

## NEW SPECIES OF ORIBATID MITES FROM THE SOUTHERN ISLAND OF JAPAN

南西諸島から見いだされたササラダニ類の新種

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### Synopsis

Nine new species and two new subspecies of oribatid mites were reported from the southern islands of Japan : Amami-Oshima, Kumejima and Ishigakijima. The new taxa described are : *Austrocarabodes curvisetiger*, *Dolicheremaeus distinctus*, *D. infrequens amamiensis*, *Hemileius tenuis*, *Xylobates magnus*, *X. gracilis*, *Cultrobates nipponicus*, *Neoribates rotundus* and *Galumna planicalava ishigakiensis*. *Galumna flabellifera* HAMMER was newly recorded from Japan.

The oribatid fauna of Japan becomes richer toward the southern region increasing in the species number. Some investigations were made on the oribatids of the southern islands of Japan (Aoki, 1973, 1976, 1978, 1980 ; Aoki & Nakatamari, 1974), but a number of species are still waiting for description. The present paper deals with several new species and subspecies taken from four southern islands of Japan. The type-series is deposited in National Science Museum, Tokyo.

### *Austrocarabodes curvisetiger* spec. nov.

(Fig. 1)

*Measurement.* Body length : 455-600 $\mu$ ; width : 268-354 $\mu$ .

*Prodorsum.* Lamella broadest at about mid-distance along its length, the surface almost smooth. Anterior parts of lamellae connected by a transverse ridge which is provided with a pair of round apophyses, each bearing rostral seta. Three pairs of prodorsal setae (*ro*, *le* and *in*) broad, with both the margins turned up, so that the cross section must be U- or V-shaped; the upper edges of setae very finely indented; *ro* smoothly and strongly curved inward to make a hemiring; *le* bent inward near the base; *in* almost vertical in the basal portion and then strongly bent toward lateroposterior direction; *ro* 1.5  $\times$  as long as *le*; *in* 1.7  $\times$  as long as *ro*. Median surface of prodorsum shows granular structure. Sensillus with apical portion weakly thickened, curled upward and densely set with barbs blunt at tip (Fig. 1E).

*Notogaster.* Anterior margin weakly arched. Humeral projections inconspicuous; the posterior corner of the projection found to be more angulate in lateral view. Notogastral surface except humeral parts covered by rounded granules with somewhat rough integument (Fig. 1D). Fourteen pairs of notogastral setae (Fig. 1C & D) have the same structure as the lamellar and the interlamellar setae, being long and strongly arched. RLN of the longest

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setae : 33-34.

*Anogenital region* (Fig. 1F). Genital aperture nearly rectangular, slightly longer than wide. Four pairs of genital setae fairly long. Anal setae only slightly thicker and shorter than genital ones. Aggenital setae distinctly longer than genital or anal setae, being about half as long as their mutual distance. Adanal setae leaf-shaped, having the same structure as notogastral setae.

*Legs*. All the legs monodactyle. Tarsus I : Solenidion  $\omega_2$  strongly curved latero-posteriad, thinner than weakly curved  $\omega_1$ . Tibia I : Solenidion a little longer than the tibia itself. Dorsal setae on genua I-IV broad and leaf-shaped, with strongly toothed margins (Fig. B); ventral seta on genu I long and thick, provided with 3 barbs on one side and 7-8

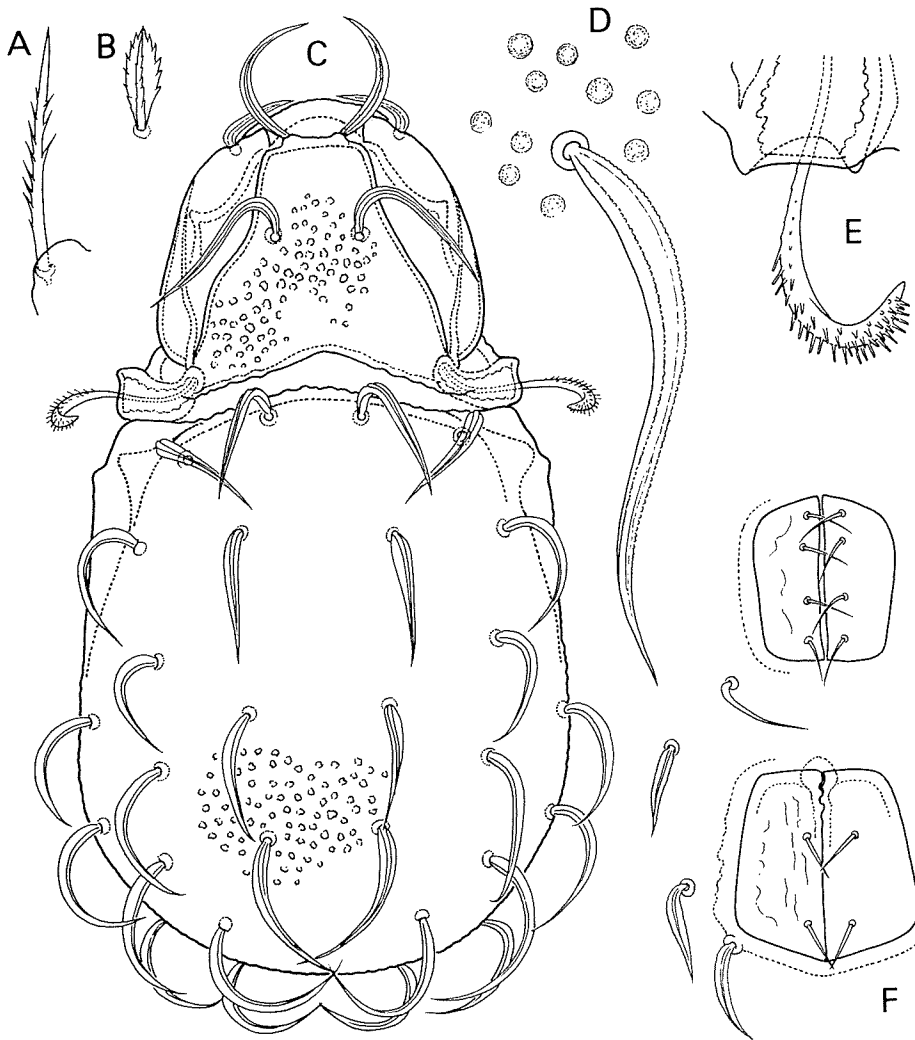


Fig. 1 *Austrocarabodes curvisetiger* spec.nov. — A: Ventral seta on genu I. B: Dorsal seta on genu I. C: Dorsal. D: Seta and granules on notogaster. E: Sensillus and bothridium. F: Anogenital region.

barbs on the other side (Fig. A). Solenidion on tibia II short and rod-like. Trochantera III-IV and femora III-IV each bears a ventral leg-fin.

