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Ten new species of *Daidalotarsonemus* (Prostigmata: Tarsonemidae) from Costa Rica

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Ten new tarsonemid species of the genus *Daidalotarsonemus* found on native plants in Costa Rica are described herein: *Daidalotarsonemus alas* sp. n. Ochoa, Rezende & Lofego; *Daidalotarsonemus azofeifai* sp. n. Ochoa, Rezende & Lofego; *Daidalotarsonemus bauchani* sp. n. Rezende, Ochoa & Lofego; *Daidalotarsonemus cuadratus* sp. n. Ochoa, Rezende & Lofego; *Daidalotarsonemus ginae* sp. n. Ochoa, Rezende & Lofego; *Daidalotarsonemus lini* sp. n. Ochoa, Rezende & Lofego; *Daidalotarsonemus marini* sp. n. Ochoa, Rezende & Lofego; *Daidalotarsonemus maryae* sp. n. Ochoa, Rezende & Lofego; *Daidalotarsonemus puntarenensis* sp. n. Rezende, Ochoa & Lofego; and *Daidalotarsonemus serratus* sp. n. Rezende, Ochoa & Lofego. Measurements, a diagnosis for all the new species and a key to the species known to occur in Costa Rica is provided. The findings related in this article emphasize the importance of conducting mite surveys in rainforests around the world, to better understand the mite diversity which inhabits these biomes.

<http://zoobank.org/urn:lsid:zoobank.org:pub:8DF0990A-E78B-43A4-935E-389AE2DFC497>

Keywords: Acari; Heterostigmata; La Selva Biological Station; rainforest; taxonomy

Introduction

Currently, the genus *Daidalotarsonemus* De Leon (1956) consists of 27 described species (Lin and Zhang 2002; Lofego et al. 2005; Sousa et al. 2014; Rezende et al. 2015). It is considered to be a plant-inhabiting taxon, apparently with a preference for hosts located in humid places with an abundance of algae, lichen and fungi on them, e.g. rain forests (Lindquist 1986). Three species of this genus, *Daidalotarsonemus deleoni* (Smiley), *D. limonensis* Ochoa and *D. ternifoliae* Ochoa, have been described from Central America, all from Costa Rica (Ochoa et al. 1991, 1994).

The Arthropods of La Selva (ALAS) Project began as an effort to discover and better understand the arthropod fauna from the La Selva Biological Station, a protected area encompassing a lowland tropical rain forest in north-eastern Costa Rica. The project began in 1991 and continues to attract taxonomic collaborators who have visited the Station to train ALAS staff to recognize, prepare and identify specimens collected in the survey. Through this project, a considerable number of new arthropod taxa have been identified, including new mite species. This article describes ten new *Daidalotarsonemus* species collected in Costa Rica by the ALAS Project and compares them with all other species of *Daidalotarsonemus*.

Materials and methods

Individuals collected throughout the La Selva Biological Station and few specimens from other provinces of Costa

Rica were studied and described. The Station is located in the Caribbean lowland at the northern base of the Braulio Carrillo National Park, 10°26'N 84°1'W, Heredia Province, Costa Rica. It comprises about 1600 ha of tropical wet forests and undisturbed lands. ALAS staff personnel used canopy fogging technique for collecting plant-inhabiting mites. They prepared the specimens on slides and entered the specimen data in a relational database designed for the project.

Daidalotarsonemus individuals sampled were analysed by two techniques: phase-contrast (PC) microscopy and differential interference contrast (DIC) microscopy. The terminology used herein mainly follows Lindquist (1986), except for gnathosomal setae *dgs* and *vgs* (Suski 1967a; Magowski et al. 1998). For each structure, the mean measurements are provided in micrometres (µm), followed in parentheses by the range of the specimens measured (when available), including the holotype. The specimens were examined, drawn and photographed using a Zeiss Axioplan microscope (DIC). For the diagnoses, comparisons with previously described species were based on the study of the holotypes, except for the following species: *Daidalotarsonemus cornutus* Lin, Chen & Zhang (1998), *D. duolamella* Lin, Chen & Zhang (1998), *D. euonymus* Yang, Ding & Zhou (1987) and *D. serissae* Yang, Ding & Zhou (1987), for which the comparisons were based on literature descriptions and illustrations.

The following abbreviations are used for institutions where the types were deposited: Canadian National Collection of Insects, Arachnids and Nematodes (CNC),

Ottawa, Ontario, Canada; Department of Zoology and Botany (DZSJRP), São Paulo State University, São José do Rio Preto, São Paulo, Brazil; Department of Life Sciences, The Natural History Museum (TNHM), London, United Kingdom; Faculty of Agronomy (CIPROC), Costa Rica University, San Jose, Costa Rica; Florida State Collection of Arthropods (FSCA), Gainesville, Florida, USA; Institute of Plant Protection, Fujian Academy of Agricultural Sciences (FAAS), Pudan, Fuzhou, Fujian, China; National Museum of Costa Rica (NMCR), Department of Natural History, San Jose, Costa Rica; Queensland Museum (QM), South Brisbane, Queensland, Australia and United States National Museum of Natural History (USNM), Smithsonian Institution, National Insect and Mite Collection located at the USDA, SEL, Beltsville, Maryland, USA. The holotypes are deposited at NMCR, Departamento de Historia Natural, San José, Costa Rica; due to the recent reorganization of the INBio collections (Wade 2014).

Results

Key to the species of *Daidalotarsonemus* from Costa Rica (based only on females)

- 1a. Insertion of the setae *c1* near border of tergite D (Figures 36 and 40); tegula rounded apically (Figures 37 and 41); one pair of fissures overlapping apodemes IV (Figures 37 and 41) 2
- 1b. Insertion of the setae *c1* not as above (e.g. Figures 1, 5, and 12); tegula truncated (e.g. Figures 2, 6 and 13); no pairs of fissures overlapping apodemes IV 3
- 2a. Setae *f* elongated ($\pm 34 \mu\text{m}$) with no visible central vein; four rows of reticula covering tergite C (Figure 36) *Daidalotarsonemus puntarenensis* sp. n.
- 2b. Setae *f* shorter ($\pm 18 \mu\text{m}$), leaf-shaped and with visible central vein; just one row of reticula completely formed on the tergite C (Figure 40) *Daidalotarsonemus serratus* sp. n.
- 3a. No rows of reticula on the tergite C (e.g. Figures 1 and 28) 4
- 3b. At least one row of reticula on the tergite C (e.g. Figures 5, 20, 24 and 32) 6
- 4a. Setae *c1* setiform (Figure 1); prosternal apodeme conspicuous to the junction to sejugal apodeme (Figure 2) *Daidalotarsonemus alas* sp. n.
- 4b. Setae *c1* oblanceolate (Figure 28); prosternal apodeme inconspicuous to the junction to sejugal apodeme (Figure 29) 5
- 5a. Setae *sc2* setiform; setae *e* wider ($\pm 12 \mu\text{m}$) (Figure 28) *Daidalotarsonemus marini* sp. n.
- 5b. Setae *sc2* oblanceolate; setae *e* narrow ($\pm 4 \mu\text{m}$) *Daidalotarsonemus limonensis* Ochoa
- 6a. Setae *e* narrow (at most $3 \mu\text{m}$) (Figures 12 and 24) 7
- 6b. Setae *e* wider (at least $8 \mu\text{m}$) (e.g. Figures 5, 20 and 32) 8
- 7a. Setae *c1* short ($\pm 15 \mu\text{m}$); setae *tc''* on tarsus II lanceolate (Figures 12 and 14) *Daidalotarsonemus bauchani* sp. n.
- 7b. Setae *c1* long ($\pm 30 \mu\text{m}$); setae *tc''* on tarsus II setiform (Figures 24 and 26) *Daidalotarsonemus lini* sp. n.
- 8a. Setae *e* asymmetric and wider ($\pm 25 \mu\text{m}$) (Figure 16) *Daidalotarsonemus cuadratus* sp. n.
- 8b. Setae *e* symmetric and narrow ($\pm 13 \mu\text{m}$) (e.g. Figures 5, 20 and 32) 9
- 9a. Setae *c1* long ($\pm 45 \mu\text{m}$); setae *sc2* long ($\pm 55 \mu\text{m}$) (Figure 20) *Daidalotarsonemus ginae* sp. n.
- 9b. Setae *c1* short ($\pm 15 \mu\text{m}$); setae *sc2* short ($\pm 35 \mu\text{m}$) (Figures 5 and 32) 10
- 10a. Setae *d* narrow ($\pm 3 \mu\text{m}$); setae *c1* short ($\pm 8 \mu\text{m}$) (Figure 5) *Daidalotarsonemus azofeifai* sp. n.
- 10b. Setae *d* wider ($\pm 10 \mu\text{m}$); setae *c1* long ($\pm 18 \mu\text{m}$) (Figure 32) *Daidalotarsonemus maryae* sp. n.

Daidalotarsonemus alas sp. n. Ochoa, Rezende & Lofego

<http://zoobank.org/urn:lsid:zoobank.org:act:DF7063BE-BAC0-4619-ACEE-47D60E805797>
(Figures 1–4)

Diagnosis

Females of this new species are most similar to *Daidalotarsonemus seitus* Attiah (1970) for the shape of the ornamentation on the prodorsal shield and tergite C; the distinct prominent tubercle-shaped insertion of the setae *f*; and the length of the setae *sc2*. They differ by the shape of ornamentation of prodorsal shield and tergite D; the tubercle-shaped insertion of setae *c1* and *c2* present in the new species; the presence of one central serrate vein on the setae *e* (not two as in *D. seitus*) and by the length of *d* and *f* dorsal setae, which are around 20–30% longer in *D. seitus*.

Adult female. Seven specimens measured.

Gnathosoma. Subtriangular in ventral view; length 30 (29–32), maximum width 26 (25–28). Setae *dgs* 12 (11–13) and *vgs* 9 smooth; palps moderately long 9 (9–10). Pharynx fusiform, 18 (18–19) long and 7 wide at maximum width.

Idiosoma – dorsum (Figures 1 and 4). Length 209 (206–213), width at level of *c1* 123 (118–127); prodorsal shield

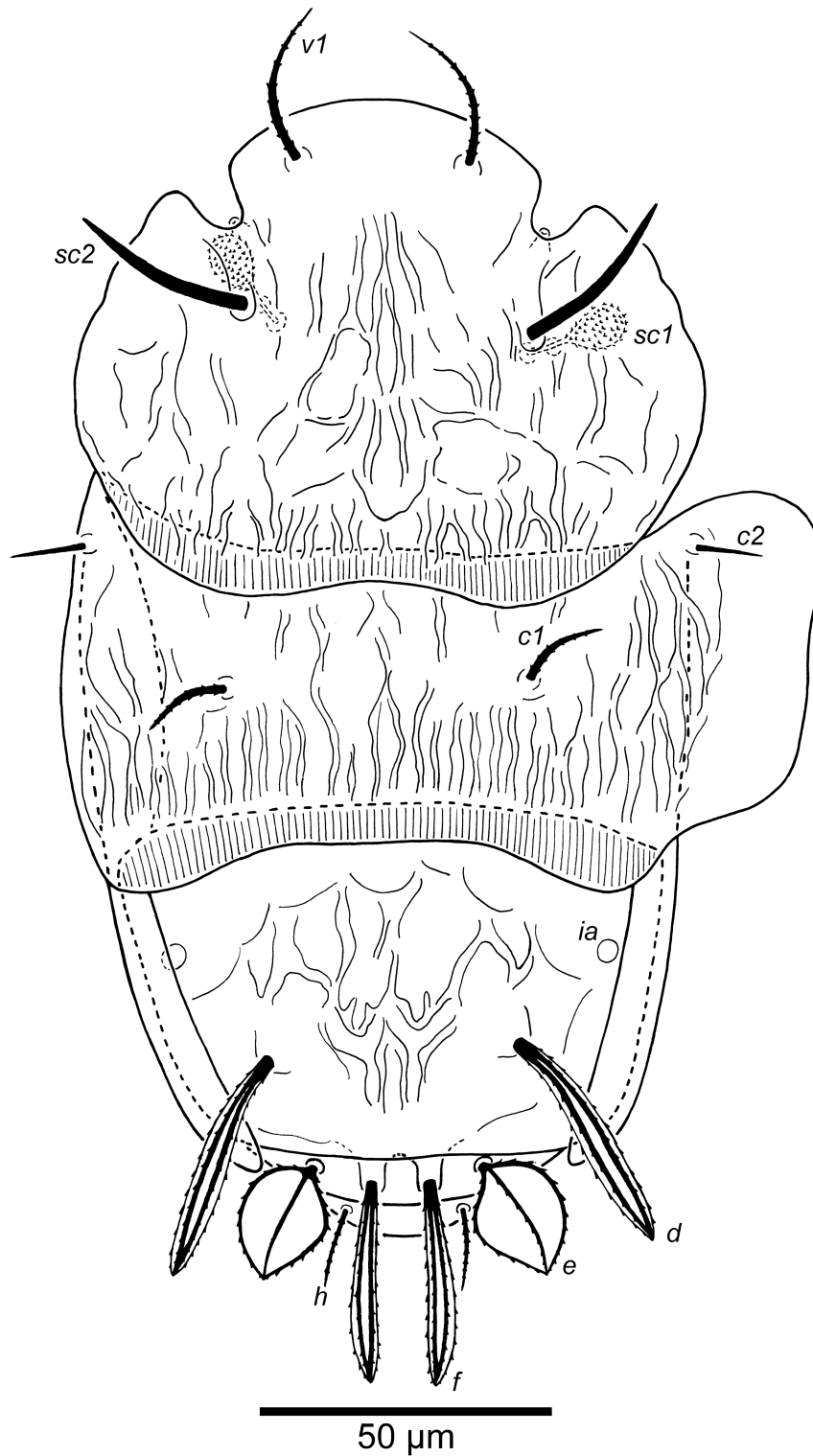


Figure 1. *Daidalotarsonemus alas* sp. n. (female). Dorsal surface.

with irregular ornamentation. Stigma located near the lateral notch of prodorsal shield, which is equidistant to the *v1* and *sc2* setal bases. Tergite C with waved and continuous ridges. Tergite D with irregular reticulation. Lengths of the setae: *v1* 25 (24–27), *sc1* 15 (14–17), *sc2* 29 (27–31), *c1* 13 (12–16), *c2* 12 (11–14), *d* 37 (35–38), *e* 18 (17–20), *f* 33 (31–35) and *h*

14 (12–16). Maximum width of expanded setae: *d* 5, *e* 14 (13–5) and *f* 4. All dorsal setae serrate, except *sc2* and *c2* smooth. Bothridial setae *sc1* capitate, with tiny spines. Setae *v1*, *c1*, *c2* and *h* setiform; *sc2* falcate; *d* and *f* linear elongated with two veins; *e* elliptical with one central serrate vein. All inserted on tubercles, except for *sc1*, *e* and *h*. Distances

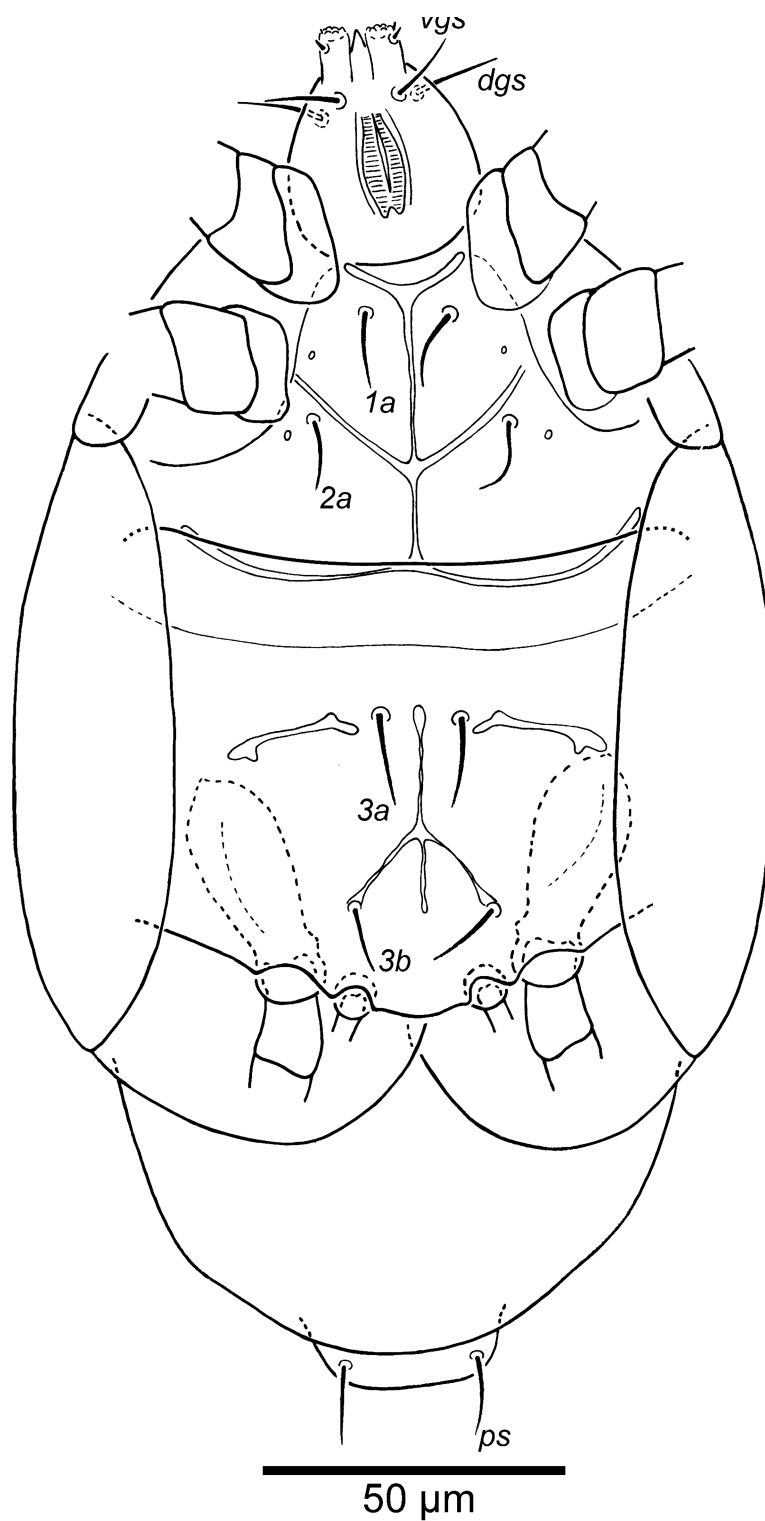


Figure 2. *Daidalotarsonemus alas* sp. n. (female). Ventral surface.

between dorsal setae: *v1-v1* 30 (28–32), *sc2-sc2* 52 (51–53), *v1-sc2* 26 (25–28), *c1-c1* 56 (55–58), *c2-c2* 108 (105–114), *c1-c2* 39 (37–41), *d-d* 46 (45–48), *f-f* 11 (10–13), *e-f* 11 (10–13) and *h-h* 20 (20–21). Setae *sc2* inserted anteriorly to *sc1*.

Idiosoma – venter (Figure 2). Setae *1a* 7 (7–8); *2a* 11 (11–12); *3a* 15 (14–17) near anteriomedial margins of apodemes 3; *3b* 7 (7–8) on posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 long and fused to the prosternal

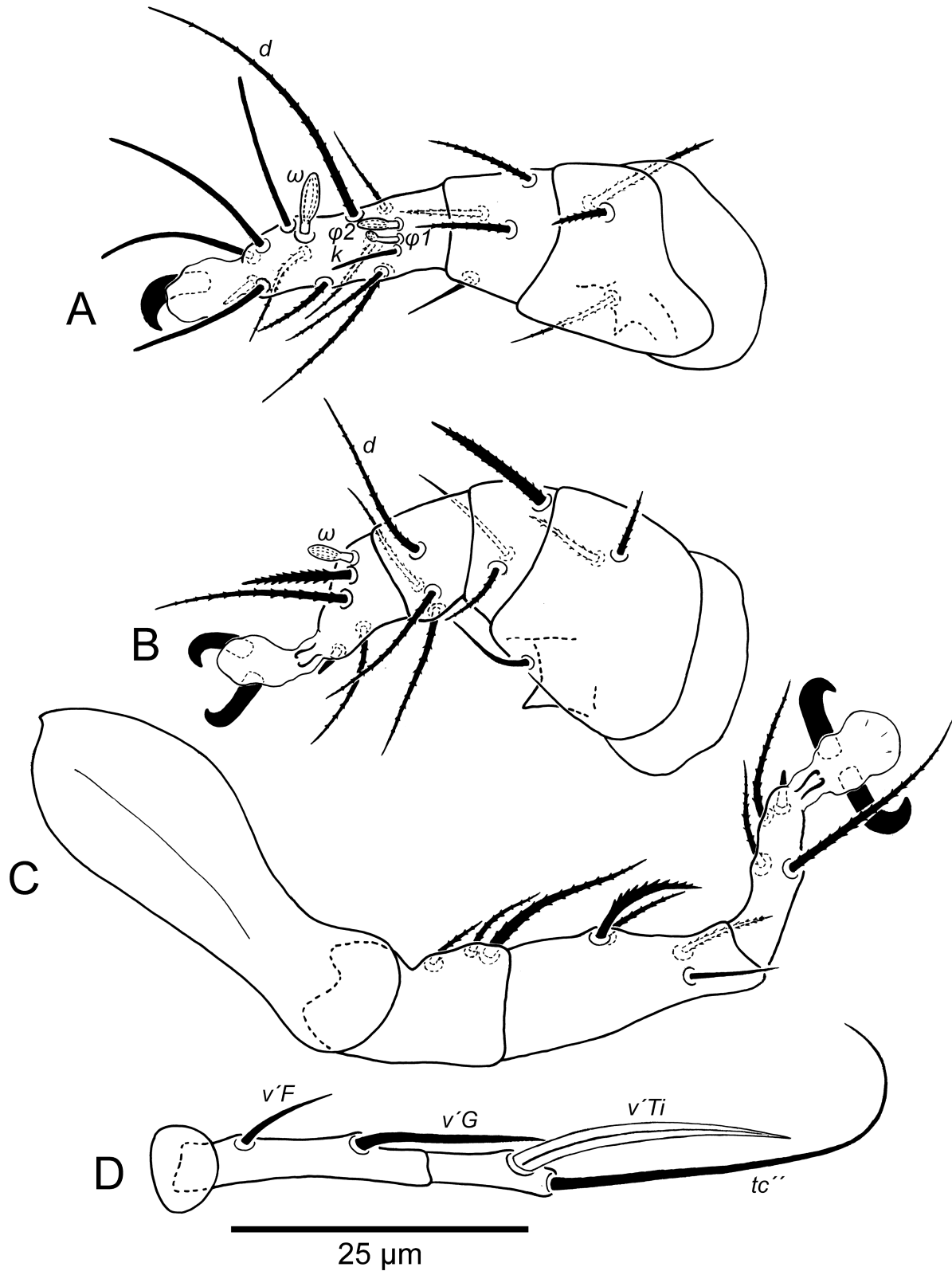


Figure 3. *Daidalotarsonemus alas* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

apodeme. Prosternal apodeme conspicuous from junction with apodeme 1 to the middle portion of sejugal apodeme, where it is fused with it. Sejugal apodeme uninterrupted, with a median furrow. Apodeme 3 with a constriction near

its middle, extending diagonally from proximity of base of seta 3a to the anterior margin of trochanter 3; apodeme 4 extending diagonally from the middle of the poststernal apodeme to base of seta 3b. Poststernal apodeme not

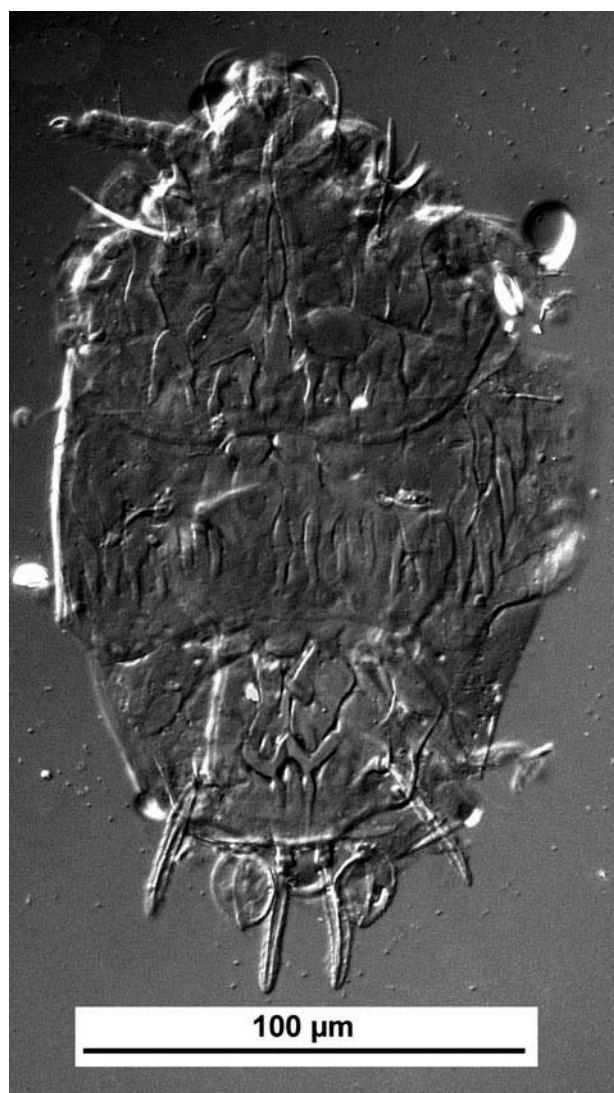


Figure 4. *Daidalotarsonemus alas* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

bifurcated anteriorly. Tegula 17 (16–18) wide and very short 4 (4–6); posterior margin slightly arched. Setae *ps* 14 (13–15) smooth.

