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## Some New Water-Mites from Japan

By

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(With 4 Text-figures)

In this paper have been reported four water-mites, basing on the specimens which are preserved in collections of the senior author. These specimens were provisionally identified by him several years ago and have recently studied again by the assistance of the junior author.

### 1. *Lundbladia japonica* n. sp.

(Fig. 1)

*Female* (holotype, prep. 887). Body oval in shape, narrowed anteriorly measuring 1270  $\mu$  long and 935  $\mu$  wide. Skin elastic and covered with minute papillae on all body surface. Frontal shield 370  $\mu$  long, about equal in width and narrowed posteriorly. Dorsal and ventral shields arranged regularly as shown in Fig. 1, a & b. Interval between eyes 480  $\mu$ . Maxillar organ 348  $\mu$  long and 155  $\mu$  wide. Mandibles slender, 59  $\mu$  high and 373  $\mu$  long, inclusive of a long claw, 129  $\mu$  long, in each. Palps measured as shown in Table 1, in  $\mu$ .

Table 1.

Segment	1	2	3	4	5
Extensor surface	52	112	64	148	48
Flexor surface	60	28	64	104	44

First segment widened in its basal portion and with a feathered bristle on the extensor surface. Second segment of almost trapezoid in shape with short flexor surface and with four feathered bristles on the extensor surface. Third segment, widest of all, having two bristles on the outer edge, the posterior one of which is feathered. Fourth segment, longest of all, narrowed anteriorly, bearing a few

1) Contribution No. 304 from the Zoological Institute, Faculty of Science, Hokkaido University, Sapporo, Japan.

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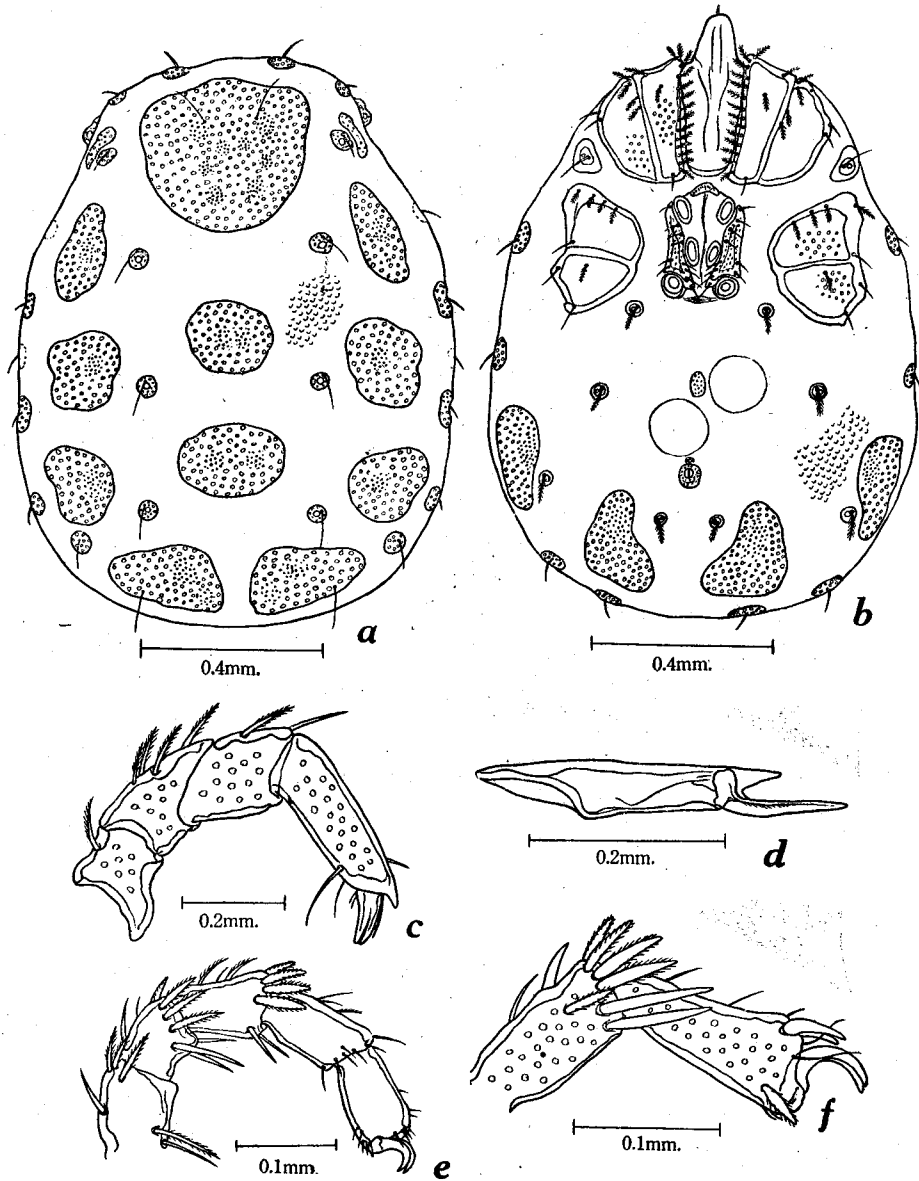


