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# Two new feather mite species of the genus *Montesauria* Oudemans (Analgoidea: Proctophyllodidae) from thrushes (Passeriformes: Turdidae) in the Indian Subcontinent

Ioana Cristina Constantinescu<sup>a</sup>, Oana Paula Popa<sup>a</sup>, Luis Ovidiu Popa<sup>a</sup>, Ioana Cobzaru<sup>b</sup>, D. Khlur B. Mukhim<sup>c</sup>, Costică Adam<sup>a</sup>

<sup>a</sup>“Grigore Antipa” National Museum of Natural History, Sos. Kiseleff no.1, 011341 Bucharest 1, Romania.

<sup>b</sup>Ecology, Taxonomy and Nature Conservation Department, Institute of Biology, Romanian Academy, Splaiul Independenței no. 296, 060031 Bucharest, Romania.

<sup>c</sup>Department of Zoology, Lady Keane College, 793001 Shillong, Meghalaya, India.

## ABSTRACT

Two new feather mite species of the genus *Montesauria* Oudemans, 1905, collected from thrushes (Turdidae) in India, are described: *Montesauria hernandesi* sp. n. from *Turdus dissimilis* Blyth, 1847 and *M. caerulea* sp. n. from *Myophonus caeruleus* (Scopoli, 1786). Both species belong to the *merulae* species group, being morphologically closest to other two species of the genus, previously described from birds of the family Turdidae in Asia (Japan): *M. sibirica* Kuroki, Nagahori and Mironov, 2006 and *M. aurea* Kuroki, Nagahori and Mironov, 2006, respectively. The new species most clearly differ from those described in Japan by the dorsal shield ornamentation. In both sexes of *M. hernandesi* sp. n., the ornamentation of the prodorsal and hysteronotal shields is represented by round and ovate lacunae, and the ornamentation of the lobar shield of females has few ovate lacunae. In both sexes of *M. caerulea* sp. n., the ornamentation of the hysteronotal shield is very particular, with large and almost round lacunae in the anterior half and small ovate lacunae in the posterior half.

**Keywords** feather mites; taxonomy; new species; *Montesauria*; India

**Zoobank** <http://zoobank.org/F5A394F4-E894-4675-9166-CA0C3C5D67A3>

## Introduction

The feather mite genus *Montesauria* Oudemans, 1905 (Analgoidea: Proctophyllodidae) is the species-richest genus of the subfamily Pterodectinae and currently includes 62 species distributed mostly in the Old World (Till 1954, 1957, Gaud 1957, Gaud and Mouchet 1957, Mironov and Kopij 1996a, 1996b, 1997, Mironov and Fain 2003, Mironov 2006, 2008, Kuroki *et al.* 2006, Hernandez *et al.* 2010, Mironov *et al.* 2010, 2012, Mironov and Tostenkov 2013, Hernandez and OConnor 2017). To date, 12 species of *Montesauria* have been described from Asia: 8 from Vietnam (Gaud and Petitot 1948, Mironov *et al.* 2012, Mironov and Tostenkov 2013), 2 from Japan (Kuroki *et al.* 2006), 1 from Taiwan (Sugimoto 1941) and 1 from Indonesia (Trouessart 1885). Atyeo (in: McClure and Ratanaworabhan 1973), reported 81 supposedly new species of this genus from Southeastern Asia; unfortunately, new species from this material have never been described. Consequently, this genus seems to be widespread on passerines of the Old World. Mironov (2006) performed a rigorous systematic study and based on clearly

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Corresponding author  
Ioana Cristina Constantinescu:  
[cristinactinescu@yahoo.com](mailto:cristinactinescu@yahoo.com)

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differentiated morphological characters divided the genus into nine species groups: *cylindrica*, *dolichodectina*, *emberizae*, *heterocaula*, *jesionowskii*, *listroprocta*, *merulae*, *pachypa* and *papillo*. Later, he proposed one additional group, *macronoi* (Mironov *et al.* 2012).

The present paper gives descriptions of two new *Montesauria* species from the *merulae* species group found on thrushes (Turdidae) in India.

## Materials and methods

The material used in the present paper was collected in the neighborhood of Shnongrim (Meghalaya, India) in January 2014. The birds were captured using mist-nets, identified and visually checked for the presence of mites and after collecting of mites released back to the wild. Mite specimens were collected manually with a needle and placed in tubes with 96% ethanol. Then, in laboratory conditions, mite specimens were cleared in 90% lactic acid for 24 hours and mounted on microscope slides in Hoyer's medium. Drawings were made using an Olympus CX21 microscope with a camera lucida drawing device. The bird specimens were identified according to Rasmussen and Anderton (2012) and Grimmett *et al.* (2011), and the taxonomy of birds follows Clements *et al.* (2017). The body setation of mites follows that of Griffiths *et al.* (1990) with the modifications by Norton (1998) concerning coxal setae, while the setation of legs follows Gaud and Atyeo (1996). The description of the new species of *Montesauria* is given according to the current format used for species of pterodectine mites (Mironov and Fain 2003, Mironov 2006, Valim and Hernandez 2006, Mironov *et al.* 2008, 2010, 2012, Mironov and Tolstenikov 2013, Hernandez and OConnor 2017) and the measuring techniques of particular structures used were described by Mironov and Proctor (2009).

We give the full set of measurements for a holotype (male) and a range of measurements for corresponding paratypes. All measurements are in micrometers ( $\mu\text{m}$ ). The holotype and paratypes of both new species are deposited in the Acarological Collection of the "Grigore Antipa" National Museum of Natural History, Bucharest, Romania (MGAB). Inventory numbers are given in brackets for all type specimens.

Six paratype specimens of *Montesauria hernandesi* sp. n. (three males ANA1442 C1, ANA1443 C2, ANA1444 C3, and three females ANA1445 C4, ANA 1446 C5, ANA1447 C6) and three paratype specimens of *M. caerulea* sp. n. (two males ANA1436 B1, ANA1438 B3, and one female ANA1441 B5) were used to isolate DNA using DNAeasy Tissue Kit (Qiagen). All specimens used for molecular analyses were mounted and kept as reference vouchers for morphological examination. The specimens preserved in ethanol 96% were transferred in 180 $\mu\text{l}$  ATL Buffer with 20  $\mu\text{l}$  of Proteinase K and incubated overnight at 56 °C on a shaking thermoblock. After 24 h, 5  $\mu\text{L}$  of Proteinase K were added and incubation was continued until 72h. For the rest of the protocol we followed the manufacturer specifications and the modification suggested by Dabert *et al.* (2008).

We used as DNA barcode region a 663bp fragment near the 5' terminus of the COI gene, amplified by PCR with the degenerate primers bcdF05 (5' – TTTTCTACHAAAYCATAAA-GATATTGC – 3') and bcdR04 (5' – TATAAACYTCDGGATGNCCAAAAAA – 3'), according to Dabert *et al.* (2008). The PCRgenotyping reaction was performed in a 50  $\mu\text{L}$  total volume containing DNA template, 1X Green GoTaq® Flexi Buffer, 2.5 mM MgCl<sub>2</sub>, each dNTP at 0.1 mM, each primer at 0.5  $\mu\text{M}$  (the primers were M13 tailed) and 1.5 units of GoTaq® DNA polymerase (5U/ $\mu\text{L}$ ) (Promega, Madison, USA). The PCR products were isolated from samples containing visible bands and sent for sequencing to Macrogen (Seoul, Korea).

Sequence electrophoregrams were edited and assembled with CodonCode Aligner version 3.7.1. Pairwise distances between sequences were computed with MEGA version 7 (Kumar *et al.* 2016) using K2P distance model (Kimura 1980). DnaSP v5 was used to obtain data about the genetic polymorphism in the studied specimens (Librado and Rozas 2009).

