ISSN 0082 - 6340

TREUBIA

A JOURNAL ON ZOOLOGY
OF THE INDO-AUSTRALIAN ARCHIPELAGO

Vol. 36, pp. 1 - 47 December 2008

Published by

RESEARCH CENTER FOR BIOLOGY
INDONESIAN INSTITUTE OF SCIENCES
BOGOR, INDONESIA

ISSN 0082-6340
Accreditated: A
No. 96/Akred-LIPI/P2MBI/2008

TREUBIA

A JOURNAL ON ZOOLOGY OF THE INDO-AUSTRALIAN ARCHIPELAGO

Vol. 36, pp. 1 – 47, December 2008

Other Publication of the RCB-Research Centre for Biology, Indonesian Institute of Sciences

REINWARDTIA

A journal on taxonomic botany and plant ecology being a continuation of the Bulletin du Jardin de Buitenzorg. Issued irregularly; one volume consists of 500-600 pages. Published by: Herbarium Bogoriense.

Subscription and Exchange

RESEARCH CENTRE FOR BIOLOGY
Jl. Raya Jakarta-Bogor Km.46 Cibinong-Bogor, 16911 – Indonesia
email: treubia@gmail.com

Received 16 January 2008
Accepted 27 May 2008
Treubia 2008 36: 11 - 22

NOTES ON *MACROCHELES* (ACARI: MACROCHELIDAE) ASSOCIATED WITH SCARABAEID DUNG BEETLE IN RAJA AMPAT, WAIGEO ISLAND, WEST PAPUA, INDONESIA

Sri Hartini

Division of Zoology, Research Center for Biology, Indonesian Institute of Sciences, Jl. Raya Jakarta-Bogor Km. 46, Cibinong - Bogor 16911, Indonesia

Abstract

Four species of the genus *Macrocheles* belonging to the family Macrochelidae were reported from Raja Ampat, Waigeo Island, West Papua, including *M. timikaensis* Hartini & Takaku 2006 and *M. dispar* (Berlese 1910) as new record to the Island. Two new species and the deutonymph of *M. timikaensis* Hartini & Takaku 2006 are described.

Key word: *Macrocheles*, Macrochelidae, dung beetles, Waigeo Island, Papua

INTRODUCTION

Thirteen species of three genera belonging to the family Macrochelidae have been recorded from Papua, Indonesia western side of the New Guinea Island (Krantz 1967, Hartini & Takaku 2006a, b). Those are two species of *Holostaspella*, one species of *Glyptholaspis* and ten species of *Macrocheles* from Jayapura, Manokwari, Timika, and Biak Island. The genus *Macrocheles* was firstly reported from the Papuan region in 2006 by Hartini & Takaku. In the present study two additional new species are reported from Raja Ampat, Waigeo Island, Papua.

MATERIALS AND METHODS

All the mite specimens were collected from Lopintol, Teluk Manyailibit, Raja Ampat, Waigeo Island, West Papua, Indonesia using human dung trap. Mites were collected from body surface of scarabaeid dung beetles and were fixed in 70% ethanol. Several mite specimens were dissected under a stereoscopic microscope after clearing in lactic acid. Each body part was mounted on slide in PVA medium. Observations were made with a differential interference contrast microscope. Illustrations were prepared with the aid of a drawing tube. All measurements are given in micrometers (m). Measurements in each description are provided as averages and range in parentheses, if more than two specimens were measured. The dorsal chaetotaxy follows Halliday 1987. Other terminology, particularly that for the sternal ornamentation follows Walter & Krantz 1986, Halliday 2000, Hartini & Takaku 2006a, b. All specimens including holotype and paratypes of each species are deposited in the collection of the Museum Zoologicum Bogoriense, Bogor, Indonesia (MZB).

RESULT AND DISCUSSION

Descriptions and locality records

Macrocheles dispar (Berlese 1910)

Diagnosis. Dorsal shield bearing 28 pairs of dorsal setae and 22 pairs of pores; setae j1 plumose in distal halves; setae z1 simple, j4 pilose distally; r2-4, S5, Z5, J5 pilose in distal halves; z4 pilose distally; other setae long simple; in some cases s2, s5, S4, and Z4 pilose in distal halves. Sternal shield wider than length; linea angulata (l. ang.), linea arcuata (l. arc.), linea media transversa (l.m.t.), linea oblique posteriorres (l.o.p.) present, l.m.t. complete; l.o.p. short, not bifurcated, disjunct from l.m.t.; a pair of short punctate lines present behind l.o.p.

