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RESEARCH ARTICLE

Three new records of Triphoridae (Gastropoda) from India

Rupavath Rajendar Kumar[1,2,*], Roberto Ardovini[3], Rajappa Babu[4], Sarangan Prabakaran[1]

[1]Marine Biology Regional Centre, Zoological Survey of India, Chennai, Tamil Nadu, India.
[2]University of Madras, Chennai, Tamil Nadu, India.
[3]ITIS FERMI ROMA Technical Institute of Information Technology, Rome, Italy.
[4]Southern Regional Centre, Zoological Survey of India, Chennai, Tamil Nadu, India.
*Corresponding author: *rrajendarkumarzsi@gmail.com*

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Abstract: This paper records three triphorid species — *Coriophora fusca* (Dunker, 1860), *Coriophora granosa* (Pease, 1871), and *Mastonia rubra* (Hinds, 1843) — from Indian waters, specifically observed at Krusadai Island in the Gulf of Mannar, along the southeast coast of India. These findings contribute significantly to the understanding of the distribution and biodiversity of Triphoridae in this region, emphasizing the need for further research on these microgastropods.
Keywords: *Coriophora*, Gulf of Mannar, Krusadai Island, *Mastonia*, microgastropods.

INTRODUCTION

Triphoridae Gray, 1847 constitutes a unique group of caenogastropod molluscs primarily distinguished by their predominantly sinistral coiling, with notable exceptions such as *Metaxia* Monterosato, 1884 (Fernandes & Pimenta 2011). These marine micro snails predominantly feed on sponge material and generally exhibit sizes ranging from 2 to 10 mm in length, although certain species can exceptionally reach dimensions of 40–60 mm (Simone 2006). Triphoridae is classified into three subfamilies: Metaxiinae Marshall, 1977, Iniforinae Kosuge, 1966, and Triphorinae Gray, 1847, as indicated by Beesley et al. (1998) and Bouchet et al. (2017). Notably, species within the Metaxiinae display dextral shell coiling, whereas those in the Iniforinae and Triphorinae exhibit sinistral shell coiling.

The biogeography of triphorids at local or regional scales can only be assessed once the species-specific associations of these micro-predators to the sponges that serve as prey/hosts are better known. Triphoridae has historically received limited attention due to the scarcity of documentation and non-detailed original descriptions (Marshall 1983). Sporadic observations have associated Triphoridae with Porifera (e.g., Fretter & Graham 1982; Marshall 1994; Poppe 2008; personal observations), but this relationship remains inadequately explored. Triphoridae inhabits a wide range of marine environments, spanning from polar to equatorial seas and from intertidal to abyssal depths, with the greatest species diversity observed in tropical shallow subtidal zones (Marshall 1983). To date, the global inventory of Triphoridae encompasses more than 797 species distributed

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across 52 genera (MolluscaBase Eds. 2021). In Indian waters, specifically, 13 species belonging to six genera have been identified, with early records dating back to Adams & Reeve (1850), Hinds (1843).

MATERIAL AND METHODS

Specimens were sampled from the fringing reef at Krusadai Island, situated in the Gulf of Mannar along the southeast coast of India (Fig. 1), at a depth of 3-4 meters. Sand sediments were carefully processed through sieves with mesh sizes of 1.0 and 0.5 mm. After sieving, the sediment was transported to the laboratory for meticulous sorting of shells, under a stereomicroscope (Olympus SZX 16). The taxonomic identification of the shells was carried out based on a range of works, including Adams and Reeve (1850), Jousseaume (1884), Hervier (1898), Laseron (1958), Marshall (1983), Okutani (2000), Jay (2007), and Poppe (2008). Following identification, the specimens were formally registered and incorporated into the National Zoological Collections of the Marine Biology Regional Centre, Zoological Survey of India, Chennai (ZSI/MBRC).

TAXONOMY

Subclass Caenogastropoda Cox, 1960
Family Triphoridae Gray, 1847
Genus *Coriophora* Laseron, 1958

Coriophora granosa (Pease, 1871)
(Fig. 2A–C)

Mesophora granosa: Marshall 1983: 45, figs. 1D,G, 19E–G, table 18.
Mastonia aegle: Jay 2007: 41, fig. 56.
Mastonia aegle: Albano 2023: 61, fig. 36.

