

Occurrence of isopod *Nerocila phaiopleura* infestation on Whitefin wolf-herring (*Chirocentrus nudus*) from Southeast coast of India

K. Raja · R. Vijayakumar · V. Karthikeyan ·
A. Saravanakumar · K. Sindhuja ·
A. Gopalakrishnan

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Abstract The present study reported the first observation of isopod parasite, *Nerocila phaiopleura* infestation on *Chirocentrus nudus* an economically important fish from Cuddalore coast, Southeast coast of India. The maximum prevalence of 6.3 % and mean intensity of 3.2 were observed during pre-monsoon 2010 and monsoon 2010 respectively. The highest intensity 7 was observed in the single host during monsoon. The site of attachment leads to wound and offer the secondary infection. Two pathogenic bacteria *Streptococcus aureus* and *E. coli* were isolated from the wound.

Keywords Isopod · Parasite · Whitefin wolf-herring · Infestation

Introduction

Fish parasites and diseases constitute one of the most important problems confronting the fishery biologist today. Fish parasites divide into two major groups which are protozoan and metazoan (Lasee 1995; Tonguthai 1997; Durborow 2003), the metazoan parasites contain Myxozoa, Platyhelminthes, Nematoda, Acanthocephala, Annelida, Arthropoda and Mollusca. Crustaceans are a very large group of arthropod and crustacean ectoparasites on fishes are diverse. Cymothoidae (Crustacea, Isopoda) are ectoparasitic isopods that are usually found on marine, brackish and freshwater fishes. These isopods cause varying degrees

of damage in their hosts, ranging from minor tissue damage at the site of attachment to differential mortality (Adlard 1989). They are often attached to the body or settled inside gill chambers, buccal cavity or body pouches (Brusca 1981; Trilles 1994; Lester and Roubal 1995; Cassier et al. 1998). They are protandric hermaphrodites and blood-feeding parasite. Their life cycle involves only one host (Trilles 1994). The parasitic infestation reduce the quality of the fishes, hence the present study made on the prevalence of isopod *Nerocila phaiopleura* infestation on *Chirocentru nudus* were illustrated.

Material method

The fishes were collected from Cuddalore landing center (11° 42 N; 79° 46 E), which is located in Tamil nadu, southeast coast of India. The total length and weight of the fishes were measured and examined for the isopod infestation, site of attachment, orientation of parasites on the host and the numbers of parasites in each fish were recorded. The isopod parasite were removed and preserved in 5 % formaldehyde. The specimens were washed thoroughly in saline solution to check the secondary infection. The homogenate sample was examined for total heterotrophic bacteria using pour plate method in Zobell marine agar.

Result and discussion

The parasitic infestation of fishes mainly depends upon the host factors such as age, size, sex, maturity, stage, behavior, feeding and breeding, lifecycle, physico-chemical and particularly environment parameters. Many fish species are infested by isopods. Cymothoid isopods have been studied

K. Raja · R. Vijayakumar · V. Karthikeyan · A. Saravanakumar ·
K. Sindhuja · A. Gopalakrishnan (✉)
Center of Advanced Study in Marine Biology, Annamalai
University, Parangipettai, Tamilnadu, India
e-mail: aquagopal@gmail.com

for many years. They are found in various parts of the fish body, including internal organs, gills even in fins. These parasites can cause the damage in gill, eye and internal organ including swim bladder.

The marine fish *C. nudus* was collected from Cuddalore landing center (11° 42' N; 79° 46' E), which is located in Tamil nadu, southeast coast of India. Total 1,528 fishes were examined for the parasitic infestation, in that 47 were infested with isopod, higher prevalence of 6.3 % was observed during pre-monsoon 2010 and lower infestation 1.1 % during post monsoon 2010 and the average mean intensity was 2.4. Higher intensity was 3.2 reported during monsoon 2010 and lower 1.5 during post-monsoon 2010 (Table 1). Length and weight of the fishes varied from 45

to 63 cm and 180 to 240 g respectively. The highest infestation was 4 isopod collected from single host, but 7 wound patch occur between anal to caudal fin, making deep wound by eating the host muscle around the attachment and offers secondary infection (Fig. 1) which leads to poor fish quality. Similarly Rameshkumar and Ravichandran (2010) reported that first time observation of *Nerocila phaeopleura* on *Rastrelliger kanagurta* with 6.4 % of prevalence from Parangipettai coastal environment. *Nerocila orbignyi* first time reported in *Solea solea* (Teleostei, Soleidae), collected from the Pazar coast, Black Sea, Turkey (Kayis and Ceylan 2011).

The wound sample was collected and homogenized for estimation of total heterotrophic bacteria (THB) using

Table 1 Prevalence and mean intensity of isopod (*Nerocila phaeopleura*) infestation on *Chirocentrus nudus* during 2010–2011 from Cuddalore, Southeast coast of India

Season	No. of fish examined	No. of infested	Prevalence (%)	No. of parasite	Mean intensity
Post monsoon 2010	189	2	1.1	3	1.5
Summer	212	7	3.3	15	2.1
Pre monsoon	176	11	6.3	27	2.5
Monsoon	183	5	2.7	16	3.2
Post monsoon 2011	192	3	1.6	5	1.7
Summer	177	6	3.4	16	2.7
Pre monsoon	212	9	4.2	23	2.6
Monsoon	187	4	2.1	7	1.8
Total	1,528	47	3.1	112	2.4



Fig. 1 *C. nudus* infested with isopod (a), arrow showing the wound (b) and *Nerocila phaeopleura* (c)

Zobell marine agar. The total heterotrophic bacteria were 9×10^{-4} CFU/g. Two different colonies were streaked on fresh Zobell marine agar for pure culture and identified as *Streptococcus aureus* and *E. coli* based on the standard biochemical test, *S. aureus* is mostly presented in the wound and pus. Ravichandran et al. (2001) reported same isopod species *N. phaiopleura* infection in *Chirocentrus dorab* from Parangipettai coast, *Vibrio parahaemolyticus* and *Vibrio anguillarum* were isolated from the wound lesion.

The parasitic attachment on the integument and the muscles, lesions initially superficial and it may lead to secondary reactions such as other parasites actions and microbial infection (Pavanelli et al. 1998). Isopods make frequent shifts in position on the host causing a serious wound. The activities also stimulate mucus secretion, epidermal proliferation and dilation of dermal capillaries. Due to increased mucus secretion, there are signs of inflammation in the dermis beneath the wound. The digestive secretion of the parasite apparently causes significant damage to the host's tissues (Ravi and Rajkumar 2007). Recently isopod infestation in fishes was reported by Gopalakrishnan et al. (2010) double parasite isopod (*Mothocya plagulophora*) and copepod (*Lernaenicus hemirhamphi*) from *H. far* and Saravanakumar et al. (2012) reported *Nerocila serra* infestation in sea snake. Our finding represents first observation of *N. phaiopleura* infestation on Whitefin wolf-herring (*C. nudus*).

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