

THREE NEW SPECIES OF THE PREDACEOUS CHEYLETIDAE (ACARI: PROSTIGMATA) PHORETIC ON INSECTS

ТРИ НОВЫХ ВИДА ХИЩНЫХ CHEYLETIDAE (ACARI: PROSTIGMATA), ФОРЕЗИРУЮЩИХ НА НАСЕКОМЫХ

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ABSTRACT

Three new species of the family Cheyletidae (Acari: Prostigmata) obligatory phoretic on insects are described, *Samsinakia tilae* sp.n. from a tenebrionid beetle *Blastinus* sp. (Mexico), *Cheletochytes occisor* sp.n. and *Ch. decorus* sp.n. ex carpenter bees *Xylocopa aruana* (Papua New Guinea) and *X. tranquebarica* (Southeast Asia), respectively. The genus *Samsinakia* spp. in is recorded for the first time for the New World.

РЕЗЮМЕ

Описаны три новых вида сем. Cheyletidae (Acari: Prostigmata), облигатно форезирующих на насекомых: *Samsinakia tilae* sp.n. с жука-чернотелки *Blastinus* sp. (Мексика), *Cheletochytes occisor* sp.n. и *C. decorus* sp.n. с пчел-плотников *Xylocopa aruana* (Папуа Новая Гвинея) и *X. tranquebarica* (Юго-Восточная Азия), соответственно. Это первая находка клещей *Samsinakia* spp. в Новом Свете.

INTRODUCTION

The family Cheyletidae (Acari: Prostigmata) includes both predaceous and parasitic mites. Parasitic cheyletids are represented mostly by permanent ectoparasites of vertebrates, birds and mammals [Bochkov, 2004]. Parasitism of cheyletids on invertebrates is only known for *Pavlovskicheyla platydemae* Thewke et Enns, 1975 parasitizing the tenebrionid beetle *Platydema ruficorne* (Sturm, 1826) [Thewke, Enns, 1975]. Phoretic associations with insects are reported for many genera of cheyletids [Volgin, 1969; OConnor, 1999; Bochkov, 2004; Bochkov, OConnor, 2004; Bochkov, Kli-

mov, 2004]. In this paper we describe three new species of cheyletid mites phoretic on insects, *Samsinakia tilae* sp.n. from a tenebrionid beetle *Blastinus* sp. from Mexico, *Cheletochytes occisor* sp.n. and *C. decorus* sp.n. ex Carpenter bees *Xylocopa aruana* from Papua New Guinea and *X. tranquebarica* from Southeast Asia, respectively. This is the first record of *Samsinakia* spp. in the New World. All species of these cheyletid genera are obligatory associated with insects [OConnor, 1993; Fain, Bochkov, 2001].

In the descriptions, the idiosomal and leg chaetotaxy follows Grandjean [1939, 1944]. Setal compliments are in brackets. All measurements are in micrometers (µm). Specimen depositories and reference numbers are cited using the following abbreviations: BMOC # — B.M. OConnor reference number; FMNH — the Field Museum of Natural History, Chicago, USA; IRSNB — Institute royal Sciences naturelles Belgique, Brussels, Belgium; LACM — Los Angeles County Museum of Natural History; NMNH — the National Museum of Natural History, Smithsonian Institution, Washington, DC, USA; UMMZ — University of Michigan Museum of Zoology, Ann Arbor, USA; UNAM — Universidad Nacional Autónoma de México; ZISP — the Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia.

Family Cheyletidae Leach, 1815

Genus *Samsinakia* Volgin, 1965

***Samsinakia tilae* Bochkov et Klimov, sp. n.**

Figs 1–2

Female (10 paratypes). Gnathosoma about 90 long, 90–100 wide. Gnathobase with 2 pairs of

