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A checklist of Entoprocta from India

Tapas Chatterjee

Near Harimandir Road, Dhanbad 826001, Jharkhand, India, ORCID: 0000-0001-5532-2726

Corresponding author email: drtchatterjee@yahoo.co.in; drtchatterjee@gmail.com

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Abstract This paper compiles the entoproct species recorded from India, Altogether 7 species belong to 4 genera viz. *Barentsia* (3 species), *Loxosomatoides* (2 species), *Pedicellina* (1 species), and *Urnatella* (1 species) were reported from India. Two species viz. *Barentsia gracilis* and *Pedicellina cernua* were recorded from both east and west coast of India.

Lista gatunków należących do typu Entoprocta z Indii

Słowa kluczowe Entoprocta, Kamptozoa, bioróżnorodność, lista gatunków, Indie

Streszczenie Niniejsza praca zestawia gatunki Entoprocta zarejestrowane w Indiach. W sumie 7 gatunków należy do 4 rodzajów, a mianowicie: *Barentsia* (3 gatunki), *Loxosomatoides* (2 gatunki), *Pedicellina* (1 gatunek) i *Urnatella* (1 gatunek) zostały stwierdzone w Indiach. Dwa gatunki, mianowicie – *Barentsia gracilis* i *Pedicellina cernua* zostały zarejestrowane zarówno na wschodnim, jak i zachodnim wybrzeżu Indii.

Introduction

Entoprocts (Phylum Entoprocta Nitsche, 1870 = Kamptozoa Cori, 1929) includes solitary or colonial, sessile animals found mostly marine from intertidal to deep sea region. Some of them also known from brackish water region. About 180 species are known under this phylum (Borisanova, 2018). *Loxosomella profundorum* was found at 5222 meters depth in the Kamchatka Trench of the Northeast Pacific (Borisanova, 2015). *Urnatella gracilis* Leidy, 1851 is a freshwater entropoct and also reported from brackish water. *Loxosomatoides sirindhornae* Wood 2005 recorded from freshwater of Thailand (Wood, 2005). These animals are found on many substrata, such as stones, algae, shells and other animals (Vieira, Migotto, 2011). These animals have a body that comprises a cuplike calyx with ciliated tentacles, supported by a stalk attached on substrata by a foot or stolon.

Annandale (1908) studied entoprocts occurring in brackish water at Port Canning, West Bengal, India and created the genus *Loxosomatoides*. Later on, papers with records of entoprocts were published by Annandale (1912, 1915), Robertson (1921), Chhapgar and Sane (1966), Rao, Saraswathi and Bhavanarayana (1988) from Indian coast. Freshwater Indian entoproct was reported by Seshaiya (1944, 1947).

Venkatraman and Wafar (2005), Alfred, Das and Sanyal (1998) referred Harmer's (1915) work as work on Entoprocta from India, but Harmer (1915) in 'Siboga expidation' reported entoproct species from Malayasia, Indonesia, Singapore etc and nearby regions (Indo-Pacific Ocean) and not from India.

Present paper compiles the entoproct species recorded from India. Species lists are important because they facilitate access to all previous data about the group under study and organize future research.

Methods

The present checklist was compiled using published records. The systematic position of entropocta follows Nielsen (1964, 1989, 2010), Vieira and Migotto (2011). The genera and species within each family are arranged in an alphabetical sequence. Some localities names were changed, thus to avoid confusion in the checklist the new name of the locality is reported and the formerly known name is kept in brackets, e.g., Odisha (Orissa).

Results

Order Coloniales Emschermann, 1972
Family Barentsiidae Emscermann, 1972
Genus Barentsia Hincks, 1880
***Barentsia discreta* (Busk, 1886)**

Records from India. This species was reported from Port Canning, Muthla estuary in Gangetic delta, east coast of India on the stalk of hydroid genera *Bimeria* and *Tubularia* (Annandale, 1912, 1915). It was also reported from Visakhapatnam harbour, Bay of Bengal as a fouling community (Rao et al., 1988).

Distribution. This is cosmopolitan species with records in Pacific, Arctic, Atlantic, Mediterannean, Antarctic and Indian Ocean (Emschermann, 1993; Wasson, 1997).

