Macrochelid mites (Acari: Mesostigmata: Macrochelidae) in Sempu Island, East Java, Indonesia

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ABSTRACT

Six species of macrochelid mites were collected from scarabaeid dung beetles in Sempu Island, East Java, Indonesia. Of these, one species, Macrocheles insulicola was described as new to science. The remaining five species were Glypholaspis asperrima (Berlese, 1905), Neopodocinum subjaspersi Hartini and Takaku 2003, M. dispar (Berlese, 1910), M. entetiensis Hartini and Takaku 2005, and M. jabarensis Hartini and Takaku 2003.

Key words: Macrochelidae, scarabaeid beetles, Sempu Island, East Java, Indonesia.

INTRODUCTION

Macrochelid mites in East Java, Indonesia, have been poorly known, and the following only 6 species of the genus Macrocheles have been recorded until now: Macrocheles hallidayi Walter and Krantz, 1986, M. kraepelini (Berlese, 1905), M. krantzi Evans and Hyatt, 1963, M. limae Samšíňák, 1962, M. oigru Walter and Krantz, 1986, and M. sp. aff. glaber (Müller, 1860) (Halliday, 2000; Hartini and Takaku, 2003; Hartini et al., 2005).

Sempu Island is located in the Regency of Malang, south of East Java Province. The island is uninhabited and lies 112°40'45" – 112°42'45"E and 8°7'24" – 8°24'54"S. This island is Nature Reserve under “Balai Konservasi Sumber Daya Alam (BKSDA) (= Division of Natural Resources Conservation)”, East Java Province. Condition of fauna and flora are preserved well, and mammals such as deer, black monkey, wild boars, and leopard have been reported from the island. Dung of mammals generally harbor insects (flies and dung beetles) and mites. Most of macrochelid mites in dung community are phoretic on scarabaeid beetles, and mites use beetles as a vehicle to move for one dung habitat to another. We would expect several macrochelid mites to appear on scarabaeid beetles in the island.

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MATERIALS AND METHODS

Scarabaeid dung beetles were collected by using dung traps installed in the forest. Mite specimens were collected from body surface of beetles and fixed in 70% ethanol. Specimens were mounted on slides in PVA (Polyvinyl alcohol – lactic acid mixture) medium, after clearing in lactic acid. In the description, all measurements are given in micrometers (μm). Measurements are provided as average and range in parentheses. Dorsal chaetotaxy and other terminology follow Halliday (1987), Krantz (1967a) and Walter and Krantz (1986a, b). The holotype and paratypes of new species will be deposited in the collection of the Museum Zoologicum Bogoriense (MZB), Bogor, Indonesia.

As the result of our investigation of macrochelid mites in Sempu Island, East Java in 2006, we found six macrochelid mite species belonging to 3 genera. One of them is described here as new to science. The remaining species are new records from East Java.

DESCRIPTIONS AND LOCALITY RECORDS

Family Macrochelidae Vitzthum, 1930

Macrocheles insulicola n. sp.

(Figs. 1-6)

Description: Female. Length of dorsal shield 721.7 (700–765), width at level of coxae II 410 (330–460) (n=3). Specimens yellowish brown.

Dorsum (Fig. 1): Dorsal shield rounded posteriorly, ornamented with reticulations; lateral margin smooth; shield bearing 28 pairs of dorsal setae and 22 pairs of pores; setae $j1$ pilose; $z1$ short, and not reaching insertion of $j2$; $j5$, $j6$, $z5$, $z6$, and $J2$ simple; other setae pilose in distal half to distal 2/3; $J5$ entirely pilose.

Venter (Fig. 2): Sternal shield wider than long; length 135, width at level of coxae II 148.3 (145–150) (n=3); linea angulata (l.ang.), linea arcuata (l.arc.), linea media transversa (l.m.t.), and linea oblique posteriores (l.o.p.) present; l.o.p. disjunct from l.m.t.; shield with 3 pairs of simple setae and 2 pairs of pores; all setae similar in length and not reaching setae behind them. Metasternal shield oval and free; each shield with 1 simple seta and an anterior pore.

Length of epigynial shield 146.7 (140–150), width 161.7 (150–170) (n=3); surface of the shield with lines and punctations; a pair of simple setae and pores located on lateral side.

Ventrianal shield covered with semi–concentric lines, and longer than wide; length 238.3 (225–250), width 213.3 (200–230) (n=3); shield with 3 pairs of preanal and pair of paranal simple setae, and 1 postanal pilose seta. Cribrum located posterior to postanal seta. Opisthogastric setae simple. A pair of metapodal shield oblong. Postcoxal pore free from podal shield. Anterior extremities of peritreme located at level of setae $z1$.