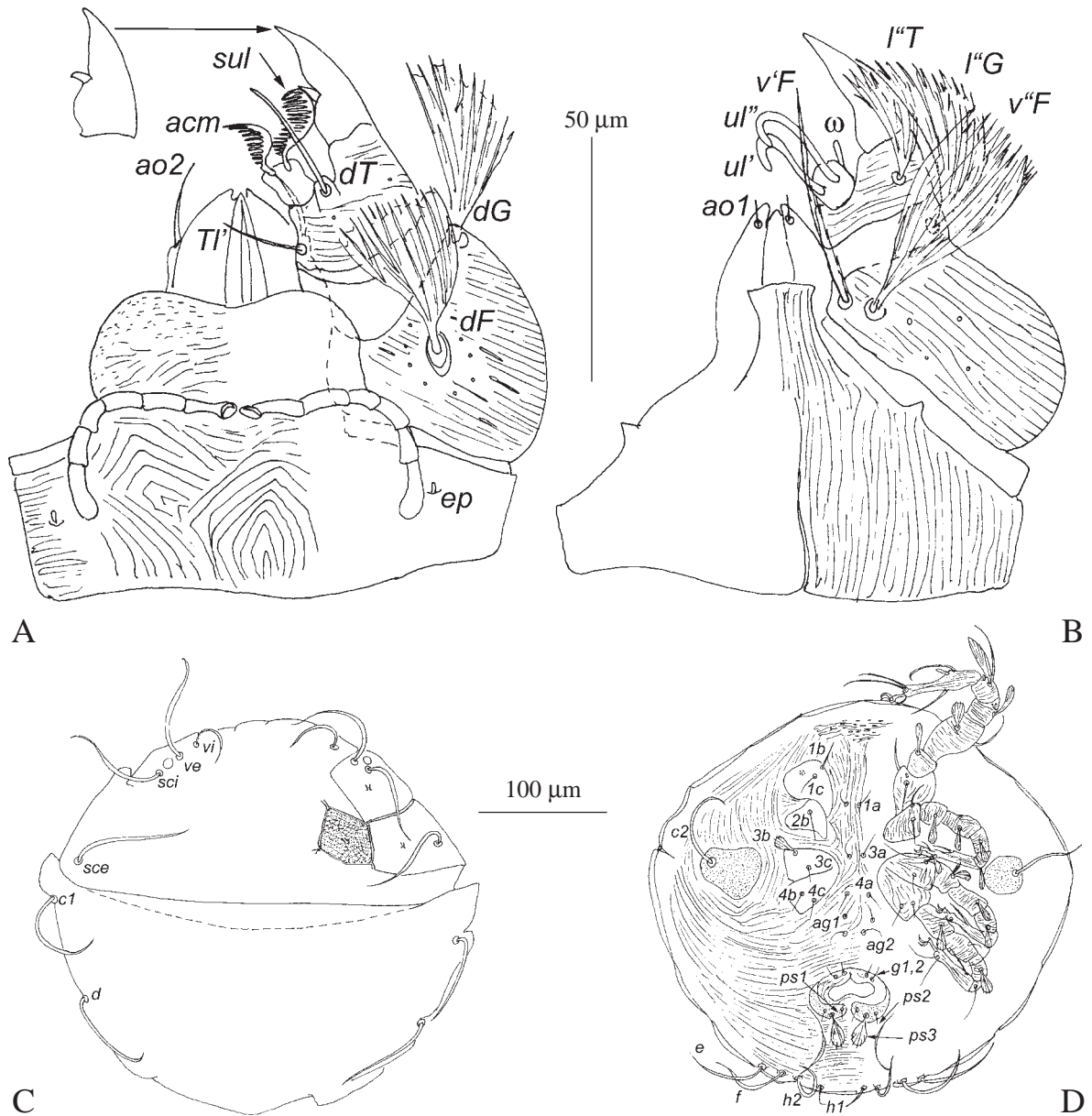


Fig. 1. *Samsinakia tilae* sp.n., holotype female: A — gnathosoma, dorsal view; B — the same, ventral view; C — idiosoma, dorsal view; D — the same, ventral view.

setae, *ao1* and *ao2*, setae *n* of gnathobase absent. Anterior margin of rostral shield (= protegmen) widely rounded, without teeth. Peritremes arch-like, with 6 pairs of segments. Palpal femur about 40 long, 50 wide. Setae *dF*, *v''F*, and *dG* (situated on palpal femur) — all fun-like; seta *v'F* thickened and distinctly barbed. Setae *d* and *l'* of palpal tibia filiform, *l''T* fan-like. Eupathidia *sul* and *acm* with numerous tines. Palpal claw with one basal tooth. Idiosoma oval, 320–330 long, 320–340 wide, gnathosoma and legs covered dorsally by idiosomal shields. Dorsal shields completely covered by polygonal distinctly granulated plate-like setae. Propodonal shield about 150–160 long, bearing eyes and lateral narrow sab-

er-like setae *vi*, *ve*, *sci*, and *sce* — all 70–80 long. Hysteronotal shield 190–200 long, with anterior margin slightly covering propodonal shield, bearing lateral narrow saber-like setae *c1*, *d*, *e* — all 60–70 long, *f* and *h2* 35–40 long, and filiform setae *h1* 20–30 long. Setae *c2* 70–80 long, situated ventrally, on small sclerotized plates. Setae *ag3* absent. Setae *ps3* fan-like. Legs setation depicted in Fig. 2. Setae of coxae, *1a–c*, *2b*, *3a*, *3c*, *4a–c* smooth filiform, excluding *3b* fan-like. Trochanters I, II, and IV with one fan-like seta, *v*. Trochanter III with 2 fan-like setae, *v* and *l*. Femora I–III with one filiform and one fan-like seta, *dFI* thickened and barbed, *dFII* and *dFIII* smooth. Femur IV with one smooth seta,