Fig. 1. *Lundbladia japonica* n. sp., female.  
 a. dorsum ; b. venter ; c. right palp ; d. mandible ; e. left 1st leg ; f. 5th and 6th segments of left 3rd leg.

hairs in the terminal end. Fifth segment short and claw-shaped. Pedal segments measured as shown in Table 2, in  $\mu$ .

Table 2.

Leg \ Segment	1	2	3	4	5	6
I	72	108	80	108	116	112
II	80	108	88	132	136	160
III	80	88	80	120	136	156
IV	172	120	128	220	168	160

Legs all with robust bristles and narrow hairs in each segment. The bristles are feathered or non-feathered as shown in Fig. 1, e & f. Claws sickle-shaped as those of the genus *Thyas*. Terminal ends of third and fourth legs each with a pair of stout bristles above claws as shown in Fig. 1, f. Epimera shown in Fig. 1, b, the third-fourth group being rather smaller than the first-second group. Genital plates each measured 168  $\mu$  long, with 3 pairs of acetabula, two anterior long-elliptical and posterior one rounded. Colour red.

*Locality.* Eleven females were captured by Dr. Yaichiro Okada, Professor of the Mié Prefectural University, on July 19, 1937 in Tsubame-onsen, a hot spring over 40°C, Niigata Prefecture.

*Remarks.* The new species is rather large among the genus. Though somewhat similar to *L. feuerborni* Viets, *L. plumifer* C. Angelier, *L. retrophila* (Michael), *L. cunctans* Lundblad and *L. muscicola* Mitchell, this new form is different from the species above given in form and relative size of the dorsal and ventral shields, mandibles and the epimera plates. The species is common in its habitat with *L. feuerborni* Viets from Java.

## 2. *Koenikea (Ecpolopsis) multiscutata* (Piersig)<sup>1)</sup>

### var. *japonica* n. var. (Fig. 2)

*Female* (holotype, prep. 880). Body almost globular in shape, 810  $\mu$  long and 745  $\mu$  wide. Skin hard, having in venter and dorsum many chitinous shields symmetrically arranged as shown in Fig. 2, a & b. Interval between eyes 220  $\mu$ . Maxillar organ 114  $\mu$  both in length and width. Mandibles 63  $\mu$  high and 171  $\mu$  long, inclusive of a claw, 63  $\mu$  long, in each. Palps measured as shown in Table 3, in  $\mu$ . First segment with a spine. Second segment, largest of all, with four feathered spines on the extensor surface. Third segment, approximately half the length of the second, having each a feathered and a non-feathered long spines.

1) The classification is based on the system by O. Lundblad (1941).