Legs (Figure 3). Lengths (measured from femur to tarsus): leg I 52 (51–54), leg II 51 (50–52), leg III 85 (84–87). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3–4–5(2)+7(1), leg II: 3–3–4–4(1), leg III: 1 + 2–4–4. Tarsal solenidion ω of tibiotarsus I 6, stout, wider medially. Sensory cluster of tibia I complete: solenidion $\phi 1$ 3, slender, capitate; solenidion $\phi 2$ 4, robust, slightly capitate; famulus *k* 6 (5–6); all inserted at approximately the same level. Seta *d* of tibia I 29 (28–30), serrate. Solenidion ω of tarsus II proximally inserted 5 long, stout, wider medially. Seta *d* of tibia II 18 (17–19), serrate. Femorogenu IV 18 (17–21); tibiotarsus IV 9 (8–10). Length of leg IV setae: $v'F$ 9 (8–11), $v'G$ 16 (14–17), $v'Ti$ 20 (19–22) and tc'' 31 (28–32); all setae smooth; $v'Ti$ falcate.

Adult male. Unknown.

Type material

Holotype female and 27 paratype females. Holotype and two paratypes from Moraceae sp., 10°26'N 84°1'W, La Selva Biological Station, Heredia, Costa Rica, 16/V/1994, ALAS; three paratypes from a Moraceae species, 17/V/1994, other collection data as holotype; one paratype from *Bolbitis portoricensis* (Spreng.) Hennipman (Dryopteridaceae), 22/V/1994, other collection data as holotype; two paratypes from *Cyathea* sp. (Cyatheaceae), 22/V/1994, other collection data as holotype; two paratypes from *Guarea guidonia* (L.) Sleumer (Meliaceae), 05/VI/1995, other collection data as holotype; three paratypes from a Melastomataceae species, 16/V/1994, other collection data as holotype; one paratype from a Myristicaceae species, 29/V/1994, other collection data as holotype; one paratype from *Nephrolepis* sp. (Nephrolepidaceae), 22/V/1994, other collection data as holotype; one paratype from a Ochnaceae species, 17/V/1994, other collection data as holotype; one paratype from a palm (Arecaceae), 16/V/1994, other collection data as holotype; one paratype from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 12/VI/1994, other collection data as holotype; one paratype from a Phytolaccaceae species, 17/V/1994, other collection data as holotype; one paratype from a Piperaceae species, 16/V/1994, other collection data as holotype; one paratype from a Rhamnaceae species, 16/V/1994, other collection data as holotype; one paratype from a Rubiaceae species, 16/V/1994, other collection data as holotype; one paratype from a Sapindaceae species, 16/V/1994, other collection data as holotype; one paratype from a Simaroubaceae species, 16/V/1994, other collection data as holotype; two paratypes from a Violaceae species, 16/V/1994, other collection data as holotype; one paratype from *Theobroma cacao* L. (Malvaceae), 9°54'N 83°40'W, Turrialba, Cartago, Costa Rica, 15/III/1994, C. Vargas. Holotype deposited at NMCR; 19 paratypes are deposited at USNM; three paratypes deposited at CIPROC; two paratypes deposited at CNC; one paratype deposited at DZSJRP; two paratypes deposited at TNHM.

Etymology

The species is named in honour of the ALAS team, for supporting the research and results presented herein.

Daidalotarsonemus azofeifai sp. n. Ochoa, Rezende & Lofego

<http://zoobank.org/urn:lsid:zoobank.org:act:68A4BFF6-8682-401D-B11E-743BED6E7AE7>
(Figures 5–11)

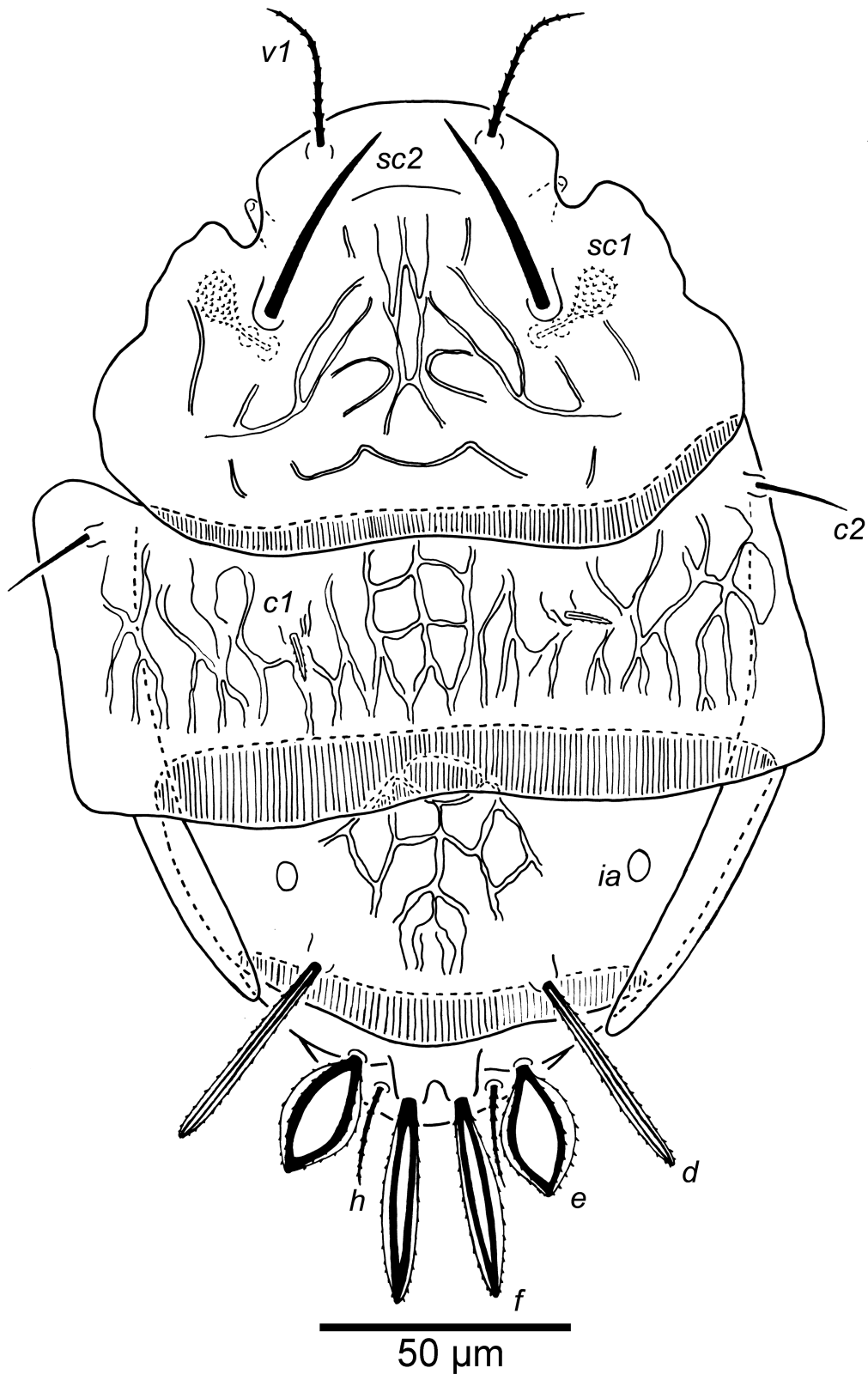


Figure 5. *Daidalotarsonemus azoifei* sp. n. (female). Dorsal surface.

Diagnosis

Females of this new species are most similar to *Daidalotarsonemus cornutus* Lin, Chen & Zhang (1998) for the shape of ornamentation on the tergite D, limited to

the centre of the tergite and the similar shape of the setae *d*, sejugal apodeme and pharynx. They differ by the ornamentation of tergite C, composed by small reticules which cover the entire plate in *D. cornutus* as opposed to having

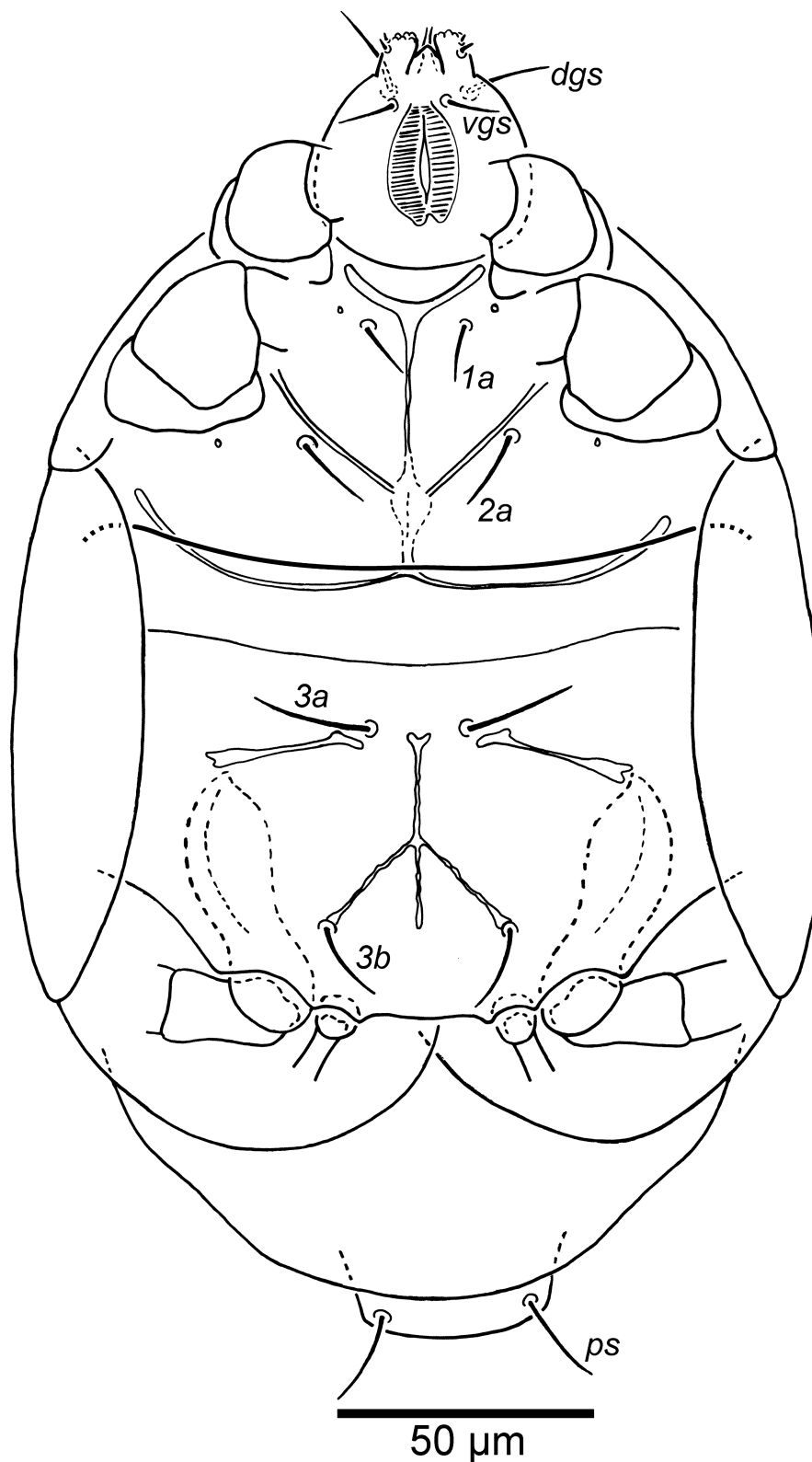


Figure 6. *Daidalotarsonemus azoifeiai* sp. n. (female). Ventral surface.

two reticulated rows between setae *c1* in the new species and by the elliptical shape of setae *e* which is lanceolate in *D. cornutus*.

Adult female. Seven specimens measured.

Gnathosoma. Subtriangular in ventral view; length 28 (26–31), maximum width 19 (18–21). Setae *dgs* 12 (11–14) and *vgs* 8 smooth; palps moderately long 10 (8–11). Pharynx fusiform, 20 (19–22) long and 12 (11–14) wide at maximum width.

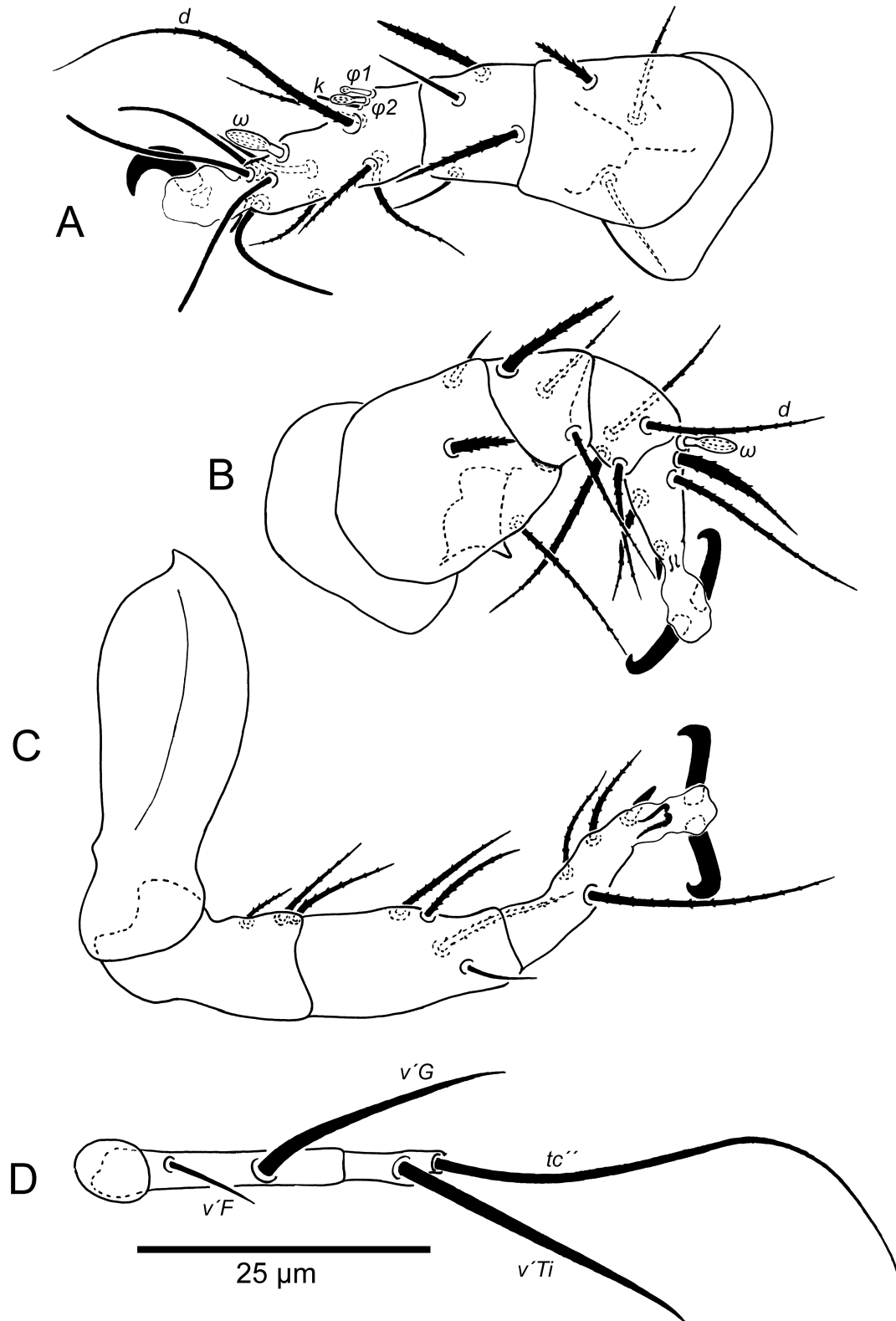


Figure 7. *Daidalotarsonemus azoifeifai* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

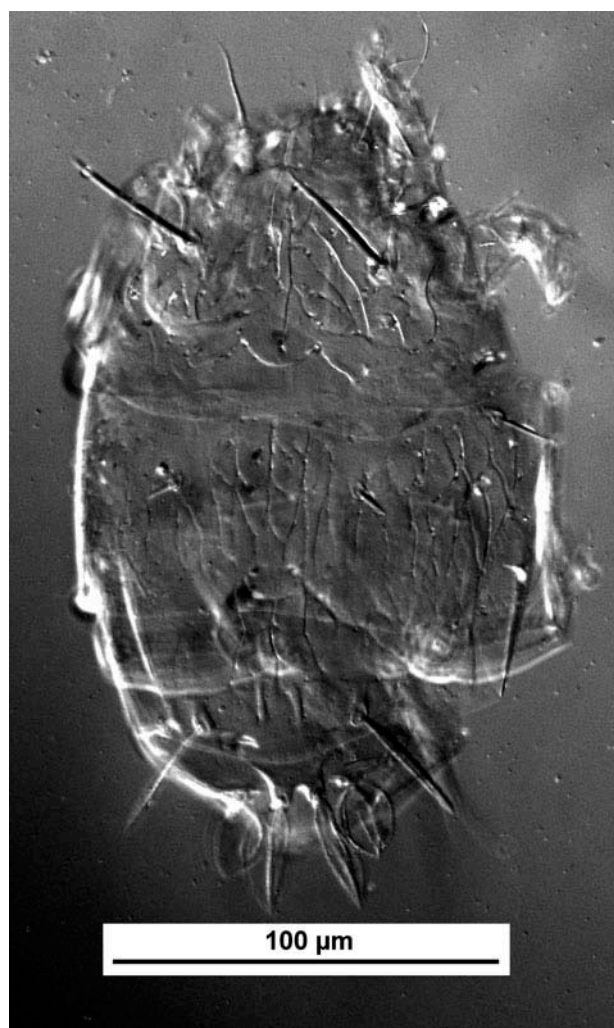


Figure 8. *Daidalotarsonemus azoifeifai* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

Idiosoma – dorsum (Figures 5 and 8). Length 198 (194–205), width at level of *c1* 139 (137–142); prodorsal shield with irregular ornamentation. Stigma located near the lateral notch of prodorsal shield, which is equidistant to the *v1* and *sc2* setal bases. Tergite C with two central rows of reticulation and irregular ornamentation laterally; tergite D reticulated between the pits *ia*. Lengths of the setae: *v1* 29 (27–31), *sc1* 18 (17–20), *sc2* 39 (38–41), *c1* 8 (8–9), *c2* 17 (15–18), *d* 37 (35–38), *e* 20 (19–22), *f* 36 (34–37) and *h* 18 (17–19). Maximum width of expanded setae: *d* 3, *e* 13 (12–15) and *f* 7 (6–8). All dorsal setae serrate; except *sc2* and *c2* smooth. Bothridial setae *sc1* capitate, with tiny spines. Setae *v1*, *c2* and *h* setiform; *sc2* falcate; *c1* linear with a central serrate vein, *d* linear elongated with two veins, *e* elliptical with two serrate veins, *f* lanceolate with two veins. All setae inserted on tubercles, except for *sc1*, *e* and *h*. Distances between dorsal setae: *v1*–*v1* 32 (30–33), *sc2*–*sc2* 52 (51–53), *v1*–*sc2* 32 (31–34), *c1*–*c1* 53 (52–54), *c2*–*c2* 119 (118–122), *c1*–*c2* 44 (43–46), *d*–*d* 43 (42–45), *f*–*f* 10 (9–11), *e*–*f* 12 (11–14) and *h*–*h* 20 (20). Seta *sc2* inserted anteriorly to *sc1*.

Idiosoma – venter (Figure 6). Setae *1a* 7 (7–8); *2a* 12 (11–13); *3a* 18 (17–20) near anteriomedial margins of apodemes 3; *3b* 12 (11–13) on the posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 long and fused to the prosternal apodeme. Prosternal apodeme conspicuous from junction with apodeme 1 to the proximal end of the apodeme 2, and inconspicuous from this point to the sejugal apodeme. Sejugal apodeme uninterrupted, with a median furrow. Apodeme 3 with a constriction near the anterior end, extending diagonally from proximity of base of seta *3a* to anterior margin of trochanter III; apodeme 4 extending diagonally from the middle of poststernal apodeme to base of seta *3b*. Poststernal apodeme bifurcated anteriorly. Tegula wide 24 (23–26) and very short 4 (4–6); posterior margin slightly arched. Setae *ps* 14 (13–15) smooth.

Legs (Figure 7). Lengths (measured from femur to tarsus): leg I 59 (58–62), leg II 51 (50–52), leg III 86 (84–87). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3–4–5(2)+7(1), leg II: 3–3–4–4(1), leg III: 1 + 2–4–4. Tarsal solenidion ω of tibiotarsus I 6, stout, wider medially. Sensory cluster of tibia I complete: solenidion $\phi 1$ 3, slender, capitate; solenidion $\phi 2$ 4, robust, slightly capitate; famulus *k* 6 (5–6); all inserted at approximately the same level. Seta *d* of tibia I 29 (28–30), serrate. Solenidion ω of tarsus II proximally inserted, 6 long, stout, wider medially. Seta *d* of tibia II 19 (18–20), serrate. Femorogenu IV 16 (15–18); tibiotarsus IV 9 (8–11). Length of leg IV setae: *v'* F 13 (12–14), *v'* G 22 (21–25), *v'* Ti 28 (28–29) and *tc''* 58 (57–60); all setae smooth; *v'* Ti falcate.

Adult male. Four specimens measured.

Gnathosoma. Subtriangular in ventral view; length 28 (26–29), maximum width 27 (26–28). Setae *dgs* 11 (10–12) and *vgs* 8 smooth; Palps moderately long 8 (8–9). Pharynx fusiform, 16 (15–17) long and 8 wide at widest region.

Idiosoma – dorsum (Figure 9). Length 168 (166–170), maximum width 104 (103–105). Prodorsal shield trapezoidal. Length of dorsal setae: *v1* 25 (24–27), *v2* 20 (19–21), *sc1* 50 (49–52), *sc2* 25 (24–27), *c1* 28, *c2* 27 (25–28), *d* 36 (34–37), *f* 24 (23–26). All setae setiform and serrate. Distances between dorsal setae: *v1*–*v1* 13 (12–14), *sc1*–*sc1* 34 (32–35), *sc2*–*sc2* 44 (43–46), *v1*–*sc2* 28 (25–30), *c1*–*c1* 92 (89–93), *c2*–*c2* 91 (89–92), *c1*–*c2* 46 (45–47), *d*–*d* 52 (50–55), *f*–*f* 18 (17–20). Seta *sc2* laterad and slightly posterior to *sc1*; seta *c1* closer to *d* than to *c2*, anterolateral to the latter.

Idiosoma – venter (Figure 10). Setae *1a* 4 posteriad of apodemes 1; setae *2a* 9 (8–11) located in the centre of coxisternal plates II; setae *3a* 15 (14–17) located near anterior end of apodemes 3 and setae *3b* 12 (10–13) located posteromedial margins of apodemes 4. Apodeme

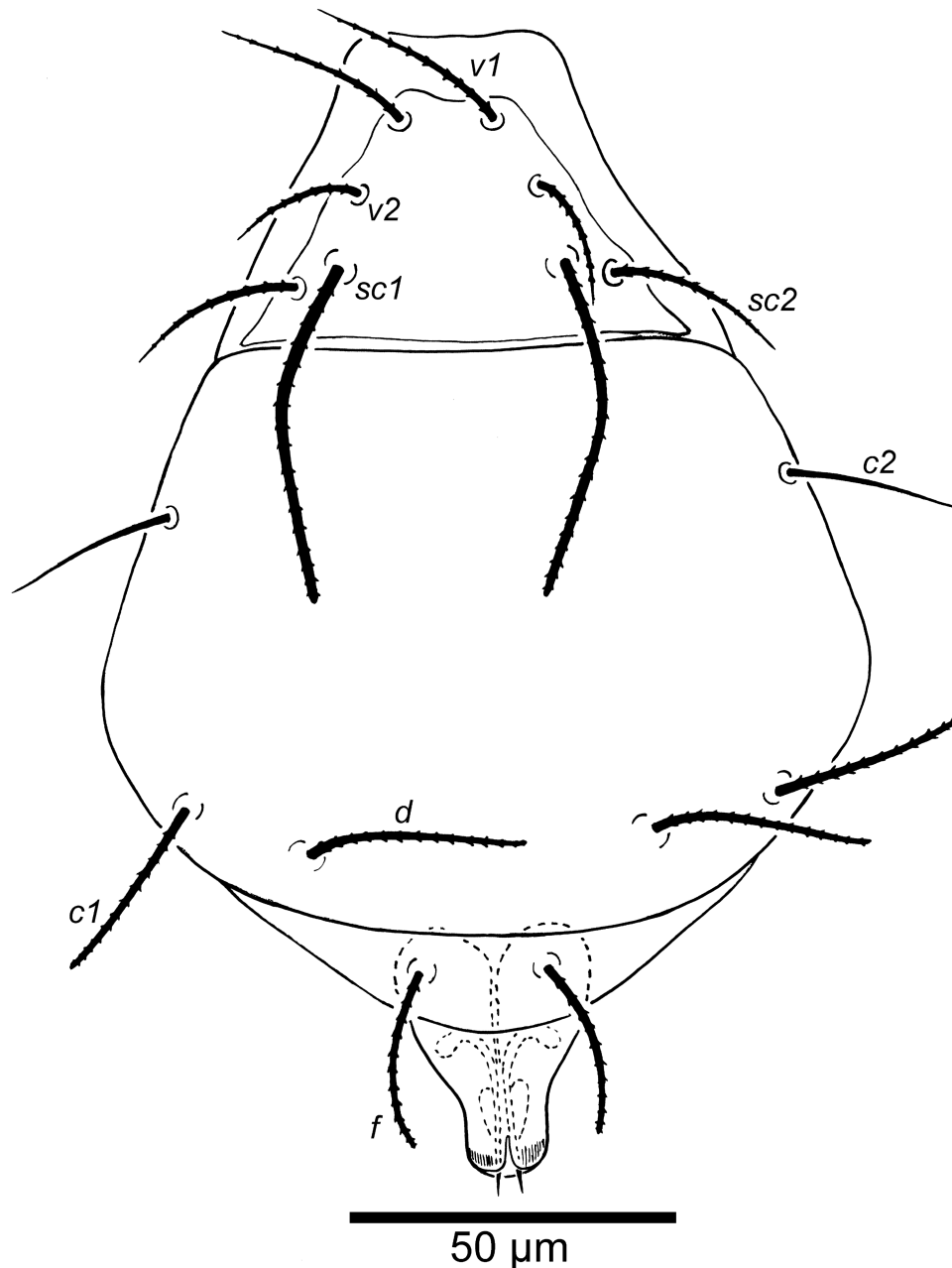


Figure 9. *Daidalotarsonemus azoifeifai* sp. n. (male). Dorsal surface.

