Species Diversity, 2008, 13, 189–193

A New Species of *Eotetranychus* Spider Mite (Arachnida: Acari: Tetranychidae) from *Tilia* (Tiliaceae) in Hokkaido

Shôzô Ehara¹ and Tetsuo Gotoh²

¹ *Hamasaka 2-15-7, Tottori, 680-0001 Japan*

E-mail: shozoehama@ncn-t.net

² *Laboratory of Applied Entomology and Zoology, Faculty of Agriculture,*

Ibaraki University, Ami, Ibaraki, 300-0393 Japan

E-mail: gotoh@mx.ibaraki.ac.jp

(Received 21 February 2008; Accepted 1 June 2008)

Eotetranychus tiliaecola Ehara and Gotoh, sp. nov. is described and illustrated from *Tilia maximowicziana* Shirasawa (Tiliaceae). It was also found to occur on *T. japonica* (Miq.) Simonkai in Hokkaido, Japan. The aedeagus of this species closely resembles that of *E. tsugaruensis* Ehara, 1989, but differs in having the distal part strongly sigmoid and its termination more slender, and in the widely concave dorsal margin of the shaft.

Key Words: Acari, *Eotetranychus*, Hokkaido, Japan, new species, spider mite, Tetranychidae, *Tilia*.

Introduction

Spider mites of the genus *Eotetranychus* Oudemans in the subfamily Tetranychinae are characterized by an opisthosoma with transverse striae in the dorso-central area and 2 pairs of para-anal setae, and by trifurcate empodia (usually except for leg I of the male). These mites are found feeding on the under surface of leaves; summer females of most species are pale green-yellow, while those of the remaining species are pale yellow or reddish. There are approximately 185 known species of *Eotetranychus* in the world (Bolland *et al.* 1998; Migeon and Dorkeld 2007), and 22 species have so far been reported from Japan (Ehara 1999; Ehara and Gotoh 2006). In the present paper a new species of this genus is described and illustrated from *Tilia maximowicziana* Shirasawa in Hokkaido.

Materials and Methods

The collected mites were preserved in 70% ethyl alcohol and later mounted in Hoyer's medium on glass slides for examination. Mites were examined under an Olympus BHS compound microscope equipped with phase contrast system. Drawings were made using a camera lucida attached to the microscope.

The setal notations generally follow Lindquist's (1985) system. The measurements are given in micrometers (μm); those of the holotype of the new species are shown in parentheses following the mean. The holotype and some of the paratypes of the new species are deposited in the collections of the National Museum of Na-

ture and Science, Tokyo (NSMT); the remainder of the paratypes are placed in the Kyoto University Museum (KUM).

Eotetranychus tiliaecola Ehara and Gotoh, sp. nov.

[Japanese name: Usinose-akehadani]
(Figs 1–11)

Material examined. Holotype: ♂ (NSMT-Ac 12930), Naganuma, Sorachi Prov., Hokkaido, 9-VIII-2006 (T. Gotoh leg.), on *Tilia maximowicziana* (Tiliaceae). Paratypes: 6♂ (NSMT-Ac 12931–12934) and 9♀ (NSMT-Ac 12935–12937), same data as holotype; 3♂ and 3♀ (KUM), same data as holotype.

In addition to the type series, the following specimens, all in poor condition, were also examined: 5♂ and 10♀, Ishikari, Ishikari Prov., Hokkaido, 8-VIII-2006 (T. Gotoh leg.), on *Tilia japonica* (Miq.) Simonkai. These specimens are retained in our collections.

Description. *Female.* Body pale green-yellow with dark lateral spots. Rostrum reaching distal part of femur I (Fig. 1). Palpus (Fig. 2) with spinneret approximately twice as long as broad; dorsal sensillum (solenidion) slender. Peritreme hooked distally (Fig. 4). Dorsal setae on idiosoma longer than distances between bases of successive setae (Fig. 1). Opisthosomal striae on dorsocentral region transverse. Genital flap with transverse striae; area immediately anterior to flap with longitudinal striae.

Numbers of setae and solenidia (in parentheses) on leg segments: coxae 2-2-1-1, trochanters 1-1-1-1, femora 10-7-4-4, genua 5-5-4-4, tibiae 9(1)-8-6-7, tarsi 14(1)+2 dupl.-13(1)+1 dupl.-10(1)-10(1). Tarsus I with 5 tactile setae and 1 solenidion proximal to proximal set of duplex setae (Fig. 5); tarsus II with 3 tactile setae and 1 solenidion proximal to duplex setae (Fig. 6). Empodia consisting of 3 pairs of hairs and 1 minute but distinct mediodorsal spur.