Remarks. It was found on many living and non-living substrata from the intertidal zone to 500 m depth; reported from exposed and protected coasts, as well as from harbours (Wasson, 1997).

***Barentsia gracilis* (M. Sars, 1835)**

Records from India. This species was reported from Chennai (Madras) harbour, Tamil Nadu, Bay of Bengal (Annandale, 1912). It was also reported from Mumbai (Bombay) coast, Maharastra, Arabian Sea (Chhapgar, Sane, 1966). This species was also reported from Visakhapatnam harbour, Bay of Bengal as a fouling community (Rao et al., 1988).

Distribution. Eastern Atlantic, Indo-west Pacific, Indian Ocean.

Remarks. This species was recorded from both east and west coast of India (Bay of Bengal and Arabian Sea). Chatterjee et al. (2022) reported peritrich ciliate *Cothurnia* cf. *pedunculata* Dons, 1918 as epibiont on entoproct *Barentsia* sp. from Worli, Mumbai coast; needs further investigation to determine the exact nature of the *Barentsia* species.

***Barentsia ramosa* (Robertson, 1900)**

Records from India. This species was reported from Visakhapatnam harbour (Bay of Bengal) as a fouling community (Rao et al., 1988).

Distribution. North eastern Pacific (e.g., Robertson, 1900; O'Donoghues 1923, 1926; Fraser, 1932; Osburn, 1953; Ricketts, Calvin, Hedgpeth, Phillips, 1985; Wasson, 1997); Netherlands (Nielsen, 1989; Emschermann, 1994); Bay of Bengal, India (Rao et al., 1988).

Remarks. Wasson (1997) doubted and tentatively added Rao's (1988) species designated as *B. ramosa*, commented that 'it is odd that a species that is rare and limited to the surf-zone on the Pacific coast should thrive in brackish water fouling communities elsewhere in the World'.

Emschermann (1994, reported in Nielsen, 1989), found colonies resembling those of *B. ramosa* in Doel Harbor, the Netherlands collected in a fouling community in brackish water, between 1962 and 1964, but the population subsequently disappeared. Wasson (1997) also doubted about its identity and tentatively added to the synonymy for *B. ramosa*.

Genus ***Urnatella*** Leidy, 1851

***Urnatella gracilis* Leidy, 1851**

Records from India. This species was reported from Annamalainagar Tamil Nadu, South India as a new species *Urnatella indica* Seshaiya, 1947 collected among the living shells of mollusca – *Paludomus*, *Podomida*, and *Lamellidens* (Seshaiya, 1947). Several specimens were also collected from the actual habitat and many of them were kept under observation in the aquaria of the laboratory for few months (Seshaiya, 1944).

Distrbution. North America (e.g., Leidy, 1851, 1884; Prenant, Bobin, 1956; Davis, 1957; Weise, 1961; Poirrier, Johnson, 1970); Europe (eg., Damas, 1939, Bacescu, 1954; Zambriborshch, 1958; Ludemann, Kayser, 1961; Seberstyén, 1962; Lukacsovics, Pécsi, 1967; Skylarova, 1969; Pécsi, Kiss, 1969; Pécsi, Erdelics, 1970; Emsehermann, 1965a, b, 1972; Vranovsky, 1994; Vranowski, Sporka,1998; Volstal, Kundrat, Pirčová, Kubiš, 1996; d'Hondt, Morgillo, Gontier 2002); South America (eg., Bonetto, Cordiviola, 1963; Mane-Garzon, 1964; du Bois-Reymond-Marcus, 1984); Africa (Wiebach, 1965; Gugel, 1993); Asia: Japan (Ikeda, 1977; Oda, 1982), India (Seshaiya, 1947). Oda (1982) summarized the distribution of this species.