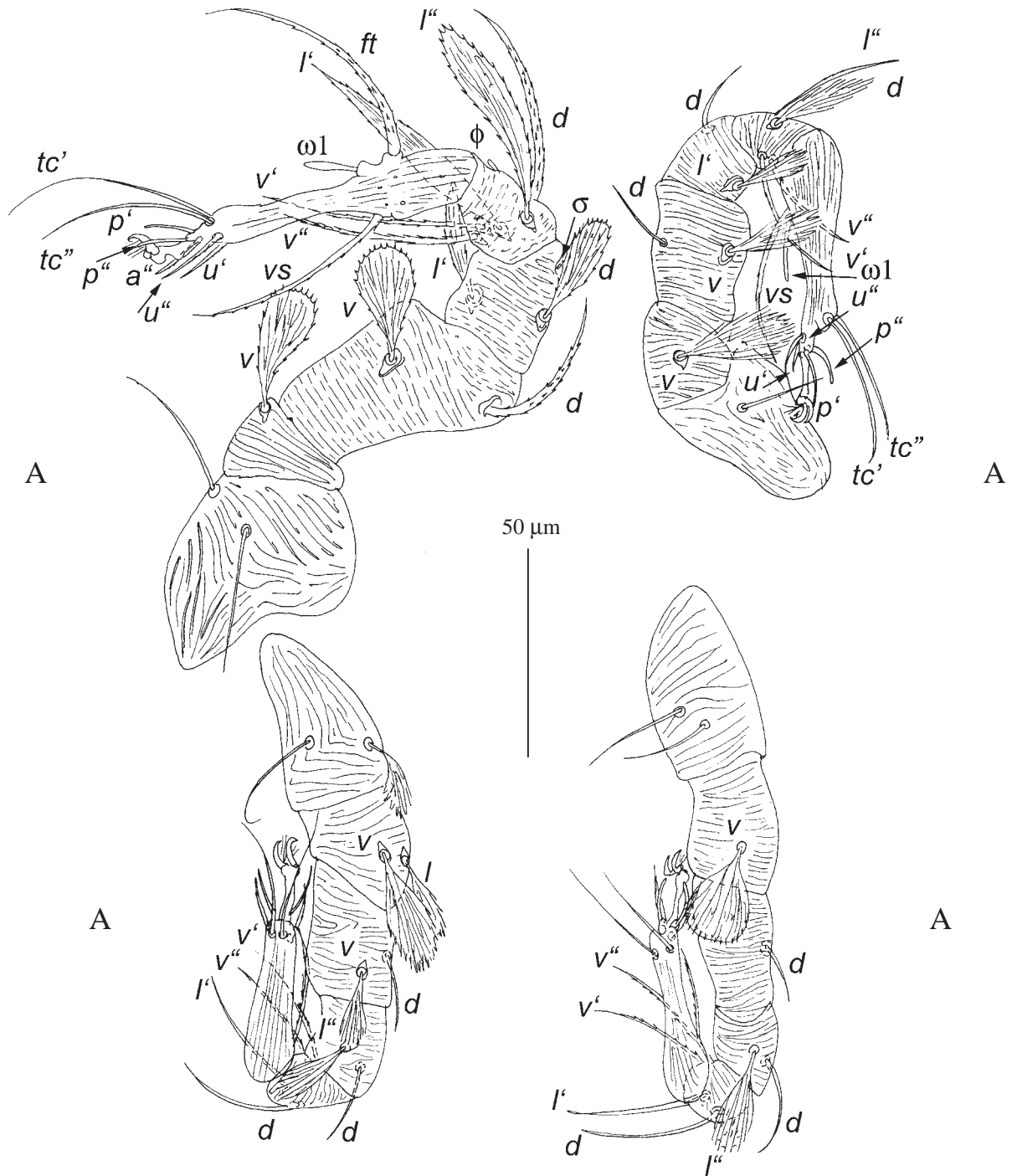


Fig. 2. *Samsinakia tilae* sp.n., legs I-IV of holotype female (A-D, respectively).

dFIV. All genua with 2 setae and genu I with solenidion ϕ , *dGI* and *l'GI-IV* fan-like, *dGII-IV* smooth, filiform, lateral setae *l'GII* and *l'GIII-IV* fan-like. Tibia I with 5 setae and solenidion σ , setae *dTiI* thickened, serrate, (*l*)*TiI* fan-like, (*v*) serrate filiform. Tibiae II-IV with 4 setae, *dTiII* fan-like, *dTiIII-IV* filiform smooth. *l''TiIII* filiform serrate and *l''TiIII-IV* fan-like. Setae (*v*)*TiIII-IV* filiform serrate. Tarsus I with 9 filiform setae and solenidion $\omega 1$, *ft*, *vs*, (*u*) — serrate, (*tc*) and (*p*) nude. Guard seta *ft* much longer than solenidion. Tarsi II-IV

with 7 setae and tarsus II with ventrally situated solenidion *w1*, setae *vs*, (*u*) — serrate, (*tc*) and (*p*) smooth.

