

Short communication

A New Record of Parasquillid Species, *Faughnia haani* (Crustacea: Stomatopoda: Parasquillidae), from Korea

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ABSTRACT

A parasquillid stomatopod, *Faughnia haani* (Holthuis, 1959), collected from Jeju Island, is reported for the first time in Korea. This species is characterized by the presence of obtuse anterolateral angles of carapace, median and three pairs of longitudinal carinae on telson, and crenulate inner margin of uropodal protopod. In this paper, a detailed description and illustrations are provided. As a result of this study, the geographical distribution of the present species is extended and 15 species of stomatopods including this species are now recorded in Korean fauna. The specimen examined herein was deposited in the National Institute of Biological Resources (NIBR).

Keywords: Korean fauna, mantis shrimp, Crustacea, Stomatopoda, Parasquillidae, *Faughnia*, Korean stomatopod

INTRODUCTION

Stomatopods are quintessential marine predators characterized by large and powerful raptorial appendages that can be used for ‘smashing’ or ‘spearing’ (Caldwell and Dingle, 1976). Of them, the family Parasquillidae has a spearing type of raptorial claw and are readily distinguished from those of other families by the presence of an asymmetrically bilobed cornea, three primary teeth on the uropodal protopod, and three teeth on the dactylus of the raptorial claw. Up to date, 13 species of three genera are described worldwide: *Faughnia* species (*F. formosae*, *F. haani*, *F. profunda*, and *F. serenei*), *Parasquilla* species (*P. boschii*, *P. coccinea*, *P. ferussaci*, *P. meridionalis*, and *P. similis*), and *Pseudosquilla* species (*P. cerisii*, *P. dofleini*, *P. lessonii*, and *P. marmorata*) (see Ah-yong, 2001; Costello et al., 2001). Only one species, *F. formosae* has been found in Korea until now (Hwang et al., 2013). In the present study, *F. haani* (Holthuis, 1959) is reported for the first time as a member of the Korean stomatopod fauna.

The specimen was collected from the subtidal zone of Jeju Island by trawler and preserved in 95% ethyl alcohol. A stereomicroscope (MZ8; Leica, Wetzlar, Germany) was used

for observation and identification. Image was recorded using a digital camera (D7000; Nikon, Tokyo, Japan). All measurements are given in millimeters (mm). Body length (total length; TL), was measured along the dorsal midline from the apex of the rostral plate to the apex of the submedian tooth of the telson. The morphological terminology of Ah-yong (2001) was adopted in this paper. Specimen examined herein was deposited in the National Institute of Biological Resources (NIBR).

SYSTEMATIC ACCOUNTS

Superfamily Parasquilloidea Manning, 1995

Family Parasquillidae Manning, 1995

Genus *Faughnia* Seréne, 1962

¹**Faughnia haani* (Holthuis, 1959) (Figs. 1, 2)

Squilla empusa de Haan, 1844: Pl. 51, fig. 6 [not *Squilla empusa* Say, 1818].

Pseudosquilla haani Holthuis, 1959: 179.

Parasquilla haani: Lee and Wu, 1966: 44, figs. 2A–D.

Korean name: ¹*세돌기갯가재 (신칭)

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Faughnia haani: Manning and Chan, 1997: 551–552, figs. 2, 4; Ahyong, 2001: 179–181, fig. 89; Ahyong et al., 2008: 57–58, figs. 41–42.

Material examined. Korea: 1♂, TL 108 mm, Jeju-do Island, Seogwipo-si, Daejeong-eup, Hamo-ri, Moseulpo port, 33°12'57.8"N, 126°15'00.4"E, by trawler, 3 May 2019, coll. Lee SH (NIBRIV0000863940).

Description. Body (Fig. 1) depressed, subcylindrical; dorsal surface distinctly pitted; articulation compressed.

Eye (Figs. 1, 2A) not reaching to end of first segment of antennular peduncle, with asymmetrically bilobed cornea; lateral margin longer than inner.

Rostral plate (Figs. 1, 2A) broader than long, without long apical spine; width 3.0 times longer than median length.

Carapace (Figs. 1, 2A) unarmed, with indistinct reflected marginal carina; anterolateral angles rounded, not produced anteriorly.

Raptorial claw (Fig. 2B) robust; ischiomerall articulation terminal; dorsal margin of carpus with two blunt teeth; occlusal margin of propodus densely pectinated, with two movable spines; dactylus slender, not inflated basally; inner distal margin with three teeth.

Sternal keel of eighth thoracic somite (Fig. 2C) rounded.

Lateral processes of sixth to eighth thoracic somites (Figs. 1, 2D) rounded, with low ridge; that of seventh somite wider than those of sixth and eighth somites.

In male, endopod of first pleopod (Fig. 2E) bearing posterior endite and lateral lobe.

Telson (Figs. 1, 2F) broader than long, bearing three pairs of primary teeth (submedian, intermediate, and lateral), with two spiniform intermediate denticles, one spiniform lateral denticle. Dorsal surface bearing median carina and three pairs of longitudinal carinae (accessory median, anterior intermediate, and marginal carinae uninterrupted); carinae of submedian teeth extending onto surface of telson; carinae of intermediate and lateral teeth short, not extending onto surface of telson. Ventral surface of telson without postanal carina.