**Superfamily Analgoidea Trouessart & Mégnin, 1884**  
**Family Proctophyllodidae Trouessart & Mégnin, 1884**  
**Subfamily Pterodectinae Park & Atyeo, 1971**  
**Genus *Montesauria* Oudemans, 1905**

***Montesauria hernandesi* Constantinescu sp. n. (Figs. 1–4)**

Zoobank: 9689B8C4-F5BC-418D-BDC8-A39B46050FDF

**Type material** — Holotype male and 25 paratypes (12 males and 13 females), from *Turdus dissimilis* Blyth, 1847 (Passeriformes: Turdidae), India, Meghalaya, Jaintia Hills, Shnongrim village, 25°21'12.36"N, 92°31'3.06"E, 25 Jan. 2014, 1151 m, subtropical forest, collector D. K. B. Mukhim.

**Type deposition** — Holotype male (ANA1412), 12 males (ANA1408–1411, ANA1413–1417, ANA1442 C1, ANA1443 C2, ANA1444 C3) and 13 female (ANA1418–1427, ANA1445 C4, ANA1446 C5, ANA1447 C6) paratypes in MGAB collection.

**Etymology** — The species is named after Dr. Fabio Akashi Hernandez (Universidade Estadual Paulista, Rio Claro, São Paulo, Brazil), a prominent expert on feather mites.

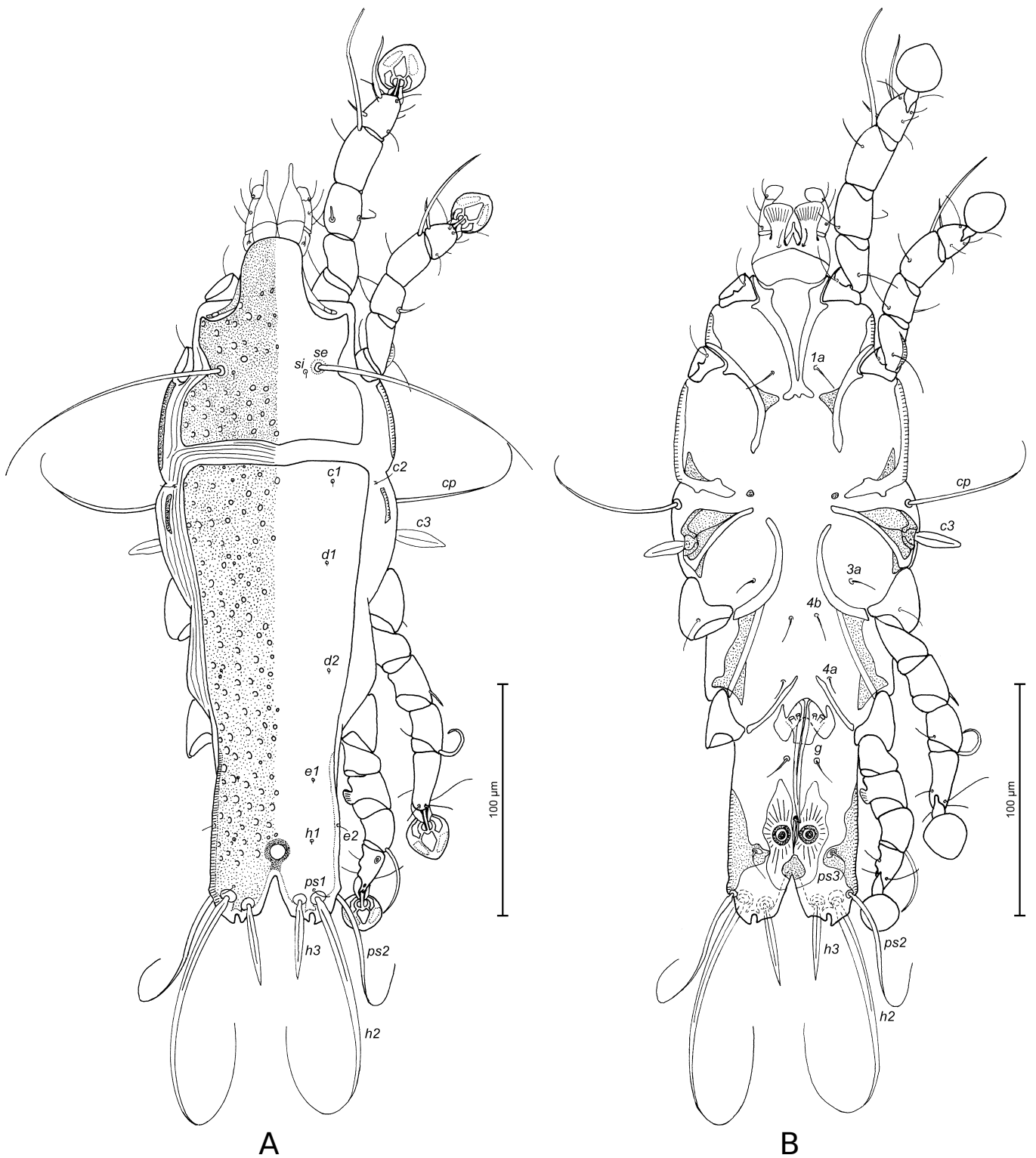
**Description**

**Male** (holotype, range for 4 paratypes). Length of idiosoma 296 (292–296), width 106 (90–114), length of hysterosoma 204 (200–208).

