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VERSITA

A new genus and species of pterodectine feather mite (Acari: Proctophyllodidae) from Tod-Tyrants in Brazil (Passeriformes: Tyrannidae)

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Abstract

A new genus and species of feather mite, *Hemitriccodectes furcatus* gen. nov., sp. nov., is described from passerines of the genus *Hemitriccus* from Brazil: *Hemitriccus furcatus*, *H. margaritaceiventer* and *H. striaticollis* (Tyrannidae). The new genus belongs to the *Pterodectes* generic complex and most clearly differs from previously established genera of this complex by the following combination of features: trochanteral setae *sR*III are present, and solenidia σ are absent from genua III. The new genus also lacks dorsal hysteroromal setae *c1*.

Keywords

Feather mites, Astigmata, Pterodectinae, new genus

Introduction

Feather mites of the subfamily Pterodectinae (Analgoidea: Proctophyllodidae) inhabit mainly the large wing and tail feathers of their avian hosts (Park and Atyeo 1971a, Mironov 2009). Their overall elongated and slightly flattened body and reduced dorsal setae allow them to fit into the narrow corridors formed by the barbs of those feathers (Park and Atyeo 1971a, Valim and Hernandes 2010, Mironov *et al*. 2012). The taxonomy of the pterodectines was confused until the early 1970s, with most species being described in the content of the genus *Pterodectes*. Park and Atyeo (1971a) established the subfamily Pterodectinae and arranged all species known by that time into twelve morphologically distinct genera. Nowadays, approximately 200 pterodectine species are known, arranged in 26 genera, and associated mainly with passerines (Passeriformes) and hummingbirds (Apodiformes), although some representatives have also been reported from the orders Coraciiformes, Piciformes, Musophagiformes, Caprimulgiformes, and Gruiformes (Park and Atyeo 1971a, 1975; Gaud and Atyeo 1996; Mironov 2006, 2009; Hernandes *et al*. 2010; Valim and Hernandes 2010).

About 90 pterodectine species in 15 genera were described from the New World (Park & Atyeo 1971a, b, 1972a, b, 1973a, b, 1974a, b, 1975, Berla 1958, 1959a, b, 1959, 1960, 1973, Černý 1974; Černý & Lukoschus 1975; OConnor et al. 2005; Hernandes & Valim 2005, 2006, 2012; Mironov et al. 2008; Mironov & González-Acuña 2011, Valim & Hernandes 2006, 2008, 2009, 2010). Among them, approximately 40 species of seven genera have been reported on passerines.

Materials and Methods

Material used in the present study was collected by two different techniques, since the birds were captured by different researchers. The specimens from *Hemitriccus furcatus* were collected in the field from birds captured by mist-nets and visually examined for the presence of feather mites; whenever mites were detected, a feather was carefully cut off with a small scissor and placed into a vial containing 70% ethanol; the birds were released to the wild after the examination. The specimens from *H. margaritaceiventer* and *H. striaticollis* were collected in the laboratory from dead birds captured with mist-nets (authorized by the IBAMA – The Brazilian Institute of Environment and Renewable Natural Resources, license number 19849-1, authentication code 28111788, 27.IV.2009). All mite specimens were mounted on glass slides in Hoyer´s medium (Krantz and Walter 2009).

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The chaetotaxy of the idiosoma and legs follows Griffiths *et al*. (1990) and Atyeo and Gaud (1966), respectively. Host common and scientific names are according to Clements *et al*. (2012). Measuring technique follows the descriptive method presented in recent papers on the Pterodectinae (see Valim and Hernandes, 2008, 2009, 2010;

