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Previous volumes (2010-2020): 250 € / year (4 issues)

Acarologia, CBGP, CS 30016, 34988 MONTFERRIER-sur-LEZ Cedex, France

ISSN 0044-586X (print), ISSN 2107-7207 (electronic)

The digitalization of Acarologia papers prior to 2000 was supported by Agropolis Fondation under the reference ID 1500-024 through the « Investissements d'avenir » programme (Labex Agro: ANR-10-LABX-0001-01)



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# A NEW SPECIES OF ZETOMOTRICHIDAE FROM SHIKOKU ISLAND IN NIPPON (ACARI: ORIBATIDA)

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(Accepted September 2005)

ACARI ORIBATIDA  
NEW SPECIES NIPPON  
ZETOMOTRICHIDAE

**SUMMARY:** A new species from the temple gardens on Shikoku Island, Nippon, belonging to the genus *Ghilarovus* of the family Zetomotrichidae (Acari) is described. The new species, *Ghilarovus sanukiensis* sp. nov. differs from any other congeners by its smaller body size (292 to 335  $\mu$  in body length); fewer rostral denticles (12 to 15); the presence of lateral ridges on the prodorsum; the presence of barbs in all epimeral setae; the cilia of sensillus variable in number (15 to 16 long cilia, and 9 to 11 short ones), notogaster not separated at the posterior border; dorsal setae *la* as long as the lyrifissure *im*; the baciliform solenidion  $\omega 1$  and famulus; and setal formula on legs.

**ZUSAMMENFASSUNG:** Eine neue Art von der Gattung *Ghilarovus* von Zetomotrichidae wurde beschrieben aus die Garten von die Tempel von die Shikoku Insel, Nippon. Die neue Art hat die kleiner Länge des Abdomens (292-335  $\mu$ ), Rostralkerbe, 12 to 15, die Prodorsalcostulae, der Borsten des Sensillus (lange, 15-16; kurz, 9-11), der Hinterrand des Notogaster ohne Separation, die lang Borste *la* ( $\cong$  R Longe des Lyrifissure *im*), das bärtig Epimeralborsten, und die stumpfer Solenidium und Famulus.

## INTRODUCTION

The family Zetomotrichidae includes twenty-seven species and one subspecies, belonging to twelve genera, that have body lengths ranging in size between 258 and 510  $\mu$ . To date, two species, *Ghilarovus saxicola* Aoki et Hirauchi, 2000 and *Mabulatrichus litoralis* Aoki et Hirauchi, 2000, have been found in Nippon. A third species was collected recently from Shikoku Island in Nippon, and is described below.

*Ghilarovus sanukiensis* sp. nov.

[Nipponese name: Sanuki-nokomesasaradani]  
(Figs. 1-4)

*Measurements and body shape:* 3 females- length, 300 (321) 335  $\mu$ m; width, 185 (197) 214  $\mu$ m, 5 males- length, 292 (295) 300  $\mu$ m; width, 171 (202) 228  $\mu$ m. Body lozenge-shaped in outline (Figs. 1A & C) and yellowish brown. Body surface smooth, with numerous micro pores on notogaster and polygonate sculpture on epimeral region.

1. Aidai-Shukusha 115, Yokogawara 1375, Shigenobu-cho, Ehime Pref., J791-0203, NIPPON

*Acarologia*, 2004 [2005], XLVI, 4 : 341-347.

*Prodorsum*: Anterior rostral margin dentate; dentations small without deep incisions; number of dents varying from 12 to 15 (FIG. 2B). Lamellar ridge absent, however, a longitudinal ridge running from insertion of rostral seta (*ro*) to lateral side of bothridium. According to mounted condition (FIG. 2A), rostral setae (*ro*) originate far from anterior rostral margin, extending in front of rostrum for a distance equal to about two-third of their length; lamellar (*le*) and interlamellar (*in*) setae extending in front of rostral anterior margin in all specimens (FIG. 2A) except for one specimen (FIG. 1A). Setae *ro*, *le* and *in* setiform, thin, pilose; relative lengths and distances:  $(in-in) > (ro-ro) \cong (le-le)$ ;  $(ro-le) \geq (le-in)$ ;  $le > in > ro$ . Sensilli setiform, bilaterally ciliate, directed outwards and slightly longer than setae *le*; 15-16 cilia on one side and 9-11 cilia on the other (FIG. 2C). Exobothridial setae (*ex*) setiform, thin, smooth, shorter than half length of setae *ro*.

