To Dr. Chace:
Many thanks for your
kindness.

Lysmata zacae Armstrong, 1941, Rediscovery from Southern Japan and New Caledonia (Crustacea, Decapoda, Hippolytidae)

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Reprinted from
SPECIES DIVERSITY
Vol. 1 No.1 p.49–54

Published by
the Japanese Society of Systematic Zoology
September 1996

Species Diversity, 1996, 1, 49–54

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(Received: 1 February 1996/Accepted: 1 July 1996)

Lysmata zacae Armstrong, 1941, previously known only by the type specimens from Savai'i Island, Western Samoa, is redescribed on the basis of two non-ovigerous females and one ovigerous female newly collected from southern Japan and New Caledonia. The rediscovery of this species suggests that it is widespread in the western Pacific.

Key Words: *Lysmata zacae*, Hippolytidae, range extension, western Pacific.

Introduction

Recently, two specimens of the hippolytid shrimp, *Lysmata zacae* Armstrong, 1941, collected from a shallow rocky reef in southern Japan, were made available to me. Furthermore, I was able to examine a specimen of this species captured during a MUSORSTOM cruise in New Caledonian waters. Apparently, these three specimens represent the rediscovery of the species and mark a large range extension from the type locality, Savai'i Island, Western Samoa.

The abbreviation CL indicates the postorbital carapace length. The institutional names are abbreviated as follows: AMNH=American Museum of Natural History, New York; MNHN=Muséum National d'Histoire Naturelle, Paris; NSMT=National Science Museum, Tokyo.

Family **Hippolytidae**

Lysmata Risso, 1816

Lysmata zacae Armstrong, 1941

(New Japanese name: Tametomo Aka-mocbi)
(Figs 1, 2)

Lysmata zacae Armstrong, 1941: 10, fig. 4 (original description; type locality= Savai'i Island, Western Samoa).

Lysmata zacae: Holthuis, 1947: 19 (listed; no additional material); Feinberg, 1971: 7 (listed; no additional material).

Material Examined. - Japan: 1 female (NSMT-Cr 1826, 3.2mm CL), 24°13.6'N, 123°58.8'E, lagoon at Kuro-shima I., Yaeyama Group, Ryukyu Is., 6 Sept. 1992,

coll. by M. Osawa; 1 female (NSMT-Cr 2633, 5.4mm CL), 33° 08.5'N, 139° 44.4'E, Nazumado, Hachijo-jima I., Izu Is., 13m depth, 28 Sept. 1993, coll. by S. Kato, J. Okuno & H. Yagi. New Caledonia: 1 ovigerous female (MNHN-Na 12965, 4.4mm CL), 22° 05.1'S, 165° 58.0'E, Passe de Saint Vincent, 5m depth, 21 Mar. 1990, coll. by Tirard.

Comparative Material. *Lysmata zacae*: 2 females (AMNH 9203, 2.2 & 3.2mm CL, paratypes of *Lysmata zacae*), Mataatu Harbor, Savai'i I., Western Samoa, 15 Oct. 1936; *Lysmata trisetacea* (Heller, 1861): 3 ovigerous females (NSMT-Cr 1827, 4.6-5.6mm CL), same data as NSMT-Cr 1826.

