

Oribatid Mites of the Northern Mariana Islands, Micronesia II. Family Oppiidae from Agrihan and Asuncion Islands

Norihide Ohkubo¹⁾ and Jun-ichi Aoki²⁾

¹⁾Mie Agricultural Research Center, Kawagita, Ureshino-cho, Mie 515–23, Japan

²⁾Institute of Environmental Science and Technology, Yokohama National University
156 Tokiwadai, Hodogaya-ku, Yokohama, Kanagawa 240, Japan

Abstract Six species of oribatid mites belonging to the family Oppiidae are reported from Agrihan and Asuncion Islands of the northern Mariana Islands. Four of them are new to science and are described as new species: *Arcoppia curvirostrata*, *Neoamerioppia flagelliapep*, *Vietoppia* (*Paragloboppia*) *pacifica* and *Insculptoppia remota*. *Neoamerioppia vietnamica* (Mahunka, 1988) comb. nov. and *Arcoppia kalimantanensis* nom. nov. are proposed.

Key words: Oppiidae, oribatid mites, new species, new combination, Agrihan Island, Asuncion Island, the Northern Mariana.

Aoki (1994) reported 32 species of oribatid mites from the two northernmost islands of North Mariana. The present paper deals with oribatid species belonging to the family Oppiidae, which were excluded from the first report. The authors examined the materials from all the islands investigated, but they found the oppiid mites only from the two islands, Agrihan and Asuncion. These mites are classified into six species, of which four species are described below as new species.

This work is part of the results of a cooperative expedition to the Northern Mariana Islands supported by the Natural History Museum and Institute, Chiba, and the Division of Fish and Wildlife, Department of Natural Resources of the Commonwealth of the Northern Mariana Islands.

All specimens including the type series are deposited in Natural History Museum and Institute, Chiba (CBM) and National Science Museum, Tokyo (NSMT).

Data of Collecting Sites

Ag-1: West valley of Agrihan Island, alt. 35 m, *Hibiscus tiliaceus*-forest, May 28, 1992, T. Kurozumi.

Ag-3: Northwest coast of Agrihan Island, alt. 10 m, *Barringtonia asiatica*-forest, May 29, 1992, T. Kurozumi.

As-1: West slope of Asuncion Island, alt. 190 m,

Neiosperma oppositifolia-*Ficus tinctoria* var. *neoebudarum*-forest, June 1, 1992, T. Kurozumi.