Measurements of holotype. Gnathosoma 88 long, 95 wide. Palpal femur 45 long, 50 wide. Idiosoma 295 long, 330 wide. Propodonal shield 165 long, hysteronotal shield 200 long. Seta lengths: *vi* 70, *ve*, *sci*, *sce*, *c1*, *d* — all about 80, *c2* 80, *e* 60, *f* and *h2* 40, *h2* 25, *w1* 18, and *ft* 60.

Type material. Holotype female (BMOC 04-0513-006#1) and 11 female paratypes (BMOC 04-

0513–006#2–12) ex *Blastinus* sp. (Coleoptera: Tenebrionidae) (UNAM), MEXICO: Chiapas, 39 km on road between Tuxtla Gutierrez & Revolución Mexicana, 10 July 1988, coll. A. Cadena, L. Carvantes.

Type depositories. Holotype and three paratypes are deposited in UNAM, three paratypes in UMMZ, one paratype in FMNH, one paratype in NMNH, one paratype in IRSNB, two paratypes in ZISP.

Etymology. This species is named in honor of the well known Mexican acarologist Dra. Tila Perez (UNAM).

Differential diagnosis. This species is close to *Samsinakia volgini* (Fain, 1972) described from the African tenebrionid beetle *Gonocephalum simplex* (Fabricius) (Coleoptera: Tenebrionidae) from Democratic Republic of the Congo [Fain, 1980; Fain, Bochkov, 2001]. In both species, dorso-lateral setae of idiosoma are narrow saber-like, setae *e* are present, coxal setation is 2–1–2–2, the guard seta (*ft'*) is serrate cylindricoconical, all setae of tibiae III–IV are filiform, and the palpal claw has one tooth. This species differs from *S. volgini* by the following characters. In *S. tilae* sp.n., the posterior peritremal segments are slightly curved, the anterior margin of the rostral shield without the lateral teeth, setae *n* of the gnathobase are absent, setae *f* and *h2* are saber-like, setae *ag3* are absent, femur III bears two setae, tibia I bears five setae and solenidion, tibia II bears one fan-like and three filiform setae. In *S. volgini*, the posterior peritremal segments are distinctly curved, the anterior margin of the rostral shield has a pair of lateral teeth, setae *n* of the gnathobase are present, setae *f* and *h2* are filiform, setae *ag3* are present, femur III bears one seta, tibia I bears five setae and solenidion, tibia II bears two fan-like and two filiform setae.

***Cheletophyes* Oudemans, 1914**

***Cheletophyes occisor* Bochkov et Klimov, sp. n.**

Figs 3–4

Female (5 paratypes). Gnathosoma 180–200 long, 175–180 wide. Prolegmen distinctly ornamented. Rostral shield (= tegmen) indistinctly ornamented in anterior third. Peritremes arch-like, with 12–13 pairs of segments. Palpal femur 60–70 long, 50–55 wide. Setae *dF* serrate, *v'F*, *v''F*, and *dG* (situated on palpal femur) — all smooth filiform. Setae *d*, (*l*) of palpal tibia smooth filiform. Eupathidia *sul* with 7–8 tines, *acm* with 4–5 tines. Palpal claw with 2 basal teeth. Idiosoma rhomb-like, 350–410 long, 250–310 wide. Dorsal shield devoid of ornamentation, all setae roughly barbed. Propodonal shield 175–205 long, 220–230 wide,

its posterior margin with 3 indistinct lobes, median lobe being largest. This shield bearing eyes and 5 pairs of setae, *vi* and *ve* 65–75, *sci* 70–75 long, *c1* 55–65, and *c3* 60–70. Setae *sce* flanking propodonal shield, 88–105 long. Scapular setae *c2* 120–130 long. Row of sclerotized plates behind posterior margin of propodonal shield absent. Pair of small, indistinctly sclerotized plates (? rudiments of hysteronotal shield) present above bases of setae *e1*. Pygidial shield 65–75 long, 50–55 wide, bearing setae *h1* and *h2*. Lengths of hysteronotal setae: *d1* 60–65, *d2* 70–80, *e1* 50–65, *e2* 70–75, *f1* 45–50 long, *f2* 85–100, *h1* 30–40, *h2* 60–65, and *h3* 45–48. Idiosomal venter and leg setation typical for this genus, depicted in Figs 3–4.

