

Oligaphorura judithnajtae n. sp. from Japan (Collembola, Onychiuridae)

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ABSTRACT

A new species *Oligaphorura judithnajtae* n. sp., from Shigawatari Do Cave, Akka Iwaizumi, Japan is described and illustrated. The new species is exceptional by the presence of ventral pseudocelli on abdominal segments I-IV, the large size of s-microchaetae (ms) on antennae and thoracic terga II and III, by the long, thin body macrochaetae and by the build of furcal remnant. *Oligaphorura judithnajtae* n. sp. seems to be most similar to *O. duocellata* Babenko & Fjellberg, 2015 but can be distinguished from that species as the first thoracic segment has one pso (two pso in *duocellata*), the presence of one pso on each subcoxae (2,2,3 pso in *duocellata*) and by the PAO with one four-lobed vesicle (three-lobed in *duocellata*).

KEY WORDS

Pref. Iwate,
Japan,
Oligaphorurini,
cave,
new species.

RÉSUMÉ

Oligaphorura judithnajtae n. sp. du Japon (Collembola, Onychiuridae).

Une nouvelle espèce *Oligaphorura judithnajtae* n. sp., originaire de la grotte de Shigawatari Do, Akka Iwaizumi, Japon, est décrite et illustrée. Il s'agit d'une espèce exceptionnelle par la présence de pseudocelles ventraux sur les segments abdominaux I-IV, la très grande taille des s-microchètes sur les antennes et les tergites thoraciques II-III, par les macrochètes longs et minces sur le corps, et par la structure du vestige furcal. *Oligaphorura judithnajtae* n. sp. semble plus similaire à *O. duocellata* Babenko & Fjellberg, 2015, mais se distingue de cette espèce car le premier segment thoracique possède un seul pso (deux pso chez *duocellata*), chaque subcoxa possède un pso (2, 2, 3 chez *duocellata*) et l'organe postantennaire (OPA) a une vésicule quatre-lobée (tri-lobée chez *O. duocellata*).

MOTS CLÉS

Pref. Iwate,
Japon,
Oligaphorurini,
grotte,
espèce nouvelle.

INTRODUCTION

The genus *Oligaphorura* Bagnall, 1949 currently comprises 21 species restricted in distribution to the Holarctic Region (Bellinger *et al.* 2016). Only eight of them have previously been recorded from Japan.

The current paper presents the description of one of several new onychiurid species bequeathed to us by Professor Ryozyo Yoshii in the 1990's.

MATERIAL AND METHODS

The type material is deposited in the Institute of Systematics and Evolution of Animals, Polish Academy of Sciences in Kraków, Poland (ISEA) and in the Muséum national d'Histoire naturelle (MNH), in Paris, France.

ABBREVIATIONS

Body parts

Abd.	abdominal segments;
AIIO	sensory organ of Ant. III;
Ant.	antennal segments;
AS	anal spines;
ms	s-microchaeta;
pso	pseudocellus;
PAO	postantennal organ;
psp	pseudopore;
psx	parapseudocellus;
Th.	thoracic segments;
VT	ventral tube.

SYSTEMATIC

Family ONYCHIURIDAE Lubbock, 1867

Genus *Oligaphorura* Bagnall, 1949

Oligaphorura judithmajtae n. sp.
(Figs 1, 2)

TYPE MATERIAL. — **Holotype**. ♂: Japan, Shigawatari Do Cave, Akka Iwaizumi, Pref. Iwate, 29.VIII.1990, leg. Yanagisawa (ISEA). **Paratypes**. 1 ♀, 2 juveniles: same data as holotype (ISEA); 1 ♂: same data as holotype (MNH).

ETYMOLOGY. — The new species is dedicated cordially to our Colleague, Master and Friend – world-renowned collembologist – Judith Najt.

DIAGNOSIS. — PAO with one four-lobed vesicle. Pso formula: 1+22/133/33342+1 dorsally, 2/-/1111 ventrally, each subcoxa with one pso. Psx indistinct. Th. tergum I with 6+6 chaetae, with some asymmetries (4-7 chaetae). Ms on Ant. IV and III, Th. II and III prominent in size.

DESCRIPTION

Body

Holotype (♂): length 1.12 mm, paratype female: 1.69 mm, paratype males: 1.47-1.66 mm. Shape of body cylindrical (Fig. 1A). Colour in alcohol white. Granulation with coarse granules around all dorsal pseudocelli, usually 12 grains around each pseudocellus.