*Type-series.* Holotype (NSMT-AC 9282): Ayamaru-misaki in Kasari-cho, Amami-Oshima Island, S. Japan (AMA-1), 8-II-1980, J. Aoki. *ex* litter under *Cycas revoluta* forest. —Paratopotypes (14 exs.): the same data as holotype. —Paratype: Misaki-cho in Ishigaki-shi, Ishigaki-jima Island, S. Japan (ISG-7), 10 m, 2-X-1978, J. Aoki. *ex* litter and soil under a shrub of *Leucaena leucocephala*.

*Remarks.* The most distinct feature of the new species is the long and strongly curved setae on notogaster. In this regard, only *Austrocarabodes elegans* HAMMER, 1966, is equal to *A. curvisetiger*. But, in this New Zealand species the notogastral setae are more slender and the sensilli are not so strongly curled up as in *A. curvisetiger*.

#### Key to the Japanese Species of the Genus *Austrocarabodes*

1. Sensillus short and clavate, with a strongly swollen head ..... 2  
—Sensillus elongate, with a weakly swollen head ..... 3
2. Notogastral setae short and broadly leaf-shaped; humeral projections strongly developed; body length: 310-436 $\mu$  ..... *Austrocarabodes nakatamarii* AOKI, 1973  
—Notogastral setae long and slenderly leaf-shaped; humeral projections weakly developed; body length: 616-672 $\mu$  ..... *Austrocarabodes australis boninensis* (AOKI, 1978), **comb. nov.**
3. Sensillar head strongly curved upward; notogastral setae very long and strongly curved; body surface granulate ..... *Austrocarabodes curvisetiger* spec. nov.  
—Sensillar head not or weakly curved; notogastral setae medium long; body surface not granulate ..... 4
4. Body surface with distinct foveolae; adanal setae short and fine .....  
..... *Austrocarabodes lepidus* (AOKI, 1978), **comb. nov.**  
—Body surface with indistinct, irregular network; adanal setae long and leaf-like .....  
..... *Austrocarabodes haradai* (AOKI, 1978), **comb. nov.**

#### *Dolicheremaeus distinctus* spec. nov.

(Fig. 2A-B)

*Measurement.* Body length: 505 $\mu$ ; width: 225 $\mu$ .

*Prodorsum.* Lateral lamelliform expansion (*spa. l*) well developed, becoming broader posteriorly. Lamellae entirely straight, widely separated from each other and slightly diverging toward anterior direction. The part along the median line of prodorsum somewhat elevated as a longitudinal ridge. Rostral and lamellar setae long, their RLN: 28-30; *ro* almost smooth, while *le* is finely barbed. Interlamellar setae short (RLN: 8.8), nearly as long as their mutual distance and 1/3 in length of *ro* or *le*. Sensillus sigmoid, the distal portion bending anteriorad; the peduncle thick and the clavate head minutely roughened (Fig. 2 B). The basal part of lamella strongly protruding laterad, so that bothridium is opening toward quite lateral direction. Four condyles on the posterior margin well developed and clearly separated from one another; *co. pl* distinctly larger than *co. pm*; mutual distance of

*co. pm* wider than distance between *co. pm* and *co. pl*.

*Notogaster.* Proportion of notogaster is small compared to large prodorsum. Four notogastral codyles markedly developed; *co. nl* large and triangular; *co. nm* especially clearcut and almost rounded square. Notogastral integument densely covered by large foveolae forming a network-like sculpture. Ten pairs of notogastral setae short and smooth; setae of median row (*ti*, *ms* and *r*<sub>1</sub>) somewhat longer (RLN; 16-18) than posterior setae (*p*<sub>1</sub>-*p*<sub>3</sub>, RLN: 10-13).

*Ventral side and legs.* Ventral plate wholly covered by large foveolae as on notogaster. Genital and anal plates glabrous, the former being darker than the latter. Distance between genital setae *g*<sub>3</sub>-*g*<sub>4</sub> larger than *g*<sub>1</sub>-*g*<sub>2</sub> and shorter than *g*<sub>2</sub>-*g*<sub>3</sub>. Type of ultimate setae of legs (Aoki, 1967, p. 300): L-S-S-S. Both solenidia on tarsus I weakly curved,  $\omega_1$  being thicker and a little shorter than  $\omega_2$ .

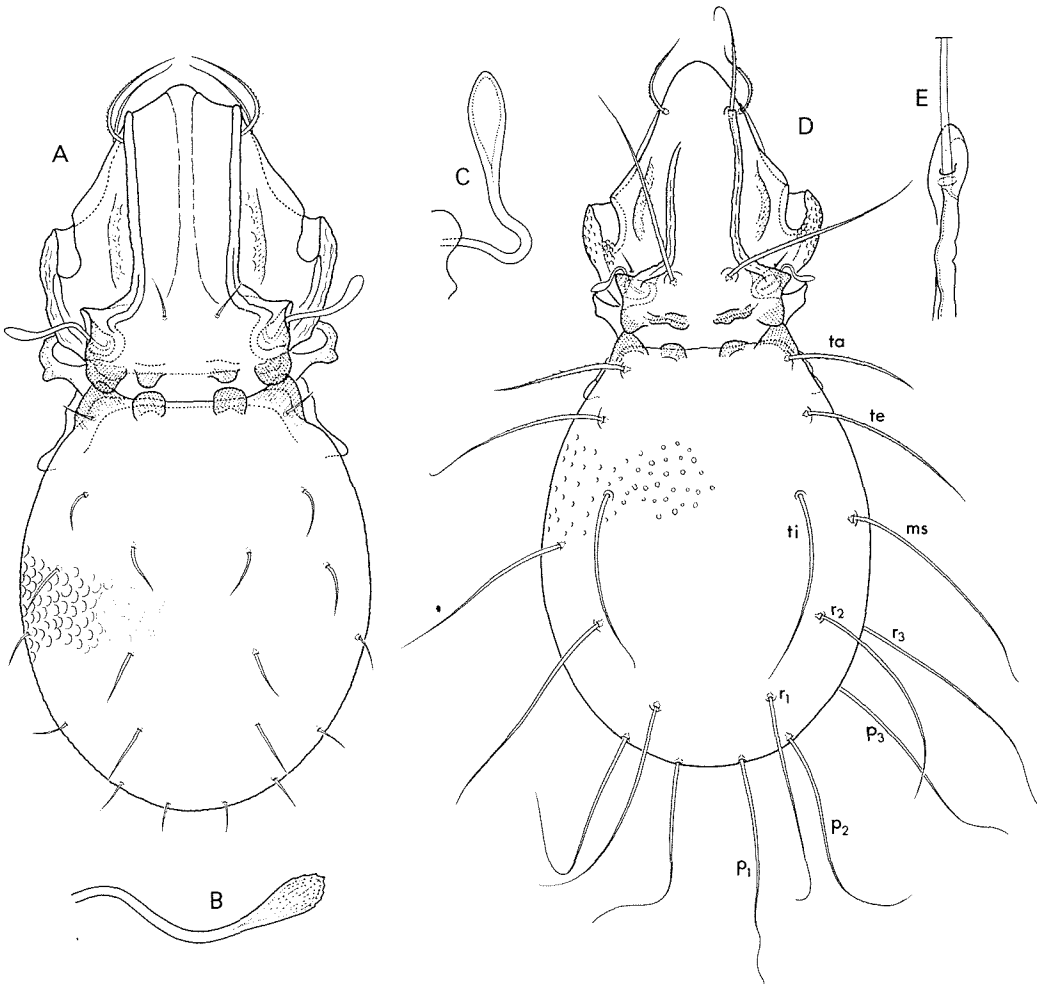


Fig. 2 A-B: *Dolicheremaeus distinctus* spec. nov. — A: Dorsal. B: Sensillus. — C-E: *Dolicheremaeus infrequens amamiensis* subsp. nov. — C: Sensillus. D: Dorsal. E: Anterior tip of lamella (the left side).

