

**TWO NEW SPECIES OF THE FEATHER MITE SUBFAMILY
PROCTOPHYLLODINAE (ACARI: PROCTOPHYLLODIDAE)
FROM SUBOSCINE BIRDS (AVES: PASSERIFORMES) IN CHILE**

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ABSTRACT: Two new species of the feather mite subfamily Proctophyllodinae (Astigmata: Proctophyllodidae) are described from suboscine passeriform birds (Passeriformes) in Chile: *Anisophyllodes elaeinae* sp. n. from *Elaenia albiceps* (Orbigny et Lafresnaye, 1837) (Tyrannidae) and *Tanyphyllodes pteroptochi* sp. n. from *Pteroptochos tarnii* (King, 1831) (Rhinocryptidae). Brief discussions of the main diagnostic features and species content of the genera *Anisophyllodes* Atyeo, 1967 and *Tanyphyllodes* Atyeo, 1966 are provided.

KEY WORDS: Astigmata, feather mites, Proctophyllodidae, *Anisophyllodes*, *Tanyphyllodes*, new species, Passeriformes

INTRODUCTION

The feather mite family Proctophyllodidae (Acari: Astigmata) currently includes over 400 species arranged in 40 genera and 2 subfamilies (Gaud and Atyeo 1996; Hernandez et al. 2007; Mironov et al. 2008; Mironov 2009). The vast majority of proctophyllodid species are associated with passeriform and apodiform birds with a few specific to other avian orders (Aty eo and Braasch 1966; Atyeo 1967; Park and Atyeo 1971; Atyeo and Gaud 1977; Gaud and Atyeo 1996). Proctophyllodids inhabit feathers with large well-developed vanes, namely the flight feathers and greater coverts of wings and the tail feathers, where they are located between barbs on the ventral side of vanes.

Although this family is the most species-rich family of feather mites (those astigmatan mites permanently living in the plumage or on the skin of birds), its diversity is still poorly explored, especially in tropical regions, where many potential passerine hosts have never been explored for their feather mite fauna.

In this paper we describe two new species of the genera *Anisophyllodes* Atyeo, 1967 and *Tanyphyllodes* Atyeo, 1966 (Proctophyllodidae: Proctophyllodinae) found in the course of processing of feather mites collected from various passerines in Chile.

MATERIAL AND METHODS

The material used in the present study was collected by the junior coauthor (DGA) in central regions of Chile (Bío Bío and Los Lagos) in the period of 2001–2008. Mites were collected from plumage of birds that had died of disease or were road-killed. Mites were removed using a needle or

forceps and placed into a tube with 70% ethanol. Further, mite specimens were mounted on microslides in Faure medium according to standard receipt (Evans 1992).

Species descriptions follow the modern format used for mites of the family Proctophyllodidae (Hernandez et al. 2007; Mironov et al. 2008). General morphological terms and leg and idiosomal chaetotaxy follow Gaud and Atyeo (1996). All measurements are in micrometres (µm). Measuring techniques for particular structures: the length of the idiosoma is measured from the anterior margin to the level of setae *h3* (in males) and to the lobar apices excluding the terminal appendages (in females); width of idiosoma is measured at the level of the humeral shields; the hysterosoma is measured in a similar way but from the level of the sejugal furrow; the distance between different pairs of setae is the shortest distance between the transverse levels formed by setae of respective pairs.

Systematics and scientific names of birds follow Dickinson (2003). Type material depositories: ZISP — Zoological Institute of the Russian Academy of Sciences (Saint Petersburg, Russia), DGA — Departamento de Ciencias Pecuarias, Facultad de Ciencias Veterinarias, Universidad de Concepción (Chillán, Chile).

**Family Proctophyllodidae
Trouessart et Mégnin, 1884**

**Subfamily Proctophyllodinae
Trouessart et Mégnin, 1884**

Genus *Anisophyllodes* Atyeo, 1967

Up to now, the genus *Anisophyllodes* included three species associated with tyrannid flycatch-

ers of the genera *Elaenia* Sundevall, 1836 and *Mionectes* Cabanis, 1844 (Passeriformes: Tyrannidae) from the New World. Atyeo (1967) established this genus for a single species, *Anisophyllodes pipromorphae* Atyeo, 1967 from *Mionectes oleagineus* (Lichtenstein, 1823). Later, Atyeo (1969) added one more species, *A. intermedius* (Trouessart and Neumann, 1888) from *Elaenia martinica* (Linnaeus, 1766), which was removed from the genus *Alloptes* Canestrini, 1879. The latter mite species was also recorded by Černý and Lukoschus (1975) from *E. flavogaster* (Thunberg, 1822). Finally, Hernandez et al. (2007) described the third species, *A. candango* Hernandez, Valim et Mironov, 2007, from *E. chiriquensis* Lawrence, 1865 in Brazil.

The main diagnostic features clearly differentiating *Anisophyllodes* from other proctophyllodines may be summarized as follows. In both sexes, the idiosoma is moderately elongated (1.8–2.7 times longer than wide); the hysterosoma bears either the complete set of dorsal setae occurring in Proctophyllodidae or setae *e1* may be absent; epimerites I are free with diverging posterior tips. In males, the opisthosoma is attenuate to posterior end, the opisthosomal lobes are either roughly rectangular, separated from each other by a very narrow parallel-sided terminal cleft and provided with rectangular terminal lamellae (heteromorph form), or they are blunt-angular, separated by shallow terminal cleft and lack any terminal lamellae (homeomorph form); the genital apparatus is relatively small and situated at the level of trochanters IV; the genital arch has a form of an inverted V, the aedeagus is short; setae *g* and *ps3* are arranged in a longitudinal rectangle; paired or unpaired pregenital apodemes (pregenital plates) are present; the adanal shields are present. In heteromorph males, legs IV are also noticeably thicker than legs III, while in homeomorphs, legs III and IV are subequal in size. Females are practically indiscernible from most proctophyllodine genera having the same features in both sexes and the hysteronotal shield completely split into anterior and lobar parts in females (*Diproctophyllodes* Atyeo, 1966, *Hadrophyllodes* Atyeo, 1971, *Hemipterodectes* Berla, 1959, and *Nycteridocaulus* Atyeo, 1966); only strongly pronounced ovate lacunae on the hysteronotal shield could be more or less suitable as genus-level diagnostic characters in the case when males are not found.

Dimorphism of males is recorded only in *A. pipromorphae*; in other known species, males correspond to the heteromorph form.

