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Infestation of parasitic copepod, *Lernanthropus latis* (Siphonostomatoida; Lernanthropidae) Yamaguti, 1954 on wild Asian sea bass, *Lates calcarifer* along Bay of Bengal off Chennai coast, India

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ABSTRACT

An attempt was made to investigate the parasitic infection in wild Asian sea bass, *Lates calcarifer* along Bay of Bengal coast, India. Several numbers of fish caught from Kasimedu fishing harbour were examined for the presence of parasites. In all the fish examined, gills were infected with a single species of copepod, *Lernanthropus latis* Yamaguti (1954). The prevalence of this parasite in different fish ranged from 2 to 24 parasites per host with a mean intensity of 9.7. The adult female parasites were found to have oblong cephalothorax with egg-strings spreading throughout the gills. Parasitic infected gills had pale discolouration and abnormal mucus secretion.

Key words: Asian sea bass, *Lernanthropus latis*, Parasitic gill copepod

INTRODUCTION

Disease is one of the limiting factors for aquatic animals both in wild and culture practices. Prevalence of diseases in wild provides clue regarding the specific measures that should be adopted while domesticating any species. Though, culture practices for many of the marine and brackish water fin fishes in India are scanty, their potential has been well felt. Aquaculture industry is a boon to mankind in meeting the growing food demand. Fish culture in coastal and brackishwater areas has been gaining importance worldwide. The Asian sea bass, *Lates calcarifer* (Bloch), has become one of the most promising species for coastal aquaculture, especially in India after the significant achievement in captive breeding of this species at Central Institute of Brackishwater Aquaculture, Chennai. Aquaculture of sea bass in various parts of the world has been facing problems due to diseases (Azad et al., 2004). Early stages of larval development have been known to be susceptible to infection. Preventive and prophylactic measures to minimize losses due to diseases can be effectively carried out with the basic information on the onset of innate and acquired immunity of the species under consideration (Ellis, 1977). There have been about 2,000 species of described parasitic arthropods and a majority of them belongs to the class Copepoda, *Lernanthropus* De Blainville, 1822, with more than 100 nominal species. Further, the most widespread genus of the family Lernanthropidae, and order Siphonostomatoida are considered to be

a common genus of parasitic copepods on fishes (Kabata, 1993). Some species of *Lernanthropus* are strictly host specific, but many are parasitic on several species of fish belonging to one genus, or on some occasions several genera of one family (Kabata, 1979; Olivier and Van Niekerk, 1995; Timi and Etchegoin, 1996; Lugue and Paraguass, 2003; Sharp et al., 2003). *Lernanthropus latis* has come under intense scrutiny, due to its frequent occurrence in fish reared in sea cages and also due to its report as the most notorious pests affecting wild and cultured marine fish species (Lester and Hayward, 2006). Kua (2012) reported Infestation of gill copepod *L. latis* (Copepoda: Lernanthropidae) and its effect on cage-cultured Asian sea bass *Lates calcarifer* in Malaysia. Ho (2011), reported six species of the Lernanthropidae (Crustacea: Copepoda) parasitic on marine fishes of Taiwan. The *Lernanthropus* use their prehensile antennae and maxillipeds to attach tenaciously to a host's gill filaments. The attachment is assisted by leg 3 which is modified into a pair of large, folded lamellae designed for clamping onto the host's gill filaments. Thus, Lernanthropids can often cause pathological effects such as desquamation, erosion, and necrosis of the gill filaments (Manera and Dezfuli, 2003) and, in cases of heavy infection, may lead to asphyxiation, anemia, and secondary bacterial infections (Tokşen et al., 2006). Moreover, parasitic copepods may serve as vectors for several viral and bacterial diseases of fish (Nylund et al., 1993). However, parasitic copepods from other families have also been reported from cultured fish and in some instances found responsible for disease (Lester and Hayward, 2006). Occurrence of parasitic Copepods, *L. sprattae* on King Mackerel (*Scomberomorus commerson*), along South-East of India (Sethi, 2012), co-infection of Yellow tip Halfbeak Fish (*Hemiramphus marginatus*) with Isopod, *Mothocya plagulophora* and Copepod, *L. hemiramphi* parasites from the Coromandal Coast, India (Sethi et al., 2013) was reported in marine captured fishes in India. The present study reported severe infestation of copepod parasites, *L. latis* on Asian Sea Bass, *Lates calcarifer* caught from Bay of Bengal off Chennai Coast.

MATERIALS AND METHODS

This study was carried out during September 2012. Ten numbers of adults (3090 ± 963.15 g) Asian Sea bass, *Lates calcarifer* (Bloch), were sampled from Kasimedu Fishing Centre along Bay of Bengal. Twenty females and five male individuals of *Lernanthropus latis* were collected from gill filaments of the host and preserved in 70% ethanol. Samples were studied using light microscopy, standard staining, manipulation and measuring techniques. Copepod identification was based on morphological features according to Yamaguti (1963), Kabata (1979), Pillai (1985), Sirikanchana (2003) and Ho and Kim (2004). Prevalence and mean intensity of each parasitic species were determined following the method of Margolis (1982).

