyrannidae and Muscicapidae (GAUD and ATYEO, 1981). Of these diverse associations, only A. psophiae occurs on the trumpeters. This species is not common in collections but this is probably due to collecting methods as A. psophiae and other Analoptes species probably occur in the protected areas of feathers (sensus PÉREZ and ATYEO, 1984).

Type data. From Psophia crepitans L. (= P. agami), Brazil.

Material examined. 12 σ♂, 1 ♀, representing specimens from each of the Psophia species listed in the preceding descriptions.
Figs. 9, 10: Ceratothrix corniger (Trouessart and Neumann), male.

9. — Ventral aspect. 10. — Dorsal idiosoma.

Setae: cx 1, 3, 4, coxals; d 1-5, l 1-5, dorsal and lateral hysterosomals; h, humerals; pae, pai, external and internal post-anaals; sh, subhumerals; vi, internal verticals.
FIGS. 11, 12: Ceratothrix corniger (Trouessart and Neumann), female.

Setae: d 1-5, l 1-5, dorsal and lateral hysterosomals; h, humerals; pai, internal postanals; sh, subhumerals; vi, internal verticals.
Figs. 13, 14: *Analoptes psophiae* (Trouessart and Neumann), male.


Setae: *a*, anals; *cx* 1, 3, 4, coxals; *d* 1-5, *l* 1-5, dorsal and lateral hysterosomals; *h*, humerals; *pae, pai*, external and internal postanals; *sh*, subhumerals.
FIGS. 15, 16: *Anilloptes psophiae* (Trouessart and Neumann), female.

15. — Ventral aspect.  16. — Dorsal idiosoma.

Setae: a, anals; d 1-5, l 1-5, dorsal and lateral hysterosomals; h, humerals; pae, pai, external and internal postanals; sh, subhumerals.
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