

## A New Land-hopper Species of *Bousfieldia* Chou and Lee, 1996, from Okinawa, Japan (Crustacea, Amphipoda, Talitridae)

Hiroshi Morino

Department of Zoology, National Museum of Nature and Science,  
4–1–1 Amakubo, Tsukuba, Ibaraki 305–0005, Japan  
E-mail: morino631@gmail.com

(Received 12 August 2014; accepted 24 September 2014)

**Abstract** *Bousfieldia omoto* sp. nov. is described from inland forests of Ishigaki and Iriomote Islands (Yaeyama Archipelago) in Okinawa. This species is a second species of *Bousfieldia* Chou and Lee, 1996, described from Taiwan. The new species is distinguished from the type species, *B. phoenixae* Chou and Lee, 1996 in having female gnathopod 1 lacking palmate setose surface on carpus and propodus, shorter rami (relative to peduncles) on pleopods, simple coxal gills on pereopod 3, and two apical robust setae on the apex of telson lobe.

**Key words:** Talitridae, *Bousfieldia omoto*, new species, Yaeyama Archipelago, Okinawa, land-hopper.

### Introduction

It has been known that Yaeyama Archipelago (Ishigaki and Iriomote Islands) in Okinawa harbors an undescribed land-hopper in inland forests (Morino, 1999, 2014). Here the taxon is described under the name of *Bousfieldia omoto* sp. nov.

The general methods follow those of Morino (2014). The specimens studied are deposited in the collection of the National Museum of Nature and Science, Tsukuba (NMST).

### Taxonomy

#### *Bousfieldia* Chou and Lee, 1996

[New Japanese name: Yaeyama-okatobimushi zoku]

*Bousfieldia* Chou and Lee, 1996: 44.

**Remarks.** The genus *Bousfieldia* is described by Chou and Lee (1996) based on a species from a subtropical forest in Taiwan, an immediately adjacent island to Iriomote (Fig. 3). This genus is allied to the following land-hoppers: *Cochinorchestia* Lowry and Peart, 2010 from southern

India and the west coast of Africa and *Lanorchestia* Miyamoto and Morino 2010 from Taiwan, in having strongly subchelate gnathopod 1 in both sexes, gnathopod 1 in male with distinct pellucid lobes on merus, carpus, and propodus, maxilliped palp article 2 broad and medially lobed, palp article 4 small, distinct, among others. While *Bousfieldia* has antenna 1 reaching the end of peduncular article 4 of antenna 2, antennae 1 of these two genera reach the end of peduncular article 5 of antenna 2. *Bousfieldia* is differentiated from *Mizuhorchestia* Morino, 2014, a land hopper genus from Honshu, Japan, by having well-developed pleopods and marginally bare outer ramus on uropod 1.

#### *Bousfieldia omoto* sp. nov.

[Japanese name: Yaeyama-okatobimushi]

(Figs. 1–3)

“*Parorchestia*” sp. 2: Morino, 1999: 639 (fig. 2), 644.

