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Research Article

FIVE MARINE FISH HOST AND PARASITIC ISOPODS GENERA(CYMOTHOIDAE) NEW DISTRIBUTIONAL RECORD FROM THE CHENNAI COAST, SOUTHEAST INDIA

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ABSTRACT

The study was conducted along the Chennai coast from March2025 to August 2025 and examined 850 marine fish specimens representing 6 species, and 365 fish were found to be infested with parasitic isopods. They are totalling 250 individuals of 6 cymothoid species. The species identified are *Mothocya plagulophora* (Haller, 1880), *Mothocya collettei* (Bruse, 1986), *Nerocila sigani* (Bowman & Tareen, 1983), *Catoessa boscii* (Bleeker,1857), *Joryma sawayah* (Bowman & Tareen, 1983), and *Norileca indica* (H. Milne Edwards, 1840). Among these, *Norileca indica* exhibited the highest prevalence, parasitizing species such as *Rastrelliger kanagurta* and *Selar crumenophthalmus*. This study shows the variety and specific hosts of cymothoid isopods along the Chennai coast, providing important information for understanding marine parasite in Indian waters.

Keywords: Cymothoidae, Chennai Coast, *Selar crumenophthalmus*, *Rastrelliger kanagurta*, *Hemiramphus far.*

INTRODUCTION

A fish parasitic isopod is a parasitic crustacean that lives on or inside a fish. It is typically feeding on blood or tissues. This type of parasitic isopods are often blood-feeding ectoparasites, that meaning they are live on the surface on the fish host. Some species like, Cymothoidae family, are even known for their unique attachment to a fish's tongs and gill chamber, where they replace the tongue with their own body. The characteristic of parasitic isopod like, all have rigid segmented exoskeletons, two pairs of antennae, seven pairs of jointed limbs on the thorax, and five pairs of branchial appendages on the abdomen that are used in respiration. The females brood their young in a under their thorax called marsupium. Chennai is capital of Tamil Nadu an important coastal and mega polytan city of India, (Packialakshmi *et al.* 2015). The Chennai coastline has a length of approximately 19 kilometers (11.8 miles). This coastline is located along the Coromandel Coast. Fish-parasitic isopods of the family Cymothoidae are well known for their parasitic associations with marine fishes. Worldwide, around 10,000 isopod species have been recorded, of which approximately 3154 are marine species in 379 genera in 37 families. In India, 338 marine isopod species have been described, while in Tamil Nadu, 22 species across 15 families have been recorded. The family Cymothoidae comprises 40 genera and 383 accepted species across 25 families. parasites are commonly found in warmer seas and can inhabit various parts of their host, including the skin, gill chambers, body surface, and buccal cavity (mouth), operculum, caudal peduncle & pectoral fin. Their presence can lead to stress, tissue damage, and secondary infections in fish, affecting overall fish health and commercial yields. Chennai is situated on the northeastern edge of Tamil Nadu, along the Eastern Coastal Plains, characterized by a relatively flat terrain that gradually ascends towards the Western Ghats, (Palanisamy *et al.,*2020). The region's topography is shaped by the confluence of fluvial and marine processes, resulting in a landscape adorned with beaches, estuaries, lagoons, and coastal dunes (Figure 1). The city's geology comprises

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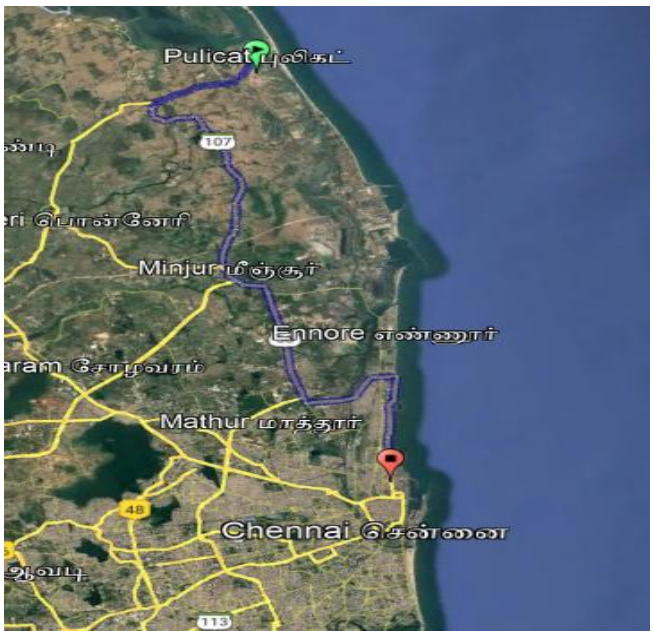
primarily clay, shale, and sandstone. Ocean pollution significantly impacts marine ecosystems, particularly affecting the health and survival of numerous fish species. Pollutants such as plastics, pesticides, heavy metals, and oil spills infiltrate aquatic environments, leading to various detrimental effects on fish health and behaviour. Diseases reported to be induced by pollution include the fin, tail rot, gill disease, hyperplasia, liver damage, neoplasia and ulceration. Several studies have shown a higher proportion of diseased fish in polluted than in unpolluted marine areas. But also, such surveys can be questioned. The overall marine capture fisheries production peaked at 82.3 million tonnes in 2015 with global per capita fish consumptions exceeding 20 kg per annum (FAO, 2016), however, everything for According to recent information, it is reported that 70% of the main stocks are overexploited or fully exploited albeit this occurs at fish consumption is also known as the amount of fish that can be consumed per person per time (Olaizola *et al.,* 2016).

