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Distribution Extension and New Host Record: *Mothocya renardi* parasitizing *Scomberoides commersonnianus* from Dholai Fishing Harbour, Northwest Coast of India

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ABSTRACT: Isopod infestations inflict substantial losses on fish populations, causing harm ranging from adult mortality and stunted juvenile growth to the premature death of young fish. Among isopods, the Cymothoidae family stands out as the most parasitic on marine fish, with all its species being obligate parasites. This study reports the prevalence of *Mothocya renardi* infestations in *Scomberoides commersonnianus* from Dholai fishing harbour, Gujarat, on the northwest coast of India. Samples collected from the harbour revealed the presence of *M. renardi* ectoparasites, primarily located ventral to the gill filaments and within the buccal cavity of the host fish. Previous studies have reported the species from Needlefishes, this is the first report from Talang Queenfish (*S. commersonnianus*) from Dholai Fishing Harbour, northwest coast of India.

Keywords: *Mothocya renardi*, Talang queenfish, Dholai Fishing Harbour, Parasitic infestations.

INTRODUCTION

Parasites pose great problems for marine ichthyofauna. Among marine fish parasites, nearly 25% are crustaceans, mainly represented by copepods, brachiura, and isopods (Pavanelli *et al.,* 2002). The larval phase of marine isopods plays an important role in the food web, in particular in removing decaying material from natural or altered environments (Del *et al.,* 2001).

Isopod parasites occur in marine, estuarine, and freshwater habitats, especially in the near-shore coastal environment (Sullivan & Stimmelmayr 2008). They occur on a fish host on the outer body or fins, in the mouth, gill chambers, or nostrils, or occasionally in self-made pockets in the flesh of their hosts (Hoffman, 2020).

Fish population losses due to isopod infestations are significant. These parasites harm fish in various ways, from killing adults and stunting juvenile growth to even causing the death of young fish before they mature Isopod crustaceans are the most common external parasites of fish. Their large size, distinct body features, and presence on the fish's outer body make them easy to identify (Thatcher, 2000). Among isopods, the Cymothoidae family holds the title of being the most parasitic on marine fish. Unlike other isopod families, all 358 species within 43 genera of Cymothoidae are obligate parasites, meaning they cannot survive or reproduce without their fish hosts. Several species of Cymothoidae are known to infest carangid fish, common parasite includes *Neoherreria carangura* (external surface), *Cymothoa exigua* (buccal cavity), *Anilocra leptostylis* (common brachial parasite) (Smit *et al.,* 2014 ; Ribeiro *et al*., 2021).

The prevalence of *Mothocya renardi* Infestations in marine fish has been studied on the east and west coasts of India. Research on the east coast includes work by Ravichandran *et al.* (2016); Mohapatra *et al.* (2021), while Panakkool *et al*. (2016) have investigated infestations on the west coast in the Malabar region. The present study was carried out to report the prevalence of *Mothocya renardi* from *Dholai fishing harbour*, Gujarat, northwest coast of India.

MATERIALS AND METHODS

Samples were collected from Dholai fishing harbor (20° 43.8' N, 72° 53.4' E), where a gill ectoparasite was retrieved from specimens of *Scomberoides commersonnianus*. Upon collection, the specimens were transported to the College of Fisheries Science, Navsari, for further analysis. Morphometric characters of host and parasite were recorded and linear correlation was applied. The ectoparasite was identified using the standard key provided by Bruce (1986), while the fish specimens were identified using the FAO species identification sheet (Fischer, 1984). All samples underwent photographic documentation for further reference and analysis. While the gill parasite was stored in a solution of 70% alcohol, the fish samples were kept in a 10% formalin solution. The samples were submitted to the aquatic biodiversity museum (Accession No:A 6.1.6.1).

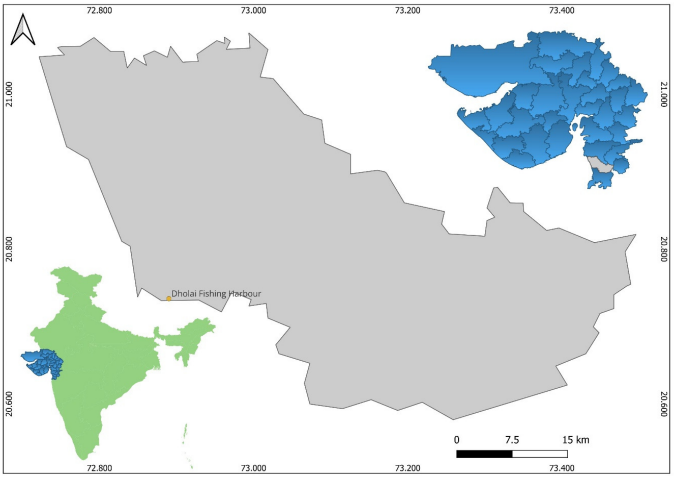

Fig. 1. Study Location.

RESULT AND DISCUSSION

Examination of the *S. commersonnianus* specimen revealed the presence of the gill ectoparasite *M. renardi*. Upon lifting the operculum, the parasite was observed positioned ventral (below) to the gill filaments, on both the left and right sides of the brachial cavity. This bilateral (present on both sides) positioning is consistent with the parasite's attachment strategy, allowing it to access the host blood flow through the gill filaments for nourishment. Additionally, due to the larger size of the female parasite, it was directly visible within the buccal cavity (mouth) of the host fish. Both the parasites were attached to the host via pereons to the host tissue, and the male was positioned upside down in the left cavity.

