Intertidal Gastropods (Gastropoda: Mollusca): Insights on diversity and distribution in the Mumbai Metropolitan Region, India.

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➢ ABSTRACT:

The coastline of the Mumbai Metropolitan Region (MMR) is among the most anthropogenically altered in the country. Despite this, documentation of the region's intertidal marine diversity remains limited. A lack of taxonomic research has led to inconsistencies in species identification and inadequate ecosystem representation. This study addresses these issues by focusing on the Molluscan class Gastropoda from the intertidal regions within the MMR. We present the spatial distribution of gastropod assemblages from 28 rocky, sandy and muddy intertidal sites within the Mumbai Metropolitan Region, on India's west coast. A total of 163 species were recorded from 2934 observations of marine gastropods. Among these, 29 species, 34 genera and one family are new records for the region. Additionally, 5 species of nudibranchs were rediscovered after 78 years; one species from Neogastropoda after 131 years and one from Siphonariida after 31 years, from their type locality, Mumbai. These species are herein illustrated with detailed morphological descriptions and their local distribution.

Keywords: Mollusca, gastropods, checklist, intertidal, Mumbai Metropolitan Region.

- INTRODUCTION:

The intertidal region represents the dynamic interface where the land and sea mutually influence each other. Species assemblage in the intertidal habitat is distributed vertically, depending on their ability to compete for space, with predators and their ability to survive in varying degrees of exposure to sunlight and water during tidal cycles. The lower intertidal region remains mostly submerged, becoming exposed only during the lowest spring tides. It transitions into the middle intertidal region, which is submerged at all high tides and exposed at low tides. The upper intertidal is submerged during the spring high tides but remains exposed otherwise. This interplay between shore topography and tidal cycles creates complex invertebrate assemblages adapted to diverse niches, responding to environmental gradients such as temperature, salinity, subaerial exposure and changes in pH. Distinct macrobenthos groups including molluscs, crustaceans, annelids, cnidarians, have adapted to these regions performing important ecological functions such as nutrient recycling (carbon, nitrogen, sulphur), disturbance regulation, mineralisation, sediment mixing, oxygen influx and serving as prey for larger predators within the ecosystem (Pawar et al., a, b; Sukumaran et al., 2021).

Mollusca is the second-largest phylum of Kingdom Animalia, comprising 1,41,052 recognised species Within it, Gastropoda is the largest and most heterogeneous class with 75,401 extant species of which 40,895 species are marine (Mollusca base,

2025; WoRMS, 2025). Marine gastropods are found across all marine interfaces, from upper intertidal margins to the deep-sea trenches of the hadal region.

Located on the west coast of India, Mumbai was originally an archipelago of seven islands that, following extensive land reclamation beginning in the eighteenth century, was transformed into a single mainland city (Riding, 2018). Today, it serves as India's financial capital, its largest metropolis, and ranks among the most densely populated cities in the world. Consequently, rapid growth in population and economic activity has placed significant anthropogenic stress on the surrounding marine environment.

Previous gastropod studies from Mumbai by Abercrombie (1893); Melvill (1893); Melvill & Abercrombie (1893); Melvill (1894); Melvill (1896) have documented 228 species of shelled gastropods from Bombay. Subsequent works by Winckworth (1946a, b); Awati & Karandikar (1948); Gavas et al., (2016) have recorded the presence of eight species of heterobranchs in the region. Other studies such as Jaiswar & Kulkarni (2005); Datta et al. (2010); Sukumaran et al. (2014); Takar et al., (2020) examined the effects of environmental degradation caused by various anthropogenic factors on the macrobenthos including intertidal gastropods diversity in the the study area. Kasinathan et al. (1975) examined spawning and development of four gastropod species from the region while earlier publications i.e., Abercrombie (1893); Melvill (1893); Melvill & Abercrombie (1893); Melvill (1894); Melvill (1896) made observations on the behavioural and ecological aspects of certain species.

Other publications on gastropod diversity and ecology from the region include Melvill & Standen (1901); Comber (1906); Rai (1933); Hornell (1949); Subrahmanyam et al. (1951, 1952); Bhatt & Bal (1973); Govindan et al. (1976); Sreeramamurthy (1980); Apte (1993); Kulkarni & Jaiswar (2000); Kulkarni & Jaiswar (2001); Jaiswar & Kulkarni (2002); Datta et al. (2008); Prabhu & Kulkarni (2012); Kulkarni et al. (2017); Kantharajan et al. (2017); Gupta et al. (2019); Salvankar & Jadhav (2021); Fatema et al. (2021); Mithbavkar et al. (2023); Shetty et al. (2024).

Most studies on gastropods from the region either comprises classical natural history accounts which lack species morphological information which may be used to identify it or are discontinuous accounts from isolated sites along the city's coast.

The current study has been built on a dataset created by the citizen science project Marine Life of Mumbai (MLOM), which sought to explore and document the intertidal biodiversity of Mumbai Metropolitan Region's shores. The present work aims to 1) summarise the diversity of gastropods from the MMR collected via opportunistic documentation over a period of a decade. 2) provide local distribution and photographic representation of the recorded gastropod diversity. We thus present the first baseline dataset in the form of an illustrated and annotated checklist documenting the diversity and distribution of gastropod species across different intertidal habitats in Mumbai.

➢ METHODS & MATERIALS

○ STUDY AREA:

The current study includes the intertidal habitats from which the species were documented. These sites have been divided into 11 zones for ease of data presentation (Cárdenas Calle et al., 2020). The zones are elaborated and listed in Table 1 and visualised in Figure 1.

○ METHODOLOGY:

The data presented in the current study (Table 2) was collected between February 2014 and January 2024. The data was documented opportunistically by walking between the high tide line and the low tide line in the pre and post monsoon months during spring tides or on days when the low tide was less than one metre.

Gastropod fauna found during these surveys were photographed in situ using DSLR cameras with macro lenses, submersible point and shoot cameras with macro capability, and smartphones. In case of shelled gastropods, animals were picked up and photographs of the dorsal, ventral and lateral sides, and the aperture were taken before placing the animal back into its original place. In cases where it was not possible to place the animal in its original position (eg: underside of a rock), it was placed close to it with the aperture facing down.

Shell-less gastropods, and gastropods with reduced shells were photographed as they were found. In case of nudibranchs, photos of their rhinophores, gills and other

distinguishing features such as cerata in aeolid nudibranchs, and other markings were taken to help identify the species.

Species were identified using morphological characters in available literature (Eliot, 1910; Rao, 1968; Bebbington, 1974; Joshi & Mankodi, 2016; Apte and Desai, 2017; Gosliner et al., 2018; Venkitesan et al., 2019; Vakani et al 2020), and reference websites (www.keralamarinelife.in, www.wildsingapore.com, www.stromboidea.de) after which photographs were uploaded to the global biodiversity repository iNaturalist.org where they were added to the 'Marine Life of Mumbai' project (https://www.inaturalist.org/projects/marine-life-of-mumbai). In case a species was new to the region, identification help was sought from subject experts on the iNaturalist platform and on online communities (Nudibase: sharing Nudibranch knowledge and Nudibranch Central (https://www.facebook.com/groups/206426176075326, https://www.facebook.com/groups/1488080524784020). Observations with photographs which were deficient of any of the specific morphological characters used to positively identify the species were not included in the current study. The binomial nomenclature and taxonomy were followed from the World register of Marine species (WoRMS, 2025). The current study only includes specimens that were encountered alive, in their natural habitat. They are described briefly along with Family, Subfamily and Tribe (wherever applicable), accepted binomial name, original

name, and its position on the image plates. The brief description also mentions key diagnostic features and notes on egg cases of the species wherever documented.

Table 1: Study sites divided into Zones (Source: Authors)

Zone	Study Sites	District
Zone 1	1. Navy Nagar	Mumbai City
	2. Geeta Nagar	Mumbai City
	3. Cuffe Parade	Mumbai City
Zone 2	4. Marine Drive	Mumbai City
	5. Girgaon Chowpatty	Mumbai City
Zone 3	6. Walkeshwar	Mumbai City
	7. Napean sea road	Mumbai City
	8. Priyadarshini Park	Mumbai City
Zone 4	9. Mahalaxmi	Mumbai City
	10. Haji Ali	Mumbai City
Zone 5	11. Worli	Mumbai City
	12. Dadar	Mumbai City
	13. Mahim	Mumbai City
	14. Mithi estuary	Mumbai City

Zone 6	15. Bandstand	Mumbai Suburban
	16. Chimbai	Mumbai Suburban
	17. Carter Road	Mumbai Suburban
	18. Khar Danda	Mumbai Suburban
Zone 7	19. Juhu Beach	Mumbai Suburban
	20. Versova	Mumbai Suburban
Zone 8	21. Madh	Mumbai Suburban
	22. Danapani	Mumbai Suburban
	23. Marve	Mumbai Suburban
Zone 9	24. Gorai Beach	Mumbai Suburban
	25. Gorai Jetty	Mumbai Suburban
	26. Uttan	Thane
Zone 10	27. Bhuigaon	Palghar
Zone 11	28. Sewri, Airoli	Mumbai City & Thane

