Jpn. J. Ent., 61 (1): 157-160. March 25, 1993

# Description of the Male of *Panonychus thelytokus* EHARA et GOTOH (Acari, Tetranychidae)

#### Shôzô Ehara

## Biological Institute, Faculty of Education, Tottori University, Tottori, 680 Japan

#### and

#### Tetsuo Gotoh

## Laboratory of Applied Entomology and Zoology, Faculty of Agriculture, Ibaraki University, Ami, Ibaraki, 300–03 Japan

Abstract The male of a thelytokous spider mite, *Panonychus thelytokus* EHARA et GOTOH, 1992, is first described and illustrated, based on two available specimens from elm of the type locality, Sapporo.

Key words: Taxonomy; Tetranychidae; Panonychus thelytokus; male; Japan.

A spider mite, *Panonychus thelytokus*, which is closely allied to the European red mite *P. ulmi* (KOCH), was recently described based only on females taken on elm in Hokkaido (EHARA & GOTOH, 1992). Prior to the original description, females of *P. thelytokus* were confirmed to be reproductively isolated from males of *P. ulmi* (GOTOH & NOGUCHI, 1990). *P. thelytokus* is a thelytokous species, though its males are very rarely produced (GOTOH & NOGUCHI, 1990). In the present paper the male of *P. thelytokus* is described for the first time, based on two available specimens of the sex. The terminology follows that of EHARA and THO (1988). The measurements are in micrometers.

#### Panonychus thelytokus EHARA et GOTOH

(Figs. 1-5)

Panonychus thelytokus Енака & Gotoн, 1992, p. 112, figs. 17-23, Q.

*Male.* Body including rostrum, 310 long, 170 wide. Lengths of setae:  $P_1$  55.9,  $P_2$  143.4,  $P_3$  103.3, H 96.6,  $C_1$  143.8,  $C_2$  144.1,  $C_3$  65.1,  $C_4$  31.6,  $L_1$  158.9,  $L_2$  141.3,  $L_3$  95.6,  $L_4$  20.1, CL 17.1. Acdeagus with shaft strongly bent dorsad to form a nearly straight distal part which is tapering, and slightly shorter than dorsal margin of shaft. Palpus with spinneret subconical, much longer than broad; dorsal sensil-lum fusiform, similar in length to spinneret. The number of setae and solenidia (in parentheses) on leg segments: femora 8-6-3-1, genua 5-5-3-3, tibiae 7 (4)-5-5-5, tarsi 12 (3)+2 dupl.-11 (1 or 2)+1 dupl.-9 (1)-9 (1). Tarsus I with 3 tactile setae

158





Figs. 1-5. Panonychus thelytokus (3). — 1, Distal segment of palpus; 2, aedeagus; 3, tarsus and tibia I; 4, tarsus and tibia II; 5, tarsus and tibia III.

and 3 solenidia proximal to proximal set of duplex setae; proximal duplex set with distal member twice to 3 times as long as proximal member. Tarsus II with 2 tactile setae and 1 or 2 solenidia proximal to duplex setae, and with 1 tactile seta

near duplex setae; distal member of duplex set 1.5 times to twice as long as proximal member.

Specimens examined. Two  $\mathcal{CC}$ , Hokkaido Univ. campus, Sapporo, Hokkaido, 18-VI-1988 (T. GOTOH), on the elm, Ulmus japonica (REHD.) SARGENT. The following specimens from Honshu, as well as the type series, are also available: Thirty  $\mathcal{QQ}$ , the Tsukuba Botanical Garden, National Science Museum, Tsukuba, Ibaraki, 27-V-1989 (T. GOTOH), on Ulmus japonica.

Distribution. Hokkaido and Honshu.

*Remarks.* The male of *Panonychus thelytokus* is distinctive from those of other members of the genus in that the distal upturned part of the aedeagus is not undulate but nearly straight. Many of the dorsal body setae of the male ( $P_2$ , H,  $C_1$ ,  $C_2$ ,  $L_1$ ,  $L_2$ ,  $L_3$ ) are noticeably longer than the corresponding setae (EHARA & GOTOH, 1991) of that of the related species *P. ulmi* (KOCH). Such a setal difference between the two species was previously found in the female (EHARA & GOTOH, 1992).