1 fused to the anterior end of prosternal apodeme; apodeme 2 not fused to prosternal apodeme. Prosternal apodeme conspicuous between coxisternal plates I but inconspicuous between coxisternal plates II, extending close to sejugal apodeme. Sejugal apodeme conspicuous. Lines of fusion between coxae III and IV with venter of idiosoma mostly conspicuous; connecting between 3, 4 and poststernal apodemes diffuse.

Legs (Figure 11). Lengths (measured from femur to tarsus): leg I 63 (62–65), leg II 59 (57–62), leg III 82 (79–83), leg IV 93 (91–95). Number of the setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3-4-5(2)+7(1), leg II: 3-3-3-5(1), leg III: 1-3-4-3.

Solenidion ω of tarsus I 5, stout, wider medially. Sensory cluster of tibia I composed of $\phi 1$ 3, $\phi 2$ 4 (4–5) and famulus k 4, both inserted at approximately same level. Seta d of tibia I 27 (26–29), serrate. Solenidion ω of tarsus II proximally inserted 5 long, stout, wider medially. Seta d of tibia II 20 (19–22), serrate. Trochanter IV slightly wider than long, seta v' 4, smooth. Femorogenu IV 50 (47–52) long and 21 (18–23) wide at v' F level; anterior margin convex, posterior margin slightly convex at proximal third. Seta v' F 4 (4–5), smooth. Setae v' G 17 (16–18) and l'' G 13 (12–15), smooth. Tibia IV 24 (22–26) long; solenidion ϕ 8 (7–9); seta v' Ti 55 (53–58), serrate. Tarsus IV short, bearing three smooth setae of the following length: tc'' 6, pv'' 6 (6–7) and u' 5 (5–6). Claw well developed.

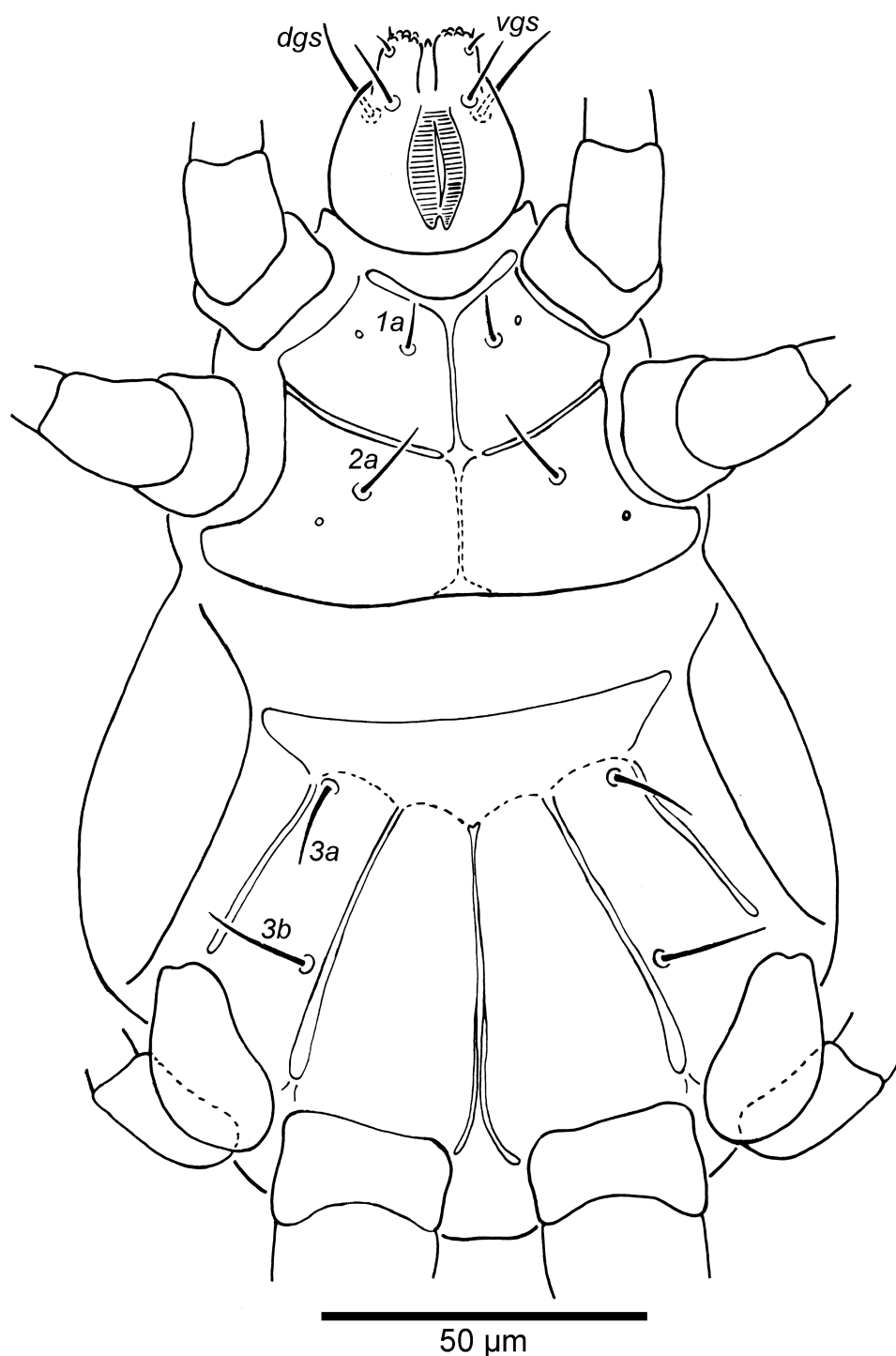


Figure 10. *Daidalotarsonemus azoifeifui* sp. n. (male). Ventral surface.

Type material

Holotype female, 28 paratype females and seven paratype males. Holotype female, 17 paratype females and seven paratype males from a palm (Arecaceae), 10°26'N 84°1' W, La Selva Biological Station, Heredia, Costa Rica, 16/V/1994, ALAS; one paratype female from a Burseraceae species, 17/V/1994, other collection data as holotype; three paratype females from a Caesalpinaceae species,

17/V/1994, other collection data as holotype; two paratype females from a Ochnaceae species, 17/V/1994, other collection data as holotype; one paratype female from *Cyathea* sp. (Cyatheaceae), 22/V/1994, other collection data as holotype; one paratype female from *Guarea guianensis* (L.) Sleumer (Meliaceae), 05/VI/1995, other collection data as holotype; one paratype female from *Pentaclethra maculosa* (Willd.) Kuntze (Fabaceae), 05/

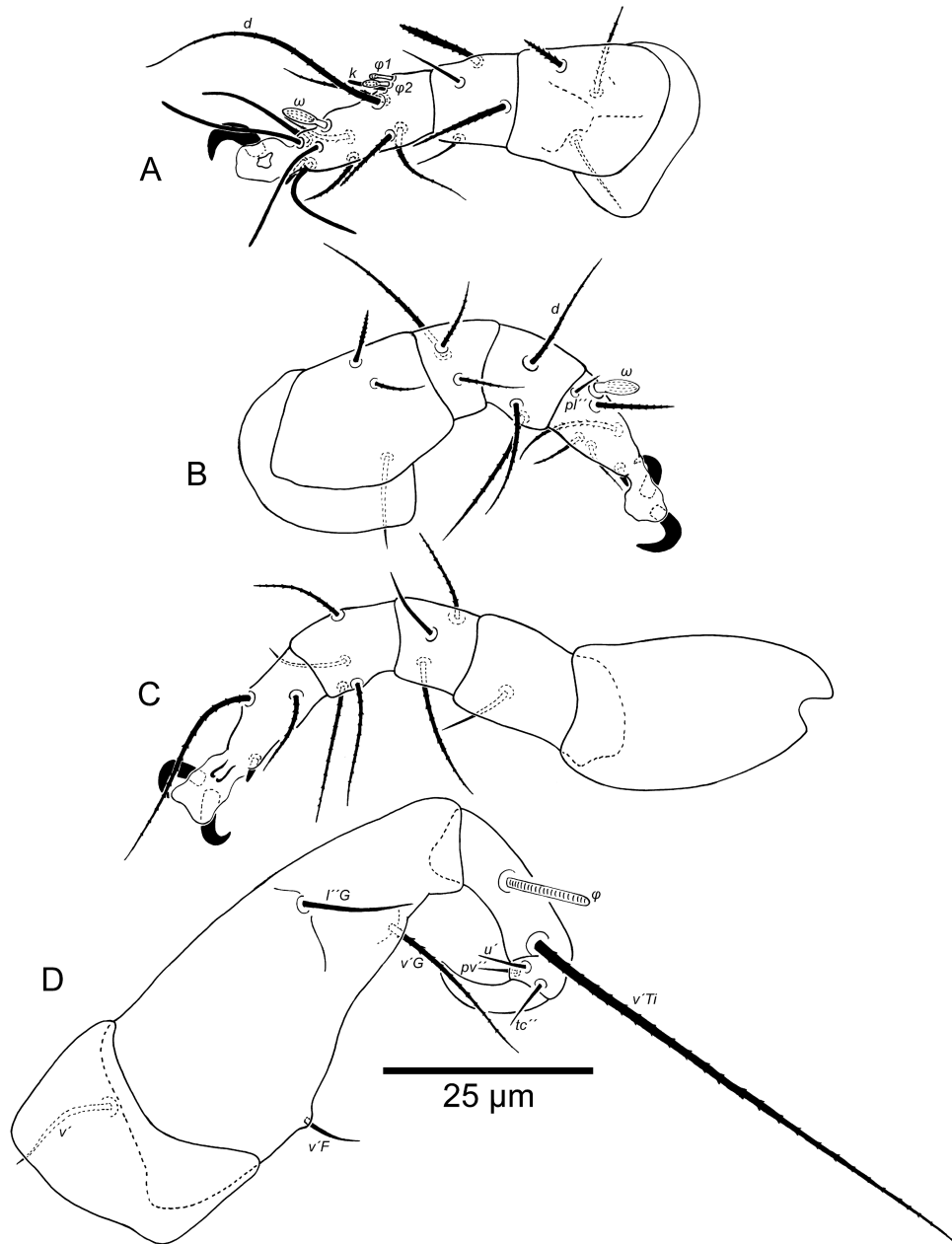


Figure 11. *Daidalotarsonemus azofeifai* sp. n. (male). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

VI/1995, other collection data as holotype; one paratype female from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 12/VI/1995, other collection data as holotype. Holotype deposited at NMCR; 17 paratype females and two paratype males deposited at USNM; two paratype females and one paratype male deposited at CIPROC; two paratype females and one paratype male deposited at CNC; two paratype females and one paratype male deposited at DZSJRP; one paratype female deposited at FAAS; one paratype female and one paratype male deposited at FSAC; one paratype female and one paratype male deposited at QM; two paratype females deposited at TNHM.

Etymology

The species is in honour of Mr Justo Azofeifa, chief technician for almost 30 years of the Laboratory of Acarology and Nematology, Escuela de Agronomía, Universidad de Costa Rica, for his dedication, support and advice to the study of mites in Costa Rica.

Daidalotarsonemus bauchani sp. n. Rezende, Ochoa & Lofego

<http://zoobank.org/urn:lsid:zoobank.org:act:0BDFB310-8B19-4142-B2D8-D91176F7B679>
(Figures 12–15)

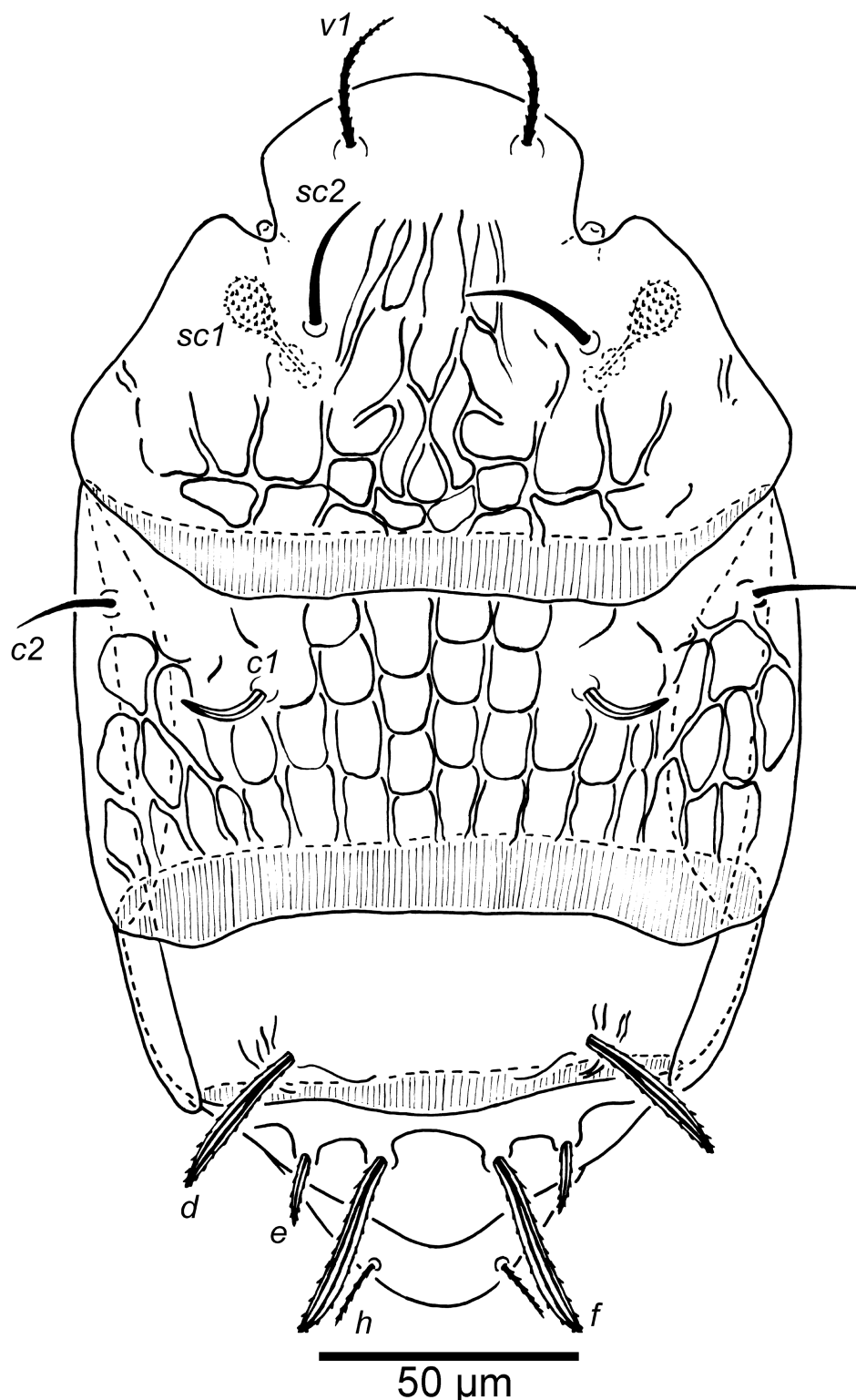


Figure 12. *Daidalotarsonemus bauchani* sp. n. (female). Dorsal surface.

Diagnosis

Females of this new species are most similar to *D. venustus* Attiah (1970) by the reticulated ornamentation on the prodorsal shield and tergite C and by the similar length of the dorsal setae *v1* and *sc2*. However, they differ by the ornamentation of tergite D, which is absent in this new

species and not fully ornamented as in *D. venustus*. They also differ by the shape of setae *e*, which is subulate in this new species and obovate as in *D. venustus* and by the shape of the setae *pl'''* on tarsus II.

Adult female. Three specimens measured.

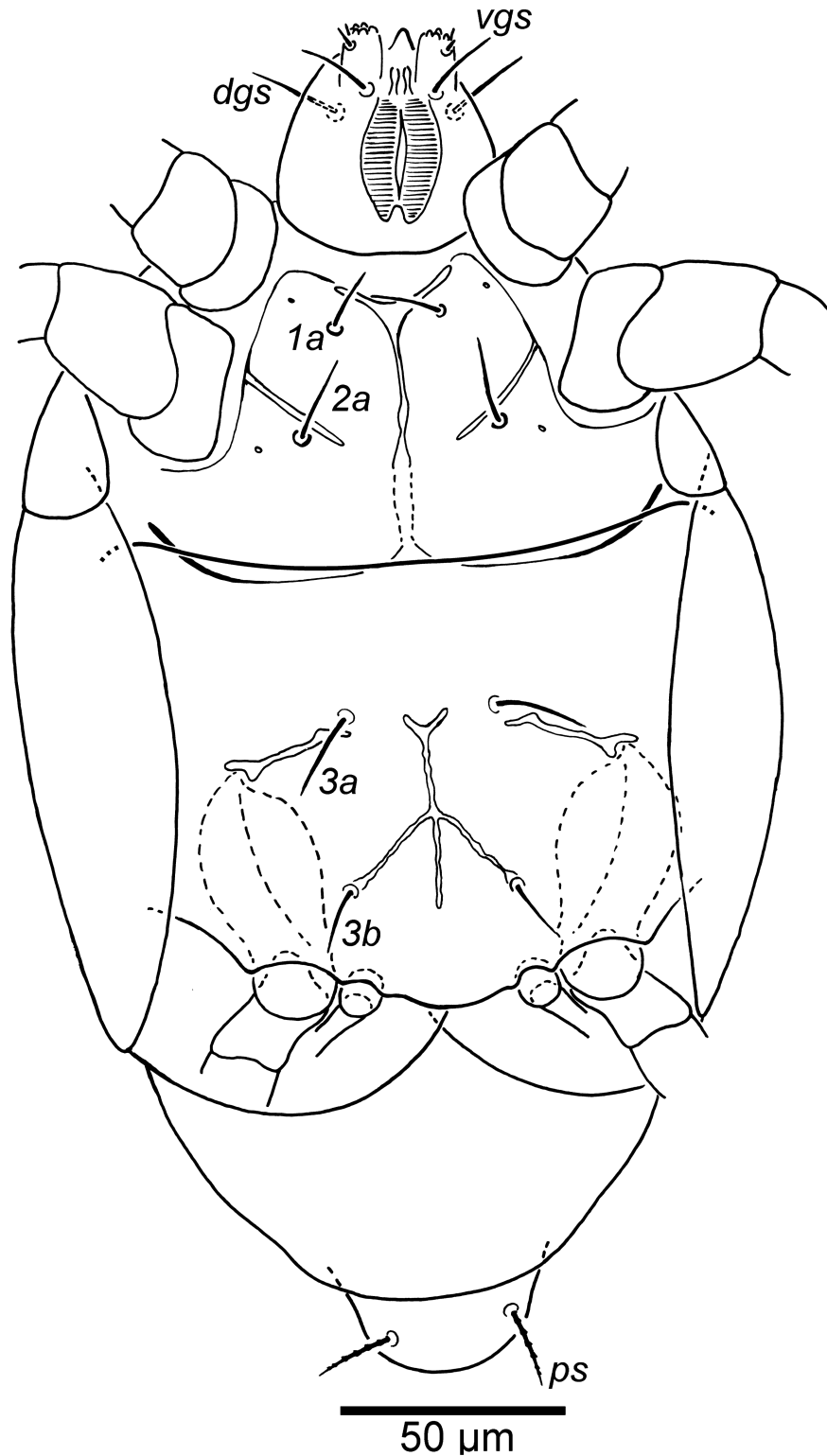


Figure 13. *Daidalotarsonemus bauchani* sp. n. (female). Ventral surface.

Gnathosoma. Subtriangular in ventral view; length 38 (36–39), maximum width 35 (33–36). Setae *dgs* 15 (14–16) and *vgs* 8 (7–9) smooth; palps moderately long 13 (12–13). Pharynx fusiform, 22 (21–23) long and 13 wide at maximum width.

Idiosoma – dorsum (Figures 12 and 15). Length 222 (220–225), width at level of *c1* 121 (118–126); prodorsal shield with irregular ornamentation. Stigma located near the lateral notch of prodorsal shield, which is equidistant to the *vl* and *sc2* setal bases. Tergite C with a reticulate ornamentation

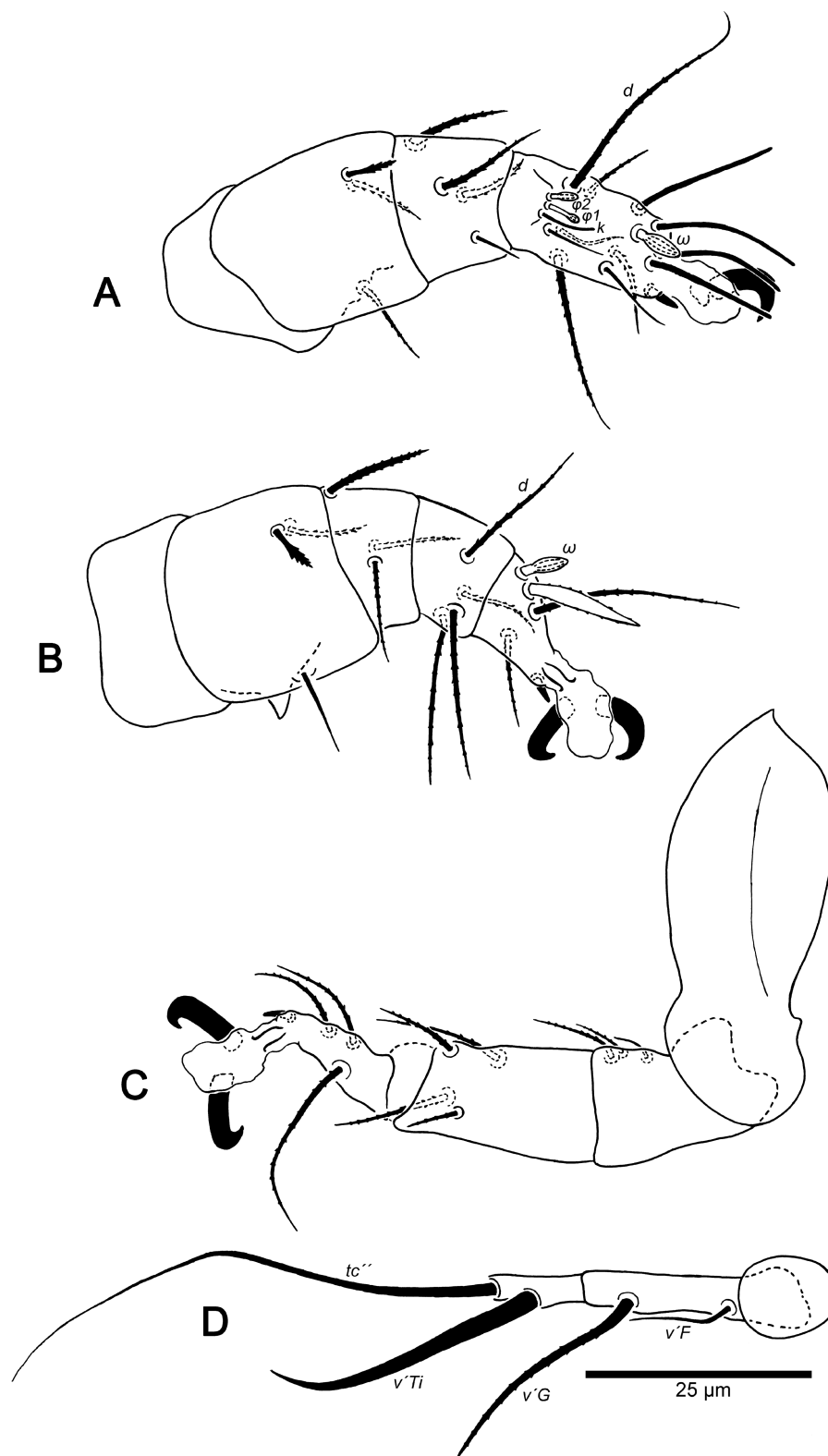


Figure 14. *Daidalotarsonemus bauchani* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

pattern covering all the tergite; tergite D with lateral ridges near setae *d*. Lengths of the setae: *v1* 26 (25–27), *sc1* 22 (20–24), *sc2* 25 (23–26), *c1* 15 (13–17), *c2* 17 (16–18), *d* 29 (28–30), *e* 13 (11–14), *f* 31 (29–33) and *h* 8 (7–9). Maximum

width of expanded setae: *d* 4, *e* 3 and *f* 5. All dorsal setae serrate; except for *sc2*, *c1* and *c2* smooth. Bothridial setae *sc1* capitate, with tiny spines. Setae *v1*, *c1*, *c2* and *h* setiform; setae *sc2* falcate. Setae *d*, *e* and *f* inserted on tubercles; setae

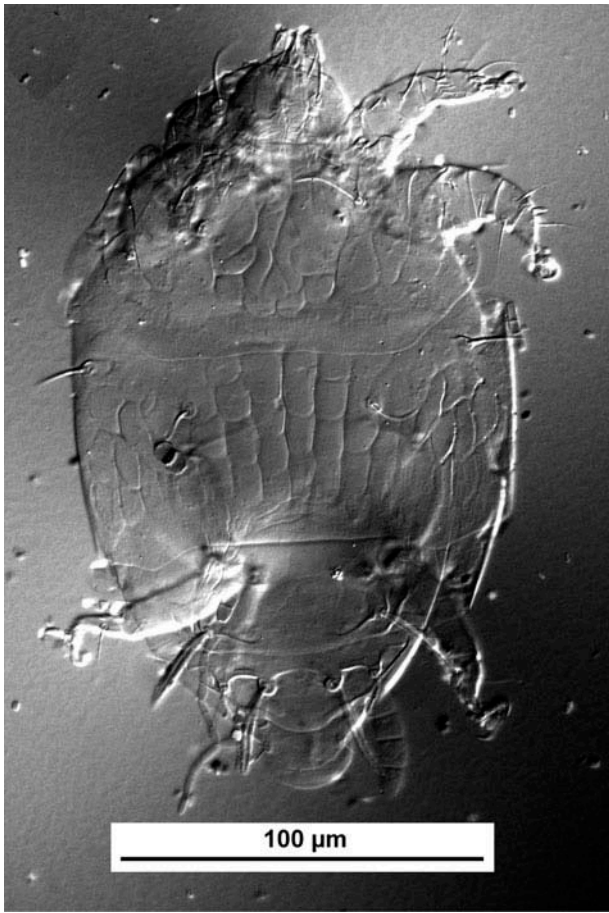


Figure 15. *Daidalotarsonemus bauchani* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

d and *f* linear, both with a central serrate vein; setae *e* subulate, with a serrate vein. Distances between dorsal setae: *v1-v1* 29 (27–30), *sc2-sc2* 57 (55–58), *v1-sc2* 34 (33–35), *c1-c1* 57 (56–58), *c2-c2* 114 (112–115), *c1-c2* 34 (33–36), *d-d* 55 (53–56), *f-f* 22 (20–23), *e-f* 13 (11–14) and *h-h* 23 (21–24). Seta *sc2* inserted anteriorly to *sc1*. Dorsal cupules not easily seen.