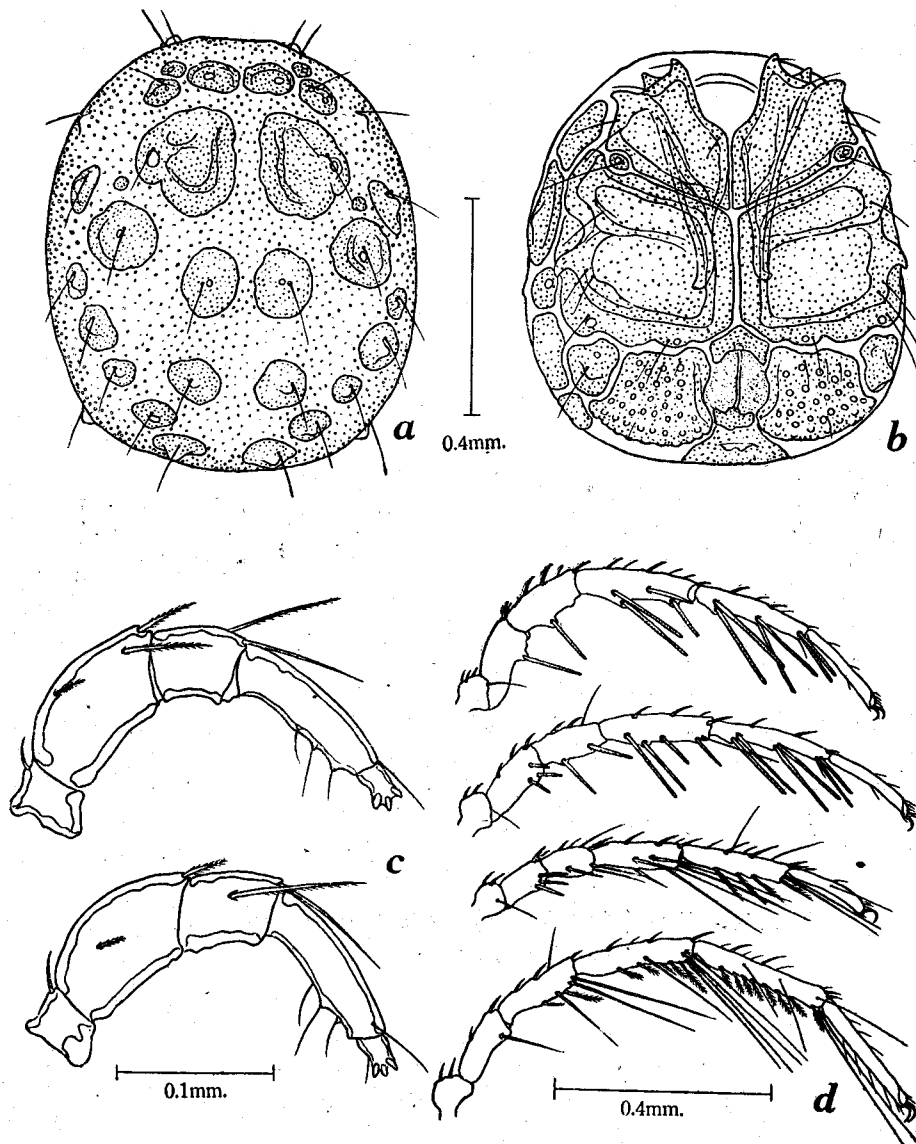


Fig. 2. *Koenikea multiscutata* var. *japonica* n. var., female.  
 a. dorsum; b. venter; c. palps; d. left legs, 1st to 4th.

Table 3.

Segment	1	2	3	4	5
Extensor surface	28	112	60	112	32
Flexor surface	28	72	40	88	—

near the terminal end. Fourth segment, longest of all, slender, having several slender hairs. Fifth segment trifurcated in its distal end. Epimera and genital area not specially different from the type species as illustrated in Fig. 2, b. Legs measured as shown in Table 4, in  $\mu$ . First and second legs with rod-shaped bristles, which

Table 4.

Leg \ Segment	1	2	3	4	5	6
I	67	133	163	244	237	192
II	74	118	141	237	252	207
III	74	104	111	185	222	192
IV	89	104	170	222	259	240

are saw-toothed on edge. Swimming hairs and feathered bristles are growing in the third and fourth legs. These legs are shown in Fig. 2, d. Colour bluish green.

*Locality.* Five females collected by late Y. Masuda in June, 1936 in Osaka were examined.

*Remarks.* *Koenikea (Ecpolopsis) multiscutata* is widely distributed from Bangkok (Siam) to Kanton and Soochow (China). In 1939, the senior author reported these specimens as *Ecpolopsis multiscutata* from Osaka without descriptions. These specimens have been examined again by the junior author. They are slightly different in the genital wings from the Siamese and Chinese species, hence formation of a variety.

### 3. *Axonopsis (Hexaxonopsis) subterraneus* n. sp.

(Fig. 3)

*Male* (holotype, prep. 903). Body oval in shape, dorsoventrally flattened, 255  $\mu$  long and 182  $\mu$  wide. Anterior portion nearly flattened and posterior part roundly narrowed. Antero-lateral corners of body zig-zag as saw-teeth as shown in Fig. 3, a & b. On both sides of the mid-lateral portion of the body contour, there is each found a characteristic conical process, of which the tip is pointed posteriorly, as shown in Fig. 3, a & b. Skin hard and finely porous. Interval between eyes 80  $\mu$ . Maxillar organ 45  $\mu$  long and 36  $\mu$  wide in the widest portion. Mandibles 27  $\mu$  high and 63  $\mu$  long, inclusive of a claw in each. Palpal segments

measured as shown in Table 5, in  $\mu$ .

Table 5.

