



New host record of the parasitic cymothoid, *Nerocila serra* Schioedte & Meinert, 1881 (Crustacea: Isopoda) from the coastal waters of Mumbai, India

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Short communication

Abstract

The present study, reports the occurrence of the parasitic cymothoid, *Nerocila serra* Schioedte and Meinert, 1881, on the blacktip sea catfish *Plicofollis dussumieri* (Valenciennes, 1840). Identified the parasite from two blacktip sea catfishes sampled during November and December 2019 along the Mumbai coast.

Keywords: Fish parasite, isopod, Mumbai coast, *Nerocila serra*

Introduction

The Blacktip sea catfish, *Plicofollis dussumieri* (Valenciennes, 1840) belongs to the family Ariidae, and is a common species in the coastal waters. It is a highly mobile species that can migrate over long distances and thrives in a variety of unstable environments (Menon *et al.*, 1990). Isopoda is a group of free-living parasitic organisms that live in a variety of environments and prey on fish. Parasitic isopods are common in marine waters and prefer to live in warmer climates (Lester, 2005). Isopods are found in many commercially valuable fish species around the world, and they injure, stunt, or harm these fish, causing major economic losses to fisheries. They may also kill or damage immature fish, causing them to perish. Many commercial fish species have parasitic cymothoid isopods, which can cause a wide range of harm to fisheries resources (Bunkley-Williams and Williams, 1998; Ravichandran *et al.*, 2009; Smit *et al.*, 2014). *Nerocila* is a larger Cymothoidae genus of almost 65 species that live on fish surfaces. Only a few studies have been done on parasites recorded from marine fishes in the Indian context (Pillai, 1964; Trilles *et al.*, 2011; Rameshkumar *et al.*, 2012, 2016; Aneesh *et al.*, 2018; Ravichandran *et al.*,

2019; Mariasingarayan *et al.*, 2020; Ray *et al.*, 2020). Isopod parasites are reported from Australia, Singapore, Mauritius, Jakarta, Java, Indonesia (Schioedte and Meinert, 1883; Trilles, 2008), Ubay, Philippines (Schioedte and Meinert, 1883; Trilles, 2008), the South China Sea (Bruce and Yu, 2006) and from the Indian coastline (Rameshkumar and Ravichandran, 2013; Aneesh *et al.*, 2013, 2017; Mariasingarayan *et al.*, 2020; Ray *et al.*, 2020). Cymothoids are one of the major parasites in fishes. Since, *Nerocila* is the largest genus in the Cymothoidae family, it is difficult to classify. About 350 species of Cymothoid isopods were described globally (Trilles, 1994; Worms, 2021), among them only around 56 species are documented from India (Rameshkumar *et al.*, 2011, 2016). Parasitic copepods are usually observed in both cultured and wild marine fishes (Rameshkumar and Ravichandran, 2013). Cymothoids infect a wide range of fish species. Most of the species live in the buccal opening of fish, while some others thrive in the gill cavity or on the body surface, as well as on the fins. Maximum studies on marine cymothoidae in India are from the east coast and this type of examination is very less from the west coast (Trilles *et al.*, 2011). Even though there are numerous studies on Cymothoid isopods, many places of the world remain understudied for these organisms (Hadfield *et al.*, 2010). Till now only 17 species from the genus *Nerocila* are described in India. As a result, more investigations on the Indian *Nerocila* species are needed (Trilles *et al.*, 2011). Hence, given the dearth of knowledge on isopod infestations in marine fishes, an investigation was undertaken on isopod parasite infestations.

Material and methods

Studies were carried out using experimental fishing from the

Mechanised fishing vessel NARMADA (IV) of ICAR-Central Institute of Fisheries Education during November and December 2019 along the coastal waters of Mumbai. Fishing operations were conducted between 19° 06'866"N and 19° 12'15.09"N latitude and from 72° 41'23.20"E to 72° 48'502"E longitude (Fig. 1). The fish length and weight were noted and standard procedures were used for finding the 'parasites'. Isopod specimens were collected in live condition, preserved in 70% ethanol and then identified up to species level. The locality, host fish, and site of attachment on the host fish were recorded. The body surface, fins, mouth and gill arches of all fish individuals were investigated for isopod parasites at the FRM laboratory, Central Institute of Fisheries Education, Mumbai. After a thorough examination, the isopod was removed with forceps from the anal fin region of the fish. The total number, site of attachment and the orientation of isopod on the host were recorded. Photographs of isopods that were attached to anal fin region of the host fishes were taken by digital camera. Taxonomic identification of the parasites is based on Bruce, 1990; Trilles *et al.*, 2011 and fish were identified based on key characters taxonomic key characters (Talwar and Kacker, 1984; Froese and Pauly (2011); FISHBASE database (www.fishbase.org) and FAO identification sheets for fishing area 51).