Idiosoma – venter (Figure 13). Setae *1a* 6 (5–8); *2a* 13 (12–14); *3a* 14 (12–15) near anteriomedial margins of apodemes 3; *3b* 9 (8–10) on posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 short and not fused to prosternal apodeme. Prosternal apodeme conspicuous from junction with apodeme 1 to the proximal end of the apodeme 2, and diffuse from this point to the sejugal apodeme. Sejugal apodeme uninterrupted, with a median furrow. Apodeme 3 with a constriction near the anterior end, extending diagonally from proximity of base of seta *3a* to anterior margin of trochanter III; apodeme 4 extending diagonally from the middle of the poststernal apodeme to base of seta *3b*. Poststernal apodeme bifurcated anteriorly. Tegula

wide 25 (23–26) and very short 4 (4); posterior margin slightly arched. Setae *ps* 11 (9–12) serrate.

Legs (Figure 14). Lengths (femur to tarsus): leg I 63 (61–64), leg II 70 (68–72), leg III 84 (82–85). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3-4-5(2)-7(1), leg II: 3-3-4-4(1), leg III: 1 + 2-4-4. Tarsal solenidium ω of tibiotarsus I 6 (5–7), stout, wider medially. Sensory cluster of tibia I: complete, solenidium $\phi 1$ 3 (3–4), slender, capitate; solenidium $\phi 2$ 4, robust, slightly capitate; famulus *k* 6 (5–6); all inserted at approximately the same level. Seta *d* of tibia I 28 (27–30), serrate. Solenidium ω of tarsus II proximal, 5 long, stout, wider medially. Seta *d* of tibia II 19 (17–20), serrate. Femorogenu IV 15 (13–16); tibiotarsus IV 9 (8–11). Length of leg IV setae: *v' F* 9 (8–10), *v' G* 24 (23–25), *v' Ti* 30 (29–31) and *tc''* 57 (55–58); setae *v' G* serrate; setae *v' Ti* and *tc''* smooth; *v' Ti* falcate.

Adult male. Unknown.

Type material

Holotype female and two paratype females. Holotype female from *Goethalsia meiantha* (Donn. Sm.) Burret (Malvaceae), two paratypes from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 10°26'N 84°1'W, La Selva Biological Station, Heredia, Costa Rica, 06/VI/1995, ALAS. Holotype deposited at NMCR; two paratypes deposited at USNM.

Etymology

The species is in honour of Dr Gary Bauchan (Electron and Confocal Microscopy Unit, United States Department of Agriculture, Agricultural Research Service, USA) for his contributions to the study of mites.

Daidalotarsonemus cuadradius sp. n. Ochoa, Rezende & Lofego

<http://zoobank.org/urn:lsid:zoobank.org:act:7423B25E-49E5-4B57-A429-E1A06C576D5E>
(Figures 16–19)

Diagnosis

Females are most similar to *D. euonymus* Yang, Ding & Zhou (1987) and *D. somalatus* Attiah (1970) for shape of the dorsal posterior setae *d*, *e* and *f*. *Daidalotarsonemus cuadradius* sp. n. is also similar with *D. somalatus* by the presence of the setae *l'' G* on femorogenu III. However, the new species is distinct from those species by the combination of the following characters: setae *sc2* with a serrate central vein; linear shape of setae *c1*; shape of ornamentation on tergite D, composed by waved continuous ridges between setae *d*; and by the oblong asymmetric shape of setae *e*.

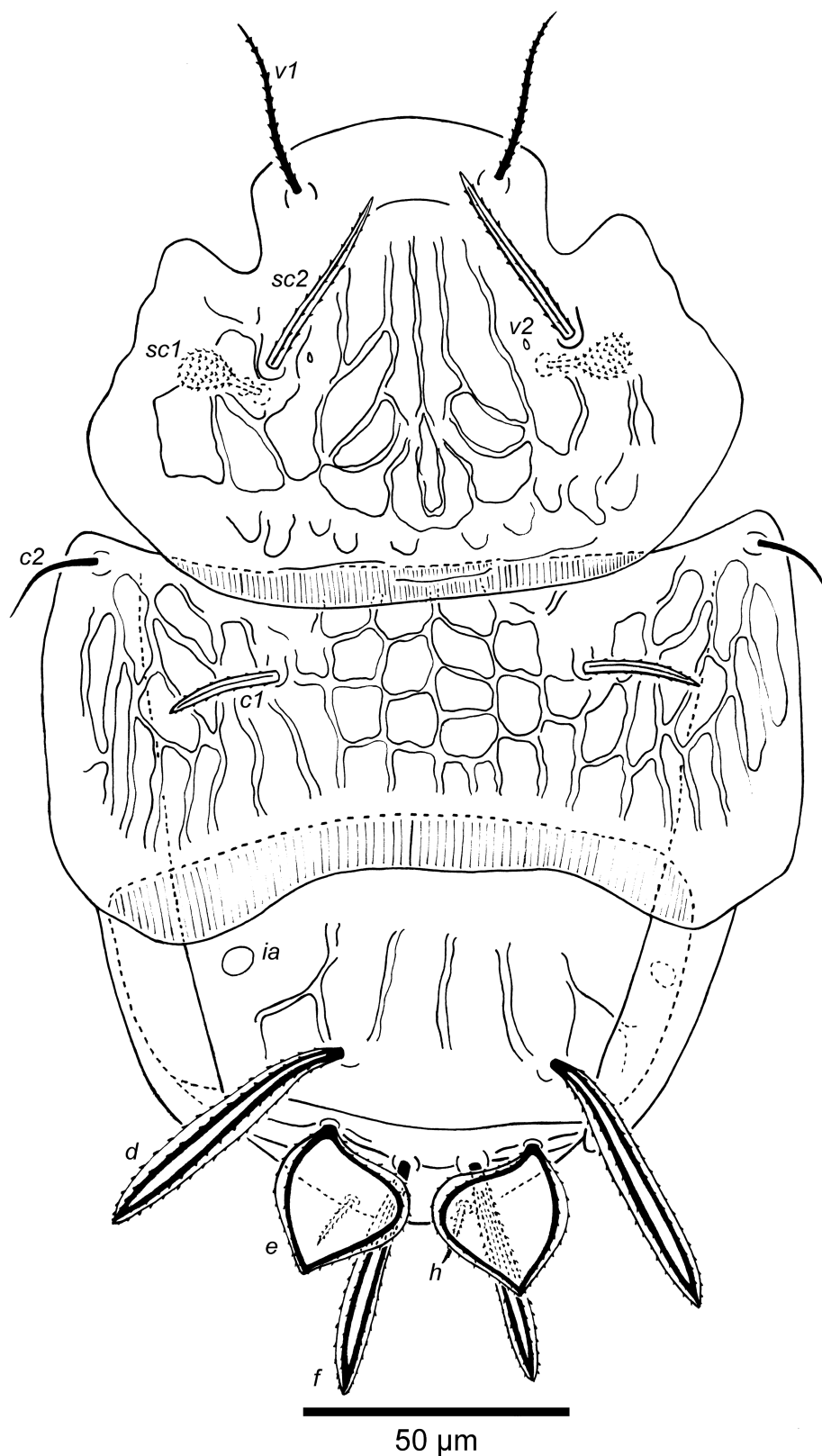


Figure 16. *Daidalotarsonemus cuadratus* sp. n. (female). Dorsal surface.

Adult female. Four specimens measured.

Gnathosoma. Subtriangular in ventral view; length 29 (28–30), maximum width 25 (24–26). Setae *dgs* 12

(11–13) and *vgs* 8 (7–9) smooth; palps moderately short 8. Pharynx fusiform, 15 (13–17) long and 7 (7–8) wide at maximum width.

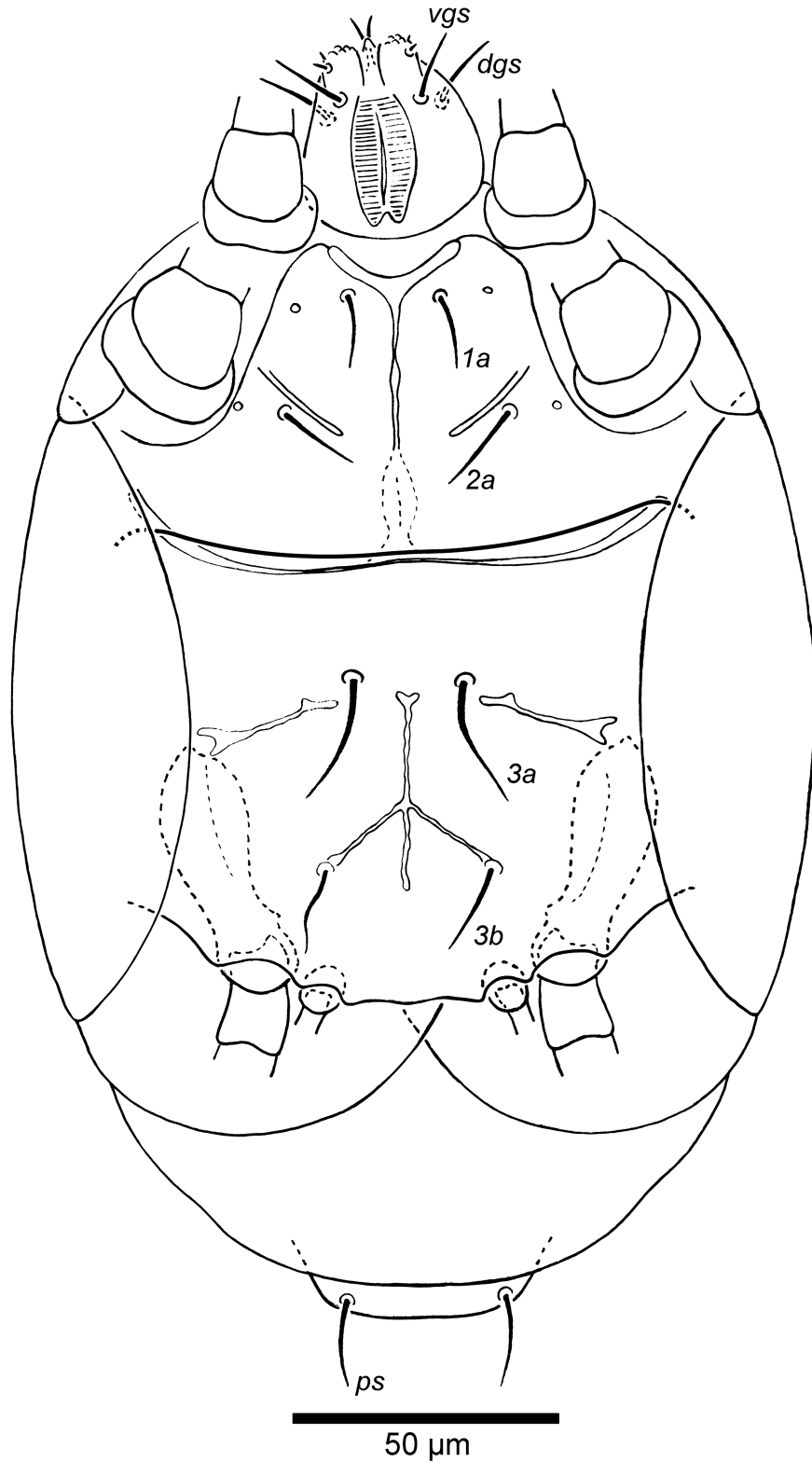


Figure 17. *Daidalotarsonemus cuadratus* sp. n. (female). Ventral surface.

Idiosoma – dorsum (Figures 16 and 19). Length 192 (190–196), width at level of *c1* 122 (120–125); prodorsal shield with irregular ornamentation. Stigma located near lateral notch of prodorsal shield, which is equidistant to the *v1*

and *sc2* setal bases. Tergite C with a reticulate ornamentation pattern covering all the tergite; tergite D with lateral ridges near setae *d*. Lengths of the setae: *v1* 31 (30–32), *sc1* 14 (13–16), *sc2* 36 (35–37), *c1* 21 (20–23), *c2* 17 (16–



Figure 18. *Daidalotarsonemus cuadradius* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

18), *d* 51 (49–52), *e* 28 (27–29), *f* 44 (43–45) and *h* 13 (12–14). Maximum width of expanded setae: *d* 7 (7–8), *e* 26 (26–27) and *f* 6. All dorsal setae serrate, except for *c2* smooth. Bothridial setae *sc1* capitate, with tiny spines. All setae inserted on tubercles, except for *sc1* and *h*. Setae *vl*, *c2* and *h* setiform; setae *sc2* falcate; *c1* linear with a central serrate vein; setae *d* and *f* linear, with two serrate veins; *e* asymmetrically oblong, with two serrate veins. Distances between dorsal setae: *vl*–*vl* 30 (29–31), *sc2*–*sc2* 51 (50–52), *vl*–*sc2* 29 (28–30), *c1*–*c1* 57 (56–59), *c2*–*c2* 115 (114–116), *c1*–*c2* 37 (36–39), *d*–*d* 37 (36–38), *f*–*f* 12

(11–14), *e*–*f* 15 (14–17) and *h*–*h* 16 (15–17). Seta *sc2* inserted anteriorly to *sc1*.

Idiosoma – *venter* (Figure 17). Setae *1a* 7 (7–8); *2a* 12 (11–14); *3a* 19 (18–21) near anteriomedial margins of apodeme 3; *3b* 9 (8–10) on posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 short and not fused to the prosternal apodeme. Prosternal apodeme conspicuous from junction with apodeme 1 to the proximal end of the apodeme 2 and diffuse from this point to the sejugal

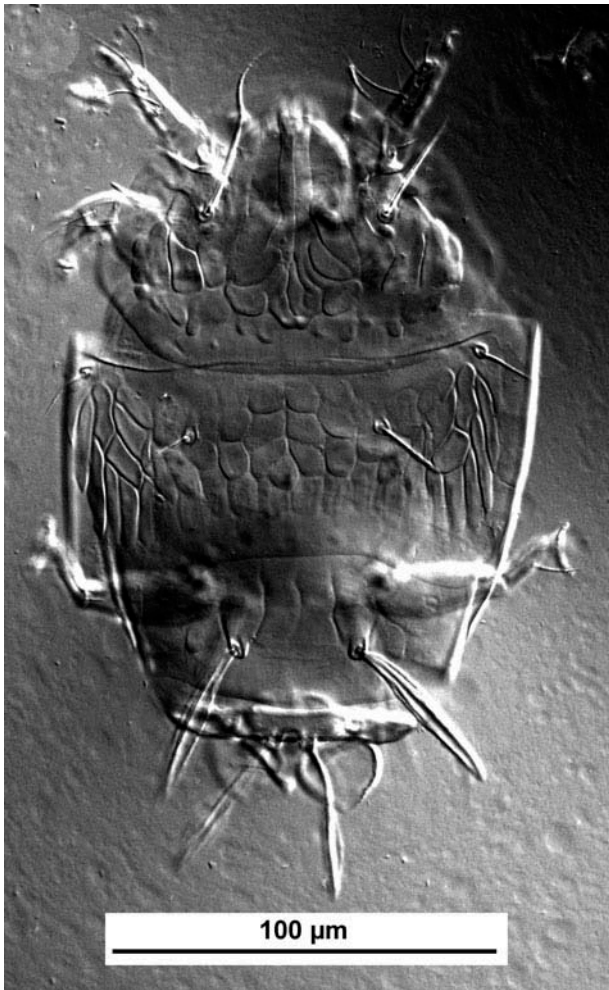


Figure 19. *Daidalotarsonemus cuadradius* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

apodeme. Sejugal apodeme uninterrupted, with a single median furrow. Apodeme 3 with a constriction near the anterior end, extending diagonally from proximity of base of seta *3a* to anterior margin of trochanter III; apodeme 4 extending diagonally from the middle of the poststernal apodeme to base of seta *3b*. Poststernal apodeme bifurcated anteriorly. Tegula wide 25 (23–26) and very short 4; posterior margin slightly arched. Setae *ps* 14 (13–15) smooth.

Legs (Figure 18). Lengths (measured from femur to tarsus): leg I 58 (57–60), leg II 56 (55–57), leg III 86 (85–87). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3–4–5(2)+7(1), leg II: 3–4–4–4(1), leg III: 1 + 3–4–4. Tarsal solenidion ω of tibiotarsus I 6, stout, wider medially. Sensory cluster of tibia I: complete, solenidion $\phi 1$ 3, slender, capitate; solenidion $\phi 2$ 4, robust, slightly capitate; famulus *k* 6; all inserted at approximately the same level. Seta *d* of tibia I 41 (40–43), serrate. Solenidion ω of tarsus II proximally inserted, 5 long, stout, wider medially. Seta *d* of tibia II 19

(18–20), serrate. Presence of the setae *l''* G on femorogenu III. Femorogenu IV 13 (11–15); tibiotarsus IV 9 (9–10). Length of leg IV setae: *v'* F 6 (6–7), *v'* G 13 (12–15), *v'* Ti 29 (27–30) and *tc''* 37 (36–39); setae *v''* F, *v''* G and *v''* Ti smooth; seta *v''* Ti falcate; seta *tc''* serrate.

Adult male. Unknown.

Type material

Holotype female and three paratype females. Holotype female from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 10°26'N 84°1'W, La Selva Biological Station, Heredia, Costa Rica, 08/VI/1995, ALAS. Two paratype females, 05/VI/1995, other collection data as holotype; one paratype female from a Melastomataceae species, 16/V/1994, other collection data as holotype. Holotype deposited at NMCR; three paratypes deposited at USNM.

Etymology

The species name *cuadradius* refers to the subquadrate reticulation between setae *c1* which is present in this species.

Daidalotarsonemus ginae sp. n. Ochoa, Rezende & Lofego

<http://zoobank.org/urn:lsid:zoobank.org:act:B0563EC2-CA9F-4A89-A6B4-75D31F1BD38B>
(Figures 20–23)

Diagnosis

Females of this new species are unique among *Daidalotarsonemus* for the length ($\pm 46 \mu\text{m}$) and linear aspect of the setae *c1*; by the length of the setae *sc2* ($\pm 55 \mu\text{m}$); by the aspect of the ornamentation on the tergites C and D, which most of the reticulation is concentrated between the setae *c1* and *d*, respectively; by the tubercle-shaped insertion of the setae *1a* and *2a* and by the irregular shape of the apodeme 2.

Adult female. Eight specimens measured.

Gnathosoma. Subtriangular in ventral view; length 25 (23–27), maximum width 24 (22–25). Setae *dgs* 7 (7–8) and *vgs* 11 (11–12) smooth; palps moderately long 8 (8–10). Pharynx fusiform, 14 (12–15) long and 6 (6–7) wide at maximum width.

Idiosoma – dorsum (Figures 20 and 23). Length 200 (194–208), width at level of *c1* 123 (118–127); prodorsal shield with irregular ornamentation. Stigma located near lateral notch of prodorsal shield, which is equidistant to the *v1* and *sc2* setal bases. Tergite C ornamented with four rows of reticles between setae *c1* and irregular ornamentation laterally; tergite D with two large reticles between setae *d*.

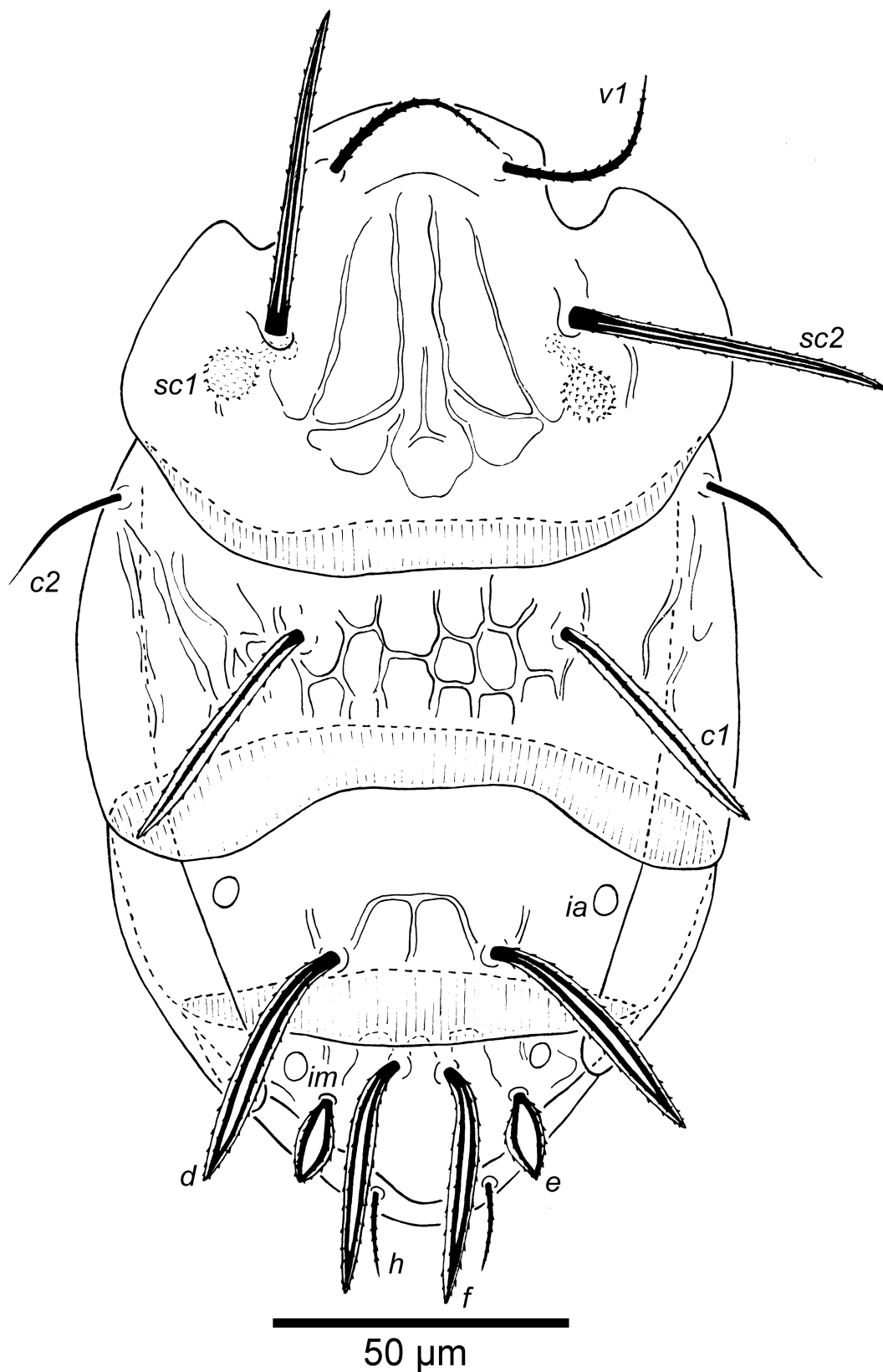


Figure 20. *Daidalotarsonemus ginae* sp. n. (female). Dorsal surface.

