

First Report of Two Species of Mantid Shrimps (Stomatopoda: Squilloidea: Squillidae) from Korean Waters

Jung-Ha Kang¹, Seok Hyun Lee², Hyun Sook Ko^{2,*}

¹Biotechnology Research Division, NIFS, Busan 46083, Korea

²Department of Biological Science, Silla University, Busan 46958, Korea

ABSTRACT

Two species of mantid shrimps were collected from southern part of Korea and identified as *Kempella mikado* and *Squilloides leptosquilla* of the Squillidae. The former species is characterized by having a dactylus of the raptorial claw with six teeth, only the fifth thoracic somite with a single spinous lateral process, and the fifth abdominal somite with a pair of black dorsal patches. However, the latter species is characterized by having a dactylus of the raptorial claw with four teeth, and the fifth to seventh thoracic somites each with a single lateral process. Both species are described with figures and photographs. The present records are extensions of their geographical distributions and new records in Korea. Hence, a total of six species of the stomatopods have been recorded in Korea up to date: *Oratosquilla oratoria*, *Faughnia formosae*, *Taku spinosocarinatus*, *Chorisquilla spinosissima*, *Kempella mikado*, and *Squilloides leptosquilla*.

Keywords: mantid shrimps, stomatopods, Squillidae, *Kempella mikado*, *Squilloides leptosquilla*, Korea

INTRODUCTION

The stomatopods include more than 450 marine species in the world (Ahyong, 2001). Among them, only four species, in three superfamilies and four families, have been reported from Korean waters: *Oratosquilla oratoria* (De Haan, 1844) of the Squillidae (Squilloidea), *Faughnia formosae* Manning and Chan, 1997 of the Parasquillidae (Parasquilloidea), *Taku spinosocarinatus* (Fukuda, 1909) of the Takuidae (Gonodactyloidea), and *Chorisquilla spinosissima* (Pfeffer, 1888) of the Protosquillidae (Gonodactyloidea) (see Kim and Rho, 1969; The Korean Society of Systematic Zoology, 1997; Hwang et al., 2013). Recently, two species of mantid shrimps were collected from the southern part of Korea and identified as *Kempella mikado* (Kemp and Chopra, 1921) and *Squilloides leptosquilla* (Brooks, 1886) in the family of Squillidae (Squilloidea). They are briefly described with figures and photographs.

The specimens of these species were preserved in 95%

ethyl alcohol and examined using Leitz zoom stereomicroscope (Leica, Wetzler, Germany) with a camera lucida. Images were obtained using a digital camera (Model E-5; Olympus, Tokyo, Japan). Digital vernier caliper (CD-15 APX; Mitutojo, Kawasaki, Japan) was used for measurement: TL (total length) was measured from the apex of the rostral plate to the apices of the submedian teeth of the telson. Morphological terminology generally follows that of Ahyong (2001). Specimens examined in this study were deposited at Silla University, Busan.

SYSTEMATIC ACCOUNTS

Order Stomatopoda Latreille, 1817
Superfamily Squilloidea Latreille, 1802
Family Squillidae Latreille, 1802