Gnathosoma (Figs. 3–5): Well developed and sclerotized. Deutosternal groove with anteriormost divided row of denticles and posterior 5 transverse rows of denticles; 3 pairs of hypostomal and 1 pair deutosternal setae simple. Epistome (Fig. 4) with median process and pair of lateral elements; median process bifurcate distally and with small spicules; lateral margin
serrate. Fixed digit of chelicera (Fig. 5) with serrate dorsal seta, small distal tooth, robust median tooth, pilus dentilis, and terminal hook; movable digit with bidentate median tooth, minute distal tooth, and terminal hook; length of fixed digit 206.7 (205–210) and movable digit 93.3 (85–100) (n=3).

**Legs:** Most of leg segments with simple and pilose setae except for coxae I–IV, trochanters I–III, and tibia and tarsus I with only simple setae, genu IV with only pilose setae. Leg chaetotaxy typical for the genus. Genu IV with 6 pilose setae. Leg length (except ambulacrum, n=3); leg I, 625 (585–650); leg II, 573.3 (545–610); leg III, 601.7 (580–630); leg IV, 836.7 (800–900).

**Sacculus foemineus** (Fig. 6): Pair of sacculi fused; small cornu rounded distally and sclerotized; spermatheca oval.

**Male and other stage:** Unknown.

**Type series:** Holotype: female (MZB.Acar. 4141–2), Sempu Island, Sendang Biru, Desa Tambak rejo, Sumber Manjing Wetan, Malang, East Java, 28 June 2006, S. Hartini leg., ex Paragymnopleurus maurus. Paratypes: 2 females, same data as for the holotype.

**Etymology:** The specific epithet is the Latin word meaning islander.

**Remarks:** The present species is similar to Macrocheles sukaramiensis Takaku, 2001 recorded from Sukarami, Sumatra, Indonesia, in the shape of dorsal setae, but it is distinguished from the latter by the following characteristics (corresponding conditions of **M. sukaramiensis** in parentheses on the basis of the original description): 1) dorsal setae Z1 and Z3 pilose distally (simple); 2) l.ang. without punctations (punctate along the line); 3) l.o.p. without punctations (punctate along line and with a pair of short punctate lines behind l.o.p.); and 4) sternal shield wider than long (longer than wide).

**Macrocheles dispar** (Berlese, 1910)

_Holostaspid dispar_ Berlese, 1910: 251.

_Macrocheles_ (Coprholaspis) _dispar:_ Berlese, 1918: 151; Vitzthum, 1925: 13–16.

_Macrocheles dispar:_ Walter and Krantz, 1992: 244, fig. 1D; Hartini and Takaku, 2003: 1262, figs. 1–6; Hartini et al., 2003: 308; Hartini et al., 2007: 75; Hartini et al., 2009: 419.

**Diagnosis:** Female. Dorsal setae j1 plumose distally; j4, z2, z4, r2–4, J5, Z5, and S5 pilose distally; j2, j3, and s2 simple, but in some cases pilose distally; other setae simple. Sternal shield ornamented with lines and punctuation; l.ang., l.m.t., l.o.p. with distinct punctations; l.m.t. complete; l.o.p. disjunct from l.m.t. and not bifurcated; center of posterior half of the shield with small punctations.

**Material examined:** 75 females, _ex Onthophagus_ (Macronthophagus) rotundicollis, O. (O.) orientalis, O. (O.) cibratus, O. luridipenis, O. (O.) javaecola, O. (O.) malangensis, O. (Serrophorus) mulleri, O. hirustulus, O. (Gibbonthophagus) fuscopunctatus, Paragymnopleurus maurus, P. sparsus javanus, Sisyphus thoracicus. Other collection data are same as for the preceding species.

**Habitat:** This species has been collected from species of genera _Aphodius, Catharsius, Copris, Onthophagus, Paragymnopleurus, Sisyphus_ (Scarabaeidae), and _Enoplotrupes_ (Geotrupidae).

**Distribution:** Indonesia (Java, Sumatra, Kalimantan, Lombok, and Sulawesi), Vietnam, the Philippines, China (Sichuan Province) and Taiwan.
Fig. 1-6. *Macrocheles insulicola* n. sp., holotype, female (MZB.Acar.4141.2). 1, dorsum; 2, venter; 3, ventral view of gnathosoma; 4, epistome; 5, chelicera; 6, sacculus foemineus. (l.ang.: linea angulata; l.arc.: linea arcuata; l.m.t.: linea media transversa; l.o.p.: linea oblique posteriores)
**Macrocheles entetiensis** Hartini and Takaku, 2005


**Diagnosis:** Female. Dorsal seta _j1_ pilose distally; _j3_ and _z4_ thickened and pilose distally; _j5_, _j6_, _z5_, _z6_, and _J2_ simple; other dorsal setae pilose distally or pilose in distal half. Sternal shield with distinct l.ang., l.arc., and l.m.t.; l.o.p. disjunct from l.m.t and not bifurcated.