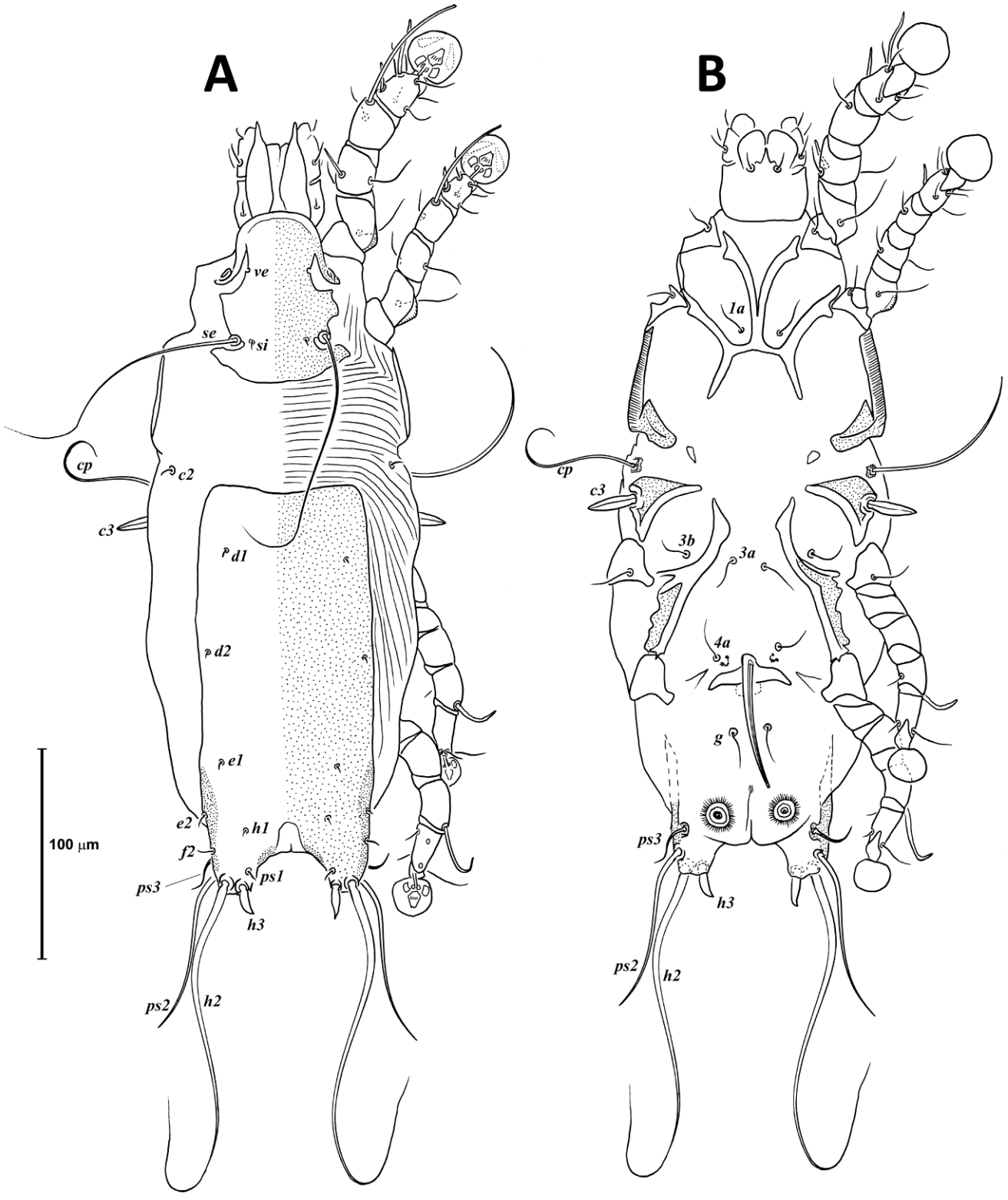

Fig. 1. *Hemitriccodectes furcatus* gen. nov., sp. nov., male: dorsal (**A**) and ventral (**B**) views

Table I. Measurements of male specimens of *Hemitriccodectes furcatus* from different host species of *Hemitriccus* (number of acarine specimens from each host in parenthesis; H = holotype; P = paratype)