Description of Species

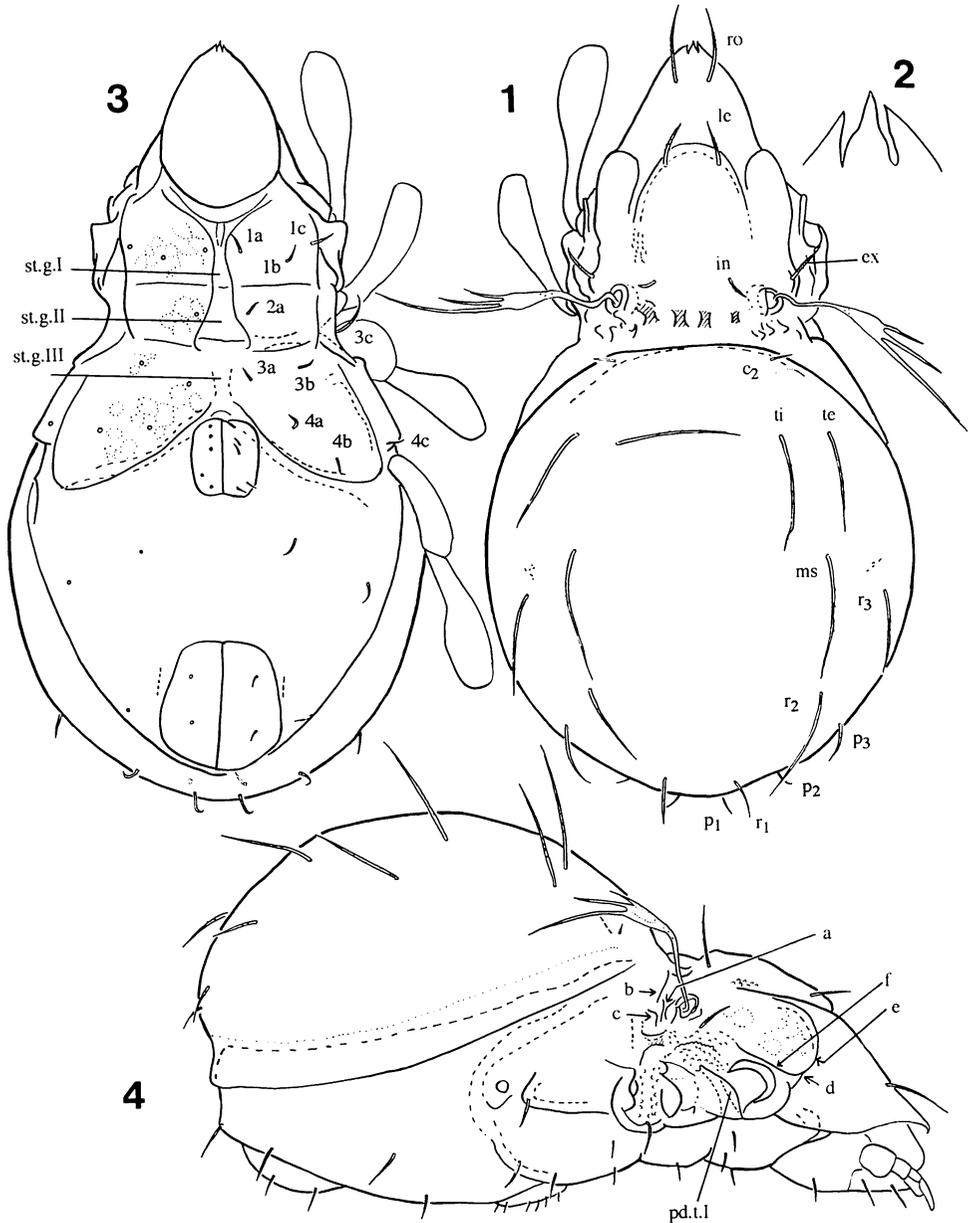
Arcoppia curvirostrata sp. nov.

(Figs. 1–8)

Material examined. Holotype (CBM-ZA-92) and 11 paratypes (CBM-ZA-93–99, NSMT-Ac 10552 to 10555): Northwest coast of Agrihan Island, May 29, 1992, T. Kurozumi.

Measurements. Body length 391–454 μm (mean 427 μm); body width 215–255 μm (mean 236 μm).

Prodorsum. Three tips of incised rostrum acute; the middle one abruptly narrowed distally, longer than the lateral ones and strongly beaked. The ridge anterior to lamellar setae arched and not interrupted. Two pairs of longitudinal ridges between bothridia strongly developed. The depression (*a*) behind bothridium transverse, fairly deep with a long and a short ridges (*b* and *c*) behind it. All the prodorsal setae minutely barbed; rostral setae (*ro*) as long as interlamellar setae (*in*) and 2.3 times longer than lamellar setae (*le*) which are as long as exobothridial setae (*ex.*) Sensillus with a swollen head, bearing three long spines; stem and the spines bearing a few very minute barbs. Bothridium nearly circular; posterior slit of the



Figs. 1-4. *Arcoppia curvirostrata* sp. nov. 1: Dorsal view. 2: Rostral tip. 3: Ventral view. 4: Lateral view.