Segment	1	2	3	4	5
Extensor surface	18	33	15	39	15
Flexor surface	12	27	21	33	15

First segment curved, with a spine on the extensor edge. Second segment stout and broadest, with two spines on the extensor surface; terminal portion of flexor edge conically protruded. Third segment, shorter than the second, with a long spine on outer surface. Fourth segment, longest of all, convex in the middle part of flexor edge, bearing a few hairs as shown in Fig. 3, d. Fifth segment tapered

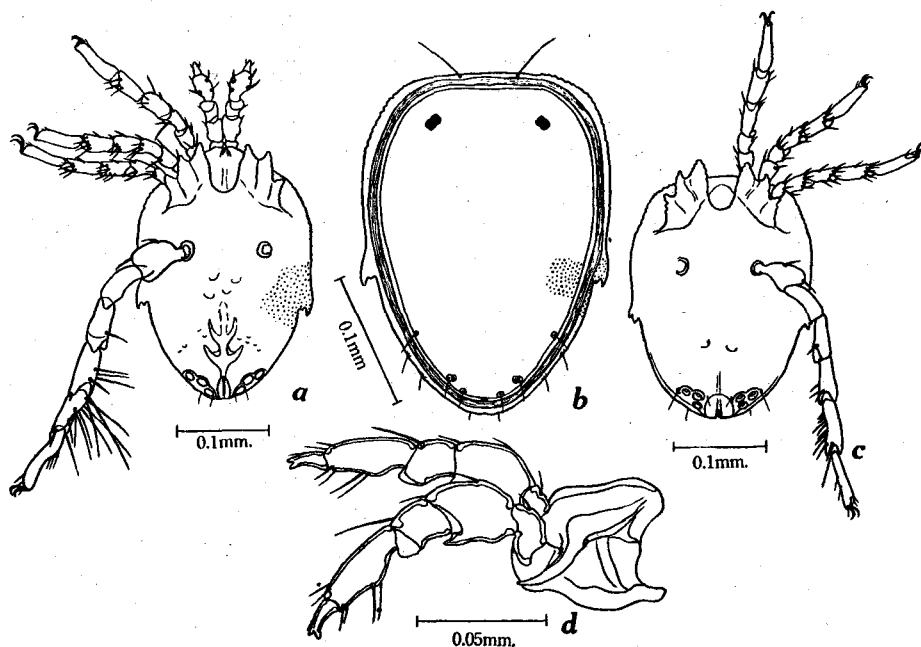


Fig. 3. *Axonopsis subterraneus* n. sp.

a. male venter; b. male dorsum; c. female venter; d. male palps attached to maxillar organ.

towards its distal portion and bifurcated in its terminal end. The outline of three anterior pairs of epimera clearly marked but the fourth pair merged into the

ventral chitinous skin. Three anterior legs nearly similar in form, but fourth pair characterized especially in fourth and fifth segments in having long bristles arising almost perpendicularly to the shaft of the leg. Legs measured as shown in Table 6, in  $\mu$ .

Table 6.

Leg \ Segment	1	2	3	4	5	6
I	21	24	21	33	39	48
II	18	24	18	33	36	45
III	21	27	21	33	42	45
IV	51	48	51	54	54	72

Genital area localized in posterior portion, with three pairs of acetabula, three on each side. Genital aperture  $21 \mu$  long in the ventral view. Penis scaffold  $102 \mu$  long and  $42 \mu$  wide in the widest portion. Excretory aperture opening in dorsum at the posterior end of the dorsal shield.

*Female* (allotype, prep. 904). Body shape, mouth parts, dorsum and venter nearly equal in feature to those of the male. Body measured  $260 \mu$  long and  $194 \mu$  wide. Interval between eyes  $80 \mu$ . Maxillar organ  $45 \mu$  long and  $36 \mu$  wide. Mandibles  $63 \mu$  long. Palpal segments as shown in Table 7, in  $\mu$ . Legs measured as shown in Table 8, in  $\mu$ . First to third legs similar in shape to those

Table 7.

Segment	1	2	3	4	5
Extensor surface	15	33	18	36	15
Flexor surface	12	27	18	33	—

Table 8.

Leg \ Segment	1	2	3	4	5	6
I	21	21	21	36	36	48
II	21	24	21	33	33	45
III	24	30	24	33	42	51
IV	48	39	42	54	57	57

of the male. But the fourth legs are different from those of the male in the fourth and fifth segments; they are more slender and bear shorter bristles as compared with those of the male as shown in Fig. 3, c. Genital plates wider than those of



the male and acetabula slightly different in arrangement from the male.

*Locality.* Ten males and six females were obtained together with *Lethaxona heteropalpis* Uchida & Imamura from the water works of Osaka City by Mr. S. Kondo in Sept., 1936.

