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First Record of Maritime Pseudoscorpion *Garypus japonicus* (Garypidae) from Korea

Eun Hwa Choi[1] and Ui Wook Hwang[1,2,*]

[1]College of Natural Sceinces, Graduate School, Kyungpook National University, Daegu 702-701, Korea
[2]Department of Biology, Teachers College & Institute for Phylogenomics and Evolution, Kyungpook National University, Daegu 702-701, Korea

ABSTRACT

A maritime pseudoscorpion *Garypus japonicus* Beier, 1952 collected from Dokdo Island in the East Sea of Korea is reported and illustrated, which is the first record in Korea. The family Garypidae is also newly recorded in Korea. *G. japonicus* has been known only from Japan by Beier (1952) so far. Through the present study, its distributional range is extended to Korea.

Key words: *Garypus japonicus*, pseudoscorpiones, Garypidae, Dokdo Island, the East Sea of Korea

INTRODUCTION

It is known that members of the pseudoscorpion family Garypidae represented by about 10 genera (Harvey, 1992) are considered to be mostly tropical and subtropical in distribution (Hoff, 1964). In general, the garypid species have some distinguished morphological characters such as a carapace showing triangular shape, pleural membrane with coarse wrinkle, and granulated derm. In Korea, any members of the family Garipidae have not been reported until now.

A widely distributed littoral or maritime genus *Garypus* consists of 23 species, which are distributed mainly in tropical regions (=tropicopolitan species). A typical maritime pseudoscorpion *Garypus japonicus* Beier, 1952 known to occur only in Japan has been supposed to be distributed along the southern coast of Japan (Umashima Is., Tsushima Is., Kojima Is., and Kashima Is.) and Enoshima Island, Japan by Morikawa (1958). *G. japonicus* favors the area of exposure to sunlight and is distributed at an altitude of 1 to 15 m above sea level (Sato, 1978).

Through the present study, *G. japonicus* was collected from Dokdo Island in the East Sea of Korea and was redescribed and illustrated.

MATERIALS AND METHODS

The specimens of the maritime pseudoscorpion *Garypus japonicus* used in the present study were collected individually from under stones or the rock crevices at one locality in Dokdo Is. The specimens were preserved in 95% ethanol and deposited in the author's collection (Department of Biology Education, Kyungpook National University).

For drawing morphological characters of *G. japonicus*, a specimen was dissected and mounted in a solution of 30% glycerin-70% ethanol for 1-2 days. Microscopical examination was carried out with a differential interference contrast microscope (Olympus BX-50), which was also used to take measurements of the appendages, with a micrometer and drawings with the aid of a drawing tube. For scanning electron microscopy, the materials were bleached and then coated with ion sputter coater and examined with a Scanning Electron Microsope (Hitachi-S-4800).

Abbreviations are as follows; A. Pedipalp: eb, exterior basal; esb, exterior subbasal; isb, interior subbasal; ib, interior basal; ist, interior subterminal; est, exterior subterminal; it, interior terminal; et, exterior terminal; b, basal; sb, subbasal; t, terminal, B. Chelicera; bs, basal seta; es, exterior seta; is, interior seta; ls, laminal seta; sbs, subbasal seta.

SYSTEMATIC ACCOUNTS

Order Pseudoscorpionida de Geer, 1778
Family Garypidae E. Simon, 1879
Genus *Garypus* L. Koch, 1873
[1]***Garypus japonicus* Beier, 1952 (Figs. 1, 2)**
Garypus japonicus Beier, 1952, p. 235, fig. 1.
Garypus sp. Morikawa, 1952, p. 256, figs. 13, 14a-b, 15.

