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RESEARCH NOTE

Two new records of minute marine gastropods from Marine National Park, Gulf of Kachchh in India

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India has nearly 8000 km of coastline, spanning nine states and four Union Territories, which are home to diverse coastal biodiversity. Marine Mollusca habitats range from sandy beaches and mangroves to coral reefs and down to the depths of the ocean. In India, much of the malacofaunal studies are based on coastal collections due to the abundance and easy accessibility. There are 5,070 species of molluscs reported, of which 3,370 have been listed to occur in the coastal and marine environment of India (Subba Rao 2003, 2017; Ramakrishna *et al*. 2010; Tudu *et al*. 2018).

The Marine National Park (MNP) is located in the southern shore of the Gulf of Kachchh (22°28'N 69°37'E) in the Devbhumi-Dwarka district of Gujarat state in India; it has been declared as the first marine National Park of India in 1982 under the provision of the Wildlife (Protection) Act, 1972. The MNP occupies an area of 7,300 km^2 and comprises 42 islands along the Jamnagar coast, surrounded by reefs, coral pinnacles, mangroves, and sandy beaches, which provide suitable habitat for the aquatic flora and fauna. More than 1,075 marine species have been reported from this Protected Area, including 178 species of marine molluscs (Subba Rao & Sastry 2005). Moreover, they have documented 124 species of gastropods, 50 species of Bivalvia, three species of Cephalopoda, and one species of Polyplacophora from MNP, although this is comparatively very low in terms of diversity of other Protected Areas in India. During the examination of molluscan specimens from different parts of the MNP, we found two minute gastropod species, *Pseudoliotia henjamensis* (Melvill & Standen, 1903) of the family Vitrinellidae and *Cyclostrema ocrinium* Melvill & Standen, 1901 of the family Liotiidae, which have never hitherto been reported from India. In this communication, we report and illustrate these two newly recorded minute species along with a description and taxonomic details.

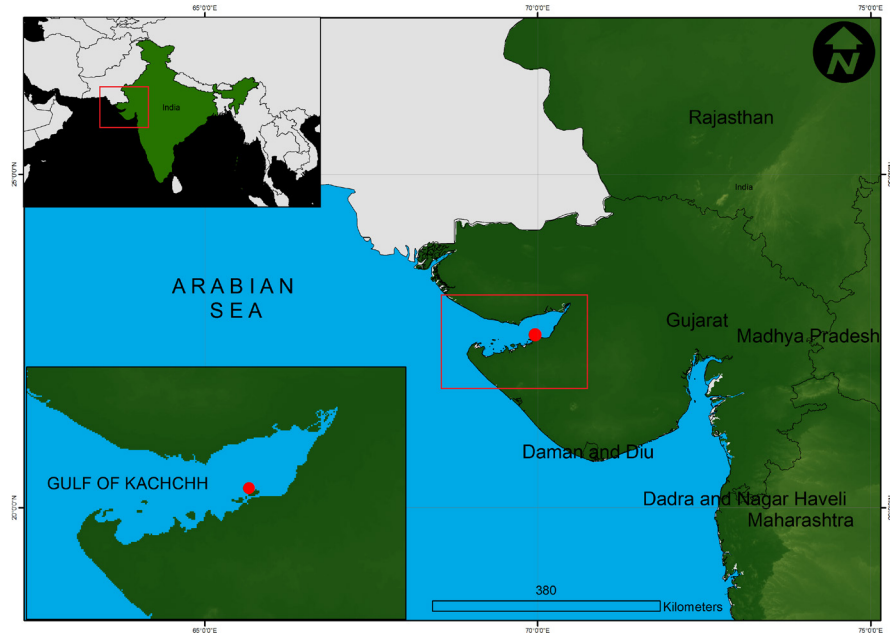

Figure 1. Collection locality of *Pseudoliotia henjamensis* and *Cyclostrema ocrinium* in MNP, Gulf of Kachchh, India.

The specimens were collected during the low tide along the intertidal zone of Pirotan Island in MNP during the field surveys along the Gujarat coast during 2016–2017 (Figure 1). The collected specimens were examined and identified as new records for India. The identification of the species was made based on the original descriptions and followed

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the methods of Bosch *et al*. (1995) and Rubio & Rolán (2018). Current taxonomic status was established in Bouchet *et al*. (2017). The examined material was registered and deposited in the National Zoological Collection of Zoological Survey of India (NZSI).