Antennae

Antennae shorter than head. Ant. I with 8 chaetae, Ant. II with 15-16 chaetae. AIIO consisting of five guard chaetae, five papillae, two smooth sensory rods, two sensory clubs morel-like (internal one straight and smaller, external bent and bigger), lateral s-microchaeta (ms) present (Fig. 1B, C). Ant. IV with subapical organite and s-microchaeta in the second basal row of chaetae (Fig. 1B).

Postantennal organ

PAO with one four-lobed vesicle (two anterior twice longer than posterior ones), located in small cuticular depression (Figs 1D; 2A). Labral formula of chaetae: 4/342. Labium of type AC, 10 (7 long and 4 spiniform) guard setae and 6 proximal setae present (Fig. 1E).

Pseudocelli

PSO formula dorsally: 1+22/133/33342+1 (Fig. 1A); ventrally: 2/-/1111. Psx indistinct. All subcoxae 1 with one pseudocellus. Psp formula dorsally 011/1111, ventrally 111/???1m.

Chaetotaxy

Dorsal chaetotaxy with asymmetry, as in Fig. 1A. Chaetae relatively long and thin, differentiated into macro- and mesochaetae. Sensory chaetae s undifferentiated. Th. tergum I with 6+6 chaetae sometimes asymmetrically with 4-7 chaetae. Th. tergum II and III with prominent lateral microsensilla (ms) = 0.05 mm (Fig. 2C, D). Abd. tergum V without medial unpaired chaetae. Abd. tergum VI with two medial chaetae, a0 and p0. AS on small papillae (Fig. 1A), reaching in length inner edge of claw.

Th. sterna I-III with 0+0, 1+1, 1+1 chaetae respectively. VT with 8+8 chaetae and 2+2 setae at base (Fig. 2B). Male genital plate as in Figure 2E, males without ventral organ.

Furcal rudiment as a very small, finely granulated area with very small cuticular furrow. Chaetotaxy of manubrial field consists of 2 chaetae in ma-row (so-called "dental setae"), 4 chaetae in mm'-row, 4 chaetae in mm-row and 4 chaetae in mp-row (external ones as macrochaetae) (Figs 1F; 2G). Anal valves with numerous acuminate chaetae; each lateral valve with a0 and 2a1; upper valves with chaetae a0, 2b1, 2b2, c0, 2c1, 2c2 (Fig. 2F).

Legs

Tibiotarsi I-III with 20 (11 A+T, 8 B, 1C), 20-21 (11 A+T, 8 B, 1-2C) and 19 chaetae (11 A+T, 7 B, 1C), respectively. Femora I, II, III with 17, 16, 14, trochanters I, II, III with 9, 9, 9, coxae I, II, III with 3, 8-11, 9-12, scx 2 I, II, III with 0, 3, 3 and scx 1 I, II, III with 2-3, 3-4, 3-4 chaetae. Claw without denticle. Empodial appendage with small basal lamella, length of empodium 0.6 of inner edge of claw (Fig. 1G).

DISCUSSION

The new species is quite exceptional by the presence of ventral pseudocelli on abdominal segments I-IV, the large size of s-microchaetae (ms) on antennae and thoracic terga II and III, by the long, thin body macrochaetae and by the build of furcal remnant (see above).