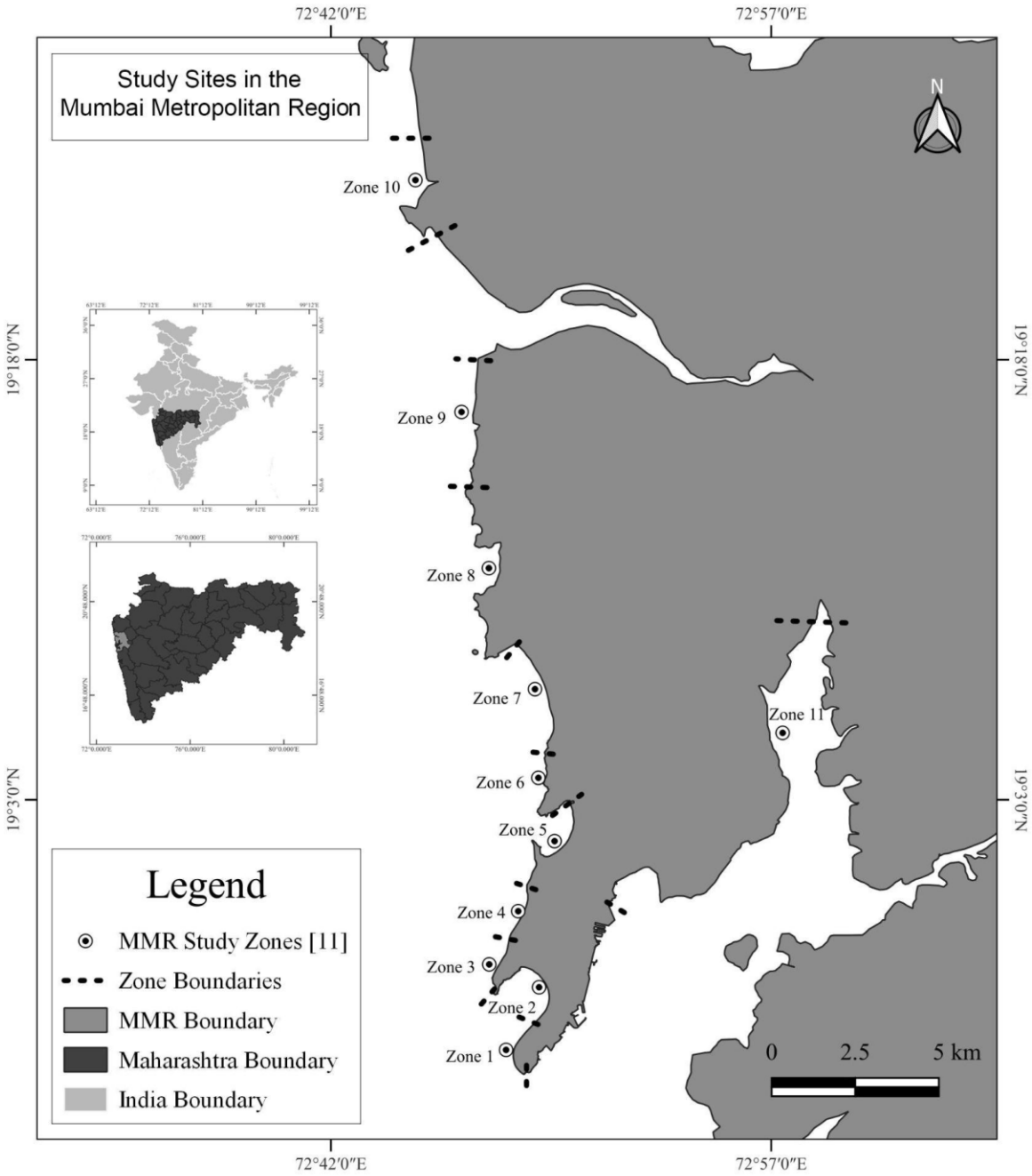

Figure 1: Map of MMR region showing the Study sites (Source: Authors)

➢ RESULTS:

We report a total of 163 gastropod records belonging to 112 genera, 66 families and 5 subclasses from 28 locations within the Mumbai Metropolitan Region (Table 2). Additionally, 64 new records are reported for Mumbai, comprising 29 new species records, 34 new genus records, one new family record (Table 3). The subclass Heterobranchia is the most diverse group represented by 79 species, and subclass Patellogastropoda being the least diverse with three species.

Five species from the order Nudibranchia were rediscovered nearly 78 years after their original description in 1946, while one species each from Neogastropoda and Siphonariida were recorded from their type locality after 131 and 31 years respectively (Table 4).

Table 5 lists the shelled gastropods recorded in live condition or if only the shell.

Table 3: New Records of Gastropods from MMR (Source: Authors)

New Records of Species from MMR	
Family	***Species***
Aplysiidae	1) *Aplysia cf. rudmani*
Haminoeidae	2) *Smaragdinella sieboldi*
Onchidiidae	3) *Paromoionchis penangensis*
	4) *Platevindex tigrinus*

Facelinidae	5) *Herviella yatsui*
	6) *Cratena* sp.1
	7) *Cratena* sp.2
Bornellidae	8) *Bornella stellifera*
Cuthonidae	9) *Cuthona annandalei*
Tritoniidae	10) *Marionia pambanensis*
Janolidae	11) *Janolus mirabilis*
Chromodorididae	12) *Hypselodoris zebrina*
Discodorididae	13) *Atagema tristis*
	14) *Atagema* sp.
	15) *Carminodoris* sp.1
	16) *Carminodoris* sp.2
Dorididae	17) *Doris immonda*
	18) *Sebadoris fragilis*
Goniodorididae	19) *Goniodoris modesta*
	20) *Murphydoris puncticulata*
	21) *Trapania japonica*
Dendrodorididae	22) *Dendrodoris fumata*
	23) *Doriopsilla miniata*
Polyceridae	24) *Plocamopherus ceylonicus*

	25) *Thecacera pennigera*
Muricidae	*26)* *Chicoreus torrefactus*
Terebridae	*27)* *Duplicaria spectabilis*
Cypraeidae	*28)* *Naria Turdus*
Ovulidae	*29)* *Crenovolva striatula*
New Records of Genera from MMR	
Limapontiidae	*1)* *Ercolania* sp.1
	2) *Ercolania* sp.2
	3) *Ercolania* sp.3
Costasiellidae	*4)* *Costasiella* sp.
Pleurobranchidae	*5)* *Berthella* sp.
Facelinidae	*6)* *Phidiana* sp.
	7) *Noumeaella* sp.
Flabellinidae	*8)* *Coryphellina* sp.1
	9) *Coryphellina* sp.2
Dotidae	*10)* *Doto* sp.1
	11) *Doto* sp.2
Eubranchidae	*12)* *Eubranchus* sp.
Trinchesiidae	*13)* *Tenellia* sp.1
	14) *Tenellia* sp.2

Actinocyclidae	*15)*	*Hallaxa* sp.1
	16)	*Hallaxa* sp.2
	17)	*Actinocyclus* sp.
Goniodorididae	*18)*	*Ceratodoris* sp.1
	19)	*Ceratodoris* sp.2
	20)	*Ceratodoris* sp.3
Onchidorididae	*21)*	*Atalodoris* sp.
Dendrodorididae	*22)*	*Doriopsilla* sp.1
	23)	*Doriopsilla* sp.2
Dorididae	*24)*	*Doris* sp.
Polyceridae	*25)*	*Polycera* sp.
	26)	*Thecacera* sp.1
	27)	*Thecacera* sp.2
Ovulidae	*28)*	*Cuspivolva* sp.
	29)	*Primovula* sp.
Velutinidae	*30)*	*Lamellaria* sp.
Vermetidae	*31)*	*Thylacodes* sp.1
	32)	*Thylacodes* sp.2

	33) Thylacodes sp.3
Muricidae	*34) Reishia cf. bitubercularis*
New Records of Family from MMR	
Limapontiidae	1) Unidentified

Table 4: Rediscoveries of species originally described from Mumbai. (Source: Authors)

Family	**Species**
Chromodorididae	*1) Glossodoris poecila*
	2) Glossodoris semeion
	3) Goniobranchus bombayanus
	4) Goniobranchus trimarginatus
	5) Goniodoris kolabana
Muricidae	*6) Lataxiena bombayana*
Siphonariidae	*7) Siphonaria basseinensis*

Table 5: Record of Shelled Gastropods if they were observed live. (Source: Authors)

Species Name	**Encountered live**	**Encountered dead. (only shell)**	**Earlier record from MMR**
1) *Aplysia cf. rudmani*	✓		
2) *Bursatella leachii*	✓		
3) *Bakawan rotundata*	✓		
4) *Haloa pemphis*	✓		
5) *Haloa wallisii*	✓		
6) *Smaragdinella sieboldi*	✓		
7) *Cylichna cylindracea*		✓	✓
8) *Cassidula aurisfelis*	✓		
9) *Cassidula nucleus*	✓		
10) *Ellobium* sp.		✓	✓
11) *Melampus sincaporensis*		✓	✓
12) *Creseis* sp.	✓		
13) *Siphonaria basseinensis*	✓		
14) *Neripteron violaceum*	✓		
15) *Nerita albicilla*	✓		
16) *Nerita chamaeleon*	✓		
17) *Nerita oryzarum*	✓		
18) *Clithon colombarium*	✓		
19) *Euchelus asper*	✓		

20) *Diodora lima*	✓		
21) *Diodora ruppellii*	✓		
22) *Scutus unguis*	✓		
23) *Trochus radiatus*	✓		
24) Clanculus depictus	✓		
25) *Umbonium vestiarium*	✓		
26) *Turbo intercostalis*	✓		
27) *Astralium semicostatum*	✓		
28) *Cellana radiata*	✓		
29) *Cellana rota*	✓		
30) *Patelloida lentiginosa*	✓		
31) *Planaxis sulcatus*	✓		
32) *Pirenella cingulata*	✓		
33) *Telescopium telescopium*	✓		
34) *Clypeomorus batillariaeformis*	✓		
35) *Melanoides tuberculata*	✓		
36) *Turritella duplicata*		✓	✓
37) *Turritella* sp.		✓	
38) *Babylonia spirata*	✓		
39) Family: Muricidae - Unidentified	✓		

40) *Chicoreus brunneus*	✓		
41) *Chicoreus torrefactus*	✓		
42) *Murex* sp.	✓		
43) *Indothais lacera*	✓		
44) *Indothais sacellum*	✓		
45) *Indothais blanfordi*	✓		
46) *Purpura bufo*	✓		
47) *Purpura persica*	✓		
48) *Semiricinula tissoti*	✓		
49) *Reishia cf. bitubercularis*	✓		
50) *Ergalatax contracta*	✓		
51) *Lataxiena bombayana*		✓	✓
52) *Arakawania granulata*	✓		
53) *Turricula javana*	✓		
54) *Conus achatinus*	✓		
55) *Conus biliosus*	✓		
56) *Conus hyaena*	✓		
57) *Conasprella dictator*		✓	
58) *Annulaturris amicta*		✓	✓
59) Family: Turridae-Unidentified		✓	
60) *Duplicaria spectabilis*	✓		