Material examined. 1♂, 1♀: Dongdo, Dokdo Is., Ulleungdo

*To whom correspondence should be addressed
Tel: 82-53-950-5911, Fax: 82-53-950-6809
E-mail: uwhwang@knu.ac.kr

[1]*비파앉은뱅이(신칭)

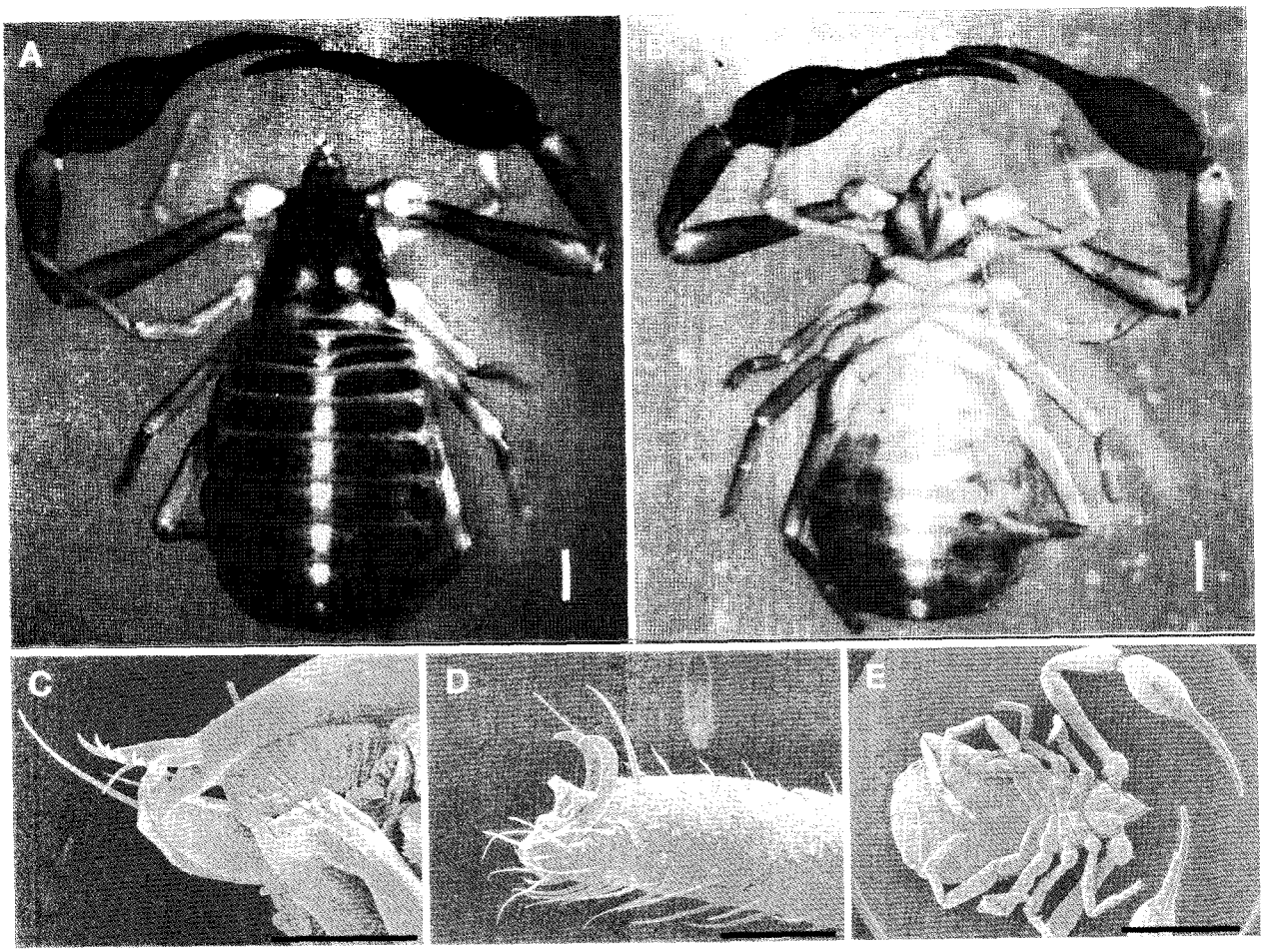

Fig. 1. *Garypus japonicus*, female. Light microscope photographs (A, B) and SEM phothographs (C, D, E). A, dorsal view; B, ventral view; C, chelicera, ventral view; D, claw of right leg II; E, abdomen, ventral view. Scale bars=0.5 mm (A, B), 1 mm (C, D), 2 cm (E).