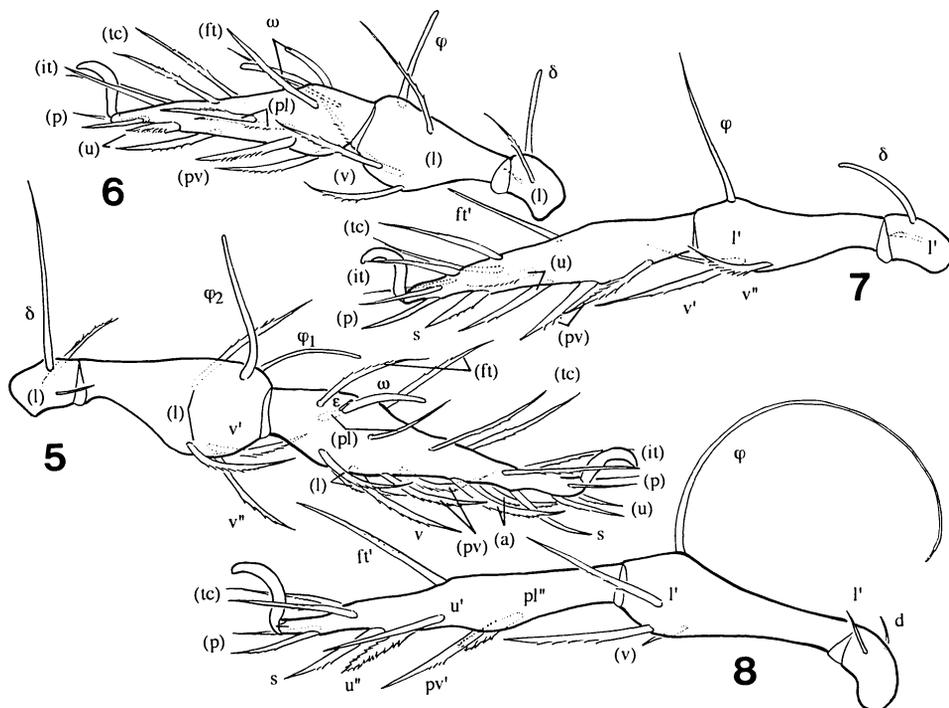
rim obscure. Lower corner (d) of lateral plate of prodorsum well rounded; anterior border (e) of the plate smoothly round; ventral border (f) of the plate situated relatively near to acetabular tectum I.

Podosoma. Pedotectum I ($pd.t.I$) in lateral view pointed at upper end. Sternal grooves ($st.g$) I and II making a triangular region as a whole. Sternal groove III weakly developed.

All epimeral setae smooth, similar in length except setae $3c$ which are barbed and slightly longer than the others.

Ano-genital region. Setae on ano-genital region smooth.

Notogaster. Setae c_2 present. All the setae nearly smooth, but showing a few minute barbs. Setae ti , ms and r_2 slightly longer than setae tc and r_3 . Setae r_1 , r_2 and p_1 to p_3 shorter.



Figs. 5-8. *Arcoppia curvirostrata* sp. nov. 5: Leg I (antiaxial). 6: Leg II (paraxial). 7: Leg III (paraxial). 8: Leg IV: (antiaxial).

Setae *ti* and *te* arranged at the same level. Mutual distance of setae r_1 shorter than $1/3$ of that of setae r_2 .

Legs. Chaetotaxies on legs I to IV, each from trochanter to tarsus, with solenidia in parentheses: 1-5-2(1)-4(2)-21(1), 1-5-2(1)-4(1)-14(2), 2-3-1(1)-3(1)-12 and 1-2-2-3(1)-10.

Remarks. *Arcoppia curvirostrata* sp. nov. most resembles a Malaysian species, *Arcoppia kalimantanensis* nom. nov. (= *Arcoppia sabahensis* Mahunka, 1988 nom. nud.: a junior primary homonym of *Arcoppia bidentata sabahensis* Mahunka, 1987). The new species is distinguishable from the latter by (1) swollen sensillus and (2) shorter notogastral setae c_2 and r_1 .

Neoamerioppia ventrosquamosa

(Hammer, 1979)

(Fig. 9)

Material examined. Two specimens: Northwest coast of Agrihan Island, May 29, 1992, T. Kurozumi.

Measurements. Body length and width: $344 \mu\text{m} \times 198 \mu\text{m}$ and $320 \mu\text{m} \times 186 \mu\text{m}$.

