

## A Description of the Male of *Pachylaelaps copris* Ishikawa, 1984 (Acari: Pachylaelapidae)<sup>1</sup>

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### ABSTRACT

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The male of *Pachylaelaps copris* Ishikawa is described and illustrated on the basis of materials from Hokkaido, northern Japan. This species has been collected only from the body surface of the dung beetle *Copris ochus* Motschulsky.

Key words: *Pachylaelaps copris*, Pachylaelapidae, male, northern Japan, *Copris ochus*

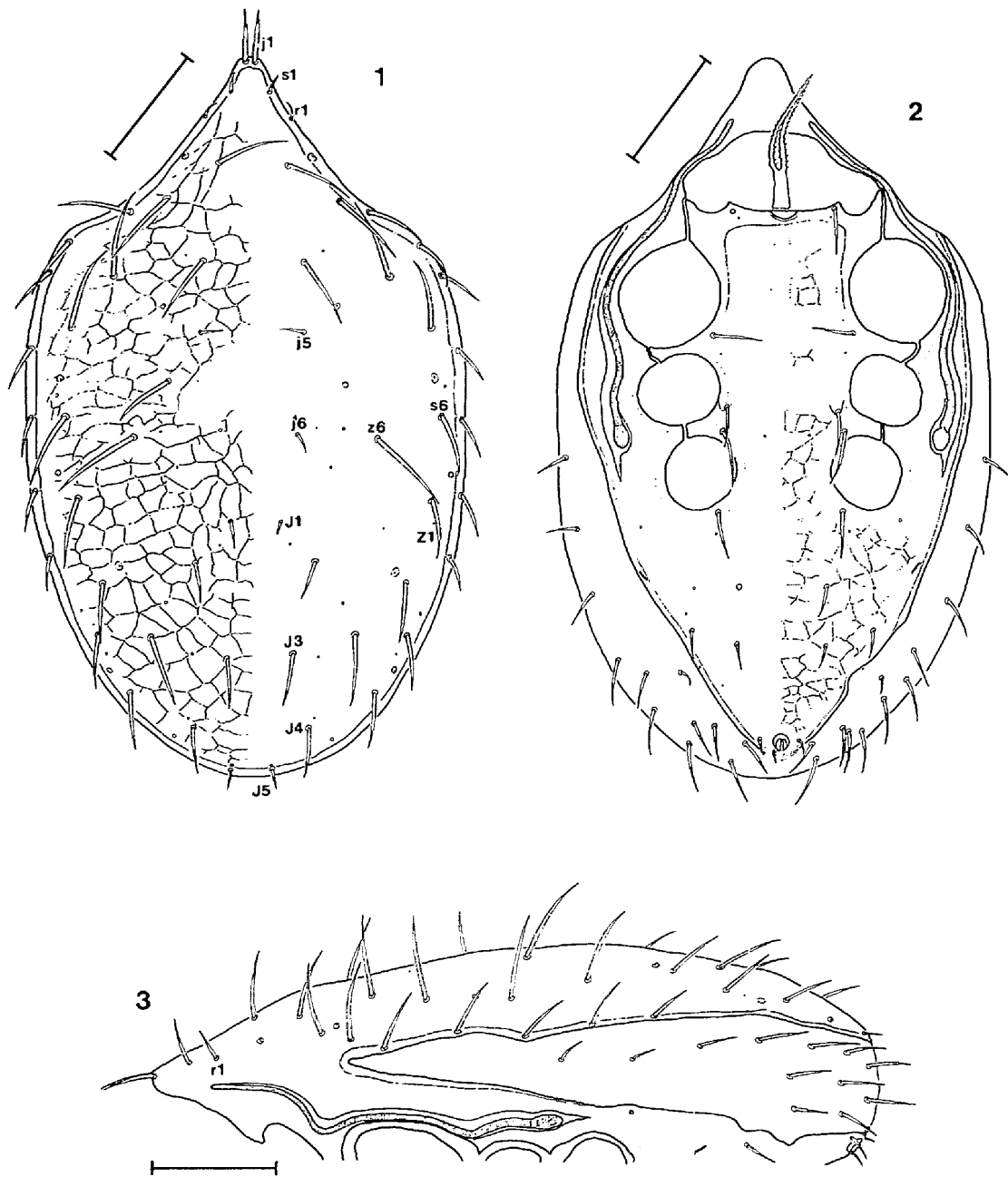
### INTRODUCTION

The genus *Pachylaelaps* Berlese currently comprises about 110 species. In Japan, this genus has so far been represented by four species, namely *P. ishizuchiensis* Ishikawa, *P. daruma* Ishikawa, *P. harukoe* Ishikawa and *P. copris* Ishikawa (Ishikawa, 1977 & 1984). Of these species, *P. harukoe* and *P. copris* are known to be phoretic on *Hister japonicus* Marseul (Coleoptera: Histeridae) and *Copris ochus* Motschulsky (Coleoptera: Scarabaeidae), respectively. *P. copris* was originally described on the basis of female specimens collected in Kyushu, southwest Japan (Ishikawa, 1984) and later recorded from Hokkaido, northern Japan (Takaku *et al.*, 1994). In the present study, the male of *P. copris* collected in Hokkaido is described and illustrated for the first time.

All the mite specimens were collected from the body surface of *Copris ochus*. They were fixed with 70% ethyl alcohol and mounted in gum-chloral medium after clearing in lactophenol. Observations and measurements were made with a phase-contrast microscope, and illustrations were prepared with the aid of a drawing apparatus. All measurements were given in micrometers ( $\mu\text{m}$ ).

In this paper, dorsal chaetotaxy follows Evans and Till (1979). Examined materials will be deposited in the collection of Graduate School of Science, Hokkaido University; collection of the Laboratory of Biology, Matsuyama Shinonome College, Matsuyama;