RESULTS AND DISCUSSION

The body of female parasite was elongated. Length from anterior margin of cephalic shield to posterior margin of dorsal plate was 8 mm (range= 6.6-9.0 mm); the average length of legs including fourth legs was 3.5 mm (range=3.3-4.5 mm) and where as the cephalic shield length was of 0.91 mm (range = 0.65-0.96). Body surface was ventrally ornamented with several patches of setules. Cephalothorax with the dorsal shield was slightly narrower anteriorly and anterolateral corners were more rounded than posterolateral corners from dorsal view. Female *L. latis* with characteristic oblong cephalothorax and egg-string were seen on most part of the gills (Fig. 1, 2). Egg sacs were long, uniseriate and with numerous eggs. Male parasites were comparatively smaller than the female with a mean body length of 2.5 mm (range = 1.7 -2.8 mm) lacking dorsal plate. A 100% parasitic prevalence was seen in all the ten Asian sea bass examined with the number of *L. latis* ranging from 5 to 24 (Table 1). In the present work, the heavily infested Asian sea bass showed pale gill discoloration and excessive mucus production indicating anaemic condition. Similar symptoms have been reported in fish infested with *L. kroyeri* in European sea bass (Toksen, 2007).

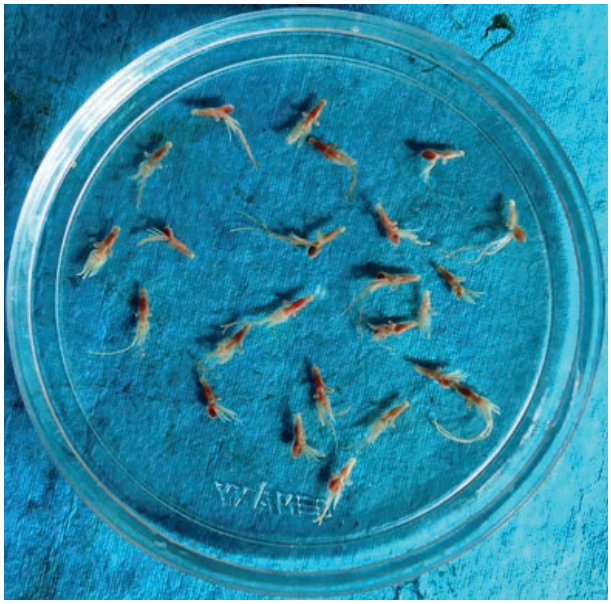

Fig. 1. Fresh specimens of females of *Lernanthropus latis* with the egg-strings collected from gills of wild caught Asian Seabass, *L. calcarifer* from Kasimedu landing centre off Chennai coast.

Fig. 2. Dorsal views of female (Big size with string shaped eggs) and male (Small size without string shaped eggs) of parasitic copepod, *L. latis* were under light microscopy.

Table 1. Prevalence, mean intensity and gross observation on the gills of captured Asian sea bass *L. calcarifer* along Bay of Bengal off Chennai coast.

Number of fishes examined	Weight (g)	Gross observation of gills of fishes		Examination of parasitic copepods
		Pale in colour	Excessive mucus	*Lernanthropus latis* (number)
1	5000	+	+	+ (24)
2	3600	+	+	+ (5)
3	2500	+	-	+ (8)
4	2000	+	+	+ (7)
5	1800	+	-	+ (9)
6	2800	-	+	+ (2)
7	4000	+	+	+ (5)
8	2700	-	-	+ (7)
9	3000	+	-	+ (17)
10	3500	+	+	+ (13)
Prevalence (%)	3090 ± 963.15	80	60	100 (5-24), M.I.(9.7)

Prevalence (%) 3090 ± 963.15, 80 60 100 (5–24), M.I (9.7); Note: + (present), – (absent), Prevalence (number of individuals of a host species infected with parasite ÷ number of hosts examined) and mean intensity (M.I)

Similarly, fish infected with *Lernanthropus* spp. have been reported to exhibit a wide variety of clinical symptoms such as respiratory distress, lethargy, dark coloured skin, increase mucus secretion and severe mortality particularly in small size fish (Henry, 2009). Infestations with lernanthropids mostly in marine fish were reported to cause pathological symptoms such as desquamation and necrosis to the secondary lamellae near the site of attachment (Jithendran, 2008). Similar observation was also noticed in the present studies. Therefore, extensive gill damage due to the attachment and feeding by *L. latis* mighty have reduced fish respiratory surface. The open wounds at the gills caused by the parasite could also lead to secondary infections (Lester and Hayward, 2006).

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