Material examined. 10 females, Wai Bayon, Lopintol, Raja Ampat, Waigeo Island, West Papua, Indonesia 30 May-1 June and 6-9 June 2007, Darmawan and Endang Cholik, leg., *ex Onthophagus* sp.

Remarks. This specimen is tentatively identified as *Macrocheles dispar* (Berlese 1910) because of its similarities to *M. dispar* in most characters. However the

present specimen is different from the original description of *M. dispar* on sternal ornamentation which is more distinct than that of *M. dispar*.

Macrocheles timikaensis Hartini & Takaku 2006

(Figures 1-5)

Macrocheles timikaensis Hartini & Takaku 2006: 39, figs 19-29.

Female and male of this species were described by Hartini & Takaku 2006. In this species new additional characters from the deutonymph is described here.

"Notes". Female and male of *M. timikaensis* have characteristic of dorsal shield with 29 pairs of dorsal setae and 22 pairs of pores, surface ornamentation with punctations around Z1-Z4 and J5; setae j1 plumose; J5 pilose entirely; J2 and Z5 pilose in distal halves, but in some case J2 simples; other dorsal setae small simple.

Deutonymph. Length of dorsal shield 434 (415-492.5), width at level of coxae II 242.5 (250-290) (n=9). Living specimens yellow.

Dorsum (Figure 1). Dorsal shield and dorsal setae same as female only rather pale, surface ornamented with reticulate pattern, shield with 29 pairs setae and 8 pairs of pores; j1 plumose; J5 pilose entirely; Z5 and S5 pilose in distal halves; J2 pilose in distal halves, but in some cases simple; other dorsal setae small and simple. Lateral incision in dorsal shield.

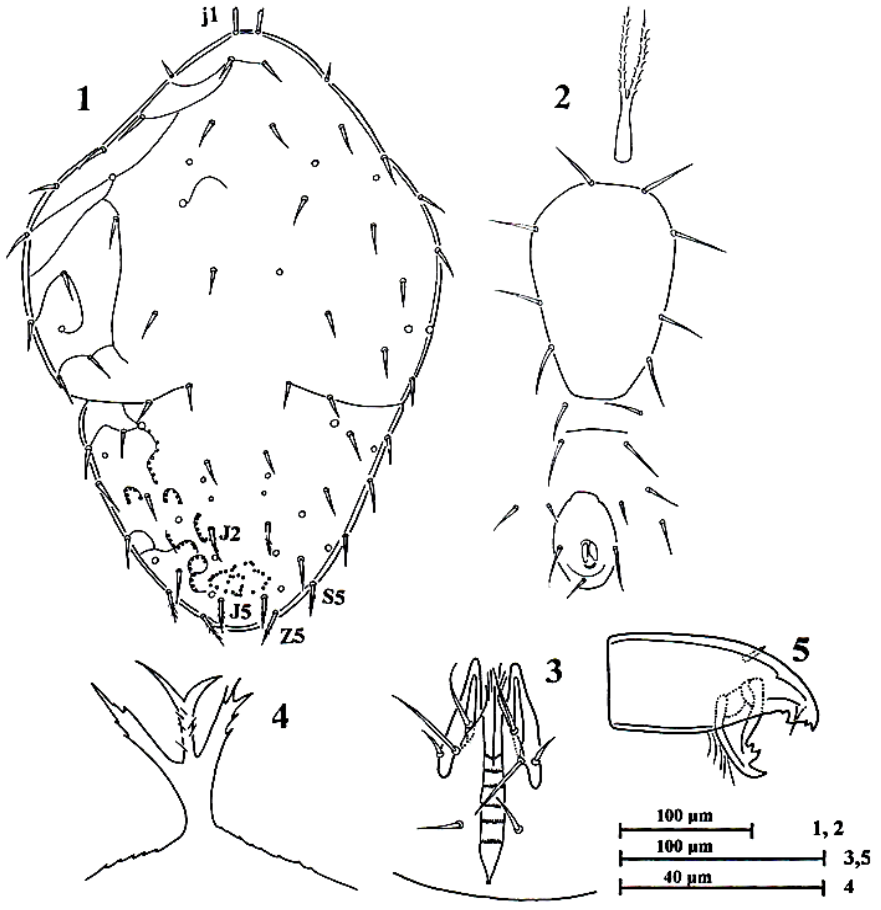
Venter (Figure 2). Tritosternum as in female. Sternoventral shield longer than wide, 186.7 (162.5-200) long and width at level of coxae II 117.2 (105-135) (n=9); shield with 4 pairs of simple setae and 3 pairs of pores; all setae same in length.