61) *Anachis terpsichore*	✓		
62) Family: Columbellidae–Unidentified	✓		-
63) *Volegalea cochlidium*	✓		
64) *Nassarius stolatus*	✓		
65) *Nassarius jacksonianus*	✓		
66) *Nassarius foveolatus*	✓		
67) *Nassarius nodiferus*	✓		
68) *Bullia* sp.		✓	✓
69) *Cantharus spiralis*	✓		
70) *Scalptia scalarina*	✓		
71) *Pseudonebularia proscissa*	✓		
72) *Agaronia gibbosa*		✓	✓
73) *Mauritia arabica*	✓		
74) *Monetaria moneta*		✓	✓
75) *Naria turdus*	✓		
76) *Erronea pallida*	✓		
77) *Palmadusta lentiginosa*	✓		
78) *Cuspivolva* sp.	✓		
79) *Primovula* sp.	✓		
80) *Crenavolva striatula*	✓		
81) *Lamellaria* sp.	✓		

82) *Littoraria* sp. 1	✓		
83) *Littoraria* sp. 2	✓		
84) *Littoraria* sp. 3	✓		
85) *Littoraria* sp. 4	✓		
86) *Echinolittorina malaccana*	✓		
87) *Paratectonatica tigrina*	✓		
88) *Tanea lineata*	✓		
89) *Neverita didyma*	✓		
90) *Tibia curta*	✓		
91) *Bufonaria echinata*		✓	✓
92) *Gyrineum natator*	✓		
93) *Assiminea* sp.1	✓		
94) *Assiminea* sp.2	✓		
95) *Iravadia bombayana*	✓		
96) *Thylacodes* sp.1	✓		
97) *Thylacodes* sp.2	✓		
98) *Thylacodes* sp. 3	✓		
99) Family: Calyptraeidae - Unidentified	✓		
100) *Janthina* sp.		✓	✓

Family: Aplysiidae

1. *Aplysia cf. rudmani* (Bebbington, 1974) - Plate 1

Original name: *Aplysia rudmani*

Description: Dark greenish brown in colour, with mottling of black, pale white and brown and bears opaque white spots crowded at some places as well as distantly placed. The parapodia is flap-like which helps them to swim and bears white crowded spots at its edge.

2. *Bursatella leachii* (Blainville, 1817) - Plate 1

Original name: *Bursatella leachii*

Description: The animal is dark brown in colour and vibrant blue ocelli scattered on the whole body. Small black patches may be present. The body is covered with several elongated papillae that are branching from the sides as well as at the tip.

Family: Haminoeidae

3. *Bakawan rotundata* (A. Adams, 1850) Plate 1

Original name: *Bulla (Haminea) rotundata*

Description: The animal is reddish orange and speckled with indistinct microscopic black spots. Two black eye spots are clearly visible. The shell is rounded - oval and translucent, having a whitish tinge. Very fine longitudinal striations can be seen on the shell. A greyish green morph is also found in the region. The green morph has also been observed mating with the red one.

4. *Haloa pemphis* (R. A. Philippi, 1847) - Plate 1

Original name: *Bulla pemphis*

Description: The general body colour is translucent and pale cream in colour. White spots are scattered all over. The anterior side shows mottling of brown and orange colours. The shell is transparent and shows a reddish white tinge. Two black eye spots can be seen at the anterior end of the head.

5. *Haloa wallisii* (Gray, 1825) - Plate 1

Original name: *Bulla wallisii*

Description: The animal is translucent pale white in colour with brownish black mottlings. The body is speckled with white, black, and orange spots of varying sizes. The shell is narrow, oval, and transparent with fine longitudinal lines. Eggs are laid in a super coiled thread like manner stuffed inside a short and transparent cylindrical tube.

6. *Smaragdinella sieboldi* (A. Adams, 1864) - Plate 1

Original name: *Smaragdinella sieboldi*

Description: The base colour of the animal is translucent pale white, with light and dark brown and green mottlings present on the body. Patches of closely placed opaque white spots are seen on the body. The shell is oblong, oval, and transparent with fine longitudinal striations. It lays its eggs in a super coiled, spiral and inside an arched and transparent cylindrical tube.

Family: Cylichnidae

7. *Cylichna cylindracea* (Pennant, 1777) Plate 11

Original name: *Bulla cylindracea*

Description: It is cylindrical in shape, rounded at both ends. Spire is turned inside like a scroll. Shell is translucent white in colour with extremely fine spiral lines.

Family: Ellobiidae

Subfamily: Pythiinae

8. *Cassidula aurisfelis* (Brugiere, 1789) Plate 11

Original name: *Bulimus aurisfelis*

Description: The shell is ovate, maroonish brown in colour. The spire is elevated, plano-convex whorls. The whorls may show a cream band near the suture. The edge is thickened and flattens on the ventral side. The aperture is irregular and elongated. The outer lip also has an irregular crenation and inner lip bears three pointed teeth placed distantly from each other.

9. *Cassidula nucleus* (Gmelin, 1791) Plate 11

Original name: *Helix nucleus*

Description: The shell characteristics are like that of *C. aurisfelis*, the body whorl shows several cream colour bands of varying thickness.

10. *Ellobium* sp. (Roding, 1798) Plate 11

Original name: N/A

Description: The shell is fusiform, off white in colour. Sutures are simple, elevated spire, whorls are slightly convex. The aperture is elongated

drop-like. The inner lip is thick and smooth, the outer lip is thick and rounded and shows a tooth towards the upper end.

Subfamily: Melampodinae

11. *Melampus sincaporensis* (L. Pfeiffer, 1855) Plate 11

Original name: *Melampus sincaporensis*

Description: The shell is oval and fusiform in shape and bears longitudinal striations. The body whorl is 2/3rd of the spire. The whorls are rounded. It is pale yellow in colour and a transverse thick brown band is present near the sutures. The body whorl shows four transverse brown bands of varying thickness. The aperture is narrow and sub vertical. The inner lip shows three parietal folds. The outer lip shows 3-4 denticulations on the inner side.

Family: Onchidiidae

12. *Paromoionchis penangensis* (Dayrat & Goulding, 2109) Plate 1

Original name: *Paromoionchis penangensis*

Description: The dorsal surface will always be covered in mud and colour is light grey to dark grey. The dorsal surface appears leathery and warty with some large tubercles in between. The pedicels are pale orange in colour.

13. *Peronia verruculata* (Cuvier, 1830) Plate 1

Original name: *Onchidium verruculatum*

Description: The general body colour is dark grey. The mantle is quite thick, rough, and completely covered with conical tubercular elevations of irregular sizes placed randomly in a compact manner.

14. *Platevindex tigrinus* (Stolickza, 1869) Plate 1

Original name: *Onchidium tigrinum*

Description: The dorsum appears thick and leathery and is light pale brown in colour. Large black spots are scattered randomly on the mantle. Small, rounded tubercles cover the whole dorsal surface with some larger ones in between.

Family: Plakobranchidae

15. *Elysia bangtawaensis* (Swennen, 1998) Plate 2

Original name: *Elysia bangtawaensis*

Description: The body is broad in front and tapering towards the end. General body colour is dark green which fades to light green towards the head. Opaque white and light green small spots of varying sizes are scattered all over the body including parapodia. The parapodia is thin, large and has small orange spots placed distantly at the edge. The head also shows the same specifications except the orange spots.

16. *Elysia cf. hirasei* (Baba, 1955) Plate 2

Original name: *Elysia hirasei*

Description: The body is translucent light green in colour and has a leaflike shape, rear end is tapering, and conical and front end appears to have head notched in the centre. The head bears

a transverse black band in the front which divides into two longitudinal lines and median to these two lines is a pinkish red patch, which seems to be present only in the individuals found in the geographical region. Two longitudinal lines also run from the front end of the lateral sides of the head up to the parapodia. There is a white circular patch with several distinct, opaque, and small white spots present just behind the head. The ramifying digestive glands resembling veins on a leaf are spread all over the body and parapodia. The parapodia has opaque distinct and irregularly shaped white spots placed almost equidistantly on the edge. In some individuals, the parapodia is seen speckled with small and opaque white spots. The edge also shows the presence of a brownish cream band made up of small spots densely packed at the edge. The head is pale and translucent green in colour with light pink coloured spots that are very closely placed almost smudging into each other.

17. *Elysia tomentosa* (K. R. Jensen, 1997) Plate 2

Original name: *Elysia tomentosa*

Description: The body is uniformly bright green in colour having a pair of large parapodia of irregular margin. The parapodial margin is lined with black on either side and slight creamish pigmentation in the centre. The body surface bears numerous pale white papillae and small, opaque black spots. The egg ribbon is laid in a spiral

manner and eggs are yellow in colour arranged in tight coils.

18. *Elysia* sp. (Risso, 1818) Plate 2

Original name: N/A

Description: The body shape is same to that of *E. hirasei.* It is uniformly light green in colour and speckled with small white spots and some larger orange spots. The parapodial edges show larger white spots that are distantly placed. The rhinophores show densely packed tiny light orange spots at the tip. Eye spots can be seen at the base of the rhinophores.

Family: Limapontiidae

19. *Ercolania* sp.1 (Trinchese, 1872) Plate 2

Original name: N/A

Description: The body is translucent light brown in colour with minute white and dark brown specks all over. The rhinophores are simple and cylindrical. Rhinophores bear brown lines that extend up to their head. Cerata are flat and leaf-like having the same colouration as the body. Digestive glands can be seen through the translucent membrane.