Key to species of *Anisophyllodes*

1. Prodorsal and hysteronotal shields close to each other, almost touching. All surfaces of prodorsal and hysteronotal shields with numerous small circular lacunae. Setae *e1* absent. In males, pregenital apodemes fused together forming a transverse sclerite in the form of a rectangular bracket, anal suckers dentate, and tarsus IV with claw-like apical process *A. pipromorphae* Atyeo, 1967 — Prodorsal and hysteronotal shields clearly distant from each other. Surface of prodorsal shield uniformly punctate, hysteronotal shield with ovate lacunae only in posterior part. Setae *e1* present. In males, pregenital apodemes represented by short longitudinal plates well separated from each other, anal suckers edentate, and tarsus IV with bidentate apical process (Figs. 1B, 3D) 2
2. In both sexes, idiosoma 2.5–2.7 times longer than wide
.... *A. intermedius* (Trouessart et Neumann, 1888) — Idiosoma 1.8–2 times longer than wide in males and 1.9–2.3 times in females 3
3. In males, legs IV extending by ambulacral disc beyond posterior margin of terminal lamellae. In females, legs IV extending slightly beyond the level of lobar apices; head of spermatheca as small inflation at proximal end of primary spermatheca *A. candango* Hernandez et al., 2007 — In males, legs IV scarcely extending to posterior margin of terminal lamellae. In females, legs IV extending to the level of setae *h2*; head of spermatheca pear-shaped (Fig. 3E) *A. elaeniae* sp. n.

Anisophyllodes elaeniae sp.n.

Figs. 1–3

Type material. Male holotype (ZISP 4495), 5 female paratypes from *Elaenia albiceps* (Orbigny et Lafresnaye, 1837) (Tyrannidae), Chile, Bio-Bio, Ñuble, El Carmen, 36°53'51" S 72°1'19" W, 02 February, 2001; 2 male and 1 female paratypes, same host, Chile, Bío Bío, Ñuble, Huemules de Niblinto, 36°43'34" S 71°30'56" W, 7 December 2006; 1 female paratype, same host, Chile, Bío Bío, Ñuble, 36°36'25" S 72°6'11" W, 2007; collector in all cases — D.A. González-Acuña. Holotype, 1 male and 5 female paratypes — ZISP, 1 male, 2 female paratypes — DGA.

Differential diagnosis. Among two *Anisophyllodes* species previously known from tyrannids of the genus *Elaenia*, the new species is most similar to *Anisophyllodes candango* by the proportion of idiosoma within the limits 1.8–2.3 (ra-

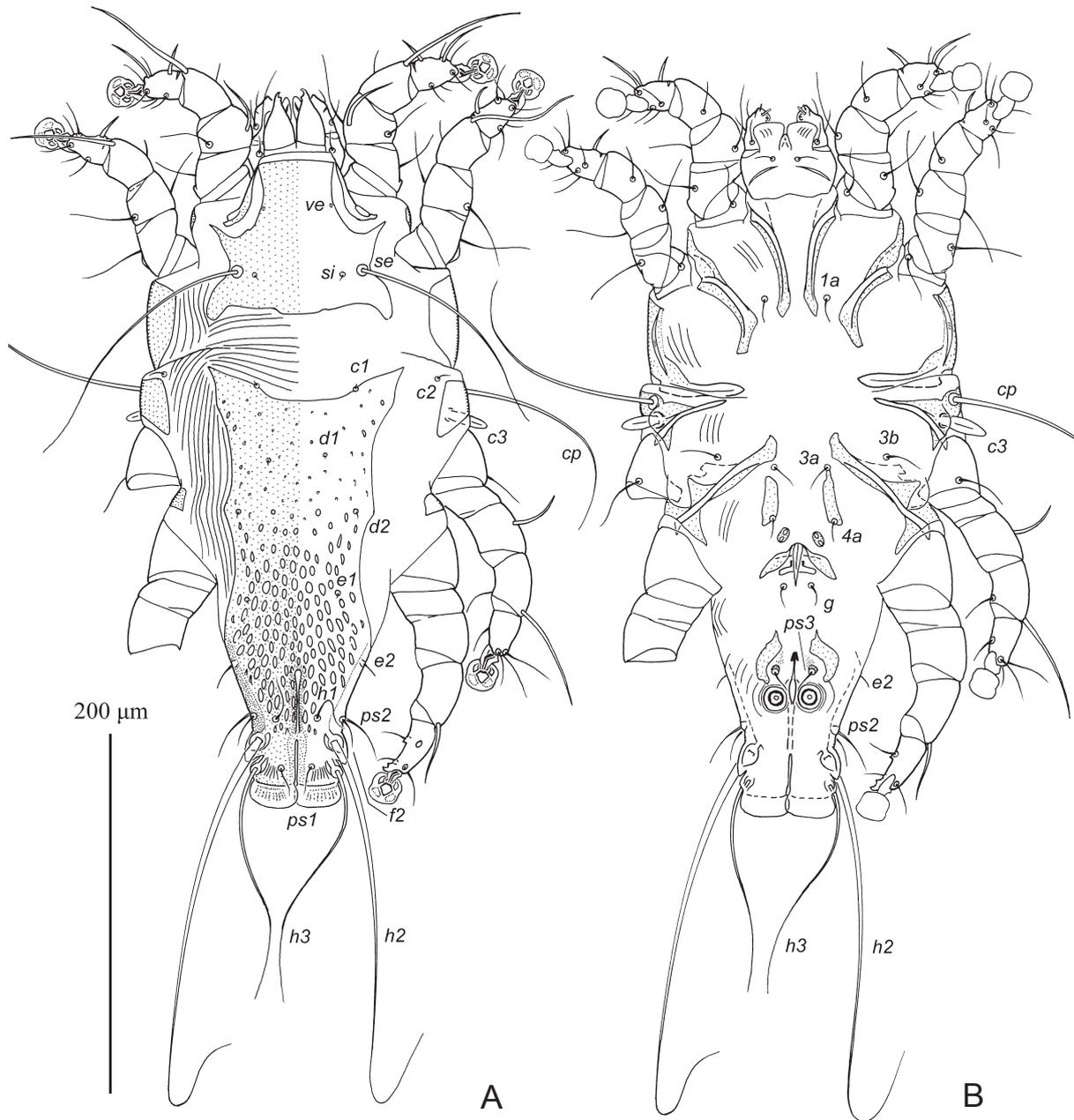


Fig. 1. *Anisophyllodes elaeinae* sp. n., male. A — dorsal view, B — ventral view.

ratio length/width). In *A. intermedius*, the idiosoma is more elongated, 2.5–2.7 times longer than wide. Both sexes of *A. elaeinae* sp. n. differ from *A. candango* by their relatively shorter legs IV; in males, the ambulacral discs of legs IV reach the level of terminal lamellae (Fig. 1A), and in females, they extend to the level of setae *h2* (Fig. 2A). Additionally, females of *A. elaeinae* differ by having a pear-shaped head of spermatheca (Fig. 3E). In males of *A. candango*, legs IV are extending beyond the posterior margin of terminal lamellae by ambulacral disc, and in females, they are extending beyond the level of lobar apices, and the head of spermatheca has a scarcely distinct inflation at

the proximal end of primary spermatheca (Hernandes et al. 2007).