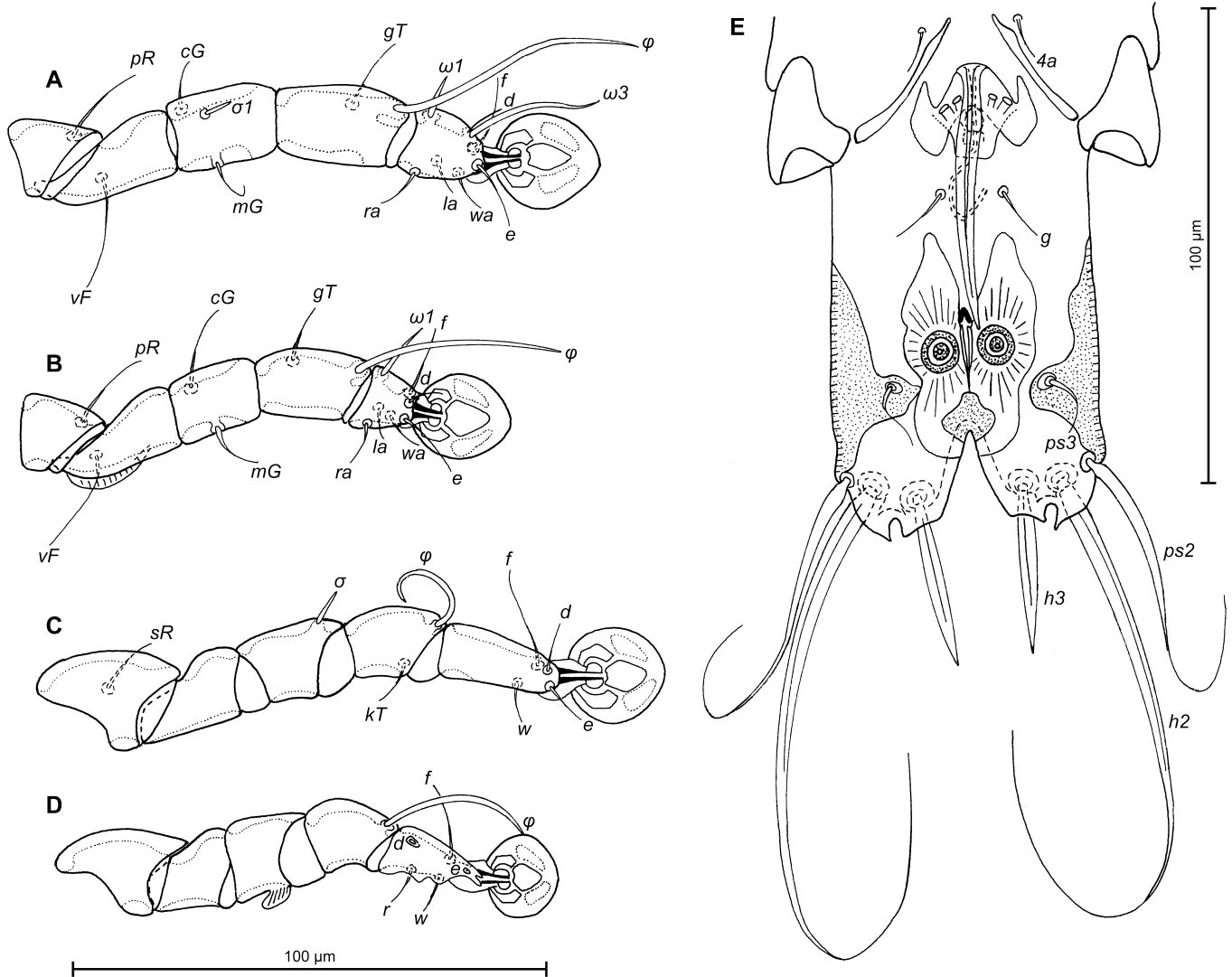
Prodorsal shield: entire, lateral margins slightly concave at level of scapular setae, posterior margin with acute median extension, length along midline 90 (88–96), width at posterior margin 80 (82–90), surface with round and ovate lacunae. Setae *ve* absent. Scapular setae *se* separated by 43 (42–46). Humeral shields poorly developed, represented by narrow dorsal sclerites, separated from epimerites III, not encompassing setae *cp*. Setae *c2* situated dorsally on soft tegument. Subhumeral setae *c3* lanceolate, 23 (19–24) × 8 (6–7). Hysteronotal shield: greatest length from anterior margin to lobar apices 190 (180–190), width at anterior margin 80 (82–90), anterior margin almost straight, surface of this shield with round and ovate lacunae. Opisthosomal lobes well developed, short and almost straight, posterior margin of lobes with small notch, terminal cleft V-shaped, 21 (18–20) in length. Setae *f2* absent, setae *h2* and *h3* slightly distant from margin, *h3* spindle-shaped, with acute apices, 40 (38–42) in length, 4 (4–5) in width, *h2* 144 (126–150) in length, 5 (4–5) in width. Supranal concavity circular, well outlined. Setae *h1* situated at level of anterior margin of supranal concavity. Setae *ps1* situated in anterior half of opisthosomal lobes, approximately equidistant from outer and inner margins of these lobes, 6 (5–6) in length. Setae *ps2* 70 (70–80) in length (Fig. 1A). Distance between bases of dorsal setae: *c2–d2* 80 (72–81), *d2–e2* 70 (74–80), *e2–h3* 36 (34–40), *d1–d2* 45 (29–42), *e1–e2* 24 (23–34), *h1–ps2* 24 (22–27), *h2–h2* 40 (38–40), *h3–h3* 23 (20–24), *ps2–ps2* 54 (48–54).

Epimerites I fused posteriorly into a V, fused part with a pair of rounded transverse extensions almost touching medial part of epimerites II (Fig. 1B). Coxal fields I, II without wide sclerotized areas. Rudimentary sclerites rEpIIa present. Coxal fields I, II and III open. Epimerites IVa present, long, exceeding level of setae *4a* bases. Genital arch with wing-like lateral extensions, 20 (17–22) in length, 24 (20–25) in width including extensions, basal sclerite of genital apparatus shaped as inverted trapezium, aedeagus 55 (54–58) long, extending to level of anterior margin of anal suckers. Genital papillae situated at midlevel of genital apparatus, touching at their bases. Genital shield absent. Anal suckers 9 (8–9) in diameter, corolla without indentations, surrounded by radially striated area. Opisthoventral shields well-developed, roughly triangular, situated posterior to the level of anal suckers, setae *ps3* situated on these shields. Anterior end of terminal cleft surrounded by small sclerotized plate (Fig. 1B). Distance between ventral setae: *3a–4b* 24 (18–28), *4b–4a* 32 (26–33), *4a–g* 34 (34–42), *g–ps3* 40 (36–42), *ps3–ps3* 32 (32–34), *ps3–h3* 21 (22–25).

Legs I slightly longer than legs II, femora II with ventral crest. Solenidion  $\sigma I$  of genu I spiculiform, situated in proximal half of the segment (Fig. 2). Setae *mGII* thickened basally,



**Figure 1** *Montesauria hernandesi* sp. n., Male: A – dorsal view; B – ventral view.



**Figure 2** *Montesauria hernandesi* sp. n., Male: A – D – details of legs, dorsal view, A – leg I, B – leg II, C – leg III, D – leg IV; E – details of opisthosoma.

with filiform apex. Setae *d* of tarsi II, III shorter than corresponding setae *f*. Genu IV with ovate ventral apophysis. Tarsus IV with bidentate apex, 20 (20–22) in length, setae *d* and *e* ovate and small, diameter of seta *e* twice as short as that in seta *d* (Fig. 2D). Length of solenidia:  $\omega$ II 10 (8–10),  $\omega$ III 10 (8–10),  $\sigma$ II 4 (4–9),  $\sigma$ III 6 (5–7),  $\phi$ III 20 (20–25),  $\phi$ IV 24 (27–30).

**Female** (range for 5 paratypes). Length of idiosoma excluding terminal appendages 396–408, width 122–150, length of hysterosoma 284–292.

Prodorsal shield: shape and ornamentation as in male, 86–110 long, 98–112 wide (Fig. 3A). Setae *ve* absent. Scapular setae *se* separated by 52–56. Humeral shields poorly developed, represented by narrow dorsal sclerites. Setae *c2* situated on soft tegument. Setae *c3* lanceolate, 24–26 × 6–7. Anterior and lobar parts of hysteronotal shield separated by narrow transverse band of soft tegument. Hysteronotal shield: anterior margin straight, posterior margin convex in median part, length 208–220, width at anterior margin 92–112, with ovate lacunae. Length of lobar region excluding terminal appendages 60–70, width at level of setae *h2* 76–82, median