¹*Genus *Kempella* Low and Ahyong, 2010

Korean name: ¹*큰점박이갯가재속

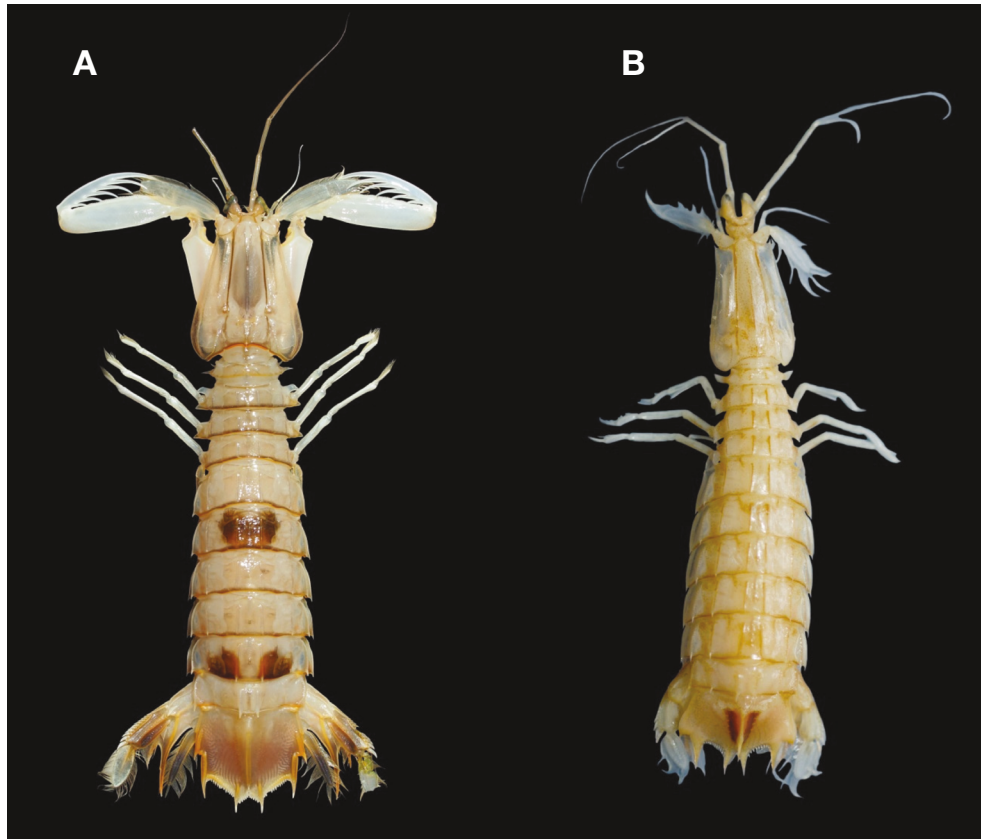


Fig. 1. A, *Kempella mikado* (Kemp and Chopra, 1921): female (TL 163 mm), dorsal view; B, *Squilloides leptosquilla* (Brooks, 1886): male (TL 82 mm), dorsal view.

¹**Kempella mikado* (Kemp and Chopra, 1921)
(Figs. 1A, 2)

Squilla mikado Kemp and Chopra, 1921: 301, fig. 2; Manning, 1965: 257–259, 262, fig. a.

Squilla zanzibarica Chopra, 1939: 143–148, figs. 2, 4.

Kempina mikado: Manning, 1978: 40, fig. 23a–c; 1995: 24, 208; Moosa, 1986: 400–402, fig. 10; Ahyong, 2001: 267, fig. 130.

Kempella mikado: Low and Ahyong, 2010: 68.

Material examined. Korea: 2 ♀♀ (TL 163–164 mm), Seogwipo port (Jeju Island), 29 May 2015, Ko HS.

Description. Eye (Figs. 1A, 2A) small, broader than stalk, not extending to distal end of segment 1 of antennular peduncle; cornea bilobed, set obliquely on stalk. Rostral plate (Fig. 2A) broader than long; apex rounded; median carina present.

Carapace (Figs. 1A, 2A) narrowed anteriorly; dorsal surface rugose, pitted; anterolateral spines present; median

carina distinct, uninterrupted at base of anterior bifurcation, branches of anterior bifurcation distinct; intermediate carina parallel to gastric groove.

Dactylus of raptorial claw (Figs. 1A, 2B) with 6 teeth on inner margin, increasing in size distally; propodus (Fig. 2B) pectinate on inner margin, with 3 movable spines on inner proximal margin; dorsal carina of carpus entire; merus without outer inferodistal spine.

Mandibular palp (Fig. 2C) 3-segmented.

Maxillipeds 1–4 each with epipod (Fig. 2D); maxilliped 5 without epipod.