Remarks. Seshaiya (1947) proposed *Urnatella indica* as new species based on specimens collected from freshwater of South India. Nielsen (1989) considers *U. indica* to be synnymous with *U. gracilis*. d'Hondt et al. (2002) also followed *U. indica* as a junior synonym of *U. gracilis.* Carlton (2009) mentioned *Urnatella indica* under 'pseudoindigenous species' (introduced species mistaken as native – indigenous or endemic species) and made catagorised as introduced species re-described as 'new' following their introduction to a region. *Urnatella dnjestriensis* Zambriborshch, 1958 was described from USSR (Zambriborshch, 1958) was also considered as junior synonym of *U. gracilis* by Nielsen (1989). *Urnatella gracilis* is a freshwater species but also reported in slight brackish water region (Poirrier, Johnson, 1970; Tachet, Richoux, Bournaud, Usseglio-Polatera, 2000; Zaitsev, Oztjirk, 2001).

Family Pedicellinidae Johnston, 1847
Genus ***Pedicellina*** **(Pallas, 1774)**
Pedicellina cernua **(Pallas, 1774)**

Records from India. This species was reported from Puri, Odisha (Orissa) state, Bay of Bengal found growing on twigs (Robertson, 1921). It was also reported from Mumbai (Bombay) coast, Maharastra, Arabian Sea (Chhapgar, Sane, 1966). This species was also reported as a fouling community from Visakhapatnam harbour, Bay of Bengal (Rao et al., 1988; Pati, Rao, Balaji, 2014, 2015).

Distribution. Pacific, Arctic, Atlantic, Mediterannean, Antarctic and Indian Ocean.

Remarks. This species was recorded from both east and west coast of India (Bay of Bengal and Arabian Sea).

Order Solitaria Emschermann, 1972
Família LOXOSOMATIDAE Hincks, 1880
Genus *Loxosomatoides* Annandale, 1908
Loxosomatoides colonialis **Annandale, 1908**

Records from India. This species was reported from Port Canning, South 24 Parganas, West Bengal in brackish pond growing amidst dense colonies of bryozoans *Victorcella Bowerbankia* , *Irene*, and also on grass stem (Annandale, 1908, 1915).

Distribution. India, Bay of Bengal (Annandale, 1908, 1915).

Remarks. Woods (2005) commented that *Loxosomatoides colonialis* Annandale 1908, was reported to form a two-chambered hibernaculum (Wasson, Holle, Toft, Ruiz, 2000) but no description has yet been published.

Loxosomatoides laevis **Annandale, 1915**

Records from India. This species was reported from Chilka Lagoon (Barakuda, Manikapatna) on oyster-beds of Manikpatna (Annandale, 1915). It was also reported from Ennur Backwater, a few miles up the coast from Chennai (Madras) on oyster-beds (Annandale, 1915). This species was also reported from Visakhapatnam harbour, Bay of Bengal as a fouling community (Rao et al., 1988).

Distribution. India: Bay of Bengal – Chilka lagoon, Chennai, Viskhapatnam (Annadale, 1915; Rao et al., 1988), Japan : Matsushima Bay – Honshu (Toriumi, 1951); Eastern North America (Atlantic Coast): Chesapeake Bay – Maryland and Virginia, USA (Wasson et al., 2000).

Remarks. Wasson et al. (2000) synonymized *L. japonicum* reported from Matsushima Bay, Honshu with *L. Laevis.*

Discussion

Altogether 7 species belong to 4 genera viz. *Barentsia* (3 species), *Loxosomatoides* (2 species), *Pedicellina* (1 species), and *Urnatella* (1 species) were reported from India. *Urnatella gracilis* was reported from freshwater. Two species viz. *Barentsia gracilis* and *Pedicellina cernua* were recorded from both east and west coast of India.

Pati et al. (2015) discussed on diversity and abundance of biofoulers altered since the environmental conditions changed in Visakhapatnam harbour and mentioned one entoproct *Pedicellina*

cernua in the biofoulers list. But surprisingly, they did not mention earlier work of Rao et al. (1988) on entoprocts as biofoulers reported from Visakhapatnam harbour.

Five species of entoprocts viz. *Barentsia discreta*, *B. gracilis, B. ramosa*, *Loxosomatoides laevis* and *Pedicellina cernua* were found as biofoulers reported from Visakhapatnam harbour, east coast of India (Rao et al., 1988).

The study of Indian entroproct is far from complete. Vast stretches of the long Indian coastline almost remain unexplored for the entoproct fauna except few records from certain small areas. It is difficult at present to determine the nature of the regional distribution of species and more studies are needed to get better idea about species of Indian entoprocts.

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