Posterolateral angles of third to fifth abdominal somites (Fig. 2G) bearing low marginal carinae.

Uropod (Figs. 1, 2H) with exopod having eight movable spines on proximal segment. Protopod with crenulate inner margin.

Distribution. Australia, Hong Kong, southwestern Japan (Tokushima, Kochi, Hiroshima and Wakayama Prefecture), Taiwan, and Korea (the present study).

Coloration. Color overall pale yellowish, with merus and carpus of raptorial claw, carapace, and thoracic and abdominal somites, telson, and uropods largely pale yellowish. Antennular peduncle, antennal scales, rostral plate, and pereio-



Fig. 1. *Faughnia haani* (Holthuis, 1959), male. Whole animal, 108 mm.

ods ivory. Dactylus and movable spines of raptorial claw, a pair of submedian carinae of sixth abdominal somite, median carina and all primary teeth of telson, as well as distal margin of uropodal protopod orange (Fig. 1).

Remarks. The present report is the first record of *Faughnia haani* (Holthuis, 1959) from Korean waters. This species has been reported from Australia, Taiwan, Hong Kong, and Japan (Ahyong et al., 2008). Through the present study, its geographic distribution known as mainly tropical and subtropical regions has been expanded.

Among the known species of *Faughnia*, *F. haani* is morphologically similar to *F. serenei* Moosa, 1982 in sharing the following characteristics: (1) the presence of crenulate or smooth inner margin of the uropodal protopod, (2) the presence of median and at most three pairs of carinae on the dorsal surface of telson, and (3) the presence of obtuse anterolateral angle of the carapace. However, *F. haani* can be easily