Thoracic somite 5 (Figs. 1A, 2E, F) with lateral process as single slender spine directed laterally; ventral spine directed anterolaterally. Thoracic somite 6 with bilobed lateral processes; anterior lobe broad, trapezoid, with acute apex; posterior lobe triangular; incision between anterior and posterior lobe very wide. Thoracic somite 7 (Figs. 1A, 2E) with bilobed lateral processes; anterior lobe slender, with acute apex; posterior lobe broad, triangular. Thoracic somite 8 with short

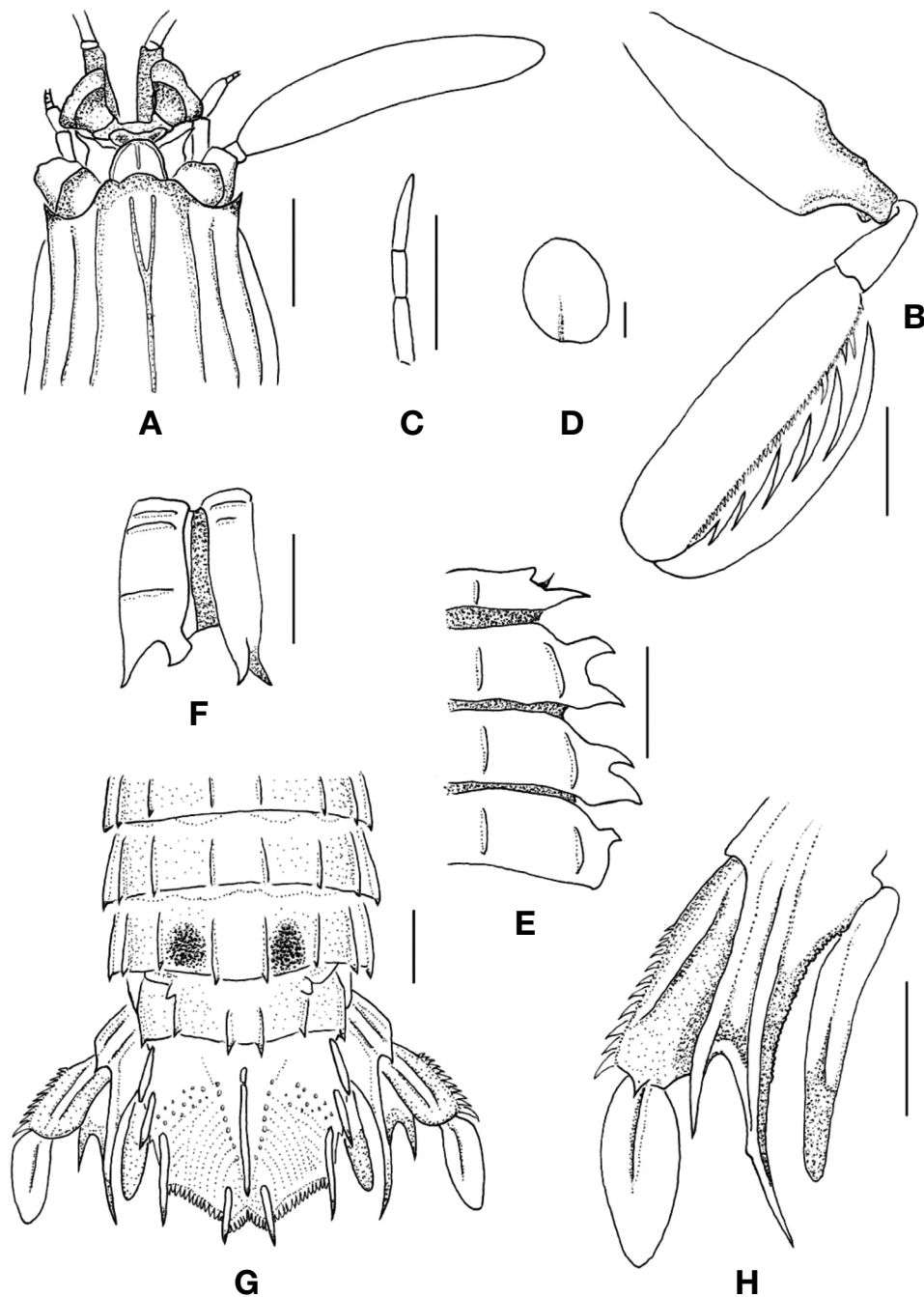


Fig. 2. *Kempella mikado* (Kemp and Chopra, 1921): female (TL 164 mm). A, Anterior cephalon, dorsal; B, Raptorial claw, right lateral; C, Palp of mandible, right; D, Epipod of maxilliped 4, right; E, Lateral processes of thoracic somites 5-8, right dorsal; F, Lateral processes of thoracic somites 5-6, right lateral; G, Abdominal somites 3-6, telson and uropod, dorsal; H, Uropod, right ventral. Scale bars: A, B, E-H=10 mm, C=5 mm, D=1 mm.

trapezoid lateral process.

