***Neotrombicula teuriensis* (Acari: Trombiculidae): A new species of chigger mite collected from the nesting grounds of the Rhinoceros Auklet *Cerorhinca monocerata* (Pallas, 1811) on Teuri Island, Northwestern Hokkaido, Japan**

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Abstract: *Neotrombicula teuriensis* n. sp. is described and illustrated. The type material was collected from the nesting grounds of the Rhinoceros Auklet *Cerorhinca monocerata* (Pallas, 1811) on Teuri Island, Hokkaido, Japan. This new species may be distinguished easily by a 2-pronged palpotibial claw (internal > external), sensillae flagelliform and a dorsal setae arrangement of 2–8–6–6–4–4–2.

Key words: Trombiculidae, chigger, Rhinoceros Auklet, *Cerorhinca monocerata*, *Neotrombicula teuriensis*

Chiggers of the genus *Neotrombicula* Hirst, 1925 have a worldwide distribution, and large numbers of species have been recorded from various areas of the world (Brennan and Wharton, 1950; Gould, 1956; Sasa, 1956; Womersley and Audy, 1957; Domrow and Lester, 1985; Vercammen-Grandjean and Kolebinova, 1985; Goff, 1995; Li, 1997; Kudryashova, 1998; Fernandes and Kulkarni, 2003). However, only 7 species have been recorded from Japan (Takahashi and Misumi, 2007). Intensive faunistic surveys were conducted in 1997 and 2000 from several areas on Teuri Island in Northwestern Hokkaido, Japan, where the largest breeding site of the Rhinoceros Auklet *Cerorhinca monocerata* in the world exists (Osa and Watanuki, 2002). Chiggers collected from the nesting grounds of *C. monocerata* were mounted with Hoyer's solution for identification under a photomicroscope. Only one semi-engorged larva collected on 17 June 2000 at Akaiwa area from

the Island was rare and uncommon, and showed morphologically unique characteristics. This chigger belongs to the *autumnalis* group of the genus *Neotrombicula* Hirst, 1925 and was shown to be distinct.

The description of *Neotrombicula teuriensis* n. sp. is based on the holotype. It is not customary to describe a new species based on a single individual. However, we decided to describe this chigger species because we were unable to collect other individuals of this species from the nesting soil samples (>30 kg) of *C. monocerata*. Fortunately, this specimen was morphologically complete presenting no problems for a description.

Abbreviations and terminology used below are as in Goff et al. (1982) with some modifications. Paired structures were measured and the average is described. The holotype (NS-MT-Ac 13621) is deposited in the collection of the Department of Zoology, National Museum of Nature and Science, Tokyo, Japan.

***Neotrombicula teuriensis* Takahashi,
Takahashi et Misumi, n. sp.
(Japanese name: Teuri-tsutsugamushi)
(Fig. 1)**

Diagnosis of larva. SIF=7BS-N-2-1001.1101; fPp=B/B/NNB; fCx=1.1.1; fSc=PL>AM>AL; Ip=857; fD=2H-8-6-6-4-4-2; DS=32; fV=28; NDV=60.

Description of larva: Live, semi-engorged larva pale red in color.

Idiosoma: Body longer than wide, measuring 398 long by 310 μm wide. Two pair of eyes on ocular plate located near the scutum at the level of the posterolateral setae (PL); diameter of anterior and posterior eyes 10 and 9 μm , respectively.

Gnathosoma: Gnathosomal base bearing a pair of branched setae, moderate punctations 82 μm wide at the line of the branched setae; cheliceral bases merely rounded, 29 μm wide with small punctations; cheliceral blade 19 μm wide with a tricuspid cap. Galeal seta nude. fPp=B/B/NNB/7BS; Palpal claw stout, 2-pronged, internal prong 21 and external prong 15 μm of unequal length, and shorter than internal prong.

Scutum. Shape roughly rectangular; its anterior margin straight; lateral margins between anterolateral setae (AL) and PLs slightly indented; posterior margin rounded posterior to PL bases; lateral margins slightly rounded at PL bases; anteromedian seta (AM) base slightly below AL seta bases; sensillary bases slightly anterior to level of PL bases; PL>AM>AL. Sensillae unexpanded, flagelliform. Other scutal setae with a moderate number of short setules for almost their entire length. Large punctations distributed on scutum excluding around seta AM and near anterior margin of scutum. Scutal measurements (in micrometers): AW 67; PW 87; SB 25; ASB 38; PSB 25; SD 63; AP 32; AM 41; AL37; PL 46; sens 74.

Idiosomal setae. One pair humeral setae (HS) measuring 52 μm ; 32 dorsal idiosomal setae (DS) arranged 2, 8, 6, 6, 4, 4, 2; dorsal setae covered with a moderate number of thick and short setules for almost their entire length. HS and DS similar to scutal setae.

