Two New Species of Phytoseiid Mites from Japan (Acarina: Phytoseiidae)¹

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Amblyseius (*Amblyseius*) *alpicola* n. sp. and *Amblyseius* (*Indoseiulus*) *liturivorus* n. sp. from Honshu were described and illustrated. *A. (A.) alpicola* was taken from *Acer* on Shiga Heights, Nagano Prefecture, and from *Alnus* on Mt. Daisen, Tottori Prefecture. *A. (I.) liturivorus* was found to prey on spider mites of *Tetranychus* and young larvae of *Spodoptera litura* (FABRICIUS) on soy bean in a greenhouse of Wakayama Prefecture.

About sixty species of the predaceous mite family Phytoseiidae have hitherto been reported from Japan. In the present paper two new species of the genus *Amblyseius* BERLESE from Honshu are described and figured: *A. (A.) alpicola* from *Acer* on Shiga Heights, Nagano Prefecture, and from *Alnus* on Mt. Daisen, Tottori Prefecture; and *A. (Indoseiulus) liturivorus* feeding on spider mites of *Tetranychus* and young larvae of the common cutworm *Spodoptera litura* (FABRICIUS) on soy bean in a greenhouse of Wakayama Prefecture.

The type-series of the new species will be preserved in the Biological Institute, Faculty of Education, Tottori University.

Amblyseius (*Amblyseius*) *alpicola* n. sp.

(Japanese name: Takane-kaburidani)
(Figs. 1–9)

Female. Dorsal shield reticulate, with seven pairs of pores (solenostomes). Setae on dorsal shield: L_9 very long, stout, barbed, approximately twice as long as M_2 , the latter stout, barbed; remaining setae smooth; L_4 approximately as long as M_2 ; L_6 less than twice as long as L_5 ; L_7 longer than, or as long as distance between L_7 and M_2 . Setae S_1 and S_2 on interscutal membrane. Peritreme extending anterior to, or beyond seta D_1 ; posterior extension of peritrematal shield with termination truncate. Sternal shield with three pairs of setae; metasternal platelets longer than wide. Ventrianal shield longer than wide, wider than genital shield, with lateral margins slightly concave; three pairs of preanal setae; a pair of crescentic pores (solenostomes) between and slightly caudad of posterior pair of preanals. Two pairs of slender metapodal platelets. Spermatheca as figured. Fixed digit of chelicera multidentate; the movable digit tridentate. Chaetotaxic formula: genu II, 2–2/0, 2/0–1; genu III, 1–2/1, 2/0–1. Leg IV with three macrosetae, genu, tibia and basitarsus. Measurements in μm : idiosoma length 330, idiosoma width 240; lengths

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Figs. 1-6. *Amblyseius* (*Amblyseius*) *alpicola* n. sp. (♀). 1, dorsum of idiosoma. 2, sternal shield. 3, posterior ventral surface. 4, spermatheca. 5, chelicera. 6, genu, tibia and basitarsus of leg IV.

of setae: L_1 37.7 ± 0.3 ,¹ L_2 18.9 ± 0.2 , L_3 23.1 ± 0.3 , L_4 44.0 ± 0.4 , L_5 16.7 ± 0.4 , L_6 25.3 ± 0.7 , L_7 20.2 ± 0.4 , L_8 17.0 ± 0.4 , L_9 102.8 ± 1.5 , M_1 7.8 ± 0.2 , M_2 46.8 ± 0.8 , D_1 22.7 ± 0.5 , D_2 9.2 ± 0.3 , D_3 5.8 ± 0.3 , D_4 10.7 ± 0.3 , D_5 11.1 ± 0.2 , D_6 6.8 ± 0.2 , S_1 19.4 ± 0.5 , S_2 14.3 ± 0.3 , VL_1 43.1 ± 1.2 , macrosetae on leg IV: genu 37.1 ± 0.4 , tibia 34.0 ± 0.4 , basitarsus 45.3 ± 0.6 .

Male. Setae S_1 and S_2 on dorsal shield. Peritreme not extending anterior to seta D_1 . Ventrianal shield fused with peritrematal shield, with three pairs of pre-

¹ Mean $\pm$ standard error, $n=10$.

Figs. 7-9. *Amblyseius (Amblyseius) alpicola* n. sp. (♂). 7, ventrianal shield. 8, 9, spermatodactyl.

anal setae; a pair of crescentic pores (solenostomes) between and slightly caudal to posteromedian pair of preanals. Spermatodactyl L-shaped, with distal arm very narrow. Measurements in μm : idiosoma length 240, idiosoma width 170; lengths of setae: L_1 32.0, L_2 16.4, L_3 19.4, L_4 35.2, L_5 15.5, L_6 19.4, L_7 16.3, L_8 13.2, L_9 62.9, M_1 7.6, M_2 32.8, D_1 20.4, D_2 8.5, D_3 6.0, D_4 11.4, D_5 12.7, D_6 6.2, S_1 15.2, S_2 12.7, VL_1 26.8, macrosetae on leg IV: genu 25.5, tibia 25.3, basitarsus 39.2.

Type-series. Holotype: ♀, Shiga Heights, Nagano Pref., 26-VII-1978 (S. EHARA), on *Acer ukurunduense* TRAUTV. et MEY. Paratypes: 1 ♀, 18-VII-1968 (H. MORI), other data same as for holotype; 5 ♀♀ & 1 ♂, data same as for holotype; 3 ♀♀, on *Acer tschonoskii* MAXIM., other data same as for holotype; 4 ♀♀, Mt. Daisen, Tottori Pref., 1-VIII-1978 (S. EHARA), on *Alnus pendula* MATSUM.