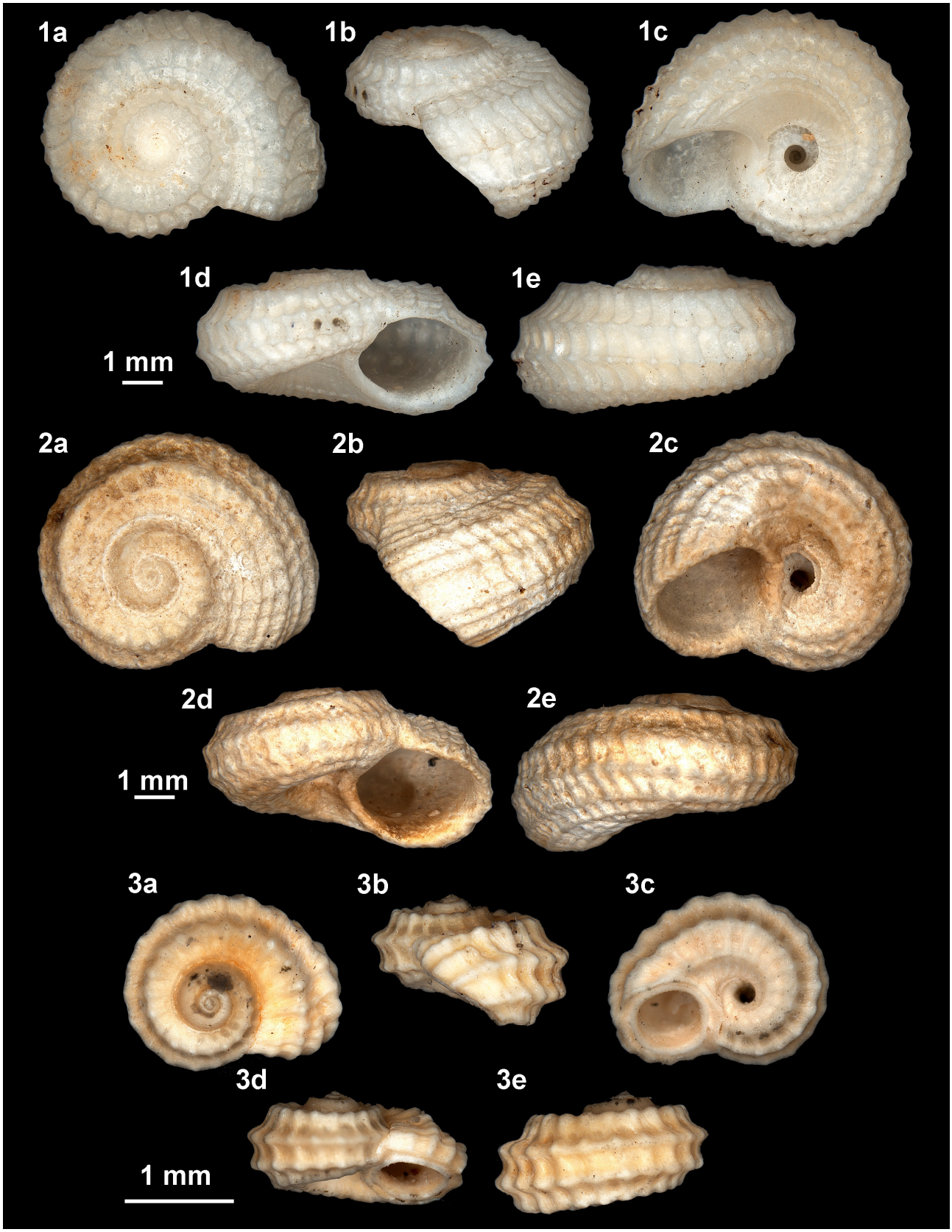

Figure 2. New records of minute marine Gastropoda collected in MNP, Gulf of Kachchh, India. 1–2. *Pseudoliotia henjamensis*, NZSI M.29411/7. 3. *Cyclostrema ocrinium*, NZSI M.29407/7.

Abbreviations used: NZSI, National Zoological Collection of Zoological Survey of India; MNP, Marine National Park; coll., collector; Reg. No., Registration number; ex, example(s).

Family Vitrinellidae

Pseudoliotia henjamensis (Melvill & Standen, 1903)
(Figures 2.1, 2.2)

Cyclostrema henjamense Melvill & Standen, 1903: 291, pl. 20, fig. 3.

Material examined: MNP, Gulf of Kachchh, Pirotan Island, Gujarat: Station No. 1 (22°35'54.79"N and 69°57'47.88"E), 7 sh., 26/x/2016, coll. A.K. Mukhopadhyay *et al*., NZSI M.29411/7.