20. *Ercolania* sp.2 (Trinchese, 1872) Plate 2

Original name: N/A

Description: It is translucent with dark grey to black pigmentation. The head shows a black band running from in between the rhinophores and black long markings in front of the head. The eye spots can be seen laterally just behind the rhinophores on a

translucent background. The rhinophores are translucent with white markings at its base and tip, and black in the middle. The cerata are flat, leaf like and black in colour with scattered white spots and white tips.

21. *Ercolania* sp.3 (Trinchese, 1872) Plate 2

Original name: N/A

Description: It is translucent white in colour with black pigmentation. The rhinophores are simple, cylindrical and have black pigmentation, white at the tips. Cerata are narrow, have black pigmentation all over and specks of white in the middle and at the tip.

22. Unidentified - Plate 2

Original name: Limapontiidae (Gray, 1847)

Description: The body is translucent, pale cream in colour and bears smudged markings of pale green colour all over. The cerata are long, narrow and cylindrical having similar colouration as the body. The rhinophores are simple, cylindrical and are speckled with white and pale green spots.

Family: Costasiellidae

23. *Costasiella* sp. (Pruvot-fol, 1951) Plate 3

Original name: N/A

Description: The body is translucent, pale greyish cream in colour and is speckled with white and black colour spots. The rhinophores have a similar colour to the body with a dark cream band seen inside it. The cerata are bulbous, slightly arched and heavily

speckled, crowded white specks at the tips.

Family: Creseidae

24. *Creseis sp.* (Rang, 1828) Plate 10

Original name: N/A

Description: It is a transparent, needle-like conical shell, few mm in size.

Family: Siphonariidae

25. *Siphonaria basseinensis* (Melvill, 1893) Plate 13

Original name: *Siphonaria basseinensis*

Description: The shell is sufficiently elevated and conical. It is oval in shape. It is pale cream to white in colour with biradiate brown stripes.

Family: Pleurobranchidae

26. *Berthella* sp. (Blainville, 1824) Plate 3

Original name: N/A

Description: The body is round and bulbous. Uniformly translucent white in colour with small white opaque and irregular spots. The texture of the body resembles that of a sponge.

Family: Facelinidae

27. *Cratena lineata* (Eliot, 1905) Plate 3

Original name: *Hervia lineata*

Description: The body is translucent pale white in colour. Distinct white longitudinal lines are present on the notum and cerata. The cerata are dull and light orange coloured and tipped with white. There is a bright orange colour patch between the rhinophores

and tentacles. The upper half of the rhinophores are pale white while the lower half shows slight orange colouration.

28. *Cratena pawarshindeorum* (Bharate, Padula, Apte & Shimpi, 2020) Plate 3

Original name: *Cratena pawarshindeorum*

Description: Translucent pale white body with cerata translucent and dark reddish digestive glands with a white tip can be seen in the centre. Rhinophores are translucent pale white at the base and at the tip, mid region is bright orange coloured. Oral tentacles are of the same colour as the body with little white pigmentation near the tip. Two large bright orange patches are present between the oral tentacles and rhinophores, almost smudging into each other. The egg ribbon appears white in colour and is wrapped in tight coils on the branches of the hydroid it feeds on.

29. *Cratena* sp.1 (Bergh, 1864) - Plate 3

Original name: N/A

Description: The morphological characters of this *Cratena* sp. are very similar in appearance to *C. pawarshindeorum*. The differences occur in the colouration of the rhinophores, which are light orange in colour and the orange patches present in between the oral tentacles and rhinophores are placed apart at a distance from each other dorsally on top of the head as compared to its former counterpart.

30. *Cratena* sp. 2 ((Bergh, 1864) Plate 3

Original name: N/A

Description: The body is translucent white in colour. The rhinophores and oral tentacles are translucent at the base and white towards the tip. The cerata are translucent with white irregular marks scattered throughout and dark red on the inside. The patches between the oral tentacles and rhinophores are small and faded orange in colour.

31. *Herviella yatsui* (Baba, 1930) Plate 4

Original name: *Cratena yatsui*

Description: The colour of the body is pale cream with brownish grey patch running throughout the notum. The base colour of cerata is also pale cream with brownish grey pigmentation and tipped with white. The oral tentacles and rhinophores show three bands of colouration - basal pale cream, mid dark brownish grey and tip is white.

32. *Phidiana* sp. (Gray, 1850) Plate 4

Original name: N/A

Description: The body is translucent white in colour. The oral tentacles bear a white tip followed by orange colouration that continues a line in front of the head. The rhinophores also show a similar pattern of colouration. The cerata are cylindrical with pointed orange tips and a white line running in the centre with black digestive glands visible inside.

33. *Noumeaella* sp. (Risbec, 1937) Plate 4

Original name: N/A

Description: It is dark grey to black in colour with pale white blotches all over the body. The white blotches are crowded in the oral tentacles and at tips of cerata. The cerata are cylindrical with pointed and curved tips. The rhinophores have dark grey to black pigmentation with white markings at the tips.

Family: Flabellinidae

34. *Coryphellina* sp. 1 (O'Donoghue, 1929) Plate 4

Original name: N/A

Description: The body is translucent with a broken vibrant bluish-purple line running in the centre dorsally. The oral tentacles bear a white tip, bluish purple in the centre and translucent at the base. The rhinophores are translucent at the base and bluish purple at the tip. The cerata show the same pattern of colouration as that of oral tentacles with distinct, orange-coloured digestive glands inside. The tip of the tail too shows bluish purple pigmentation.

35. *Coryphellina* sp. 2 (O'Donoghue, 1929) Plate 4

Original name: N/A

Description: The body is translucent with a small sky blue-ish iridescent line present in between the base of the rhinophores. The rhinophores are translucent at the base and have a light purplish-blue colouration at the tip. The oral tentacles are translucent at

the base, sky blue-ish iridescence in the middle and white at the tip. The cerata too are white at the tip, sky blue-ish iridescent sub-apically and translucent at the remaining length with light orange digestive glands visible in the centre.

Family: Bornellidae

36. *Bornella stellifera* (A. Adams & Reeve, 1848) Plate 4

Original name: *Dendronotus stellifer*

Description: The body is pale orangish brown in colour and bears opaque and large white distinct patches that appear as cracks on a surface. The cracks in between the white patches appear orange in colour. Lateral appendages and rhinophore sheaths bear a white tip, followed by orange colour and a darker orange band. The rhinophores are present on a long stalk with a ring of long pointed papillae. The oral tentacles are modified into star-like sensory organs.

Family: Dotidae

37. *Doto* sp.1 (Oken, 1815) Plate 4

Original name: N/A

Description: Translucent white coloured body rounded anterior and tapering posterior foot corners. Brown coloured branching patterns can be seen all over the body. The rhinophoral sheaths are translucent white in colour may or may not show the brown branching pattern and shows presence of small distinct small white spots. The rhinophores are brown in colour bearing white tip. Cerata are irregular with several conical tubercles, transparent sheath. The egg mass is

laid in the form of ribbons that are compactly coiled on the hydroid branches and is pale yellow in colour. Individuals with dark brown pigmentation and a non-pigmented body were also observed.

38. *Doto* sp.2 (Oken, 1815) Plate 4

Original name: N/A

Description: The body is translucent, cream in colour, speckled with irregular spots of pale yellow, white and black colour towards the head. Cerata brown in colour, have conical tubercles with white tips. Rhinophores are translucent and speckled with white, more at the tip. Rhinophoral sheaths are also translucent.

Family: Eubranchidae

39. *Eubranchus* sp. (Forbes, 1838) Plate 5

Original name: N/A

Description: General body is translucent white with distinct black spots scattered all over the body except the foot. The foot's tentacular processes, oral tentacles, ceratal tips, and rhinophores have a subapical orange band, and their tips appear to have shining iridescent pigmentation. The cerata are arranged laterally in vertical rows and each cerata has three circlets of conical tubercles. Yellowish orange stem of the digestive gland is visible inside the cerata.

Family: Cuthonidae

40. *Cuthona annandalei* (Eliot, 1910) Plate 5

Original name: *Cuthona annandalei*

Description: The body is translucent off white to white in colour. The foot is rounded and disc-like and produces two tentacular processes anteriorly. The body surface shows white shining patches present all over and light grey patches can also be observed in some individuals on rhinophores or on the back of head. The rhinophores and foot processes are translucent, covered with shining white pigmentation. The cerata are arranged on either side of the body with a gap seen after the first two pairs. Ceratal tips become narrower towards, giving the appearance of bulging sub-apically, the degree of which seems to vary from individual to individual. Light to dark grey digestive glands is visible through the translucent membrane of cerata. Their tips may show bands of shining pigmentation or may be completely smudged with it.

Family: Trinchesiidae

41. *Tenellia* sp.1 (Lhering, 1879) Plate 5

Original name: N/A

Description: The body and cerata are translucent and bears shining iridescent white to peach pigmentation, which extends as a band in between the rhinophores and oral tentacles. The rhinophores and oral tentacles have orange pigmentation that fades towards the tip. The cerata are cylindrical and slightly bulbous.

42. *Tenellia* sp.2 (A. Costa, 1866) - Plate 5

Original name: N/A

Description: The body is translucent, viscera being clearly visible in yellow. Rhinophores are simple and translucent. The cerata are cylindrical, with a subapical bulging. It has white and orangish brown irregular markings. The branching digestive glands, brown in colour, are distinctly seen in the centre of the body.

Family: Tritoniidae

43. *Marionia pambanensis* (O' Donoghue, 1932) Plate 5

Original name: *Marionia pambanensis*

Description: The body is oval and tapering towards the hind end. The colour of the body is translucent cream with internal organs visible. The oral veil is present at the anterior end, in front of the rhinophores and is bifurcated. The dorsal surface and lateral sides are covered by small conical pustules. The mantle and the oral veil bear a symmetrical and reticulated pattern of dark brown and orange, brown colour, running in between the pustules.