Lengths of the setae: *v1* 31 (29–32), *sc1* 13 (12–15), *sc2* 55 (53–56), *c1* 46 (44–48), *c2* 22 (21–24), *d* 45 (43–46), *e* 13 (11–15), *f* 41 (38–43) and *h* 11 (10–13). Maximum

width of expanded setae: *d* 5, *e* 8 and *f* 4. All dorsal setae serrate, except for *c2*. Bothridial setae *sc1* capitate, with tiny spines. Setae *v1*, *c2* and *h* setiform. Setae *sc2* falcate,

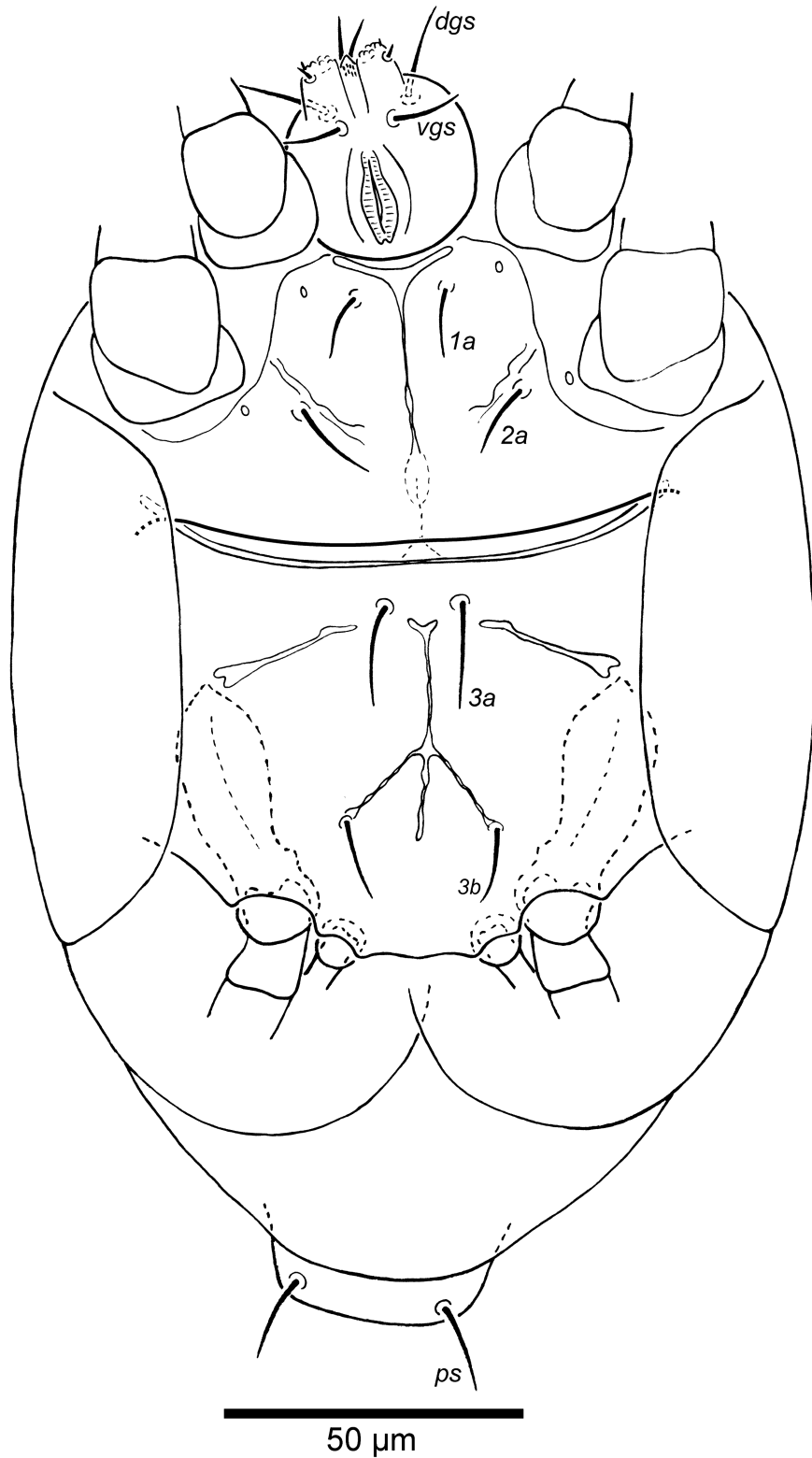


Figure 21. *Daidalotarsonemus ginae* sp. n. (female). Ventral surface.

with two serrate veins. Setae *c1* linear, with a serrate vein. Setae *e* elliptical with two serrate veins. Setae *d* and *f* linear with two serrate veins. All setae inserted on tubercles, except for *sc1* and *h*. Distances between dorsal setae:

v1-v1 27 (26–29), *sc2-sc2* 50 (48–52), *v1-sc2* 28 (27–30), *c1-c1* 47 (46–49), *c2-c2* 106 (103–108), *c1-c2* 41 (39–43), *d-d* 29 (28–31), *f-f* 8 (7–9), *e-f* 14 (13–16) and *h-h* 22 (20–25). Seta *sc2* inserted anteriorly to *sc1*.

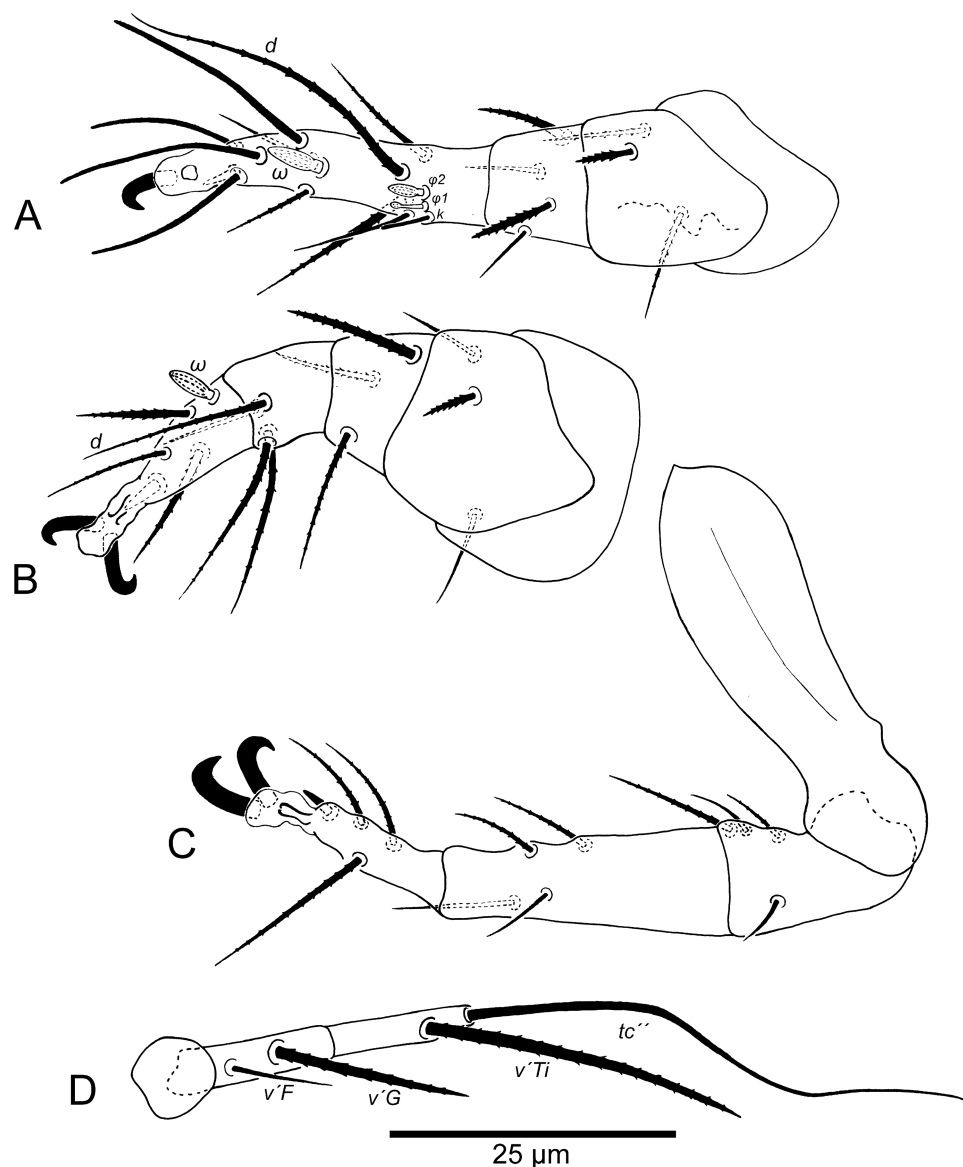


Figure 22. *Daidalotarsonemus ginae* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

Idiosoma – venter (Figure 21). Setae *1a* 7 (7–8); *2a* 12 (11–13); *3a* 15 (13–16) near anteriomedial margins of apodemes 3; *3b* 9 (9–10) on posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 short and not fused to the prosternal apodeme. Prosternal apodeme conspicuous from junction with apodeme 1 to the proximal end of the apodeme 2 and diffuse from this point to the sejugal apodeme. Sejugal apodeme uninterrupted. Apodeme 3 with a constriction near the anterior end, extending diagonally from proximity of base of seta *3a* to anterior margin of trochanter III; apodeme 4 extending diagonally from the middle of the poststernal apodeme to base of seta *3b*. Poststernal apodeme bifurcated anteriorly. Tegula wide 16 (15–17) and short 4 (4–5); posterior margin slightly arched. Setae *ps* 8 (7–10) smooth.

Legs (Figure 22). Lengths (measured from femur to tarsus): leg I 57 (55–59), leg II 58 (57–61), leg III 94 (92–97). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3–4–5(2)+7(1), leg II: 3–4–4–4(1), leg III: 1 + 3–4–4. Tarsal solenidium ω of tibiotarsus I 5, stout, wider medially. Sensory cluster of tibia I: complete, solenidium $\phi 1$ 3, slender, capitate; solenidium $\phi 2$ 4, robust, slightly capitate; famulus *k* 6 (6–7); all inserted at approximately the same level. Seta *d* of tibia I 27 (26–29), serrate. Solenidium ω of tarsus II proximally inserted, 5 long, stout, wider medially. Seta *d* of tibia II 58 (56–60), serrate. Presence of the setae *l'' G* on femorogenu III. Femorogenu IV 11 (10–12); tibiotarsus IV 14 (13–16). Length of leg IV setae: *v' F* 7 (7–8), *v' G* 9 (9–10), *v' Ti* 30 (28–32) and *tc''* 38 (36–41); setae *v' F* and *tc''* smooth; seta *v' G* and *v' Ti* serrate; *v' Ti* falcate.

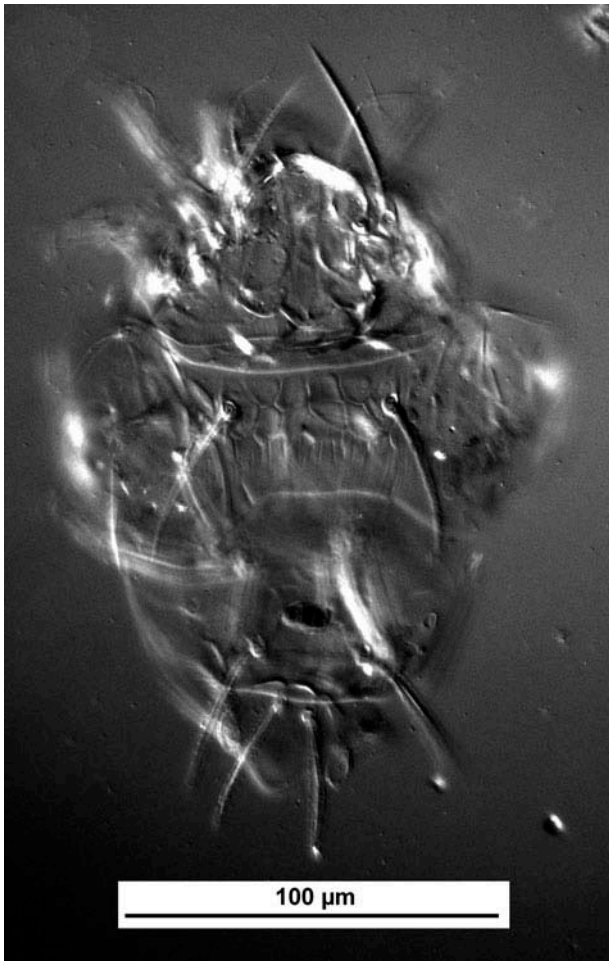


Figure 23. *Daidalotarsonemus ginae* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

Adult male. Unknown.

Type material

Holotype female and 15 paratype females. Holotype female from a Moraceae species, 10°26'N 84°1'W, La Selva Biological Station, Heredia, Costa Rica, 16/V/1994, ALAS; one paratype from *Goethalsia meiantha* (Donn.Sm.) Burret (Malvaceae), 08/VI/1995, other collection data as holotype; nine paratypes from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 05/VI/1995, other collection data as holotype; three paratypes from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 07/VI/1995, other collection data as holotype; two paratypes from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 08/VI/1995, other collection data as holotype. Holotype deposited at NMCR; eight paratypes deposited at USNM; three paratypes deposited at CIPROC; one paratype deposited at CNC; one paratype deposited at DZSJRP; one paratype deposited at FAAS; one paratype deposited at TNHM.

Etymology

The species is in honour of Alice Eugenia (Gina) Ochoa, daughter of Ronald Ochoa, for her interest in nature and these little arthropods.

Daidalotarsonemus lini sp. n. Ochoa, Rezende & Lofego

<http://zoobank.org/urn:lsid:zoobank.org:act:3CAF2E9D-7950-4363-AAD4-1988BF89B070>

(Figures 24–27)

Diagnosis

Females of this new species are most similar to *D. ethiopicus* Mahunka (1981) and *D. venustus* Attiah (1970) by the ornamentation on the prodorsum and between setae *c1* on the tergite C; by the tubercle-shaped insertion on the setae *c2*. This new species is easily distinguished by the acicular shape of setae *c1*; and by length, width and lanceolate shape of the setae *e*.

Adult female. Six specimens measured.

Gnathosoma. Subtriangular in ventral view; length 29 (28–32), maximum width 25 (23–28). Setae *dgs* 12 (12–13) and *vgs* 7 smooth; palps moderately long 11 (11–12). Pharynx fusiform, 17 (16–18) long and 8 (8–9) wide at maximum width.

Idiosoma – dorsum (Figures 24 and 27). Length 221 (218–226), width at level of *c1* 114 (112–116); prodorsal shield with irregular ornamentation. Stigma located near lateral notch of prodorsal shield, which is equidistant to the *v1* and *sc2* setal bases. Tergite C ornamented with four rows of reticles between setae *c1* and irregular ornamentation laterally; tergite D with short longitudinal ridges around setae *d*. Lengths of the setae: *v1* 29 (28–33), *sc1* 15 (15–16), *sc2* 31 (30–32), *c1* 27 (25–29), *c2* 23 (21–24), *d* 31 (30–32), *e* 12 (10–13), *f* 30 (29–31) and *h* 14 (13–15). Maximum width of expanded setae: *d* 7, *e* 3 and *f* 6. All dorsal setae serrate. Bothridial setae *sc1* capitate, with tiny spines. Setae *v1*, *c2* and *h* setiform; setae *sc2* falcate; setae *c1* acicular with a serrate vein, *d* and *f* elliptical with two serrate veins, *e* lanceolate with two serrate veins. All setae inserted on tubercles, except for *sc1* and *h*. Distances between dorsal setae: *v1*–*v1* 29 (28–31), *sc2*–*sc2* 51 (49–53), *v1*–*sc2* 27 (26–28), *c1*–*c1* 47 (46–47), *c2*–*c2* 100 (99–101), *c1*–*c2* 40 (38–41), *d*–*d* 31 (30–31), *f*–*f* 15 (13–16), *e*–*f* 9 (9–10) and *h*–*h* 17 (17–18). Seta *sc2* inserted anteriorly to *sc1*.

Idiosoma – venter (Figure 25). Setae *1a* 6 (6–7); *2a* 10 (9–11); *3a* 12 (11–14) near anteriomedial margins of apodemes 3; *3b* 11 (10–13) on posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 short and not fused to the prosternal apodeme. Prosternal apodeme

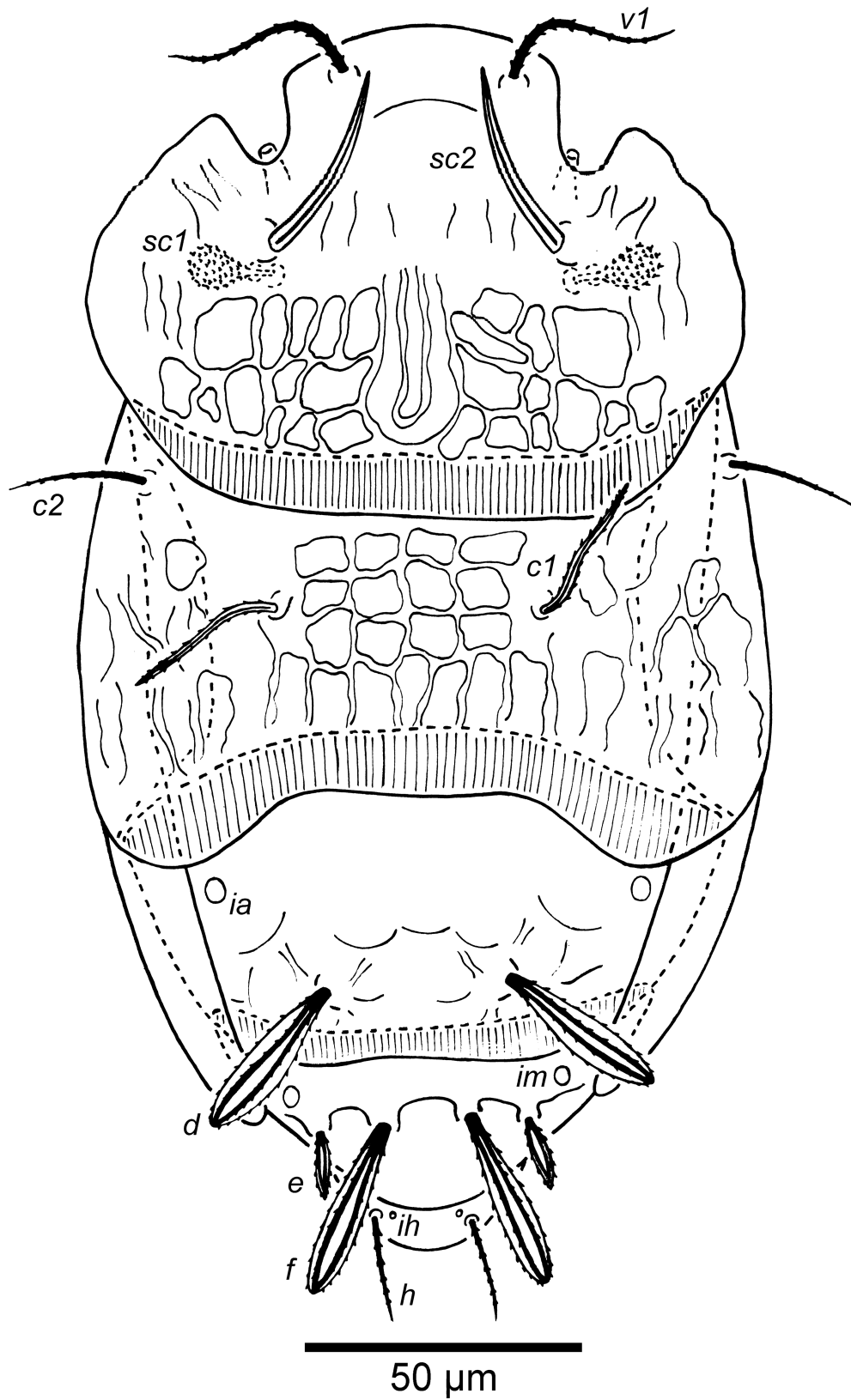


Figure 24. *Daidalotarsonemus lini* sp. n. (female). Dorsal surface.

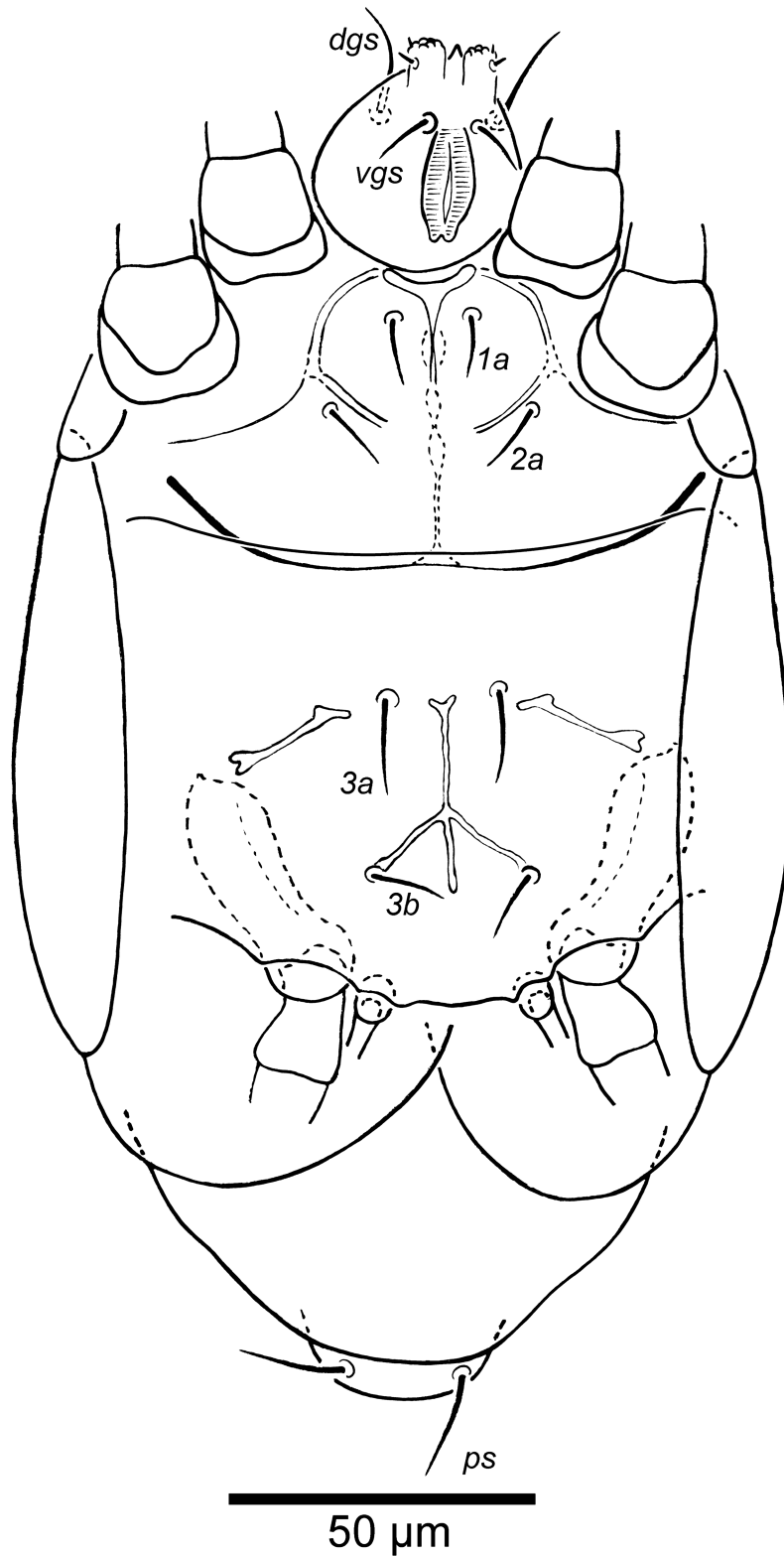


Figure 25. *Daidalotarsonemus lini* sp. n. (female). Ventral surface.

conspicuous from junction with apodeme 1 to the distal end of the apodeme 2, and diffuse from this point to the sejugal apodeme. Sejugal apodeme uninterrupted, with a single median furrow. Apodeme 3 with a constriction

near the anterior end, extending diagonally from proximity of base of seta *3a* to anterior margin of trochanter III; apodeme 4 extending diagonally from the middle of the poststernal apodeme to base of seta *3b*. Poststernal

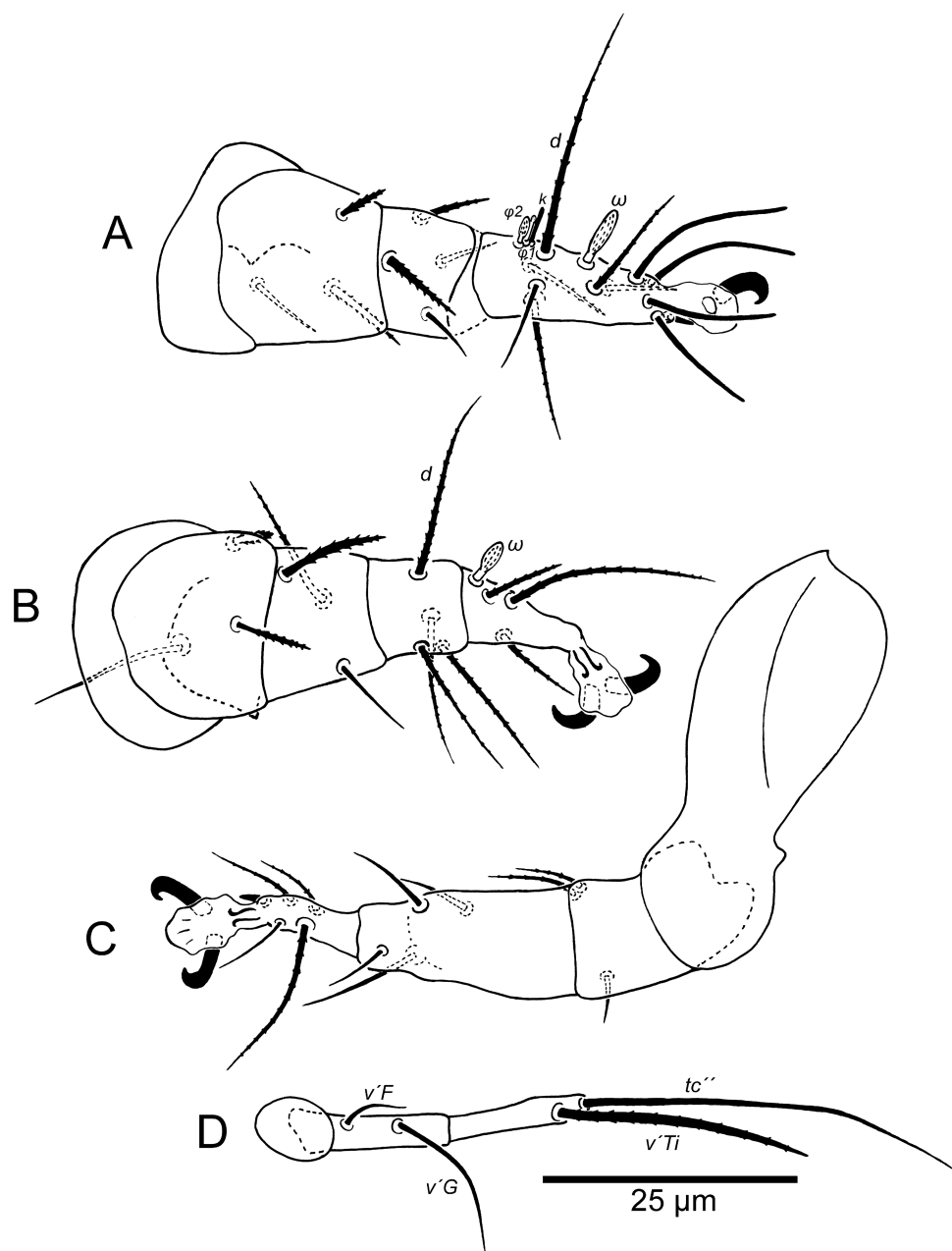


Figure 26. *Daidalotarsonemus lini* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

apodeme bifurcated anteriorly. Tegula 15 wide (14–17) and very short 5 (5–6); posterior margin slightly arched. Setae *ps* 14 (13–15) smooth.