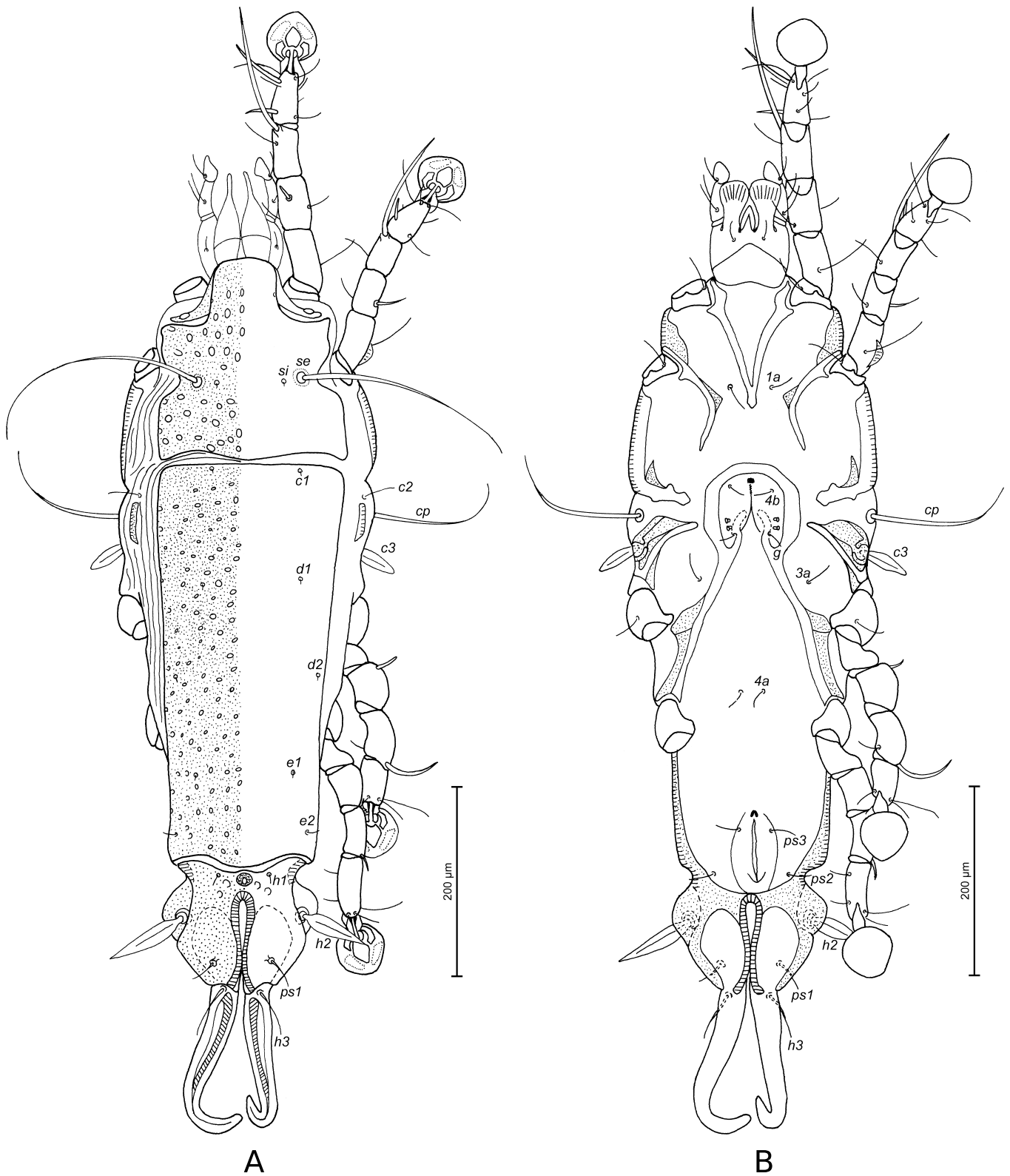
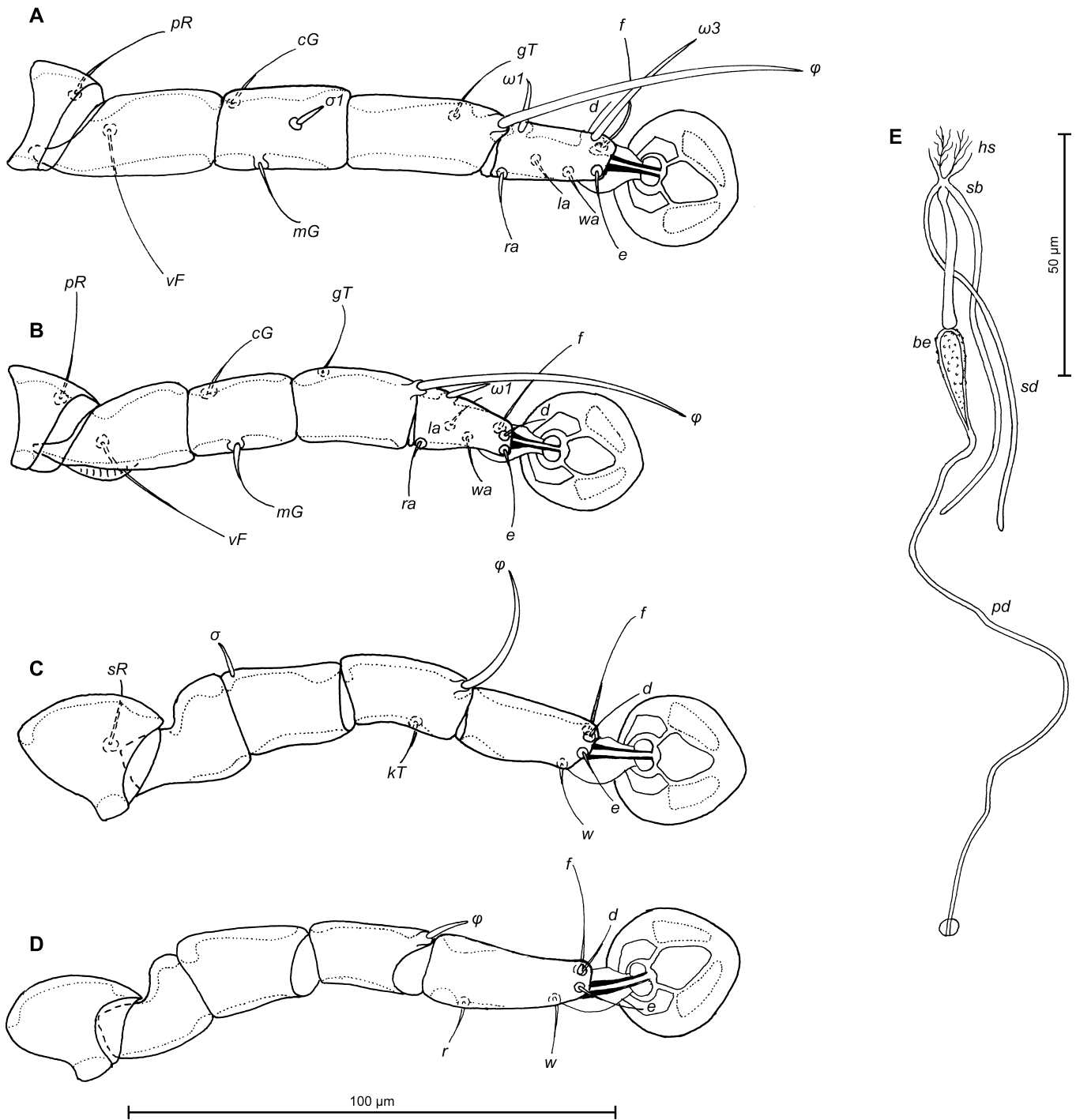


Figure 3 *Montesauria hernandesi* sp. n., Female: A – dorsal view; B – ventral view.



**Figure 4** *Montesauria hernandesi* sp. n., Female: A – D – details of legs, dorsal view, A – leg I, B – leg II, C – leg III, D – leg IV; E – spermatheca; Abbreviations: be – bulb-like enlargement of primary spermaduct, hs – head of spermatheca, pd – primary spermaduct, sb – small bulge of primary spermaduct, sd – secondary spermaduct.



part of anterior margin slightly convex, ornamentation with few ovate lacunae in anterior part. Terminal cleft narrow, with lateral margins almost parallel and touching at level of setae *ps1*, 48–54 long. Supranal concavity circular, small, strongly outlined. Setae *f2* absent, setae *h1* on lobar shield, near its anterior margin. Setae *h2* spindle-like, with acute apices, 48–52 long, 8–10 wide. Setae *h3* filiform, 26–30 in length, about 1/3 of the length of terminal appendages. Setae *ps1* situated dorsally on lobes. Distance between bases of dorsal setae: *c2–d2* 98–108, *d2–e2* 84–90, *e2–h2* 40–46, *h2–h3* 40–42, *d1–d2* 47–58, *e1–e2* 27–36, *h1–h2* 22–30, *ps1–h2* 27–30, *h1–h1* 22–28, *h2–h2* 56–62.