Length of dorsal setae as follows: medial seta of 1st posthumeral row 45 μm ; dorsal medial seta in central position 41 μm ; posterodorsal medial seta 44 μm ; dorsal terminal seta 47 μm . Sternal setae (StS) 2–2, anterior 38 and posterior 39 μm , covered with a moderate number of setules on the surface of their entire length, more pliant than preanal setae; 16 preanal setae (or true ventral setae, VS) similar in nature to StS but shorter; length of medial seta in 1st preanal setal row 33 μm ; 8 postanal setae (or caudal setae, CS) similar in nature to DS but shorter and more slender; length of medial seta in 1st postanal row 40 μm .

Legs. IP=857 μm . All 7-segmented, terminating in a pair of claws and a slender claw-like empodium. Onychotriches lacking. Conspicuous small punctations on coxae and free leg segments. No modified leg segments.

Leg I: 292 μm long; tarsus 61 long by 25 μm wide; coxa with 1 branched seta (1B); trochanter 1B; basifemur 1B; telofemur 5B; genu 4B, 1 genuala 19 μm , 1 microgenuala 4 μm ; tibia 8B, 2 tibialae (proximal tibiala 16 and distal tibiala 17 μm), 1 microtibiala 3 μm ; tarsus 22B, 1 tarsala 15 μm , 1 microtarsala 2 μm , 1 parasubterminala 16 μm , 1 subterminala 27 μm , 1 pretarsala 16 μm .

Leg II: 260 μm long; tarsus 61 long by 22 μm wide; coxa 1B; trochanter 1B; basifemur 2B; telofemur 4B; genu; 3B, tibia 6B, 2 tibialae (proximal tibiala 11 and distal tibiala 13 μm); tarsus 16B, 1 tarsala 17 μm , 1 microtarsala 2 μm .

Leg III: 305 μm long; tarsus 72 long by 18 μm wide; coxa 1B; trochanter 1B; basifemur 2B; telofemur 3B, long and nude 1 mastifemorala 79 μm ; genu 3B; tibia 6B, 1 mastitibiala 71 μm , 1 tibiala 15 μm ; tarsus 15B, 1 mastitarsala 50 μm .

Etymology: The species name “teuriensis” refers to Teuri Island where this new species was collected.

Type Material. Holotype, Teuri Island (44°22'N, 141°19'E), west of Haboro Town, Northwestern Hokkaido, Japan, 17-VI-2000, Coll. K. Takahashi, ex nesting grounds of *Rhinoceros Auklet*, *C. monocerata*.

Remarks. The genus *Neotrombicula* is sep-

Fig. 1. *Neotrombicula teuriensis* n. sp. Larva. A and B: Ventral and dorsal aspects of larva. C and D: Ventral and dorsal aspects of gnathosoma. E: Coxa III. F: Scutum and eyes on ocular plate. G: details on setae: HS: Humeral seta. DS: dorsal medial seta of 1st posthumeral row. ST: anterior sternal seta. VS: ventral medial seta of 1st post-sternal row. H, I, J: Legs I, II and III. Length of the scale bars for each structure and measurements of setae on legs I, II and III are given in micrometers.

arated into three groups based on the number and arrangement of mastitalsala (MTa), mastitibiala (MTi) and mastifemorala (MF) on leg III, such as “*autumnalis*” group with one MTa, “*bisignata*” group with 3 MTa and one MTi, and “*microti*” group with 2 MTa, one MF and one MTi (Brennan and Wharton, 1950; Kardos, 1954). *Neotrombicula teuriensis* n. sp. belongs to the autumnalis group with a single mastitalsala on leg III. Three species (*N. japonica*, *N. nagayoi* and *N. nogamii*) out of 7 *Neotrombicula* species recorded in Japan belong to this group. *Neotrombicula teuriensis* n. sp. differs clearly from these three species both in dorsal chaetotaxy and in morphology of scutum. However, *Neotrombicula teuriensis* n. sp. resembles *N. rissa* Kudryashova, 1998, in general configuration and chaetotaxy but can be distinguished from the latter species by the characteristics shown below: In *Neotrombicula teuriensis* n. sp., DS are 2–8–6–6–4–4–2=32 (The Ds of *N. rissa* 2–6–6–6–4–4=28, Palpotibial claw bifurcate, Gr=2 (Gr=3), fPp was B/B/NNB (B/N/BNB), Number of genuala on leg I is a single seta, but on *N. rissa* is 2 setae.

We extensively examined more than 30 kg of soil samples from ground beds of *C. monocerata* in several other areas on the Island, but no *Neotrombicula teuriensis* n. sp. were collected. This new species may only be distributed in a limited number of potential sites.

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