Abdomen (Figs. 1A, 2G) with submedian, intermediate, lateral and marginal carinae; somites 5-6 with submedian carinae spined posteriorly; somites 3-6 with intermediate carinae spined posteriorly; somites 1-6 with lateral carinae

spined posteriorly; somites 1-5 with marginal carinae spined posteriorly.

Telson (Figs. 1A, 2G) as broad as long; dorsal surface scattering of granules, with median carina spined posteriorly; prelateral lobe present; 3 pairs of primary teeth each with

dorsal carina; submedian teeth with fixed apices on posterior margin; 1 lateral, 14–15 intermediate, 6 submedian denticles present.

Uropod (Figs. 1A, 2G, H) with slender endopod; protopod crenulated on inner margin, terminating in 2 spines, inner spine longer than outer one; proximal segment of exopod with 10–11 movable spines on outer margin, with distal spine ventrally.

Distribution. Western Indian Ocean to Vietnam, Japan, the Philippines, New Caledonia, Australia (Ahyong, 2001), Taiwan (Ahyong et al., 2009), and now Korea.

Coloration. Dorsal color in life light brown. Grooves on carapace and posterior margins of thoracic and abdominal somites dark brown. Carapace with orange posteromedian margin. Abdominal somite 2 with dark brown median patch, somite 5 with pair of dark brown patches dorsally. Telson with orange carinae. Uropodal protopod and exopod with orangish margins; proximal segment of exopod dark brown.

Remarks. Recently, the genus *Kempella* Low and Ahyong, 2010 was established as a replacement name for *Kempina* Manning, 1978. The genus can be distinguished from other squilloid genera by having the fifth thoracic somite with a spiniform lateral process and the sixth to seventh thoracic somites with bilobed lateral processes. It presently includes only two Indo-West Pacific species: *K. mikado* and *K. stridulans* (Wood-Mason, 1894). However, a median carina of the rostral plate is present in *K. mikado* (vs. absent in *K. stridulans*) and a pair of dark dorsal patches on the fifth abdominal somite is present in *K. mikado* (vs. absent in *K. stridulans*) (see Ahyong, 2001). The present specimens agree well with the descriptions of the species by Kemp and Chopra (1921) and Ahyong (2001). Their sizes (females: TL 163–164 mm) exclude the size range of females reported by Moosa (1986) as TL 46–142 mm, but, include that by Ahyong (2001) as TL 51–182 mm. At present, *K. mikado* is the first species of the genus *Kempella* and one of two species of the Squillidae from Korean waters.

¹*Genus *Squilloides* Manning, 1968

²**Squilloides leptosquilla* (Brooks, 1886) (Figs. 1B, 3)

Squilla leptosquilla Brooks, 1886: 30–34, Pl. 1, figs. 1, 2.

Squilloides leptosquilla: Takeda, 1982: 227, fig. 674; Miyake, 1982: 167, fig. 2; Moosa, 1986: 410–411, Pl. 1, figs. D, E; Hamano, 1995: 151, Pl. 80–5; Ahyong, 2001: 310–312, fig. 150; 2002: 382.

Material examined. 2♂♂ (TL 82–88 mm), 1♀ (TL 72 mm), off Geojeodo Island (34°43.9'N, 129°01.2'E), 90 m

depth, trawl, 27 May 2007.

Description. Eye (Figs. 1B, 3A) small, broader than stalk, not extending to distal end of segment 1 of antennular peduncle; cornea bilobed, set obliquely on stalk. Rostral plate (Fig. 3A) subtriangular; median carina present.