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Figs. 1-3. *Pachylaelaps copris*, male. 1: Dorsum. 2: Venter. 3: Lateral view of idiosoma. Scale bars = 200  $\mu$ m.

and in the Acarology Collection of Oregon State University.

### DESCRIPTION

Family Pachylaelapidae Berlese, 1913

Genus *Pachylaelaps* Berlese, 1888

*Pachylaelaps copris* Ishikawa, 1984

*Pachylaelaps copris* Ishikawa, 1984, p. 98, Fig. 6 (holotype: Mt. Aso, Kumamoto Pref.,

Japan; in the collection of Biological Laboratory, Matsuyama Shinonome Junior College (MSJC-BL 168); not examined); Takaku *et al.*, 1994, p. 307.

*Male.* Length of idiosoma, 1208-1493 ( $1382.0 \pm 97.3$ ,  $n=11$ ); width at level of coxae IV, 653-914 ( $847.9 \pm 75.5$ ,  $n=11$ ). Length of dorsal shield, 1200-1485 ( $1362.7 \pm 98.7$ ,  $n=11$ ); width at level of coxae IV, 653-914 ( $839.7 \pm 73.5$ ,  $n=11$ ). Dorsal shield yellowish brown.

Dorsum (Fig. 1): Dorsal shield large, oval and with anterior projection; surface of the shield ornamented with irregular reticulation; the shield bearing 30 pairs of dorsal setae; all of the dorsal setae simple. Setae j1 on anterior projection longer than the posterior s1 and r1; j5, j6 and J5 slender and short; J1 also short, but longer than the j5, j6 and J5; J5 shorter than J4, but not vestigial; z6 long and reaching or surpassing the bases of Z1; J3 shorter than the distances between the bases of J3 and J4.

Length of setae: j1, 78-94 ( $86.0 \pm 5.7$ ,  $n=11$ ); j5, 24-49 ( $38.0 \pm 9.7$ ,  $n=5$ ); j6, 33-49 ( $40.2 \pm 5.9$ ,  $n=5$ ); J1, 41-82 ( $57.8 \pm 16.8$ ,  $n=6$ ); J3, 90-131 ( $106.6 \pm 14.4$ ,  $n=9$ ); J4, 90-126 ( $107.2 \pm 12.0$ ,  $n=11$ ); J5, 20-33 ( $26.9 \pm 5.4$ ,  $n=11$ ); z6, 126-196 ( $159.1 \pm 23.6$ ,  $n=7$ ); s1, 29-78 ( $53.9 \pm 17.0$ ,  $n=11$ ); r1, 24-51 ( $36.5 \pm 10.2$ ,  $n=11$ ).