Description. Male (holotype, range for 2 paratypes indicated in parentheses). Length of idiosoma 352 (348–358), width 175 (170–175), length of hysterosoma 230 (235–240). Prodorsal shield: antero-lateral extensions short and acute, lateral margins without incisions, posterior angles acute, posterior margin shallowly concave, setae *ve* present, surface uniformly punctate, length along midline 88 (84–90) width at posterior margin 100 (98–100). Scapular setae *se* separated by 68 (68–73). Setae *c1* on anterior margin of hysteronotal shield; setae *c2* on striated tegument near

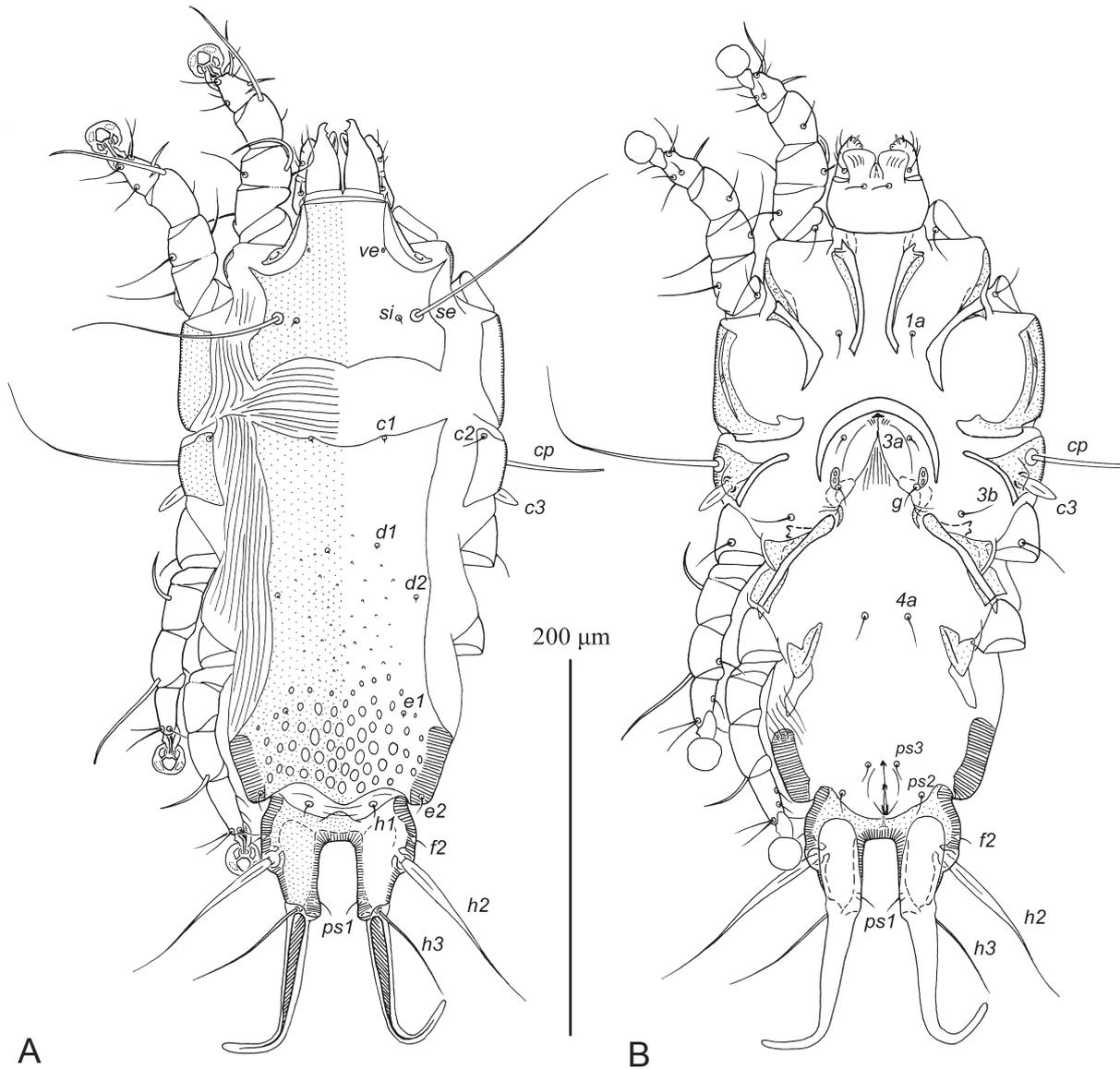


Fig. 2. *Anisophyllodes elaeinae* sp. n., female. A — dorsal view, B — ventral view.

antero-mesal angles of humeral shields, setae *cp* on humeral shield; setae *c3* lanceolate, 18 (17–22) in length and 4.5 (4.5–5) in width. Distance between prodorsal and hysteronotal shields along midline 46 (40–46). Hysteronotal shield: 227 (225–240) in length, 110 (110–125) in width; anterior margin strongly concave; anterior angles acute, surface with numerous oval lacunae in posterior half between levels of setae *d2* and *h1* (Fig. 1A). Opisthosoma strongly attenuate from level of trochanters IV to setae *h2*, 48 (44–48) in narrowest part, opisthosomal lobes almost rectangular, their posterior margins truncate with short and wide terminal lamellae, about 12 (10–12) in length and 25 (22–25) in width. Terminal cleft between lobes slit-shaped, its anterior end extending to level of setae *h2*, length from anterior end to pos-

terior margin of lobes 26 (20–25); supranal concavity distinct, represented by narrow longitudinal groove (Fig. 1A). Setae *h2* situated on oblique semi-ovate lateral extensions, setae *h3* on outer margins of lobes near bases of terminal lamellae, setae *ps1* approximately at level of setae *h3*. Length of setae *ps2* 22 (22–26). Distance between dorsal setae: *c2*:*d2* 73 (73–77), *d2*:*e2* 84 (84–88), *e2*:*h3* 62 (60–62), *h2*:*h2* 40 (37–42), *h3*:*h3* 47 (42–47), *h1*:*h2* 11 (11–14), *d1*:*d2* 24 (24–28), *e1*:*e2* 37 (32–40).