Carapace (Figs. 1B, 3A) narrowed anteriorly; dorsal surface rugose, pitted; anterolateral spines present; median carina present, without anterior bifurcation; intermediate carina shorter than and parallel to gastric groove.

Dactylus of raptorial claw (Figs. 1B, 3B) with 4 teeth on inner margin, increasing in size distally; propodus (Fig. 3B) pectinate on inner margin, with 3 movable spines on inner proximal margin; dorsal carina of carpus entire; merus without outer inferodistal spine.

Mandibular palp absent.

Maxillipeds 1–4 each with epipod (Fig. 3C); maxilliped 5 without epipod.

Thoracic somite 5 (Figs. 1B, 3D, E) with single lateral process as lobe directed laterally. Thoracic somites 6–7 each with single lateral process; anterior margin rounded, posterior margin acute. Thoracic somite 8 (Figs. 1B, 3D) with triangular lateral process.

Abdomen (Figs. 1B, 3G) with submedian, intermediate, lateral and marginal carinae; somite 6 with submedian carinae spined posteriorly; somites 3–6 with intermediate carinae spined posteriorly; somites 1–6 with lateral carinae spined posteriorly; somites 1–5 with marginal carinae spined posteriorly. Endopod of pleopod 1 (Fig. 3F) flattened, with elongated tube and hook processes in male.

Telson (Figs. 1B, 3G, I) subtriangular, slightly broader than long; dorsal surface scattering of granules, with median carina ending in strong spine; 3 pairs of primary teeth without dorsal carina; lateral teeth minute in male, but, well developed in female; submedian teeth with fixed apices on posterior margin; prelateral lobe absent; 1 acute lateral denticle present in female (Fig. 3I); 12–13 intermediate, 12–14 submedian denticles present in both sexes.

Uropod (Figs. 1B, 3G, H) with slender endopod; protopod crenulated on inner margin, terminating in 2 spines, inner spine longer than outer one; proximal segment of exopod with 6–8 movable spines on outer margin.

Distribution. Indonesia, Japan, the Philippines, Australia (Ahyong, 2001), Taiwan (Ahyong et al., 2009), and now Korea.

Coloration. Dorsal color in life light brown. Carapace grooves and posterior margins of thoracic and abdominal somites brown. Telson with pair of dark brown patches on dorsal surface.