Character	Host			
	Hemitriccus furcatus		*Hemitriccus margaritaceiventer*	*Hemitriccus striaticollis*
	(n=1)	(n=1)	(n=9)	(n=3)
	H	P	min-max	min-max
Length of idiosoma	335	330	326–358	331–349
Width of idiosoma	139	123	124–159	147–158
Length of prodorsal shield	80	83	83–98	86–89
Width of prodorsal shield	67	65	80–89	81–88
Length of seta *se*	126	132	107–133	103–131
Distance between setae *se*	45	42	45–54	46–52
Distance between setae *si*	26	25	26–34	29–32
Distance between prodorsal and hysteronotal shields	53	55	43–67	45–62
Length of hysteronotal shield	200	191	195–207	199–207
Width of hysteronotal shield	82	68	73–85	82–84
Distance between setae *d1-d2*	51	42	28–45	29–37
Distance between setae *d2-e1*	55	51	51–74	52–64
Distance between setae *e1-h1*	35	35	23–39	36–39
Distance between setae *h3-h3*	48	45	42–51	44–50
Length of seta *h3*	12	14	10–14	10–11
Width of seta *h3*	4	4	4–5	4–4
Length of adeagus	68	70	71–76	71–74
Width of genital arch	39	38	43–49	45–48
Length of genital arch	7	7	6–9	8–10
Distance between setae *3a–4a*	49	41	37–47	39–39
Distance between setae *4a–g*	41	33	42–48	41–46
Distance between setae *g–ps3*	57	53	44–54	48–53
Distance between setae *ps3–ps3*	63	58	54–73	54–71
Diameter of anal suckers	11	10	8–10	9–10
Distance between anal suckers	33	28	25–48	27–44
Length of tarsus IV	29	27	29–33	31–34
Length of seta *c3*	24	24	25–28	24–26
Width of seta *c3*	6	8	5–7	6–6
Length of seta *h2*	195	154	158–202	165–201
Length of seta *ps2*	64	69	75–92	74–86
Length of seta *ps3*	24	22	15–20	15–17

Mironov and González-Acuña 2011). All measurements are in micrometres.

The specimens studied herein are deposited in the Acari Collection of the Department of Zoology of the Universidade Estadual Paulista, Rio Claro, São Paulo, Brazil (DZUnesp-RC).

Proctophyllodidae Trouessart et Mégnin, 1884
Pterodectinae Park et Atyeo, 1971a
Pterodectini Park et Atyeo, 1971a

***Hemitriccodectes* gen. nov.**
Type-species: *Hemitriccodeces furcatus* sp. nov.

Diagnosis. Both sexes. Vertical setae *ve* present, represented by microsetae. Prodorsal shield covering median area of prodorsum. Dorsal idiosomal hysteronotal setae *c1* absent. Supranal concavity well developed. Legs I, II subequal in size. Setae *wa* anterior to setae *la* and *ra* on tarsi I, II. Seta *sR* of trochanters III present; solenidion *σ1* of genu III absent.

Male. Epimerites I fused into a Y (with short sternum), fused part connected with epimerites II by narrow transverse bands. Coxal fields I closed, coxal fields II, III, IV open. Opisthosomal lobes present, short, widely separated. Terminal cleft wide, roughly semicircular. Genital arch at midlevel of trochanters IV; aedeagus much longer than genital arch. Genital papillae situated anterior to genital arch. Opisthoventral shields narrow. Setae *ps3* posterolateral to anal suckers. Setae *g* and *ps3* in trapezoid arrangement. Epimerites IVa present. Legs III, IV subequal. Tarsus IV without apical claw-like process.

Table II. Measurements of female specimens of *Hemitriccodectes furcatus* from different host species of *Hemitriccus*. (number of acarine specimens from each host in parenthesis)