Legs (Figure 26). Lengths (measured from femur to tarsus): leg I 58 (57–60), leg II 61 (59–62), leg III 96 (94–97). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3-4-5(2)+7(1), leg II: 3-4-4-4(1), leg III: 1 + 2-4-4. Tarsal solenidion ω of tibiotarsus I 7, stout, wider medially. Sensory cluster of tibia I: complete, solenidion $\phi 1$ 4, slender, capitate; solenidion $\phi 2$ 3, robust, slightly capitate; famulus *k* 6; all inserted at approximately the same level. Seta *d* of tibia I 30 (29–32), serrate. Solenidion ω of tarsus II proximally

inserted, 5 long, stout, wider medially. Seta *d* of tibia II 19 (18–20), serrate. Femorogenu IV 11 (10–12); tibiotarsus IV 15 (14–17). Length of leg IV setae: $v'F$ 6 (6–7), $v'G$ 17 (16–19), $v'Ti$ 26 (25–28) and tc'' 41 (38–44); setae $v'F$, $v'G$ and tc'' smooth; seta $v'Ti$ serrate and falcate.

Adult male. Unknown.

Type material

Holotype female and eight paratype females. Holotype female from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 10°26'N 84°1'W, La Selva Biological Station, Heredia, Costa Rica, 05/VI/1995, ALAS; one

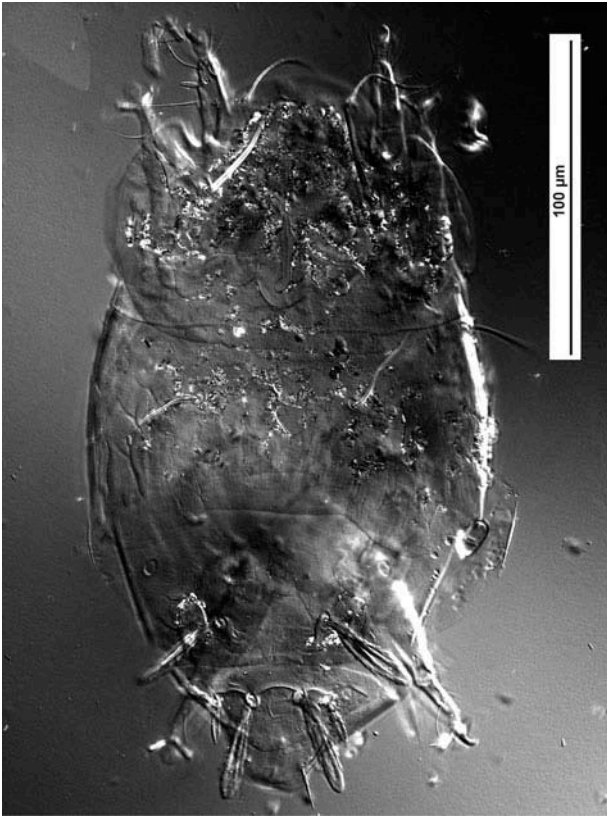


Figure 27. *Daidalotarsonemus lini* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

paratype from a Ochnaceae species, 17/V/1994, other collection data as holotype; one paratype from *Nephrolepis* sp., 22/V/1994, other collection data as holotype; two paratypes from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 07/VI/1995, other collection data as holotype; three paratypes from *Goethalsia meiantha* (Donn.Sm.) Burret (Malvaceae), 08/VI/1995, other collection data as holotype; one paratype from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae), 12/VI/1995, other collection data as holotype. Holotype deposited at NMCR; four paratypes deposited at USNM; two paratypes deposited at CIPROC; one paratype deposited at CNC; one paratype deposited at DZSJRP.

Etymology

The species is in honour of Dr Jianzhen Lin, from the Institute of Plant Protection, Fujian Academy of Agricultural Science, Fuzhou, Fujian, China, for his contributions to the study of the family Tarsonemidae.

Daidalotarsonemus marini sp. n. Ochoa, Rezende & Lofego

<http://zoobank.org/urn:lsid:zoobank.org:act:B97F07C7-AA8C-417B-BC72-BA3C4E2BA1A9>
(Figures 28–31)

Diagnosis

Females of this new species are very similar to *D. duolamella* Lin, Chen & Zhang (1998), mainly by the shape of prodorsal shield and tergite C; and by the shape and the tubercle-shaped insertion of the setae *d*. However, they are distinguished by the shape of setae *c1*, which is setiform in *D. duolamella* and ob lanceolate in the new species; and by the shape of setae *e* and *f*, which are obovate and lanceolate in *D. duolamella* and both elliptical in *D. marini* sp. n.

Adult female. Six specimens measured.

Gnathosoma. Subtriangular in ventral view; length 37 (36–39), maximum width 28 (27–30). Setae *dgs* 13 and *vgs* 7 (7–8) smooth; palps moderately long 11 (10–12). Pharynx fusiform, 28 (26–30) long and 16 (15–18) wide at maximum width.

Idiosoma – dorsum (Figures 28 and 31). Length 255 (252–258), width at level of *c1* 138 (137–139); prodorsal shield with irregular ornamentation and a central “H” form on it. Stigma located near lateral notch of prodorsal shield, which is equidistant to the *v1* and *sc2* setal bases. Tergite C ornamented with long longitudinal ridges, between setae *c1*; tergite D with short longitudinal ridges just between setae *d*. Lengths of the setae: *v1* 32 (30–34), *sc1* 16 (15–17), *sc2* 42 (42), *c1* 35 (35), *c2* 26 (25–27), *d* 49 (47–51), *e* 26 (26–27), *f* 27 (25–28) and *h* 23 (20–26). Maximum width of expanded setae: *d* 4, *e* 12 (11–13) and *f* 11 (10–12). All dorsal setae serrate; except *h* smooth. Bothridial setae *sc1* capitate, with tiny spines; setae *v1*, *c2* and *h* setiform; setae *sc2* falcate; setae *c1* ob lanceolate with two serrate veins, *d* linear elongated with two serrate veins, setae *e* and *f* elliptical with two serrate veins. All inserted on tubercles, except *sc1* and *h*. Distances between dorsal setae: *v1*–*v1* 30 (30–31), *sc2*–*sc2* 56 (55–57), *v1*–*sc2* 32 (31–34), *c1*–*c1* 48, *c2*–*c2* 122 (118–126), *c1*–*c2* 41 (40–42), *d*–*d* 46 (46–47), *f*–*f* 9, *e*–*f* 13 (12–14) and *h*–*h* 19. Seta *sc2* inserted anteriorly to *sc1*.

Idiosoma – venter (Figure 29). Setae *1a* 7; *2a* 17 (16–18); *3a* 27 (26–30) near anteriomedial margins of apodemes 3; *3b* 18 on posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 short and not fused to the prosternal apodeme. Prosternal apodeme conspicuous from junction with apodeme 1 to the middle portion of sejugal apodeme, where it is fused with it. Sejugal apodeme uninterrupted, with a median furrow. Apodeme 3 with a constriction near the anterior end, extending diagonally from proximity of base of seta *3a* to anterior margin of trochanter III; apodeme 4 extending diagonally from the middle of the poststernal apodeme to base of seta *3b*. Poststernal apodeme bifurcated anteriorly. Tegula wide 19 (19–20) and short 6; posterior margin slightly arched. Setae *ps* 10 (9–12) smooth.

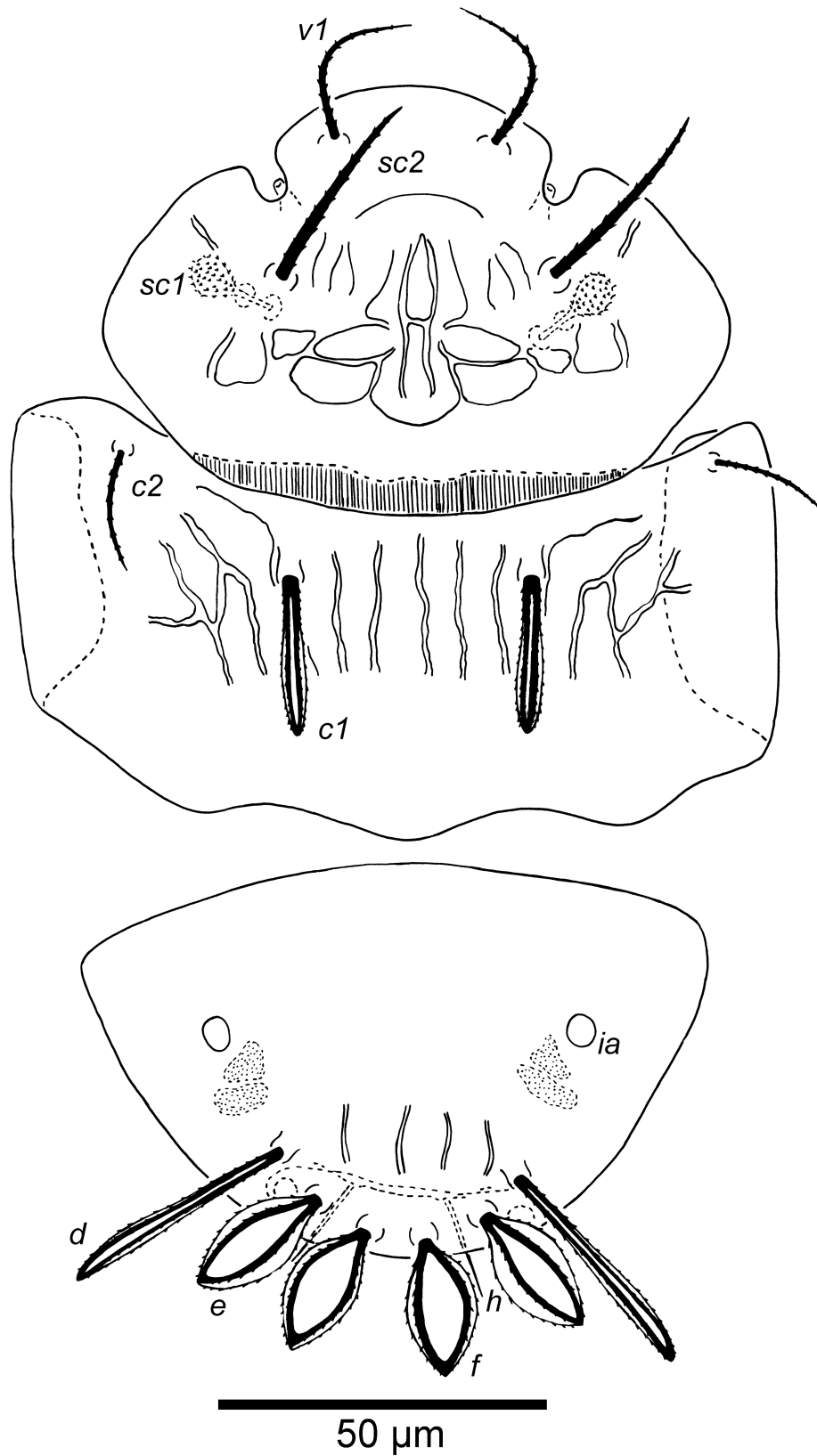


Figure 28. *Daidalotarsonemus marini* sp. n. (female). Dorsal surface.

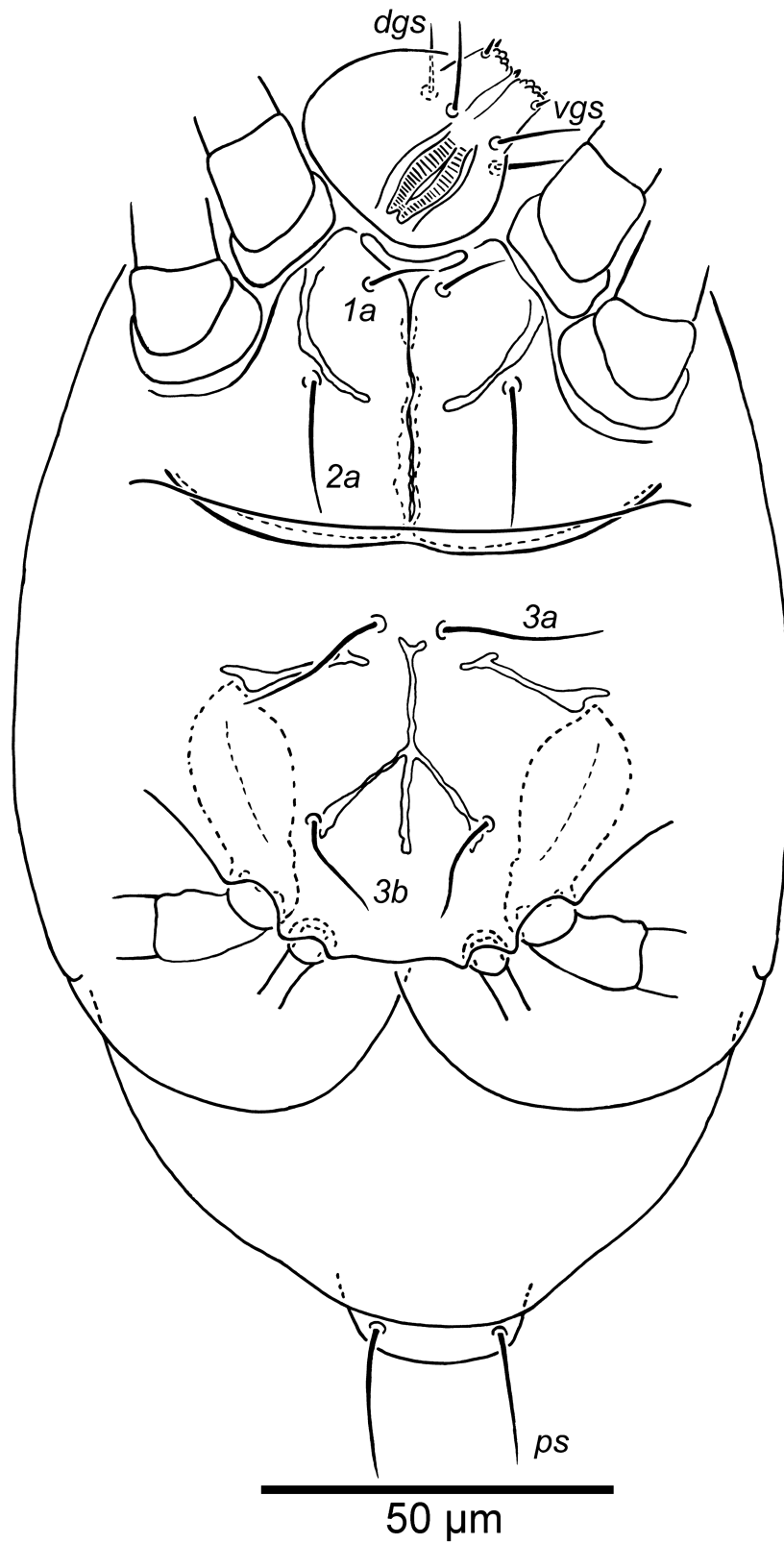


Figure 29. *Daidalotarsonemus marini* sp. n. (female). Ventral surface.



Figure 30. *Daidalotarsonemus marini* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

Legs (Figure 30). Lengths (measured femur to tarsus): leg I 55 (54–56), leg II 51 (50–52), leg III 105 (104–106). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3-4-6(2)+7(1), leg II: 3-3-4-4(1), leg III: 1 + 3-4-4. Tarsal solenidium ω of tibiotarsus I 6, stout, wider medially. Sensory cluster of tibia I: complete, solenidium $\phi 1$ 4, slender, capitate; solenidium $\phi 2$ 3, robust, slightly capitate; famulus k 6 (5–6); all inserted at approximately the same level. Seta d of

tibia I 39 (38–40), serrate. Solenidium ω of tarsus II proximally inserted, 6 long, stout, wider medially. Seta d of tibia II 19 (18–20), serrate. Presence of the setae $l' G$ on femorogenu III. Femorogenu IV 16; tibiotarsus IV 9 (8–11). Length of leg IV setae: $v' F$ 15 (15–16), $v' G$ 22 (21–23), $v' Ti$ 36 (35–37) and tc'' 51 (50–52); all setae smooth; $v' Ti$ falcate.

Adult male. Unknown.

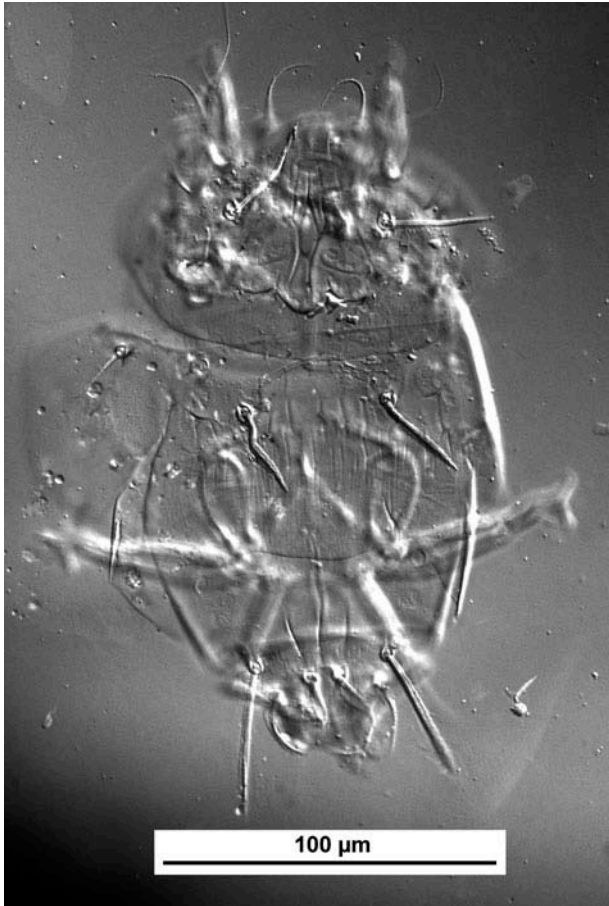


Figure 31. *Daidalotarsonemus marini* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

Type material

Holotype female and 23 paratype females. Holotype female collected on a palm (Arecaceae), 10°26'N 84°1' W, La Selva Biological Station, Heredia, Costa Rica, 29/V/1994, ALAS; eight paratypes from an unknown host, unknown calendar date, other collection data as holotype; one paratype from a Malvaceae species, 17/V/1994, other collection data as holotype; nine paratypes from a Moraceae species, 16/V/1994, other collection data as holotype. Five paratypes from *Theobroma cacao* L., 9° 53'N 83°39'W, Tropical Agricultural Research and Higher Education Center, Costa Rica, 15/II/1994, CATIE. Holotype deposited at NMCR; 14 paratypes deposited at USNM; three paratypes deposited at CIPROC; two paratypes deposited at CNC; one paratype deposited at DZSJRP; one paratype deposited at FAAS; two paratypes deposited at TNHM.

Etymology

The species is in honour of Agr. Eng. Francisco Marín-Thiele, Pro-NAP, Ministerio de Agricultura y Ganadería, Costa Rica, for his dedication to entomology in Costa Rica.

Daidalotarsonemus maryae sp. n. Ochoa, Rezende & Lofego

<http://zoobank.org/urn:lsid:zoobank.org:act:A5C1F899-B03A-4A18-B8A0-9F58A4CB8EBA>

(Figures 32–35)

Diagnosis

Females of this new species are similar to *D. folisetae* Lofego, Ochoa & Moraes (2005) by having irregular ornamentation on the prodorsum; longitudinal, waved continuous ridges as on tergites C and D; and the prosternal apodemes inconspicuous from the level of the apodemes 2 to the joint of the sejugal apodeme. They are distinguished by the following characters present on the new species: reticulation between setae *c1*; tubercle-shaped insertion of the setae *c1* and *c2*; presence of the setae *l''* G on femorogenu III; and shape of the dorsal posterior setae *d*, *e* and *f*.

Adult female. Two specimens measured.

Gnathosoma. Subtriangular in ventral view; length 28 (27–30), maximum width 24 (22–25). Setae *dgs* 12 (12–13) and *vgs* 7 (7–8) smooth; palps short 8. Pharynx fusiform, 15 (14–16) long and 6 (6–7) wide at maximum width.

Idiosoma – dorsum (Figures 32 and 35). Length 188 (186–190), width at level of *c1* 108 (107–109); prodorsal shield with irregular ornamentation. Stigma located near the lateral notch of prodorsal shield, which is equidistant to the *v1* and *sc2* setal bases. Tergite C and D ornamented with reticles between setae *c1* and irregular ornamentation laterally. Lengths of the setae: *v1* 15 (14–16), *sc1* 15, *sc2* 29 (29–30), *c1* 18 (17–20), *c2* 17 (16–18), *d* 25 (24–27), *e* 15, *f* 24 (23–26) and *h* 12 (12–13). Maximum width of expanded setae: *d* 10, *e* 11 and *f* 7. All dorsal setae serrate, except for *c1* and *c2*. Bothridial setae *sc1* capitate, with tiny spines. Setae *v1*, *c1*, *c2* and *h* setiform; setae *sc2* falcate; setae *d*, *e* and *f* elliptical with two serrate veins; all setae inserted on tubercles, except for *h*. Distances between dorsal setae: *v1*–*v1* 27 (27–28), *sc2*–*sc2* 51 (50–52), *v1*–*sc2* 27 (26–28), *c1*–*c1* 52, *c2*–*c2* 101 (100–103), *c1*–*c2* 36 (35–37), *d*–*d* 42, *f*–*f* 13 (13–14), *e*–*f* 12 (12–13) and *h*–*h* 15 (15–16). Seta *sc2* inserted posterior to *sc1*.

Idiosoma – venter (Figure 33). Setae *1a* 4 (4–5); *2a* 8 (8–9); *3a* 6 (6–7) near anteriomedial margins of apodemes 3; *3b* 6 (5–7) on posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 short and not fused to the prosternal apodeme. Prosternal apodeme conspicuous from junction with apodeme 1 to the proximal end of the apodeme 2 and diffuse from this point to the sejugal apodeme. Sejugal apodeme uninterrupted, with a median furrow. Apodeme 3 with a constriction near the anterior end, extending diagonally from proximity of base of seta *3a* to anterior margin of trochanter III; apodeme 4 extending diagonally from the

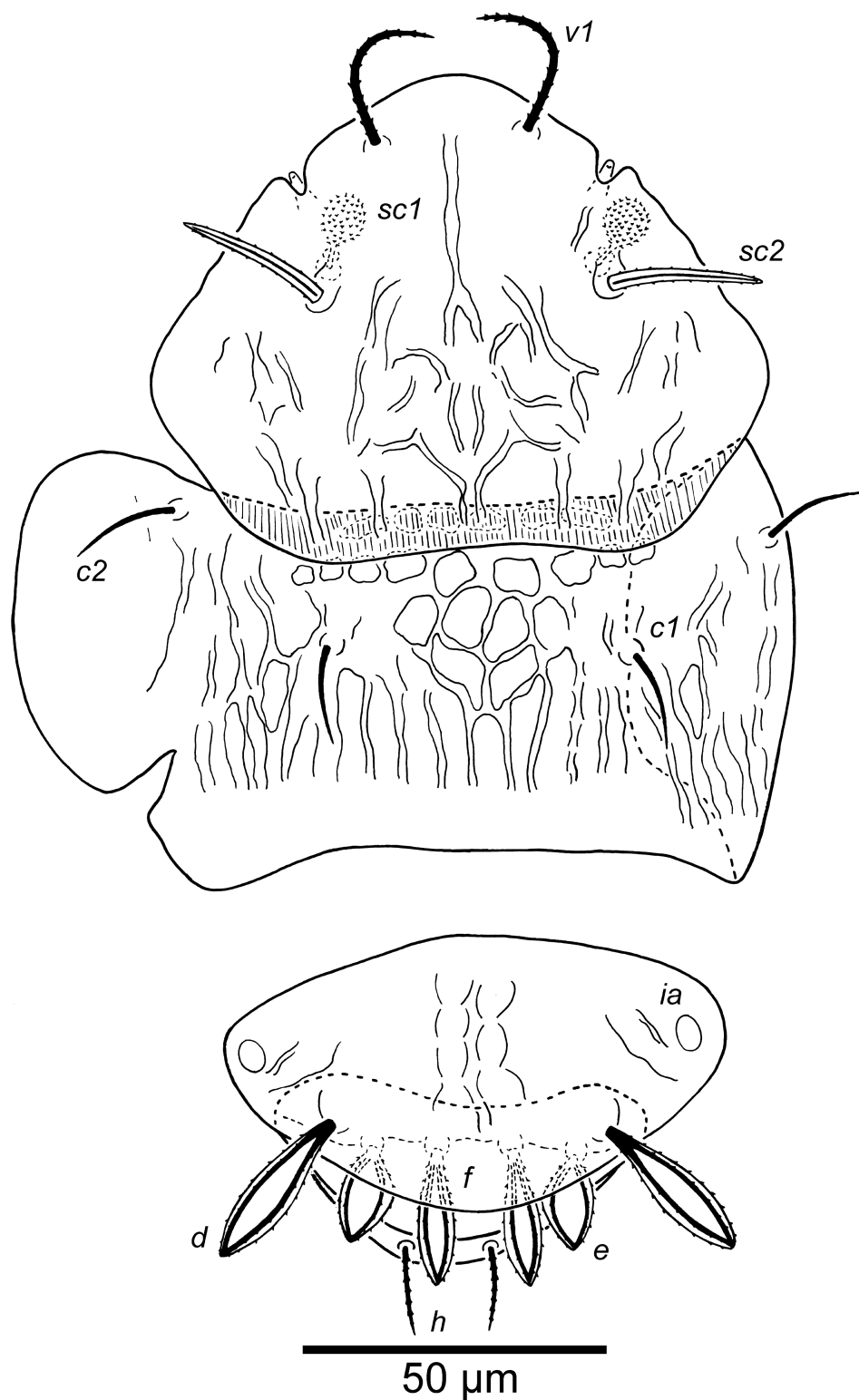


Figure 32. *Daidalotarsonemus maryae* sp. n. (female). Dorsal surface.

middle of the poststernal apodeme to base of seta 3*b*. Poststernal apodeme bifurcated anteriorly. Tegula wide 14 (14–15) and very short 4 (4–5); posterior margin slightly arched. Setae *ps* 9 (8–10) smooth.