For the parasite identification, a total of 13 morphometric characters were recorded for identification (Table 1). The male specimens measured 22 mm in length and weighed 0.4 g, while the female specimens measured 30 mm in length and weighed 2.8 g. The cephalon's width exceeds its length, and the first pereonite is crescent-shaped to accommodate the cephalon. The eyes are positioned on the front lateral side of the cephalon, small in size, measuring about one-third of the cephalon's width. The width of the pereonite increases from Pereonite 1 to Pereonite 3, with the body being widest at Pereonite 3. However, from Pereonite 4 to Pereonite 7, the width gradually decreases. Pereopods lack spines, primarily relying on attachment to the host. Among all the pereopods, the first pereopod is the shortest, while the seventh pereopod is the longest. The Pleotelson expands horizontally, with a width 1.2 times its length.

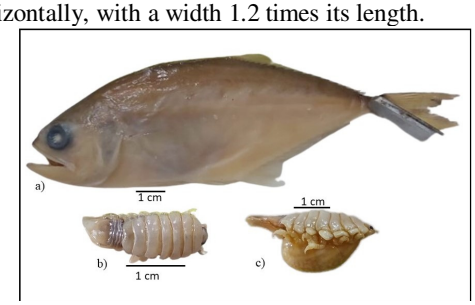

Fig. 2: (a) Host *Scomberoides commersonnianus* (b) *Mothocya renardi* male (c) *M. renardi* female.

Table 1: Morphometric parameters of *Mothocya renardi*.

Parameters	Female	Male
	% TL	% TL
Total Length	100.00	100.00
Width	40.00	40.91
Cephalon	6.67	9.09
Eye Diameter	3.33	4.55
Pereonite 1	16.67	18.18
Pereonite 2	30.00	31.82
Pereonite 3	40.00	40.91
Pereonite 4	40.00	40.91
Pereonite 5	33.33	36.36
Pereonite 6	30.00	22.73
Pereonite 7	26.67	27.27
Pleotelson width	36.67	36.36
Pleotelson length	30.00	27.27

Coloration: In fresh specimens, females are uniformly colored, white colored dorsally and ventrally. Males have a dark pigmentation running along the median line of pereonite and pleonite.

Host: The length of the host species was 232 mm, a total of 15 morphometric and 7 meristic characters were recorded in Table 2.

Species Description: Dorsal profile of head convex. Snout blunt, upper lip is attached to snout at the center by frenum. The upper jaw extends well beyond the eye. Shallow grove present on dorsal mid-profile. Both dorsal fins are separated, first dorsal fin solely consists of spines that are depressible and fit well in the grove on the midline. There are 10 small semidetached finlets followed by the second dorsal fin. The anal fin has two detached spines, and 10 semidetached ventral finlets present after the anal fin.

Table 2: Morphometric parameters of *Scomberoides commersonnianus.*

Sr. No.	Parameter	% TL
1.	Total length	100.00
2.	Standard length	80.60
3.	Fork length	88.36
4.	Pre-dorsal length	25.43
5.	pre-pelvic length	20.69
6.	Pre-anal length	18.53
7.	Head length	31.90
8.	pre-orbital length	18.10
9.	Body depth	3.45
10.	Body depth at anus	3.88
11.	Snout	10.34
12.	Caudal peduncle height	27.59
13.	Caudal peduncle width	27.59
14.	Pectoral fin base	3.02
15.	Sub-orbital depth	1.29

Coloration: Head and body green to bluish dorsally and grey to silvery below. About 5-8 large blotches are present near the lateral line. The dorsal and anal fins are dark.

During a routine observation on ichthyofaunal diversity of Dholai fishing harbor a species of *Scomberoides commersonnianus* was noticed with *Mothocya renardi* attached to it. The specimen had a pair of male and female attached to its brachial cavity. The female being larger in size was able to reach its buccal cavity, resulting in less food ingestion, which leads to loss of appetite, resulting in weight loss, and eventual death of the host. It can be assumed that due to the effects of the parasite, the effects on host species were as follows: the damage was done to the walls of brachial chambers, where the parasite was attached through the use of its pereons. The gill filaments were damaged, resulting in hypoxia and lethargy which led to other infestations. Various studies have been carried out about the prevalence of *Mothocya renardi* from the Bay of Bengal to the RedSea. Previous research suggests *Strongylura leiura* is the most common host for *Mothocya renardi*, with *Strongylura strongylura* and *Tylosurus crocodilus* being less frequent hosts. However, other studies have found infestations in a wider range of fish families, including Carangidae (*Alepes melanoptera*, *Caranx hippos*, *Parastromateus niger*), Stromateidae (*Pampus argenteus*), and Serranidae (*Epinephelus coioides*) (Purivirojkul & Songsuk 2020). These studies typically reported isopods located within the mouth of the host (Panakkool *et al*., 2016). This report is the first to document *Mothocya renardi* infesting a carangid fish, specifically *Scomberoides commersonnianus*, from the Dholai fishing harbor in northwest India.

CONCLUSIONS

In conclusion, the observation of *Mothocya renardi* infesting a *Scomberoides commersonnianus* at the Dholai fishing harbor in northwest India highlights a new host-parasite relationship within the region. While previous studies primarily focused on *Mothocya renardi* infestations in other host species, particularly *Strongylura leiura*, this report expands our understanding by documenting infestation in a carangid fish species. Further research is needed to elucidate the prevalence and impact of *Mothocya renardi* across different fish families and geographical regions.

FUTURE SCOPE

The discovery of *Mothocya renardi* infesting a *Scomberoides commersonnianus* at the Dholai fishing harbor opens up numerous avenues for future research and exploration. These include investigating the dynamics of the host-parasite relationship and delving into factors influencing infestation rates, parasite distribution, and their impacts on host health and population dynamics. Additionally, broader surveys should be conducted to evaluate the geographical distribution of *Mothocya renardi* and its host range across various fishing harbors, coastal areas, and marine environments, both within India and neighboring regions.

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Conflict of Interest. None.

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