Character	Host		
	Hemitriccus furcatus (n=2)	*Hemitriccus margaritaceiventer* (n=3)	*Hemitriccus striaticollis* (n=5)
	min-max	min-max	min-max
Length of idiosoma	447–472	464–484	442–468
Width of idiosoma	158–171	169–179	150–175
Length of prodorsal shield	88–94	105–107	98–107
Width of prodorsal shield	86–89	101–109	98–111
Length of seta *se*	110–141	119–122	104–139
Distance between setae *se*	58–60	62–65	62–66
Distance between setae *si*	37–38	40–43	37–42
Distance between prodorsal and hysteronotal shields	72–85	75–87	66–106
Length of anterior hysteronotal shield	197–200	189–205	178–198
Width of anterior hysteronotal shield	108–111	106–115	104–118
Length of lobar region	93–96	87–102	83–100
Width of lobar region	95–95	84–93	82–94
Length of terminal cleft	54–63	59–63	56–71
Length of seta *h2*	47–48	51–59	52–57
Width of seta *h2*	8–9	8–8	8–9
Length of seta *h3*	11–13	13–21	12–27
Distance between setae *h3-h3*	45–52	39–52	30–55
Distance between setae *d1-d2*	57–59	49–54	42–49
Distance between setae *d2-e1*	54–57	65–81	64–80
Distance between setae *e1-h1*	58–65	52–61	48–59
Distance between setae *h1-h1*	39–40	24–30	28–37
Distance between setae *h2-h2*	76–79	66–75	66–75
Distance between setae *ps1-ps1*	50–53	32–41	30–42
Distance between setae *1a–3a*	62–70	69–73	58–80
Distance between setae *3a–g*	26–27	26–30	24–34
Distance between setae *g–4a*	100–101	109–118	86–114
Distance between setae *4a–ps3*	80–83	69–79	70–92
Distance between setae *ps2–ps3*	19–20	15–22	17–19
Distance between setae *ps2–ps2*	54–63	46–61	45–53
Distance between setae *ps3–ps3*	32–38	28–34	26–36
Length of seta *c3*	20–21	23–23	21–24
Width of seta *c3*	6–7	6–8	6–7

Female. Epimerites I fused into a V. Lobar region of opisthosoma separated from hysterorosoma; opisthosomal lobes well developed, with long terminal appendages. Hysteronotal shield split dorsally into anterior and lobar shields. Epigynum horseshoe-shaped. Legs I, II subequal.

The genus is so far monotypic and restricted to passerines of the genus *Hemitriccus* Cabanis et Heine (Tyrannidae).

Etymology. The generic name is a combination of the genus of the type host, *Hemitriccus*, and the type genus of the Pterodectinae, *Pterodectes*.

Differential diagnosis

The leg chaetotaxy plays an important role in determining supra-generic taxa of feather mites (Gaud and Atyeo 1996), and particularly in the family Proctophyllodidae. The new genus described herein belongs to the *Pterodectes* generic complex (Mironov 2009, Valim and Hernandes 2010), and is similar to the genera *Amerodectes*, *Tyrannidectes*, and *Metapterodectes*. These three genera differ from each other mainly by combinations (presence/absence) of setae *sR*III and solenidion *σ1* on trochanters and genua of legs III. Both the seta and solenidion are present in *Amerodectes*, seta *sR*III is absent in *Tyrannidectes*, and both setal structures are absent in *Metapterodectes*. The new genus presents the remaining possible combination, i.e. seta *sR*III is present and solenidion *σ1* is absent. Besides, the new genus can be distinguished from all three genera by lacking dorsal hysterosomal setae *c1*, which is always present in those genera.

***Hemitriccodectes furcatus* sp. nov.**

Type-host: *Hemitriccus furcatus* (Lafresnaye, 1846) (Tyrannidae), the Fork-tailed Pygmy-Tyrant.

Type-locality: Pereque, Rio de Janeiro, Brazil.

Type-material. Male holotype (DZUnesp-RC 356) ex *Hemitriccus furcatus*, Pereque, Rio de Janeiro, Brazil, 08.VI.2012, colls. M.R. Bornschein and R. Belmonte-Lopes. Paratypes: 1 male and 4 females, same data as holotype.