Family: Janolidae

44. *Janolus mirabilis* (Baba & Abe, 1970) Plate 6

Original name: *Janolus mirabilis*

Description: The colour of the body, cerata and rhinophores is pale grey with irregular marks of brown and pale white. Rhinophores are closely situated to each other. The cerata have pointed tips and several conical tubercles and similar extensions on the anterior side. The cerata are arranged in two groups, one is placed anteriorly and other posteriorly.

Family: Actinocyclidae

45. *Hallaxa* sp. 1 (Eliot, 1909) Plate 6

Original name: N/A

Description: Shape of the body is elongated and ovoid. Body colour is translucent pale white to having brownish tinge with internal organs visible. White spots are scattered unevenly on the notum. The rhinophores are translucent pale white with brown pigments at the top. The branchial plume is smoky dark grey in colour. The egg mass is creamish white and laid in a spiral and ruffled ribbon form.

46. *Hallaxa* sp. 2 (Eliot, 1909) Plate 6

Original name: N/A

Description: The body is elongated and oval in shape. It is translucent with internal organs visible. The entire notum is speckled with faint brownish grey spots along with irregular and raised white spots placed distantly. The branchial plume is also similar in appearance with white spots at extreme ends. The tail has a pointed tip, is translucent with brownish grey tinge and absentia of any white spots.

47. *Actinocyclus* sp. (C.G. Ehrenberg, 1837) Plate 6

Original name: N/A

Description: The body is oval in shape, translucent and heavily pigmented with cream colour. Notum is decorated with round, elevated tubercles, brown in colour which are depressed in the centre with black pigments. The

tubercles are more in number on the sides and surrounding the gills. The gills are reddish pink in colour.

Family: Chromodorididae

Subfamily: Chromodoridinae

48. *Glossodoris poecila* (Winckworth, 1946) Plate 6

Original name: *Glossodoris poecila*

Description: The base colour of the body is pale white to pale blue in colour with irregular yellow spots of varying sizes present all over the notum. The notum also bears a network of red lines and patches which seem to differ in different individuals. The mantle's edge has yellow and light purple colour spots with outlines of bright blue, which becomes red on joining the central network of red lines and patches. The gills are pale white with reddish orange outlines. The rhinophores also are pale white in colour with orange pigmentation, faded from the base and darkened towards the tip. The tail also has a similar pattern of colouration.

49. *Glossodoris semeion* (Winckworth, 1946) Plate 6

Original name: *Glossodoris semeion*

Description: The notum is pale white in colour with irregular purple spots of varying sizes present all over the body. The gills and rhinophores are white in colour with orangish yellow pigmentation towards their tips. The edge of the notum has a sub marginal yellow band.

50. *Goniobranchus bombayanus* (Winckworth, 1946) Plate 6

Original name: *Glossodoris bombayana*

Description: General body colour is white. Mantle margin has a deep orange colour with a row of dark purple spots. Small white spots are densely populated and concentrated in the centre of the dorsal surface. Large dark purple spots are scattered irregularly. The foot is short and white in colour. The foot, rhinophores and gills are translucent and pale white, speckled with silver spots.

51. *Goniobranchus trimarginatus* (Winckworth, 1946) - Plate 7

Original name: *Glossodoris trimarginata*

Description: Body is translucent, pale white to creamish in colour. The notum is decorated with red spots of varying sizes and closely placed. The edge of the mantle is trimarginated. The outermost band is white in colour with a slight blue tinge, middle band is deep red and innermost band is orange red in colour. It also shows the presence of highly branched mantle glands which are white in colour. The gills and rhinophores are pale white and translucent with white edges.

Subfamily: Miamirinae

52. *Hypselodoris zebrina* (Alder & Hancock, 1864) - Plate 7

Original name: *Chromodoris zebrina*

Description: Body is elongated, rounded in front, and tapering behind. The general body colour is translucent pale white. The notum has yellowish - orange spots and a red coloured line running in the centre from the front end

to 1/3rd of the body. The edges of the mantle skirt have spots of similar colour to that of the body along with purplish blue spots. The gills and rhinophores have orange pigmentation.

Family: Discodorididae

53. *Atagema osseosa* (Kelaart, 1858) - Plate 7

Original name: *Doris osseosa*

Description: The shape of the body is elliptic and oblong. The general body colour is uniformly grey or creamish white. The notum is covered with compound stellate clusters of several caryophyllida. The rhinophores and gills are of the same colour as the body, in two of the individuals observed, the rhinophores were lightly pigmented with brown on the outlines.

54. *Atagema tristis* (Alder & Hancock, 1864) - Plate 7

Original name: *Doris tristis*

Description: The body is slightly raised and is ovate and oblong in shape. The body is pale to bright cream or pale grey in colour. The notum has angular ridges which show dark grey pigmentation at the sides filled with large tubercular elevations. Few minute tubercles with light brown pigmentation are also present towards the mantle edge. The rhinophores are pigmented with grey at the tip and pale at the base. In one of the observations, a brown indistinct line is seen in the centre of the notum, behind the rhinophores that breaks in the middle and then reaches up to the gill branches.

55. *Atagema* sp. (Gray, 1850) Plate 7

Original name: N/A

Description: The shape and features of the body are similar to that of *A. osseosa*. The colour of the body, gills and rhinophores is smoky black.

56. *Carminodoris cf. grandiflora* (Pease, 1860) Plate 7

Original name: N/A

Description: The body shape is oval and oblong, slightly raised in the centre having a slight orangish tinge. The basal body is creamish to grey in colour with dark grey wide striations from edge of the mantle to the central part of the dorsal surface. The notum is covered by prominent rounded tubercles with varying sizes and becomes smaller in size towards the mantle edge and most of them have white circling ring at the base. The rhinophores have brownish black pigmentation and are tipped with white. The gills have a deep grey colour with white outline. The egg masses are in a form of flat, ruffled ribbon laid in a spiral manner.

57. *Carminodoris* sp. 1 (Bergh, 1889) - Plate 7

Original name: N/A

Description: Body is oval and pale brown in colour with random black patches. Notum is filled with rounded tubercles of the same colour as the body with a bit darker pigmentation at their tips and a white ring at the base. The gill branches are six or seven in number and brown in colour with black

pigmentation at the border. Rhinophores have pale brown colour and darker pigmentation of brown at the tip.

58. *Carminodoris* sp. 2 (Bergh, 1889) Plate 7

Original name: N/A

Description: The shape of the body is similar to its counterparts. The colour of the notum is translucent grey with teal green pigmentation. It also has grey band-like patches scattered all over. The surface is completely covered with rounded tubercles that are shortest towards the edge, increasing in size towards the centre, and several longest ones concentrated in the centre. The tubercles also show teal green to white coloured rings at their base. The rhinophores and the gill branches are translucent grey towards the base, getting darker grey towards the tip and bear white pigmentation and outline.

Family: Dorididae

59. *Doris immonda* (Risbec, 1928) Plate 8

Original name: *Platydoris immonda*

Description: The mantle is pale yellowish cream in colour and bears several rounded tubercles of varying sizes with black pigments. The centre of the mantle has a slight long and rounded elevation, the middle portion of which is pale white in colour. The rhinophores have black pigmentation at their edges.

60. *Doris* sp. (Linnaeus, 1758) Plate 7

Original name: N/A

Description: The mantle, rhinophores and gills are lemon yellow in colour. The mantle appears textured with short and pointed tubercles present all over the surface of the notum.

61. *Sebadoris fragilis* (Alder & Hancock, 1864) - 8

Original name: *Doris fragilis*

Description: The base colour of the body is cream which gets paler at the margin and profusely spotted with brown spots. The centre of the notum is marked by a brown band and has white pigmentation inner to it. The notum also bears randomly placed brown to black blotches. Gills are dark brown in colour. The rhinophores are also brown in colour with a darkened outline and have slight white pigmentation towards the tip.

Family: Goniodorididae

62. *Pelagella kolabana* (Winckworth, 1946) Plate 8

Original name: *Goniodoris kolabana*

Description: The body is translucent, pale cream to pale white in colour and is minutely speckled with brown spots, hence giving a general appearance of pale brown colour. The inner organs are visible. The edge of the mantle is rounded and rolled downwards with small conical tubercles seen on the lateral side and under the mantle fold. It meets behind the gills and is continued into a dorsal median crest. The rhinophores are pale and pigmented with brown at the base and white or cream at the tip. Gills have

scarce to deep pigmentation of brown, base colour being pale white or cream. The head bears two lateral tentacles.

63. *Pelagella modesta* (Alder & Hancock, 1864) - Plate 8

Original name: *Goniodoris modesta*

Description: The body is ovoid in shape. Notum, gills and rhinophores appear as a mottling of white and brown colours. The mantle's edge has large yellow and brown spots. The gill branches are pale white in colour with brown pigmentation all over. The rhinophores bear the same pattern as the notum.

64. *Murphydoris puncticulata* (Paz-Sedano, Smirnoff, Candás, Gosliner & Pola, 2022) Plate 8

Original name: *Murphydoris puncticulata*

Description: Pale white and translucent body with densely packed cream patches present all over the notum, rhinophores and gills. Dark brown, irregularly shaped, small spots are present behind the rhinophores forming a triangular shape and few are found scattered on the mantle margin and notum.

65. *Trapania japonica* (Baba, 1935) - Plate 8

Original name: *Drepania japonica*

Description: The general body colour is pale white and translucent and internal organs are visible. Dark brown patches of irregular shape are seen on the body everywhere including the rhinophores. The gill branches too have dark brown

colouration appearing like a venation. Extra-branchial and extra-rhinophoral appendages are yellowish orange in colour.

66. *Ceratodoris* sp.1 *(Menke, 1830)* Plate 8

Original name: N/A

Description: The mantle is translucent white in colour with finger-like extensions. The mantle, rhinophores and gills are speckled with yellow and reddish spots of varying sizes. The egg mass is laid in a tight and flat spiral, and it is white in colour.

67. *Ceratodoris* sp. 2 (Menke, 1830) Plate 8

Original name: N/A

Description: The body is translucent, orange in colour with finger-like processes present at the edges of the mantle that are white in colour. Irregularly shaped spots of dark brown colour are present all over the body, mantle extensions and gills. The rhinophores and gills are orange in colour with brown specks at their tips. One finger-like process is also present just before the gills.