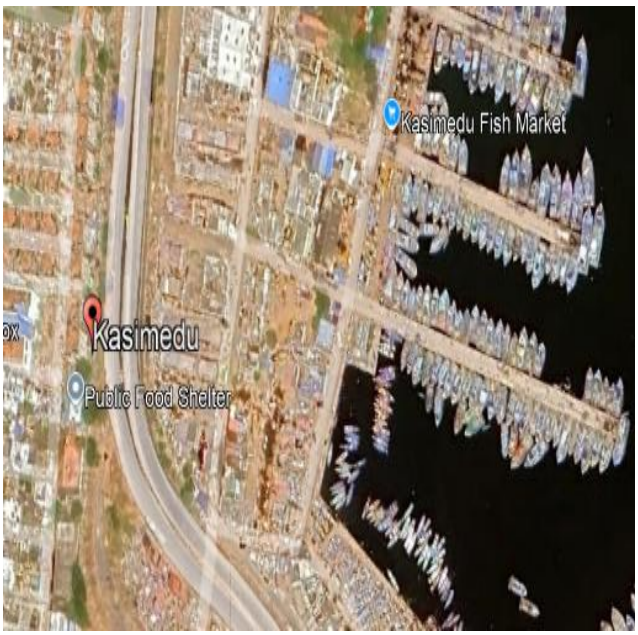
There is limited data on the overall isopod population along the Chennai coast. However, most existing reports focus on host and parasitic isopods, particularly those belonging to the family *Cymothoidae*. "Although five genera of isopods have previously been recorded from the Chennai region, they were not specifically documented along the exact Chennai coast. However, in my current study, I have recorded these genera precisely from the Chennai coastal area."

MATERIALS AND METHODS

Samples were collected from the Chennai Fish Landing Centre, India. Parasitic isopods were found attached to various regions of the fish, including the buccal cavity, skin, body surface, caudal peduncle, and gill chamber. The isopods were carefully removed from the host fish and transported to the laboratory. Upon arrival, the external surfaces of the isopods were thoroughly examined for additional parasites. All samples were preserved in 70% ethanol. Measurements and photographs of both the isopods and host fish were taken prior to dissection, and the GPS coordinates of the collection site were recorded. Dissections were performed using dissecting needles and forceps. Both fish and isopods were identified to their respective taxonomic levels. The total length and weight of each specimen were recorded. Male and female isopods were observed and identified to their respective parasitic species.



Study areas **Figure 1**



Study areas **Figure 2**

RESULTS AND DISCUSSION

The present study reports the occurrence of six fish species belonging to five genera that were examined for parasitic isopods. A total of 585 parasitic isopods, representing six species from the family Cymothoidae, were identified. These isopods were reported along the Chennai coast and belonged to five different genera; each associated with different fish hosts. Among the affected fish species, *Rastrelliger kanagurta* (Figure15), *Selar crumenophthalmus* (Figure 13) and *Sardinella longiceps* (Figure 11) were the most commonly infected. Five parasitic isopod species were predominantly found infecting the fish hosts: *Mothocya plagulophora, Mothocya collettei, Nerocila sigani, Norileca indica, Catoessa boscii* and *Joryma sawayah. In particular Catoessa boscii* was

found parasitizing the fish species Ilisha melastoma (Figure -12). Finally, I have collected the 130 quantities of fish parasitic isopods that are reported in the papers.

Systematics

Order: Isopoda

Family: Cymothoidae

Genus: *Mathocya*

***Mothocya plagulophora*(Haller, 1880)**

1880, *Lironeca plagulophora*, Haller,1880. Archiv fur Naturgeschichte. 46(1): 375 -395

Material Examined

Nainarkuppam,Tamil Nadu,India, 12.874903° N 80.251219° E, 9exs,10.Vii.2025, Coll A. Maria Monisa, Reg.No IS.802.

Description

The parasites consist of large, wide peleons (abdominal segments) and pleotelsons (tails) and a distinctive color pattern of dark bands along the pereonite and pleonite posterior margins. Ovigerous (egg-carrying) females range from 1.7 to 2.6 cm in length, and non-ovigerous females are between 1.7 and 2.5 cm. The males typically range from 1.2 to 1.4 cm. This parasite particularly attached to the fish *Hemiramphus far*. It is found in the marine environment and is normally attached to the gills of its host fish.

Distribution

Chennai of India, Nainarkuppam

Elsewhere

Indo – west pacific, Indonesia, Australia (Great Berrier Reef), Sri Lanka.