Remarks. This species was first recorded

from Java, and strongly resembles *Neoamerioppia vietnamica* (Mahunka, 1988) comb. nov. (= *Pseudoamerioppia vietnamica*) from Vietnam. The specimens from Mariana show some features different from the original description as follows: 1) two submedian rows of light spots on prodorsum fairly near to each other, 2) mutual distance of lamellar setae a little wider, and 3) body larger.

***Neoamerioppia flagelliapex* sp. nov.**

(Figs. 10-13)

Material examined. Holotype (CBM-ZA-103) and 6 paratypes (CBM-ZA-104 to 107, NSMT-Ac 10556 and 10557): West slope of Asuncion Island, June 1, 1992, T. Kurozumi.

Measurements. Body length $414-438 \mu\text{m}$ (mean $426 \mu\text{m}$); body width $231-255 \mu\text{m}$ (mean $242 \mu\text{m}$).

Prodorsum. Costula (C) scarcely developed. Lamellar line (L) present. Some lines on the lateral side appeared anterior to acetabular tectum I. Rostral setae near to each other, distinctly barbed near the middle. Lamellar setae weakly barbed. Exobothridial setae thick



Fig. 9. *Neoamerioppia ventrosquamosa* (Hammer, 1979). Dorsal view.

with some strong barbs. Bothridium nearly round with a small protrusion posteriorly; its wall thinner anteriorly. Sensillus clavate, bearing conspicuous barbs from stem to head.

Podosoma. Acetabular tectum I (*ac.t.I*) strongly dented with three protrusions and an incised lower lobe. In lateral view, the upper contour between pedotectum I and acetabular tectum II (*ac.t.II*) widely and roundly excavated. Discidium (*dis*) pointed. Sternal groove I narrowed at setae *1a*; sternal groove II widened backward; sternal groove III gradually narrowed backward. Sternal apodemes (*st.a*) narrower than the grooves. A small protrusion at the mesal corner of each epimeron II. Epimeral setae *1b, 3b, 3c, 4b* and *4c* long; *1a, 1c, 2a* and *3a* short.

Ano-genital region. Genital and aggenital setae smooth. Anal and adanal setae thicker and longer than the genital ones, barbed.

Notogaster. Setae *c*₂ only existing as alveoli. Nine pairs of setae barbed, fairly thick, but with a short whipping tip. Setae *ti, te, ms, r*₂ and *r*₃ long, *p*₁ shorter and *r*_{1, p}₂ and *p*₃ the shortest. The mutual distance of setae *r*₂ longer than that of setae *ms*. The mutual distance of setae *r*₁ shorter than that of setae *p*₁.

Remarks. The new species greatly resembles *Neoamerioppia woolleyi* (Hammer, 1968) from New Zealand and Fiji, but is distinguishable from it by 1) notogastral setae fairly thick but with whip-like tip, and 2) sensillar stalk rather short.

***Vietoppia (Paragloboppia) pacifica* sp. nov.**
(Figs. 14–16)

Material examined. Holotype (CBM-ZA-108) and 2 paratypes (NSMT-Ac 10558 and 10559): Northwest coast of Agrihan Island, May 29, 1992, T. Kurozumi.

Measurements. Body length about 320 μm; body width about 170 μm.

Prodorsum. Rostrum weakly pointed at tip. Linear wrinkles existing instead of lamellar line. Three pairs of light spots between interlamellar setae: the middle ones nearest to each other. All prodorsal setae weakly barbed. Rostral setae well separated from each other; their mutual distance narrower than that of interlamellar setae. Lamellar setae tapering to an acute tip, shorter than their mutual distance which is a little wider than that of interlamellar setae. Interlamellar setae longer than their mutual distance, less acute than lamellar setae. Exobothridial setae a little shorter and less acute than lamellar setae. Bothridium with a thick rim. Sensillus clavate with minute barbs.

Podosoma. Acetabular tectum I relatively narrow with a large lower lobe. In lateral view, the upper contour between pedotectum I and acetabular tectum II smoothly continued. Discidium weakly developed with a round tip. A central groove (*g*) of mentotectum conspicuous. Sternal grooves I and II almost absent; sternal groove III narrowed at the middle. Epimeral groove II (*ep.g.II*) almost absent; sejugal groove (*sj.g*) and posterior border of epimera III+IV well developed, the latter ending near the anterolateral corner of genital aperture. Epi-



Figs. 10-13. *Neoamerioppia flagelliapex* sp. nov. 10: Dorsal view. 11: Ventral view. 12: Lateral view. 13: Tip of notogastral setae r_2 .