Material examined: 1 sh. (h = 3.2 mm: w = 6.1 mm) ZSI/MBRC-2973, India, Krusadai Island Gulf of Mannar, 9°14'49.94"N,79°13'22.49"E, 3–4 m depth, Rajendar Kumar coll., 21/IX/2019.
Description: Shell relatively small (h = 3.2–6.1 mm), sinistral. Teleoconch composed of eight whorls, each initially adorned with two spiral rows of nodules; third row emerging between the two initial ones from the eighth whorl onward, reaching the same size as spiral 3 on the last (ninth) whorl immediately after the protoconch; axial ribs narrow, with nodules offset between spirals 1 and 3; two weak spirals evident on the base. Outer lip of aperture flared, with a short anterior channel facing backwards; anterior siphonal canal and a posterior notch bearing a small u-shaped groove. Colour ranging from fawn to orange-brown, with lighter coloured nodules.
Distribution: Australia (Marshall 1983; Nützel 1997), China Sea (Zongguo & Mao 2012), French Polynesia (Tröndle & Boutet 2009; Boutet et al. 2020), Gulf of Aqaba (Blatterer 2019), Japan (Okutani 2000; Hasegawa et al. 2001; Chang & Wu 2005; Okutani 2017), Marshall Islands (Kay & Johnson 1987; Kosuge 1990).
Habitat: Common on reefs throughout the tropical and subtropical Western Pacific (Marshall 1983). From intertidal to abyssal depths, and from polar to equatorial seas, being particularly diverse in tropical shallow subtidal depths.

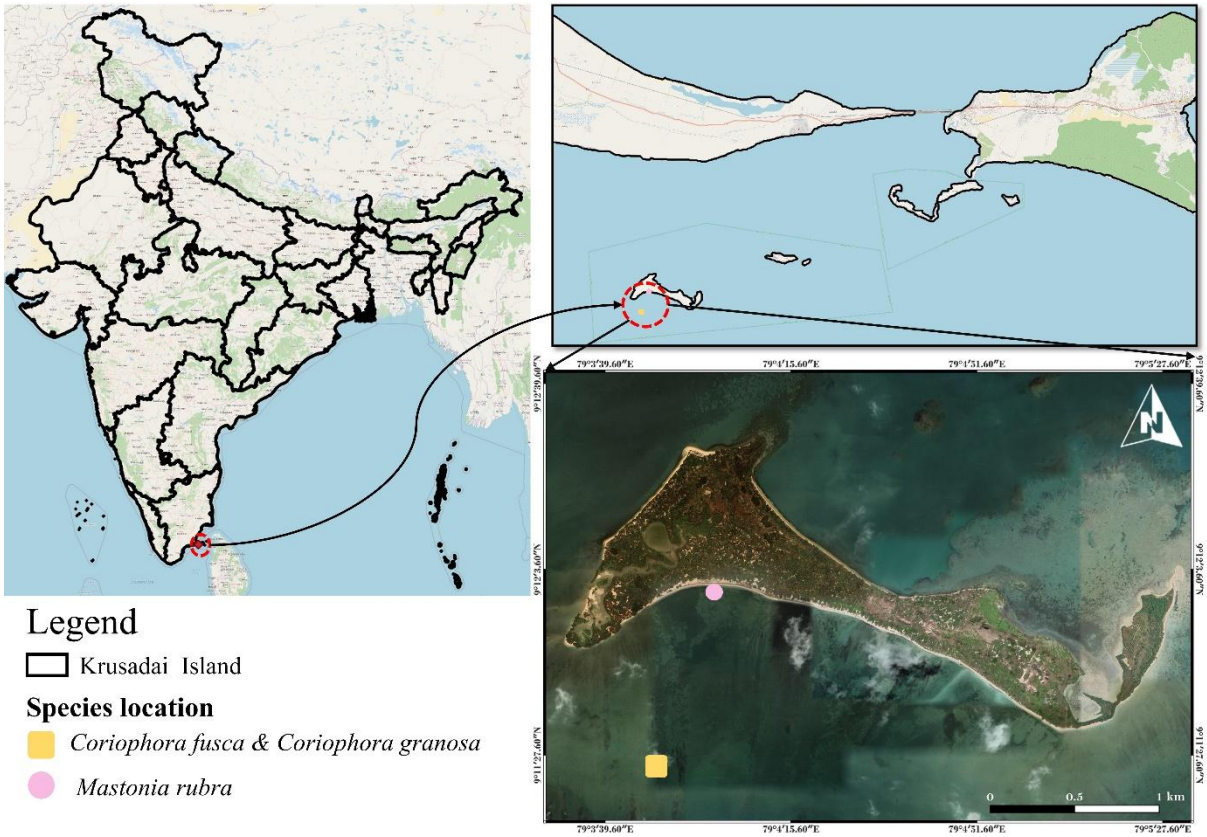

Figure 1. Geographical position of sampling stations.