Description: Shell is small (1.56–3.28 mm diameter and 1.18–2.06 mm in width), white and moderately thick; the spire low and flat; the dorsoventral region is flattened, five strong spirally chords sculpture running throughout the body and intercepting with axial node, of which two are smooth. Last whorl with 5–9 spiral chords, three are strongly keeled at periphery. Axial sculpture present as growth lines, which looks like coarse cancellated sculpture. Whorls 4¼–4½. Peristome is moderately thick and the aperture sub-circular, usually distinctly angled anteriorly; outer lip crenulated. Umbilicus deep and narrow, with whorl visible.

Distribution: India: Gujarat, MNP, Gulf of Kachchh: Pirotan Island (reported for the first time). Elsewhere: South East Gulf, Red Sea (Bosch *et al*. 1995; Dekker & Orlin 2000).

Habitat: These tiny shells are exclusively marine and inhabit in the intertidal region.

Remarks: Melvill & Standen (1903: 291) clearly mentioned about the appearance of the species to be in between the genus *Cyclostrema* Marryat, 1819 and *Liotia* Gray, 1842, based on the peristome characters being cyclostremoid. Whereas Dekker & Orlin (2000) placed the species in the genus *Pseudoliotia* Tate, 1898, without any clear taxonomical discussion. Nevertheless, the species *P. henjamensis*, described as *Cyclostrema henjamensis*, has seven keels on the last whorl, with closely longitudinally intersected by oblique riblets and gemmulated at the point of junction (Melvill & Standen 1903). Moreover, all the specimens collected from the field were empty shells and therefore, the genitalia could not be investigated.

Family Liotiidae

Cyclostrema ocrinium Melvill & Standen, 1901
(Figure 2.3)

Cyclostrema ocrinium Melvill & Standen, 1901: 346, pl. 22 fig. 1.

Material examined: MNP, Gulf of Kachchh, Pirotan Island, Gujarat: Station No. 1 (22°35'54.79"N and 69°57'47.88"E), 1 sh.; Station No. 2 (22°35'48.79"N and 69° 57'43.45"E), 2 ex., 26/x/2016, coll. A.K. Mukhopadhyay *et al*., NZSI M.29407/7.

Description: Shell is small (2.05–2.28 mm in diameter and 0.85–1.06 mm in width), pale white in colour, thick and glossy, spire depressed conoid, the flat-sided periphery angular with strong, stellate and keel-like spiral cord, five on the last whorl, crossed by fine close-set axial ridges and descending below. Whorls 4¼–4½. Apex pointed, with deep suture progressively deeper and more channelled with growth. Interstices are plain. Umbilicus strongly spiralled and deep. Peristome thick, oblique and crenulated; aperture circular; columella curved.

Distribution: India: Gujarat, MNP, Gulf of Kachchh: Pirotan Island, (reported for the first time); Elsewhere: North-West Gulf, South-East Gulf, Gulf of Oman, Southern coast of Iran (Bosch *et al*. 1995; Ghasemi *et al*. 2011).

Habitat: These tiny shells are exclusively marine and inhabit in the intertidal region.

Remarks: Members of the family Liotiidae were earlier placed under the family Turbonidae, and subfamily Margaritinae, and in family Cyclostrematidae (Dey 2016), but they differ in terms of shell morphology, radula and internal anatomy, as compared to Trochidae. Therefore, Bouchet *et al*. (2017) considered Liotiidae as separate family, based on previous molecular work (Williams *et al*. 2008). We relied on the classification of Bouchet *et al*. (2017) and hence considered the species accordingly, as *Cyclostrema ocrinium*, under the family Liotiidae.

The faunal composition of MNP closely resembles that of Persian Gulf, Gulf of Arabian and Red Sea (Dey 2016). These two marine gastropod species have been previously reported from mangrove and intertidal region of South-East Gulf, Red Sea, North West Gulf, South East Gulf, Gulf of Oman, and Southern coast of Iran (Melvill & Standen 1901, 1903; Dekker & Orlin 2000; Ghasemi *et al*. 2011). Previously four *Cyclostrema* species, *C. bushi* Dautzenberg & Fischer, 1906, *C. dunkeri* Tryon, 1859, *C. eburnean* Nevill & Nevill, 1875 and *C. solariellum* Melvill, 1893, have been reported from the east and western coast of India (Dey 2016), whereas the genus *Pseudoliotia* is here reported for the first time from India. Furthermore, there are many new gastropods and new records to be found from Arabian seas and the Indian Ocean, mostly minute gastropods. Comprehensive and coordinated studies should add further records to the list of marine Mollusca of India.

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