Epimerites I fused into a Y, with short sternum (Fig. 3B). Lateral parts of coxal fields I, II without heavily sclerotized areas. Epimerites II do not reach the level of anterior margin of epigynum. Epimerites IVa absent. Translobar apodemes of opisthosomal lobes present, fused to each other anterior to terminal cleft. Epigynum horseshoe-shaped, greatest width 50–60, apodemes of ovipore connected with coxal apodemes IIIa. Head of spermatheca weakly sclerotized, with longitudinal striation, secondary spermaducts longer than distance between large bulb-shaped enlargement of primary spermaduct and small bulge near head of spermatheca. Bulb-shaped enlargement of primary spermaduct with small tubercles (Fig. 4E). Distance between pseudanal setae: *ps2–ps2* 37–40, *ps3–ps3* 18–20, *ps2–ps3* 19–22.

Legs I slightly longer than legs II, femur II with ventral crest; other segments of legs I, II without processes. Solenidion  $\sigma I$  of genu I spiculiform, situated in distal half of the segment (Fig. 4A). Setae *mGII* thickened basally, with filiform apex. Setae *d* of tarsi II–IV much shorter than corresponding setae *f*. Length of solenidia:  $\omega II$  8–12,  $\omega III$  7–10,  $\sigma II$  6–11,  $\sigma III$  4–6,  $\phi III$  22–26,  $\phi IV$  5–9.

**Differential diagnosis** — The new species, *Montesauria hernandesi* sp. n., belongs to *merulae* species group and is most similar to *M. sibirica* Kuroki, Nagahori and Mironov, 2006 described from the Siberian thrush *Geokichla sibirica davisoni* (Hume, 1877) (Passeriformes, Turdidae) (Kuroki *et al.* 2006). In males of both species, the posterior margin of opisthosomal lobes is notched, the opisthoventral shields have a triangular form, and the inner angles of these shields are slightly posterior to the level of anal suckers, the anterior end of terminal cleft is surrounded by small sclerotized plate, setae *h1* are situated at the level of anterior margin of supranal concavity, the genua IV have an ovate ventral apophysis, setae *d* and *e* of tarsus IV are ovate, the diameter of seta *e* is twice as short as that in seta *d*; in females, the primary spermaduct has a bulb-shaped enlargement, and setae *h3* are about 1/3 the length of terminal appendages. *Montesauria hernandesi* sp. n. clearly differs from *M. sibirica* by the following features (corresponding character states of *M. sibirica* in parentheses): in both sexes, the ornamentation of prodorsal and hysteronotal shields is represented by ovate lacunae (*vs.* small pit-like lacunae), in males, tarsus IV has a bidentate apex (*vs.* with apical claw-like process); in females, the lobar shield bears a few ovate lacunae in the anterior part (*vs.* without ornamentation), epimerites I are fused into a Y (*vs.* fused into a V), the secondary spermaducts are longer than the distance between the large bulb-shaped enlargement of primary spermaduct and the small bulge near the head of spermatheca (*vs.* shorter than this distance).

### ***Montesauria caerulea* Constantinescu sp. n. (Figs. 5–8)**

Zoobank: 26BD4193-539F-4C7E-A27B-A7972AB8AD43

**Type material** — Holotype male and 22 paratypes (11 males and 11 females), from *Myophonus caeruleus* (Scopoli, 1786) (Passeriformes: Turdidae), India, Meghalaya, Jaintia Hills, Shnongrim village, 25°21'12.36"N, 92°31'3.06"E, 22 Jan. 2014, 1151 m, subtropical forest, collector D. K. B. Mukhim.

**Type deposition** — Holotype male (ANA 1395), 11 males (ANA 1388–1394, ANA 1396–1397, ANA 1436 B1, ANA 1438 B3) and 11 females (ANA 1398–1407, ANA 1441 B5) paratypes in MGAB collection.

**Etymology** — The species epithet is taken from the species name of the type host and is an adjective.

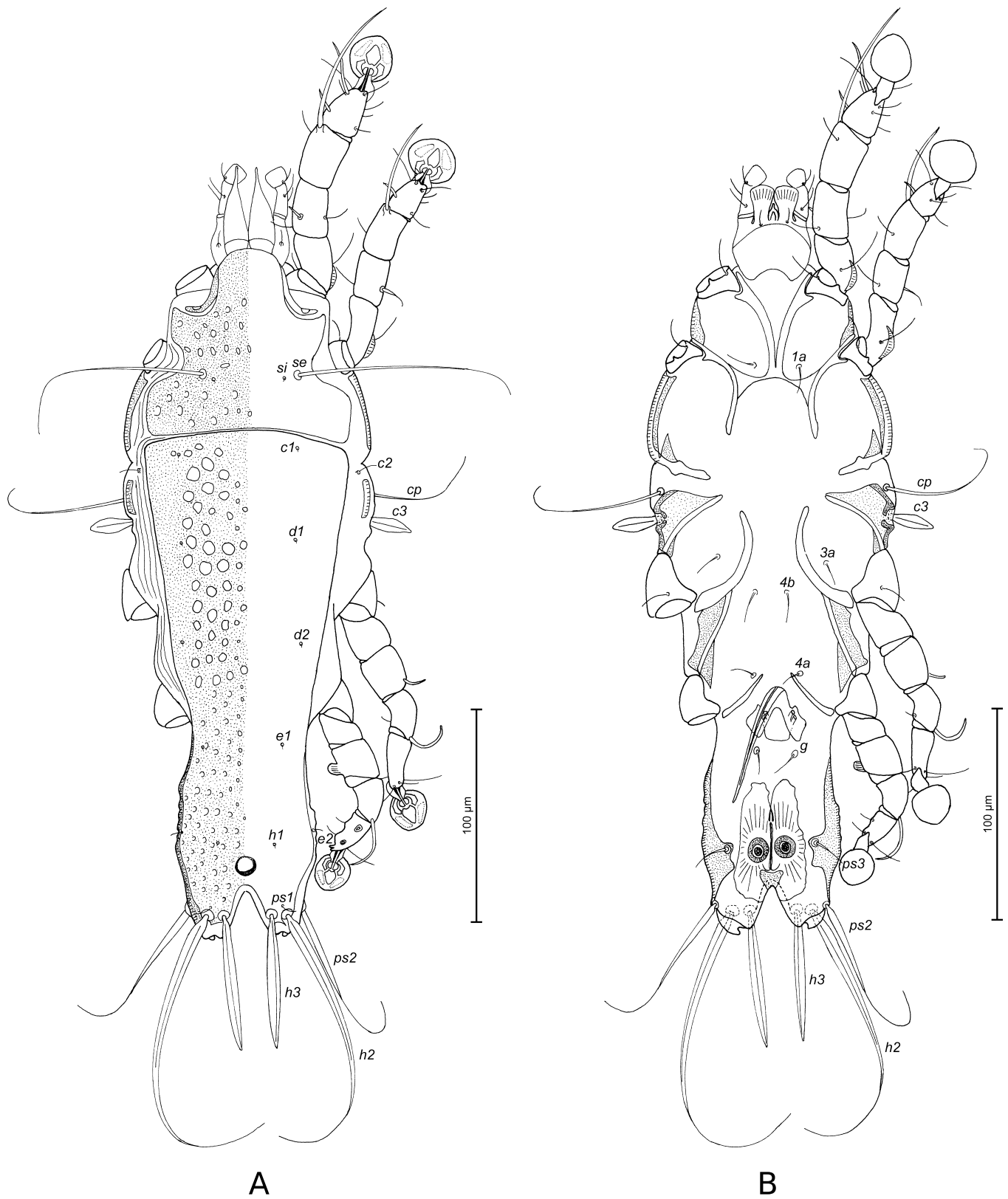


Figure 5 *Montesauria caerulea* sp. n., Male: A – dorsal view; B – ventral view.