Anal shield oval; length of shield 81.4 (72.5-92.5), width 66.1 (52.5-92.5) (n=9); shield with pair of paranal setae and 1 postanal seta; all the setae simple; cribrum located on posterior margin of anal shield. Ophisthogastric setae simple. A pair of metapodal shield oblong. Postcoxal pore free from podal shield. Peritreme fine.

Gnathosoma (Figure 3). Gnathosoma as in female. Epistome (Figure 4) with median process and pair of lateral processes; median process bifurcated and with many spicules; distal parts of lateral processed polyfurcated; basal margin serrate. Fixed digit of chelicera (Figure 5) with simple dorsal seta, robust median tooth, minute distal tooth, *pilus dentilis*, minute proximal tooth, and terminal hook; movable digit with bidentate

robust median tooth, and terminal hook; arthrodial process strongly pilose; length of fixed digit 108.3 (92.5-117.5) and movable digit 48.9 (42.5-55) (n=9).

Legs. All of leg segments with simple setae. Leg chaetotaxy typical for the genus. Genu IV with 6 simple setae. Leg length (except ambulacrum, n=9); leg I, 310 (250-362.5); leg II, 290 (255-330); leg III, 272.8 (242.5-302.5); leg IV, 349.7 (300-390).



Figures 1-5. *Macrocheles timikaensis* Hartini and Takaku, 2006, deutonymph. 1, dorsal shield; 2, venter; 3, ventral view of gnathosoma; 4, epistome; 5, chelicera

Material examined: 20 females, 5 males, 6 deutonymphs, Wai Rabiai, Lopintol, Teluk Manyailibit, Raja Ampat, Papua Barat, Indonesia, 3-5 June 2007, E. Cholik and Darmawan leg., *ex Onthophagus* sp.; 3 deutonymphs and 1 female, Wai Bayon, Lopintol, Teluk Manyailibit, Raja Ampat, Papua Barat, Indonesia; 6-9 June 2007, E. Cholik and Darmawan leg., *ex Onthophagus* spp.; 4 females, Lopintol, Lopintol, Teluk Manyailibit, Raja Ampat, Papua Barat, Indonesia, 30 May-1 June 2007, E. Cholik and Darmawan leg., *ex Onthophagus* sp.

Habitat: This species has been collected from scarabaeid beetles of the genus *Onthophagus*.

Distribution: Indonesia {Papua [Timika, Waigeo island (new record)]}.

Macrocheles amaliae n. sp.

(Figures 6-10)

.

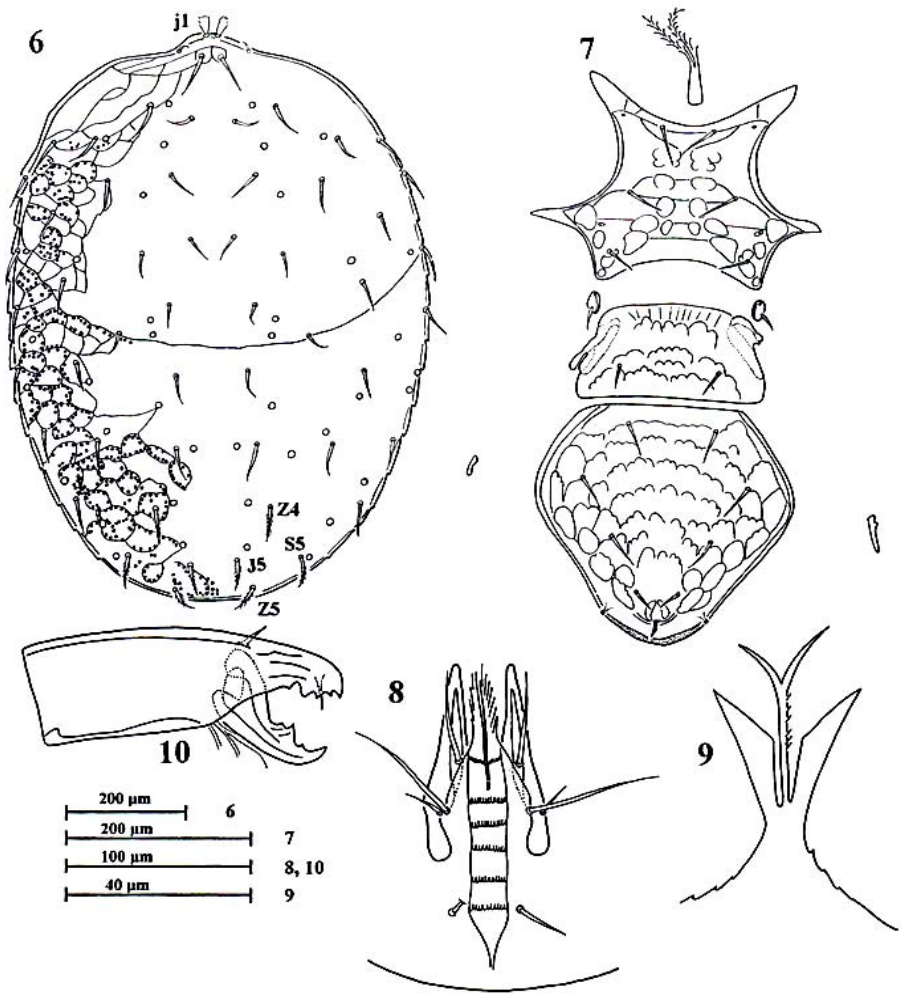
Type series. Holotype: female (MZB.Acar. 4394), Wai Bayon, Lopintol, Raja Ampat, Waigeo Island, West Papua, Indonesia, 6-9 June 2007, Darmawan and Endang Cholik, leg., *ex Onthophagus* sp. Paratypes: 9 females, data as for holotype; 5 females, Lopintol, Lopintol, Raja Ampat, Waigeo Island, West Papua, Indonesia, 30 May-2 June 2007, other data same as for holotype.