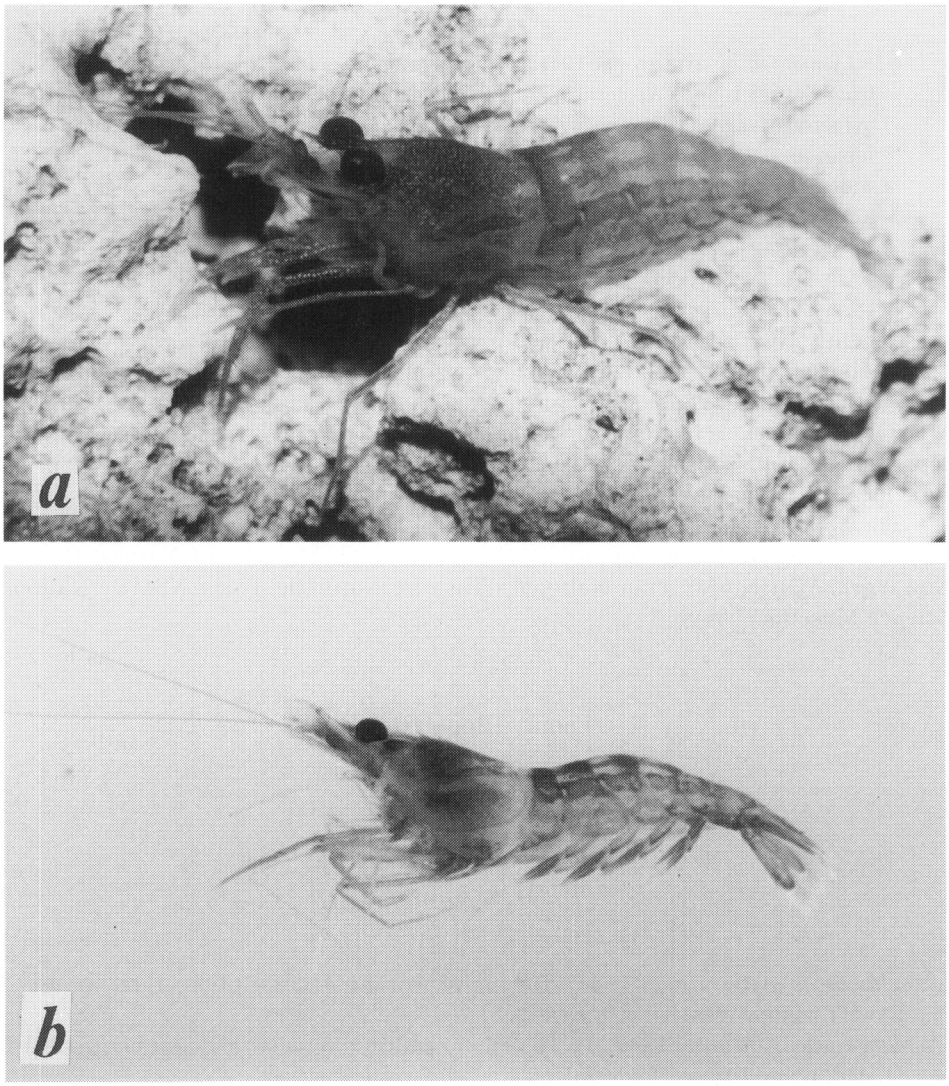

Fig. 1. *Lysmata zacae* Armstrong, 1941. Female (5.4mm CL, NSMT-Cr 2633), a, specimen alive in aquarium; b, fresh specimen, lateral view.

Description. - Carapace smooth, glabrous. Rostrum (Fig. 2a) short, almost straight, 0.6-0.8 times as long as carapace, reaching distal margin of middle segment of antennular peduncle; dorsal margin armed with five teeth, posterior two teeth posterior to level of orbital margin, distalmost tooth situated at distal fifth of rostral length; ventral margin armed with four teeth along distal two thirds of rostral length; lateral carina distinct, continuous with upper orbital margin of carapace (Fig. 2a). Antennal spine moderately strong, supported by carina, directed anteriorly. Pterygostomial angle rounded, without spine.

First three abdominal somites with rounded pleurae; fourth somite with feeble posteroventral protrusion; pleurae of fifth and sixth somites each with acute posteroventral tooth.

Telson (Fig. 2b) 0.6-0.7 times as long as carapace, 1.5-1.8 times as long as sixth abdominal somite, armed with two pairs of dorsolateral spines, anterior pair situated at proximal third of telson, posterior pair at distal third; posterior margin with small median protrusion with two pairs of lateral spinules.

Eye stout, with glabrous, pigmented cornea.

Antennular peduncle (Fig. 2c) reaching about as far as scaphocerite, with acute tooth on ventral inner margin of proximal segment; distal segment slightly shorter than middle segment; stylocerite short, reaching level of proximal third of proximal segment. Dorsal antennular flagellum distinctly biramous.

Scaphocerite 0.6-0.7 times as long as carapace, 3.6-4.1 times as long as maximum width; distolateral tooth reaching level of distal margin of truncate lamella. Basicerite stout, with acute ventrolateral tooth.

Mouthparts typical of genus. Third maxilliped overreaching rostral apex by length of ultimate segment, ultimate segment 0.6-0.7 times as long as carapace, 2.1-2.3 times as long as penultimate segment, with 4-6 corneous terminal spines.

First pereiopod overreaching scaphocerite by length of chela; carpus slightly longer than chela.

Second pereiopod (Fig. 2d) long and slender, overreaching rostral apex by lengths of carpus and chela; merus 0.7-0.8 times as long as carapace, with 18-28 articles; carpus long, 1.5-1.6 times as long as carapace, 14.0-17.0 times as long as chela, with 34-38 articles.