Epimerites I free, well separated, posterior tips slightly divergent; epimerites I, II with narrow surface fields; epimerites IVa absent, rudimentary sclerite rEpIIa absent. Aedeagus stylet-like, 23 (22–24) in length, reaching level of setae *g*. Genital arch 18 (17–20) in length and 40 (40–44) in

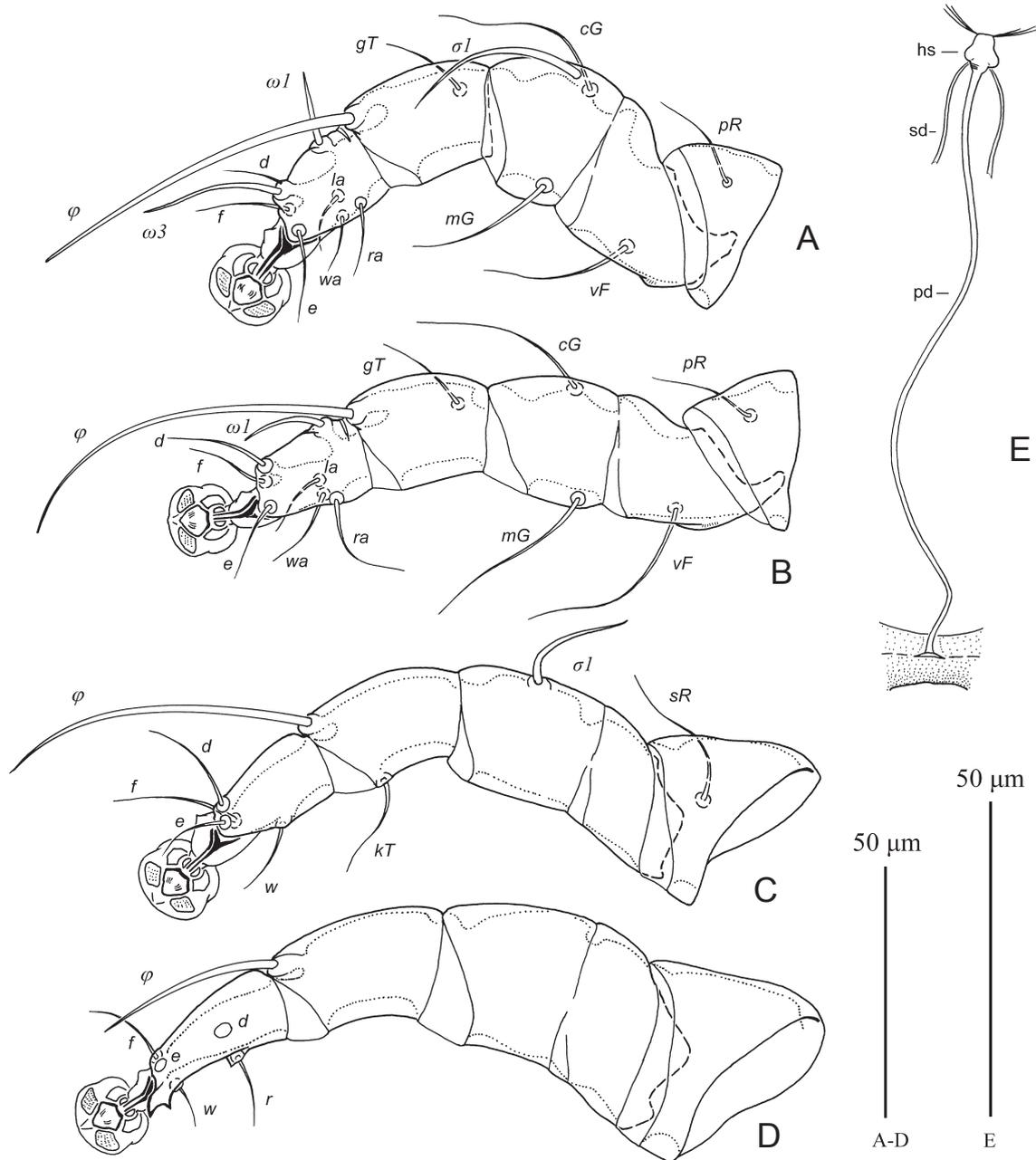


Fig. 3. *Anisophyllodes elaeinae* sp. n., details. A–D — legs I–IV of male, respectively, E — spermaducts and spermatheca. hs — head of spermatheca, pd primary spermaduct, sd — secondary spermaduct.

width. Genital papillae on small oval plates at level of genital arch apex. Pregenital apodemes represented by a pair of longitudinal sclerites situated between tips of epimerites IIIa and genital apparatus, setae *4a* on posterior tips of these apodemes, setae *3a* on anterior tips of apodemes or on soft tegument near them (Fig. 1B). Distance between ventral setae: *3b:3a* 5 (4–6), *3a:4a* 28 (22–31), *4a:g* 35 (33–37), *g:ps3* 49 (44–48), *ps3:ps3* 20 (19–20) *ps3:h2* 44 (44–46). Anal suckers 8.5 (7.5–8.5) in diameter, corolla edentate. Adanal shields represented by a pair of curved sclerites

situated anterior to anal suckers; setae *ps3* situated mesal to each of these sclerites.

Legs IV thicker than legs III, extending by ambulacral disc to level of terminal lamellae. Solenidion $\sigma 1$ of genu I about 1.5 times longer than segment. Solenidion $\sigma 1$ of genu III situated at midlevel of segment. Tarsus IV 33 (33–35) in length, with bidentate claw-like apical process and with minute spine-like process near base of ventral seta *r*; button-like seta *d* approximately at midlevel of this segment (Fig. 3D). Seta *e* of tarsus III about 2/3rd the length of corresponding setae *d*

and *f*. Length of solenidia: ωI I 13 (13–15), ωI II 15 (15–16), σI I 32 (32–40), ϕ I 68 (66–69), ϕ II 64 (62–64), ϕ III 55 (55–57), ϕ IV 33 (32–35).

Female (range for 7 paratypes). Length of idiosoma excluding terminal appendages 375–432, width 175–225, length of hysterosoma 254–295. Prodorsal shield: general structure as in male but posterior margin with a pair of shallow concavities, 88–106 in length and 102–117 in width. Setae *se* separated by 73–82. Setae *c1* on anterior margin of hysteronotal shield; setae *c2* on antero-mesal angles of humeral shields; setae *c3* lanceolate, 20–24 in length and 4.5–6 in width. Setae *cp* set on humeral shields. Distance between prodorsal and hysteronotal shields along median line 42–48. Anterior hysteronotal shield: 187–225 in length and 98–110 in width; anterior margin slightly concave, anterior angles acute, posterior margin with short median extension and pair of shallow concavities, surface with numerous oval-shaped lacunae on posterior third (Fig. 2A). Lobar region: anterior margin with small median extension, greatest length 66–82, greatest width (at level of setae *h2*) 82–95. Terminal cleft as an inverted U, 42–46 in length and 20–26 in width. Supranal concavity indistinct; area between bases of lobes with several transverse striae. Setae *h1* inserted on striated tegument between the anterior hysteronotal and lobar shields. Setae *h2* strongly thickened basally, with filiform apical part, 90–115 in length, 5.5–6.5 in width; setae *h3* 53–66 in length. Setae *h1* and *f2* in trapezoidal arrangement. Distance between dorsal setae: *c2:d2* 84–92, *d2:e2* 105–122, *e2:h2* 35–42, *h2:h3* 27–35, *h1:h2* 28–33, *d1:d2* 24–33, *e1:e2* 40–54, *h1:h1* 33–35, *h2:h2* 69–78, *h3:h3* 42–48.