Is., 11 Jun. 2008 and 10 Sep. 2008.

Description. Male. Body length=4.06 mm.

Coloration. Carapace dusty dark brown, a pair of non-melanic spots near posterior margin.

Cephalothorax (Fig. 2A). Carapace triangular; anterior margin bilobed with 4 short setae, 0.99 times longer than broad, maximum width at the posterior region, more narrow to the anterior region, posterior margin concave, surface granular dorsally, light sclerotization of two spots near posterior margin. Two pairs of eyes with flattened lens, 1 setae located between two eyes.

Legs (Fig. 2B-C). Derm granulated, well developed granulations on telofemur, articulation between metatarsus and tarsus oblique in all legs. Leg IV proportion: trochanter 1.65, femur 1.00, patella 2.78, tibia 3.37, metatarsus 2.73, and tarsus 2.00 times longer than broad. Tarsus of all legs with setae longer than metatarsus. Arolia shorter than claws.

Pedipalp (Fig. 2D-E). Trochanter, femur, patella, and chela granulate; setae on internal margins of trochanter, femur and patella very short and acicular. Trochanter 1.25, femur 4.71, patella 3.63, chela 7.56 without pedicel, hand 1.81 times longer than broad. Movable finger 1.13 times longer than hand. Fixed chelal finger with 8 trichobothria, movable chelal finger with 4 trichobothria; trichobothria eb of fixed finger situated basally, eb and esb at base of finger, isb situated near ib, ist situated near esb, est situated middle of fixed finger, it distal to est, et sub-distal, trichobothria b of movable finger situated basally, sb situated near b, st situated middle of movable finger, nearer to sb than to t, t slightly shortened. Chelar teeth of both fingers flattened; fixed finger with 58 teeth, movable finger with 64 teeth.

Chelicera (Fig. 2F). 5 setae on hand, all setae acuminate, bs, es, is, and ls long, sbs very short. Movable finger with one subdisatal seta, serrula exterior with 18 blades, galea with small 4 branches. Flagellum with 3 setae; 3 setae about same length, each seta with about 4 apical blades.

Habitat. This species was found under the rocks at littoral regions including the drift line on the seashore.

