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Gnathia nubila n. sp. and a new record of *Gnathia grandilaris* (Crustacea, Isopoda, Gnathiidae) that parasitizes elasmobranchs from Okinawan coastal waters, Japan

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Abstract

Gnathiid larvae were collected as ectoparasites on elasmobranchs caught in fisheries off Okinawa Island, Ryukyu Archipelago, southwestern Japan. The larvae were reared in a laboratory aquarium; some metamorphosed into male and female adults of *Gnathia nubila* n. sp. and *Gnathia grandilaris* Coetzee, Smit, Grutter & Davies, 2008. Males of *G. nubila* n. sp. were easily distinguished from all other species by the bifit and dentate mediofrontal process of the frontal border and by a narrow pleotelson. *Gnathia grandilaris* was originally recorded from the Great Barrier Reef (GBR), Australia, and here we report a second find of this species from the Ryukyus. Since the first description did not include female adult of *G. grandilaris*, we provide the morphology of female.

Key words: Gnathiids, Ectoparasite, Larva, Elasmobranch, New species.

Introduction

Gnathiid isopods have a biphasic life cycle, with morphological differentiation among larvae (known as zuphea and pranizae), adult males, and adult females (Monod, 1926). Praniza larvae are ectoparasites of teleost and elasmobranch fish; they suck blood from the hosts. After feeding, praniza larvae leave host fishes and hide among benthic substrata to rest and molt (reviewed by Smit & Davis, 2004). Adults are non-feeding and reproduce in substrata such as sponges, dead corals, barnacle nests, and polychaete worm tubes (Cohen & Poore, 1994; Tanaka & Nishi, 2008).

The Gnathiidae includes more than 190 species in 12 genera worldwide (Cohen & Poore, 1994; Hadfield & Smit, 2008; Kensley *et al.* 2009). There are about 30 species in 6 genera from Japan and adjacent waters (Shimomura & Tanaka, 2008). Species descriptions of gnathiids have traditionally been based on the morphology of adult males, and it has been almost impossible to make species identifications from larvae alone. Gnathiid larvae are one of the most common ectoparasites of coral reef fishes (Grutter, 1994; Grutter & Poulin, 1998). Some author have been attempted to discover their ecology such as the host specificity (Jones *et al*. 2007), the interactions among gnathiid larvae, their host fishes, and cleaner fishes (predator of ectoparasites) (*e.g.* Grutter, 1996, 2002, 2008). Furthermore, gnathiid larvae have the possibility as the vectors of some fish blood protozoans (*e.g.* Davies *et al.* 1994; Mckiernan *et al.* 2005). However, the gnathiid larvae were rarely identified in most of the studies. Descriptions of larval morphologies are necessary for gnathiid identifications based on the larvae and should be useful for the studies on gnathiid.

Currently, five *Gnathia* species have been described from elasmobranch hosts: *G. pantherina* Smit & Basson, 2002; *G. capillata* Nunomura & Honma, 2004; *G. grandilaris* Coetzee, Smit, Grutter & Davis, 2008; *G. trimaculata* Coetzee, Smit, Grutter & Davis, 2009; and *G. maculosa* Ota & Hirose, 2009. In these

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