Coriophora fusca (Dunker, 1860)
(Fig. 2D–F)

Mesophora fusca: Marshall 1983: 46, figs. 41, 19I–K, table 19.
Coriophora fusca: Özdikmen 2013: 254; Polhemus 2022: 6, figs. 4–5.

Material examined: 1 sh. (h = 5.6 mm; w = 12 mm) ZSI/MBRC-2974, India, Gulf of Mannar, Krusadai Island, 9°14'49.94"N,79°13'22.49"E, 2-3 m depth, Rajendar Kumar coll., 21/IX/2019.
Description: Shell sinistral. Protoconch multispiral, covered with fine, crisp, axial riblets. First and third teleoconch spirals starting immediately after the protoconch, while the second spiral begins on the 6th to 10th teleoconch whorl; axial ribs weak, numbering between 18 to 21 on penultimate teleoconch whorl; anterior siphonal canal short and upturned, while posterior canal is a U-shaped or recognizable as a triangular notch. Colour dark reddish-brown, with lighter nodules.
Distribution: Australia (Marshall 1983; Wilson 1994; Higo et al. 1999; Chang & Wu 2005; Lee et al. 2018; Chan & Lau 2020), China (Lee et al. 2018), China Sea (Chang & Wu 2005), French Polynesia (Boutet et al. 2020), Hong Kong (Chang & Wu 2005).
Habitat: Very common intertidally in the tropical West Pacific (Marshall 1983), occurs in estuaries, sometimes in the upper reaches (Lee et al. 2018).