Measurements of holotype. Gnathosoma 195 long. Idiosoma 355 long. Propodonal shield 195 long. Pygidial shield 68 long, 55 wide. Seta lengths: *vi*, *ve*, *c1*, *c3*, *h2* about 65, *sci* 75, *sce* 105, *c2* 120, *d1* 60, *d2* 68, *e1* 55, *e2* — all 70, *f1* and *h3* 45, *f2* 88, and *h1* 40.

Type material. Holotype female (BMOC 83–1024–002) ex *Xylocopa aruana* Ritsema (Hymenoptera: Apidae) (UMMZ), PAPUA NEW GUINEA: Popondetta Distr., Popondetta, 08°46'00"S, 148°14'00"E, 11 February 1944, coll. U.N. Lanham. Five female paratypes (BMOC 03–0601–002#1–5) ex *Xylocopa aruana* (mesosomal acarinarium) (UMMZ), same locality, 02 February 1944, coll. U.M. Lanham.

Type depositories. Holotype and four paratypes are deposited in UMMZ, one paratype in ZISP.

Etymology. This species name is derived from the Latin word occisor (murderer) referring to the predaceous mode of life of these mites and treated here as a noun in apposition.

Differential diagnosis. This new species is closely related to *Cheletophyes apicola* Fain, Lukoschus et Nadchatram, 1980 described from *Xylocopa latipes* (Drury) from Malaysia [Fain et al., 1980]. In both species, the dorsal shields are devoid of ornamentation, the propodonal shield is wider than long, the pygidial shield bears two pairs of setae, the dorsal setae are not spatulate, setae *c4* are absent. *C. occisor* sp.n. differs from *C. apicola* by the following characters. In *C. occisor* sp.n., the lobes of the posterior margin of the propodonal shield are weakly developed, a row of sclerotized patches situated immediately behind the propodonal shield is absent, the length and width of the pygidial shield are subequal, setae *f2* and *h2* are subequal, the peritremes with 12–13 pairs of seg-