Remarks

Mothocya plagulophora(Figure 7) is an isopod species that is a parasite of the fish *Hemiramphus far*. It is known for its large, wide pleon (abdominal segments) and pleotelson (tail) and a distinctive color pattern of dark bands along the pereonite and pleonite posterior margins.

1. ***NORILECA INDICA*** **(MALE)**

Figure 4. *Norileca indica* (male) Dorsal view

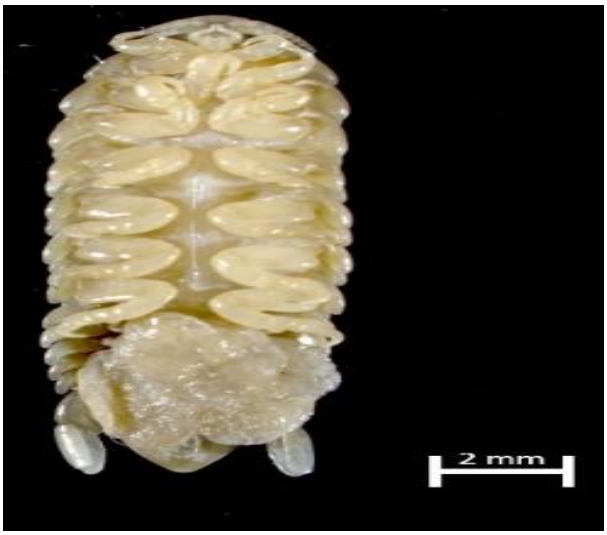


Figure 4. *Norileca indica* (male) Ventral view

***NORILECA INDICA* (FEMALE)** (Figure 5)

Figure 5. *Norileca indica* (Female)- Dorsal view

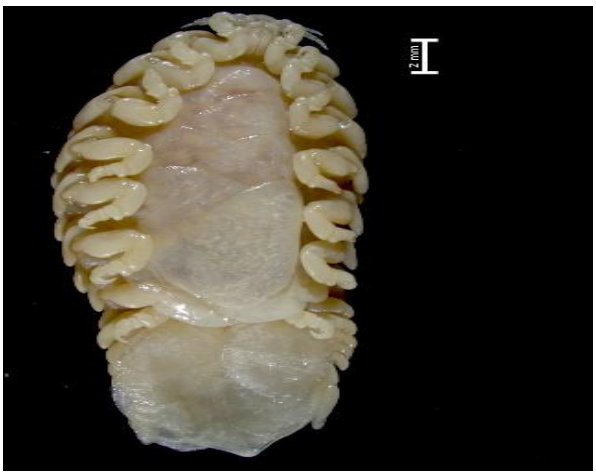
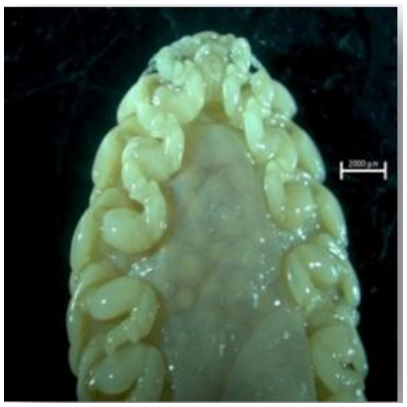


Figure 5. *Norileca indica* (Female)- Ventral view

Cephalon



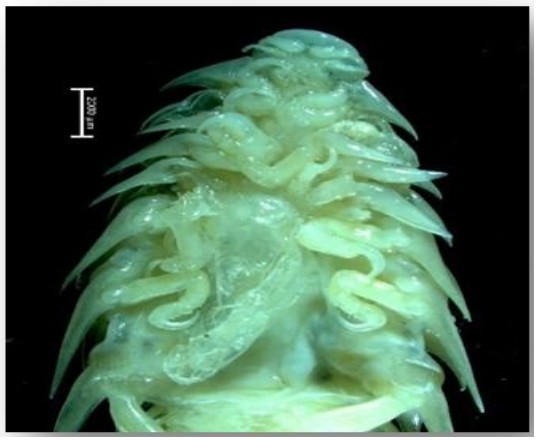
Brood- pouch

Uropod

2. *NEROCILA SIGANI* (FEMALE) (Figure 6)