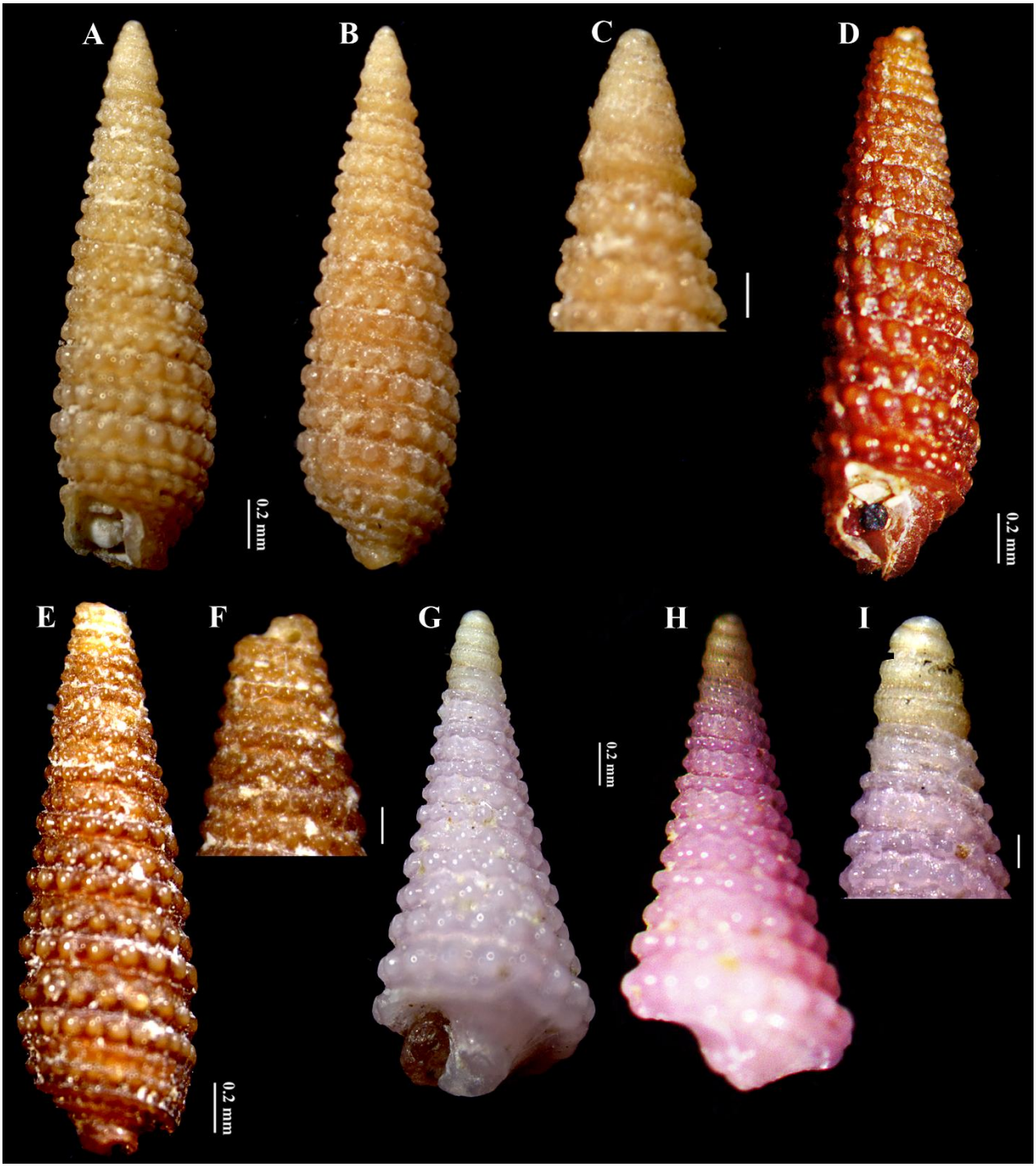

Figure 2. **A–C.** *Coriophora granosa* (ZSI/MBRC-2973); **A.** apertural view; **B.** abapertural view; **C.** protoconch detail (scale = 0.1 mm). **D–F.** *Coriophora fusca* (ZSI/MBRC-2974); **D.** apertural view; **E.** abapertural view; **F.** protoconch detail (scale = 0.1 mm). **G–I.** *Mastonia rubra* (ZSI/MBRC-2975); **G.** apertural view; **H.** abapertural view; **I.** protoconch detail (scale = 0.1 mm).

Genus *Mastonia* Hinds, 1843

Mastonia rubra (Hinds, 1843)
(Fig. 2G–I)

Triphoris ruber Hinds 1843: 19, pl. 2.

Mastonia rubra: Kosuge 1966: 306, fig. 3; Marshall 1983: 18, figs. 1C, 4J, 20B–D; Okutani 2000: 153, fig. 39.

Material examined: 1 sh. (h = 2.2 mm; w = 1.4 mm) ZSI/MBRC-2975, India, Gulf of Mannar, Krusadai Island, 9°14'49.94"N, 79°13'22.49"E, 3–4 m depth, Rajendar Kumar coll., 21/IX/2019.
Description: Shell small (h = 2.2 mm), sinistral. Protoconch multispiral, cylindrical, reddish-brown in colour, with whorls having spiral cords crossed by numerous thin axial ribs. Teleoconch with whorls slightly stout and sculptured with 3 spiral cords; body whorl sculptured with 4 spiral cords, with 5 basal cords behind the peristome bearing dense nodules that decrease in size as they approach the siphonal canal; nodules purple and rounded; aperture rounded oval; posterior canal is deep, circular, folded, and opened; suture is shallow; colour purple with a golden apex.
Distribution: Australia (Hedley 1907; Laseron 1958; Kosuge 1962; Wilson 1994; Nützel 1997; Higo et al. 1999), Australia, Christmas Island (Tomlin 1935), Australia, Cocos Islands (Wells 1994; Chang & Wu 2005), China (Hasegawa et al. 2001b), China Sea (Zongguo & Mao 2012)
Habitat: Under rocks in the intertidal zone (Lee et al. 2018).

DISCUSSION

The records of *Coriophora fusca*, *Coriophora granosa* and *Mastonia rubra* from Indian waters represent a significant addition to the known distribution of Triphoridae in this region. These records highlight the rich and previously underexplored diversity of microgastropods in the Gulf of Mannar. The identification of these species underscores the importance of detailed taxonomic studies in revealing the full extent of marine biodiversity. The ecological roles of Triphoridae, particularly their interactions with sponge communities, warrant further investigation. Continued exploration and documentation efforts are essential to uncover the full spectrum of Triphoridae species in this region.

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