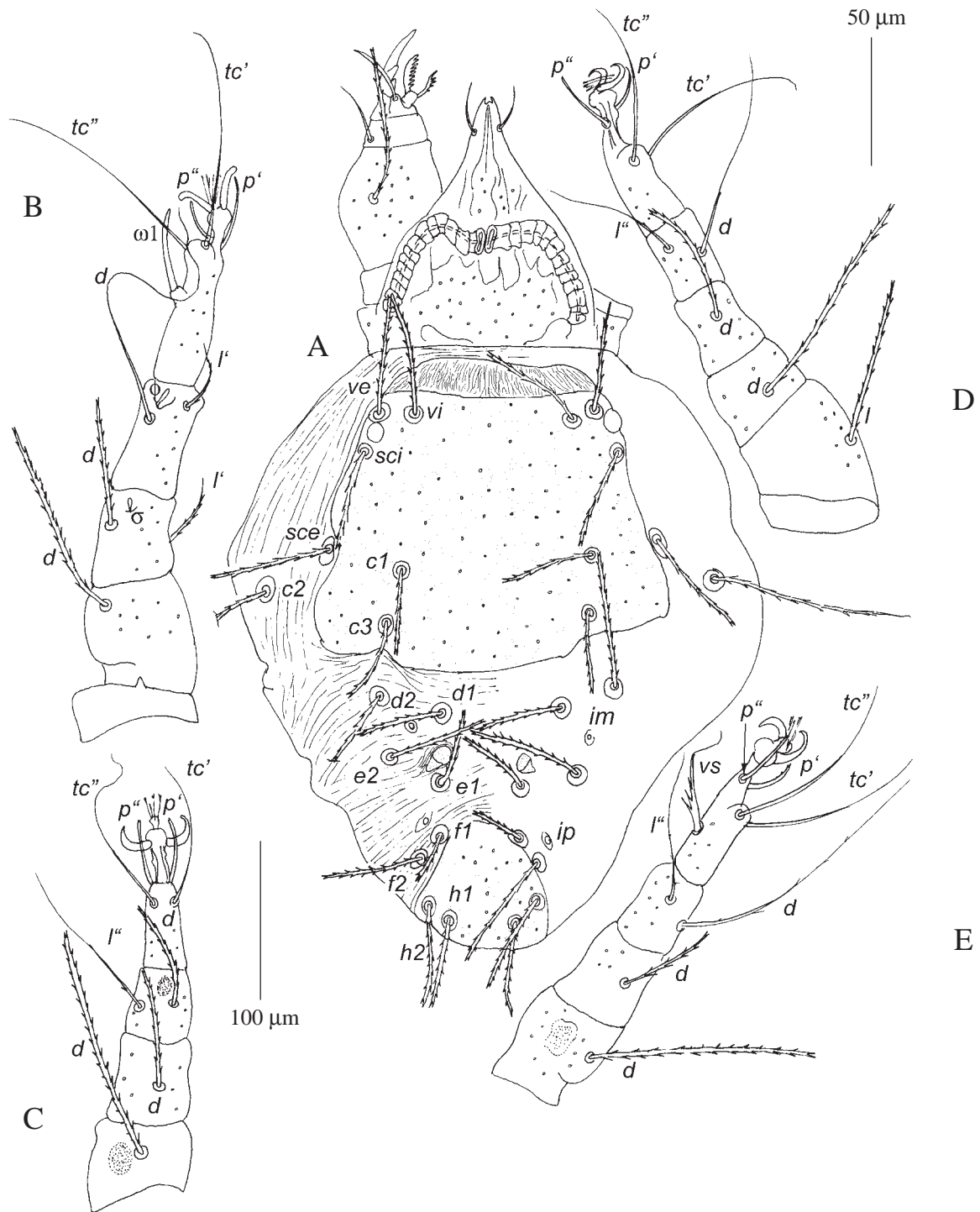


Fig. 3. *Cheletophyes occisor* sp.n., holotype female: A — dorsal view; B–E — legs I–IV, respectively, dorsal view. Scale bars: 100 μ m (A), 50 μ m (B–D).

ments. In *C. apicola*, lobes of the posterior margin of the propodonotal shield are distinctly developed, a row of the sclerotized patches is present immediately behind the posterior margin of the propodonotal shield, the pygidial shield is 1.3 longer than wide, setae *f2* are approximately 1.5 times longer than *h2*, the peritremes with 15–17 pairs of segments.

***Cheletophyes decorus* Bochkov et Klimov, sp. n.**

Fig. 5

Female (10 paratypes). Gnathosoma 145–165 long, 125–135 wide. Protegmen distinctly ornamented. Rostral shield (= tegmen) covered by distinct reticulate ornamentation. Peritremes arch-like, with 16–17 pairs of segments. Palpal femur