Measurements (n=10). Length of body (including rostrum) 393–454, mean 431; width of body 205–269, mean 234. Lengths (mean±SE) of setae: v2 64.7±0.4, sc1 125.0±0.8, sc2 83.0±0.5, c1 114.8±0.6, c2 113.1±1.4, c3 104.5±1.9, d1 106.8±1.5, d2 109.6±1.2, e1 100.1±1.0, e2 100.0±0.9, f1 90.5±1.0, f2 65.1±0.9, h1 59.3±0.8.

Male. Color similar to female. Palpus (Fig. 3) with spinneret subconical to nipple-shaped and much shorter than dorsal sensillum. Aedeagus (Figs 9–11) with shaft very broad and strongly downcurved to form conspicuously sigmoid, tapering distal part of aedeagus; termination nearly straight, slender; shaft with dorsal margin widely concave and ventral margin convex posteriorly.

Numbers of setae and solenidia (in parentheses) on leg segments: coxae 2-2-1-1, trochanters 1-1-1-1, femora 10-7-4-4, genua 5-5-4-4, tibiae 9(3)-8-6-7, tarsi 13(3)+2 dupl.-13(1)+1 dupl.-10(1)-10(1). Tarsus I with 4 tactile setae and 3 solenidia proximal to proximal set of duplex setae (Fig. 7); tarsus II with 3 tactile setae and 1 solenidion proximal to duplex setae (Fig. 8). Empodium I with fine mediodorsal spur and 3 pairs of digits, including stout dorsal and middle pairs and weak ventral pair; empodia II–IV similar to those of female.

Measurements (n=10). Length of body (including rostrum) 300–343, mean 321 (312); width of body 119–142, mean 131 (–). Lengths (mean±SE) of setae: v2 50.3±0.8

Figs 1-4. *Eotetranychus tiliaecola* sp. nov. 1, Dorsum (♀); 2, distal segment of palpus (♀); 3, ditto (♂); 4, peritreme (♀).

Figs 5–14. *Eotetranychus tiliaecola* sp. nov. (5–11) and *E. tsugaruensis* (12–14). 5, Tarsus and tibia I (♀); 6, tarsus and tibia II (♀); 7, tarsus and tibia I (♂); 8, tarsus and tibia II (♂); 9–14, aedeagi (9, holotype; 12–14, after Ehara 1989).

(50.6), sc1 89.2 ± 1.2 (91.6), sc2 65.2 ± 1.1 (64.8), c1 79.7 ± 0.8 (77.4), c2 82.2 ± 1.0 (83.3), c3 76.4 ± 1.2 (77.8), d1 72.4 ± 0.9 (72.3), d2 79.1 ± 0.8 (75.4), e1 63.3 ± 1.0 (61.4), e2 69.8 ± 1.0 (70.3), fl 49.0 ± 1.4 (45.8), f2 24.2 ± 0.6 (25.7), h1 20.1 ± 0.5 (20.7).

Etymology. The specific name *tiliaecola* (masculine noun) is derived from the Latin *tilia*, “linden tree”, plus the Latin *cola*, “inhabitant”, and refers to the occurrence of the present mites on linden trees.

Remarks. *Eotetranychus tiliaecola* sp. nov. is assigned to the *E. hicoriae* species group. The new species is similar to *E. nanningensis* Ma and Wang, 1981, *E. cyphus* Baker and Pritchard, 1960, and *E. tsugaruensis* Ehara, 1989 in the shape of the aedeagus (cf. Baker and Pritchard 1960; Meyer 1974, 1987; Wang and Ma 1981; Ehara 1989); however, *E. nanningensis* differs from *E. tiliaecola* in having the male palpus with no spinneret, and *E. cyphus* differs from it in having just a minute spinneret. Furthermore, the aedeagus of *E. tsugaruensis* is distinct from that of the new species in that the distal part of the former is more weakly sigmoid and the dorsal margin of its shaft is slightly concave (Figs 12–14).

Acknowledgement

We are very grateful to Dr. Y. Hirashima (Professor Emeritus, Kyushu Univer-

sity) for his valuable advice concerning the zoological nomenclature.

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