**Type material.** Holotype (NSMT-Cr 22951), female 9.5 mm, base of Mt. Omoto (under litter,

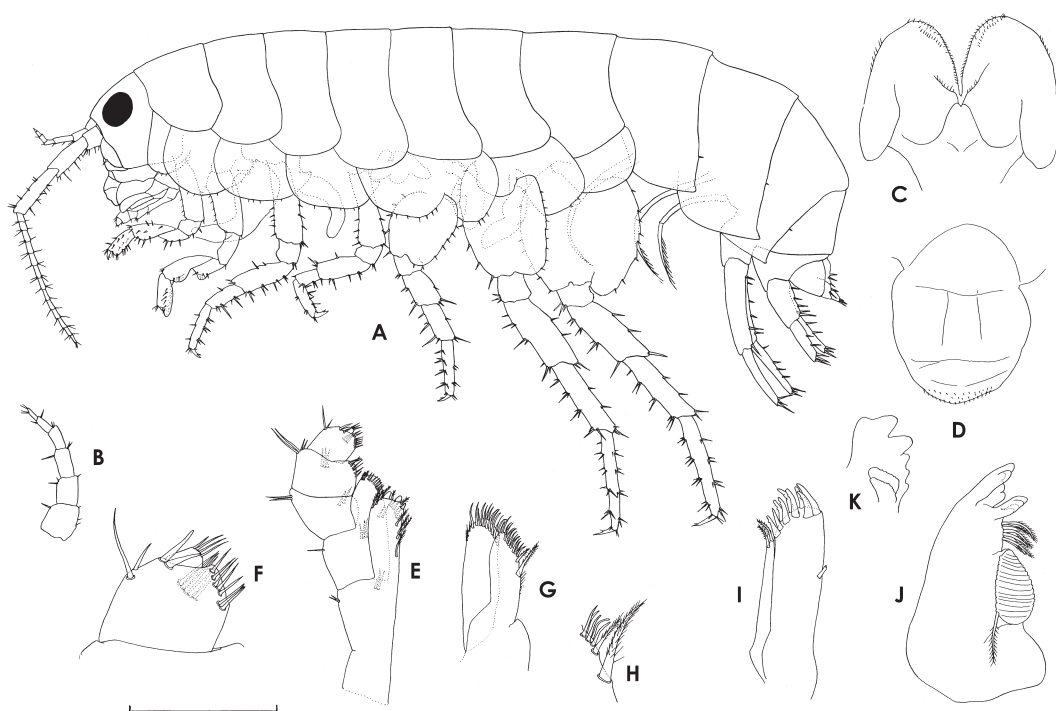


Fig. 1. *Bousfieldia omoto* gen. et sp. nov. Female, 9.5 mm (holotype: NSMT-Cr 22951). Mt. Omoto, Ishigaki Island, Okinawa, Japan. — A, habitus, lateral view (after Morino, 1999); B, antenna 1; C, lower lip; D, upper lip; E, maxilliped; F, palp articles 3 and 4 of maxilliped; G, maxilla 2; H, pappose setae on inner plate of maxilla 2; I, maxilla 1; J, left mandible; K, distal part of right mandible. Scale: A, 1.61 mm; B, 1.09 mm; C–E, G, I–K, 0.36 mm; F, H, 0.14 mm.

*Macaranga tanarius*, *Alocasia odora*, ferns), Ishigaki Island, OKINAWA; 25 Sept. 1978; H. Morino collect. Allotype (NSMT-Cr 22952), male 8.2 mm, same data as holotype. Paratypes (NSMT-Cr 22950), 2 males, 3 females, 2 juveniles; base of Mt. Omoto (forest, under litter); Ishigaki Island, OKINAWA; 1 Apr. 1975; H. Morino collect.

**Additional materials examined.** 1 female (NSMT-Cr 22954) and 1 female (NSMT-Cr 22955); Mt. Tedou (370 m alt., *Castanopsis sieboldii*, *Feycinetia formosana*), Iriomote Island, OKINAWA; 3 Oct. 1978; H. Morino collect. 1 female (NSMT-Cr 22956) and 1 male (NSMT-Cr 22957); “The First Cottage”, Iriomote Island, OKINAWA; 16 Jul. 1976; S. Tanaka collect.

**Description of female (Holotype).** Body size medium (Fig. 1A). Eyes medium large. Antenna

1 (Fig. 1A–B) reaching end of peduncular article 4 of antenna 2, peduncle longer than flagellum, peduncular articles 1–3 subequal in length, flagellum with 3 articles. Antenna 2 (Fig. 1A), flagellum longer than peduncle, peduncular article 5 subequal to articles 3 and 4 combined, flagellum with 14 articles.

Upper lip (Fig. 1D) lacking robust setae. Mandible (Fig. 1J–K), incisor 5-dentate, left lacinia 4-dentate. Maxilliped (Fig. 1E–F), palp articles 2 and 3 broad, mediolaterally lobed, article 4 reduced, distinct, apically positioned on article 3. Other mouth parts (Fig. 1C, G–I) same as those of other talitrid species.