Remarks. The genus *Squilloides* can be distinguished from

Korean name: ¹*사니갯가재속, ²*사니갯가재

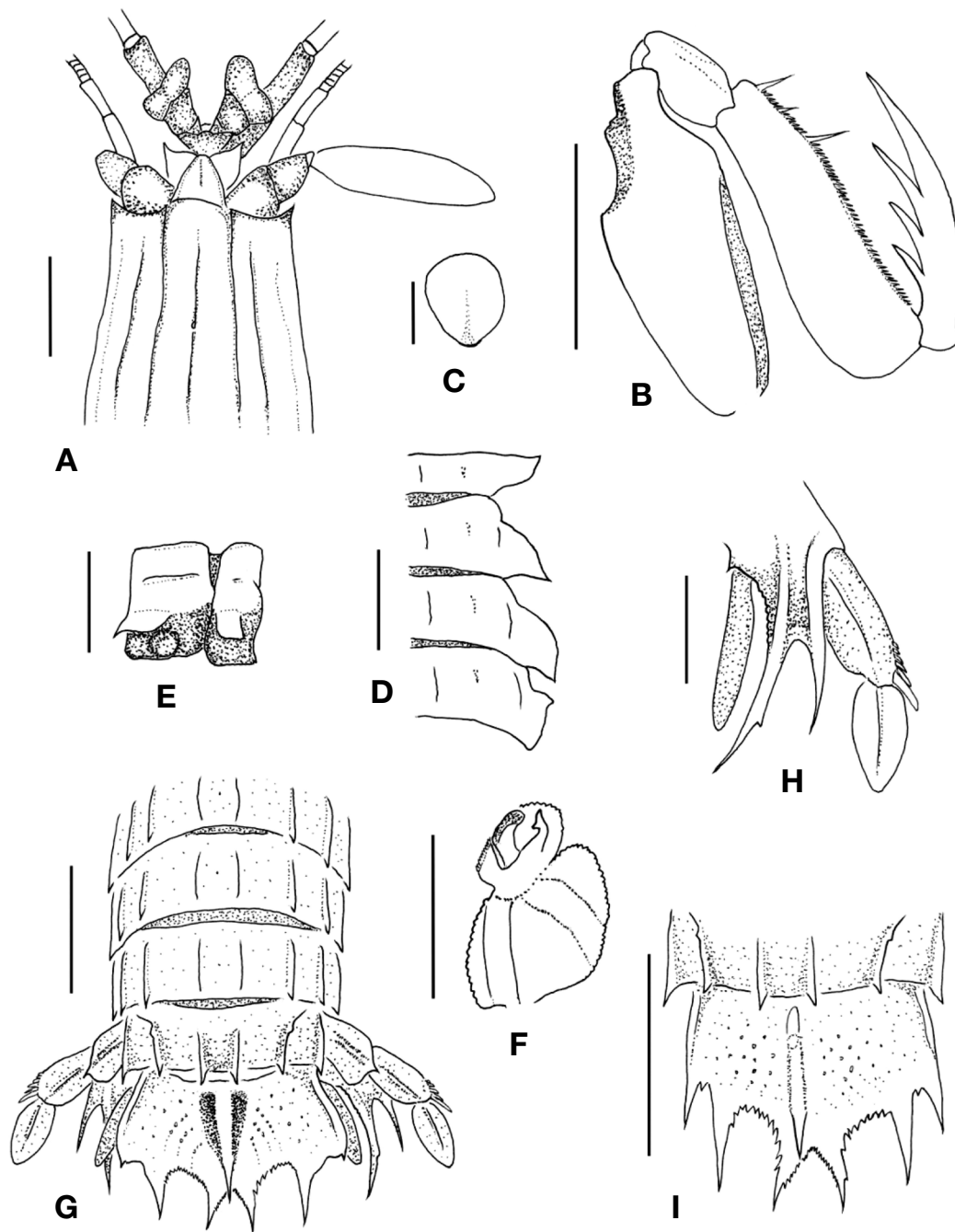


Fig. 3. *Squilloides leptosquilla* (Brooks, 1886): A-H, Male (TL 82 mm); I, Female (TL 72 mm). A, Anterior cephalon, dorsal; B, Raptorial claw, right lateral; C, Epipod of maxilliped 4, right; D, Lateral processes of thoracic somites 5-8, right dorsal; E, Lateral processes of thoracic somites 5-6, right lateral; F, Endopod of pleopod 1, right; G, Abdominal somites 3-6, telson and uropod, dorsal; H, Uropod, left ventral; I, Abdominal somite 6 and telson of female. Scale bars: A, D-F, H=5 mm, B, G, I=10 mm, C=1 mm.

other squilloid genera by having a carapace with a median carina, a dactylus of the raptorial claw with four teeth, and the sixth to seventh thoracic somites each with a single sharp lateral process. It presently includes only two species: *S.*

leptosquilla and *S. tenuispinis* (Wood-Mason, 1891). However, they can be distinguished from each other with the following character of carapace: an intermedian carina on the carapace is present in *S. leptosquilla* (vs. absent in *S.*

tenuispinis) (see Ah Yong, 2001). The present specimens generally agree with the accounts of Brooks (1886) and Ah Yong (2001).

The secondary sexual character of the reduced and swollen lateral teeth in male telson has been reported for the Philippines and the Australian specimens by Moosa (1986) and Ah Yong (2001). This character is also found in the Korean specimens.

Squilloides leptosquilla is the first species of the genus *Squilloides* and one of three species of the Squillidae from Korean waters. Hence, the Korean stomatopod fauna consists of six species and four families: *Oratosquilla oratoria* (Squillidae), *Faughnia formosae* (Parasquillidae), *Taku spinosocarinatus* (Takuidae), *Chorisquilla spinosissima* (Protosquillidae), *Kempella mikado* (Squillidae), and *Squilloides leptosquilla* (Squillidae).

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