*Type.* Holotype (NSMT-AC 9292): Ohtana in Yamato-mura, Amami-Ohshima Island, S. Japan (AMA-3), 175 m, 9-II-1980, J. Aoki. *ex* litter and soil under a coppice forest of *Castanopsis cuspidata* var. *sieboldii*.

*Remarks.* The most characteristic feature of the new species is the straight lamellae which are widely separated from each other and slightly diverging anteriorly. Most of the *Dolicheremaeus* species have lamellae more or less bending and converging anteriorly. The presence of a median prodorsal ridge and the clearcut median notogastral condyles (*co. nm*) are also useful to distinguish the new species from the known congeners. Only one species, *Dolicheremaeus markusi* BALOGH, 1970, somewhat resembles the new species in having the straight lamellae, the distinct median notogastral condyles and the straight lamellae, the distinct median notogastral condyles and the foveolate notogastral integument. But, this Ceylonese species differs from *D. distinctus* in the lamellae situated more close to each other, the longer notogastral setae, the sesilli pointed apically and the larger body size ( $662 \times 343 \mu$ ).

***Dolicheremaeus infrequens amamiensis* subsp. nov.**

(Fig. 2C-E)

*Measurement.* Body length : 900-970  $\mu$ ; width : 400-460  $\mu$ .

In having the peculiar slipper-shaped appendage on the anterior end of lamella, the low prodorsal condyles irregular in shape and the long notogastral setae, the present form belongs apparently to *Dolicheremaeus infrequens* AOKI, 1967. But, the interlamellar setae and notogastral setae (especially the anterior pairs) of this form are considerably longer than those of *D. infrequens infrequens* and *D. infrequens hachijoensis* (Table 1). The present form taken from Amami-Ohshima Island is dealt here as a separate new subspecies. The left lamella of the holotype specimen is in abnormal condition and lacks in the anterior portion as lamellar setae (Fig. 2 D). The normal shape is shown in Fig. 2 E.

*Type-series.* Holotype (NSMT-AC 9297) : Ohtana in Yamato-mura, Amami-Ohshima Island, S. Japan (AMA-3), 175 m, 9-II-1980, J. Aoki. *ex* litter and soil under a coppice forest of *Castanopsis cuspidata* var. *sieboldii*. — Paratype : Ton-zaki in Tatsugo-mura, Amami-Ohshima Island, S. Japan (AMA-2), 15 m, 8-II-1980, J. Aoki. *ex* litter and soil under a coppice forest of *Castanopsis cuspidata* var. *sieboldii*.

**Table 1.** Comparison of length of notogastral setae among subspecies of *Dolicheremaeus infrequens* AOKI. Figures in the table show RLN (relative length to notogaster).

	<i>ta</i>	<i>te</i>	<i>ti</i>	<i>ms</i>	<i>r</i> <sub>1</sub>	<i>r</i> <sub>2</sub>	<i>r</i> <sub>3</sub>	<i>p</i> <sub>1</sub>	<i>p</i> <sub>2</sub>	<i>p</i> <sub>3</sub>
<i>D. infrequens infrequens</i>	23	27	27	39	62	66	49	58	59	61
<i>D. infrequens hachijoensis</i>	23	28	27	29	31	31	33	36	44	44
<i>D. infrequens amamiensis</i>	29	45	49	58	61	63	61	65	63	55
	36	46	58	59	64	68	66	62	66	66

**Hemileius tenuis** spec. nov.

(Fig. 3)

*Measurement.* Body length : 342-360  $\mu$ ; width : 145-160  $\mu$ .

*Prodorsum.* Rostral, lamellar and interlamellar setae smooth and fine ; *le* shorter than their mutual distance and a little shorter than *ro* ; *in* slightly longer than *ro*, extending beyond the tip of lamella for a short distance. Lamella almost equal in width throughout its length. Sensillus curved anterodorsad, bearing a peduncle and a distinctly swollen head. A network-like sculpture found outside lamella on each side. Pedotecta II markedly developed as an elongate projection.

*Notogaster.* Elongate oval, ratio L/W of notogaster about 1.8. The anterior margin weakly angulate medially. Ten pairs of notogastral setae short and fine, RLN of the longest setae being 4.6. Four pairs of sacculi large and distinct. *Sa* situated inside seta *te* ; seta *ti* located at a level posterior to *te* ; *S*<sub>1</sub> situated close to seta *ms* and just outside the seta.