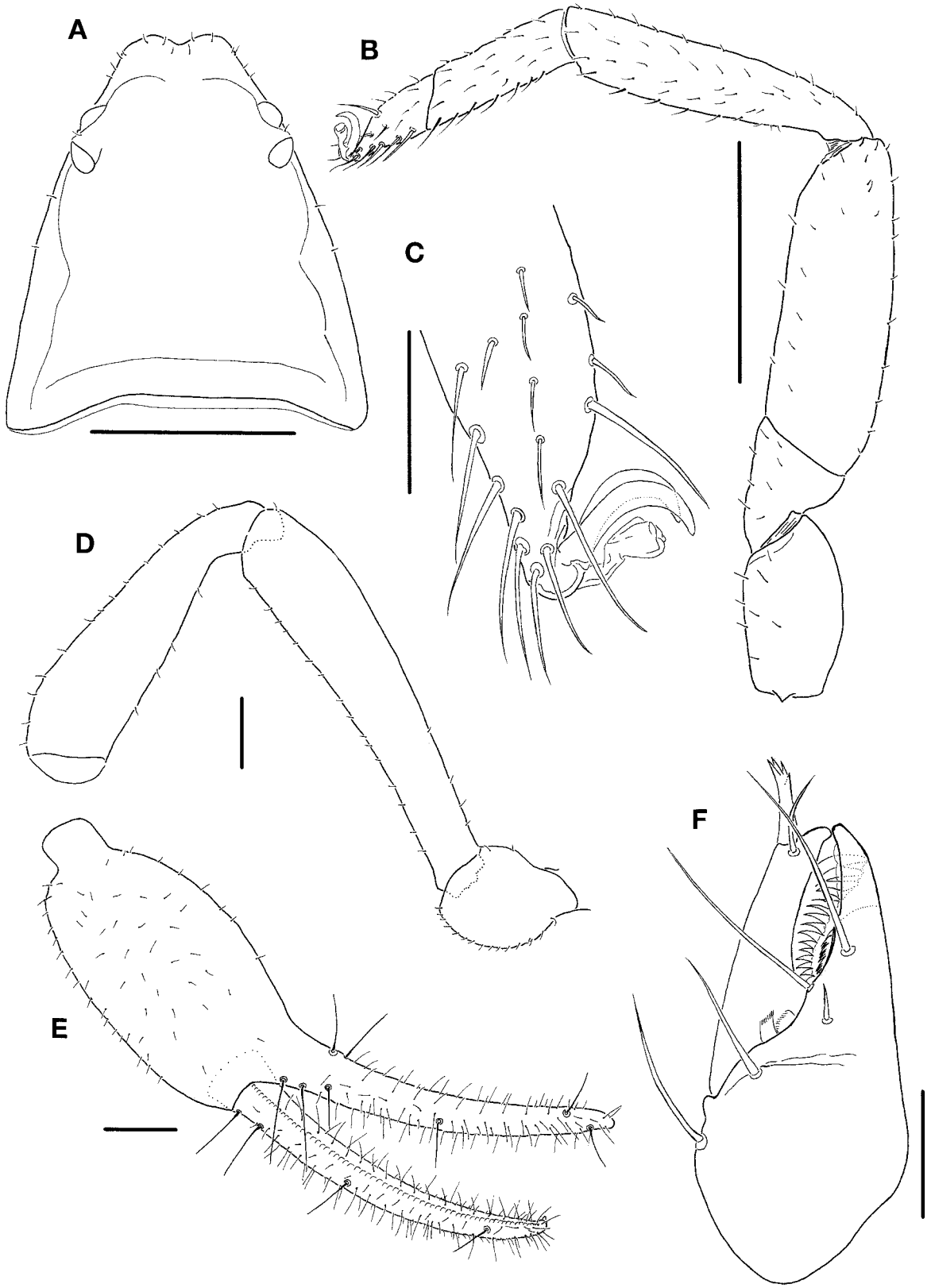

Fig. 2. *Garypus japonicus*, male. A, carapace, dorsal view; B, leg IV; C, claw of leg IV; D, dorsal view of right palp, without chela; E, lateral view of right chela; F, left chelicera. Scale bars=0.5 mm (A, B), 0.1 mm (C, F), 0.2 mm (D, E).

Distribution. Korea (Dokdo Is., the present record), Japan (Enoshima Is., Umachima Is., Tsushima Is., Kojima Is., and Kashima Is.)

Remarks. The Korean individuals of this species are found under stones and debris just above the high tide line, and in rock crevices at the back of a beach from Dongdo, Dokdo Island. Likewise, the species were distributed on the sunlight exposure region and not found in the shady spots. This species has been known only from Japan, and the present record is the first from the Asiatic mainland in the same range of latitudinal distribution.

The minor differences are seen between the Korean specimen from Dokdo Is. and the Japanese specimen from Enoshima Is. illustrated by Beier (1952). The ranges of proportions and measurements in individuals of the two specimens do overlap with the exception of the chelal length to breadth ratio. The chelal ratio of the Japanese specimen is 5.00 (♂), but the ratio of the Korean specimen is 7.56 (♂), the chela of the Korean specimen is more slender.

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