Ambulatory pereiopods slender, similar to each other. Third pereiopod overreaching rostral apex by lengths of three distal segments; merus 1.1 times as long as carapace, 1.6 times as long as carpus, with 3-5 spines on outer margin, 3 spines on ventral margin; carpus 0.7 times as long as carapace, with sparse long distal setae; propodus 1.1 times as long as carpus, with sparse spinules on ventral margin; dactylus with 4 accessory claws posterior to terminal largest claw. Fourth pereiopod (Fig. 2e) overreaching rostral apex by lengths of two distal segments; merus 0.8-0.9 times as long as carapace, 1.5-2.0 times as long as carpus, with 5 spines on outer margin, 2-4 spines on ventral margin; carpus 0.5 times as long as carapace; propodus 1.2-1.6 times as long as carpus, with spinules similar to those of third pereiopods; dactylus (Fig. 2f) with 4-5 claws posterior to terminal claw. Fifth pereiopod overreaching rostral apex from midlength of propodus; merus 0.6-0.7 times as long as carapace, 1.0-1.3 times as long as carpus, with 3-5 spines on outer margin, ventral margin unarmed; carpus 0.5 times as long as carapace; propodus 1.2-1.6 times as long as carpus, with spinules similar to those of third and fourth pereiopods; number of accessory claws on dactylus agreeing with that of fourth pereiopod.

Coloration. - Ground color of body and all appendages brownish red; carapace, rostrum, third maxilliped, and pereiopods with dense cover of fine, white spots; abdominal somites with pale, broken, longitudinal stripes (Figs 1a, b).

Distribution.- Savai'i Island, Western Samoa (type locality); Izu and Ryukyu Islands, southern Japan; and New Caledonia.

Remarks. - *Lysmata zacae* was described by Armstrong (1941) based on three specimens captured in Mataatu Harbor, Savai'i Island, Western Samoa. I was able to examine the two paratypes for comparison. One of them, labeled as male (3.2mm CL), is a non-ovigerous female. The specimens from southern Japan and New Caledonia agreed well with the paratypes in their major morphological characters: rostrum reaching distal margin of middle segment of antennular peduncle (Fig. 2a); stylocerite reaching distal end of proximal third of proximal antennular segment (Fig. 2c); scaphocerite reaching about as far as distal margin of antennular peduncle (Fig. 2a); carpus of second pereiopod divided into more than 34 articles (Fig. 2e).

As mentioned in the original description, the smaller female paratype (2.2mm CL) has an extra spine on the dorsal surface of the telson. However, the other paratype and all the specimens from southern Japan and New Caledonia possess no extra spine. The dactyli of the ambulatory pereiopods have four accessory claws

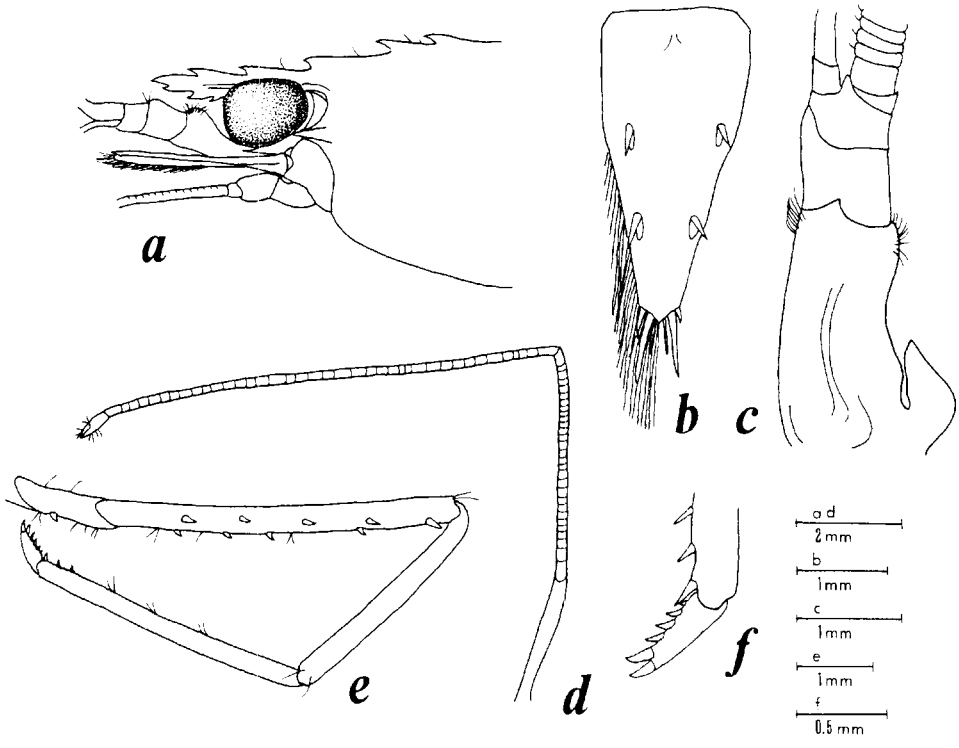

Fig. 2. *Lysmata zacae* Armstrong, 1941. Female (5.4 mm CL, NSMT-Cr 2633). a, anterior part of carapace and cephalic appendages, lateral view; b, telson, lateral setae omitted from right side; c, antennular peduncle; d, second pereiopod; e, fourth pereiopod; f, same, dactylus.