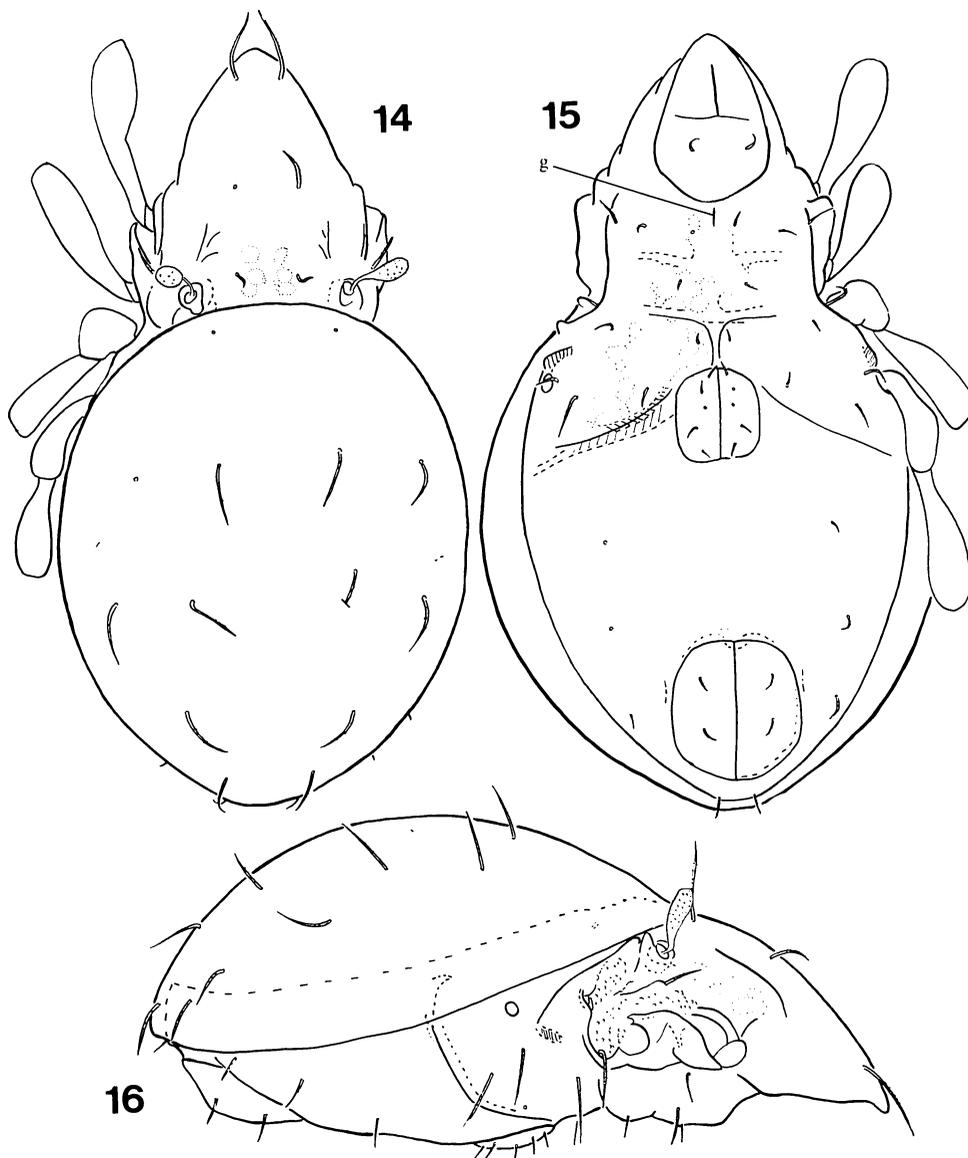
meral setae $1a$, $2a$, $3a$ and $4a$ short while the others are long.