### Description

**Male** (holotype, range for 4 paratypes). Length of idiosoma 316 (312–332), width 116 (114–124), length of hysterosoma 228 (224–232).

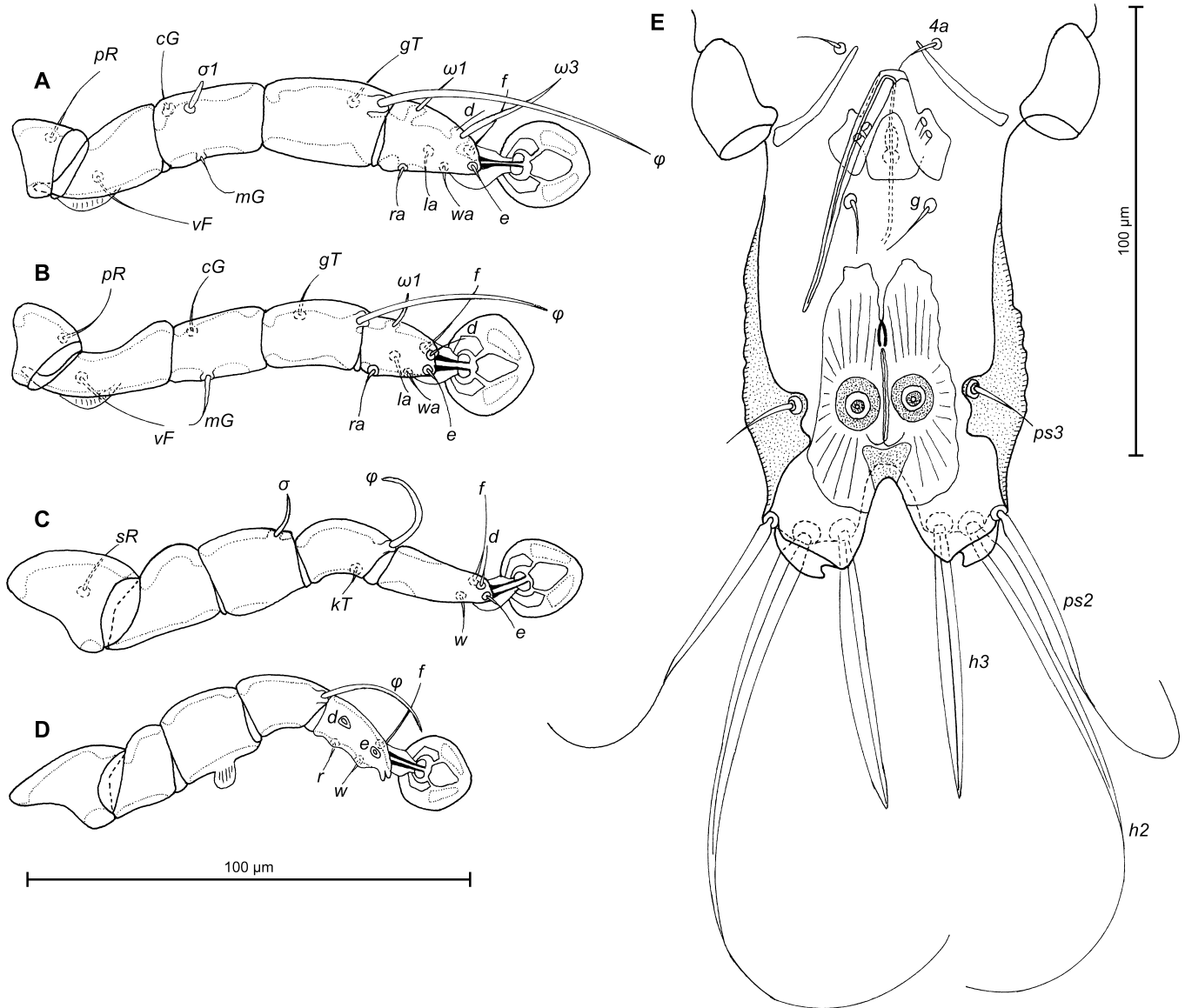
Prodorsal shield: entire, lateral margins slightly concave at level of scapular setae, posterior margin concave, length along midline 88 (84–94), width at posterior margin 94 (90–93), surface with ovate lacunae. Setae *ve* absent. Scapular setae *se* separated by 44 (44–48). Humeral shields poorly developed, represented by narrow dorsal sclerites, separated from epimerites III, not encompassing setae *cp*. Setae *c2* situated dorsally on soft tegument. Subhumeral setae *c3* lanceolate, 22 (22–23) × 6 (6–8). Prodorsal and hysteronotal shields almost touching in median part, separated by very narrow transverse band of soft tegument. Hysteronotal shield: greatest length from anterior margin to lobar apices 220 (208–232), width at anterior margin 96 (86–92), anterior margin slightly convex, surface of this shield with big circular lacunae in anterior half and small ovate lacunae in posterior half. Opisthosomal lobes well developed, short and with apices slightly narrowed, distal margins with small notch, terminal cleft V-shaped, 22 (20–22) in length. Setae *f2* absent, setae *h2* and *h3* slightly distant from margin, *h3* spindle-shaped, 66 (62–72) in length, 4 (4–5) in width, *h2* 164 (160–180) in length, 6 (4–6) in width. Supranal concavity circular, well outlined. Setae *h1* situated anterior to the level of supranal concavity. Setae *ps1* situated in anterior half of opisthosomal lobes, approximately equidistant from outer and inner margins of these lobes, 7 (5–8) in length. Setae *ps2* 84 (70–90) in length (Fig. 5A). Distance between bases of dorsal setae: *c2–d2* 80 (78–80), *d2–e2* 100 (100–110), *e2–h3* 32 (26–34), *d1–d2* 44 (34–42), *e1–e2* 40 (46–52), *h1–ps2* 38 (22–36), *h2–h2* 38 (30–38), *h3–h3* 22 (20–22), *ps2–ps2* 50 (46–50).

Epimerites I fused posteriorly into a V, fused part with transverse extensions connected to medial part of epimerites II (Fig. 5B). Coxal fields I, II without wide sclerotized areas. Rudimentary sclerites rEpIIa absent. Coxal fields I, II and III open. Epimerites IVa present, long, exceeding bases of setae *4a*. Genital arch with wing-like extensions, 22 (18–21) in length, 30 (26–28) in width including extensions, basal sclerite of genital apparatus shaped as inverted trapezium, aedeagus 60 (56–60) long, reaching anterior margin of anal opening. Genital papillae situated at midlevel of genital apparatus, connected by their bases. Genital shield absent. Anal suckers 11 (10–12) in diameter, corolla without indentations, surrounded by striated area. Opisthoventral shields well-developed, trapezoidal in shape, situated at level of anal suckers, setae *ps3* situated on these shields. Anterior end of terminal cleft surrounded by small sclerotized plate (Fig. 5B). Distance between ventral setae: *3a–4b* 26 (24–26), *4b–4a* 34 (32–40), *4a–g* 34 (34–36), *g–ps3* 42 (42–46), *ps3–ps3* 40 (38–40), *ps3–h3* 32 (30–34).

Legs I slightly longer than legs II, femora I, II with ventral crest. Solenidion  $\sigma I$  of genu I spiculiform, situated in proximal half of the segment (Fig. 6A). Setae *mGII* thickened basally, with filiform apex. Setae *d* of tarsi II, III shorter than corresponding setae *f*. Genu IV with semi-rounded ventral apophysis. Tarsus IV with bidentate apex, 24 (20–24) in length, setae *d* and *e* button-like. (Fig. 6D). Length of solenidia:  $\omega II$  12 (8–12),  $\omega III$  8 (6–8),  $\sigma I$  9 (6–10),  $\sigma III$  7 (6–7),  $\varphi III$  22 (22–24),  $\varphi IV$  30 (26–31).