Dorsal view

Ventral view

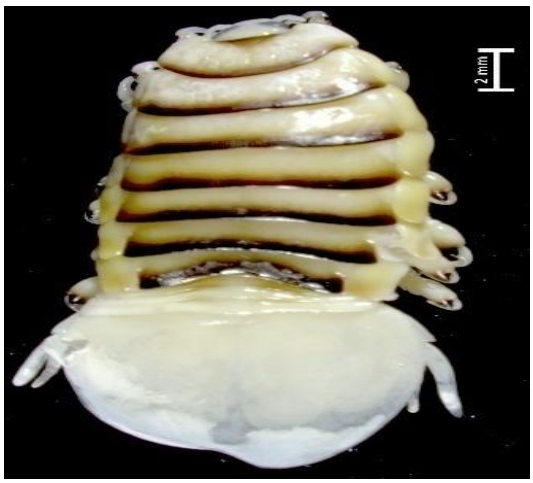


Cephalon

Uropod: Exopod

Ventral side uropod

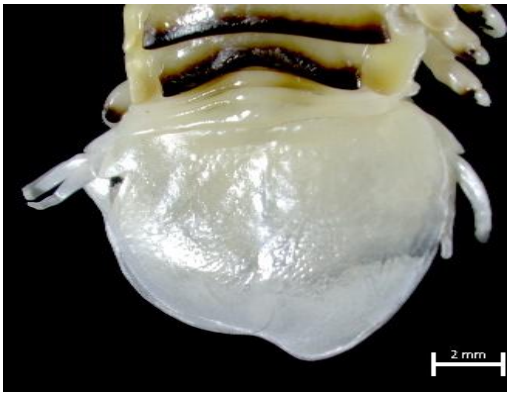
3. *MOTHOCYA PALGULOPHORA* (FEMALE) (Figure 7)



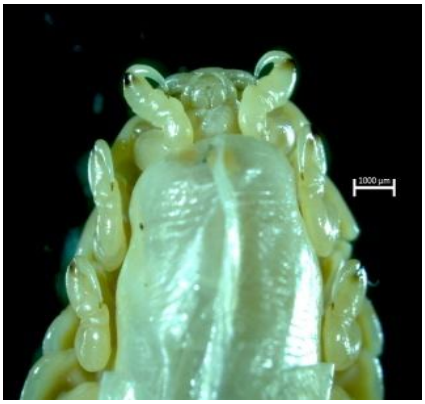
Dorsal view

Ventral view

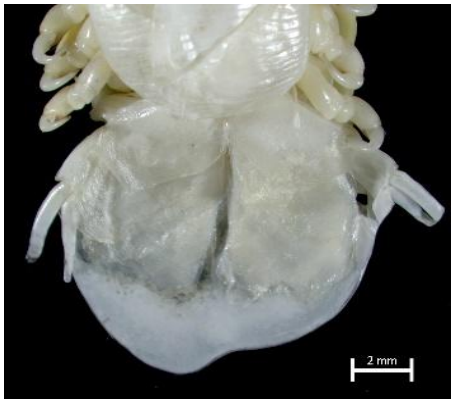
Eye part



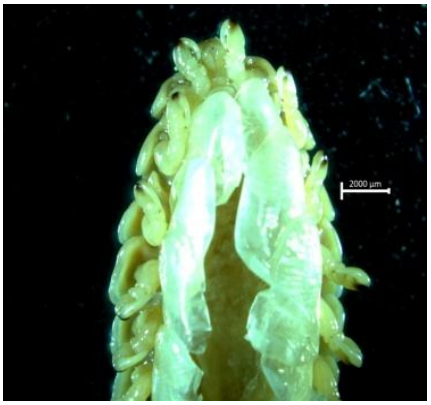
pleopods segment



Ventral cephalon



Uropod

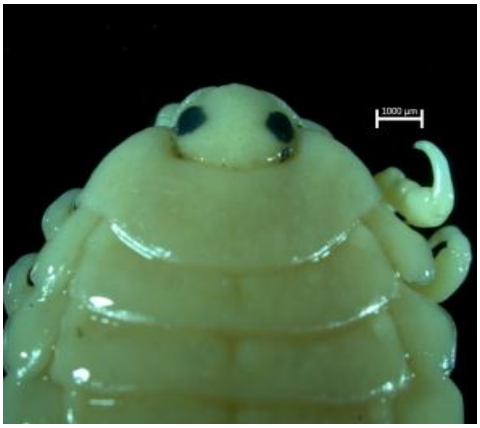


Brood-pouch

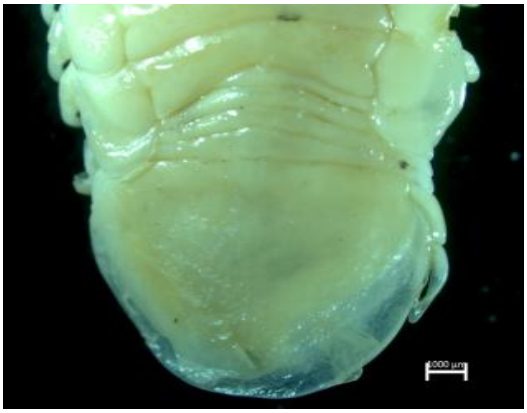
4. *MOTHOCYA COLLETTEI* (FEMALE) (Figure 8)