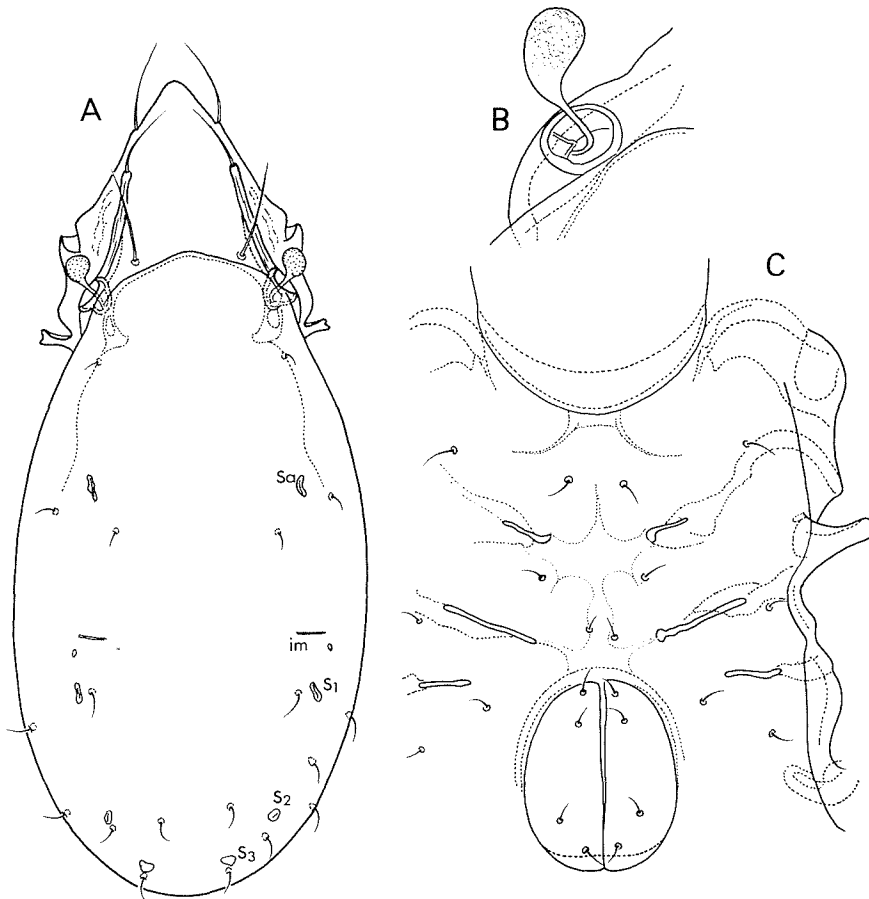


Fig. 3 *Hemileius tenuis* spec. nov. ——— A : Dorsal. B: Sensillus and bothridium. C: Epimeral and genital region.

Lyrifissure *im* long and conspicuous.

*Ventral side and legs.* Genital aperture oval, longer than wide; 4 pairs of genital setae short and fine. Aggenital setae also short and fine, their distance from anal aperture being  $3 \times$  as long as that from genital aperture. Anal aperture nearly as long as wide. Two pairs of anal and three pairs of adanal setae similar in length to notogastral setae. Adanal setae  $ad_1$ - $ad_3$  arranged with wide interspaces. The ratio between the distances  $ad_2$ - $ad_3$  /  $ad_1$   $ad_2$  = 1.1 ~ 1.4. Setal formula for epimerata : 2-1-2-2. All the legs heterotridactyle. Femur of each leg sculptured by dense transverse striae.

*Type-series.* Holotype (NSMT-AC 9299) : Ton-zaki in Tatsugo-mura, Amami-Ohshima, S. Japan (AMA-2), 15 m, 8-II-1980, J. Aoki. *ex* litter and soil under a coppice forest of *Castanopsis cuspidata* var. *sieboldii*. —Paratopotypes (4 exs.) : the same date as holotype.

*Remarks.* The new species is easily distinguishable from any other species of the genus *Hemileius* by (1) Elongate body, (2) Strongly clavate sensilli, (3) Sharply projecting pedotecta II, and especially, (3) Angulate anterior margin of notogaster.

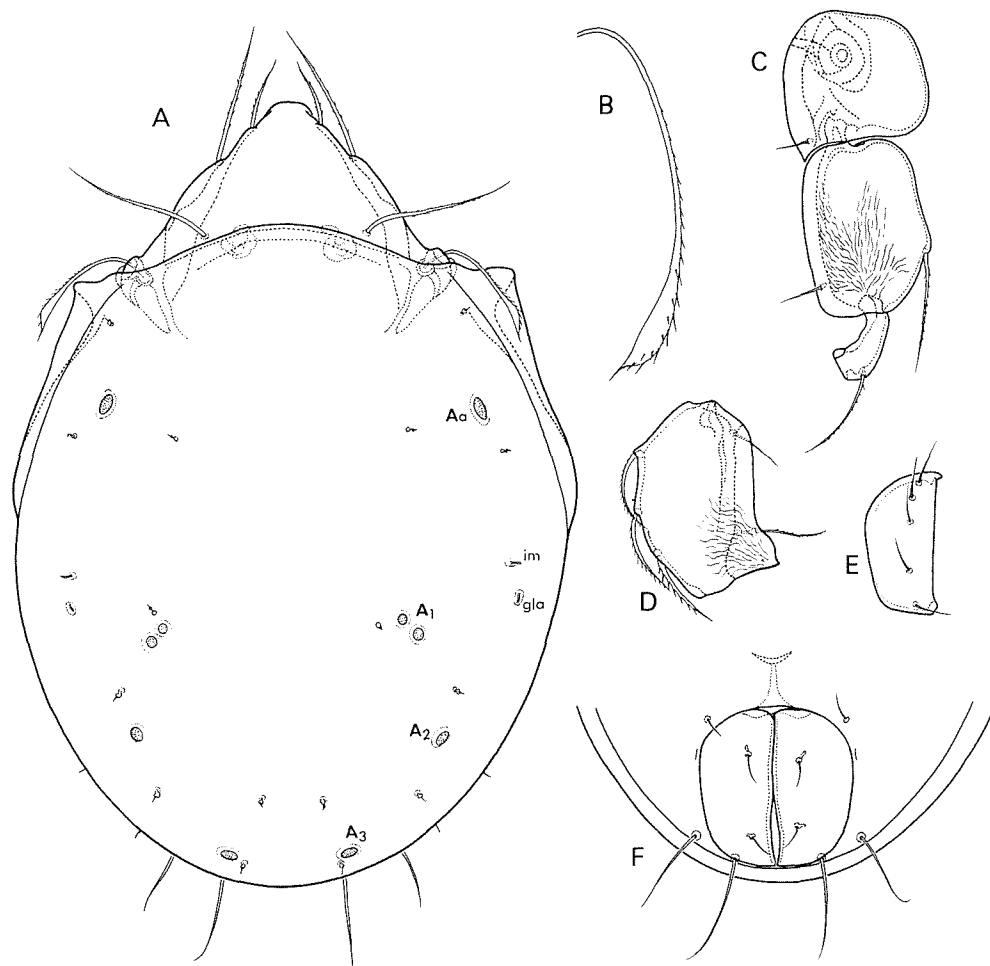


Fig. 4 *Xylobates magnus* spec. nov. — A: Dorsal. B: Sensillus. C: Trochanter, femur and genu of leg IV. D: Femur of leg II. E: Genital plate. F: Ano-adanal region.

**Xylobates magnus** spec. nov.

(Fig. 4)

*Measurement.* Body length : 660 (773) 872  $\mu$  ; width (excluding pteromorphae): 440 (530) 620  $\mu$ .

*Prodorsum.* Rostral, lamellar and interlamellar setae all barbed bilaterally ; *le* 1.5-1.9  $\times$  as long as *ro* ; *in* 2.0-2.5  $\times$  as long as *ro* and distinctly longer than their mutual distance. RLN of these setae : *ro* 12.8-17.1, *le* 22.1-26.9, *in* 31.4-33.3. Bothridium bearing a scale-like appendage posterolaterally. Sensillus bending toward posterolateral direction and bearing a lanceolate head which has one arched border and the other almost straight border (Fig. 4 B); except for the proximal part the organ set with barbs become longer toward the tip ; the barbs arranged in two rows on the head.

