

New potential host for *Ryukyua globosa* (Crustacea, Isopoda, Cymothoidae) from Parangipettai, Southeast coast of India

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Abstract In the present study *Ryukyua globosa* parasitic isopod on the marine fishes of the Parangipettai coast are reported. *R. globosa* was found attached in the gill chamber of *Sardinella gibbosa*. The attachment position of *Ryukyua* species differs from that of other member of this genus. Until now, *R. globosa* was only reported on *Amblygaster sirm* and *A. leiogaster*. *S. gibbosa* is a new host record for *R. globosa*. *R. globosa*, branchial parasites, already known from Japan and is now recorded from the Southeast coast of India.

Keywords *Ryukyua globosa* · *Sardinella gibbosa* ·
New host record · Parangipettai · Southeast coast of India

Introduction

Several groups of the marine and fresh water fishes are infested by parasitic Cymothoidae (Crustacea, Isopoda) (Trilles 1994). Bruce (1990) revised the genus *Lironeca* or *Livoneca* and noted that the species *Lironeca circularis* (Pillai 1954), did not belong in this genus and that the generic position of this species was entirely uncertain. Later, Williams and Williams (1986) reported this parasitic

cymothoid in the same host from Thailand and transferred this species to the new genus *Ryukyua* (Williams and Bunkley-Williams 1994). In the present study *Ryukyua globosa* parasitic on the marine fishes of Parangipettai coasts and the host fish are new records in the worldwide.

Materials and methods

Fishes were collected from Parangipettai coastal waters (Lat 11°29'N; 79°46'E) and examined for isopod parasites. Isopods were measured for total length and maximum width to the nearest 0.1 mm and preserved in 70 % ethanol. The isopods were identified according to the morphological description by (Pillai 1954, 1964; Williams and Williams 1986; Williams and Bunkley-Williams 1994). Host nomenclature and fish taxonomy are according to Fish Base (Froese and Pauly 2013). The sampling locality, the host fish and the site of attachment on the host fish were recorded. Isopod specimens are deposited Department of Zoology of the Bharathiar University (Rameshkumar collection), Coimbatore-641046, Tamil Nadu, and India.

Results and discussion

Ryukyua globosa cymothoid isopods belonging to the genus *Ryukyua*, (Fig. 1) were collected from, *S. gibbosa* from the Parangipettai coast. Until now, *R. globosa* was only reported on *Amblygaster sirm* and *Amblygaster leiogaster*. This is a new record host for *R. globosa*. In this study, cymothoid isopods are reported in India and them for the first time.

Ryukyua globosa seems to be host-specific to *A. sirm*. Specimens of the remaining 13 species of Japanese

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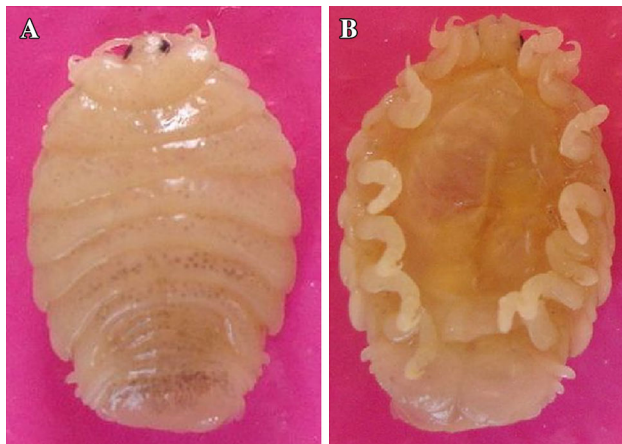


Fig. 1 a *R. globosa* dorsal view Fig. 1. b *R. globosa* ventral view

clupeids (Masuda et al. 1984) that we examined were not infested. Pillai (1954) reported *Lironeca circularis* (as *Livoneca circularis*) from the gill chamber of *A. leiogaster* (as *Clupea leiogaster*), and Williams and Williams (1986) reported this isopod from *A. sirm*. *R. globosa* was first described from the northern Okinawa, Toguchi Market, Motobu-cho, Okinawa, Japan, by Williams and Bunkley-Williams (1994) from *A. sirm* and *A. leiogaster* host. The geographic range of isopods in the genus *Ryukyua* is far wider. We know they occur in southern India in the Indian Ocean (Veerappan and Ramanathan 1997), Thailand in the South China Sea, and the *Ryukyus* in the Pacific. These routes also correspond to the known ranges of the species in Parangipettai, Southeast coast of India. *R. globosa* differs from *R. circularis* by having the anterior margin of head flexed and produced into a lobe between bases of antennae 1 instead of having no lobe, having antennae not reaching posterior border of the head instead of reaching beyond it and having a rectangular instead of a triangular pleotelson (Williams and Bunkley-Williams 1994).

Two ecto-parasitic isopods namely, *R. circularis* and *Nerocila pigmentata* (Crustacea: Cymothoidae) were observed on the marine trenched sardine, *A. sirm*, from Parangipettai coast (Veerappan and Ramanathan 1997). Ishimori (2013) reported two species of *A. leiogaster* and *A. sirm* are sympatrically distributed in the Ryukyu islands. However, in the present study, *S. gibbosa* (Fig. 2) belonging to the family Clupeidae, as a new host for the *R. globosa*. Males and females of *R. globosa* species seem to be almost always associated in pairs even though they are isolated in opposite gill chambers.

The unusual attachment position of the female of this isopod was not described by Pillai (1954, 1964). *Lironeca* sp. usually attach in the ventral portion of the gill chamber of their host, with their dorsal (not ventral) surfaces



Fig. 2 *Ryukyua globosa* in the gill chamber of *Sardinella gibbosa*

exposed when the opercular flap of the host is opened. In the present study *R. globosa* attach in the dorsal portion of the gill chamber of *S. globosa* (Fig. 2) and not previously recorded from worldwide. *R. circularis* and *L. circularis* is a typical species agreeing with other species in the structure of the appendages but nearly circular body distinguishes it from all the others (Pillai 1954). *Ryukyua* is approximately equal (male and female) on both sides of the body. Various other characters separate *Ryukyua* from these genera, and thus their resemblance is only superficial. No other described cymothoid genus is similar to *Ryukyua* (Williams and Bunkley-Williams 1994).

The position of *R. globosa* in the posterior dorsal corner of the gill chamber of their hosts, attached to the operculum, is unusual among parasitic isopods of fishes. We are only aware of two other species, *Agarna malayi* (Tiwari 1953) and *Norileca indica* (Bruce 1990), with this orientation in the gill chambers of their hosts. *Joryma engraulides* (Barnard 1936) may possibly have a similar attachment position (Barnard 1936). The separation of female and male in opposite gill chambers in *R. globosa* is similar to the duplex arrangement of females and males of *M. plagulophora* reported by (Rameshkumar et al. 2015). Pillai (1964) reported that male and female *circularis* are the same total length (12 mm). Williams and Bunkley-Williams 1994 assumed that this was a typographical error (as female cymothoids are invariably larger than males) until examined specimens. In the present study the length of specimens ranged from 12 to 18 mm *R. globosa* and the width of the body was half as broad as the length.

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