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Terratosyringophilus reichholffi, a new species of quill mites parasitizing the black-capped lory *Lorius lory* (L.) in New Guinea

(Acari, Cheyletoidea, Syringophilidae)

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A new species *Terratosyringophilus reichholffi* spec. nov. is described from quills of *Lorius lory* (L.) (Psittaciformes: Psittacidae) from New Guinea. The syringophilids were acquired from the bird specimens housed in the The Bavarian State Collection of Zoology, Germany. The new species is distinguishable from other described species of this genus by the length ratio of setae *ve:sci* 1:2.2–2.5, in females. A key to the species of this genus is given.

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Introduction

The quill mites of the family Syringophilidae (Acari: Prostigmata: Cheyletoidea) are obligatory permanent ectoparasites of birds inhabiting quills of the flight and covert feathers. Although they are widely distributed on their hosts, and up to now were reported from representatives of 18 bird orders (Bochkov et al. 2004), our knowledge of syringophilid fauna is still fragmentary.

The *Terratosyringophilus* Bochkov & Perez, 2002 is one of 35 genera in the family Syringophilidae (Bochkov et al. 2004; Nattress & Skoracki 2007). This small genus (5 species) and other three genera: *Peristerophila* Kethley, 1970, *Psittacophilus* Fain, Bochkov & Mironov, 2000 and *Castosyringophilus* Bochkov & Perez, 2002, form a compact, closely related generic group, which is associated with parrots (Psittaciformes) and doves (Columbiformes) (Bochkov & Perez 2002). *Terratosyringophilus* comprises large mites (more than 1,200 µm), characterized by the reduction of setae *vi*, *vs* II and *dFII*, presence of 2 pairs of the sausage-like median protuberances,

weakly sclerotized propodonal shield, rounded posteriorly stylophore and very long apodemes I.

The present paper contains the description of a new species *T. reichholffi* spec. nov. collected from the black-capped lory *Lorius lory* (Linnaeus, 1758) (Psittacidae) from New Guinea.

Materials and methods

The syringophilids were acquired from the bird specimens (dry skins) housed in the Bavarian State Collection of Zoology, Munich, Germany. Initially, mites were placed in lactic acid (10 %) for five days. Later, they were mounted on slides in Faure's medium and examined using an Olympus BH2 microscope with DIC optics.

The nomenclature of idiosomal setae is based on that of Fain (1979) in the version adapted for the family Syringophilidae (Bochkov & Mironov 1998) and the chaetotaxy for the legs is that of Grandjean (1944). Bird taxonomy follows Howard and Moore (1991). All measurements are given in micrometres (µm).

Abbreviations for institutions where the materials are deposited: AMU, Department of Animal Morphology, A. Mickiewicz University, Poznan, Poland; ZIN, Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia; ZSM, Bavarian State Collection of Zoology, Munich, Germany.

Results

Family Syringophilidae Lavoipierre, 1953

Subfamily Syringophilinae Lavoipierre, 1953

Genus *Terratosyringophilus* Bochkov & Perez, 2002

Terratosyringophilus reichholfi spec. nov.

(Figs 1-10)

Type material. ♀ holotype, 3♀ and 3♂ paratypes (Syr. 142) from quill of great covert of the black-capped lory *Lorius lory* (Psittaciformes: Psittacidae); New Guinea, Astrolabe, 25 April 1894, coll. B. Hapen. The host specimen is deposited at ZSM.

Type depositary. Whole material is deposited at AMU, except 1♀ and 1♂ paratypes at ZIN and 1♀ paratype at ZSM.