Remarks. *Amblyseius alpicola* is close to a Russian species *A. bicaudus* WAINSTEIN, but differs from the latter in the relative lengths of setae M_2 , L_7 and L_8 (WAINSTEIN, 1962; LIVSCHITZ and KUZNETZOV, 1972). Furthermore, this species is somewhat similar to *A. tsugawai* EHARA (Japan), but is distinguished from it by having seta L_7 approximately one half as long as L_4 , and by the shape of the spermatheca (EHARA, 1959, 1961, 1964, 1967, 1972).

Subgenus *Indoseiulus*, new name

Indoseiulus GHAI and MENON, 1969, p. 347.

Type: *Indoseiulus ricini* GHAI and MENON, by original designation. Non *Indoseiulus* EVANS, 1955, p. 107.

The subgenus *Indoseiulus* is distinctive in that the peritrematal shields are not fused anteriorly with the dorsal shield. This subgenus bears six pairs of dorsal setae, two pairs of median setae, four pairs of prolateral setae, and four pairs of postlateral setae. The third pair of postlateral setae (L_7) is absent so that the postmedian setae are not transversely paired with any of the postlateral setae. The ventrianal shield is weakly sclerotized, with the margins ill-defined and barely discernible by the surrounding striae on the interscutal membrane.

As here defined, *Indoseiulus* includes two previously described species: *Amblyseius ricini* (GHAI and MENON, 1969) from India, and *A. irregularis* (EVANS, 1953) from Malaysia. The following new species belongs to this subgenus.

Figs. 10-15. *Amblyseius (Indoseiulus) liturivorus* n. sp. (♀). 10, dorsum of idiosoma. 11, sternal shield. 12, posterior ventral surface. 13, metapodal platelet (P: posterior direction). 14, 15, spermatheca.

Amblyseius (Indoseiulus) liturivorus n. sp.

(Japanese name: Kii-kaburidani)

(Figs. 10-18)

Female. Dorsal shield smooth, not fused with peritrematal shields, with seven pairs of pores (solenostomes). Setae on dorsal shield very short, fine, smooth; none

Figs. 16–18. *Amblyseius (Indoseiulus) liturivorus* n. sp. (♀). 16, chelicera. 17, anterior part of peritrematal shield. 18, tarsus, tibia and genu of leg IV.

of these noticeably longer than the rest, D_1 very slightly stouter. Setae S_1 and S_2 on interscutal membrane. Peritreme with anterior end located at coxa I or II (at or near the level of seta D_1); peritrematal shield with posterior extension very narrow. Sternal shield weakly sclerotized, ill-defined, with three pairs of setae; metasternal platelets variable in shape. Ventrianal shield weakly sclerotized, with ill-defined margins, much longer than wide, narrower than genital shield; three pairs of preanal setae, the middle pair caudad from the other two pairs; a pair of distinct pores (solenostomes) posterior to the middle preanals; paranals flanking anterior end of anus. A pair of slender metapodal platelets. Spermatheca with cervix very slender; minor duct dilated near atrium. Fixed digit of chelicera multidentate, the movable digit tridentate. Chaetotaxic formula: genu II, 2–2/0, 2/0–1; genu III, $1-\frac{2,2}{1}$ –1. Leg IV with three macrosetae, genu, tibia and basitarsus. Measurements in μm : idiosoma length 380, idiosoma width 290, length of dorsal shield 341.8, width of dorsal shield 235.8; lengths of setae: L_1 18.9 ± 0.6 , L_2 15.6 ± 0.4 , L_3 16.3 ± 0.5 , L_4 20.4 ± 0.5 , L_5 18.7 ± 0.7 , L_6 21.5 ± 0.4 , L_8 18.4 ± 0.5 , L_9 23.1 ± 0.4 , M_1 14.8 ± 0.4 , M_2 17.2 ± 0.2 , D_1 15.2 ± 0.3 , D_2 13.0 ± 0.5 , D_3 13.7 ± 0.8 , D_4 14.7 ± 0.3 , D_5 16.2 ± 0.4 , D_6 6.5 ± 0.2 , S_1 15.2 ± 0.5 , S_2 17.6 ± 0.4 , VL_1 23.5 ± 0.4 , macrosetae on leg IV: genu 33.7 ± 0.6 , tibia 45.9 ± 0.5 , basitarsus 45.3 ± 0.7 .

Male. Not known.

Type-series. Holotype: ♀, Kisigawa, Wakayama Pref., 5-X-1980 (S. YANO), on soy bean (in greenhouse). Paratypes: 15 ♀♀, data same as for holotype; 1 ♀, 30-IX-1980, other data same as for holotype.

Remarks. *Amblyseius liturivorus* resembles *A. ricini* (GHAI and MENON) from India and *A. irregularis* (EVANS) from Malaysia. But, it differs from *ricini* in the vertical setae (D_1), the movable digit of the chelicera, and the macrosetae on leg IV (GHAI and MENON, 1969). Further, *A. liturivorus* is readily distinguished from *irregularis* by the relative lengths of the dorsal idiosomal setae (CHANT, 1959), and by the structure of the chelicera (EVANS, 1953).

This mite was found by Mr. S. YANO to prey on spider mites of *Tetranychus* and on young larvae of the common cutworm *Spodoptera litura* (FABRICIUS) on soy bean in a greenhouse (YANO, personal communication).

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