Epimerites I as in male; epimerites I–II with narrow surface fields. Epimerites IVa present, with long posterior extension. Epigynum horse-shoe-shaped, thin, with acute tips, 40–46 in length, 64–70 in width, tips almost extending to level of setae *g*. Genital papillae and setae *g* on small ovate sclerotized plate (Fig. 2B). Setae *ps2* slightly posterior to middle of the anal opening. Translobar apodemes fused to each other anterior to terminal cleft. Copulatory opening ventral, situated on fused part of translobar apodemes, head of spermatheca pear-shaped, secondary spermatheca 18–20 in length (Fig. 3E). Distance between pseudanal setae, *ps2:ps2* 39–44, *ps3:ps3* 15–18, *ps2:ps3* 19–22.

Legs IV extending by ambulacral disc to level of setae *h2* (Fig. 2A). Solenidion σI of genu I about 1.3 times longer than segment. Solenidion

σI of genu III situated closer to basal part of this segment. Solenidion ϕ of genu IV slightly shorter than corresponding tarsus. Setae *e* of tarsi III–IV about 2/3rd the length of corresponding setae *d, f*. Length of solenidia: ωI I 13–15, ωI II 13–16, σI I 42–48, ϕ I 62–71, ϕ II 60–66, ϕ III 50–60, ϕ IV 27–33.

Etymology. The specific epithet derives from the generic name of the type host and is a noun in the genitive case.

Genus *Tanyphyllodes* Atyeo, 1966

The genus *Tanyphyllodes* previously included a sole species *Tanyphyllodes scelorchiiae* Atyeo, 1966 described from *Scelorchilus rubecula* (Kittlitz, 1830) (Rhinocryptidae) from Chile (Atyeo 1966). This genus most clearly differs from other known proctophyllodine genera by the following characters in males: the opisthosoma is strongly elongated (over 1/3 of total length of idiosoma), with strong lateral ledges bearing setae *ps2*; the distal part of opisthosoma (posterior to these ledges) is much narrower than anterior one and forms opisthosomal lobes continuing in large lanceolate or tongue-like terminal lamellae with pinnate pattern. Females of this genus may be recognized by having one-pieced hysteronotal shield, which is not separated into the anterior and lobar parts. The genus *Tanyphyllodes* is probably restricted to Rhinocryptidae, an endemic suboscine subfamily in South America.

Tanyphyllodes pteroptochi sp. n.

Figs. 4–6

Type material. Male holotype (ZISP 4501), 9 male and 9 female paratypes from *Pteroptochos tarnii* (King, 1831) (Rhinocryptidae), Chile, Los Lagos, Palena, Huinay, 42°22'S 72°24'W, 7 December 2008, coll. D.A. González-Acuña. Holotype, 6 male and 7 female paratypes — ZISP, 2 male and 2 female paratypes — DGA.

Description. Male (holotype, range for 9 paratypes indicated in parentheses). Length of idiosoma 401 (395–410), width 155 (150–155), length of hysterosoma 285 (275–285). Prodorsal shield: lateral margins with incision around bases of setae *se*, antero-lateral extensions short (in some specimens bidentate), posterior part of shield small, with short and acute lateral extensions, posterior margin blunt-angular; surface uniformly punctate, length along midline 93 (88–92), greatest width posterior to scapular setae 55 (40–60) (Fig. 4A). Setae *ve* rudimentary, scarcely distinct.

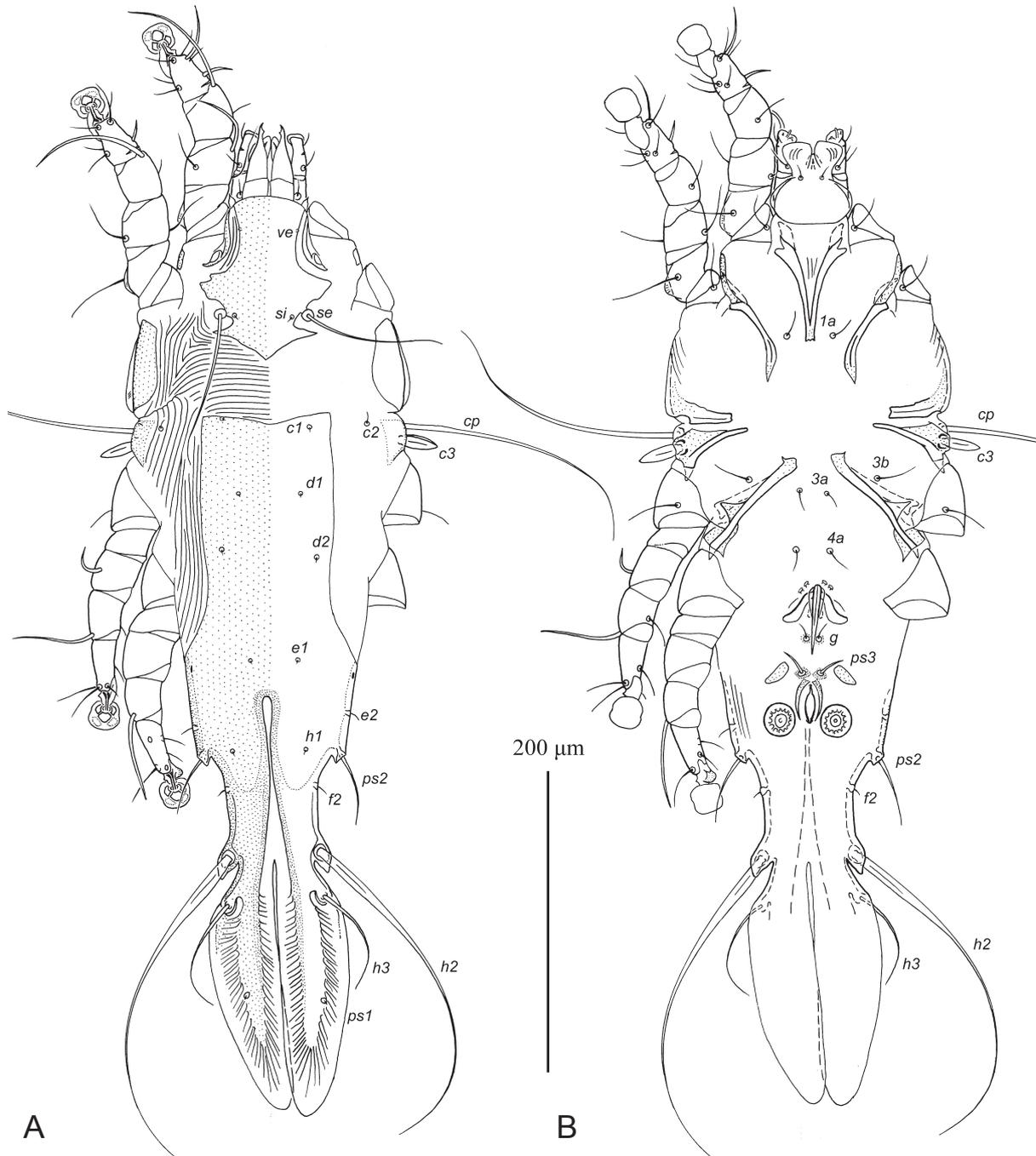


Fig. 4. *Tanyphyllodes pteroptochi* sp. n., male. A — dorsal view, B — ventral view. lp — lobar part of opisthosoma.