**Female** (range for 5 paratypes). Length of idiosoma (excluding terminal appendages) 412–440, width 126–150, length of hysterosoma 308–336.

Prodorsal shield: shaped as in male, 94–104 long, 94–118 wide, with ovate lacunae in anterior half and few circular and ovate lacunae in central part of posterior half (Fig. 7A). Setae *ve* absent. Scapular setae *se* separated by 50–58. Humeral shields present, poorly developed as narrow dorsal sclerites. Setae *c2* situated on soft tegument. Setae *c3* lanceolate, 24–25 × 7–8. Anterior and lobar parts of hysteronotal shield separated by narrow transverse band of soft tegument. Hysteronotal shield: anterior margin straight, posterior margin convex in median part, length 236–248, width at anterior margin 100–120, surface of this shield with big and almost round lacunae in anterior half and small ovate lacunae in posterior half. Length of



**Figure 6** *Montesauria caerulea* sp. n., Male: A – D – details of legs, dorsal view: A – leg I, B – leg II, C – leg III, D – leg IV; E – details of opisthosoma.

lobar region excluding terminal appendages 72–80, width at level of setae *h2* 72–80, median part of anterior margin slightly convex, anterior part few ovate lacunae. Terminal cleft narrow, with lateral margins almost touching in posterior half, 48–54 long. Supranal concavity circular, small, strongly outlined. Setae *f2* absent, setae *h1* on lobar shield near its anterior margin. Setae *h2* spindle-like, with acute apices, 40–50 long, 8–9 wide. Setae *h3* filiform, 30–46 in length, about 1/2 of the length of terminal appendages. Setae *ps1* situated dorsally on lobes. Distance between bases of dorsal setae: *c2*–*d2* 102–120, *d2*–*e2* 88–98, *e2*–*h2* 50–54, *h2*–*h3* 36–40, *d1*–*d2* 55–64, *e1*–*e2* 30–40, *h1*–*h2* 28–34, *ps1*–*h2* 28–34, *h1*–*h1* 18–22, *h2*–*h2* 54–60.

Epimerites I fused into a Y, with short sternum (Fig. 7B). Lateral parts of coxal fields I, II without heavily sclerotized areas. Epimerites II do not reach the level of anterior margin of epigynum. Epimerites IVa absent. Translobar apodemes of opisthosomal lobes present, fused to each other anterior to terminal cleft. Epigynum horseshoe-shaped, greatest width 54–66, apodemes of ovipore connected with coxal apodemes IIIa. Head of spermatheca

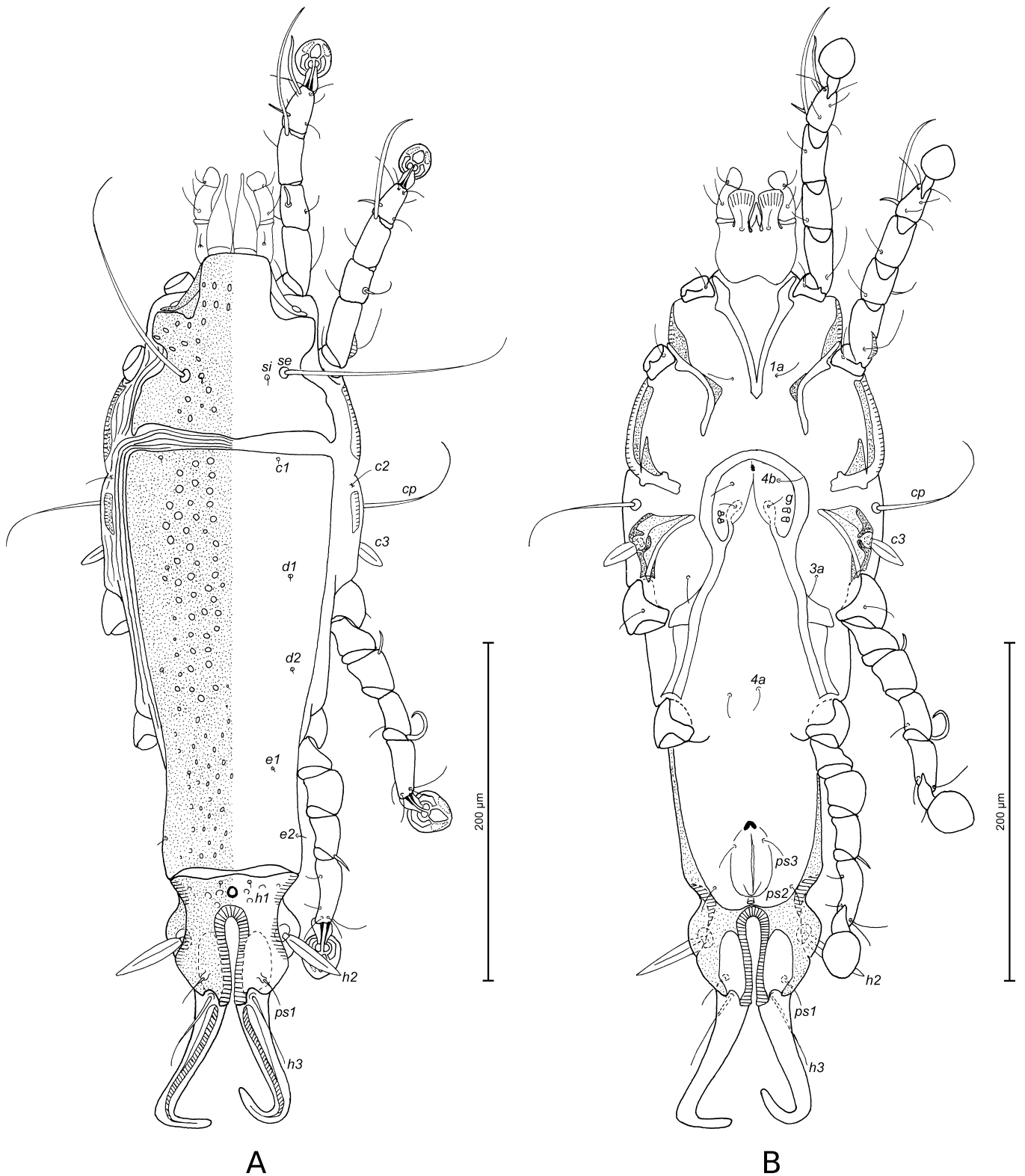
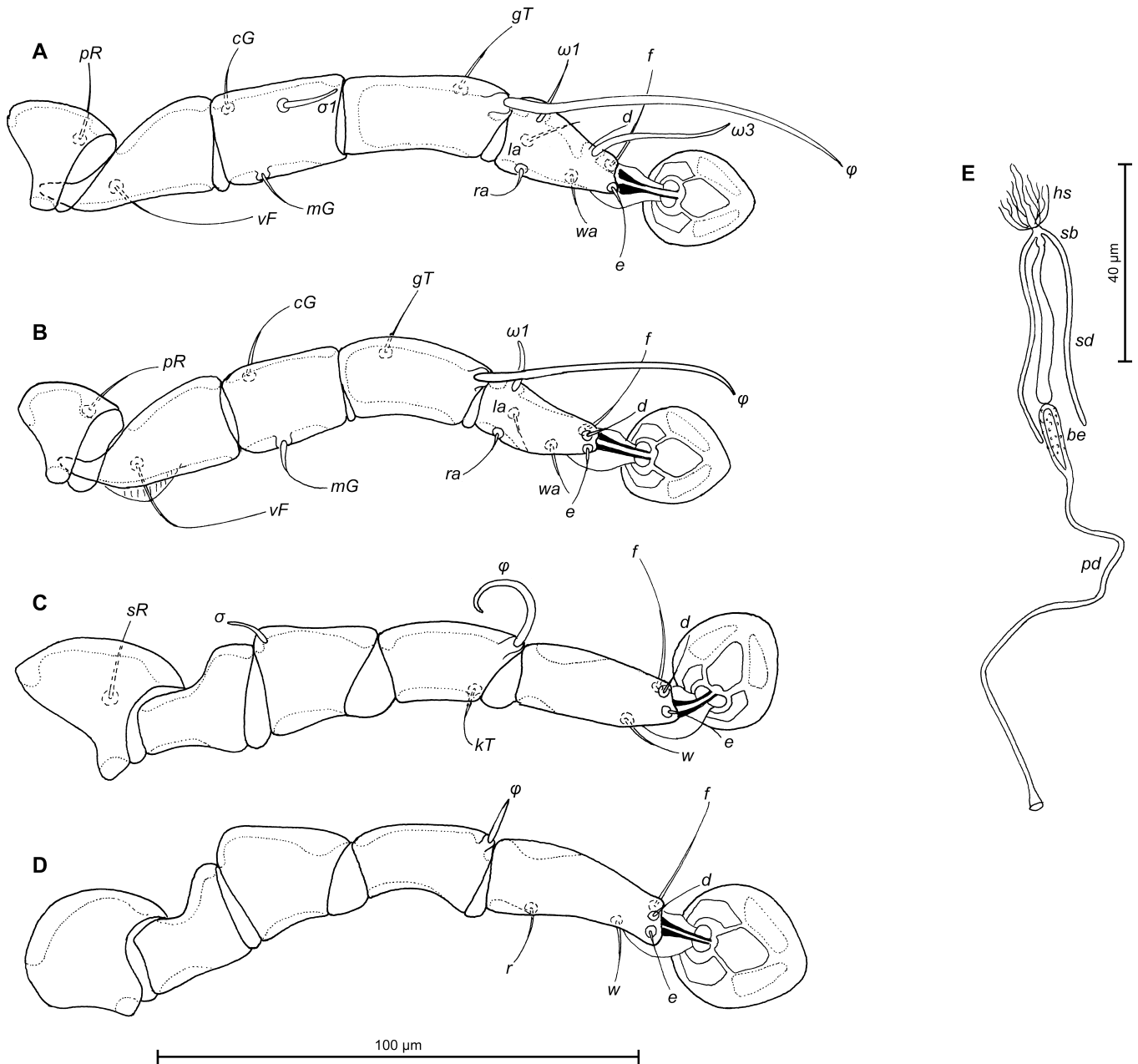