Ano-genital region. Setae smooth. Aggenital setae widely separated from each other. Posterior adanal setae near to each other.

Notogaster. Nine pairs of setae setiform,

slightly barbed; setae c_2 only existing as alveoli. Setae te and ti far apart from the anterior border of notogaster. Setae p_3 remote from the lateral border of notogaster.

Remarks. The genus *Vietoppia* contains three other species. The present new species is



Figs. 14–16. *Vietoppia pacifica* sp. nov. 14: Dorsal view. 15: Ventral view. 16: Lateral view.

separable from them by more posteriorly located notogastral setae *ti*. Though the authors classified the present new species in the genus *Vietoppia*, its systematic position should be further investigated.

***Insculptoppia remota* sp. nov.**

(Fig. 17)

Material examined. Holotype (CBM-ZA-111): Northwest coast of Agrihan Island, May 29, 1992, T. Kurozumi.

Measurements. Body length 375 μm ; body width 213 μm .

Prodorsum. Rostral tip weakly protruding. A transverse linear groove anterior to lamellar setae, angulated at both lateral ends. Costulae inconspicuous, $1/3$ as long as the distance between lamellar setae and bothridium. Lamellar lines behind the costulae, a little longer than the costulae. A transverse ridge located between bothridia, anterior to dorsosejugal line.

Rostral, lamellar and interlamellar setae



Fig. 17. *Insculptoppia remota* sp. nov. Dorsal view.

finely barbed, moderately long. Rostral setae widely separated from each other; their mutual distance slightly narrower than that of interlamellar setae. Mutual distance of lamellar setae 1.3 times as long as that of interlamellar setae. Sensillus with ovate head, bearing several spines.

Notogaster. Nine pairs of setae rather stout but sharply pointed at tip, slightly barbed. Seta c_2 absent. Seta ti anterior to seta te . Seta ms anterior to r_3 . Mutual distance of setae r_1 relatively wide, as wide as that of setae ti .

Remarks. The new species fairly resembles a Spanish species, *Insculptoppia terricola* Subías et Rodriguez, 1986, but is distinguishable from it by 1) wider prodorsum, 2) wider mutual distance of rostral setae, and 3) more posterior position of notogastral seta p_2 . It is also similar to *I. elliptica* (Berlese, 1908) which was re-described by Subías (1980) and Subías and Rodriguez (1986), but differs from the latter in 1) wider prodorsum, 2) wider mutual distance of

rostral setae, 3) dull tip of discidium, and 4) wider mutual distance of notogastral setae r_3 .

***Oppiella nova* (Oudemans, 1902)**

Material examined. Two specimens: East valley of Agrihan Island, May 28, 1992, T. Kurozumi.

Measurements. Body length and width: 316 μm \times 166 μm and 324 μm \times 174 μm .

List of Species Collected

Agrihan Island

Arcoppia curvirostrata sp. nov.

38 ex. (Ag-3).

Neoamerioppia ventrosquamosa (Hammer, 1979)

2 ex. (Ag-3).

Vietoppia pacifica sp. nov.

3 ex. (Ag-3).

Insculptoppia remota sp. nov.

1 ex. (Ag-3).

Oppiella nova (Oudemans, 1902)

2 ex. (Ag-1).

Asuncion Island

Neoamerioppia flagelliapex sp. nov.

7 ex. (As-1)

Vietoppia pacifica sp. nov.

2 ex. (As-1).

Acknowledgments

The authors express their sincere thanks to Mr. T. Kurozumi of Natural History Museum and Institute, Chiba, who collected a good series of oribatids from North Mariana and gave them a chance to study the mites.