Scapular setae *se* separated by 53 (51–55). Setae *c1* on hysteronotal shield near to its anterior margin; setae *c2* on striated tegument near inner margins of humeral shields, setae *cp* off humeral shield; setae *c3* lanceolate, 20 in length and 5.5 in width (20–22 × 5–5.5). Distance between prodorsal and hysteronotal shields 38 (35–40). Hysteronotal shield: anterior margin slightly concave, anterior angles right-angular; surface uniformly punctate, length from anterior margin to level of setae *h3* 280 (275–285), width at anterior margin

71 (70–82) (Fig. 4A). Opisthosoma strongly elongated, distal (lobar) part about half the width of proximal one, lateral margins with strong ledge bearing setae *ps2*, width at level of setae *ps2* 80 (73–82), narrowest width 49 (48–55), width at level of setae *h2* 86 (64–86). Opisthosomal lobes long and narrow, distally continuing in long tongue-shaped terminal lamellae with pinnate pattern on dorsal surface. Total length of lobar part of opisthosoma including lamellae (from level of setae *ps2* to lamellar apices) 204 (190–210). Termi-

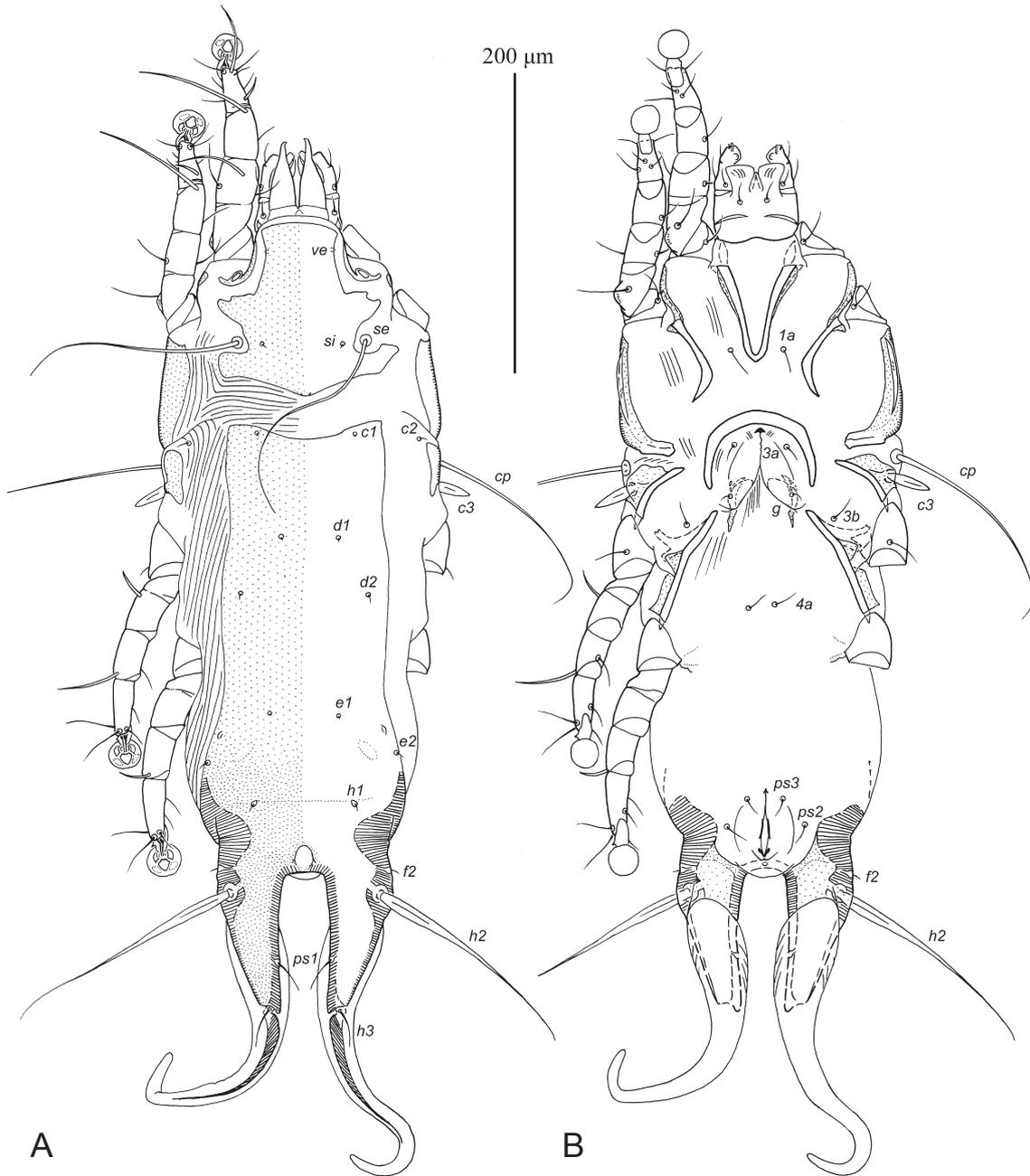


Fig. 5. *Tanyphyllodes pteroptochi* sp. n., female. A — dorsal view, B — ventral view.

nal cleft between lobes narrow, connected with supranal concavity and almost completely occupied by interlobar membrane, length of terminal cleft from level of setae *h3* to anterior end of supranal concavity 125 (120–126). Length of terminal lamellae (from level of setae *h3* to apex) 115 (110–135), greatest width 37 (35–40). Setae *h1* approximately at level of setae *ps2*; setae *f2* posterior to setae *ps2*; setae *ps1* in medial part of lamellae; setae *h3* extending to midlevel of terminal lamellae. Length of incision in membrane between lamellae 144 (138–145). Length of setae *ps2* 44 (43–46). Distance between dorsal setae: *c2:d2* 75

(75–78), *d2:ps2* 115 (110–125), *ps2:h2* 57 (50–60), *h2:h3* 26 (25–27), *d1:d2* 33 (33–40), *e1:ps2* 52 (52–62), *ps2:ps2* 80 (73–82), *h2:h2* 53 (51–60), *h3:h3* 55 (53–56).