Dorsal view

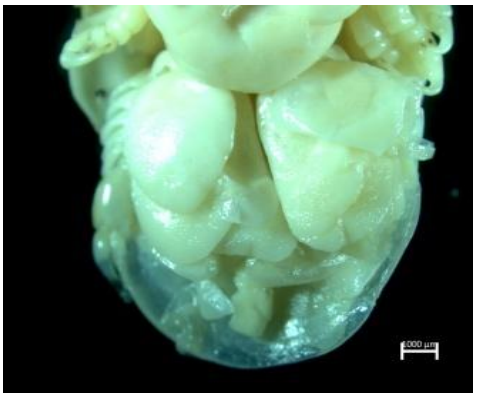
Ventral view



Cephalon



Uropod



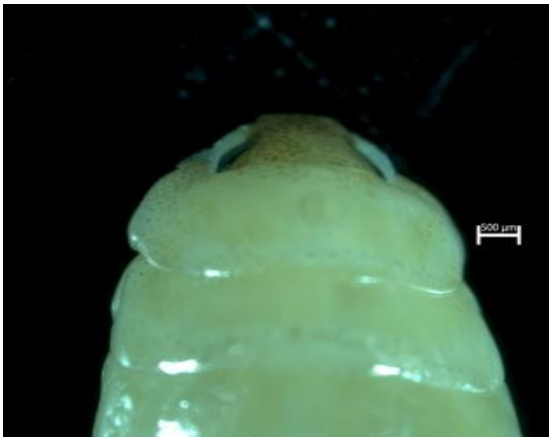
Ventral uropod

Brood-pouch

5. *CATOESSA BOSCII* (FAMALE) (Figure 9)