Figure 7 *Montesauria caerulea* sp. n., Female: A – dorsal view; B – ventral view.



**Figure 8** *Montesauria caerulea* sp. n., Female: A–D details of legs, dorsal view: A – leg I, B – leg II, C – leg III, D – leg IV; E – spermatheca and spermaducts; Abbreviations: be – bulb-like enlargement of primary spermaduct, hs – head of spermatheca, pd – primary spermaduct, sb – small bulge of primary spermaduct, sd – secondary spermaduct.

weakly sclerotized, with longitudinal striation, secondary spermaducts shorter than distance between large bulb-shaped enlargement of primary spermaduct and small bulge near head of spermatheca. Bulb-shaped enlargement of primary spermaduct with small tubercles (Fig. 8E). Distance between pseudanal setae: *ps2-ps2* 34–40, *ps3-ps3* 16–22, *ps2-ps3* 24–29.

Femur II with ventral crest; other segments of legs I, II without processes. Solenidion  $\sigma I$  of genu I spiculiform, situated in distal half of the segment (Fig. 8A). Setae *mGII* thickened basally, with filiform apex. Setae *d* of tarsi II–IV much shorter than corresponding setae *f*. Length of solenidia:  $\omega II$  10–16,  $\omega III$  8–10,  $\sigma I$  6–11,  $\sigma III$  6–8,  $\varphi III$  22–30,  $\varphi IV$  6–10.

**Differential diagnosis** — *Montesauria caerulea* sp. n. belongs to *merulae* species group

and is most similar to *M. aurea* Kuroki, Nagahori and Mironov, 2006 described from White's thrush *Zoothera aurea toratugumi* (Momiya, 1940) (Passeriformes, Turdidae) in Japan (Kuroki *et al.* 2006). Males of the both species have a similar shape of opisthosomal lobes, which are short, with apices slightly narrowed, and with notched distal margins, the aedeagus does not reach the level of anterior margin of anal suckers, the genua IV have semi-round ventral apophysis, the setae *h1* are situated anterior to the level of the supranal concavity; females have setae *h3* about 1/2 the length of terminal appendages. *Montesauria caerulea* sp. n. clearly differs from *M. aurea* by the following features (corresponding character states of *M. aurea* in parentheses): in both sexes, the ornamentation of hysteronotal shield is represented by big and almost circular lacunae in the anterior half and small ovate lacunae in the posterior half (*vs.* small pit-like lacunae), in males, epimerites I and II are connected (*vs.* disconnected), the basal sclerite of the genital apparatus is shaped like an inverted trapezium (*vs.* crescent-shaped), the opisthoventral shields are almost trapezoidal in shape and located at the level of anal suckers (*vs.* almost triangular and located slightly anterior to the level of anal suckers), tarsus IV has bidentate apex (*vs.* apical claw-like process). In females of the new species, the humeral shields are present (*vs.* humeral shields absent), the epimerites I are fused into a Y (*vs.* fused into a V), the posterior margin of the hysteronotal shield is convex in median part (*vs.* concave), the secondary spermathecae are shorter than the distance between the large bulb-shaped enlargement of the primary spermatheca and the small bulge near the head of spermatheca (*vs.* longer than that distance).

## DNA barcodes

### *Montesauria hernandesi*

GenBank accession numbers for molecular voucher ANA1442 C1 male MH746221, ANA1443 C2 male MH746222, ANA1444 C3 male MH746223, ANA1445 C4 female MH746224, ANA1446 C5 female MH746225, ANA1447 C6 female MH746226.

In the resulted alignment of 482-pb fragment of the mitochondrial cytochrome C oxidase subunit I (COI) gene, we identified 5 polymorphic sites (three with singleton variable sites and two parsimony informative ones). Three haplotypes were identified: H1 (ANA1442 C1 male, ANA1446 C5 female), H2 (ANA1443 C2 male), H3 (ANA1444 C3 male, ANA1445 C4 female, ANA1447 C6 female). Intraspecific genetic distances between the analyzed specimens using K2P model is 0.5%. Also, all observed nucleotide substitutions were synonymous and did not have differences in the amino acid sequence.

### *Montesauria caerulea*

GenBank accession numbers for molecular voucher ANA1436 B1 male MH746227, ANA1438 B3 male MH746228, ANA1441 B5 female MH746229.

In the resulted alignment of 482-pb fragment of the mitochondrial cytochrome C oxidase subunit I (COI) gene, we identified 4 singleton variable sites. Three haplotypes were identified: H1 (ANA1436 B1 male), H2 (ANA1438 B3 male) and H3 (ANA1441 B5 female). Intraspecific genetic distances between the analyzed specimens using K2P model is 0,6%. All observed nucleotide substitutions were synonymous and did not have differences in amino acid sequence.

The reported intraspecific genetic distances for the two species of *Montesauria* described in the present study are comparable with genetic distances found in other related mites like *Proterothrix chachulae* (0.8%) (Constantinescu *et al.* 2017) also belonging to the subfamily Pterodectinae and distributed the Oriental Region.

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