posterior to the terminal claw, except for the largest specimen from Hachijo-jima Island (5.4mm CL) having the fourth and fifth dactyli armed with five accessory claws. These morphological differences can be considered as intraspecific variation.

Judging from the localities mentioned above, *L. zacae* may be widely distributed in the western Pacific. The record from Hachijo-jima Island constitutes the northernmost limit of its known distributional range. The specimen from Kuro-shima Islet was living in coral rock in the lagoon, and the specimen from Hachijo-jima Island was captured in submarine crevices of the rocky reef at a depth of 15 m. It seems that these cryptic habitats may have delayed the species' rediscovery since the finding of the type specimens.

Following Chace (1972) and Wicksten (1990), I recognize herein the genus *Hippolysmata* Stimpson as a junior synonym of *Lysmata* Risso. There are 14 Indo-Pacific species of *Lysmata* (Chace, pers. comm.). Among them, *Lysmata zacae* may be the most closely related to *L. trisetacea* (Heller, 1861) in having a distinctly biramous dorsal flagellum of the antennule, no pterygostomial spine, and the carpus of the second pereiopod divided into numerous articles. Both species occur in the tropical and subtropical western Pacific. I compared the specimens of *L. zacae* with three ovigerous females of *L. trisetacea* (NSMT-Cr 1827, 4.6-5.6mm CL) from the lagoon at Kuro-shima Islet. *Lysmata trisetacea* can be readily differentiated from *L. zacae* by having the rostrum reaching the midlength of the middle antennular peduncular segment, the stylocerite reaching about as far as the distal margin of the proximal antennular segment, the scaphocerite overreaching the distal margin of the antennular peduncle, and the carpus of the second pereiopod being divided into fewer than 27 articles.

Acknowledgments

Dr. F. A. Chace, Jr. of the National Museum of Natural History, Smithsonian Institution, Washington, D. C., kindly provided me with valuable suggestions for the draft and his unpublished checklist of *Lysmata* species. Dr. C. H. J. M. Fransen of the Nationaal Natuurhistorisch Museum, Leiden, and Dr. T. Komai of the Natural History Museum and Institute, Chiba, gave me helpful comments on the draft. Dr. A. Crosnier (MNHN) and Dr. L. L. Tolchin (AMNH) kindly sent me specimens on loan. Dr. M. Takeda (NSMT) kindly assisted me with literature. Mr. M. Osawa of the Tokyo University of Fisheries kindly donated to me the specimens be captured at Kuro-shima Islet. Messrs. S. Kato of Hachijo-jima Island and H. Yagi of Kawagoe City supported my efforts to collect at Hachijo-jima Island.

References

Armstrong, J. C. 1941. The Caridea and Stomatopoda of the Second Templeton Crocker-American Museum Expedition to the Pacific Ocean. American Museum Novitates 1137: 1-14.

Chace, F. A., Jr. 1972. The shrimps of the Smithsonian-Bredin Caribbean Expedition with a summary of the West Indian shallow-water species (Crustacea: Decapoda: Natantia). Smithsonian Contributions to Zoology 98: 1-179.

Feinberg, H. S. 1971. *A Catalogue of Type Specimens in the Department of Living Invertebrates, The American Museum of Natural History, New York, New York, U. S. A. Phylum Arthropoda. Class Crustacea. Part One: Order Decapoda.* Department of Living Invertebrates, American Museum of Natural History, New York, iii + 75 pp.

Heller, C. 1861. Synopsis der im rothen Meere vorkommenden Crustaceen. Verhandlungen zoologisch-botanischen Gesellschaft in Wien 11: 3-32.

Holthuis, L. B. 1947. The Decapoda of the Siboga Expedition part IX. The Hippolytidae and Rhynchocinetidae collected by the Siboga and Snellius Expeditions with remarks on other species. Siboga-Expeditie 39a^{8}: 1-100.

Wicksten, M. K. 1990. Key to the hippolytid shrimps of the eastern Pacific Ocean. Fishery Bulletin, U. S. 88(3): 587-598.