Venter (Figs. 2, 3): Tritosternum well developed, with a pair of pilose laciniae. Holoventral shield well developed and sclerotized; length of the shield 947-1093 ( $1025.9 \pm 52.2$ ,  $n=11$ ); shield ornamented with irregular reticulation, the reticulation weak in the sternal region; genital orifice situated medially on anterior margin; with 8 pairs of setae, a pair of paranal setae and a postanal seta, all of them simple; anterior 4 pairs of setae long, paranal and postanal setae short. Integument with 12 pairs of simple setae. Cribrum distinct.

Peritreme well developed, with the anterior extremity reaching the level of dorsal setae r1 (Fig.3); stigmata located at a level between coxae III and IV.

Gnathosoma (Figs. 4-6): Well developed and sclerotized. Venter of gnathosoma (Fig. 4) with 3 pairs of hypostomatic setae, a pair of palpcoxal setae and 3 pairs of small triangular projections. Length of anterior hypostomatic setae, 61-80 ( $68.8 \pm 6.1$ ,  $n=11$ ); internal posterior hypostomatic setae, 96-151 ( $120.4 \pm 12.8$ ,  $n=11$ ); external posterior hypostomatic setae, 37-55 ( $43.8 \pm 5.6$ ,  $n=10$ ); palpcoxal setae, 35-45 ( $38.5 \pm 3.1$ ,  $n=11$ ). Corniculi narrow and elongate; length of corniculi 106-126 ( $117.5 \pm 6.8$ ,  $n=11$ ). Deutosternal groove with 6 rows of denticles and a posterior transverse ridge without denticles.

Palptibia without any processes. Palpal chaetotaxy of trochanter, femur and genu 2-5-6, palptarsus with trifold apotele. Tectum (Fig. 5) without narrow basal neck; each lateral margin weakly serrate; distal margin of tectum more or less flat, deeply divided to form 6 to 12 fingers as illustrated.

Fixed digit of chelicera (Fig.6) with a robust tooth, a distal small tooth, a terminal hook, a *pilus dentilis* and a fine dorsal seta; movable digit with a large tooth, a terminal hook, a ventral hook and a short spermatodactyl distally; spermatodactyl shorter than movable digit; length of the movable digits 106-131 ( $120.0 \pm 7.7$ ,  $n=11$ ), length of the spermatodactyl 80-86 ( $82.2 \pm 2.2$ ,  $n=11$ ).

Legs (Figs. 7-8): All tarsi with ambulacra and a pair of claws. Femur and tibia of leg II (Fig. 7) each with a large spur ventrally; genu of leg II with one or two ventral spurs;

ventral aspect of tarsus II with one or two small rounded protuberances in proximal half, a small spur and a conical thick seta distally. Trochanter and femur of leg IV (Fig. 8) with one and three rounded ventral protuberances, respectively.