Panonychus thelytokus reproduces by thelytoky, and its males are very rarely produced ( $\mathfrak{Q}: \mathfrak{Z}=604:5$ ; GOTOH & NOGUCHI, 1990; GOTOH & EHARA, unpublished). The males are possibly sterile (EHARA & GOTOH, 1992). A similar situation is found in a common false spider mite, *Brevipalpus obovatus* DONNADIEU (Tenuipalpidae) by PIJNACKER *et al.* (1980, 1981). Namely, *B. obovatus* is thelytokous, and its males appear at a very low frequency in the populations, and are sterile. Thelytokous parthenogenesis is well known to occur in many species of the Bryobiinae, while it is uncommon in the Tetranychinae.

As far as we are aware, Oligonychus thelytokus GUTIERREZ is the only obligate thelytokous species in the Tetranychinae (GUTIERREZ, 1977), except for *P. thelytokus*. However, O. thelytokus is polyphagous and entirely devoid of males, whereas *P. thelytokus* appears to be monophagous and has spanandric males. In addition, several bisexual species of the Tetranychinae may also have thelytokous strains: *Eurytetranychus buxi* (GARMAN) (RIES, 1935), Oligonychus ilicis (MCGREGOR) (FLECHTMANN & FLECHTMANN, 1982), Tetranychus pacificus MCGREGOR (HELLE & BOLLAND, 1967) and T. urticae KOCH (BOUDREAUX, 1963).

### Acknowledgement

We are grateful to Prof. Ronald SHEEN, Faculty of Education, Tottori University, for his review of the English presentation of the early manuscript.

## References

BOUDREAUX, H. B., 1963. Biological aspects of some phytophagous mites. Annual Rev. Ent., 8: 137-154.

EHARA, S., & T. GOTOH, 1991. A new species of *Panonychus* from dwarf bamboo in Japan (Acari: Tetranychidae). *Int. J. Acarol.*, 17: 9-12.

\_\_\_\_\_ & \_\_\_\_\_ 1992. Descriptions of two Panonychus spider mites from Japan, with a key

160

Shôzô EHARA and Tetsuo GOTOH

to species of the genus in the world (Acari: Tetranychidae). Appl. Ent. Zool., 27: 107-115.

- EHARA, S., & Y. P. THO, 1988. Spider mites of the Malay Peninsula (Acarina: Tetranychidae). J. Fac. Educ. Tottori Univ. (Nat. Sci.), 37: 1-24.
- FLECHTMANN, N. N. B., & W. H. C. FLECHTMANN, 1982. Observações sobre a reprodução do ácaro vermelho do cafeeiro. Il Congresso Brasileiro de iniciação científica em ciências agrárias, 8-10 setembro, pp. 109-111. ESALQ-USP, Piracicaba-S.P.
- GOTOH, T., & O. NOGUCHI, 1990. Developmental success and reproductive incompatibility among populations of the European red mite, *Panonychus ulmi* (Acari: Tetranychidae). *Expl. appl. Acarol.*, **10**: 157–165.
- GUTIERREZ, J., 1977. Un tetranyque polyphage de la zone intertropicale: Oligonychus thelytokus n. sp. (Acariens, Tetranychidae). Description et premières données biologiques. Cah. Off. Rech. Sci. Tech. Outre-Mer, Sér. Biol., 12: 65-72.
- HELLE, W., & H. R. BOLLAND, 1967. Karyotypes and sex determination in spider mites (Tetranychidae). Genetica, 38: 43-53.
- PUNACKER, L. P., M. A. FERWERDA, H. R. BOLLAND, & W. HELLE, 1980. Haploid female parthenogenesis in the false spider mite *Brevipalpus obovatus* (Acari: Tenuipalpidae). *Genetica*, 51: 211-214.

-----, ------ & W. HELLE, 1981. Cytological investigations on the female and male reproductive system of the parthenogenetic privet mite *Brevipalpus obovatus* DONNADIEU (Phytoptipalpidae, Acari). Acarologia, 22: 157-163.

RIES, D. T., 1935. A new mite (Neotetranychus buxi n. s. GARMAN) on boxwood. J. econ. Ent., 28: 55-62.

(Received December 4, 1992; Accepted December 17, 1992)