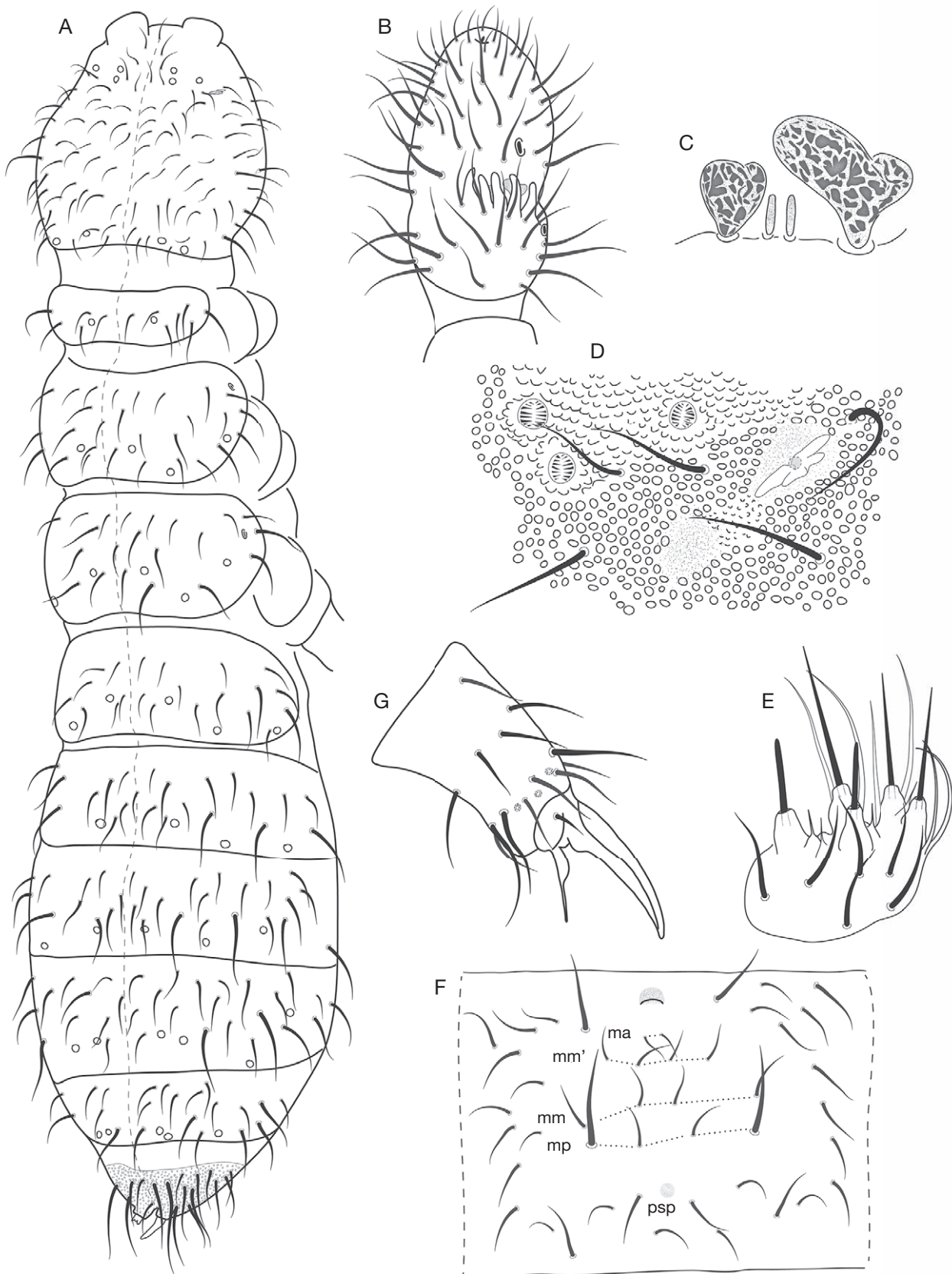


FIG. 1. — *Oligaphorura judithnajtae* n. sp.: **A**, habitus and dorsal chaetotaxy; **B**, dorsal side of Ant. IV; **C**, sensory elements of Ant. III; **D**, PAO and anterior cephalic pso; **E**, labial palp; **F**, furcal area; **G**, tibiotarsus of leg III. Abbreviations: see Material and methods.

