A New Species of the Genus *Nothrus* from Central Japan
(Acari: Oribatida: Nothridae)

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Abstract A new oribatid mite of the family Nothridae, *Nothrus undulatus* sp. nov., is described from litter and soil layer of natural forests of Arimine in Toyama, Central Japan. The new species is distinguishable from other closely related species of *Nothrus* mainly by large body size and long setae *c*, only slightly shorter than setae *c*.

Key words: Central Japan, new species, *Nothrus*, Oribatida

Introduction

The most recent revision of the genus *Nothrus* in Japan was made by FUJIKAWA (1999), who described eight new species from Hokkaido, Sado Island and northern Honshu of Japan. At this moment, 14 species are assigned to the genus in Japan. We add here one more species collected from the natural forests of Arimine at the foot of Mt. Tateyama in Toyama Prefecture, Central Japan.

*Nothrus undulatus* sp. nov.

(Figs. 1–17)

*Nothrus* sp. 2: SUMA, HIRAUCHI, ISHI, ISHIKAWA, SHIBA, NOMURA, SATO, ASAMA, ISHIZUKA, NAKAMURA, NEGORO and NUNOMURA, 2002, p.75.

Measurements and color (7 exs.): Body length 1080 (1142) 1188 μm; width 594 (629) 664 μm. Brown or dark brown.

Prodorsum: Surface covered with alveoli variable in size and form (Figs. 1 and 12). Rostrum split at tip, the part appearing to be a light spot surrounded by a dark frame (Fig. 3). Rostral setae (*ro*) spiniform, slightly roughened, 34–47 μm, shorter than their mutual distance (Fig. 3). Lamellar setae (*le*) bacilliform, minutely barbed, usually covered with a simple hyaline integument, 45–59 μm, only a little longer than their mutual distance and their tips not reaching at the insertions of setae *ro* (Fig. 3). Interlamellar setae (*in*) slightly notched at tip, spatula-like in shape with a simple hyaline integument, 51–55 μm, about 0.3 × as long as their mutual distance, longer than setae *ro*, as long as setae *le* (Figs. 1, 3 and 4). Sensillus (*ss*) slender bacilliform, nearly glabrous with sparse minute barbs, 232–275 μm, about as long as distance between bothridia which situated far from each other (Figs. 1 and 4). Exobothridial seta (*ex*) glabrous, spiniform, with a simple hyaline integument (Fig. 4). A lateral round protubrance is present in front of leg I (Fig. 1). Relative lengths and distances of prodorsal setae: *ss* ≥ (*Bo-Bo*) > (*in-in*) > (*le-le*) > (*ro-*ro*) > *le* ≥ *in* > *ro* > *ex*.

Notogaster: Elongate; anterior margin almost straight, but the posterior margin strongly convex; lateral and posterior margin undulate (Fig. 1). Notogastral shield arched in central part, widest at level of setae *e*; surface covered with round or oval foveolae; interspace among foveolae slightly wider than in other species; the foveolae smaller and less distinct on marginal field of notogaster (Figs. 1 and 13). Central field wide; pairs of setae *c*, *d*₁, *d₂*, *e*, and *f₁* inserted far from margin of central field; mutual distance of setae *d*₁ smallest. All notogastral setae more or less covered with a hyaline sheath, masking their actual shape (Figs. 1, 2 and 6). Each seta of *c*, *d*, *e*, and *f₁* series with a sheath like a willow leaf, weakly pointed at tip (Fig. 2), while each seta of *h* and *p* series clavate, gradually thickened distally, except for seta *p*_ short and sharply pointed at tip (Fig. 6). Actual shape of setae, when removed the covering sheath, only slightly

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The Japanese Society of Soil Zoology

branched in c-, d-, e- and f- series and more distinctly branched in h- and p- series. Setae c-, d- and e- series approximately equal in length (c- series 92–113 µm, d-series 101–119 µm and e- series 96–118 µm), and longer than setae f- series (80–96 µm); seta c; inserted somewhat close to c; distance between c; and c; about 1.1 x as long as that between c; and c;; seta c; subequal in length to, or slightly shorter than, seta c (Figs. 1 and 2); setae h; and p; considerably branched under sheath layer, longer and wider than others; seta h; 127–157 µm, 1.1–1.5 x as long as seta p; (105–135 µm), varied in length; seta h; 64–81 µm, about one-half as long as seta h; (Fig. 6); tip of seta h; only slightly or not extending beyond the posterior margin of notogaster (Fig. 1); seta h; inserted at the level of insertion of seta p; (Fig. 8). 

**Ventral region:** Ventral setae glabrous; setae an, ad, g and h with a simple hyaline integument (Figs. 7, 8 and 11). Genital setae g; inserted near lateral margins of plates; the remainder near inner margins of plates (Fig. 7). Epimerata III and IV separated mediad; setial formula of epimerata: 6[7]–4[5]–5[6]–6; setae of epimerata I, II and III variable in number; epimeral setae glabrous, usually with a simple hyaline integument (Fig. 7). Tarsal setae of pedipalp glabrous; solenidion bacilliform; ulimal and superior setae pointed at tip; setal formula of pedipalp: 0–1–1–3–9 (Fig. 9). 