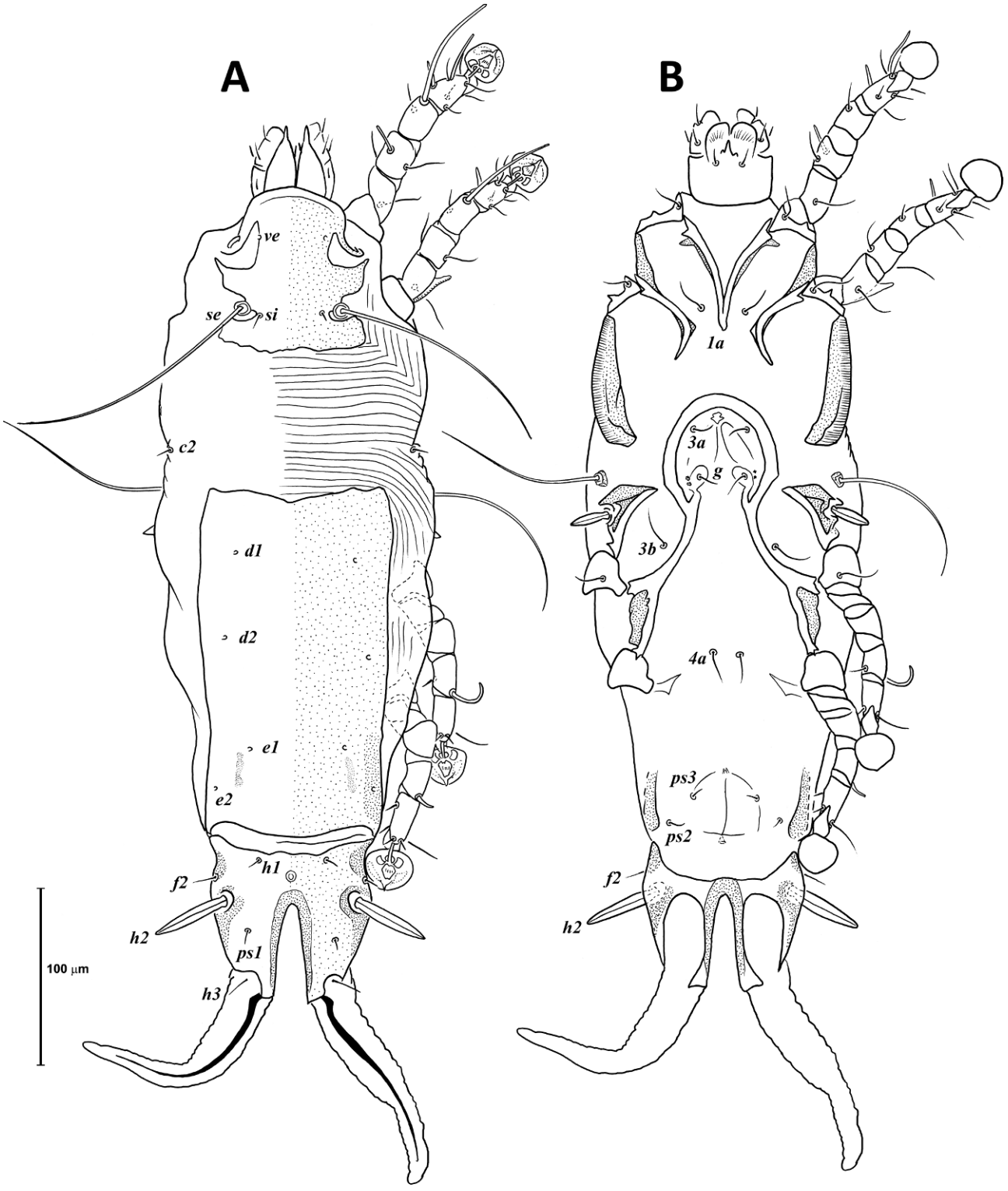

Fig. 2. *Hemitriccodectes furcatus* gen. nov., sp. nov., female: dorsal (**A**) and ventral (**B**) views

Additional material, 5 males and 4 females from *Hemitriccus margaritaceiventer* (Orbigny et Lafresnaye, 1837), "Mata da Escola Agrícola de Jundiaí-UFRN" (5°53′S–35°23′W), Macaíba, Rio Grande do Norte, Brazil, 20.IV.2011, col. H.M. Silva; 3 males and 5 females from *Hemitriccus striaticollis* (Lafresnaye, 1853), same locality as *H. margaritaceiventer*, 03.XII.2011.