*Notogaster*: Dorsosejugal suture interrupted medially, directed forwards, reaching between insertions of lamellar and interlamellar setae. Humeral projections well developed, bearing setae *c*<sub>2</sub>; *c*<sub>2</sub> thick setiform, barbed through the length. Humeral sac (*hu*) discernible. A total of ten dorsal setae including *c*<sub>2</sub> and *la* present; with the exception of *c*<sub>2</sub>, all other notogastral setae thin, smooth, short, about half the length of *c*<sub>2</sub>. Four pairs of lyrifissures (*im*, *ih*, *ip* and *ips*) and one pair of opiothosomal glands present; *im* longest, aligned transversely, located anterolaterally to setae *lm*; *ih* aligned obliquely located lateral to *im*; *ip* aligned almost transversely, located between setae *h*<sub>2</sub> and *h*<sub>3</sub>; *ips* behind setae *h*<sub>2</sub>. Relative lengths:  $la \cong im > ih \cong ip > ips$ . Notogaster not separated, namely, without two lobes at the posterior border (FIGS. 1B & D).

*Ventral region*: Diarthric subcapitulum; infracapitulum setae; 1-1-1; setae *a* thin, unilaterally barbed; setae *h* and *m* thick, bilaterally barbed. Pedipalpal setae 0-2-1-3-9[1]; solenidion thick, long (FIG. 3D). Custodium sharp, long, extending anteriorly of setae *lc* (FIG. 3B). Epimeral setal formula 3-1-3-3; setae *lb*, *lc* and *3b* thick, pilose; the rest thin with sparse minute barbs (FIG. 3F), although barbs are hard visible under low magnifications (FIG. 1B). The relative lengths,  $1c > 1b > 3c > 1a > 2a \cong 3a \cong 3b > 4a \cong 4c > 4b$ ;  $h > 1.7X1a$ . Genito-anal setal formula, 4-1-2-2; all setae thin, glabrous; relative length,  $ge > ag > ad > an$ ;  $ge \cong 2Xan$ . Both genital and anal openings almost as wide as long; anal opening larger

than genital opening; about  $An \cong 2XGe$ ; distance between genital- and anal openings about 1.5X as long as genital opening. Genital setae *g*<sub>3</sub> and *g*<sub>4</sub> inserted away from *g*<sub>1</sub> and *g*<sub>2</sub>. Aggenital setae (*ag*) inserted almost at level of posterior genital margin; distances,  $(ag-ag) > 2X$  as wide as anal opening. Anal setae *an*<sub>1</sub> inserted far from *an*<sub>2</sub>. Adanal setae (*ad*<sub>1</sub>) inserted at level of posterior anal margin. Setae *ad*<sub>2</sub> inserted variably between midway along the anal aperture and anterior anal margin. Lyrifissures *iad* situated at level of anterior anal margin and aligned transversely or obliquely (FIGS. 3A and C). Cheliceral setae *cha* setiform bearing some pectinations; *chb* thick, forked (FIG. 3E).

*Legs*: All legs heterotridactylous: median claw thick, shorter than lateral ones. Leg chaetotaxy including famulus but excluding solenidia: I (1-5-2-4-21); II (1-5-2-4-16); III (2-4-1[2]-3-16); IV (1-2-2-3-14); setae on genu III variable in number. Solenidiotaxy: I (1-2-2); II (1-1-2); III (1-1-0); IV (0-1-0). Dilated or modified setae absent on all legs (FIG. 4). On leg I, solenidion  $\omega_1$  bacilliform; other solenidia  $\omega_2$ ,  $\varphi_1$ ,  $\varphi_2$  and  $\sigma$  setiform. On tarsus I,  $\omega_2$  inserted on apophysis; famulus bacilliform inserted on apophysis between  $\omega_2$  and seta *ft*'';  $\omega_1$  inserted posteriorly far from famulus, extending for a short distance in front of famulus. On genu I, solenidion  $\sigma$  adjacent to seta *d*. Leg IV adapted for jumping, much enlarged.