*Notogaster.* Vast and well swollen. The ratio L/W of notogaster 1.12-1.16. Five pairs of distinct areae porosae are present ; *A*<sub>1</sub> occasionally divided into two closely situated pores on both sides (Fig. 4 A) or on one side.

*Anogenital region.* Genital as well as anal opening nearly as long as wide ; interspace between them subequal in length to anal opening. Genital opening small, about 1/2.5 of anal opening. Genital plate set with 5 setae. A pair of aggenital setae similar in length to genital setae. Of 3 pairs of adanal setae, the anteriormost pair (*ad*<sub>3</sub>) subequal in length to genital or anal setae, while the posterior 2 pairs of setae (*ad*<sub>1</sub> and *ad*<sub>2</sub>) are markedly longer than any other seta on hysterosoma (Fig. 4 F) and well visible even in dorsal aspect (Fig. 4 A) ; *ad*<sub>1</sub> slightly longer than *ad*<sub>2</sub> ; they are 3.0-3.5  $\times$  as long as *ad*<sub>3</sub> ; setae *ad*<sub>1</sub> 1.3-1.6  $\times$  as long as their mutual distance ; RLN of these setae : *ad*<sub>1</sub> 18.3-21.0, *ad*<sub>2</sub> 14.4-20.0, *ad*<sub>3</sub> 4.8-5.8.

*Legs.* All the legs heterotridactyle. Femora I-IV each bears a blade-like ventral appendage ("Beinflösse" by Aoki, 1958 ; "leg-fin" by Aoki, 1965), which is very narrow and indistinct on femur I, while it is broad and its distal part has an expansion with a small pointed tip (Fig. 4 D). Trochanter IV bearing also a leg-fin which has a short, but sharply pointed distal projection (Fig. 4 C). Femur II with 3 strong and barbed setae on dorsal side and 2 thin setae on ventral side. Femur IV with 2 setae, one long and barbed, and the other short and thin. Trochanter IV with a short seta on ventrodiscal part.

*Type-series.* Holotype (NSMT-AC 9240) : Yoshihara in Ishigaki Is., S. Japan [ISH-1], 45 m, 2-X-1978, J. Aoki. *ex* soil and litter under plantation of *Aletris spicata*. —Paratopotypes (4 exs.) : the same data as holotype.

*Remarks.* As the taxonomic status of the genus *Protoribates* BERLESE is not certain, the present new species was classified into the closely related genus *Xylobates* JACOT. Among the known species of these two genera, *Xylobates triangularis* HAMMER, 1971, *X. seminudus* HAMMER, 1971, *X. bipilus* HAMMER, 1972, *X. rhomboides* HAMMER, 1972, *Protoribates monodactylus* (HALLER, 1884), *P. capucinus* BERLESE, 1908, *P. vastus* (MIHELČIČ, 1956), and *P. elongatus* MIHELČIČ, 1956, resemble the new species in some respects, particularly in having (1) minute notogastral setae, (2) distinct dorsosejugal suture and (3) long and barbed sensilli with a more or less swollen apical portion. But, the new species, *X. magnus*, differs from any of the species mentioned above in having two pairs of long adanal setae (*ad*<sub>1</sub>



and  $ad_2$ ), long lamellar setae and large body size. *X. oblongus* (EWING, 1909) has the sensilli and the adanal setae very similar to those of *X. magnus*, but it is distinguishable from the latter by the far smaller body size, the genital plate with only 4 setae and the single area porosa  $A_1$ .

***Xylobates gracilis* spec. nov.**

(Fig. 5)

*Measurement.* Body length : 340  $\mu$ ; width : 180  $\mu$ .

*Prodorsum.* Rostral, lamellar and interlamellar setae short and weakly barbed ; *ro* inserted at distal end of a ridge extending from lamella ; *le* a little shorter than *ro*, just reaching the insertion pore of rostral seta ; setae *in* subequal in length to *ro*, about 1/1.6 as

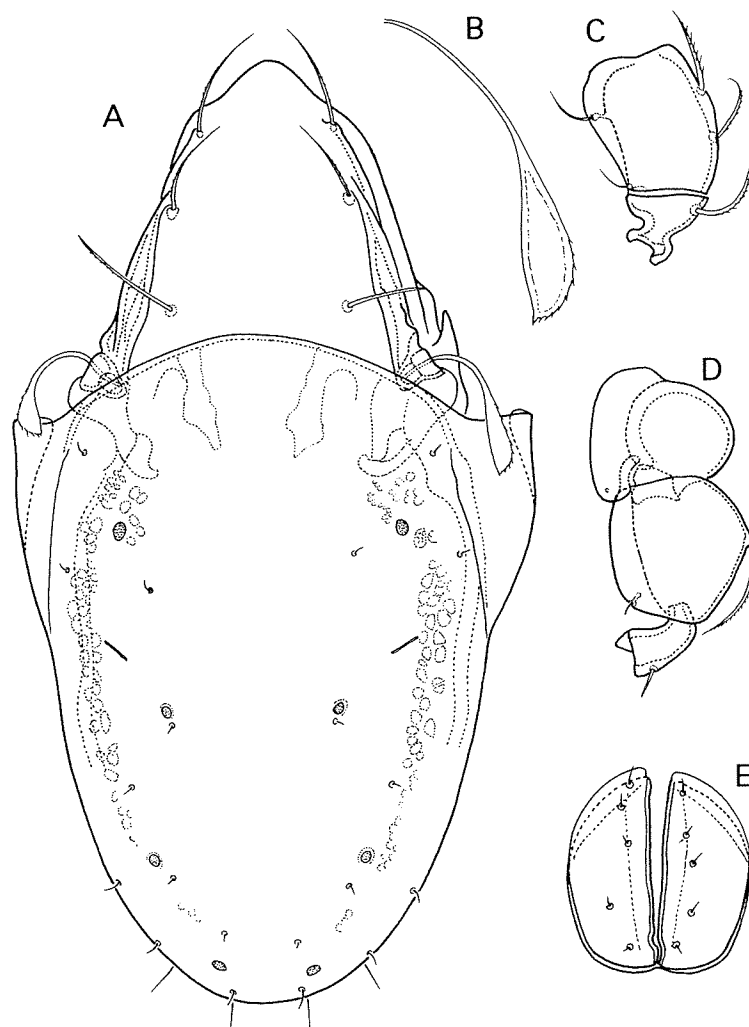


Fig. 5 *Xylobates gracilis* spec. nov. — A: Dorsal. B: Sensillus. C: Femur of leg II. D: Trochanter, femur and genu of leg IV. E: Genital plates.

long as their mutual distance. Bothridium accompanied posterolaterally by a large semi-circular plate-like appendage. Sensillus bendig backward and having a very thin peduncle and a markedly expanded head with minute barbs ; the head swelling strongly on one side and very weakly on the other side (Fig. 5 B). The basal part of lamella shows an undulation in front of bothridial opening.