68. *Ceratodoris* sp.3 Plate 8

Original name: N/A

Description: This *Ceratodoris sp.* has similar morphological characteristics as the one mentioned above, except it is entirely translucent white in colour with absence of irregular brown spots.

Family: Onchidorididae

69. *Atalodoris* sp. (Iredale & Donoghue, 1923) - Plate 9

Original name: N/A

Description: It is oval in shape with a translucent white body. The body texture resembles exactly like the bryozoan it feeds on. The rhinophores have a slight dense light orange to brown pigmentation and gills are translucent white in colour.

Family: Dendrodorididae

70. *Dendrodoris fumata* (Ruppell & Leuckart, 1830) - Plate 9

Original name: *Doris fumata*

Description: The body is ovoid, elongated and rounded at both ends. The colour can vary from orange, pink, smoky grey, brown, or black. Black or grey blotches are present on the dorsal surface. Rhinophores and gills have a similar colour like that of the notum. An individual with bushy and smoky grey coloured gills has also been observed.

71. *Doriopsilla miniata* (Alder & Hancock, 1864) Plate 9

Original name: *Doridopsis miniata*

Description: It has a highly decorated notum with deep reddish orange colour which appears to fade towards the mantle's edge, in some specimens the mantle edge has creamish white colour. Tubercles are rounded and pale orange in colour are present all over the dorsal surface. Distinct small white spots can be seen more populated surrounding the tubercles and the mantle margin. Gills and rhinophores are pale and light orange in colour and in some are deeply pigmented. The colouration differs slightly from the specimens observed elsewhere. The

eggs are laid in a spiral and flat ribbon form, yellow in colour.

72. *Doriopsilla* sp. (Bergh, 1880) Plate 9

Original name: N/A

Description: The colour of the mantle is orangish brown, which is lighter in the centre and darker towards the edge. It is completely covered with rounded tubercles of varying sizes. Some of the tubercles have a white ring at their base. The rhinophores and gills are orangish brown at the base, dark brown sub-apically and white pigmentation at their tips.

Family: Polyceridae

Subfamily: Triophinae

73. *Plocamopherus ceylonicus* (Kelaart, 1858) Plate 9

Original name: *Polycera zeylanica*

Description: The general body colour is pale white and brown blotches form patterns on the dorsum. The body is speckled with small brown spots and large orangish yellow spots. The orange - yellow spots form a band at the anterior most margin of head. The head is veiled with a fimbriated membrane. The lateral sides of the dorsum possess three pairs of papillae that end in pink to brown rounded knobs and emit light when disturbed. The foot is translucent pale white in colour with bright orange spots.

Subfamily: Polycerinae

74. *Polycera* sp. (Cuvier, 1816) - Plate 9

Original name: N/A

Description: The body is rounded anteriorly and tapering posteriorly. It is pale white in colour with grey colouration, bearing yellow, black and orange irregular specks. Narrow, conical and yellow-coloured extensions are seen scattered all over the body. The gills and rhinophores have blackish grey pigmentation and have yellowish orange pigmentation at the tip.

75. *Thecacera pennigera* (Montagu, 1813) - Plate 9

Original name: *Doris pennigera*

Description: The body is translucent and speckled with black and orange irregular spots or varying sizes, including the rhinophores and gills. Extra-rhinophoral and extra-branchial appendages have a white tip.

76. *Thecacera* sp.1 (J. Fleming, 1828) Plate 10

Original name: N/A

Description: The body, rhinophores and gills are translucent and dull coloured. They bear black spots densely placed almost covering all the surfaces, in between are yellow- and orange-coloured irregular spots.

77. *Thecacera* sp.2 (J. Fleming, 1828) Plate 10

Original name: N/A

Description: The body is translucent and white in colour and has long black patches present all over the body. Body is also speckled with orange and pale-yellow spots of different sizes. Similar pattern is observed on rhinophores and gills. Extra-

rhinophoral appendages have a creamish tip, black towards the tip and an orange band in the centre. Extra-branchial appendages have a similar colour pattern as that of the body.

Family: Neritidae

Subfamily: Neritininae

78. *Neripteron violaceum* (Gmelin, 1791) Plate 11

Original name: *Nerita violacea*

Description: The general colour of the shell is cream with an orangish tinge and black patches and wavy bands forming latitudinal patterns which vary from individual to individual. The shell is thick, solid, and globose. The spire is flat and strongly keeled posteriorly. The aperture is half-moon shaped and callous is thick and appears deep violet, maroon, light or dark brown coloured. The outer lip is thin and smooth. The inner lip appears crenated.

79. *Nerita albicilla* (Linnaeus, 1758) Plate 11

Original name: *Nerita albicilla*

Description: The shell is thick, solid, and globose. The spire is not elevated, the apex appears a bit depressed and strongly keeled posteriorly. The aperture is half-moon shaped. The columella is thick, creamy, and calloused. The outer lip is thin, sharp, crenulated on the inside and at the edge has light brown spots. The inner margin bears 4 weak teeth and several granulations. The shell's colour is variegated by black and white.

80. *Nerita chamaeleon* (Linnaeus, 1758) Plate 11

Original name: *Nerita chamaeleon*

Description: The shell is thick, solid, and globose. The spire is not elevated, the apex is pointed. The whorls are convex and are sculptured with spiral ridges. Aperture is small, half-moon shaped and deep. The columella is creamy, thick and the outer margin is thin, sharp, and traversed by two to three longitudinal ridges and granulations on the outer and inner side. The outer margin has black spots or a thin black band. The inner lip is denticulated, with the first two superior ones being knob shaped and the inferior one is the strongest. The spiral ridges are wavy, and its colour can vary from greenish black, greyish, reddish orange with blotched oblique bands of a different colour.

81. *Nerita oryzarum* (Récluz, 1841) Plate 11

Original name: *Nerita oryzarum*

Description: The shell is thick, solid, and globose. The spire is flat. The whorls are convex and have spiral ridges. Aperture is half-moon shaped and deep. The outer lip's inner margin is crenulated and the outer margin thin and sharp. The inner lip is denticulated with three pointed small teeth. The callous has few longitudinal ridges and granulations. The base colour of the shell is cream and bears irregular spiral greyish black or reddish orange bands.

82. *Clithon colombarium* (Recluz, 1846) Plate 11

Original name: *Nerita (Clithon) colombaria*

Description: The shell is comparatively smaller and thinner than *Nerita* sp. Shape is oval, the spire is compressed. Surface appears smooth and glossy. The colour and patterns of the shell highly vary. The whorls have been observed to have chipped surfaces or damaged surfaces. The aperture is half-moon shaped. Columella is slightly calloused and bears three fine teeth in the depression.

Family: Chilodontoidae

83. *Euchelus asper* (Gmelin, 1791) Plate 12

Original name: *Trochus asper*

Description: The shell is quite thick, and the spire is elevated. The shell appears dark brownish grey in colour. The whorls are inflated and have a beaded appearance because of grainy spiral ridges. The aperture is round. The columella has a conspicuous tooth at the base. The dorsal ridges extend up to the margin of the outer lip thereby giving it a toothed appearance.

Family: Fissurellidae

Subfamily: Diodorinae

84. *Diodora lima* (G. B. Sowerby II, 1862) Plate 12

Original name: *Fissurella lima*

Description: The shell margin is oval, conical, concave and inclined anteriorly. Prominent spiral and radial ridges seen.

85. *Diodora ruppellii* (G. B. Sowerby I, 1835) Plate 12

Original name: *Fissurella ruppellii*

Description: The shell is oval in shape and slightly elevated. Shell surface bears fine radial ribs and riblets. It is pale orange in colour with eight radial black bands. The aperture is elongated.

Subfamily: Emarginulinae

86. *Scutus unguis* (Linnaeus, 1758) Plate 12

Original name: *Patella unguis*

Description: The shell is flat, oblong, shield-like and reddish brown in colour. It is posteriorly inclined. The mantle extends out of the shell and almost covers the shell completely. The colour of the mantle is translucent white and black reticulated blotches all over. The muscular impression of the foot is horseshoe shaped.

Family: Trochidae

Subfamily: Trochinae

87. *Trochus radiatus* (Gmelin, 1791) Plate 13

Original name: *Trochus radiatus*

Description: Shell is conical with the whorls straight, and its base is circular and flat. The whorls have three spirally arranged rows of tubercles, in which the top row has larger tubercles than the two below it. The base also has spirally arranged ridges. The base colour is cream with a pinkish or green tinge and wavy oblique bands of reddish-brown colour are present on it.

88. *Clanculus depictus* (A. Adams, 1855) Plate 13

Original name: *Clanculus depictus*

Description: Conical shell, with flat whorls and a slightly convex base. Smaller than and very similar to *T. radiatus*, hence often confused as its juvenile form. It is generally cream to light yellow in colour, sometimes uniformly grey, with black to brownish black stripes.

Subfamily: Umboniinae

89. *Umbonium vestiarium* (Linnaeus, 1758) Plate 13

Original name: *Trochus vestiarius*

Description: The shell is solid, disc shaped and compressed. The surface of the shell is smooth and glossy. The colour and patterns on the shell highly vary. The operculum is very small, thin, and circular.

Family: Turbinidae

Subfamily: Turbininae

90. *Turbo intercostalis* (Menke, 1846) Plate 13

Original name: *Turbo intercostalis*

Description: The shell is thick and heavy. Few prominent and thick spiral ridges encircle the whorl. A denticle is formed by extension of the largest middle ridge on the margin of the outer lip. Umbilicus is deep and narrow. The shell generally appears uniform grey in colour or has a chequered pattern of black or dull green.