*Secondary sexual characters*: Conspicuous feature of sexual dimorphism absent, except for genital organs (FIGS. 2D & E), however males have smaller body size and shorter distance between genital and anal apertures.

*Material examined*: Holotype (Female) (NSMT-Ac 11801) : from litter, humus and soil sample at the garden of the Jinne-in Temple (45 m above sea level) at Kanwonji City in Kagawa Pref., Feb.-8-2004, T. Fujikawa; 6 paratypes (2 females and 4 males) (NSMT-Ac 11802 to 11805): from litter, humus and soil sample at the garden of the Shusshakaji Temple (90 m above sea level) at Zentsūji city in Kagawa Pref., Feb.-7-2004, T. Fujikawa; 1 paratype (male): from litter, humus and soil sample at the garden of the Daikōji Temple (60 m above sea level) at Yamamoto-chō in Kagawa Pref., Feb.-8-2004, T. Fujikawa.

*Remarks*. The new species has some characters in common with members of the genus *Ghilarovus* Krivolutsky, 1966. However, the new species differs from any other congeners by: its smaller body size (292 to 335  $\mu$ m in length); fewer rostral dents (12 to 15); the

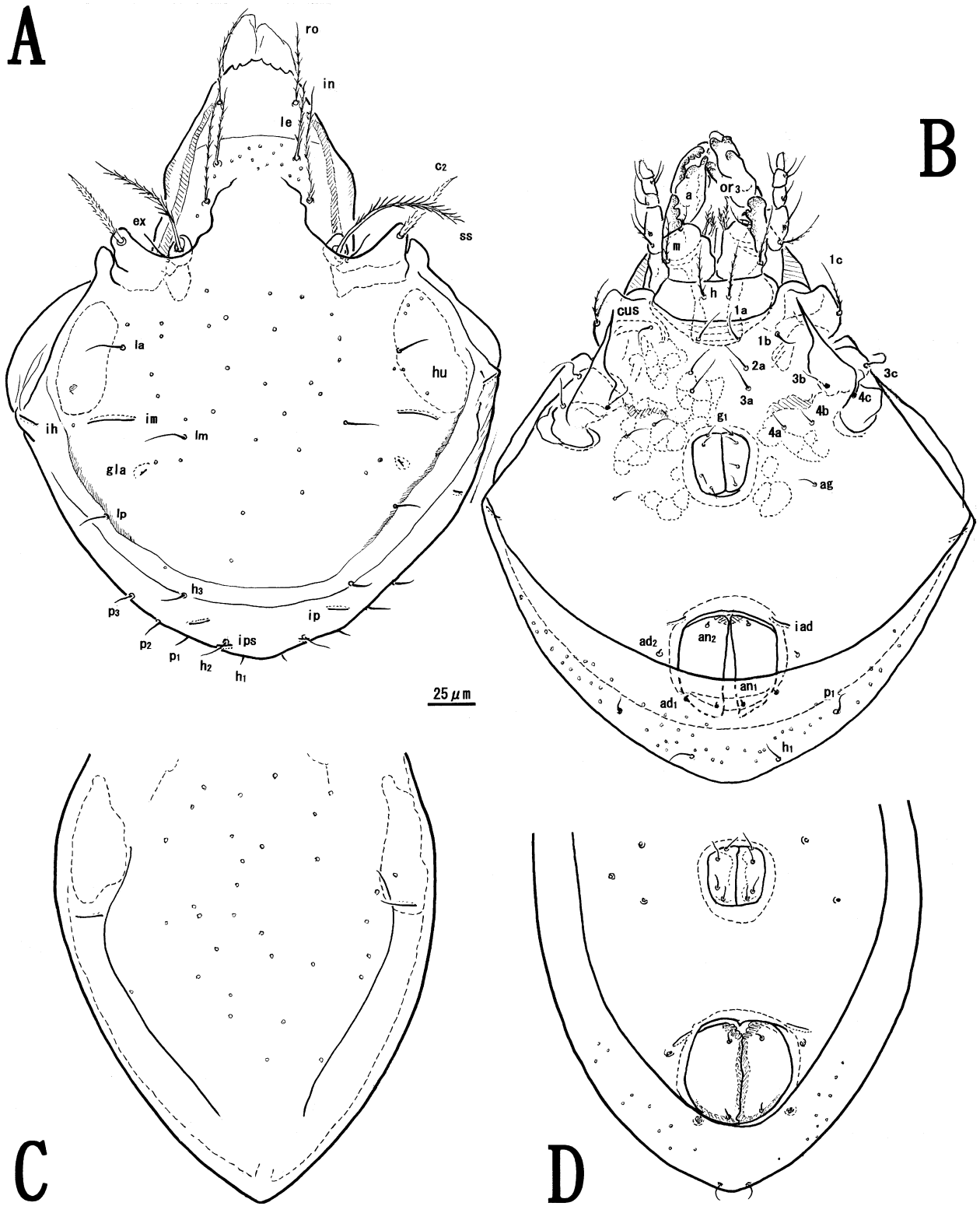


FIG. 1: *Ghilarovus sanukiensis* sp. nov. (X 600; not depressed condition) A. — Dorsal view; B. — Ventral view; C. — Notogaster; D. — Genito-anal region. Abbreviations: *ro*, *le*, *in*, *ex*: Rostral, lamellar, interlamellar and exobothridial setae; *ss*: Sensillus; *la*, *lm*, *lp*, *c*<sub>2</sub>, *h*<sub>1-3</sub>, *p*<sub>1-3</sub>: Dorsal setae; *im*, *ip*, *ips*, *iad*: Lyrifissures; *1a-c*, *2a-c*, *3a-c*, *4a-c*: Epimeral setae; *g*<sub>1</sub>, *ag*, *an*<sub>1-2</sub>, *ad*<sub>1-2</sub>: Genital, aggenital, anal and adanal setae; *a*, *m*, *h*: Anterior, medial and posterior subcapitular setae; *Or*<sub>3</sub>: adoral seta; *hu*: Humeral sac; *cus*: Custodia.