**Material examined:** 14 females, _ex Onthophagus (O.) cribratus, O. (O.) javaecola, O. (G.) malangensis, O. (G.) fuscopunctatus, P. sparsus javanus, S. thoracicus_. Other collection data are same as for the preceding species.

**Habitat:** This species has been collected from species of genera Aphodius, Catharsius, and Onthophagus (Scarabaeidae).

**Distribution:** Indonesia (Timor, Sumba, Flores, Sumbawa, and Java).

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**Macrocheles jabaransesis** Hartini and Takaku, 2003

_Macrocheles jabaransesis_ Hartini and Takaku, 2003: 1266, figs. 7–12. _Macrocheles jabaransensis_: Hartini et al., 2003: 308; Hartini et al., 2007: 76; Hartini et al., 2009: 420.

**Diagnosis:** Female. Dorsal seta _j1_ plumose distally, _S5_ and _Z5_ pilose in distal half, _J5_ entirely pilose, and in some case _j4_ pilose distally; other dorsal setae simple. Sternal shield with distinct l.ang., l.m.t., and l.o.p.; l.o.p. disjunct from l.m.t. and not bifurcated.

**Material examined:** 12 females, _ex Onthophagus (M.) rotundicollis, O. (O.) cribratus, O. (O.) javaecola, O. (S.) mulleri, O. (G.) fuscopunctatus, P. sparsus javanus, and S. thoracicus_. Other collection data are same as for the preceding species.

**Habitat:** This species has been collected from species of the genera Catharsius, Microcopris, Onthophagus, Paragymnopleurus, and Sisyphus (Scarabaeidae).

**Distribution:** Indonesia (Java, Kalimantant, Sumatra, Lombok, Sumbawa, and Sulawesi).

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**Glyptholaspis asperrima** (Berlese, 1905)

_Holostaspis asperrimus_ Berlese, 1905: 163–164, fig. 25.

Macrocheles (Macrocheles) asperrimus: Berlese, 1918: 172.


**Diagnosis:** Female. Dorsal shield strongly ornamented with reticulate pattern; lateral margin of shield serrate; shield bearing 28 pairs of dorsal setae; setae _z5_ simple and pointed; _j5_, _j6_, _z6_, _J2_, and _J5_ fine and pilose; remaining dorsal setae distinctly plumose; _j6_ located at anterior level of _z6_; length of _J5_ almost same as _Z5_; posterior margin between _Z5_ serrate; sternal shield ornamented with reticulate pattern; sternal setae plumose; ventrianal shield broader than long, rounded laterally.

**Material examined:** 1 female, _ex Onthophagus (M.) rotundicollis_. Other collection data are same as for the preceding species.

**Habitat:** This species has been collected from species of genus Onthophagus (Scarabaeidae)
and forest leaf litter.

**Distribution:** Indonesia (West and East Java), Micronesia (Caroline and Marshall Islands), and India.

*Neopodocinum subjaspersi* Hartini and Takaku, 2003


*Neopodocinum subjaspersi:* Hartini and Takaku, 2004: 86.

**Diagnosis:** Female. Dorsal shield oval, attenuated posteriorly; surface strongly punctate posteriorly; shield bearing 28 pairs of dorsal setae and unpaired Jx seta; setae j1 broad and plumose; z1 short and plumose; j2, s2, r2, s6, S1, S2, S4, S5, Z5, and J2 pilose; other dorsal setae simple. Sternal shield ornamented with slight reticulations and punctations; I.m.t. broken medially. Anal shield small, with a pair of simple paranal setae and a simple postanal seta; opisthogastric setae simple or slightly pilose.

**Material examined:** 1 female and 4 deutonymphs, *ex Onthophagus (O.) cribratus*. Other collection data are same as for the preceding species.

**Habitat:** The present species has been collected from species of genera *Catharsius* and *Onthophagus* (Scarabacidae).

**Distribution:** Indonesia (Java and Kalimantan).

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**REFERENCES**


摘要
インドネシア・東ジャワ・スンプ島のハエダニ類（ダニ亜綱：トゲダニ目：ハエダニ科）
Sri HARTINI（インドネシア科学院生物学研究所）・高久 元（北海道教育大学教育学部札幌校）
インドネシア・東ジャワにあるスンプ島で食糞性コガネムシ類の体表から6種のハエダニ科ダニ類が発見された。これらのダニ類のうち、1種は新種であり、Macrocheles insulicolaと命名し記載を行った。その他の5種は、 Glypholaspis asperrima (Berlese, 1905), Neopodocinum subjaspersi Hartini and Takaku 2003, M. dispar (Berlese, 1910), M. entetiensis Hartini and Takaku 2005, M. jabarensis Hartini and Takaku 2003 であり、いずれも東ジャワからは初めての記録である。