Epimerites I fused into a V, posterior tip extending to level of setae *Ic*. Epimerites I–IV without large sclerotized areas; epimerites IVa absent, rudimentary sclerites rEpIIa absent. Genital apparatus at level of posterior margin of trochanters IV; aedeagus 42 (38–42) in length, extending slightly beyond level of genital setae *g*, genital arch 22 (20–22) in length and 40 (38–42) in width (Fig. 4B). Pseudanal setae *ps3* thickened. Genital

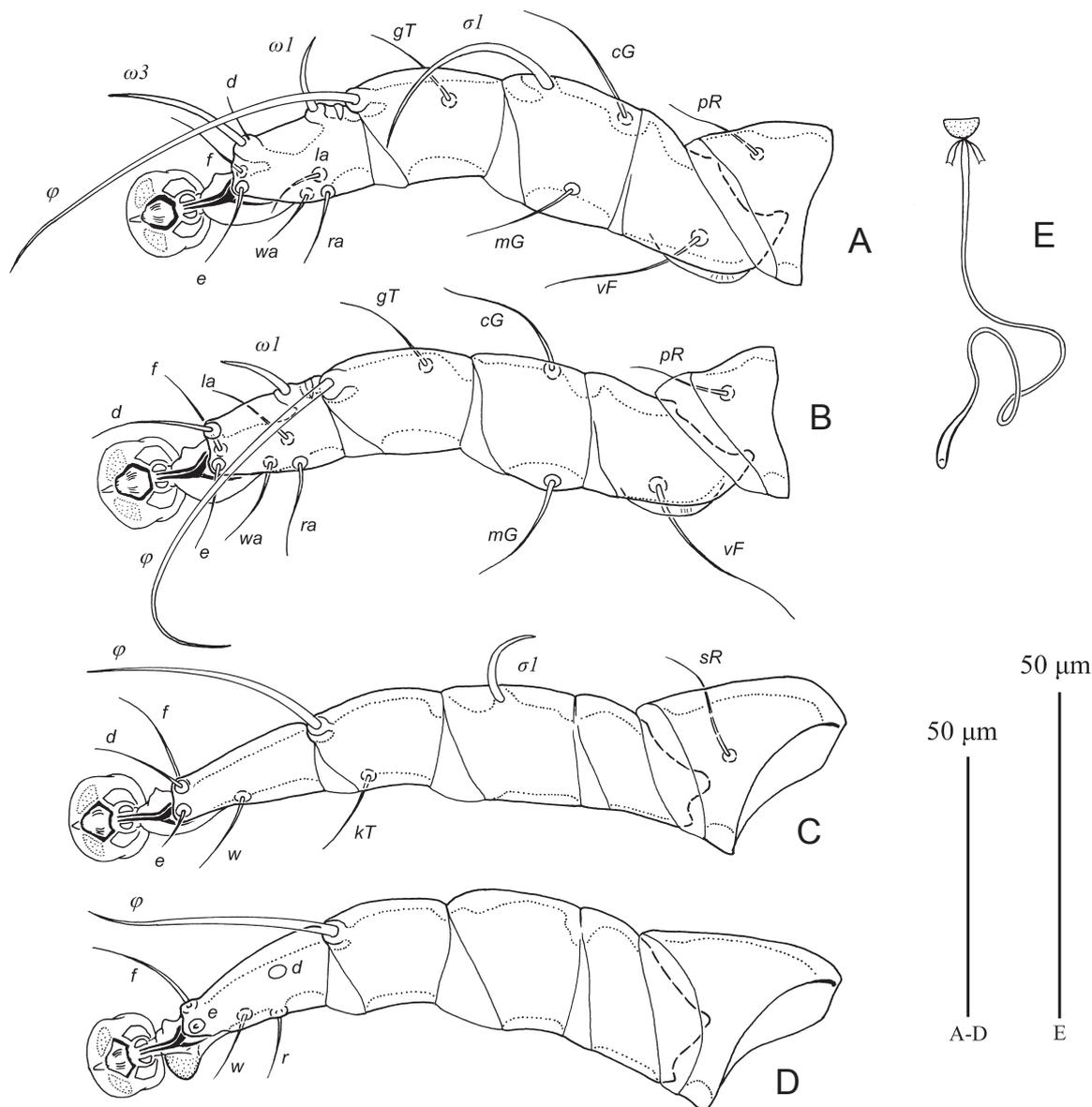


Fig. 6. *Tanyphyllodes pteroptochi* sp. n., details. A–D — legs I–IV of male, respectively, E — spermatheca and spermatheca.

papillae at level of genital arch apex. Setae *3a* off epimerites III. Setae *4a* at level of epimerite III bases. Distance between ventral setae: *3b:3a* 5 (2–8), *3a:4a* 33 (33–38), *4a:g* 51 (47–51), *g:ps3* 20 (18–20), *ps3:ps2* 47 (47–51), *ps3:ps3* 19 (18–19). Adanal shield represented by two pairs of sclerites: a pair of ovate lateral pieces, and pair of small sclerites around bases of setae *ps3* with arc-shaped posterior extensions flanking anal opening (Fig. 4B). Anal suckers 7 (8) in diameter; corolla dentate, with 13–15 rounded teeth.

Legs IV extending by ambulacral discs to midlevel between setae *ps2* and *h2*. Solenidion σI of genu I about 1.5 times longer than segment. Solenidion σI of genu III situated at midlevel of this

segment. Seta *e* of tarsus III half as long as corresponding setae *d, f*. Tarsus IV 33 (31–34) in length, without apical process, with rounded ventral process on ambulacral stalk; button-like seta *d* closer to base of this segment (Fig. 6D). Length of solenidia: ωI I 13 (13–15), ωI II 13 (12–14), σI I 48 (40–52), ϕ I 75 (65–75), ϕ II 62 (58–62), ϕ III 42 (40–44), ϕ IV 42 (40–42).