*Notogaster.* Shape of notogaster slender, the ratio of notogastral length to width (excluding pteromorphae) being 1.54. Four pairs of areae porosae relatively small and rounded. Ten pairs of notogastral setae short. Lyrifissure *im* fairly long. A number of light spots arranged peripherally on notogaster. A pair of internal hyaline appendages (*Hy*) hanging from dorsosejugal suture elongate.

*Anogenital region.* Genital opening slightly longer than wide. Genital plate with 5 minute setae. Anal opening about twice as large as genital one in length as well as in width. Interspace between genital and anal opening one and a half as long anal opening. Aggenital seta and adanal seta *ad<sub>3</sub>* a little shorter than anal setae ; adanal setae *ad<sub>1</sub>* and *ad<sub>2</sub>* a little longer than anal setae.

*Legs.* All the legs monodactyle. Femora II-IV and trochanter IV each has a blade-like ventral appendage (leg-fin), though that on femur III is very narrow ; the margin of these appendages rounded, never bearing projection ; the appendage on trochanter IV most strongly developed among them, its distal part well protruding and partly overlapping the proximal part of femur. Femur II divided near the basal part into two portions by a transverse furrow (Fig. 5 C), being provided with 3 distinctly barbed dorsal setae and fine ventral setae. Femur IV with a long, barbed dorsal seta and very minute ventral seta. Trochanter IV without seta, only a setal pore found on the distal part of blade-like appendage.

*Type-series.* Holotype (NSMT-AC 9245) : Tonzaki in Tatsugo-mura, Amami-Oshima Is., S. Japan [AMA-2] , 15 m, 8-II-1980, J. Aoki. *ex* soil and litter under a forest of *Castanopsis cuspidata* var. *sieboldii*. —Paratopotypes (3 exs. ) : the same data as holotype.

*Remarks.* In having sensilli bending backward and bearing a distinctly swollen head with very minute barbs, the present new species shows a resemblance to *Protoribates glaber* MIHELČIČ, 1965 from Spain. However, the Spanish species has more stout body shape (the ratio L/W of notogaster 1.16 from Mihelčič's figure), larger body size (480-650  $\mu$ ), 4 pairs of setae on genital aperture and 3 setae on trochanter IV.

### **Cultrobates nipponicus** spec. nov.

(Fig. 6)

*Measurement.* Body length : 260  $\mu$ ; width : 145  $\mu$ .

*Prodorsum.* Rostrum with a median nose-like projection and a thin blade-like structure pointed at tip on each side (Fig. B). Lamella nearly of the same thickness throughout its length. Lamellar cusp short, with a deep U-shaped notch. Interspace between both the cusps nearly as wide as lamella. Rostral and lamellar setae smooth, subequal in length to each other. Interlamellar setae minute, being shorter than their mutual distance and about 1/3 as long as lamellar setae. Dorsal margin of bothridial opening deeply curved in. Sensillus has a long, thin peduncle and makes an elbow just outside the bothridial opening, being

directed inward and provided with a swollen head pointed at tip (Fig. 6 C).

*Notogaster*. Integument smooth. Pteromorpha clearly separated from notrogastal shield by a distinct suture. Ten pairs of notogastral setae short and fine, of which *ta* are situated on pteromorphae. Four pairs of areae porosae rounded; *Aa* located between setae *ti* and *te*; *A*<sub>1</sub> between setae *ms* and *r*<sub>3</sub>.

*Anogenital region*. Genital aperture pentagonal, a little wider than long. Genital plate bearing 5 setae, of which the anteriormost one is very long, while the remaining 4 are minute (Fig. 6 D). Aggenital setae minute. Anal and adanal setae subequal in length to notogastral setae.

*Legs*. All the legs heterobidactyle; legs I and II each bearing a thick antiaxial claw and a thin paraxial claw; legs III and IV each bearing a thin antiaxial claw and a thick paraxial claw. No leg-fin is found on any part of legs I-IV.

*Type-series*. Holotype (NSMT-AC 9294): Ton-zaki in Tatsugo-mura, Amami-Oshima Island, S. Japan [AMA-2], 15 m, 8-II-1980, J: Aoki. *ex* litter and soil under a coppice forest

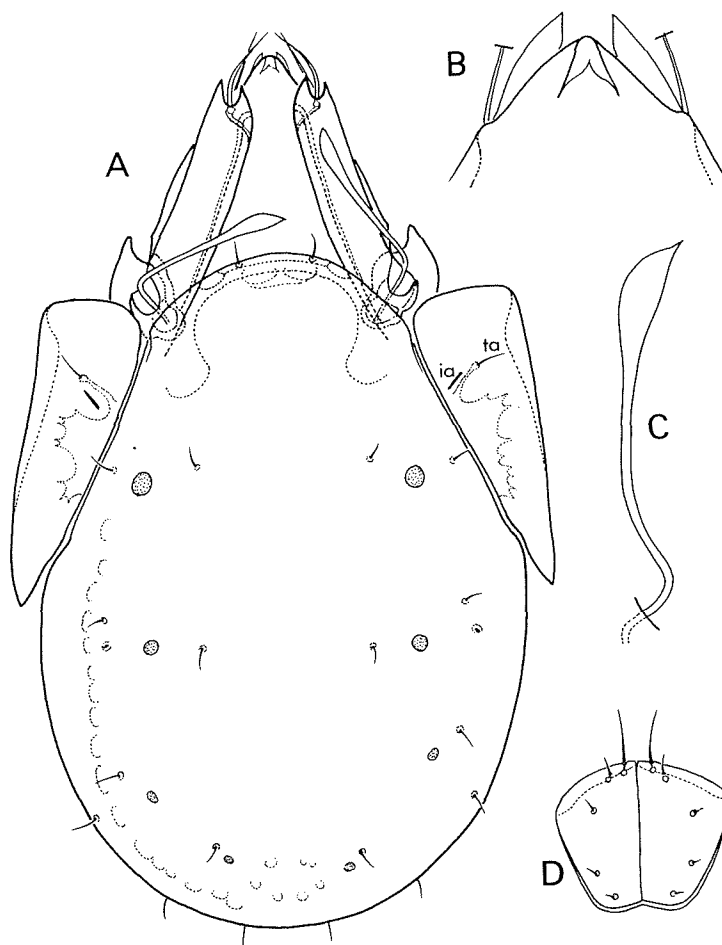


Fig. 6 *Cultrobates nipponicus* spec. nov. — A: Dorsal. B: Rostrum. C: Sensillus. D: Genital plates.

of *Castanopsis cuspidata* var. *sieboldii*. —Paratopotypes (3 exs.) : the same data as holotype. —Paratypes (3 exs.) : Ohtana in Yamato-mura, Amami-Oshima Island. S. Japan [AMA-3] , 175 m, 9-II-1980, J. Aoki. ex litter and soil under a coppice forest of *Castanopsis cuspidata* var. *sieboldii*.