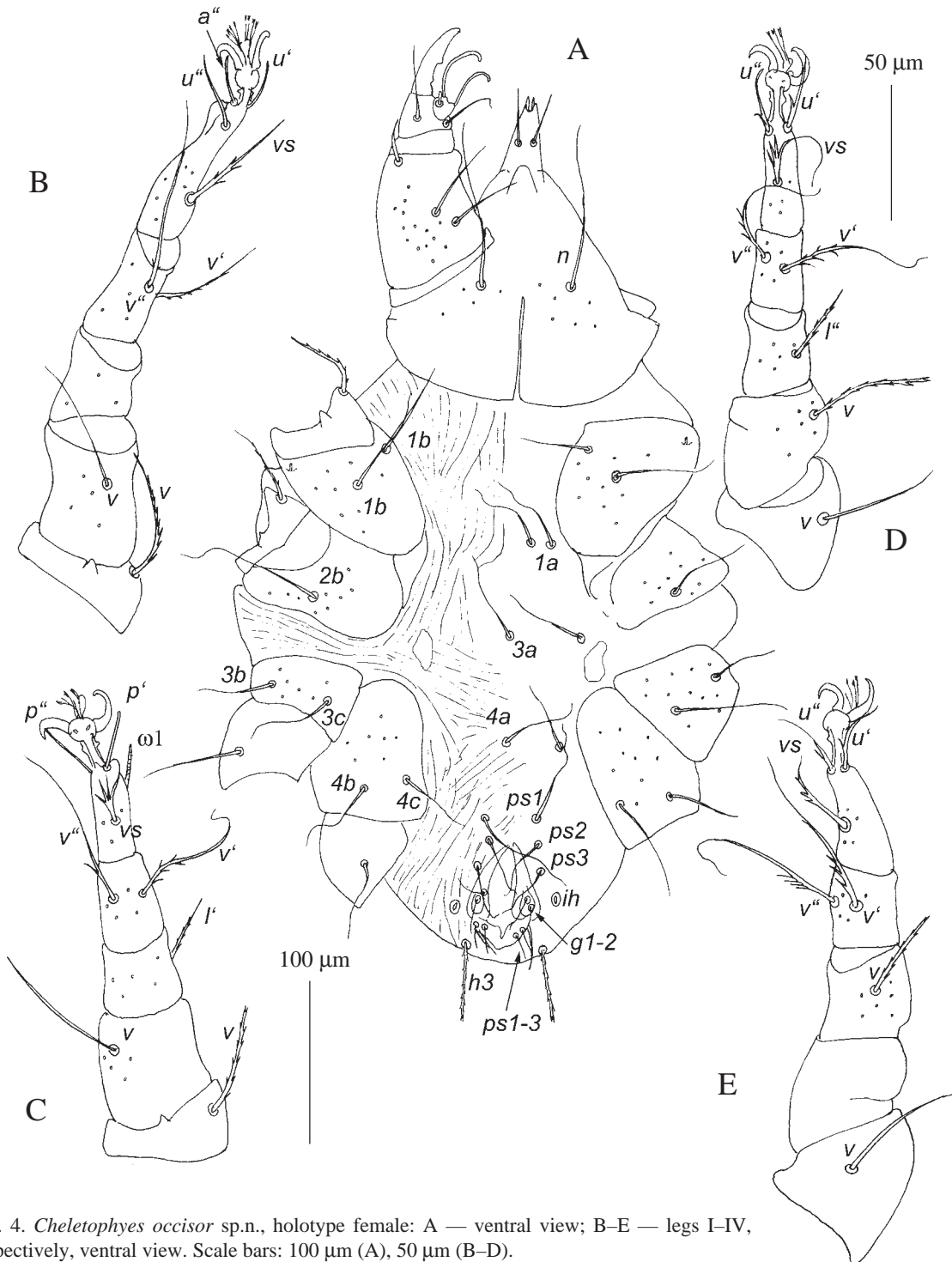


Fig. 4. *Cheletophyes occisor* sp.n., holotype female: A — ventral view; B–E — legs I–IV, respectively, ventral view. Scale bars: 100 μ m (A), 50 μ m (B–D).

about 55–60 long, 45–50 wide. Setae *dF* serrate, *v'F*, *v''F*, and *dG* (situated on palpal femur) — all smooth filiform. Setae *d*, (*l*) of palpal tibia smooth filiform. Eupathidia *sul* with 8–9 tines, *acm* with 9–10 tines. Palpal claw with 3 basal teeth. Idiosoma rhomb-like, 310–350 long, 245–275 wide. Dorsal shield covered with reticulate ornamentation, all setae roughly barbed. Propodonotal shield 155–165 long, 165–190 wide, its posterior margin without distinct lobes. This shield bearing eyes

and 5 pairs of setae, *vi*, *ve*, *sci* 65–70 long, *c1*, *c2* 55–65, and *c3* 60–70. Setae *sce* flanking this shield, 60–65 long. Scapular setae *c2* 85–110 long. Row of sclerotized plates behind posterior margin of propodonotal shield absent. Pair of small, indistinctly sclerotized plates (? rudiments of hysteronotal shield) present above bases of setae *e1*. Pygidial shield 35–45 long, 30–40 wide, bearing only setae *h1*. Lengths of hysteronotal setae: *d1*, *e1*, *e2*, *f2*, *h1*, and *h2* — all 45–55, *f1* 35–