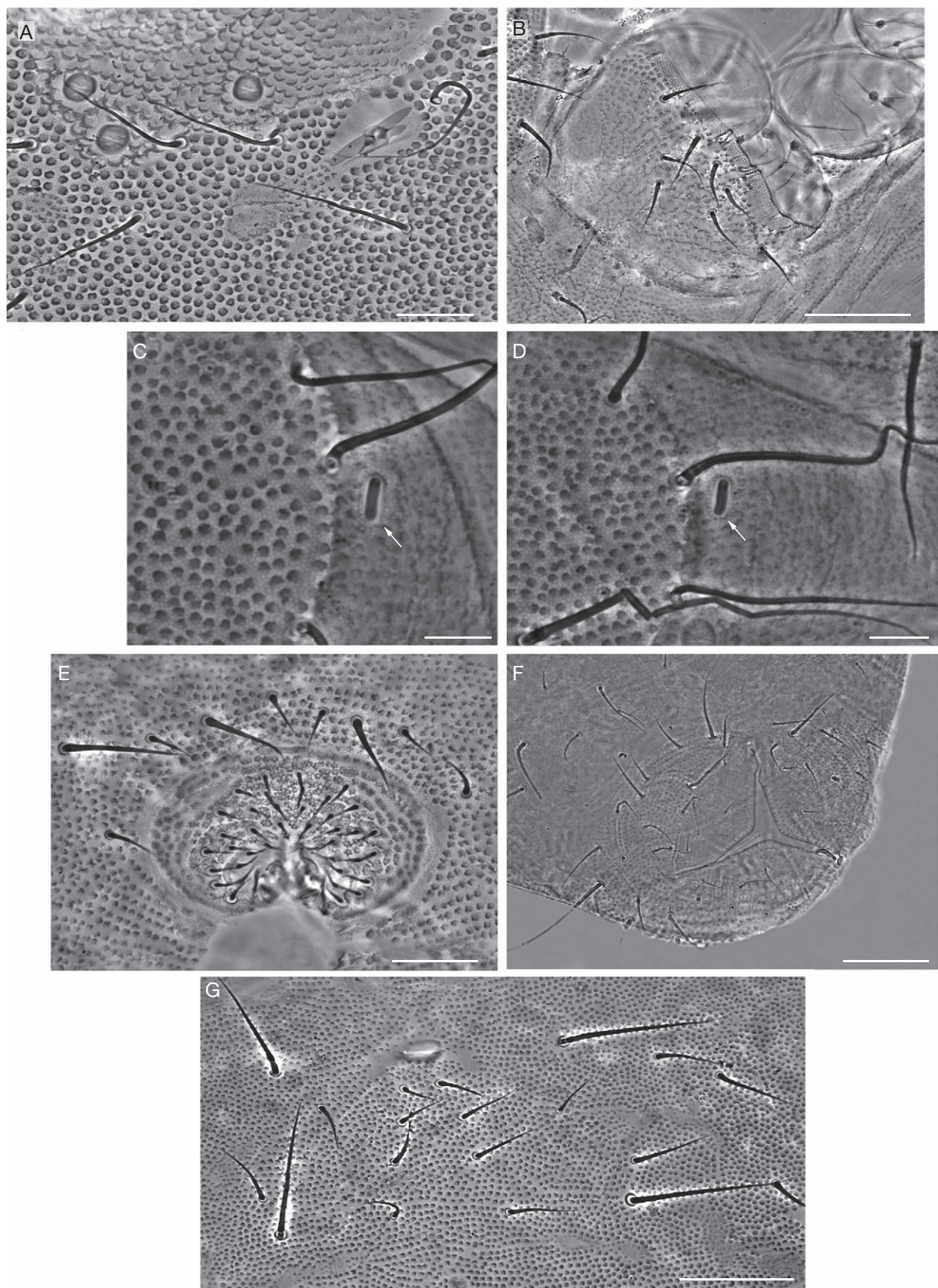


FIG. 2. — *Oligaphorura judithnajtae* n. sp.: **A**, PAO and anterior cephalic pso; **B**, ventral tube; **C**, microsensilla (arrow) on thoracic tergum II; **D**, microsensilla (arrow) on thoracic tergum III; **E**, male genital plate; **F**, anal valves; **G**, furcal area. Scale bars: A, E, 10 µm; B, F, G, 20 µm; C, D, 5 µm.

Only four species in the tribe possess ventral pso on abdominal segments and anal spines: *Onychiurus* (*Oligaphorura*) *multiperforata* Gruia, 1973 and *Onychiurus* (*Oligaphorura*) *uralica* Khanislomova, 1986, both treated as *Micraphorura* in Bellinger *et al* (2016), *Dimorphaphorura olenae* Weiner & Kaprus, 2014 and *O. duocellata* Babenko & Fjellberg, 2015, the only member of the genus *Oligaphorura*.

All these species differ from *O. judithnajtae* n. sp. mainly by the build of furcal remnant (four rows of manubrial setae in the new species, in contrast to the three rows in remaining species). Additionally, *M. multiperforata* is unique by multiplication of dorsal pso, while *M. uralica* differs from the new species by the dorsal abdominal pso formula (44454 in *uralica* and 33343 in the new species) and by the number of pso on subcoxae (2,3,3 in *uralica* and 1,1,1 in the new species). *Dimorphaphorura olenae* clearly differs from *O. judithnajtae* n. sp. mainly by the PAO with one three-lobed vesicle (four-lobed in the new species) and nine setae in distal whorl of tibiotarsi (eleven in the new species).

Oligaphorura judithnajtae n. sp. seems to be most similar to *O. duocellata* but can be distinguished from that species as the first thoracic segment has one pso (two pso in *duocel-*

lata), the presence of one pso on each subcoxae (2,2,3 pso in *duocellata*) and by the PAO with one four-lobed vesicle (three-lobed in *O. duocellata*).

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