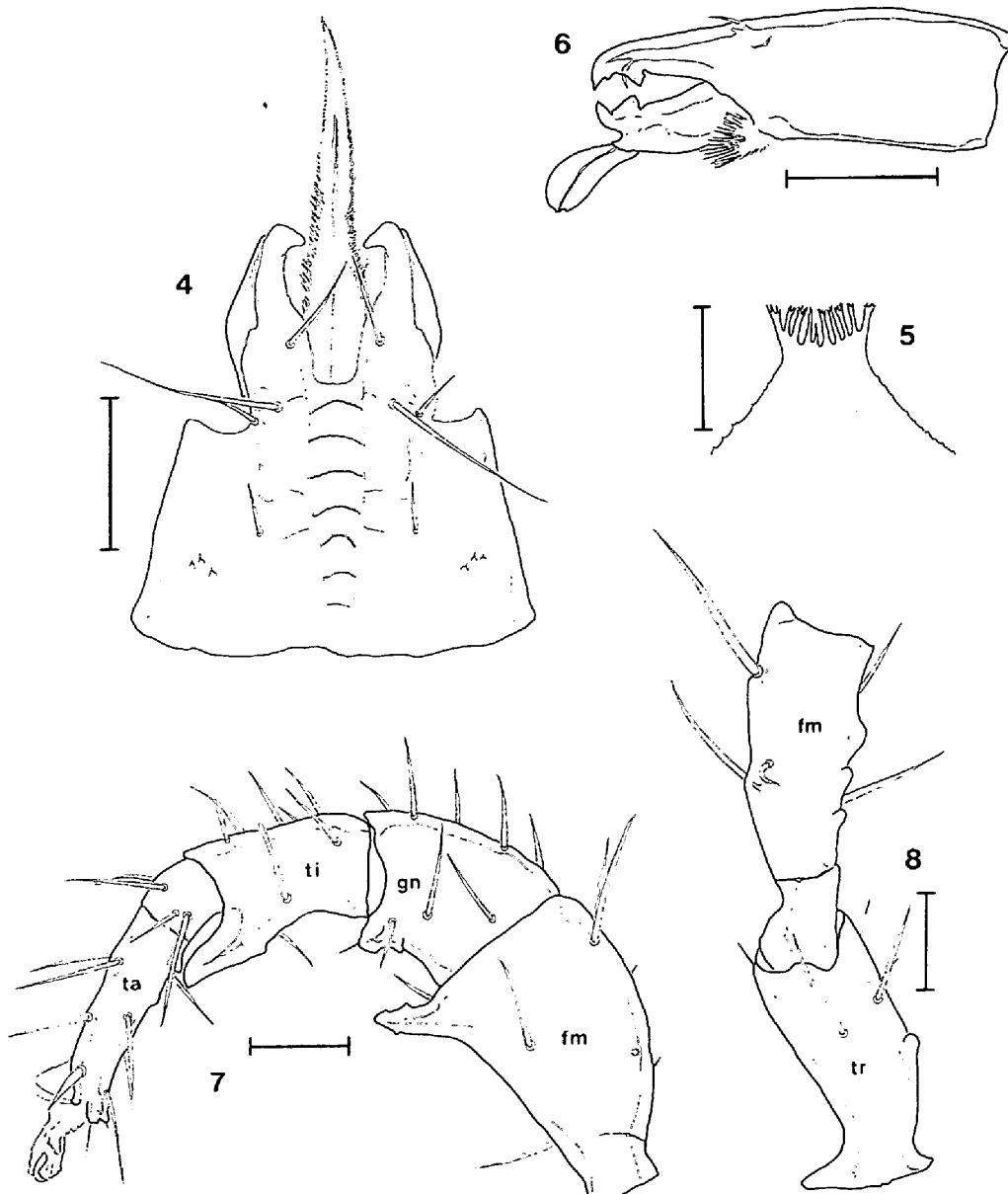
Leg chaetotaxy (coxa, trochanter, femur, genu and tibia) as follows:

Leg I: 0, 0/1, 0/1, 0; 1, 1/1, 0/2, 1; 2, 3/1, 2/3, 2; 2, 3/2, 2/1, 2; 2, 3/2, 3/1, 2.

Leg II: 0, 0/1, 0/1, 0; 1, 0/1, 0/2, 1; 2, 3/1, 2/2, 1; 2, 3/1, 2/1, 2; 2, 2/1, 2/1, 2.

Leg III: 0, 0/1, 0/1, 0; 1, 1/1, 0/1, 1; 1, 2/1, 1/0, 1; 1, 2/1, 2/0, 1; 1, 1/1, 2/1, 1.