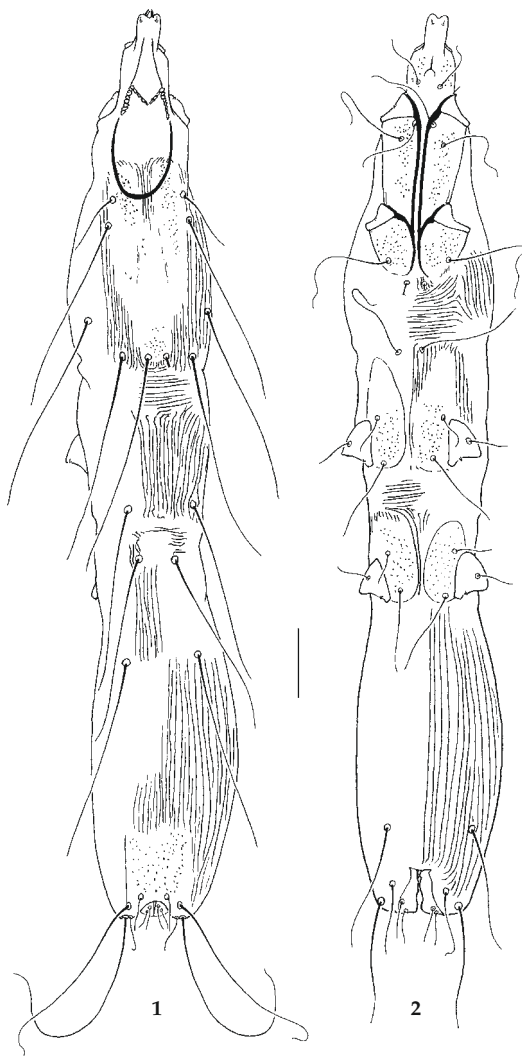
Differential diagnosis. Females of *Terratosyringophilus reichholfi* spec. nov. are easily distinguishable from other described species of this genus by the length of the propodonotal setae *ve* and *sci*. In females of *T. reichholfi* spec. nov. the setae *sci* are 2.2-2.5 times longer than the setae *ve*. In females of *T. longisoma* (Casto, 1979) the setae *sci* are about 5 times longer than *ve*. In females of the rest species (*T. pioni*, *T. lorincinus* and *T. geotrygonus*) setae *sci* are no more than 1.3 times longer than *ve*.

Description

Female (Figs 1-5). Total body length 1,300 in holotype (1,270-1,310 in 3 paratypes).

Gnathosoma. Gnathosoma punctated ventrally. Hypostomal apex with 2 pairs of large protuberances and 2 pairs of hypostomal lips (Fig. 3). Cheliceral digit dentate, 190 (185-190) long. Each transverse branch of peritremes with 6-7 chambers, each longitudinal branch with 9-10 chambers (Fig. 4). Stylophore rounded posteriorly, 250 (250) long.

Idiosoma. Propodonotal shield weakly developed with indiscernible margins, constricted posteriorly, punctated, carrying bases of setae *ve*, *sci* and *d1*. Bases of setae *h* and *sce* situated on striated tegument. Setae *sce* and *d1* subequal in length, bases of these setae set at the same transverse level. Length ratio of setae *ve:sci* 1:2.2-2.5. Hysteronotal shield absent. Setae *l1*, *d2* and *l2* subequal in length.