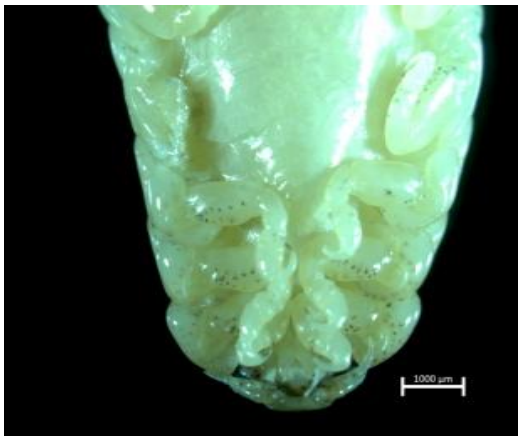
Dorsal view

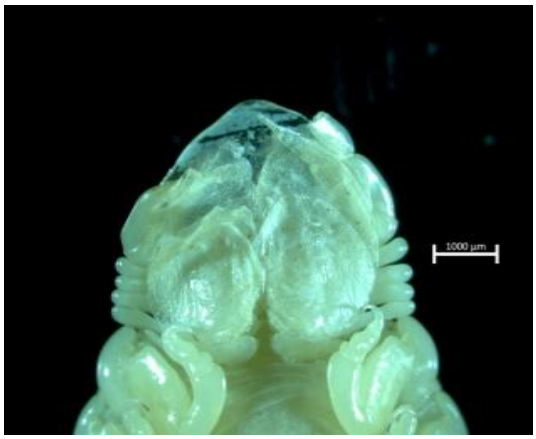
Ventral view



Cephalon

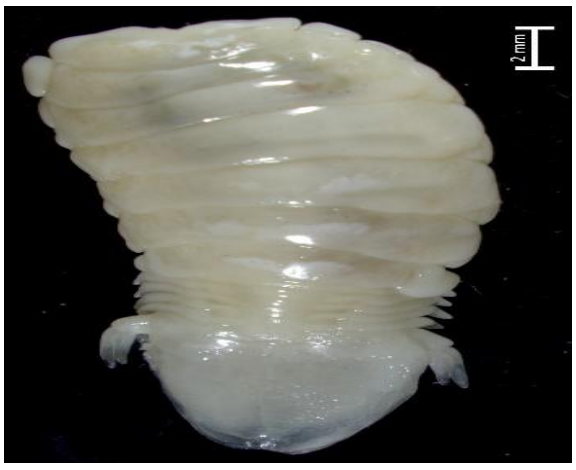
Paratype female



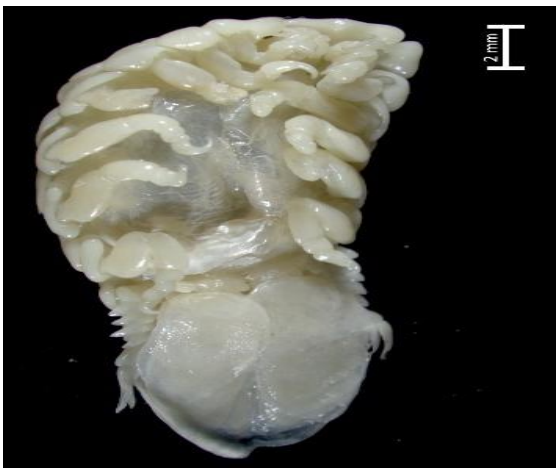


Uropod

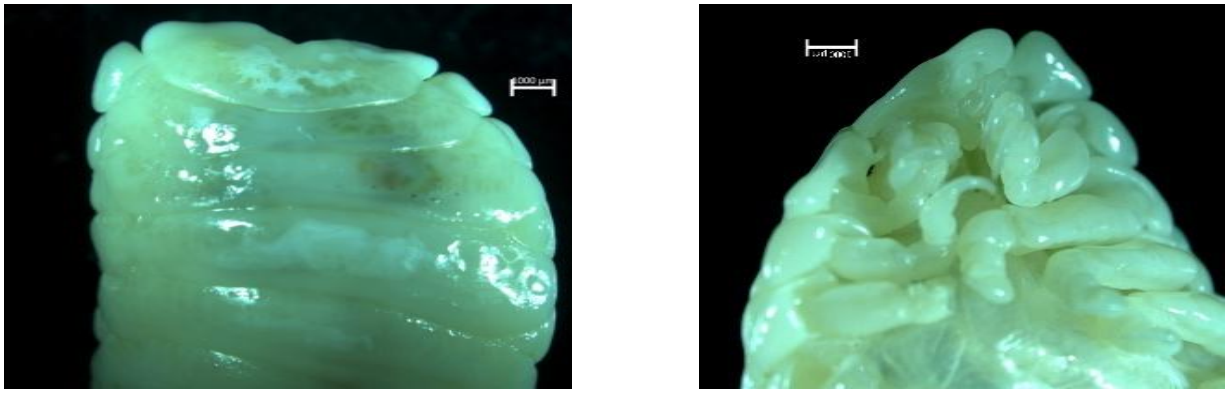
6. *JORYMA SAWAYAH*(FEMALE) (Figure 10)



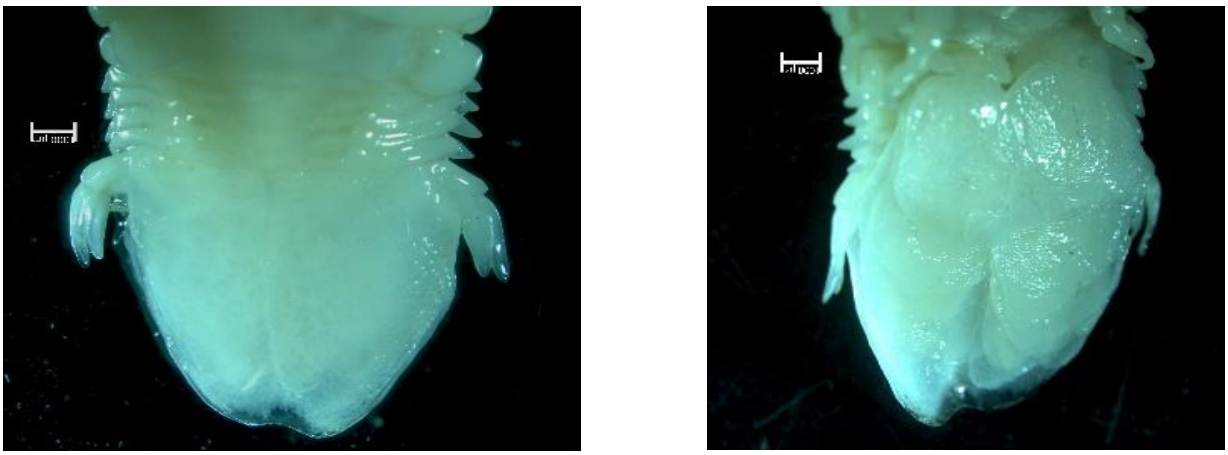
Dorsal view



Ventral view



Cephalon



Uropod

Parasitic isopods attached to the fish host

Figure 14.*Sardinella longiceps*(Soodai)

Figure13. *Ilisha melastoma*

Figure 14. *Hemiramphus far* (Mural)

Figure 15. *Selar crumenophthalmus*

Figure16. Kasimedu Fishing Area

Figure 17. Kasimedu Fishing Area

Figure 18. Palaverkadu Fishing Area

Figure 19. Palaverkadu Fishing Area

***Mothocya collettei* (Bruse, 1986)**

1986, *Mothocya costa* (Bruse,1986). Journal of Natural History.20(5):1089 – 1192.

Material Examined

Kasimedu,Tamil Nadu,India, 13.172396° N 80.198128° E, 2 exs,10.Vii.2025, Coll A. Maria Monisa, Reg.No IS.803.

Description

It is weakly twisted body and appears relatively straight compared to some other Mothocya species. This type of parasite commonly infests the branchial (gill chamber) of its host fish. It is specifically the Hemiromphidae families. *M. collettei* has been found in different locations, such as the East Coast of India and Japan. The body shape with the cephalon (head) is deeply recessed. Pereonite 1, the first segment of the thorax, and the brood pouch are found by four pairs of overlapping oostegites. It is infesting *Strongylura leiura*, which represents a new host record for this parasite.

Distribution

Chennai Coast of India, Kasimedu

Elsewhere

East coast of India, Japan.

Remarks

Mothocya colletti (Figure 8) isopod species to presence in the branchial cavity Specifically, the body is faintly twisted to the right, with a weakly convex dorsum and moderately large eyes. Mostly it is found in needlefish & marine fishes.