91. *Astralium semicostatum* (Keiner, 1850) Plate 13

Original name: *Trochus semicostatus*

Description: The shell is chalky to creamy white in colour. Conical in shape, elevated spire, whorls are

concave with its upper and lower margins scalloped and slightly extended outside the edges. Base is circular and flat with numerous lirae. Aperture is semioval and white in colour. Outer and lip edges are smooth.

Family: Nacellidae

92. *Cellana radiata* (Born, 1778) Plate 13

Original name: *Patella radiata*

Description: The shell is moderately conical and roundly ovate in shape. The base colour is pale cream, and rays have brownish black pigmentation.

93. *Cellana rota* (Gmelin, 1791) Plate 13

Original name: *Patella rota*

Description: The shell is moderately elevated and conical. The shape is more or less circular. The shell is slightly sculptured with fine riblets. It bears greyish black stripes in alternation with cream stripes with orange streaks on them.

94. *Patelloida lentiginosa (Reeve, 1855)* Plate 13

Original name: Patella lentiginosa

Description: The shell is moderately elevated and almost circular in shape. It bears greyish black stripes alternated with cream stripes. In some individuals the striped pattern may appear smudged. Diagnostic orange zig-zag streaks are clearly visible on the cream stripes.

Family: Planaxidae

Subfamily: Planaxinae

95. *Planaxis sulcatus* (Born, 1778) Plate 14

Original name: *Buccinum sulcatum*

Description: Conical shell and is dark purplish or maroon in colour, white or cream colour spots arranged spirally on spiral striae. The aperture is wide, oval, and dark black in colour and sometimes can have dark purple grooves. The outer lip appears wavy because of the rounded ridges. Inner lip is pale white and shows light purple colouration.

Family: Potamididae

96. *Pirenella cingulata* (Gmelin, 1791) Plate 14

Original name: *Murex cingulatus*

Description: Elongated and conical shell. The spire is structured with spirally arranged granulation. The shell is black in colour with transverse light brown lines present near the suture and several similar lines of varying thickness is seen on the body whorl. The aperture is half-moon shaped. The outer lip appears crenated and shows purple bands and the inner lip is smooth.

97. *Telescopium telescopium* (Linnaeus, 1758) Plate 14

Original name: *Trochus telescopium*

Description: The shell is thick and conical. Whorls are 14-16 in number, and sides are straight. It is brownish black in colour. The surface bears several flat and uneven spiral stripes. The aperture is small, twisted. Columella is canalled. The outer lip is

thick and flares anteriorly over the siphonal canal.

Family: Cerithiidae

98. *Clypeomorus batillariaeformis* (Habe & Kosuge, 1966) Plate 14

Original name: *Clypeomorus batillariaeformis*

Description: The shell is black in colour. Elongated, conical and the spire is elevated. The whorls are slightly convex and decorated with spirally beaded ribs. Its egg ribbon is transparent with microscopic creamish-yellow eggs, long and loosely folded in a random manner, on a rock.

Family: Thiaridae

Subfamily: Thiarinae

99. *Melanoides tuberculata* (O. F. Muller, 1774) Plate 14

Original name: *Nerita tuberculata*

Description: This species is known to have several shell colours and various patterns. Although it is a freshwater species, it is also reportedly found in almost every aquatic habitat provided the water is well oxygenated. The shell is conical, elongated and the spire is elevated. The whorls are rounded. The base colour is pale cream, ornamented with reddish orange flame like spots present longitudinally on each whorl. The surface of the shell is structured with spirally arranged ridges. The aperture is oval. The outer and inner lips are smooth.

Family: Turritellidae

100. *Turritella duplicata* (Linnaeus, 1758) Plate 15

Original name: *Turbo duplicatus*

Description: The shell is elongate, conical and the spire is elevated and pointed. It is light brown in colour. The whorls are convex and bear 2 spirally placed sharp ridges in the centre. Sutures are slightly impressed and tight. The aperture is oval, both lips are smooth.

101. *Turritella* sp. (Lamarck, 1799) Plate 15

Original name: N/A

Description: the shell characteristics are similar as that of *T. duplicata*. Except the whorls show 3 spirally placed sharp ridges in their centre.

Family: Babyloniidae

102. *Babylonia spirata* (Linnaeus. 1758) Plate 15

Original name: *Buccinum spiratum*

Description: The shell is smooth and heavy and the whorls are inflated. The spire is high, elongated with shoulders prominent and sutures are deep and channelled. The aperture is large and ovate with the outer lip sharp and strongly turned at the top and the interior is smooth and thick. The colour is pale white to cream with light brown blotches and spots arranged obliquely.

Family: Muricidae

103. Unidentified - Plate 15

Original name: Muricidae (Rafinesque, 1815)

Description: The shell is spindle shaped and quite thick. It is reddish

maroon in colour with cream colour bands of different thicknesses. The spire is elevated, and the whorls are flat and bear ridges with slightly raised tubercles. The sutures appear concave. The body whorl shows three rounded and slightly raised ridges. The outer lip is thick and bears 5-6 denticulations on its inside. The inner lip is thin and smooth.

Subfamily: Muricinae

104. *Chicoreus brunneus* (Link, 1807) Plate 15

Original name: *Purpura brunnea*

Description: The shell appears rhomboid in shape. Colour of the shell is burnt black. Elevated spire and body whorl is 2/3rd of the spire. The spiral cords are thick with very fine tubercles, varices are frilled and bear spines. The spines on the shoulder are elongate and foliate.

105. *Chicoreus torrefactus* (G. B. Sowerby II, 1841) Plate 15

Original name: *Murex torrefactus*

Description: The shell is spindle shaped, tapering at both ends. The surface bears numerous latitudinal reddish orange lines of varying thickness. The base colour can vary from individual to individual. The surface also bears very fine granulation. Radial margins of the whorls are extended and frilled. The aperture is round, creamish white. Outer lip is wavy, and the inner lip is smooth.

106. *Murex* sp. (Linnaeus, 1758) - Plate 15

Original name: N/A

Description: The shell is off white in colour, conical in shape and with elevated spire. The whorls are convex, shoulders are rounded. The whorls show latitudinal thick and thin alternating ribs. The thick ribs have small bands of brown colour. The siphonal canal is long, recurved anteriorly and bears 6 primary spines decreasing in size towards the anterior side. The body whorl has 3 primary spines, with the shorter spine in between the 2 longer spines.

Subfamily: Rapaninae

107. *Indothais lacera* (Born, 1778) - Plate 15

Original name: *Murex lacerus*

Description: The shell is oval and fusiform in shape. It can be orangish brown, peach to grey in colour. Shoulders are prominent, angulated and bear pointed, conical projections. Aperture is cream in colour. Outer lip is denticulate, and the inner lip is smooth. The egg cases are laid in clusters. Its apex is pointed and curved.

108. *Indothais sacellum* (Gmelin, 1791) Plate 16

Original name: *Murex sacellum*

Description: The shell is oval and fusiform in shape. The colour can be yellowish tan, grey with brown patches or completely grey when covered in mud. The whorls have distinct projecting knobs on shoulders and squamose spiral cords that are separated by intervals as broad as

cords. The body whorl has larger and thicker spiral cords which are closely placed. The aperture is white in colour, the outer lip bears denticulations that extend far inside the aperture. The egg cases are laid in clusters, rectangular in shape with a longitudinal depression running in the centre.

109. *Indothais blanfordi* (Melvill, 1893) Plate 16

Original name: *Purpura (Stramonita) blanfordi*

Description: The shell appears fusiform in shape and blackish grey in colour. Spire is elevated, apex is pointed. Whorls are decorated with large, rounded elevations in the centre. The body whorl has wide, spiral ribs distanced with riblets in between them. The aperture is oval with inner lip smooth. Outer lip has a waved margin and bear six longitudinal denticulations in pairs.

110. *Purpura bufo* (Lamarck, 1822) Plate 16

Original name: *Purpura bufo*

Description: The shell characteristics are similar to that of *P. persica*. Except that the spire is slightly low, and the body whorl shows large, rounded nodules. The egg cases are laid in clusters. They are cylindrical with a blunt, flat tip of the apex.

111. *Purpura persica* (Linnaeus, 1758) Plate 16

Original name: *Buccinum persicum*

Description: The shell is fusiform, spire is elevated. It is blackish grey in colour. The spire whorls are slightly convex

while the body whorl is convex and narrowing anteriorly. The body whorl bears spirally arranged raised ribs with black and white colour bands alternating each other. This rib is spaced with 5 – 6 impressed lines that are black in colour and bear a row of rounded tubercles. The aperture is white in colour with a slight orange tinge and oval. The outer lip has a crenulated margin, and its inside are smooth. The egg cases are laid in clusters, anchored to rocks and they are somewhat bilaterally flat, arch shaped with a slight depression in the centre at the apex, appearing like a tooth.

112. *Semiricinula tissoti* (Petit de la Saussaye, 1852) Plate 16

Original name: *Purpura tissoti*

Description: It is often confused with *I. blanfordi* because visually it's very similar looking. It has transverse bisulcate grooves and spiral raised ridges of equidistant rounded nodules. Egg cases are laid in clusters and anchored to a rock. Each case is cylindrical with a rounded tip at the apex, like a finger.

113. *Reishia cf. bitubercularis* (Kuroda & Habe, 1971) Plate 16

Original name: *N/A*

Description: The shell is fusiform, black in colour with white interrupted bands alternated by 2 to 3 flat ridges on the whorls. The spire is elevated, whorls appear concave with nodular shoulders. Body whorl shows two spiral rows of large, rounded nodules. The aperture is oval in shape. The outer

lip shows black colouration towards the inside edges and margin appears wavy, denticulations are absent, while the inner lip is smooth and creamish orange in colour.

Subfamily: Ergalataxinae

114. *Ergalatax contracta* (Reeve, 1846) Plate 16

Original name: *Buccinum contractum*

Description: The shell is uniformly dark reddish brown in colour. It is fusiform in shape; the spire is elevated with pointed apex. The whorls are convex and bear longitudinal, raised and rounded ridges. It is also structured with spirally arranged flat ribs. The aperture is oval, elongated and white in colour. Inner lip is smooth while the outer lip bears denticulations on the inside.