Etymology. Contraction of the generic name of the type host and *Pterodectes*, the type genus of the Pterodectinae.

Description (Figs 1–3)

Male. Prodorsal shield: lateral margins with incisions posterior to bases of setae *se*, posterior margin convex, surface uniformly punctate (Fig. 1A). Scapular shields not developed dorsally. Humeral shields absent. Setae *cp* situated ventrally on soft tegument. Setae *c2* situated on soft tegument. Sub-humeral setae *c3* lanceolate. Hysteronotal shield: anterior margin slightly concave, surface uniformly punctate. Opisthosomal

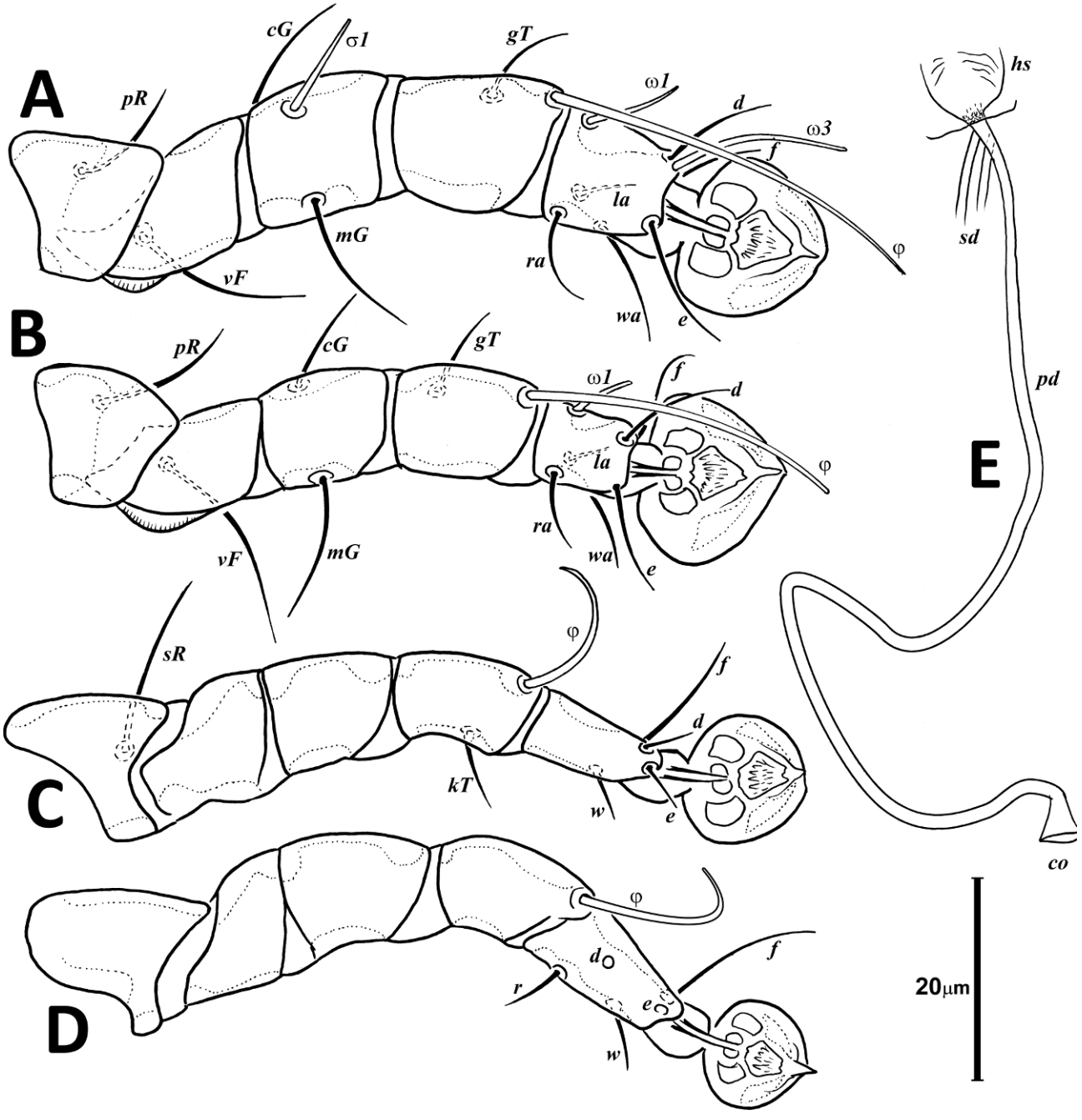

Fig. 3. *Hemitriccodectes furcatus* gen. nov., sp. nov., male legs I–IV (**A-D**), female spermatheca (**E**), hs = head of the spermatheca, pd = primary duct, sd = secondary ducts, co = copulatory opening

lobes short, their posterior margins rounded. Supranal concavity present, open posteriorly (Fig. 1A). Setae *h1* situated at level of anterior end of supranal concavity. Setae *h3* short, narrowly lanceolate; setae *ps1* minute, filiform, situated slightly anterior to setae *h3*.

Epimerites I fused into a Y (Fig. 1B), with posterior tips connected with epimerites II by transverse sclerotized bands. Coxal fields I and II without large sclerotised areas. Rudimentary sclerite rEpIIa present. Coxal fields II–IV open. Epimerites IVa present, poorly sclerotised. Genital papillae connected by bases. Paragenital apodemes and genital shields absent. Corolla of anal suckers without indentations.

Femora I, II with narrow ventral crests, other segments without processes. Solenidion σ*1* of genu I stick-like, approximately the same length as solenidion ω*1* of corresponding tarsus, situated in basal half of segment. Genual seta *cG*I and II, and *mG*I and II, setiform (Figs. 3A, B). Seta *gT* situated medially on tibia I, and on basal half of tibia II. Solenidia ω*1* of tarsi I and II subequal in length. Legs III and IV similar in form and size; setae *d* and *e* of tarus IV button-like (Fig. 3D).