Leg IV: 0, 0/0, 0/1, 0; 1, 0/2, 0/1, 1; 1, 2/1, 2/0, 0; 1, 2/1, 2/0, 1; 1, 1/1, 2/1, 1



Figs. 4-8. *Pachylaelaps copris*, male. 4: Ventral view of gnathosoma (scale bar = 100  $\mu$ m). 5: Tectum (scale bar = 50  $\mu$ m). 6: Chelicera (scale bar = 100  $\mu$ m). 7: Leg II (excluding coxa, trochanter) (scale bar = 100  $\mu$ m). 8: Trochanter and femur of leg IV (scale bar = 100  $\mu$ m) (fm-femur; gn-genu; ta-tarsus; ti-tibia; tr-trochanter).

Leg length (except ambulacrum, n=11): Leg I, 1093-1346 ( $1229.1 \pm 89.7$ ); Leg II, 857-1281 ( $1063.1 \pm 139.6$ ); Leg III, 898-1093 ( $1014.1 \pm 71.5$ ); Leg IV, 1273-1567 ( $1433.8 \pm 108.1$ ).

*Material examined*: Three males, Ishikari, Hokkaido, Japan, 11 June 1989, N. Yoshida leg., ex *Copris ochus* Motschulsky. Four males, 26 July 1991; 2 males, 5 August 1991; 2 males, 25 July 1994, Hokkaido Agricultural Experiment Station, Sapporo, Hokkaido, Japan, G. Takaku leg., ex *C. ochus*.

*Habitat*: Adult females and males were found exclusively on the body surface (mainly the ventral surface of body, in particular the membraneous portion between pro- and mesothorax) of *Copris ochus* Motschulsky in Hokkaido, northern Japan. No immature stages have been discovered yet.

*Distribution*: Japan (Hokkaido and Kyushu).

*Remarks*: The male of *Pachylaelaps copris* is similar to that of *P. nidicolens* Koroleva (Koroleva, 1977) in the shape of spermatodactyl, but differs from the latter as follows (corresponding conditions of *nidicolens* in parentheses): length of dorsal shield 1200-1485 (510-550); dorsal shield with anterior projection (without projection); dorsal setae j4, j5 and J5 shorter than surrounding setae (similar to surrounding setae in length); femur II with only one ventral spur (with a small protuberance distally in addition to a ventral spur).

According to the original description, the female had 29 pairs of setae on the dorsal shield (Ishikawa, 1984), while the male examined in the present study had 30 pairs of dorsal setae. This difference, however, is probably due to a mere individual variation. The female should have 29 or 30 pairs on the dorsal shield, because the paratype material of the female I examined had 30 pairs of the setae.

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## 和文摘要

ダイコクコガネダルマダニ *Pachylaelaps copris* の雄の記載 高久 元 (北海道大学大学院理学研究科生物科学専攻)

北海道内で採集された個体に基づいてダニ科ダイコクコガネダルマダニの雄を記載した。本種はこれまで北海道及び九州から記録されており、コガネムシ科のダイコクコガネの体表からのみ採集されている。

## REFERENCES

Evans, G.O. and W.M. Till (1979): Mesostigmatic mites of Britain and Ireland (Chelicerata: Acari-

- Parasitiformes) An Introduction to their external morphology and classification. *Trans. zool. Soc. Lond.*, 35: 139-270.
- Ishikawa, K. (1977): Mites of the genus *Pachylaelaps* Berlese (Acari, Mesostigmata, Pachylaelapidae) in Japan (I). *Annot. Zool. Jap.*, 50: 249-254.
- Ishikawa, K. (1984): Studies on the mesostigmatid mites associated with the insects in Japan (II). *Rep. Res. Matsuyama Shinonome Jr. Col.*, 15: 89-102.
- Koroleva, E.V. (1977): New species of the genus *Pachylaelaps* Berlese, 1888 (Parasitiformes, Pachylaelaptidae). *Parazit. Sb.*, 27: 119-148.
- Takaku, G., H. Katakura and N. Yoshida (1994): Mesostigmatic mites (Acari) associated with ground, burying, roving carrion and dung beetles (Coleoptera) in Sapporo and Tomakomai, Hokkaido, northern Japan. *Zool. Sci.*, 11: 305-311.