Female. Length of dorsal shield 638.7 (575-670), width at level of coxae II 358.3 (350-400) (n=15). Living specimens yellowish brown.

Dorsum (Figure 6). Dorsal shield oval, ornamented with reticulations and punctations anteriorly, posteriorly and laterally; lateral margin serrrate; shield bearing 29 pairs of dorsal setae and 22 pairs of pores; setae j1 broadened throughout, elliptical with strongly serrated edges; setae z1 minute and simple; Z4, and J5 pilose in distal, two thirds; Z5 pilose in distal halves; other setae simple.

Venter (Figure 7). Sternal shield as long as width; length of sternal shield 136.3 (125-140), width at level of coxae II 131 (105-140) (n=15); surface ornamented with line and paired large round fossae symmetrically; l. ang., l. arc., l.m.t., and l.o.p. distinct; shield with 3 pairs of simple setae and 2 pairs of pores; all setae same in length. Metasternal shield oval and free; each shield with 1 simple seta and an anterior pore.

Length of epigynial shield 118.7 (110-135), width 200.7 (185-215) (n=15), surface ornamented with lines and reticulations; shield with pair of simple setae and pores on lateral side.



Figures 6-10. *Macrocheles amaliae* n. sp., female, holotype (MZB..Acar.4394). 6, dorsal shield; 7, venter; 8, ventral view of gnathosoma; 9, epistome, 10, chelicera

Ventrianal shield expanded, wider than long, ornamented with punctations in posterior and laterally and with lines in anteriorly; length 233.3 (210-250), width 262.3 (250-275) (n=15); shield with 3 pairs of preanal setae, pair of paranal setae and 1 postanal seta; all the setae simple except for pilose postanal seta; cribrum located posterior to postanal seta. Ophisthogastric 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 (Figure 8). Well developed and sclerotized. Deutosternal groove with 5 transverse rows of denticles. Epistome (Figure 9) with median process and pair of lateral elements; median process bifurcate distally and with small spicules; lateral margin serrate. Fixed digit of chelicera (Figure 10) with simple dorsal seta, robust median tooth, two small distal teeth, *pilus dentilis*, small proximal tooth, and terminal hook; movable digit with bidentate robust median tooth, small distal tooth, and terminal hook; length of fixed digit 156.1 (145-170) and movable digit 64 (60-70) (n=15).

Legs. Most of leg segments with simple, pilose, and plumose setae except for coxae, trochanters, femurs I, III, genu I, tibiae and tarsi I-II with only simple setae. Leg chaetotaxy typical for the genus. Genu IV with 6 simple and plumose setae. Leg length (except ambulacrum, n=15); leg I, 431.3 (390-475); leg II, 447 (395-475); leg III, 389.3 (355-410); leg IV, 583.3 (575-650).

Sacculus foemineus. Not observed.

Other stage. Unknown.

Etymology. This species is named after the late Miss. Pipit Amalia, a young entomologist in Indonesian Institute of Sciences (LIPI) who passed away after this EWIN expedition.