References

Aoki, J. 1994. Oribatid mites of the northern Mariana Islands, Micronesia. I. Uracas and Maug Islands. Nat. Hist. Res., Special Issue (1): 181-194.
 Hammer, M. 1968. Investigations on the oribatid fauna of New Zealand with a comparison between the oribatid fauna of New Zealand and that of the Andes Mountains, South America. Part III. Biol. Skr. Dan. Vid. Selsk. 16(2): 1-96, 33 pls.
 Hammer, M. 1979. Investigations on the oribatid fauna of Java. Biol. Skr. Dan. Vid. Selsk. 22(9): 1-79, 47 pls.
 Mahunka, S. 1987. Neue und interessante Milben aus dem Genfer Museum LX. Oribatids from Sabah

- (East Malaysia) II. (Acari: Oribatida). *Revue suisse Zool.* 94(4): 765–817.
- Mahunka, S. 1988. New and interesting mites from the Geneva Museum LXI. Oribatids from Sabah (East Malaysia) III. (Acari: Oribatida). *Revue suisse Zool.* 95(3): 817–888.
- Mahunka, S. 1988. A survey of the oribatid fauna (Acari) of Vietnam, II. *Acta Zool. Hung.* 34(2-3): 215–246.
- Subías, L. S. 1980. Oppiidae del complejo "*clavipectinata-insculpta*" (Acarida, Oribatida). *EOS, Madrid* 54: 281–313.
- Subías, L. S. and P. Rodriguez, 1986. Oppiidae (Acari, Oribatida) de los sabinars (*Juniperus thurifera*) de España, II. *Ramusella (Insculptoppia)* Subías y *Ramuselloppia* n. gen. *Boletín Asoc. esp. Entom.* 10: 83–94.

(Accepted on 10 January 1995)

北マリアナ諸島のササラダニ類 II.
アグリハン島とアスンシオン島のツブダニ科

大久保憲秀¹⁾・青木淳一²⁾

1)三重県農業技術センター
〒515-23 一志郡嬉野町川北 530

2)横浜国立大学環境科学研究センター
〒240 横浜市保土ヶ谷区常盤台 156

北マリアナ諸島のササラダニ類の調査においてツブダニ科はアグリハン島とアスンシオン島のみから6種が得られた。この中には新種として *Arcoppia curvirostrata*, *Neoamerioppia flagellipex*, *Vietoppia pacifica*, *Insculptoppia remota* を含む。又 *Pseudoamerioppia vietnamica* (Mahunka, 1988) の所属する属を変更して *Neoamerioppia vietnamica* (Mahunka, 1988) とし、*Arcoppia sabahensis* Mahunka, 1988 は *Arcoppia bidentata sabahensis* Mahunka, 1987 のホモニムであるので、新名 *Arcoppia kalimantanensis* を提唱した。

Corrigenda

The Registration Code cited in part I of this series (Aoki, J. 1994. Oribatid mites of the northern Mariana Islands, Micronesia I. Uracas and Maug Islands. *Nat. Hist. Res., Special Issue* (1): 181–194) was changed from CBM-ZU to CBM-ZA.

- p. 182, right column line 8, for CBM-ZU-56 read CBM-ZA-56
p. 183, left column line 1, for CBM-ZU-55 read CBM-ZA-55
p. 184, left column line 8, for CBM-ZU-57 read CBM-ZA-57
p. 184, left column line 9, for CBM-ZU-58–60 read CBM-ZA-58–60
p. 184, right column line 1, for CBM-ZU-61 read CBM-ZA-61
p. 184, right column line 2, for CBM-ZU-62–65 read CBM-ZA-62–65
p. 185, right column line 16, for CBM-ZU-66 read CBM-ZA-66
p. 185, right column line 16, for CBM-ZU-67–69 read CBM-ZA-67–69
p. 187, left column line 18, for CBM-ZU-70 read CBM-ZA-70
p. 187, left column line 19, for CBM-ZU-71 read CBM-ZA-71
p. 188, left column line 19, for CBM-ZU-72 read CBM-ZA-72
p. 188, right column line 1, for CBM-ZU-73–75 read CBM-ZA-73–75
p. 189, left column line 34, for CBM-ZU-76 read CBM-ZA-76
p. 189, left column line 35, for CBM-ZU-77–80 read CBM-ZA-77–80
p. 189, right column line 33, for CBM-ZU-81 read CBM-ZA-81
p. 189, right column line 34, for CBM-ZU-82 read CBM-ZA-82