Female. Prodorsal shield: lateral margins with incisions posterior to bases of setae *se*, anterolateral extensions well developed and acute, posterior margin irregular. Humeral shields absent. Setae *cp* situated ventrally, on soft tegument. Setae *c2* situated on soft tegument. Setae *c3* lanceolate. Anterior hysteronotal shield roughly rectangular, surface uniformly punctate (Fig. 2A). Pair of barely discernible oval pale patches between levels of setae *e1* and *e2*. Terminal cleft U-shaped. Setae *h1* on lobar shield close to its anterior margin. Setae *h2* blade-like. Setae *ps1* situated on opisthosomal lobes dorsally, approximately equidistant from bases of *h2* and *h3*. Setae *h3* setiform.

Epimerites I fused into a narrow V. Coxal fields II as in male (Fig. 2B). Epimerites IVa present. Translobar apodemes of opisthosomal lobes present, fused to each other anterior to terminal cleft. Epigynum horseshoe-shaped. Apodemes of oviporus (epigynum) connected to tips of epimerites IIIa, Primary spermaduct not enlarged near head of spermatheca (Fig. 3E); copulatory opening situated ventrally, posterior to anal opening. Pseudanal setae *ps2* and *ps3* setiform, seta *ps2* situated at level of posterior end of anal opening.

Femur I without ventral crest, femur II with acute angle-shaped ventral crest. Solenidion σ*1* of genu I stick-like, approximately the same length as solenidion ω*1* of corresponding tarsus. Genual seta *cG*I and II, and *mG*I and II, setiform. Seta *gT* situated medially on tibia I, and on basal half of tibia II. Solenidia φ of tibiae IV much shorter than on tibiae III. Seta *d* of tarsus II subequal to corresponding seta *f*, and setae *d* of tarsi III, IV much shorter than corresponding seta *f*. Solenidia ω*1* of tarsi I and II subequal in length. Genu IV with dorsal inflation, genu III not modified.

Etymology. The species name is taken from the specific name of the type host and is a noun in apposition.

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