*Remarks.* The present new species is easily distinguished from any other species of the subgenus *Hexaxonopsis* by the body contour, especially the lateral conical protrusions, and by the male fourth legs.

#### 4. *Axonopsis (Hexaxonopsis) tokyoensis* n. sp.

(Fig. 4)

*Female* (holotype, prep. 905). Body of short ellipse in shape, dorsoventrally rather thick, 415  $\mu$  long and 333  $\mu$  wide. Skin hard and finely porous. Dorsal shield having many conical hooks in the anterior half as shown in Fig. 4, c. Interval between eyes 126  $\mu$ . Maxillar organ 80  $\mu$  long and 40  $\mu$  wide. Mandibles 100  $\mu$  long, inclusive of a claw in each. Palps measured as shown in Table 9, in  $\mu$ . First segment short and convex on flexor surface. Second segment, broadest of all, having three spines on the extensor surface. Third segment, half the length of the second, having a long spine on the terminal edge of extensor surface. Fourth segment, longest of all, with convex ridge on the flexor surface. Fifth segment smallest and trifurcated in end.

Table 9.

Segment	1	2	3	4	5
Extensor surface	30	51	27	69	27
Flexor surface	18	42	18	54	—

First and second epimera each with crooked hooks on outer edges as shown in Fig. 4, b. Fourth epimera merged into the ventral skin. Legs longer in posterior ones, and swimming hairs found in the posterior two pairs. Pedal segments measured as shown in Table 10, in  $\mu$ . Genital area large and with six acetabula, three on

Table 10.

Leg \ Segment	1	2	3	4	5	6
I	—	30	33	51	66	60
II	—	36	36	54	72	78
III	—	48	42	63	81	84
IV	57	66	60	78	87	90

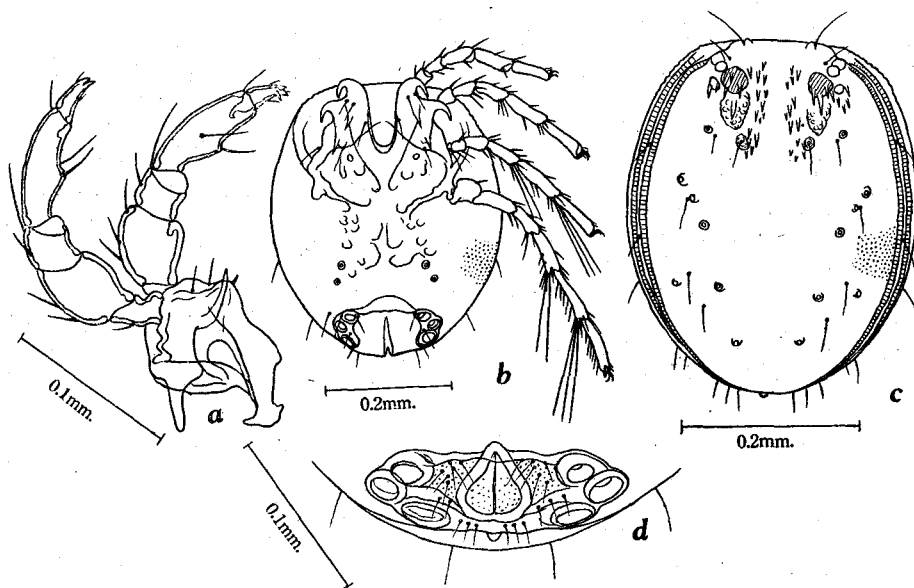


Fig. 4. *Axonopsis tokyoensis* n. sp.

a. female palps attached to maxillar organ; b. female venter; c. female dorsum; d. male genital area.

each plate which measured  $57 \mu$  long. Genital aperture  $66 \mu$  long in the ventral view. Body colour unknown in preservative, but chitinous skin wholly slightly blackish blue.

*Male* (allotype prep. 907). Body shape, colour and other characters similar to those of the female. Genital area more depressed than in the female as shown in Fig. 4, d, Genital aperture  $30 \mu$  long.

*Locality*. Seven females and four males were captured by Dr. H. Yamaguchi of the Hakodate Gakugei College on April 8, 1938 in a pond of the Tokyo University, Tokyo.

*Remarks*. The present species is somewhat similar to *A. serrata* Walter, *A. trituberculatus* Walter, and *A. ekmani* Walter, but it can be distinguished from those species by the features of the spine-like spines in dorsum, palps and the body contour. The Japanese specimens are slightly different from those from *A. paxillatus* in larger size, more dorsal spines and blackish blue colour, though their epimera and genital area almost agree with Chinese ones.

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