Genus: *Nerocila*

Table 1. Isopods capture from the site of attachment.

S. No	Species	No of Parasites	Host	Site of Attachment	Capture
1	*Mothocya palgulophora*	25	*Hamiramphus far*	Buccal cavity	Trawlers
2	*Mothocya collettei*	15	*Selar crumenophthalmus*	Branchial cavity	Trawlers
3	*Nerocila sigani*	13	*Rastrilliger kanagurta*	Body surface	Trawlers
4	*Norileca indica*	45	*Rastrilliger kanagurta*	Buccal cavity	Trawlers
			Selar crumenophthalmus	Body surface	Trawlers
5	*Catoessa boscii*	19	*Ilisha melastoma*	Brachial cavity	Trawlers
6	*Joryma sawayah*	13	*Ilisha melastoma*	Brachial cavity	Trawlers

Table 2. List of fish host and isopod parasites in Chennai coast.

S.No	Fish Host	Fish Parasitic Isopod	Quantity of Isopod	Locality
1	*Hemiramphus far*	*Mathocya plagulophora*(Haller,1880)	25	Nainarkuppam
2	*Ilisha melastoma*	*Mothocya collettei*(Bruse,1986)	15	Palaverkadu
3	*Selar crumenophthalmus*	*Nerocila sigani*(Bowman & Tareen,1983)	13	Kasimedu
4	*Selar crumenophthalmus* *Rastrilliger kanagurta*	*Norileca indica* (H.Milne Edwards,1840)	45	Kasimedu
5	*Ilisha melastoma*	*Catoessa boscii* (Bleeker,1857)	19	Ennore
6	*Ilisha melastoma* *Sardinella longiceps*	*Joryma sawayah Bowman* & Tareen,1983)	13	Palaverkadu
			Total - 130	

***Nerocila sigani* (Bowman & Tareen, 1983)**

1983, *Nerocila sigani* (Bowman & Tareen, 1983), Smithsonian Contributions to Zoology, 382, 1 – 30.

Material Examined

Kasimedu,Tamil Nadu,India, 13.172454° N 80.197183° E, 1 ex,10.Vii.2025, Coll A. Maria Monisa, Reg.No IS.804.

Description

It is identified by the unique body shape. These appendages, particularly the coxae, are called basal leg segments, pereonites (body segments), and pleonites (abdominal segments). *N. sigani* Parasites attached to the external surface of its fish coast. *Mothocya colletti* isopod species present in the branchial cavity Specifically, the body is faintly twisted to the right, with a weakly convex dorsum and moderately large eyes. Mostly it is found in needlefish & marine fishes. The first & fifth pleonites are the longest, while the third & fourth are subequal in length. The first & second pleonites are the widest. The uropod exopod is slender and slightly longer than the endopod. The eyes are small & distinct, and there is mainly a spine mark on the external side.

Distribution

Chennai Coast of India, Kasimedu.

Elsewhere

Kuwait, Indo-pacific region, west Indian ocean, Sri Lanka, Penang & Taiwan.

Remarks

Nerocila sigani (Figure 6) parasites body is asymmetrical and elongated, with distinct features including a broad cephalon, well-developed coxae, and a pereon that gradually widens from segments 1 to 6. The entire body is described as steel blue in color.

Genus: *Catoessa*

***Catoessaboscii* (Bleeker, 1857)**

1857, *Livoneca boscii*, (Bleeker,1857). Verhandelinger der Natuurkundige Vereeniging in Nederlandisch Indie. 2(25): 1-40,pls.1,2.

Material Examined

Palaverkadu,Tamil Nadu,India, 9.279326° N 79.205802° E, 1 ex,10.Vii.2025, Coll A. Maria Monisa, Reg.No IS.806.

Description

These parasites commonly attach in the mouth and throat of the host fishes. It is found in the *Rastrelliger kanagurta* species. Ovigerous (egg-carrying) females are 15 to 20 mm, and non-ovigerous females are 15 to 21 mm in length. It is commonly found in Scombridae families. The cephalon obtunds to a first segment of pereon when viewed dorsally. The antenna has more than 10 articles, and pereopods (walking legs) are relatively short and strongly curved. Abdominal appendages are not visible in dorsal view and halfway along the lateral margin of the pleotelson.

Distribution

Chennai Coast of India, (Palaverkadu)

Elsewhere

Indo-west Pacific, Indonesia.

Remarks

Catoessa boscii (Figure 9) parasites is elongate body shape, 2.5-3 times as long as greatest width and narrower pleon. The pleon is normally twisted pereon that gradually widens from segments 1 to 6. It is pale tan to pale brown in color.

Genus: *Joryma*

***Joryma sawayah*(Bowman & Tareen,1983)**

1983, *Joryma sawayah* (Bowman & Tareen,1983). Smithsonian Contribution to Zoology. 382: 1-30.

Material Examined

Palaverkadu,Tamil Nadu,India, 13.419525° N 80.318285° E, 1 ex,10.Vii.2025, Coll A. Maria Monisa, Reg.No IS.805.