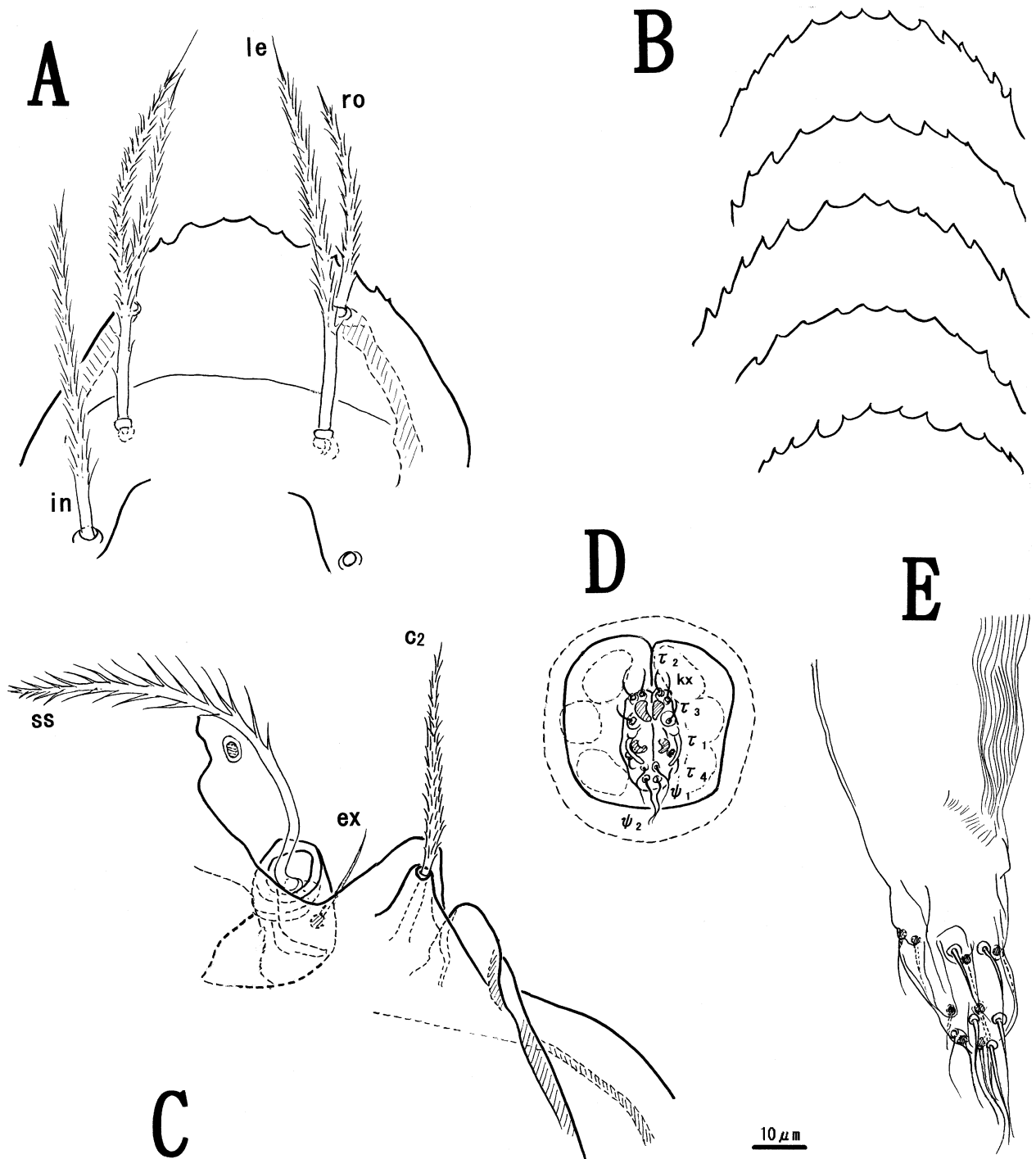


FIG. 2: *Ghilarovus sanukiensis* sp. nov. (X 1,500; depressed condition) A. — Anterior region of prodorsum; B. — Variation of rostral dents; C. — Bothridial and humeral region; D. — Genital organ of male; E. — Genital organ of female. Abbreviations: *ro*, *le*, *in*, *ex*: Rostral, lamellar, interlamellar and exobothridial setae; *ss*: Sensillus.  $c_2$ : Dorsal seta  $\psi_1$   $\psi_2$ ;  $\tau_{1-4}$ , *kx*: Eugenital setae.