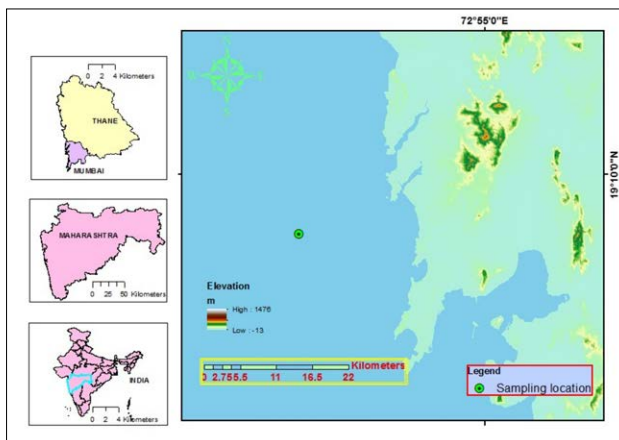


Fig. 1. Study area along the Mumbai coastal waters, India.

Results and discussion

The cymothoid isopod, *N. serra* was seen in the anal region of *P. dussumieri* (Fig. 2). Isopod infection has been observed in a total of two blacktip sea catfish.

Taxonomic keys and description

Body colouration is a yellowish-brown and dark black stripe on the lateral side of the body. In the dorsal side of the cephalon, a pair of sessile eyes and two distinct antennae. Three longitudinal dark stripes on the body. Endopod with a deep notch on the

medial margin and serrate lateral margin. Pleonites 1 and 2 with ventrolateral structures are common in *Nerocila*, as are uropods that stretch beyond the posterior of the pleotelson (Kazmi *et al.*, 2002).

The order Isopoda is found in various types of habitats, including terrestrial, marine, freshwater, and groundwater. Some parasitic organisms have been identified in freshwater, marine, and brackish water fish species (Bariche and Trilles, 2005). The most commonly observed group of crustacean ectoparasites in marine fish species is parasitic isopods. Isopods are haematophagous, and their lateral oesophageal glands create an anticoagulant compound (Bariche and Trilles, 2005). They feed on their hosts' blood and haemolymph and inflict lesions on their body surfaces, reducing the fish's economic worth (Printrakoon and Purivirojkul, 2011). The infection of isopod parasites in fishes is scanty (Ravichandran *et al.*, 2009, 2019; Rameshkumar *et al.*, 2012, 2016; Aneesh *et al.*, 2018; Mariasingarayan *et al.*, 2020; Ray *et al.*, 2020) and no such studies have been made on the infestation of *N. serra* in *P. dussumieri*. Cymothoid isopod causes severe problems for host fishes by impacting the host's physiological functions either directly or indirectly (Brusca, 1981; Maxwell, 1982; Ravichandran *et al.*, 2009; Trilles *et al.*, 2011, 2013). Trilles (2013) reported 11 *Nerocila* species from 22 marine fishes under 15 families and 144 total hosts' fish were collected during the study. Ravichandran and Rameshkumar (2004) identified isopod pathogenicity and examined how the parasite's body imparts stress on the host tissue. *N. serra* species was collected from a variety of fish species, with a predominantly *Hexanematichthys sagor* (as *Arius sagor*), *Otolithes ruber* (as *Otolithus argenteus*) (Perciformes, Sciaenidae), and *Nemapteryx nenga* (as *Arius nenga*) (Siluriformes, Ariidae), (Barnard, 1936; Pillai, 1964; Jayadev Babu and Sanjeeva Raj, 1984; Trilles, 1994). *N. serra* species infections in caudal peduncle region of *Arius maculatus* (Catfish) were reported along the Nagapattinam coast, totalling 106 species (Trilles *et al.*, 2013). Studies on the nature of crustacean parasite infestation in fishes of the southwest coast of India (Radhakrishnan and Nair, 1983; Ravichandran *et al.*, 2009), revealed a higher prevalence and intensity of parasite infestation in female hosts than that in male hosts. The maximum

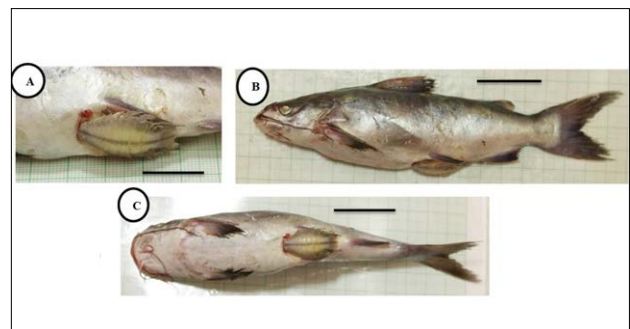


Fig. 2. Attachment of *N. serra* along the anal region of *P. dussumieri* (scale bar 5 mm).

and minimum sizes of fish that can be infested vary depending on the host species Romestand and Trilles (1979).

Conclusion

N. serra infested *P. dussumieri* and present along the Mumbai coastal waters. Though the occurrence of *Nerocila* sp. was commonly reported in the branchial cavity and the gills, they also attach to the body surface. Since parasites are economically significant as they are affecting considerable damage to fisheries resources, it is high time to carry out a comprehensive long-term study on the isopod parasites and their impact on host fishes.

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