Description

It is identified several morphological characters, including exposed cephalon, bilobed pereonite 1 expansion, inflated coxae of pereonites 2 & 3, and unequal uropod rami. The body is asymmetrical, oblong, dorso-ventrally flattened, and curved to the left side. The cephalon (head) is not visible dorsally as it is immersed in the first pereonite 1. Body color is described as whitish with a slight greenish tinge on the dorsal side. This type of parasite is commonly found in the branchial cavities (gills) of various fish species. It is attached to the Illisha melastoma fish host. The ovigerous (egg-carrying) females are 15 to 19 mm in length, and non-ovigerous ones are slightly smaller, at 12 to 16 mm. The males are normally smaller than the females, 12 mm in length.

Distribution

Chennai Coast of India, (Palaverkadu)

Elsewhere

Kuwait, Doha, Island of Faylaka

Remarks

Joryma sawayah (Figure 10) parasitic isopod species, the body is asymmetrical, oblong, dorso-ventrally flattened, and curved to the left side. The cephalon (head) is not visible dorsally as it is immersed in the first pereonite 1. Body colour is described as whitish with a slight greenish tinge on the dorsal side.

Genus: *Norileca*

***Norileca indica* (H. Milne Edwards,1840)**

1840, *Livoneca indica* (H. Milne Edwards,1840). Histoire Natural des Crustaces.1-32, pls-1-42.

Material Examined

Kasimedu,Tamil Nadu,India, 13.1724454° N 80.197183° E, 10 exs,10.Vii.2025, Coll A. Maria Monisa, Reg.No IS.807.

Description

This is distinctive and asymmetrical body that is twisted. The cephalon (head) is triangular with a rounded apex. The pleon (abdomen) is composed of five segments. The pleotelson is roughly as long as it is wide. Then commonly found in the branchial cavities of different fish coasts. The body twisted right or left, a character identified as female, and the male body is straight. The body surface is smooth & polished. The eyes are large, oval, and have distinct margins. Egg-carrying females are 19 to 33 mm, and non-ovigerous females are 14 to 20.1 mm. The male parasites are 11 to 14 mm.

Distribution

Chennai Coast of India, (Kavankarai)

Elsewhere

Philippines, Indonesia(sunatra), New Guinea,Mozombique&Madadagascar

Remarks

Norileca indica (Figure 5) isopod species, commonly found in the gills of various fish species, particularly in tropical regions. It is elongate and twisted to one side, with the cephalon (head) being as long as wide. The distinct pleonites (abdominal segments), and a triangular pleotelson. *Norileca indica* (Figure 5) is generally creamy-white in color. The ventral area is usually light brown, and the pereopods are white. This study reports the first record of parasitic isopod infestation in marine fishes along the Chennai coast, India, along the Bay of Bengal. It marks the first documentation of five different isopod genera infecting various host species and different landing centers on the Chennai Coast, including Kasimedu (Figure-16), Palaverkadu (Figure-17), Nainarkuppam near Kovalam, and Ennore Landing Center (Table-1). I have found in trawler catching fishes. I have collected directly and bought a lot of fish in the field**.** The species include Norileca indica (H. Milne Edwards, 1840) (Figure-5), Nerocila sigani (Bowman & Tareen, 1983) (Figure-6).*Mothocya plagulophora* (Haller, 1880) (Figure 7), *Mothocya colletti* (Bruse, 1986) (Figure 8), *Catoessa boscii*(Bleeker,1857)(Figure-9), and *Jorymasawayah* (Bowman & Tareen, 1983) (Figure 8).

Fish larvae, juveniles, or adults can be infected by parasites, although relatively little is known about the negative impact of parasites on the growth and condition of fish larvae (Palacios Fuentes *et al.,* 2012). Mouth-living parasites have overcome by becoming firmly attached to the host tissue. The damage to the gills is caused by isopods dwelling in the branchial chamber by attachment and feeding, and the extent of the damage is a function of both the size of the parasite and the time settled. Erosion of gill lamellae, damage of gill rakers, and pale gills were the severe gross lesions observed as a consequence of isopod infestation. The pale color of the gills of infested fish indicated anemia, which may be due to loss of blood, the obstruction of branchial circulation by the attachment of parasites, and the homophagous nature of the branchial cymothoids (Romestand, 1979).

CONCLUSION

This study focuses on the fish parasitic isopod records from the Chennai Coast, Southeast India. The study reports five genera of parasitic isopods on the Chennai Coast, attaching to the five fish hosts as specimens. Different types of hosts and isopods are present in the marine water. This study shows the variety and specific hosts of cymothoid isopods along the Chennai coast, providing important information for understanding marine parasites in Indian waters.

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CONFLICT OF INTERESTS

The authors declare no conflict of interest

ETHICS APPROVAL

Not applicable

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AI TOOL DECLARATION

The authors declares that no AI and related tools are used to write the scientific content of this manuscript.

DATA AVAILABILITY

Data will be available on request

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