Remarks. This species is similar to *Macrocheles tessellatus* Halliday 2000 recorded from Australia in the ventral ornamentation. However, *Macrocheles amaliae* is discernible from *M. tessellatus* by the following female features (corresponding conditions of *M. tessellatus* in parentheses): 1) dorsal punctations not strong, ornamented only in margin and posterior part (strongly ornamented with punctate tubercles); 2) j2-j6, z2, z4-z6, s4-6, and r2-4 simple (pilose distally); 3) sternal setae simple (thick and distally pilose); and 4) metasternal setae simple (distally pilose).

***Macrocheles waigeoensis* n. sp.**

(Figures 11-21)

Type series. Holotype: female (MZB.Acar.4363.1) Wai Rabiai; Lopintol, Raja Ampat, Waigeo Island, West Papua, Indonesia, 1-2 June 2007, Darmawan and Endang Cholik leg., *ex Onthophagus* sp. Paratypes: 6 females, data as for holotype, 7 females and 3 males, 3-5 June 2007, other data same as for holotype; 2 females, Wai Bayon,

Lopintol, Raja Ampat, Waigeo Island, West Papua, Indonesia, 6-9 June 2007, other data same as for holotype.

Female. Length of dorsal shield 623.3 (590-675), width at level of coxae II 331.1 (310-355) (n=14). Living specimens yellowish brown.

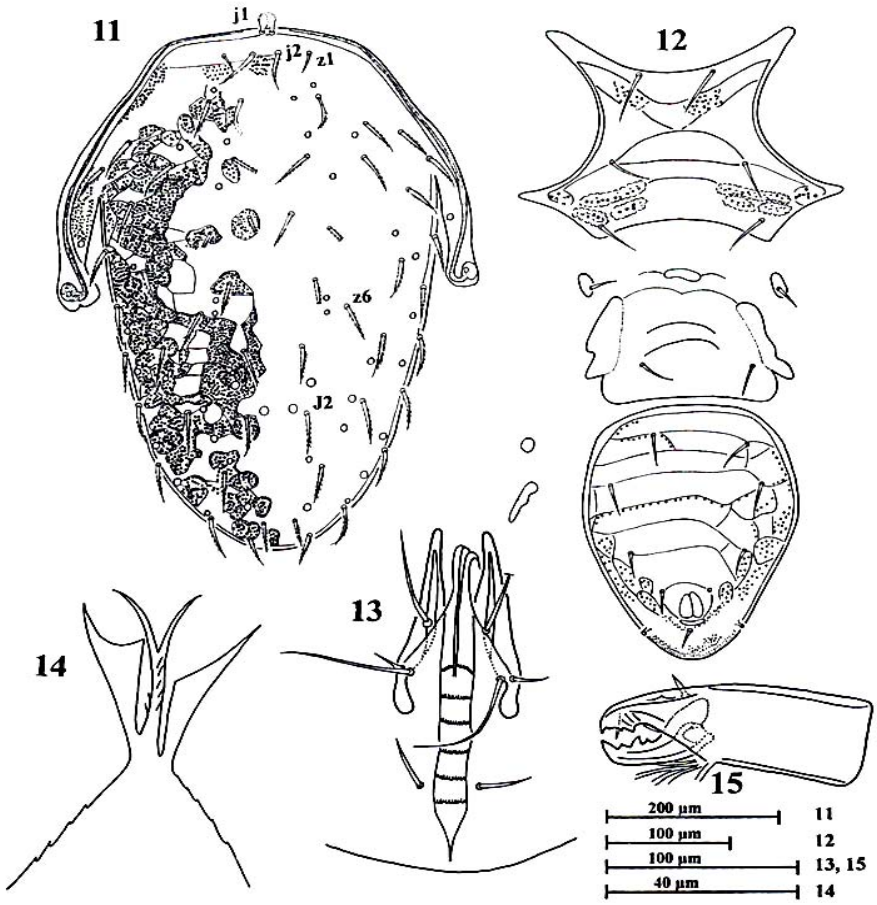
Dorsum (Figure 11). Dorsal shield strongly attenuated posteriorly, ornamented throughout with conspicuous punctate polygons, except for medial smoother area between j2-J2 and a part of anterior and posterior area; margin and posterior strongly punctate; lateral margin smooth; a pair of curved lines running behind insertions of z6; shield bearing 29 pairs of dorsal setae and 22 pairs of pores; setae j1 broadened throughout, elliptical with strongly serrate edges; setae z1 simple; other setae finely pilose for most of the length.