Legs (Figure 34). Lengths (measured from femur to tarsus): leg I 53 (52–55), leg II 50 (48–51), leg III 85 (84–86). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3–4–5(2)+7(1), leg II: 3–4–

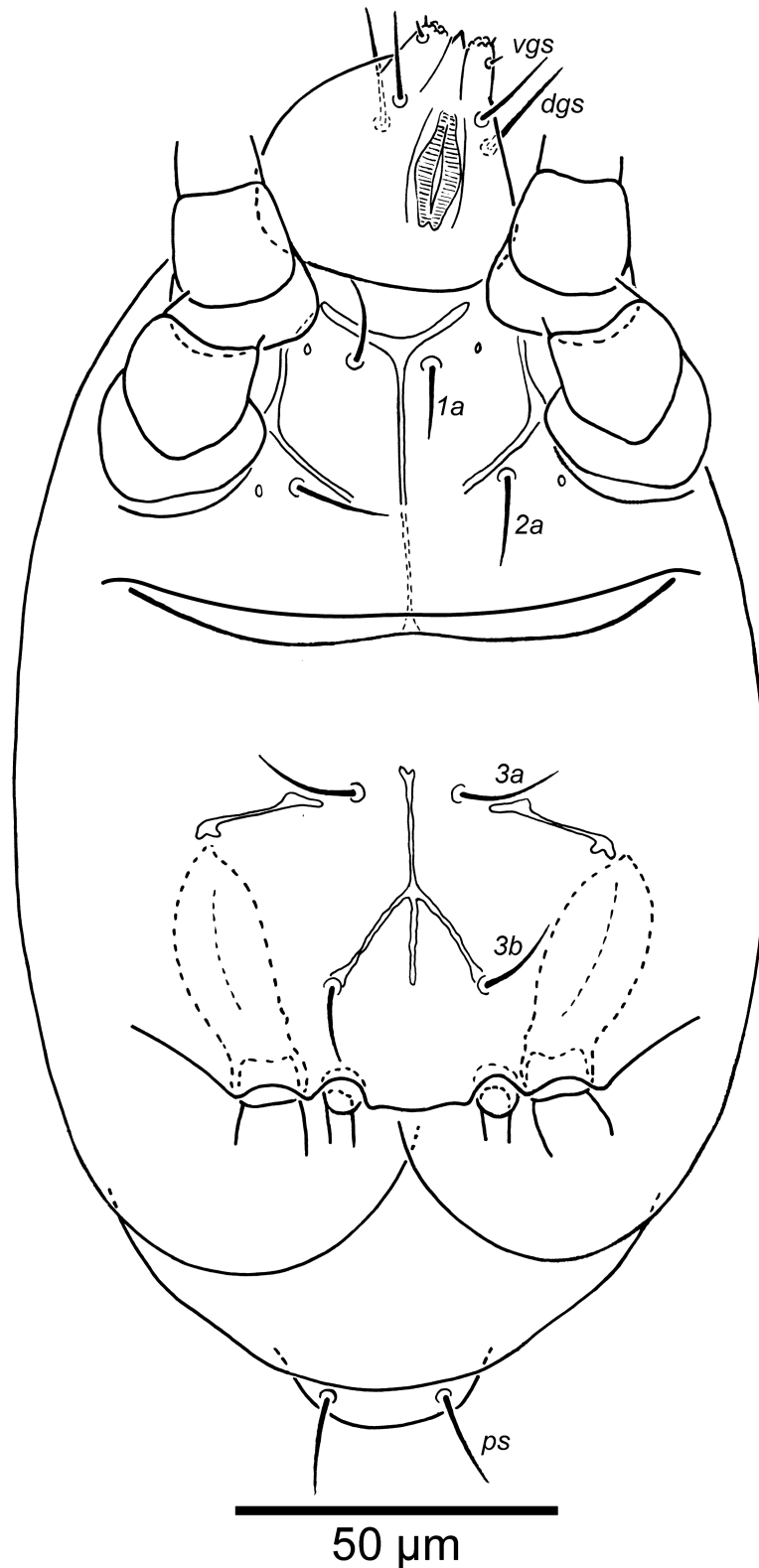


Figure 33. *Daidalotarsonemus maryae* sp. n. (female). Ventral surface.

4-4(1), leg III: 1 + 3-4-4. Tarsal solenidion ω of tibiotarsus I 5, stout, wider medially. Sensory cluster of tibia I complete; solenidion $\phi 1$ 3, slender, capitate; solenidion $\phi 2$ 4, robust, slightly capitate; famulus k 6; all inserted at approximately

the same level. Seta d of tibia I 26 (25-27), serrate. Solenidion ω of tarsus II proximally inserted, 5 (5-6) long, stout, wider medially. Seta d of tibia II 18 (17-19), serrate. Presence of the setae l''' G on femorogenu III. Femorogenu IV

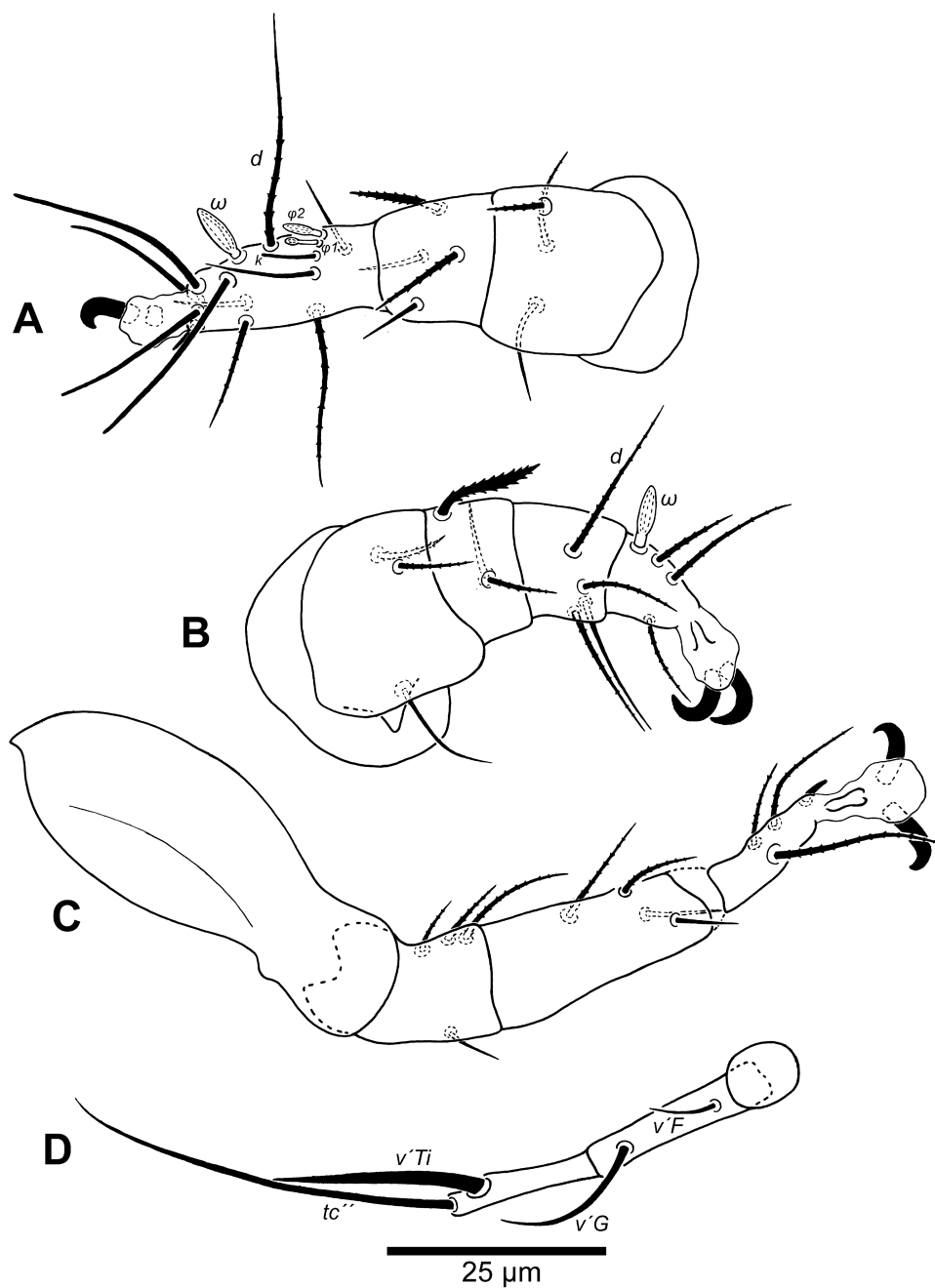


Figure 34. *Daidalotarsonemus maryae* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

30 (28–32); tibiotarsus IV 9 (9–10). Length of leg IV setae: v' F 6 (6–7), v' G 9 (9–10), v' Ti 18 (17–20) and tc'' 29 (27–31); all setae smooth; v' Ti falcate.

10°26'N 84°1'W, La Selva Biological Station, Heredia, Costa Rica, 05/VI/1995, ALAS; one paratype, 12/VI/1995, other collection data as holotype. Holotype deposited at NMCR; paratype deposited at USNM.

Adult male. Unknown.

Type material

Holotype female and one paratype female. Holotype female from *Pentaclethra macroloba* (Willd.) Kuntze (Fabaceae),

Etymology

The species is in honour of Mary Abigail Ochoa, daughter of Ronald Ochoa, for her interest in bees, butterflies, ants and mites.

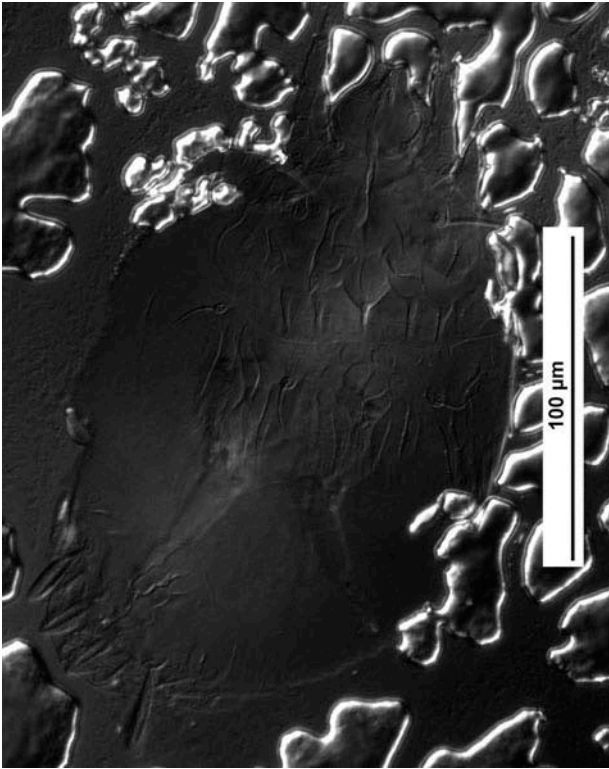


Figure 35. *Daidalotarsonemus maryae* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

***Daidalotarsonemus puntarenensis* sp. n. Rezende, Ochoa & Lofego**

<http://zoobank.org/urn:lsid:zoobank.org:act:47205780-96A6-46B2-9A54-FE30BE23BFBC>
(Figures 36–39)

Diagnosis

Females of this new species are similar to *D. vandevriei* Suski (1967b) by the shape of the posterior setae *e* and *f* and the ornamentation of the tergites C and D; but differ by the shape and position of the setae *c1*; the shape of the setae *d* and the length of palps which are around three times longer in *D. vandevriei* ($\pm 15 \mu\text{m}$). This new species also resembles *D. fossae* De Leon (1956), *D. serissae* Yang, Ding & Zhou (1987) and *D. annonae* Sousa, Lofego & Gondim Jr. (2014) by the heavily arched tegula and by the position of the setae *c1*, near to the posterior margin of the tergite C. *Daidalotarsonemus puntarenensis* sp. n. is distinguished from all these species by the ornamentation on all tergites and the shape of posterior setae *d*, *e* and *f*. Also, unlike all other ones, the prodorsal shield of *D. puntarenensis* lacks deep emarginations where the stigmata are located.

Adult female. Four specimens measured.

Gnathosoma. Subtriangular in ventral view; length 28 (27–30), maximum width 31 (29–32). Setae *dgs* 12 (11–13) and

vgs 8 (8–9) smooth; palps short 6 (6–7). Pharynx fusiform, 17 (16–19) long and 8 (8) wide at maximum width.

Idiosoma – dorsum (Figures 36 and 39). Length 254 (252–257), width at level of *c1* 121 (119–124); prodorsal shield with irregular ornamentation and lacking of deep emarginations where the stigmata are located. Stigma located near lateral notch of prodorsal shield, which is equidistant to the *v1* and *sc2* setal bases. Tergite C ornamented with reticulation covering all the tergite; tergite D with reticles around setae *d* and irregular ornamentation laterally. Lengths of the setae: *v1* 31 (29–32), *sc1* 18 (17–20), *sc2* 30 (29–32), *c1* 15 (14–16), *c2* 15 (14–17), *d* 26 (24–27), *e* 26 (24–27), *f* 34 (32–36) and *h* 17 (16–18). Maximum width of expanded setae: *d* 4, *e* 3 and *f* 6. All dorsal setae serrate. Bothridial setae *sc1* capitate, with tiny spines. Setae *v1*, *c2* and *h* setiform; *sc2* falcate; setae *c1*, *c2* and *d* lanceolate with one serrate vein; setae *e* and *f* linear; all setae inserted on tubercles, except for *h*. Distances between dorsal setae: *v1*–*v1* 39 (38–41), *sc2*–*sc2* 61 (59–63), *v1*–*sc2* 23 (21–25), *c1*–*c1* 66 (64–67), *c2*–*c2* 82 (81–83), *c1*–*c2* 36 (35–38), *d*–*d* 44 (42–45), *f*–*f* 9 (9–10), *e*–*f* 18 (17–19) and *h*–*h* 24 (22–25). Seta *sc2* inserted posterior to *sc1*.

Idiosoma – venter (Figure 37). Setae *1a* 6 (6–7); *2a* 8 (8–9); *3a* 13 (13) near anteriomedial margins of apodemes 3; *3b* 7 (7–8) on posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 short and not fused to the prosternal apodeme. Prosternal apodeme conspicuous from junction with apodeme 1 to the proximal end of the apodeme 2 and diffuse from this point to the sejugal apodeme. Sejugal apodeme uninterrupted, inconspicuous in the middle. Apodeme 3 with a constriction near the anterior end, extending diagonally from proximity of base of seta *3a* to anterior margin of trochanter III; apodeme 4 extending diagonally from the middle portion of the poststernal apodeme to close femorogena III and IV. Fissures overlapping apodemes 4, reaching the anterior level of femorogena III and IV. Poststernal apodeme bifurcated anteriorly. Tegula wide 15 (15–16) and long 8 (8–9); posterior margin heavily arched. Setae *ps* 5 (5–6) smooth.

Legs (Figure 38). Lengths (measured from femur to tarsus): leg I 54 (53–56), leg II 49 (48–51), leg III 91 (89–94). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3–4–5(2)–7(1), leg II: 3–4–4–4(1), leg III: 1 + 3–4–4. Tarsal solenidion ω of tibiotarsus I 7, stout, wider medially. Sensory cluster of tibia I complete; solenidion $\phi 1$ 4, slender, capitate; solenidion $\phi 2$ 3, robust, slightly capitate; famulus *k* 6; all inserted at approximately the same level. Seta *d* of tibia I 36 (35–38), serrate. Solenidion ω of tarsus II proximally inserted, 5 (5–6) long, stout, wider medially. Seta *d* of tibia II 28 (27–30), serrate. Presence of the setae *l''* G on femorogenu III. Femorogenu IV 24 (23–25); tibiotarsus IV 9 (9–10). Length of leg IV setae: *v' F* 7 (7–8), *v' G* 12

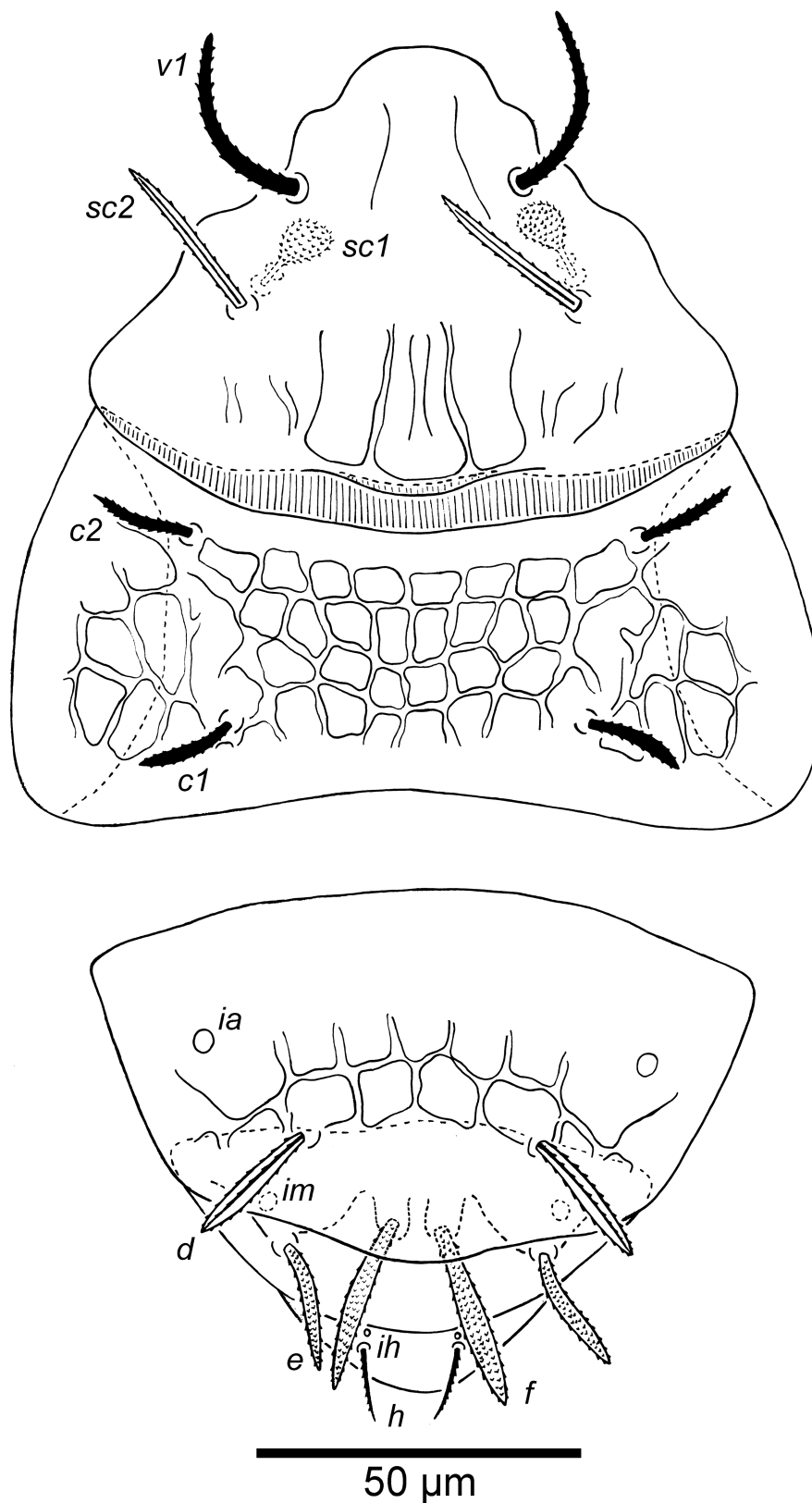


Figure 36. *Daidalotarsonemus puntarenensis* sp. n. (female). Dorsal surface.

(12–13), v' Ti 20 (20–21) and tc'' 30 (29–32); all setae smooth; v' Ti falcate.

Adult male. Unknown.

Type material

Holotype female and three paratype females. Holotype and three paratype females from *Elaeis guineensis*

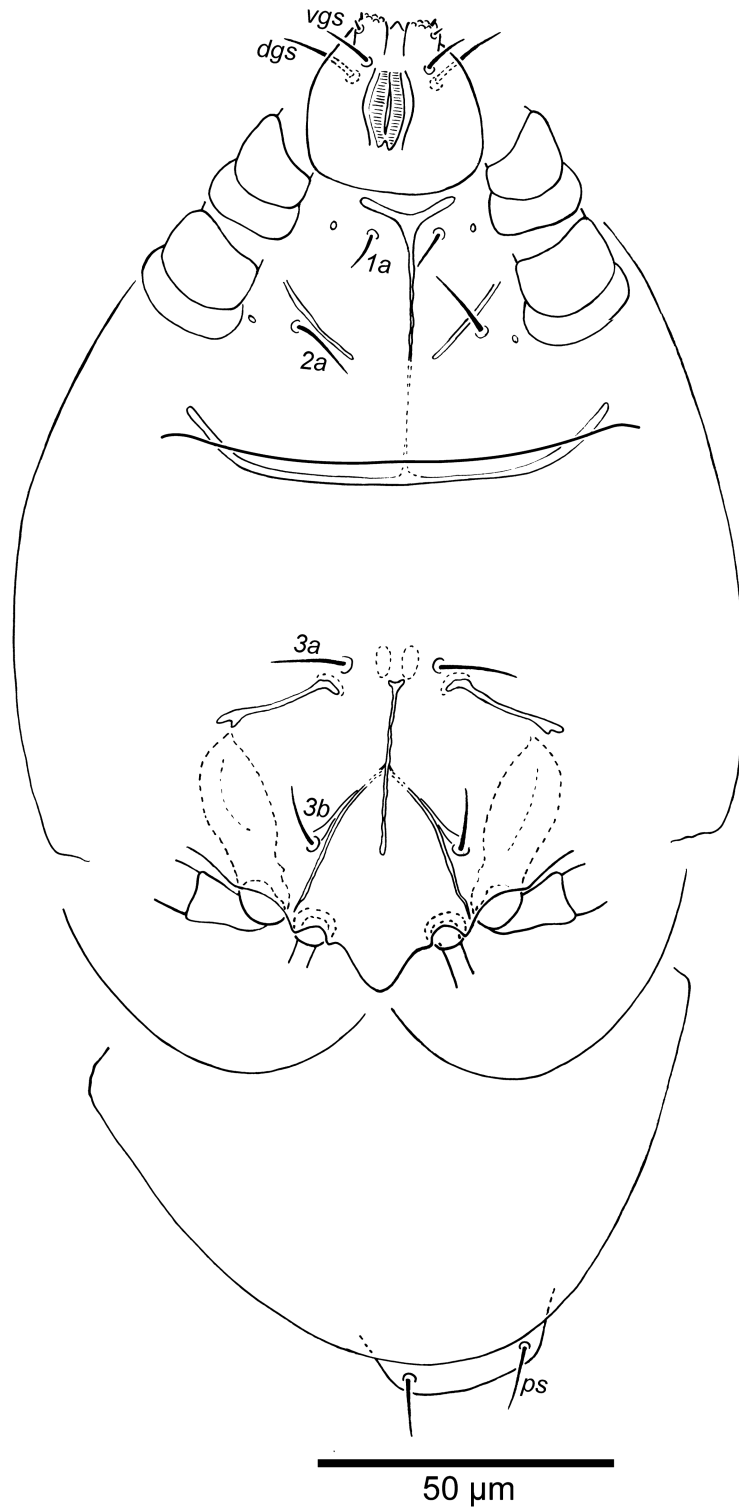


Figure 37. *Daidalotarsonemus puntarenensis* sp. n. (female). Ventral surface.