*Remarks.* After inclusion of the present new species into the genus *Cultrobates* WILLMANN, 1930, a problem remains concerning with the number of notogastral setae and that of claws. In his original description of the type species, *C. heterodactylus*, Willmann (1930) did not mention the number of notogastral setae, but in his original figure he gave 9 pairs of notogastral setae (8 pairs on notogastral shield and 1 pair on pteromorpha). His figure must be deficient in setae  $p_3$ , but it is unknown whether the setae are really absent or overlooked by him. As to the number of claws, he observed 1 claw on leg I and 3 claws on legs II-IV. But, all the legs of the new species have 2 claws, one thick and the other thin. Thus, the formula of the claw number is 1-3-3-3 in *C. heterodactylus* and 2-2-2-2 in *C. nipponicus*. According to BALOGH (1972), *Cultrobates* is said to have 6 pairs of genital setae, though no mention in this regard was made in the original description of *Cultrobates* and its type species. The Japanese new species has, however, only 5 pairs of genital setae.

In spite of these differences the structures of lamellae, bothridia, sensilli, pteromorphae and notogaster are very similar to each other between the two species, and the Japanese species belongs no doubt to the genus *Cultrobates*. The most marked features of *C. nipponicus*. According to Balogh (1972), *Cultrobates* is said to have 6 pairs of genital setae, though no mention in this regard was made in the original description of *Cultrobates* and its type species. The Japanese new species has, however, only 5 pairs of genital setae.

#### ***Neoribates rotundus* spec. nov.**

(Fig. 7)

*Measurement.* Body length : 810  $\mu$ ; width : 660  $\mu$ .

*Prodorsum.* Rostrum projecting, but with rounded tip. Rostral and lamellar setae very weakly and sparsely barbed; interlamellar seta seems to be glabrous. RLN (relative length to notogaster) of  $ro$  and  $le$  : 12.9 and 17.1, respectively; ratio in length of  $ro : le = 3 : 4$ ;  $ro$  slightly longer than their mutual distance  $ro-ro$ , while  $le$  are equal in length to  $le-le$ . Sensillus seta-like, without barbation, gradually attenuating toward the tip (RLN : 28.6). Lamellae narrow and situated marginally in dorsal aspect.

*Notogaster.* Broadly rounded and nearly circular, L/W of notogaster being 1.06. Four pairs of sacculi medium sized;  $S_a$  somewhat larger than the remaining sacculi. Notogastral setae hardly visible, only their insertion pores being detected; sacculus  $S_1$  and seta  $ms$  occupy a fairly median position. An assemblage of about 30-40 distinct light spots found in the area lateral to seta  $te$  and posterior to seta  $ti$ . Anteromedian margin of pteromorpha narrowly rimmed.

*Legs.* Heterotridactyle. Leg I : femur with 2 strong and barbed dorsal setae and 1 short and thin lateral seta; genu with 1 solenidion, 1 long and smooth seta and 2 barbed setae; solenidion  $\varphi_1$  on tibia  $2.3\times$  as long as  $\varphi_2$ ; solenidion  $\omega_2$  on tarsus distinctly thicker and shorter than  $\omega_1$ .

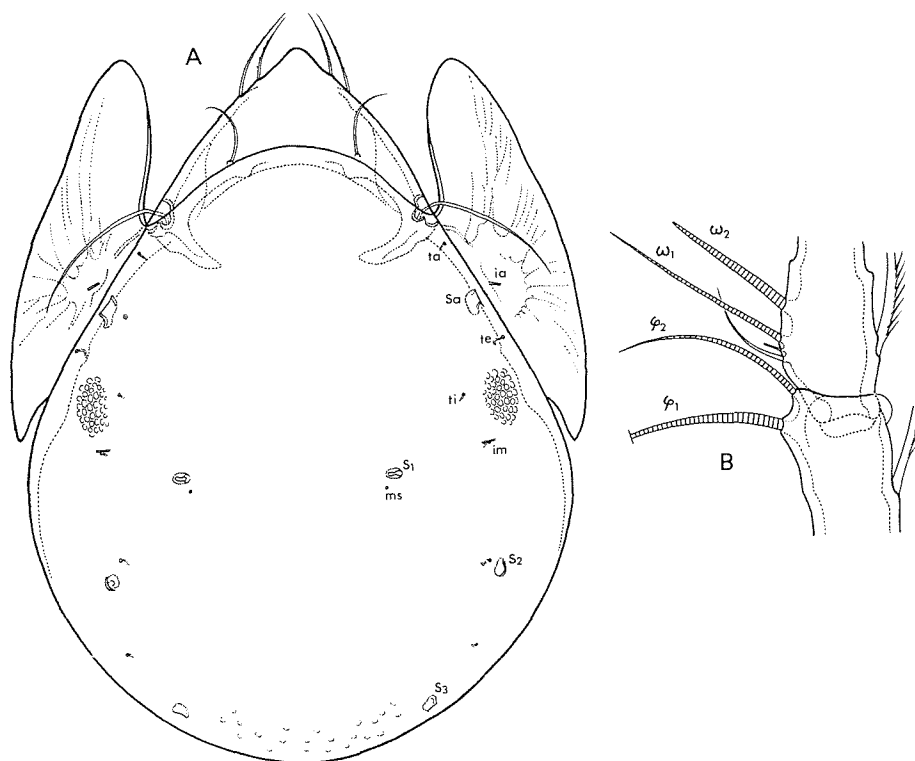


Fig. 7 *Neoribates rotundus* spec. nov. —A: Dorsal. B: Distal part of tibia and basal part of tarsus of leg I.

*Type-series.* Holotype (NSMT-AC 9238) : Mt. Odake in Gushikawa-mura, Kumejima Is., S. Japan [KME-1] , 260 m, 24-III-1980, J. Aoki. *ex* litter and soil under a secondary forest of *Castanopsis cuspidata* var. *sieboldii*. —Paratopotype : the same data as holotype.

*Remarks.* Most of the known species of the genus *Neoribates* have sensilli which bear a spindle-shaped head as in *N. aurantiacus* (OUDEMANS, 1914), *N. foraminiferus* SELLNICK, 1923, *N. rimosus* SUZUKI, 1978, *N. gracillis* TRAVÉ, 1972, or a clavate head as in *N. neglectus* WILLMANN, 1953, *N. quadrisetosus* (EWING, 1917). If the sensilli have no distinct head, they bear barbations bilaterally. However, the present new species is quite peculiar in having the sensilli which have neither head nor barbation. The almost circular notogastral shape and the existence of group of light spots on each lateral side of notogaster are also characteristic features of the new species.

***Galumna planiclava ishigakiensis* subsp. nov.**

(Fig. 8 A-C)

*Measurement.* 295-360  $\mu$ ; width : 238-280  $\mu$ .