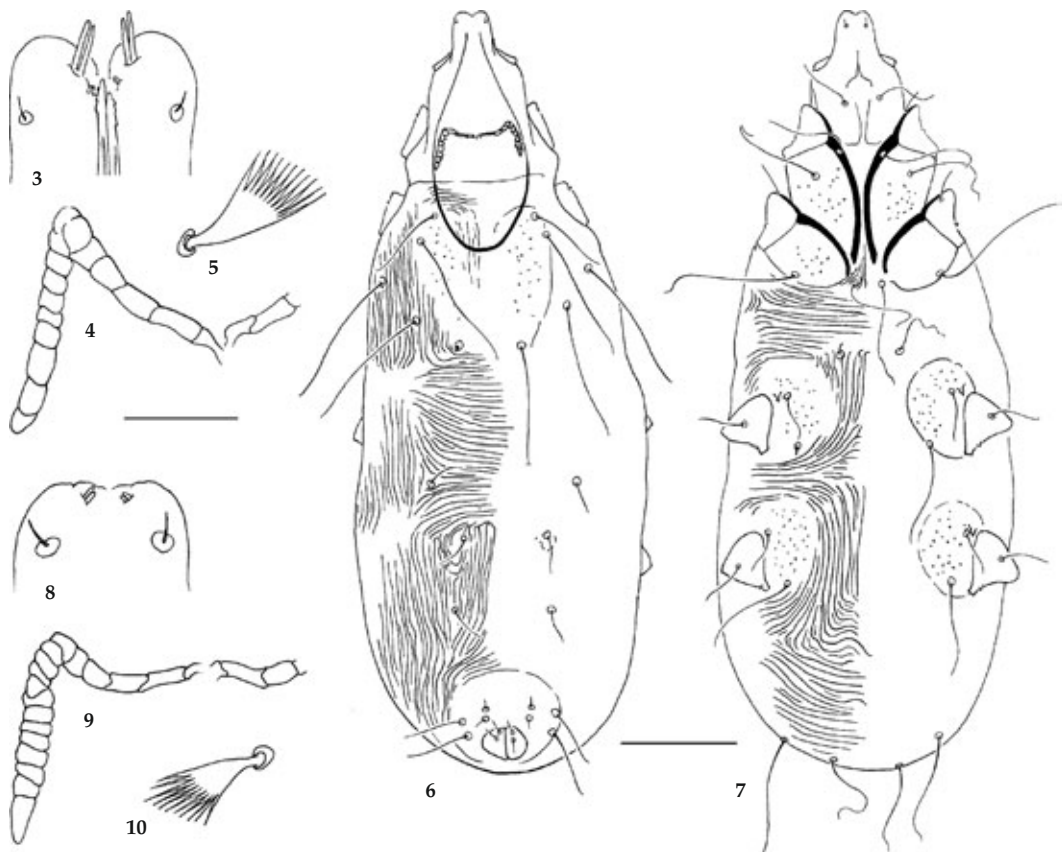


Figs 1-2. *Terratosyringophilus reichholfi*, spec. nov. Female. 1. Dorsal view; 2. Ventral view.

Pygidial shield punctated, with indiscernible anterior margin. Setae *d4* and *d5* short and subequal in length. Paragenital setae *pg1* and *pg3* subequal in length, both 1.7 times longer than *pg2*. Cuticular striations as in Figs 1 and 2.

Legs. Fan-like setae *p'* and *p''* of legs III and IV with 11-12 times (Fig. 5). Setae *tc'''III-IV* twice longer than *tc'''III-IV*. Setae *cxIII2* twice longer than *cxIII1*. Coxal fields well sclerotized and punctated.

Lengths of setae: *ve* 110 (80-110); *sci* (230-245); *h* 280 (255-275); *sce* 280 (260); *l1* (250); *l2* 260 (240); *l4* 260; *l5* 280 (295); *d1* 280 (260); *d2* 250 (210); *d4* 40 (45); *d5* 40 (50); *a1* and *a2* 25 (20-25); *g1* and *g2* 30



Figs 3-10. *Terratosyringophilus reichholffi*, spec. nov. 3-5. Female. 3. Hypostomal apex; 4. Peritreme; 5. Fan-like seta $p'III$. 6-10. Male. 6. Dorsal view; 7. Ventral view; 8. Hypostomal apex; 9. Peritreme; 10. Fan-like seta $p'III$.

(30-35); $pg1$ (165); $pg2$ (95); $pg3$ (165); $sc3$ 50 (50); $sc4$ 45; $tc'III-IV$ 55 (45-50); $tc''III-IV$ 105 (100); $cxIII1$ (40-45); $cxIII2$ (100-105).

Male (Figs 6-10). Total body length 585-595 in 3 paratypes.