Gnathopod 1 (Figs. 1A, 2A), propodus distinctly subchelate, palmar margin almost vertical, merus-propodus lacking pellucid lobe and palmate setose surface, propodus lateral surface with 2 submarginal robust setae. Gnathopod 2

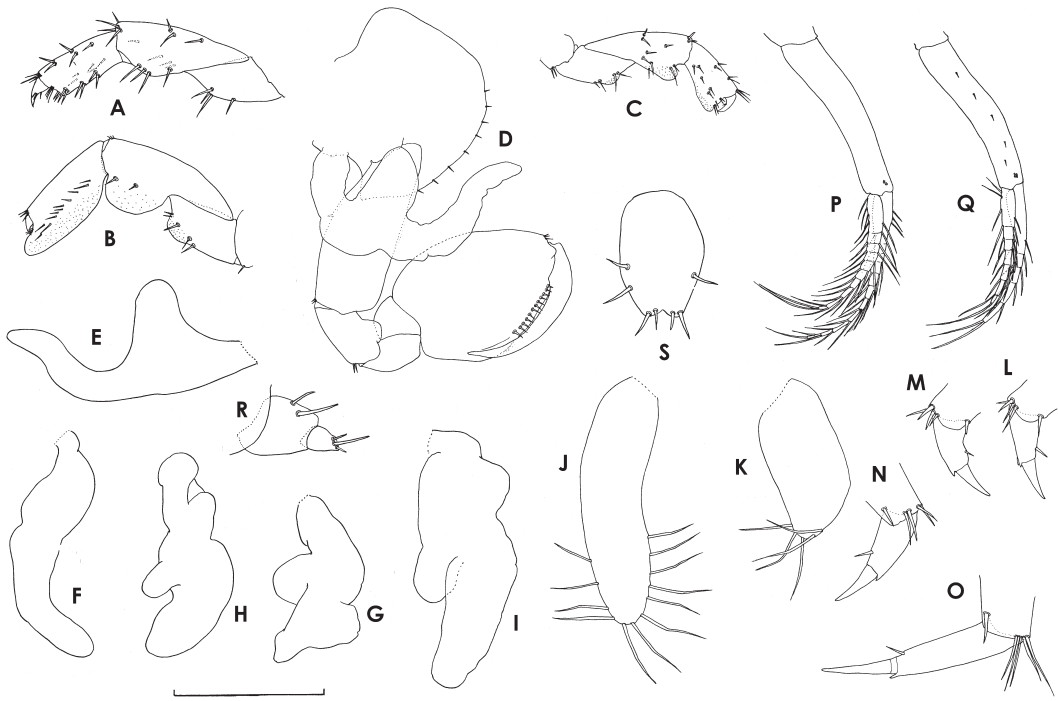


Fig. 2. *Bousfieldia omoto* gen. et sp. nov. A–B, E–S, female, 9.5 mm (holotype: NSMT-Cr 22951); C–D, male 8.2 mm (allotype: NSMT-Cr 22952). Mt. Omoto, Ishigaki Island, Okinawa, Japan. — A, distal articles of female gnathopod 1; B, distal articles of female gnathopod 2; C, distal articles of male gnathopod 1; D, male gnathopod 2; E–I, coxal gills of pereopods 2–6; J–K, oostegites of pereopods 2, 5; L–O, distal parts of pereopods 3–5, 7; P–Q, pleopods 1, 3; R, uropod 3; S, telson. Scale: A–C, 0.56 mm; D–K, P–Q, 0.63 mm; L–O, 0.28 mm; R–S, 0.48 mm.

(Figs. 1A, 2B), basis not expanded anteriorly, propodus mitten-shaped. Pereopods (Fig. 1A) cuspidactylate (bi-cuspsate), propodi locking spines well-developed (Fig. 2L–O). Pereopod 4, coxa wider than deep, dactylus weakly pinched. Pereopods 6 and 7 distinctly longer than preceding pereopods. Coxa of pereopod 6, posterior lobe smoothly curved. Coxal gills of pereopods 2, 4–6 (Fig. 2E, G–I) lobed at middle, that of pereopod 3 (Fig. 2F) simple, elongate. Oostegites (Fig. 2J–K) with 5–12 simple-tipped setae on mid to distal margins.

Pleonite side plates (Fig. 1A), posterodistal corner bluntly acuminate, with setule on posterior margins, lacking submarginal pits. Pleopods (Fig. 2P–Q) well-developed, peduncle with 2 retinacula, peduncles of pleopods 1 and 2 marginally bare, that of pleopod 3 with surface robust setae; rami subequal to peduncle in length.