The form collected on Ishigaki Island strongly resembles *Galumna planiclava* HAMMER, 1973, from Tongatapu Island, in having broadly rounded notogaster, clavate sensilli with a thin stalk and a clavate head, very minute interlamellar setae, large areae porosae,

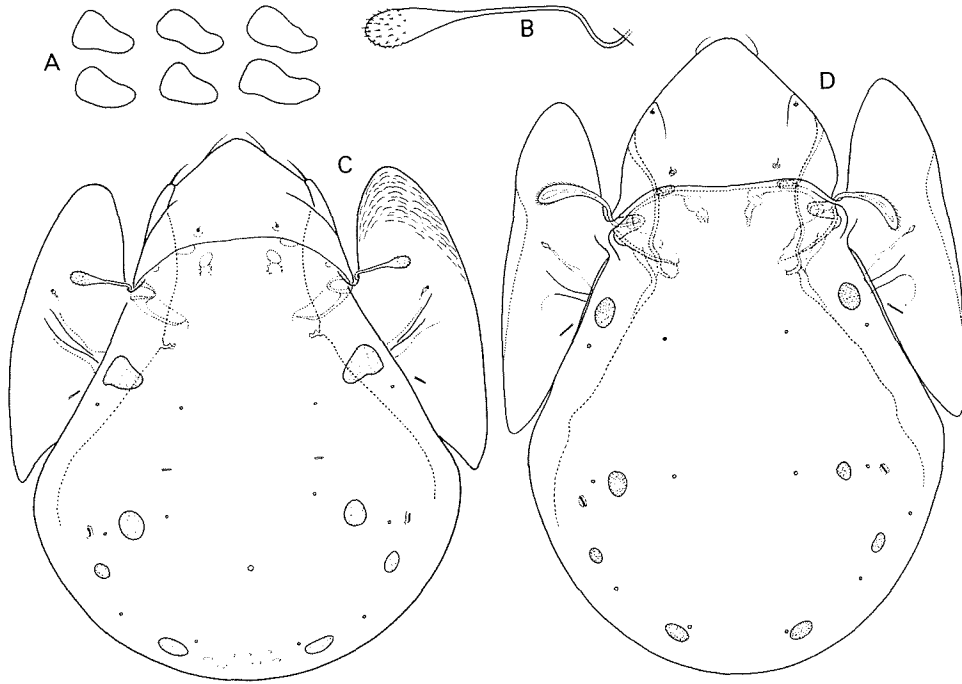


Fig. 8 A-C: *Galumna planiclava ishigakiensis* subsp. nov. — A: Variation of areae porosae Aa on the left side (drawn after crushed specimens). B: Sensillus. C: Dorsal. — D: *Galumna flabellifera* HAMMER. Dorsal.

notogastral fissures *im* located far medially and posteromedian pore on notogaster. But, a careful examination revealed the following differences, by which the Japanese form is treated here as a new subspecies. (1) Distinct lamellar setae are present, (2) Sensillar head somewhat thicker, (3) Areae porosae Aa more angular, (4) Areae porosae A<sub>1</sub> distinctly larger than A<sub>2</sub>, (5) Area porosa postanal is not so large, being less than half as wide as a single anal plate. Only the anterior part of pteromorpha shows a number of irregular wrinkles, though such a structure was not mentioned by Hammer on the Tongatapu specimens.

*Type-series.* Holotype (NSMT-AC 9303) : Yoshihara in Ishigaki-shi, Ishigaki Island, S. Japan [ISG-2], 1 m, 2-X-1978, J. Aoki. *ex* litter and soil under a natural forest of *Ardisia sieboldii* and *Planchonella obovata*. — Paratopotypes (12 exs.) : the same data as holotype.

### *Galumna flabellifera* HAMMER

(Fig. 8 D)

*Galumna flabellifera* HAMMER, 1958, p. 93, fig. 116 ; AOKI, 1964, p. 659, figs. 18-22 ; MAHUNKA, 1978, p. 334, figs. 57-58.

*Galumna flabellifera orientalis* AOKI, 1965, p. 187, figs. 97-100, *syn. nov.*

*Galumna nuda* ENGELBRECHT, 1972, p. 246, figs. 12-22, *syn. nov.*

*Galumna flabellifera* was described by Hammer (1958) from Argentine and Bolivia, and

later it was reported from Laysan Island (Aoki, 1964) and from Mauritius Island (Mahunka, 1978). Aoki (1965) described from Thailand a subspecies, *G. flabellifera orientalis*, but the differences mentioned by the author is now considered to be not so important for the subspecific segregation. Engelbrecht (1972) published a detailed description of *Galumna nuda* from South Africa, but he did not make comparison between his species and any of the known species of the genus *Galumna*. I could not find any important difference between his species and *G. flabellifera*, and considered it identical with the latter species.

*Material examined* : 1 ex. : Ayamaru-Misaki in Kasari-cho, Amami-Oshima Island, S. Japan [AMA-1], 10 m, 8-II-1980, J. Aoki. ex litter and soil under vegetation of *Cycas revoluta*; 1 ex.: Ohtana in Yamato-mura, Amami-Oshima, S. Japan [AMA-3], 175 m, 9-II-1980, J. Aoki. ex litter and soil under a coppice forest of *Castanopsis cuspidata* var. *sieboldii*. —1 ex.: Yonehara in Ishigaki-shi, Ishigaki Island, S. Japan [ISG-4], 1 m, 2-X-1978, J. Aoki. ex litter and soil under a maritime forest of *Hibiscus tilaceus*. —2 exs.: West of Nagura in Ishigaki-shi, Ishigaki Island, S. Japan [ISG-5], 1 m, 22-X-1978, J. Aoki. ex litter and soil on grassland of *Miscanthus sinensis*. —2 exs.: Nagura in Ishigaki-shi, Ishigaki Island, S. Japan [ISG-6], 10 m, 2-X-1978, J. Aoki. ex litter and soil under a shrub of *Casuarina equisetifolia*.

### 摘 要

土壌性ササラダニ類の調査が未だ十分に行なわれていない南西諸島から、7新種および2新亜種のササラダニ類を記載した。それらはケマガリイブシダニ *Austrocarabodes curvisetiger* sp. n. (奄美大島・石垣島)、コブイカダニ *Dolicheremaeus distinctus* sp. n. (奄美大島)、アマミケナガイカダニ *Dolicheremaeus infrequens amamiensis* subsp. n. (奄美大島)、エリカドコイタダニ *Hemileius tenuis* sp. n. (奄美大島)、ヤ

エヤマナガコソテダニ *Xylobates magnus* sp. n. (石垣島)、カタビロナガコソテダニ *Xylobates gracilis* sp. n. (奄美大島)、ケタバネダニ *Cultrobates nipponicus* sp. n. (奄美大島)、マルフリソテダニ *Neoribates rotundus* sp. n. (久米島)、コンボウフリソテダニ *Galumna planiclava ishigakiensis* subsp. n. (石垣島)である。なお、新種ではないが、奄美大島および石垣島からはミナミフリソテダニ *Galumna flabellifera* HAMMERが採集された。(和名はいずれも新称)

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