Venter (Figure 12). Sternal shield longer than wide; length of sternal shield 126.1 (120-140), width at level of coxae II 116.1 (115-125) (n=14); distinct l. ang., l. ang., l. arc., l.m.t. present, and l.o.p. as a transverse line behind l.m.t.; a pair of distinct punctate areas located behind l.ang. and transverse l.o.p., respectively; shield with 3 pairs of simple setae and 2 pairs of pores; all setae same in length. Metasternal shield oval and free; each shield with 1 simple seta and an anterior pore.

Length of epigynial shield 112.9 (100-135), width 156.4 (145-170) (n=14) surface ornamented with lines and a pair of punctate areas behind epigynial setae; shield with pair of simple setae and pores on lateral side.

Ventrianal shield longer than wide, ornamented with irregular punctate polygons; length 216.4 (200-235), width 179.6 (160-200) (n=14); shield with 3 pairs of preanal setae and pair of paranal setae, and 1 postanal seta; all the setae simple; cribrum with paranal extention. Ophisthogastric setae pilose and simple. A pair of metapodal shield oblong. Postcoxal pore free from podal shield. Anterior extremities of peritreme located at level of setae z1.

Gnathosoma (Figure 13). Well developed and sclerotized. Deutosternal groove with 5 transverse rows of denticles. Epistome (Figure 14) with median process and pair of lateral elements, median process bifurcate distally and with small spicules; lateral margin serrate. Fixed digit of chelicera (Figure 15) with dorsal seta, robust median tooth, two small distal teeth, *pilus dentilis*, and terminal hook; movable digit with bidentate robust median tooth, small distal tooth, and terminal hook; length of fixed digit 148.2 (140-150), movable digit 60 (40-65) (n=14).



Figures 11-15. *Macrocheles waigeoensis* n. sp., female, holotype (MZB.Acar.4363.1). 11, dorsal shield; 12, venter; 13, ventral view of gnathosoma; 14, epistome; 15, chelicera.

Legs. Most of leg segments with simple, pilose, and plumose setae except for coxae I, IV, trochanters I, III, femur I, tibia and tarsus I with only simple setae. Leg chaetotaxy typical for the genus. Genu IV with 6 simple and plumose setae. Leg length (except ambulacrum, n=14); leg I, 425.4 (385-500); leg II, 437.9 (405-470); leg III, 411.8 (390-430); leg IV, 604.6 (585-640).

Sacculus foemineus. Not observed.

Male. Length of dorsal shield 481.7 (475-490), width at level coxae II 296.7 (285-305) (n=3).

Dorsum (Figure 16). Dorsal ornamentation and chaetotaxy of male same as for female.

Venter (Figure 17). Surface of holoventral shield with distinct punctate reticulate ornamentation in ventrianal area, and with semiconcentric lines in ventrianal region; length 373. 3 (360-385), width at level of coxae II 98.3 (95-100) (n=3); 9 pairs of setae, a pair of paranal setae, a postanal setae present; all the setae simple except for pilose postanal seta; 3 pairs of pores present; cribrum with paranal extensions. Ophisthogastric setae simple and pilose.