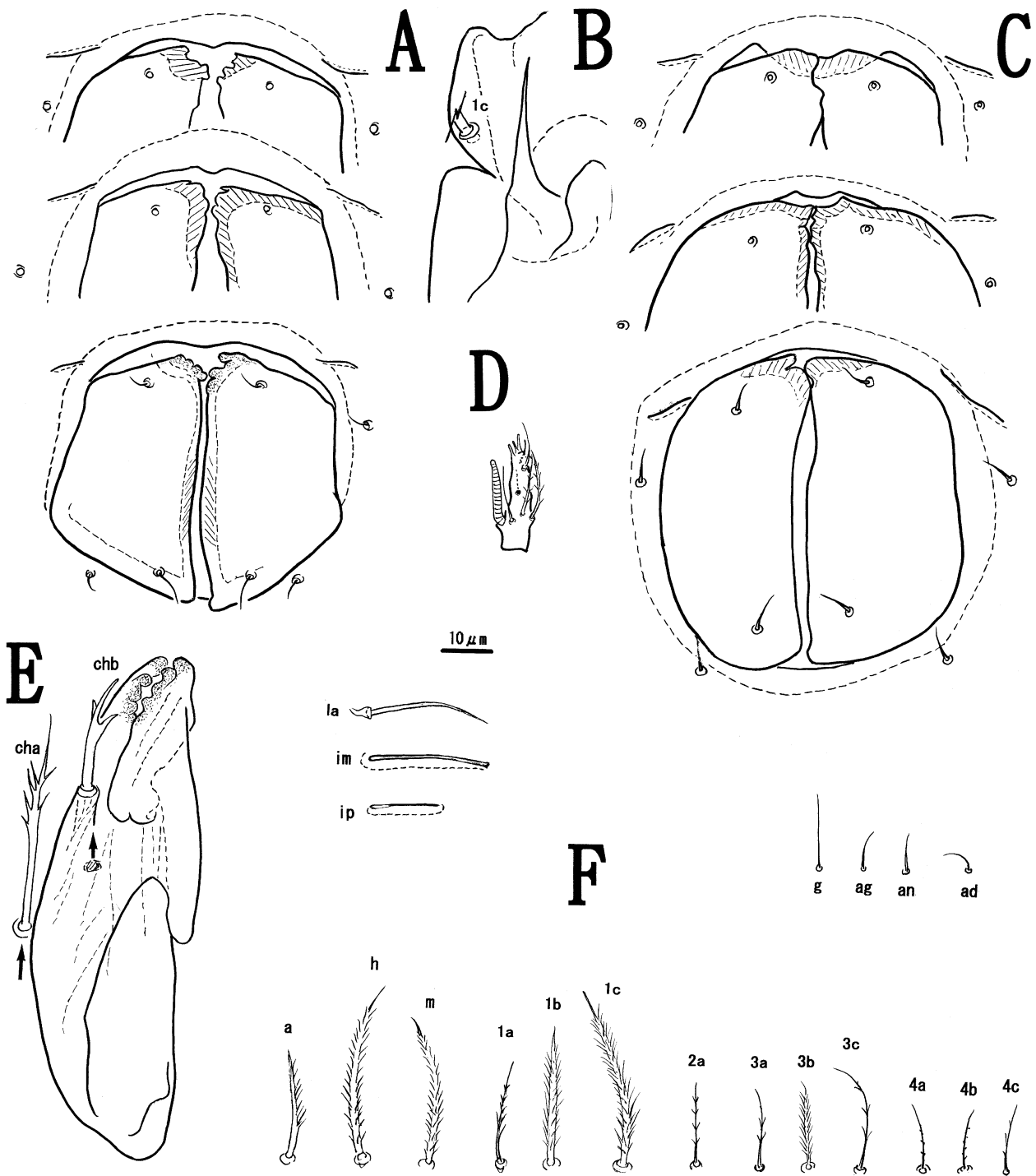


FIG. 3: *Ghilarovus sanukiensis* sp. nov. (X 1,500; depressed condition) A. — Variation of lyrifissure *iad* of females; B. — Custodium; C. — Variation of lyrifissure *iad* of males; D. — Tarsus of pedipalp; E. — Chelicera; F. — Setae and lyrifissures. Abbreviations: *la*, *lp*: Dorsal setae; *im*: Lyrifissure; *1a-c*, *2a*, *3a-c*, *4a-c*: Epimeral setae; *g*, *ag*, *an*, *ad*: Genital, aggenital, anal and adanal setae; *a*, *m*, *h*: Anterior, medial and posterior subcapitular setae; *cha*, *chb*: Posterior and anterior setae of chelicera.