Female (range for 9 paratypes). Length of idiosoma excluding terminal appendages 490–517, width 174–180, length of hysterosoma 355–375. Prodorsal shield: general form as in male but lateral extensions of posterior part longer than in male and blunt, length along midline 92–118, width of posterior part 95–120. Setae *se* separated by 80–88. Setae

c1 on hysteronotal shield near anterior margin; setae *c2* on soft tegument near antero-mesal angle of humeral shields; setae *c3* lanceolate, 20–25 in length and 6–7 in width. Setae *cp* set off humeral shields. Distance between prodorsal and hysteronotal shields along midline 25–28. Hysteronotal shield not separated into anterior and lobar pieces; anterior margin slightly concave, anterior angles acute, surface uniformly punctate; total length from anterior margin to lobar apices 350–385, width at anterior margin 92–102 (Fig. 5A). Width of lobar region at level of setae *h2* 88–115; terminal cleft as a long inverted U, 82–93 in length and 33–47 in width at level of setae *ps1*. Supranal concavity distinct, close to anterior end of terminal cleft. Setae *h2* thickened in basal part, 140–155 in length, 7.5–8 in greatest width; setae *h3* 20–24 in length, about 1/6th the length of terminal appendages. Setae *h1* and *f2* in trapezoidal arrangement. Distance between dorsal setae: *c2:d2* 92–98, *d2:e2* 110–115, *e2:h2* 75–84, *h2:h3* 65–80, *h1:h2* 549–60, *h2:ps1* 37–42, *d1:d2* 32–37, *e1:e2* 28–33, *h1:h1* 64–77.

Epimerites I fused in a narrow U; epimerites I, II and III without sclerotized areas (Fig. 5B). Setae *ps2* and *ps3* setiform, setae *ps2* at midlevel of anal opening. Epigynum horseshoe-shaped, 46–50 in length, 70–75 in width, tips almost extending to level of genital setae *g*. Distance between pseudanal setae: *ps2:ps2* 39–44, *ps3:ps3* 15–18, *ps2:ps3* 19–22. Copulatory opening ventral, near posterior end of anal opening. Head of spermatheca hemispherical, primary spermaduct with thickened wall in most distal part, secondary spermaducts about 8 in length (Fig. 6E).

Legs IV extending by ambulacral discs to level of setae *f2* (Fig. 5A). Solenidion $\sigma 1$ of genu I about 1.3 times longer than segment. Solenidion $\sigma 1$ of genu III situated in basal part of this segment. Solenidion ϕ of genu IV half as long as corresponding tarsus. Seta *e* of tarsi III, IV half as long as corresponding setae *d*, *f*. Length of solenidia: $\omega 1$ I 13–15, $\omega 1$ II 13 (12–13), $\sigma 1$ I 45–55, ϕ I 71–75, ϕ II 66–72, ϕ III 44–47, ϕ IV 19–21.

Differential diagnosis. Mites of *Tanyphylodes pteroptochi* sp. n. differ from *T. scelorchi* by the following features: in both sexes, setae *cp* are situated off humeral shield; in males, the terminal lamellae are narrower (35–40) and relatively longer (1.3–1.5 times longer the distance between setae *ps2* and *h3*), and setae *h3* extend to midlevel of terminal lamellae; in females, the anterior end of terminal cleft is rectangular and setae *h2* do not extend to apices of terminal appendages.

In both sexes of *T. scelorchi*, setae *cp* are on humeral shields; in males, the terminal lamellae are about 50 in width, their length subequal to the length of proper lobar part of opisthosoma, and setae *h3* extend to apices of terminal lamellae; in females, the anterior end of terminal cleft is rounded and setae *h2* extend to or beyond the apices of terminal appendages.

Etymology. The specific epithet derives from the generic name of the type host and is a noun in the genitive case.

ACKNOWLEDGEMENTS

The authors are thankful to the Huinay foundation for giving the opportunity (for DGA) to conduct parasitological studies in the area of the Huinay Scientific Field Station (Los Lagos, Chile). This paper is No 45 in the list of scientific publications based on the studies carried out at this station. The authors thank Dr. H.C. Proctor (University of Alberta, Edmonton, Canada) for critically reviewing the manuscript. The study was supported for SVM by the Russian Foundation for Basic Research (Grant No 07-04-00426a). Compared materials used in the study belong to the collection UFC ZIN No 2–2.20 (Zoological Institute RAS, Saint Petersburg, Russia).

REFERENCES

- Atyeo, W.T. 1966. Two new genera of feather mites (Acarina: Proctophyllodidae). *Journal of the Kansas Entomological Society*, 39: 473–480.
- Atyeo, W.T. 1967. Two new feather mite genera with polymorphic males (Analgoidea: Proctophyllodidae). *Journal of the Kansas Entomological Society*, 40: 465–471.
- Atyeo, W.T. 1969. Redescription of *Anisophylloides intermedius* (Trouessart and Neumann), 1888, new combination (Acarina: Proctophyllodidae). *Journal of the Georgia Entomological Society*, 4: 153–155.
- Atyeo, W.T. and Braasch, N.L. 1966. The feather mite genus *Proctophylloides* (Sarcoptiformes, Proctophyllodidae). *Bulletin of the University of Nebraska State Museum*, 5: 1–354.
- Atyeo, W.T. and Gaud, J. 1977. Gruiformes, a new host group for pterodectine feather mites (Acarina: Analgoidea). *The Journal of Parasitology*, 63: 141–144.
- Černý, V. and Lukoschus, F.S. 1975. Parasitic mites of Surinam. XXXIII. Feather mites (Analgoidea). *Studies on the Fauna of Suriname and other Guyanas*, 15: 184–203.
- Dickinson, E.C. 2003. *The Howard and Moore Complete Checklist of the Birds of the World, 3rd Edi-*

Two new species of the feather mite subfamily Proctophyllodinae

- tion. Princeton University Press, Princeton, N.J., 1056 pp.
- Evans, G.O. 1992. *Principles of Acarology*. CAB International, Wallingford, 563 pp.
- Gaud, J. and Atyeo, W.T. 1996. Feather mites of the World (Acarina, Astigmata): the supraspecific taxa. *Musée Royal de l'Afrique Centrale, Annales, Sciences Zoologiques*, 277, Pt. 1, 1–193; Pt. 2, 1–436 p.
- Hernandes, F.A., Valim, M.P. and Mironov, S.V. 2007. Two new genera and five new species of the feather mite subfamily Proctophyllodinae (Astigmata: Proctophyllodidae) from suboscine birds in Brazil. *Journal of Natural History*, 41: 2653–2681.
- Mironov, S.V. 2009. Phylogeny of feather mites of the subfamily Pterodectinae (Astigmata: Proctophyllodidae) and their host associations with passerines (Aves: Passeriformes). *Proceedings of the Zoological Institute RAS*, 313: 97–118.
- Mironov, S.V., Literak, I. and Čapek, M. 2008. New feather mites of the subfamily Pterodectinae (Acari: Astigmata: Proctophyllodidae) from passerines (Aves: Passeriformes) in Mato Grosso do Sul, Brazil. *Zootaxa*, 1947: 1–38.
- Park, C.K. and Atyeo, W.T. 1971. A generic revision of the Pterodectinae, a new subfamily of feather mites (Sarcoptiformes: Analgoidea). *Bulletin of the University of Nebraska State Museum*, 9: 39–88.