Uropod 1 (Fig. 1A), peduncle distolateral robust seta subequal to subdistal one in length, outer ramus marginally bare, inner ramus with 4 robust setae on dorsal margin. Uropod 2 (Fig. 1A), rami subequal in length, marginally with robust setae. Uropod 3 (Fig. 2R), peduncle narrowed distally, ramus short, conical. Telson lobe (Fig. 2S) with single lateral, (distolateral) and 2 apical robust setae.

*Allotype (male, sexual characters).* Gnathopod 1 (Fig. 2C), propodus strongly subchelate, palmar margin exceeding dactylus, lateral surface with row of 4 spines, carpus and propodus with broad-based pellucid lobes, merus with small pellucid lobe. Gnathopod 2 (Fig. 2D), propodus enlarged, palmar margin smooth, subequal to posterior margin in length, dactylus attenuate distally.

*Etymology.* The species name refers to the



Fig. 3. Distribution of *Bousfieldia omoto* sp. nov.

type locality in Ishigaki Island, Okinawa.

**Distribution.** The present new species have been collected from inland forests of Ishigaki and Iriomote Islands (Fig. 3).

**Remarks.** The present species is distinguished from the unique congener, *B. phoenixae* by a few characters: female gnathopod 1 lacking palmate setose surface on carpus and propodus, simple coxal gill of pereopod 3 (vs. lobed gill), pleopod rami subequal to peduncles in length (vs. rami longer than peduncles, fig. 5 in Chau and Lee, 1996), and 2 apical robust setae on telson lobe (vs. single robust seta).

Nansei (= Ryukyu) Archipelago is a continental island groups that was part of the Asian continent in geological times. The present fauna in the archipelago is believed to be founded basically by colonizers from southern Japan and Taiwan (and the continent). Faunal affinity of terrestrial vertebrates in Yaeyama Archipelago is highest with that of Miyako Archipelago, and the combined affinities of both archipelagoes are higher with that of Taiwan than that of Okinawa Archipelago (Toda *et al.*, 2003). This zoogeographical peculiarity is explained by the paleogeology that indicates Miyako and Yaeyama Archipelagos

were connected to Taiwan by land bridges and separated from Okinawa Archipelago by marine channels at least during two geological epochs: Miocene and Pleistocene (Toda *et al.*, 2003). The occurrence of *Bousfieldia* in Yaeyama Archipelago is explicable by this land bridge hypothesis or also by rafting in recent times. The speciation event between Yaeyama Archipelago and Taiwan suggests the former hypothesis more probable.

### Acknowledgements

I would like to thank Dr. J. K. Lowry for reviewing an earlier draft. My hearty thanks are due to Dr. H. Komatsu and Dr. S. Tanaka, who assisted the present study.

### References

Chou, W.-H. and J.-D. Lee 1996. A new terrestrial amphi-

pod (Crustacea) from a subtropical forest in Taiwan, with description of a new genus. *Bulletin of the National Museum of Natural Science*, 8: 43–55.

Lowry, J. K. and R. Peart 2010. The genus *Microrchestia* (Amphipoda: Talitridae) in eastern Australia. *Zootaxa*, 2349: 21–38.

Miyamoto, H. and H. Morino 2010. Taxonomic studies on the Talitridae (Crustacea: Amphipoda) of Taiwan. IV. The genera *Paciforchestia* and *Lanorchestia* gen. nov. *Species Diversity*, 15: 155–167.

Morino H. 1999. Amphipoda. In Aoki, J. (ed.): *Pictorial Keys to Soil Animals of Japan*, pp. 626–644. Tokai University Press, Tokyo. (In Japanese.)

Morino, H. 2014. A new land-hopper genus, *Mizuhorchestia*, from Japan (Crustacea, Amphipoda, Talitridae). *Bulletins of the National Museum of Nature and Science, Series A (Zoology)*, 40: 117–127.

Toda, M., Sh. Shokita and M. Nishida 2003. Historical formation of the fauna in the Ryukyu Islands. In Nishida, M., N. Shikatani and S. Shokita (ed.): *The Flora and Fauna of Inland Waters in the Ryukyu Islands*, pp. 25–32. Tokai University Press, Tokyo. (In Japanese.)