Gnathosoma. Hypostomal apex as in Fig. 8. Each transverse branch of peritremes with 6-7 chambers, each longitudinal branch with 11-12 chambers (Fig. 9). Stylophore rounded posteriorly, 205-210 long.

Idiosoma. Propodonal shield with indiscernible margins, constricted posteriorly, punctated, bearing bases of setae ve , sci and $d1$. Bases of setae h and sce situated on striated tegument. Setae sce set anterior to level of setae $d1$. Length ratio of setae $ve:sci$ 1:2.5-2.7. Hysteronotal shield absent. Setae $l1$, $d2$ and $l2$ subequal in length. Pygidial shield with

rounded anterior margin, not punctated. Setae $g1$ and $g2$ situated at the same longitudinal level. Length ratio of setae $d5:l5$ 1:1.3-1.5. Two pairs of paragenital setae present, $pg1$ slightly (1.2 times) longer than $pg2$. Cuticular striations as in Figs 6 and 7.

Legs. Fan-like setae p' and p'' of legs III and IV with 11 tines (Fig. 10). Setae $tc'III-IV$ twice longer than $tc''III-IV$. Setae $cxIII2$ twice longer than $cxIII1$. Coxal fields well sclerotized and punctated.

Lengths of setae: ve 55-70; sci 135-180; h 130; $l1$ 30-35; $l2$ 25-30; $l5$ 55-60; $d1$ 155; $d2$ 25-30; $d5$ 35-40; $pg1$ 90; $pg2$ 110; $tc'III-IV$ 35; $tc''III-IV$ 65-70; $cxIII1$ 30-35; $cxIII2$ 70; $sc3$ and $sc4$ 25.

Etymology. This species is named in honour of the prominent German ornithologist, Professor Josef H. Reichholf (Bavarian State Collection of Zoology, Munich, Germany).

Key to the females of *Terratosyringophilus*

- 1 Setae *sci* at least two times longer than *ve*.....2
 - Setae *sci* less than 1.3 times longer than *ve*..... 3
- 2 The length ratio of setae *ve:sci* 1:2.2-2.5.....
 -*T. reichholfi*, spec. nov.
 - The length ratio of setae *ve:sci* 1:5.....
 -*T. longisoma* (Casto, 1979)
- 3 Setae *ve* and *sci* shorter than 200.....
 - *T. loricinus* Bochkov et Fain, 2003
 - Setae *ve* and *sci* longer than 340..... 4
- 4 Pygidial shield present, ratio of distances between setae *l1-d2:d2-l2* 1:2-3.....
 -*T. geotrygonus* Skoracki et Glowska, 2008
 - Pygidial shield absent, ratio of distances between setae *l1-d2:d2-l2* 1:1.2.....
 -*T. pioni* Bochkov et Perez, 2002

Remarks

The members of the genus *Terratosyringophilus* are associated with doves (Columbiformes, Columbidae): *T. longisoma* from *Zenaida asiatica* (Linnaeus, 1758) from USA, *T. geotrygonus* from *Geotrygon linearis* (Prevost, 1843) from Venezuela, and parrots (Psittaciformes, Psittacidae): *T. pioni* from *Pionus senilis* (Spix, 1824) from Mexico, *T. loricinus* from *Lorius garrulus* (Linnaeus, 1758) and *Trichoglossus haematodus* (Linnaeus, 1771), both from Indonesia, and *T. reichholfi* spec. nov. from New Guinea (Bochkov & Perez 2002; Bochkov & Fain 2003; Skoracki & Glowska 2008; present paper).

The associations of this genus with parrots and doves indirectly confirm the hypothesis about the sister group relationship between colombiform and psittaciform birds (Sibley et al. 1988), and suggest their parasitism on the common ancestor of the Psittaciformes-Columbiformes clade (Bochkov & Perez 2002). Moreover the presence of members of the genus *Terratosyringophilus* on parrots from Old- and New World suggest that this genus, similar to their host, has Gondwanan origin (Cracraft 1973).

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