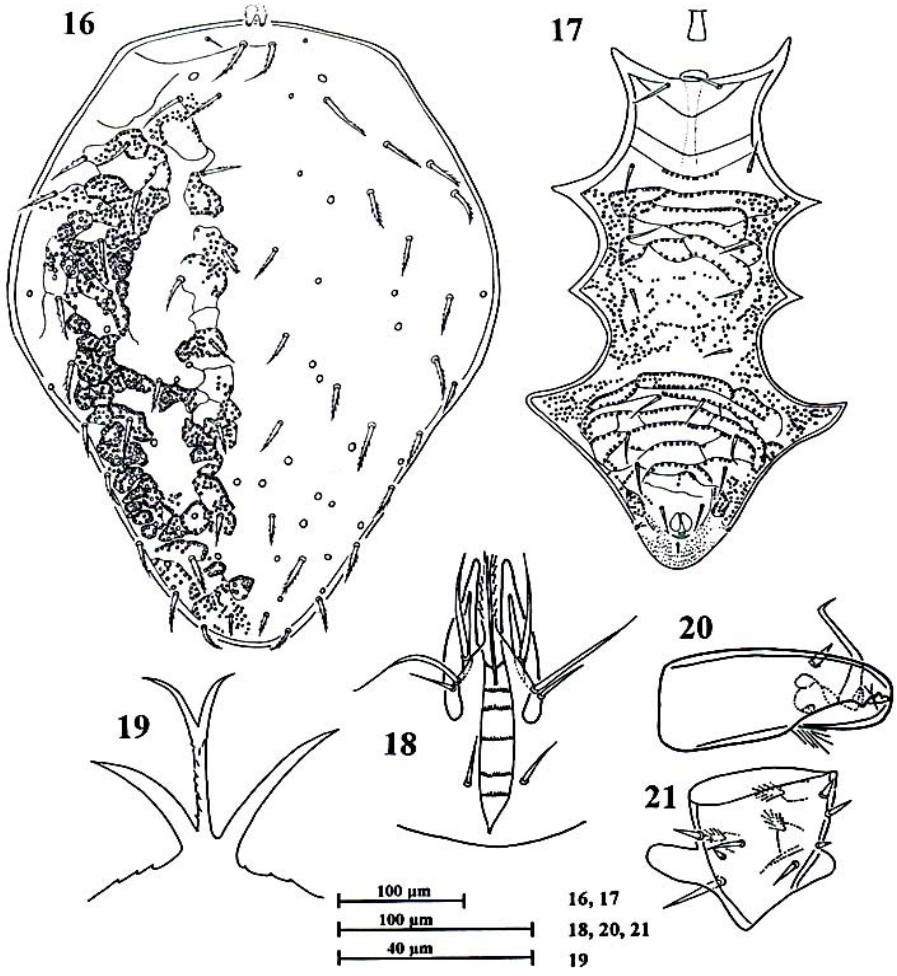
Gnathosoma (Figure 18) as in female; epistome shown in Figure 19. Fixed digit of chelicera (Figure 20) with dorsal seta, robust median teeth, two small distal tooth, *pilus dentilis*, and terminal hook; movable digit with robust median tooth, spermatodactyl, and terminal hook; spermatodactyl length 55 (n=3); length of fixed digit 115 (110-120), movable digit 46.7 (45-50) (n=3).

Legs. Most leg segments with simple, pilose and plumose setae, except for coxae and trochanters I-III, tibia I, and tarsi I-II with only simple setae; femur II with large spur ventrally (Figure 21); trochanters II, IV, femurs II-IV, genu , tibia and tarsi I-IV with ventral small spur, respectively. Leg chaetotaxy typical for genus; genu IV with 6 setae. Leg length (except ambulacrum, n=3, leg I, 381.7 (370-390); leg II, 363.3 (345-375); leg III, 348.3 (335-360); leg IV, 498.3 (495-500).

Immature stages. Unknown.

Etymology. This specific name is derived from the type locality.

Remarks. The present species is very similar to *Macrocheles omicron* Halliday 2000 recorded from Australia in the ventral ornamentation but it is distinguished from the latter by the following characteristics (corresponding conditions of *M. omicron* in parentheses on the basis of the original description): 1) dorsal setae j5, j6, J1, Z1-Z4, z2, s2, s4-6, r2-6, pilose for most of the length in *M. waigeoensis* (simple in *M. omicron*). This species resembles *Macrocheles sukabumiensis* Hartini & Takaku 2003 recorded from Java in the dorsal ornamentation. However, *M. waigeoensis* is distinguished from *M. sukabumiensis* by the following female feature (corresponding condition of *M. sukabumiensis* in parantheses): 1) j1 broadened expanded, elliptical and serrate edges (not broadened); 2) dorsal shield with 29 pairs of dorsal setae (28 pairs); 3) three pairs of sternal punctate oval shape area present in posterior half (a pair punctate area).



Figures 16-21. *Macrocheles waigeoensis* n. sp., male, paratype. 16, dorsal shield; 17, venter; 18, ventral view of gnathosoma; 19, epistome; 20, chelicera; 21, femur II.

ACKNOWLEDGEMENTS

This study was supported by Indonesian government in the "Widya Nusantara Expedition (EWIN)". Cordial thanks are due to Dr. Gen Takaku (Hokkaido University of Education Sapporo), Dr. Rosichon Ubaidillah and Dhian Dwibadra S. Si. (Research Center for Biology-LIPI) for their critical reading of the manuscript and also technicians (Endang Cholik and Darmawan) in Entomology Laboratory, Zoology Division, Research Center for Biology-LIPI, who collected valuable specimens. I would like to express my gratitude to Miss. Pipit Amalia, who participated in this expedition and passed away after the expedition.

REFERENCE

Berlese, A., 1910. Lista di nuove specie e nuovi generi di Acari. *Redia*, **6**: 242-271.

Halliday, R. B., 1987. Further observations on the dorsal idiosomal chaetotaxy in the Macrochelidae (Acarina). *International Journal of Acarology*, **13**: 51-59.