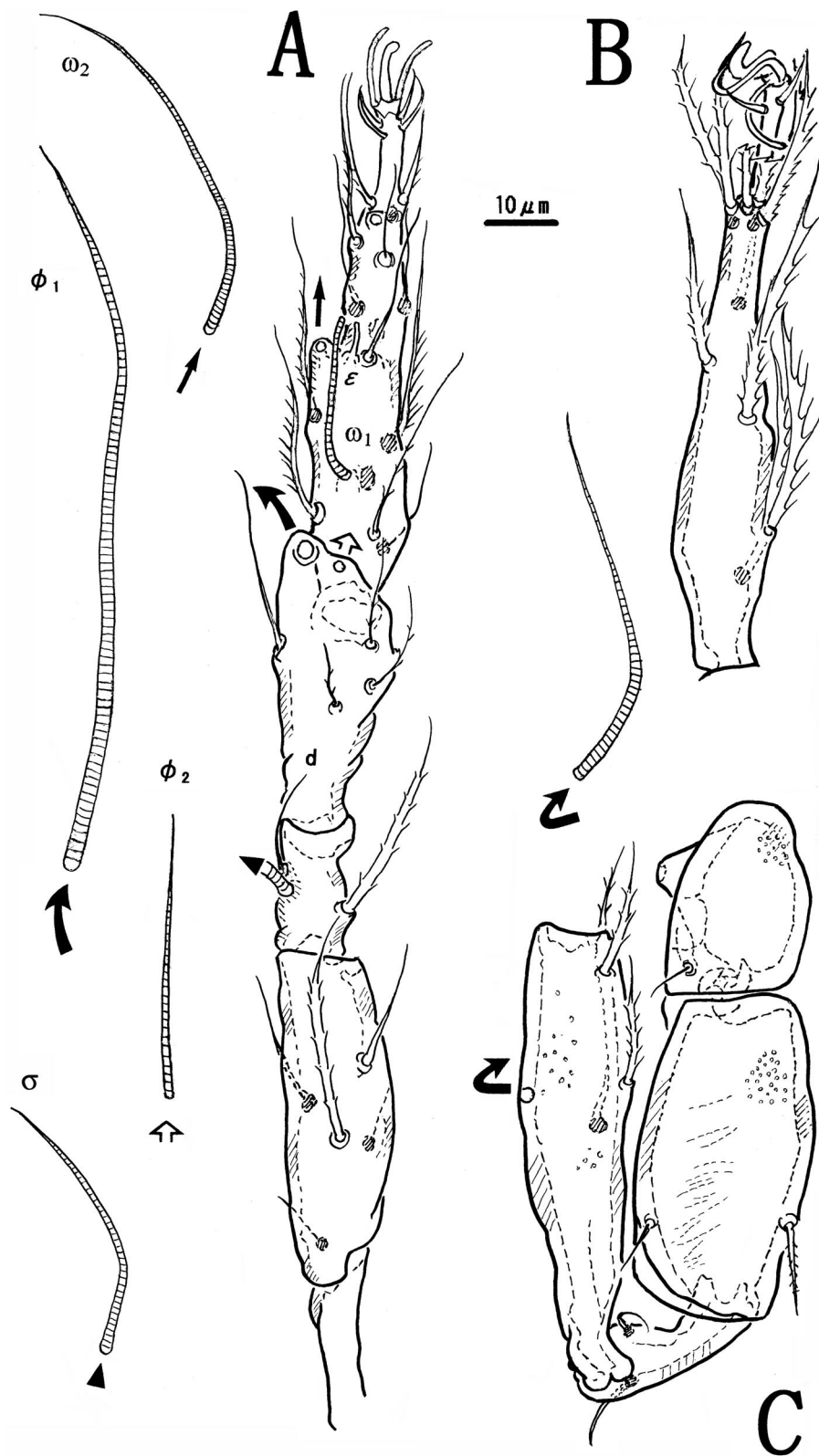


FIG. 4: *Ghilarovus samukiensis* sp. nov. (X 1,500; depressed condition) A. — Left leg I; B. — Tarsus of left leg IV; C. — Tibia to trochanter of left leg IV. Abbreviations: *d*: Dorsal setae; Famulus on tarsus of leg I;  $\omega_{1-2}, \phi_{1-2}, \sigma I$ : Solenidia on tarsi, tibiae and genua of leg I.

presence of lateral ridges on the prodorsum; the presence of barbs in all epimeral setae; the cilia of sensillus variable in number (15 to 16 long cilia, and 9 to 11 short ones); notogaster not separated at the posterior border; dorsal setae *la* that are as long as the lyrifissure *im*; the baciliform solenidion  $\omega_1$  and famulus; and setal formula on legs. Specimens of the new species were collected from horticultural gardens near the seashore and showed a high proportion of males, as is seen in *Anoplozetes jamiesoni* Lee et Pajak, 1987, collected from arid grasslands. Although both these species are found in arid habitats, it is not clear whether having a high proportion of males is an adaptation to the environment.

#### ACKNOWLEDGEMENTS

The author wishes to express her sincere thanks to the Daikōji Temple, the Jinne-in Temple and the Shusshakaji Temple in Kagawa Prefecture for their kindness in allowing her sampling and valuable advices. She would also like to thank to Prof. Dr. Y. NAKAMURA of Ehime University who kindly assisted with sampling.

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