Infracapitular setae (a, m, h) glabrous; two pairs of median infracapitular setae (m; and m;) inserted continguously each other; seta a; about twice as long as seta m;; distance between setae a; and m; considerably greater than that between m; and m; (Fig. 10). Relative lengths and distances of principal ventral setae: a; > ad; > (a-m;); ≡ an; > h ≡ g; ≡ 4a > m; > m; (m; m;).

**Legs:** All legs heterotridactylos; all claws glabrous; median claw strong and lateral claws very thin. Leg chaetotaxy including femur, but excluding solenidia: I (1–8–5–6–27); II (1–8–5–5–24); III (3–5–5–5–22); IV (2–4–4–5–22). Soleniodotaxy: I (1–2–3); II (1–1–1); III (1–1–0); IV (1–0–0). On tarsus I, all fundamental and accessory dorsal setae minutely rugged; solenidion ω; bacilliform; ω; and ω; setiform; ω; about one-half as long as ω;*, and 1.7 x as long as ω;; setal formula ε about 0.7 x as long as ω;*, and longer than ω; and ω; (Fig. 14); ω; inserted antero-laterally to ω;*, and lateral to ω;*; ε inserted anterior to ω; and ω; (Fig. 17). Seta d; shorter than solenidion on tibia I and genu I (Fig. 15).

**Type series:** Holotype (NSMT-Ac 11482, in spirit) and 4 paratypes (NSMT-Ac 11483–11486, 1 in spirit and 3 on slides): Tsudeta-dani (altitude 1,120 m), Arimine, Ohyama-machi, Toyama Prefecture, Central Japan, 9-VIII-1999, Y. Hirauchi, from litter and soil in the natural forest of *Betula platyphylla SUKATCHEV* var. *japonica HARA;* 5 palatypes (NSMT-Ac 11487–11491, 2 in spirits and 3 on slides); the same data as the above-mentioned holotype and paratypes but from forest of *Larix leptolepis MURRAY* in Nishi-tani, Arimine. The type series is deposited in the collection of the National Science Museum, Tokyo.

**Remarks:** In the strongly undulate notogaster, the present species, *Nothus undulatus* sp. nov., is similar to *Nothus rugulosus BANKS, 1895*, according to the redescription by SENGBUSCH (1951). The former is distinguished, however, from the latter by (1) far larger body size (815 × 400 µm in *N. rugulosus*), (2) setae c; longer than c; and (3) short setae h; about one-half as long as setae h;.


However, the new species is different from the first species, *N. anauniensis*, redescribed by OLSZANOWSKI (1996), in (1) far larger body size, (2) spiniform rostral setae, (3) long notogastral setae c; only slightly shorter than setae c; (4) wide central field, (5) ventral setae usually covered with hyaline integument, (6) the presence of 24 setae on tarsus II, 4 setae on genu and femur IV, (7) long femur ε, longer than half the length of ω; and longer than ω;*, and (8) the shape of notogaster, strongly convex posteriorly and undulating on postero-lateral margin; from the second species, *N. borassicus*, redescribed by SELLNICK & FORSSLUND (1955) and OLSZANOWSKI (1996), in (1) long notogastral setae c; (2) short setae h; about one-half as long as setae h;*, and slightly or not extending beyond the posterior margin of notogaster, (3) ventral setae usually covered with hyaline integument, (4) the presence of 24 setae on tarsus II, 8 setae on femur II, 4 setae on genu and femur IV, and (5) the shape of notogaster, strongly convex posteriorly and undulating on postero-lateral margin; from the third species, *N. pratensis*, described by
A new species of *Notrus* from Japan

Figs. 1–2. *Notrus undulatus* sp. nov. 1. Dorsal view; 2. Dorsal setae.
Figs. 3-6. *Nothrus undulatus* sp. nov. 3. Anterior part of prodorsum in dorsal view; 4. Left bothridial region. ss: sensillus; ex: exobothridial seta; in: interlamellar seta; 5. Lateral part of notogaster in dorsal view; 6. Posterior dorsal setae.
A new species of *Notthus* from Japan

SELLNICK (1928) and redescribed by SELLNICK & FORSSLUND (1955) and OLSZANOWSKI (1996), in (1) larger body size and the shape of notogaster, (2) rostral setae shorter than lamellar setae, (3) long notogastral setae $c_5$, (4) ventral setae usually covered by hyaline integument, and (5) the presence of 2 setae on trochanter IV and 4 setae on genu IV; from the last species, *N. ishikariensis* FUKUIWA, 1999, in (1) notogaster undulating on postero-lateral margin, (2) spiniform rostral setae, (3) short sensilli as long as distance between bothridia, (4) long setae $c_5$, only slightly shorter than setae $c_6$, (5) setae $c_5$, $d_5$, $e_5$ and $f_5$ series with a sheath, only slightly branched, (6) ventral setae glabrous and usually covered with hyaline integument, (7) setal formula of epimerata: 6[7]−5[9]−5[6]−6, (8) glabrous claws, (9) the presence of 24 setae on tarsus II, 8 setae on femur I and 4 setae on genu and femur IV, and (10) pulsus $\varepsilon$ inserted anterior to $\omega_3$ and $\omega_6$ on tarsus I. The specific name *undulatus* refers to the strongly undulate notogaster.

**References**