Jacq. (Arecaceae), 9°25'N 84°25'W, Quepos, Puntarenas, Costa Rica, 29/III/1990, Juan Rojas. Holotype deposited at NMCR; three paratypes deposited at USNM.

Etymology

The species name *puntarenensis* is in honour of the Province of Puntarenas, Costa Rica, region where this species was collected.

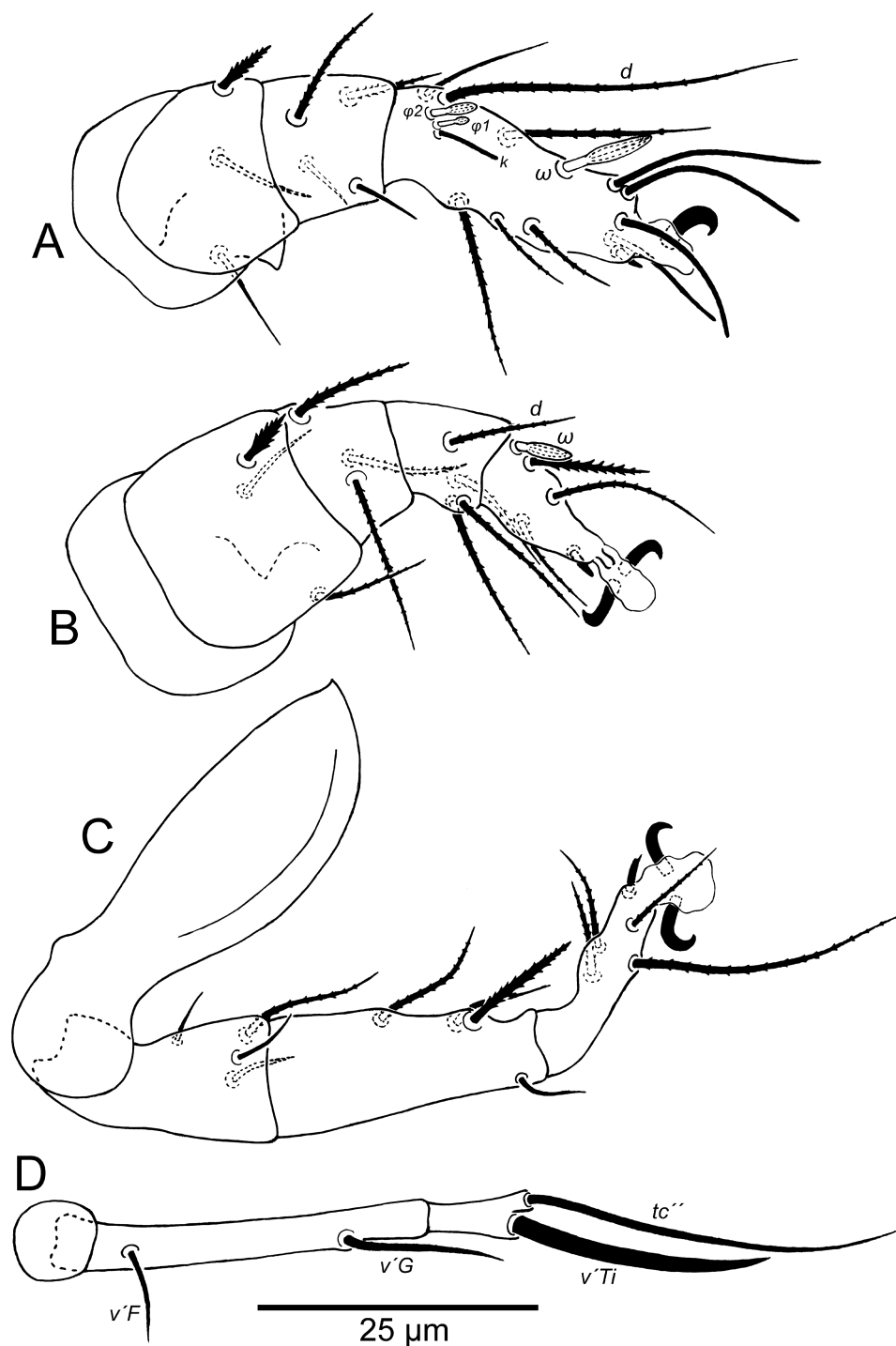


Figure 38. *Daidalotarsonemus puntarenensis* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

***Daidalotarsonemus serratus* sp. n. Rezende, Ochoa & Lofego**

<http://zoobank.org/urn:lsid:zoobank.org:act:EF4D9B6A-7C1A-4AB5-9567-8FD86116F575>
(Figures 40–43)

Diagnosis

Females of this new species are most similar to *D. serrissae* Yang, Ding & Zhou (1987), *D. annonae* Sousa,

Lofego & Gondim Jr. (2014) and *D. puntarenensis* sp. n. by the heavily arched tegula and the position of the setae *c1*, near to the posterior margin of the tergite C. However, this new species is easily distinguished from these others by the following characters: shape of the ornamentation on all tergites; shape of the setae posterior setae *d*, *e* and *f*; and the length of the apodemes 2 and prosternal.

Adult female. Three specimens measured.

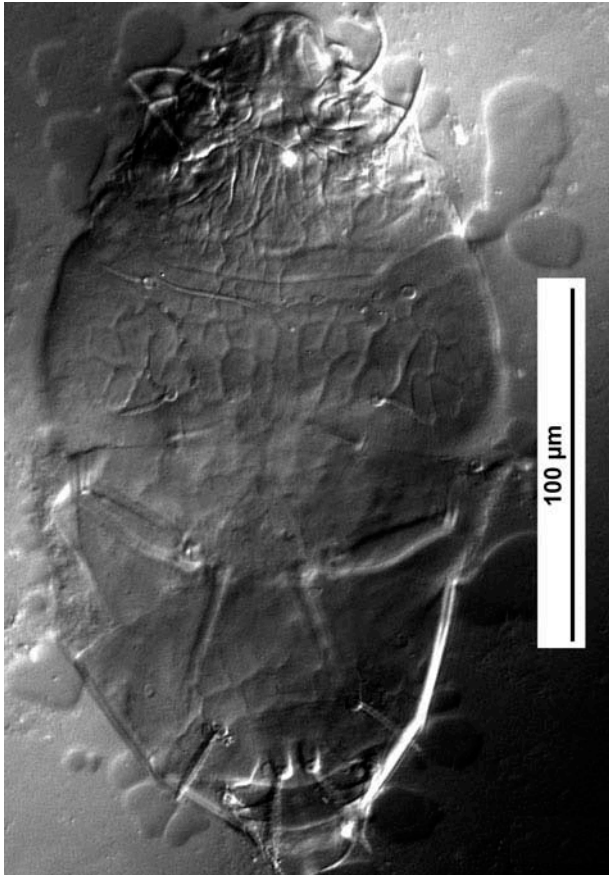


Figure 39. *Daidalotarsonemus puntarenensis* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

Gnathosoma. Subtriangular in ventral view; length 28 (27–30), maximum width 26 (25–29). Setae *dgs* 14 and *vgs* 7 (7–8) smooth; palps short 6 (6–7) Pharynx fusiform, 13 (12–14) long and 6 (6–7) wide at maximum width.

Idiosoma – dorsum (Figures 40 and 43). Length 201 (200–204), width at level of *c1* 118 (117–121); prodorsal shield with irregular ornamentation. Stigma located near lateral notch of prodorsal shield, which is equidistant to the *v1* and *sc2* setal bases. Tergite C ornamented with long longitudinal ridges between setae *c1* and irregular ornamentation laterally; tergite D with reticles around and irregular ornamentation setae *d*. Lengths of the setae: *v1* 23 (21–25), *sc1* 19 (18–20), *sc2* 31 (30–32), *c1* 24 (23–25), *c2* 18 (17–19), *d* 22 (21–24), *e* 17 (17–18), *f* 18 (17–20) and *h* 16 (15–17). Maximum width of expanded setae: *d* 5, *e* 3 and *f* 7. All dorsal setae serrate; except *h* smooth. Bothridial setae *sc1* capitate, with tiny spines. Setae *v1*, *c1* and *c2* and *h* setiform; setae *sc2* falcate; *d* and *f* cuneate with one serrate vein; setae *e* linear elongated with one serrate vein. All setae inserted on tubercles, except for *sc1* and *h*. Distances between dorsal setae: *v1*–*v1* 35 (34–36), *sc2*–*sc2* 50 (48–52), *v1*–

sc2 20 (19–22), *c1*–*c1* 62 (61–63), *c2*–*c2* 81 (80–82), *c1*–*c2* 37 (35–38), *d*–*d* 24 (23–25), *f*–*f* 11 (10–13), *e*–*f* 17 (15–18) and *h*–*h* 22 (21–23). Seta *sc2* inserted posterior to *sc1*.

Idiosoma – venter (Figure 41). Setae *1a* 6 (6–7); *2a* 9 (8–10); *3a* 12 (11–13) near anteriomedial margins of apodemes 3; *3b* 9 on posterior margins of apodemes 4. Apodeme 1 conspicuous, fused to anterior end of prosternal apodeme. Apodeme 2 short and not fused to the prosternal apodeme. Prosternal apodeme conspicuous from junction with apodeme 1 to the proximal end of the apodeme 2, and diffuse from this point to the sejugal apodeme. Sejugal apodeme uninterrupted, but inconspicuous in the middle. Apodeme 3 with a constriction near the anterior end, extending diagonally from proximity of base of seta *3a* to anterior margin of trochanter III; apodeme 4 extending diagonally from the middle portion of the poststernal apodeme to close the femorogena III and IV. Fissures overlapping apodemes 4, reaching the anterior level of the femorogena III and IV. Poststernal apodeme bifurcated anteriorly. Tegula wide 9 (9–10) and short 6 (6–7); posterior margin heavily arched. Setae *ps* 6 (5–7) smooth.

Legs (Figure 42). Lengths (measured from femur to tarsus): leg I 48 (47–50), leg II 46 (45–48), leg III 89 (87–90). Number of setae (solenidia in parentheses) on femur, genu, tibia and tarsus, respectively: leg I: 3–4–5(2)–7(1), leg II: 3–4–4–4(1), leg III: 1 + 2–4–4. Tarsal solenidium ω of tibiotarsus I 7 (7–8), stout, wider medially. Sensory cluster of tibia I complete; solenidium $\phi 1$ 4, slender, capitate; solenidium $\phi 2$ 3, robust, slightly capitate; famulus *k* 6; all inserted at approximately the same level. Seta *d* of tibia I 34 (33–35), serrate. Solenidium ω of tarsus II proximally inserted, 5 (5–6) long, stout, wider medially. Seta *d* of tibia II 22 (21–24), serrate. Femorogenu IV 19 (18–21); tibiotarsus IV 7 (6–9). Length of leg IV setae: *v' F* 5 (5–6), *v' G* 9 (8–11), *v' Ti* 18 (17–21) and *tc''* 30 (28–32); all setae smooth; *v' Ti* falcate.

Adult male. Unknown.

Type material

Holotype female and two paratype females. Holotype and two paratype females from *Nephrolepis* sp., 10°26'N 84°1' W, La Selva Biological Station, Heredia, Costa Rica, 22/V/1994, ALAS. Holotype deposited at NMCR; two paratypes deposited at USNM.

Etymology

The species is named *serratus* by having all posterior setae heavily serrated.

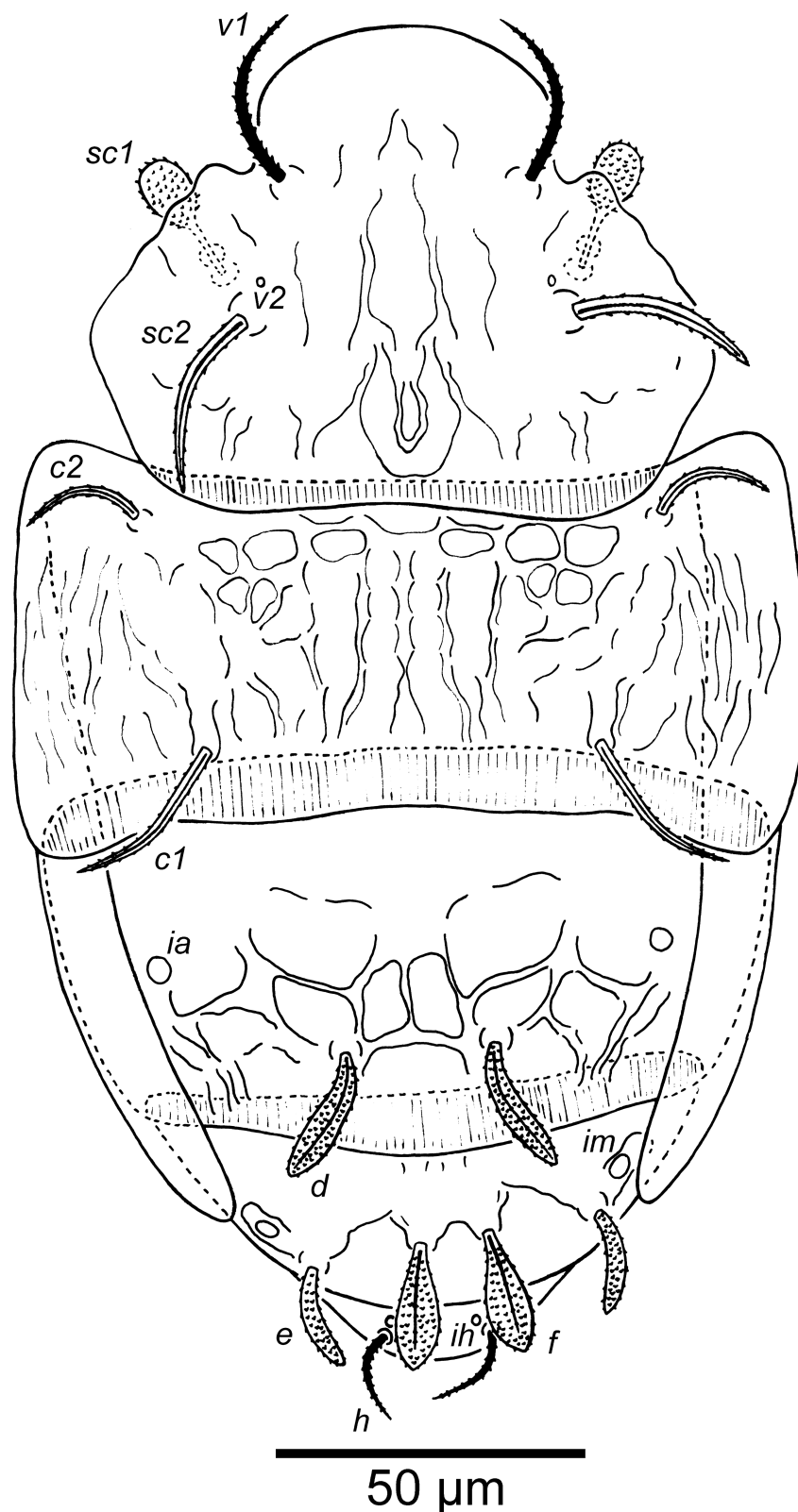


Figure 40. *Daidalotarsonemus serratus* sp. n. (female). Dorsal surface.

Discussion

It is remarkable to find so many new species belonging to the same genus in such a relatively small area. The Costa Rica rain forest is considered a biodiversity hot

spot (Myers et al. 2000), and the findings related on this article strongly reinforce it. The number of species described from this area represents around 30% of the total of *Daidalotarsonemus* known species so far. In

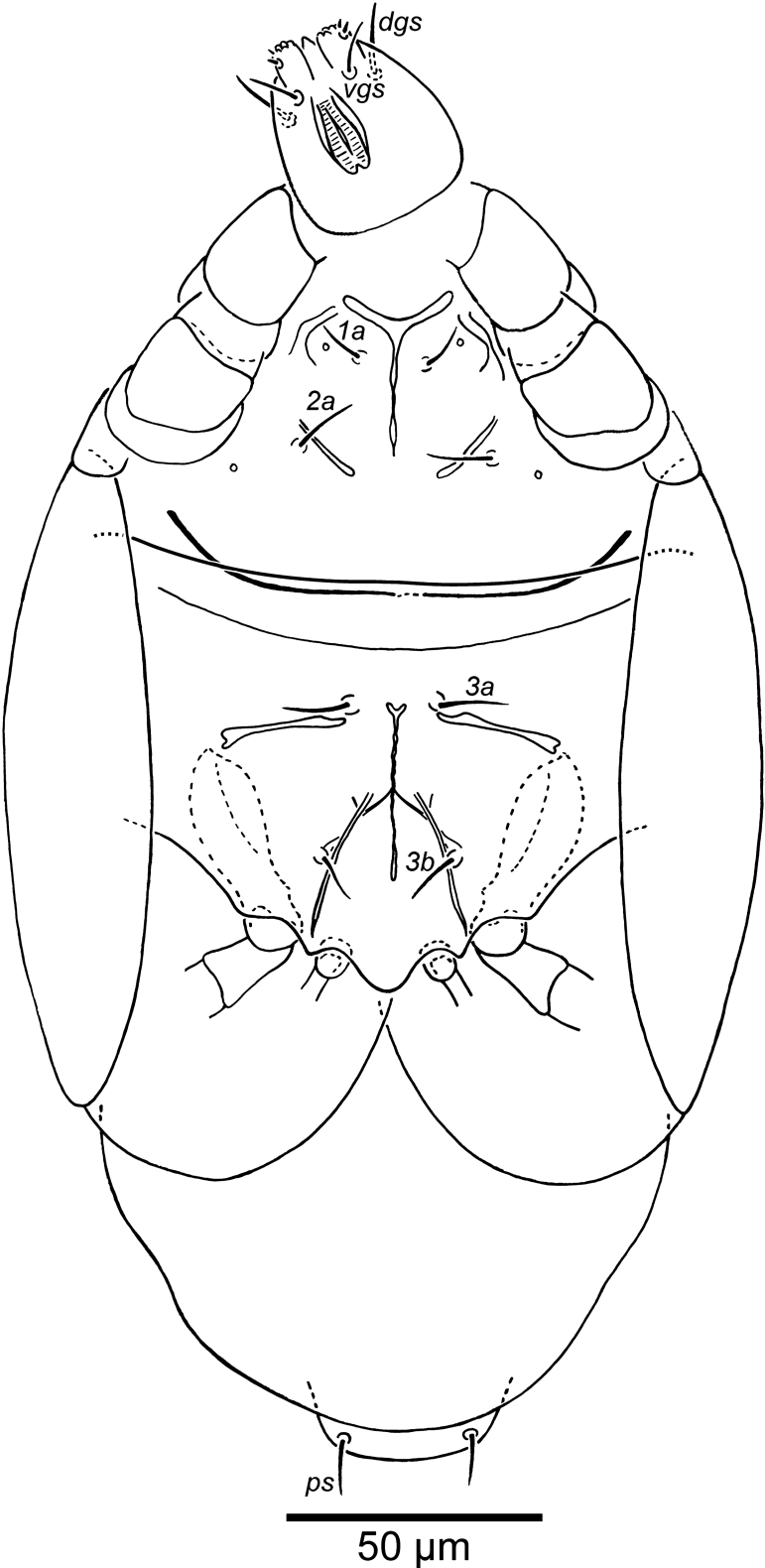


Figure 41. *Daidalotarsonemus serratus* sp. n. (female). Ventral surface.

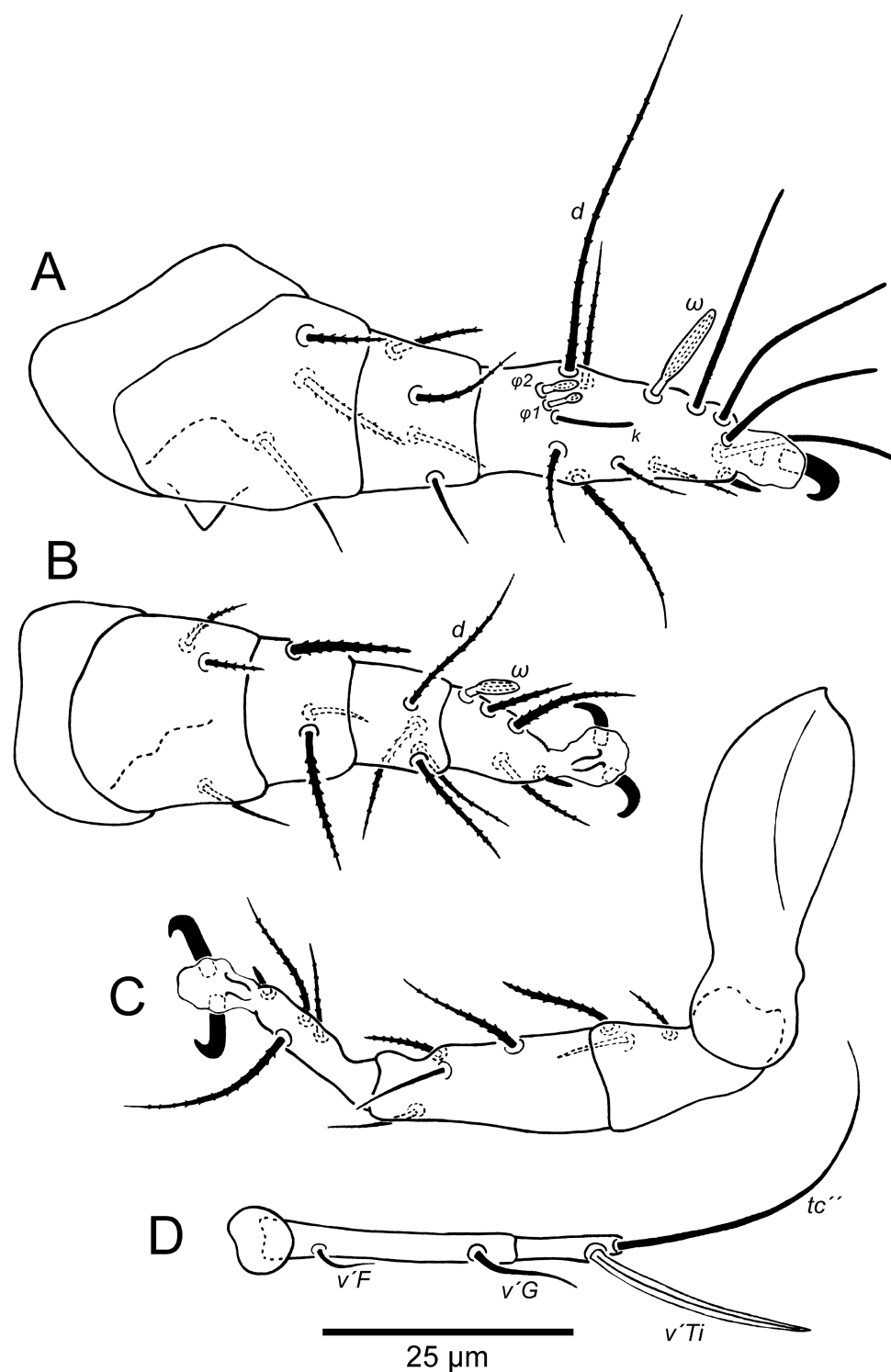


Figure 42. *Daidalotarsonemus serratus* sp. n. (female). Legs: A, leg I; B, leg II; C, leg III; D, leg IV.

Brazil, just one sampling in three plant species located in a rain forest region in the Bahia State resulted in three new tarsonemid species found (Rezende et al. 2015). Many unexplored sites of rain forests still exist around the world, which undoubtedly contain many new species. Therefore, it is necessary to increase the

sampling efforts and taxonomic studies related to the diversity of the Acari fauna in such places. In this context, the authors are currently working on a world-wide revision of the genus *Daidalotarsonemus*, which will include a key to species, geographical distribution and phylogenetic information.

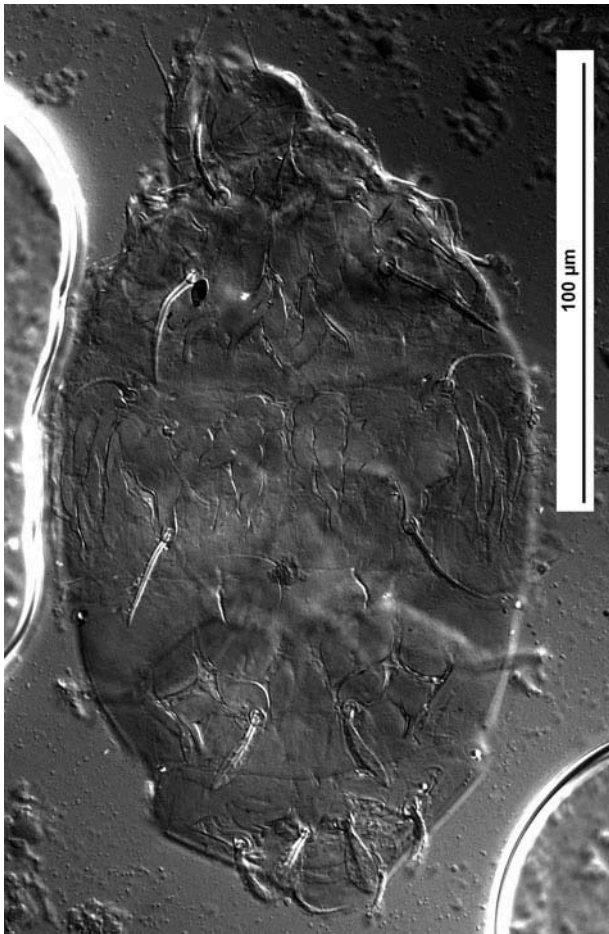


Figure 43. *Daidalotarsonemus serratus* sp. n. (female). Differential interference contrast micrograph of the dorsal surface.

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