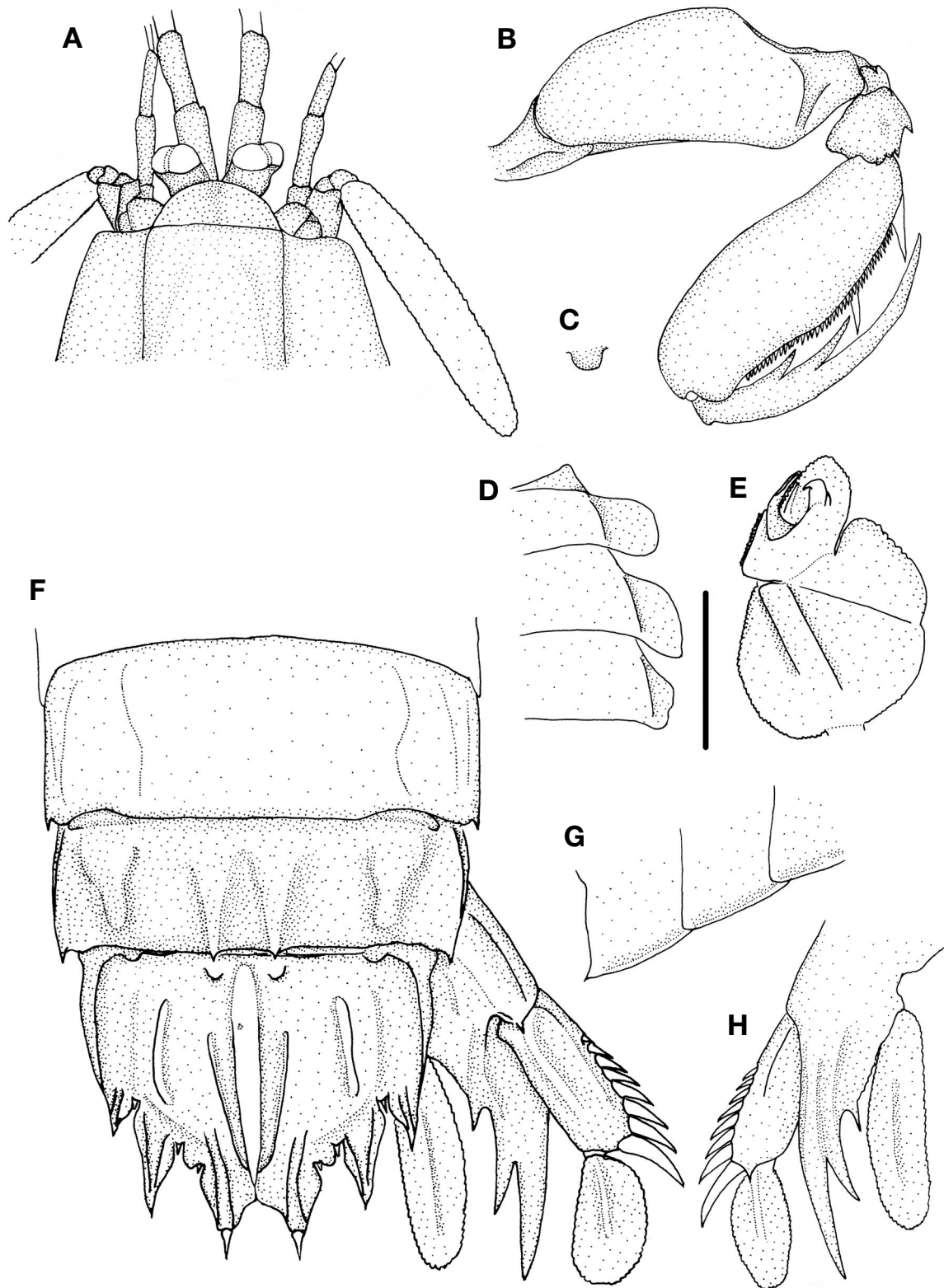


Fig. 2. *Faughnia haani* (Holthuis, 1959), male. A, Anterior cephalon; B, Raptorial claw; C, Sternal keel of eighth thoracic somite, right lateral; D, Lateral processes of sixth to eighth thoracic somites; E, Endopod of first male pleopod; F, Fifth to sixth abdominal somites, telson, and uropod; G, Posterolateral angles of fourth to sixth abdominal somites; H, Uropod, right ventral. Scale bars: A–D, F–H=2.5 mm, E=0.45 mm.

distinguished from its congeners by the presence of distinct accessory median carina on the telson and unarmed intermediate carina on the fifth abdominal somite.

Faughnia haani, within the Korean fauna, is readily distinguished from the *F. formosae* by the number of carinae on the dorsal surface of telson (three vs. five) and the inner margin of uropodal protopod (smooth or crenulate vs. with well-developed spinules).

The characteristics of Korean specimens are consistent with those shown in the original description of De Haan (1844), which had presented as a species *Squilla empusa* based on Japanese specimens. Also, it generally agrees well with published accounts (Lee and Wu, 1966; Manning and Chan, 1997; Ah Yong, 2001; Ah Yong et al., 2008) made after replacement of the species name by Holthuis (1959). However, minor difference from the Australian specimens was observed in the shape of the anterior margin of the rostral plate. The anterior margin in the Korean specimen is more obtuse-angled than that in Australian specimens (Ah Yong, 2001) and similar to that in Japanese (De Haan, 1844) and Taiwanese specimens (Lee and Wu, 1966; Manning and Chan, 1997; Ah Yong et al., 2008).

Key to the species of the genus *Faughnia* from Korea

1. Dorsal surface of telson with median and five pairs of longitudinal carinae. Uropodal protopod bearing well-developed spinules on inner margin *F. formosae*
- Dorsal surface of telson with median and three pairs of longitudinal carinae. Uropodal protopod bearing crenulate or smooth inner margin *F. haani*

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CONFLICTS OF INTEREST

No potential conflict of interest relevant to this article was reported.

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REFERENCES

- Ah Yong ST, 2001. Revision of the Australian stomatopod Crustacea. Records of the Australian Museum, Supplement, 26:1-326. <https://doi.org/10.3853/j.0812-7387.26.2001.1333>
- Ah Yong ST, Chan TY, Liao YC, 2008. A catalog of the mantis shrimps (Stomatopoda) of Taiwan. National Taiwan Ocean University, Keelung, pp. 1191.
- Caldwell RL, Dingle H, 1976. Stomatopods. Scientific American, 234:80-89. <https://doi.org/10.1038/scientificamerican.0176-80>
- Costello MJ, Emblow C, White RJ, 2001. European register of marine species: a check-list of the marine species in Europe and a bibliography of guides to their identification. Muséum National d'Histoire Naturelle, Institute d'Ecologie et de Gestion de la Biodiversité Service du Patrimoine Naturel, Paris, p. 284.
- De Haan W, 1833-1850. Crustacea. In: Fauna japonica sive descriptio animalium, quae in itinere per japoniam, jussu et auspiciis superiorum, qui summum in India batava imperium tenent, suscepto, annis 1823-1830 collegit, notis, observationibus et adumbrationibus, illustravit (Ed., von Siebold PF). Lugduni-Batavorum, Leiden, pp. 1-243.
- Holthuis LB, 1959. Stomatopod Crustacea of Suriname. Studies on the Fauna of Suriname and Other Guyanas, 3:173-191.
- Hwang HS, Lee SK, Kim M, Kim W, 2013. First report of the mantid shrimp *Faughnia formosae* (Stomatopoda: Parasquillidae) from Korea. Animal Systematics, Evolution and Diversity, 29:245-248. <https://doi.org/10.5635/ASED.2013.29.3.245>
- Lee SC, Wu SK, 1966. The stomatopod Crustacea of Taiwan. Bulletin of the Institute of Zoology, Academia Sinica, 5:41-58.
- Manning RB, Chan TY, 1997. The genus *Faughnia* from Taiwan, with the description of a new species (Stomatopoda: Parasquillidae). Journal of Crustacean Biology, 17:546-554.
- Moosa, MK, 1982. *Faughnia serenei*, new species, a stomatopod from the South China Sea (Crustacea, Stomatopoda). Journal of Crustacean Biology, 2:600-604. <https://doi.org/10.2307/1548101>

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