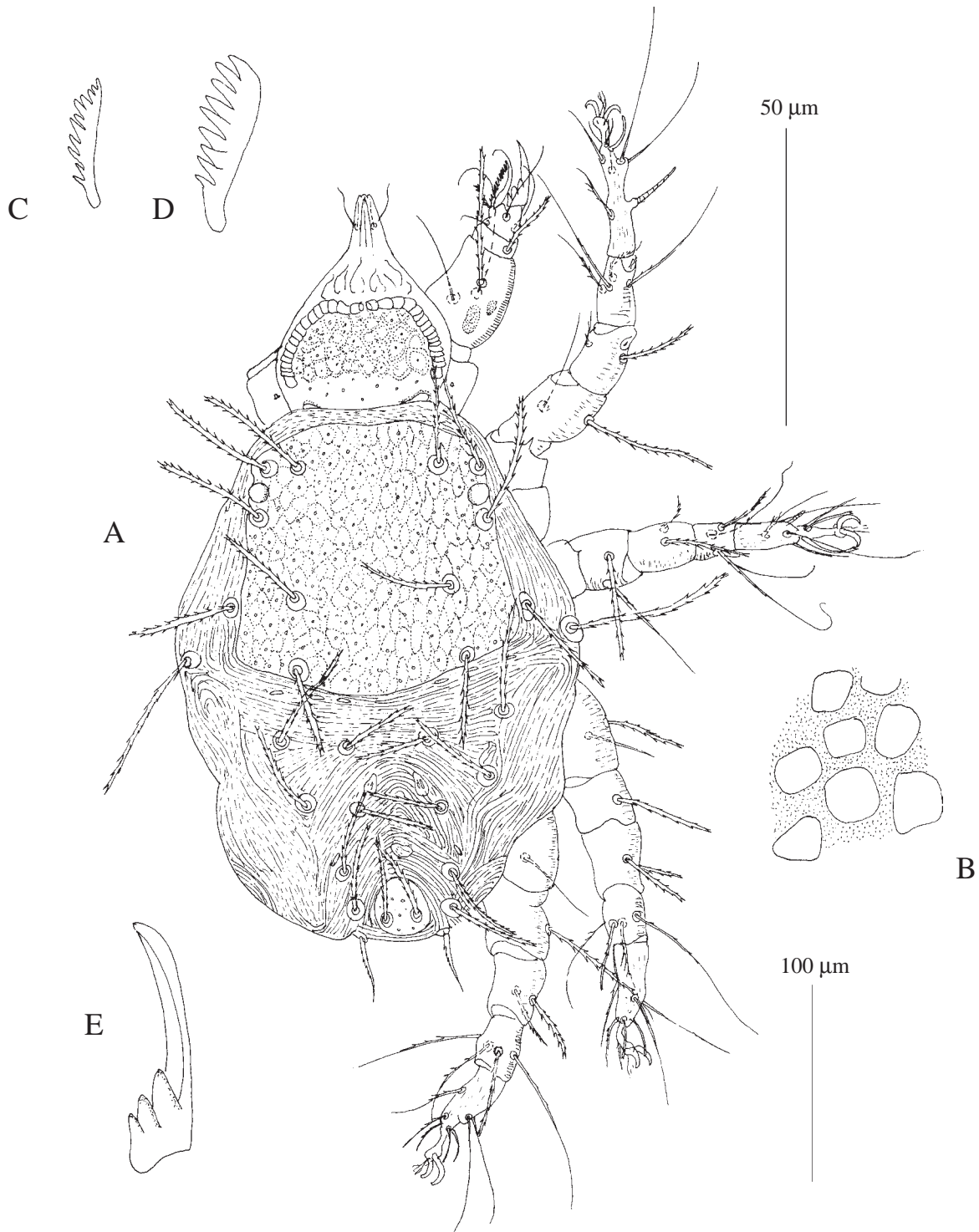


Fig. 5. *Cheletophyes decorus* sp.n., holotype female: A — dorsal view; B — ornamentation of rostral shield; C — eupathidium *amc*; D — eupathidium *sul*; E — claw of palpal tibia. Scale bars: 100 µm (A), 50 µm (B–E).

40, *d2* 60–65, and *h3* 35–40. Idiosomal venter and leg setation typical for this genus.

Measurements of holotype. Gnathosoma 160 long. Idiosoma 330 long. Propodonotal shield 155 long. Pygidial shield 37 long, 30 wide. Seta lengths: *vi* 70, *ve* 75, *sci*, *sce*, *d2* — all about 65, *c1*, *h2* 55, *c2* — all about 100, *c3* 48, *d1*, *e1* 45, *e2*, *f2* and *h1* 50, *f1* 35, and *h3* 35.

Type material. Holotype female (BMOC 05–0102–078) ex *Xylocopa tranquebarica* (Fabricius) (LACM ENT 208642), VIETNAM: Cam Ranh Peninsula, Khanh Hoa Prov., 12°20'00"N, 109°00'00"E, 17 May 1968, coll. T.W. Taylor. Eleven female paratypes (BMOC 05–0102–078, 1–11), same data; 10 female paratypes (BMOC 05–0102–079, 1–10) ex *X. tranquebarica* (LACM

ENT 208643), THAILAND: Trang Prov., Khao Chong Nature Education Centre, 07°35'N, 99°46'E, 21–24 July 1996, coll. Snelling & Sonthichai.

Type depositories. Holotype and ten paratypes are deposited in NHMLAC, six paratypes in UMMZ, one paratype in FMNH; one paratype in NMNH, one paratype in IRSNB, one paratype in ZISP.

Etymology. This species name, *decorus* (elegant), is a Latin adjective refers to the distinct shield ornamentation of these mites.

Differential diagnosis. This new species is closely related to *Cheletophyes clavipilis* Fain, Lukoschus et Nadchatram, 1980 from *Xylocopa latipes* from Malaysia [Fain et al., 1980]. In both species, the dorsal shields are covered with reticulate pattern, the pygidial shield bears one pair of setae (*h1*), setae *c4* are absent. *C. decorus* sp.n. differs from *C. clavipilis* by the following characters. In *C. decorus* sp.n., the peritremes with 16–17 pairs of segments, the length and width of the propodonal shield are subequal, dorsal setae of the idiosoma are not spatulate, the pygidial shield is not ornamented, 35–45 long. In *C. clavipilis*, the peritremes with 12 pairs of segments, the propodonal shield is about 1.2 times longer than wide, dorsal setae of the idiosoma are spatulate, the pygidial shield is distinctly striated, about 20 long.

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