Halliday, R. B., 2000. The Australian species of *Macrocheles* (Acarina: Macrochelidae). *Invertebrate Taxonomy*, **14**: 273-326.

Hartini, S. & G. Takaku, 2003. Javanese species of the mite genus *Macrocheles* (Arachnida: Acari: Gamasina: Macrochelidae). *Zoological Science*, **20**: 1261-1272.

Hartini, S. & G. Takaku, 2006a. Mites of the genus *Macrocheles* (Acari: Gamasida: Macrochelidae) associated with dung beetles in Papua, Indonesia. *Journal of the Acarological Society of Japan*, **15**: 29-46.

Hartini, S. & G. Takaku, 2006b. Two new species of the genus *Holostaspella* Acari: Macrochelidae) associated with dung beetles in Papua, Indonesia. *International Journal of Acarology* **32**: 169-173

Krantz, G. W., 1967. Acarina Mesostigmata: Macrochelidae. *Insect of Micronesia*, **3**: 149-154.

Walter, D. E. & G. W. Krantz, 1986. A review of *glaber*-group (s. str.) species of the genus *Macrocheles* (Acari: Macrochelidae), and a discussion of species complexes. *Acarologia*, **27**: 277-294.

INSTRUCTIONS FOR AUTHORS

1. General. - Manuscripts to be published in TREUBIA must be written in English and submitted in triplicate to the editors of TREUBIA, Division of Zoology, Research Center for Biology, Widyasatwaloka, Jl. Raya Jakarta Bogor Km. 46, Bogor 16911, Indonesia. They should not be offered for prior or simultaneous publication elsewhere. Concise writing and omission of unessential material are recommended. After acceptance, a soft copy of the manuscript files should be sent to the editors of TREUBIA. Further correspondence can be conducted through. email address: treubia@gmail.com

2. Text. - The text must be typed, double spaced throughout. Captions of tables, figures, and plates should be inserted where you want them to be inserted, or listed at the end of the manuscript. All numbers under 10 and any number forming the first word of a sentence must be spelled out. Year should be completely written. Scientific names should all be italicized. It is recommended to use metric measurements in abbreviation (*e.g.* kg, cm, ml).

3. Citation. - References are to be cited in the text by the author's surname and year of publication , e.g. (Calder 1996, Carpenter 2005, Somadikarta 1986). For two authors, both names should be cited: e.g. (Ackery & Vane-Wright 1984). For three or more authors, only the first author is given followed by *et al., e.g.* (Foster *et a*l. 2002).

4. Abstract. - Except for short communications, articles should be accompanied by an abstract not to exceed 250 words which clearly states the essence of the paper. Key words should be mentioned following the abstract. 5. Acknowledgements, if any, should be placed preceding the list of references.

6. References. - List of references should be in alphabetical order by the first or sole author's surname. Journal references should include author's surname and initials, year of publication, title of the paper, full title of the journal (typed in *italic*), volume number (typed in **bold**) and inclusive page numbers. Book references should include author's surname and initials, year of publication, title of the book (typed in italic) or/and title of the chapter and editor (if part of a book), publisher, city of publication, and page numbers.

For example:

LaSalle, J. & M.E. Schauff, 1994. Systematics of the tribe Euderomphalini (Hymenoptera: Eulophidae): parasitoids of whiteflies (Homoptera: Aleyrodidae). *Systematic Entomology* **19**: 235-258.

MacKinnon, J. & K. Phillips, 1993. *Field Guide to the Birds of Borneo, Sumatra, Java and Bali*. Oxford University Press, Oxford, 491 pp.

Stork, N.E., 1994. Inventories of biodiversity: more than a question of numbers. In: Forey, P.L., C.J. Humphries & R.I. Vane-Wright (eds.), *Systematics and Conservation Evaluation*. Clarendon Press (for the Systematics Association), Oxford, pp. 81-100.

Maddison, D.R., 1995. Hemiptera. True bugs, cicadas, leafhoppers, aphids, etc.. Version 01 January 1995 (temporary). *http://tolweb.org/Hemiptera/8239/1995.01.01*. In: The Tree of Life Web Project, *http://tolweb.org/* (accessed on 27 November 2007).

7. Proofs and reprints. - Final proofs are given to the first or sole author for correction and approval. Twenty five reprints are supplied free of charge. Joint authors will have to divide these copies among them at their discretion. Additional reprints can be furnished at cost, the order should be placed before the final printing.

CONTENTS OF TREUBIA

VOL. 36, December 2008