115. *Lataxiena bombayana* (Melvill, 1893) Plate 16

Original name: *Murex (Ocinebra) bombayana*

Description: The shell is fusiform in shape, elevated spire and creamish to off white in colour. It has longitudinally raised ridges and spirally raised prominent ribs or fasciae which are brown in colour. The aperture is oval. The outer lip is thick and bears denticulations on the inside.

116. *Arakawania granulata* (Duclos, 1832) Plate 17

Original name: N/A

Description: The shell is uniformly black in colour and fusiform in shape. The spire is elevated. The whorls are decorated with spirally arranged

rounded nodules that are closely placed.

Family: Clavatulidae

117. *Turricula javana* (Linnaeus, 1767) Plate 17

Original name: *Murex javanus*

Description: The shell is deep brown in colour. The spire is tall and pointed. Body whorl is longer than the spire and slightly inflated. Small nodules are obliquely arranged in the middle region of the body whorl, forming a spiral ridge. The aperture is wide, and shoulders are angular. Large nodules on the spire are lighter in colour.

Family: Conidae

118. *Conus achatinus* (Gmelin, 1791) Plate 17

Original name: *Conus achatinus*

Description: The shell is conical and the last whorl is convex. The spire is elevated. The aperture widens at the base. The colour patterns of the shell vary from individual to individual. Blotches of white, brown, black, or orange form distinct patterns on the last whorl.

119. *Conus biliosus* (Roding, 1798) Plate 17

Original name: *Cucullus biliosus*

Description: Shell is elongated and conical with a slightly elevated spire. The last whorl outline is straight and tuberculate. The shoulder is angulated. The periostracum is reddish brown in colour, white colour longitudinal striations and red spots placed equidistant covering the last whorl.

120. *Conus hyaena* (Hwass, 1792) Plate 17

Original name: *Conus hyaena*

Description: Elongated, conical shell with spire slightly elevated and convex last whorl. The shoulder is slightly convex, or sub angulated. The periostracum is orangish brown in colour and has white longitudinal striations.

Family: Turridae

121. *Annulaturris amicta* (E. A. Smith, 1877) Plate 17

Original name: *Pleurotoma amicta*

Description: The shell is conical in shape; elevated spire and the whorls are straight. It is greyish white in colour. The whorls are decorated with spiral raised lines with spaces in between. The aperture is white in colour, elongated and oval. The inner lip is smooth while the outer lip appears wavy because of the lines of the body whorl. The outer lip also shows a small fold posteriorly.

122. Unidentified - Plate 17

Original name: Turridae (H. Adams & A. Adams, 1853)

Description: The shell is chalky white in colour. It is conical in shape and the spire is elevated. The whorls are convex and bear longitudinal, raised and rounded ridges. They are also structured with latitudinal flat ribs. The aperture is also white coloured, elongated and oval. The inner lip is smooth and upturned. The outer lip is smooth too.

Family: Terebridae

123. *Duplicaria spectabilis* (Hinds, 1844) Plate 18

Original name: *Terebra spectabilis*

Description: The shell is conical in shape and the spire is elevated. The whorls are straight, sutures are slightly impressed. It is reddish brown in colour with a cream colour band placed just above and below the suture. The whorls are structured with longitudinal raised lines in two distinct sets, one is short, placed sub suturally while the longer ones are placed beneath the shorter ones. The aperture is elongated, and both the lips are smooth.

Family: Columbellidae

124. *Anachis terpsichore* (G. B. Sowerby I, 1822) Plate 18

Original name: *Columbella terpsichore*

Description: Shell is oval acuminate and pointed at apex. Body whorl is more than 2/3rd of the spire. Prominent axial ridges are seen. The outer lip is thick. The aperture is wide and is finely toothed at its interior margin at the base. Periostracum is white to cream in colour with orangish brown streaks, making distinct patterns.

125. Unidentified - Plate 18

Original name: Columbellidae (Swainson, 1840)

Description: The shell is fusiform in shape, elevated spire and convex whorls. The sutures are slightly deep. The shell displays an intricate pattern of black, brown, orange and cream colours.

Family: Melongenidae

126. *Volegalea cochlidium* (Linnaeus, 1758) Plate 18

Original name: *Murex cochlidium*

Description: The shell is reddish brown in colour. The spire is elevated, body whorl is 2/3rd of the spire. The body whorl is inflated. Shoulder bears prominent pointed turbercles. Aperture is oval and wide. Outer lip is finely ridged, and the inner lip is smooth. The egg cases measure about an inch in length, are laterally flat, concave at the top and bulging tips at the sides.

Family: Nassariidae

Subfamily: Nassariinae

127. *Nassarius stolatus* (Gmelin, 1791) Plate 18

Original name: *Buccinum stolatum*

Description: Shell is conical, spire is elevated and whorls are inflated. It is creamy white in colour with wide brown bands present at sub-sutural positions and one in the centre of the body whorl. Each whorl bears thick longitudinal ridges with spaces in between them. These ridges become almost obsolete near the outer lip on the dorsal side. The aperture is oval, the outer lip is thickened and its inside shows denticulations. The inside of the aperture shows the three spiral brown bands.

128. *Nassarius jacksonianus* (Quoy & Gaimard, 1833) Plate 18

Original name: *Buccinum jacksonianum*

Description: It is quite like *N. stolatus* with respect to its shell characteristics and colour pattern. *N. stolatus* is bigger than *N. jacksonianus*.

129. *Nassarius foveolatus* (Dunker, 1847) *Plate* 18

Original name: *Buccinum foveolatum*

Description: The shell is narrow, somewhat oval and elongate. It is greyish purple in colour with a dark band in the middle of the body whorl. Spire is elevated. Axial ribs are present with unequal interspaces in between them. Sutures appear cream in colour and nodulose on the spire.

130. *Nassarius nodiferus* (Powys, 1835) Plate 19

Original name: *Nassa nodifera*

Description: The shell is pale or ashy white in colour with bands of cream and dark red brown, conical and ovate in shape. Spire is elevated and the whorls are convex. It is longitudinally ribbed; ribs being placed closely and have enamel like shine. The suture line appears to have knobs aligning with the ridges. The aperture is oval. The inner lip is thin, and columella is extended as a thin layer. The outer lip is thick and plain with numerous ridges on its inside.

Subfamily: Bullinae

131. *Bullia* sp. (Gray, 1833) Plate 19

Original name: N/A

Description: The shell is conical in shape; spire is elevated and whorls are convex. It is grey in colour. The whorls

are smooth and show a line sub suturally and several spiral lines towards the aperture.

Family: Pisaniidae

132. *Cantharus spiralis* (Gray, 1839) Plate 19

Original name: *Cantharus spiralis*

Description: Shell is rhomboid in shape. Colour is pale creamish with brown longitudinal blotches. Spire is elevated and the apex is pointed. The whorls are structured with widely spaced prominent, thickened grooves and in between them are spiral threads. Shoulders are sunken. Aperture is oval and white in colour. Outer margin and inner margin are denticulated. The egg cases are convex and have a round margin.

Family: Cancellariidae

133. *Scalptia scalarina* (Lamarck, 1822) Plate 19

Original name: *Cancellaria scalarina*

Description: The shell is dark reddish brown in colour. It is conical in shape with an elevated spire. The sutures are depressed, and shoulders are angulated. The whorls are concave and are structured with longitudinal, raised lines and latitudinal flat lines. The aperture is oval. Both inner lip and outer lips are thickened.

Family: Mitridae

134. *Pseudonebularia proscissa* (Reeve, 1844) Plate 19

Original name: *Mitra proscissa*

Description: The shell is fusiform in shape, elevated spire and convex whorls. It is orange in colour and the whorls are structured with raised, spiral ribs. The aperture is elongated, and both the lips are smooth. The egg cases are small, cylindrical, tapering towards apex, and resemble grains of rice.

Family: Olividae

Subfamily: Agaroniinae

135. *Agaronia gibbosa* (Born, 1778) Plate 20

Original name: *Voluta gibbosa*

Description: The shell is spindle shaped, with tapering ends. The spire is elevated, and its whorls are flat. The body whorl is convex. The colour of the shell is cream with longitudinal brown wavy lines. The aperture is slit-like and becomes wider towards the anterior end. The outer lip is smooth, while the inner lip shows several spiral raised lines.

Family: Cypraeidae

Subfamily: Cypraeinae

Tribe: Mauritiini

136. *Mauritia arabica* (Linnaeus, 1758) Plate 20

Original name: *Cypraea arabica*

Description: The shell is oval, the spire is convex, smooth, and glossy. The base colour is greyish cream, and the network formed with dark brown spots and lines. The edges are thickened with brown bands placed randomly. The base is flat, greyish cream. The aperture is slit-like and wide. The outer

lip and inner lip bear numerous teeth and are yellow to brown in colour. The juvenile stage looks like olive shells, with the spire sticking out, convex whorls and a distorted colour pattern. The egg cases are triangular in shape and have pink to orange tinge.

Subfamily: Erosariinae

137. *Monetaria moneta* (Linnaeus, 1758) Plate 20

Original name: *Cypraea moneta*

Description: Shell is oval, wider at the anterior end and narrow towards the hind end. It is smooth, glossy, and yellowish white in colour. The spire is convex and elevated. A greyish blotch is present in the centre of the elevated spire. The edges are thickened. The aperture is slit-like, wide and both the lips bear teeth.

138. *Naria turdus* (Lamarck, 1810) Plate 20

Original name: *Cypraea turdus*

Description: The shell is oval and uniformly white in colour, speckled with yellowish brown spots of irregular sizes. The spire is elevated and convex. The edges are thickened. The base is white, and the aperture is wider at the anterior end and narrower towards the hind end. Both the outer and inner lips have numerous teeth that extend up to the columella and are callous.

Subfamily: Erroneinae

139. *Erronea pallida* (J. E. Gray, 1824) Plate 20

Original name: *Cypraea pallida*

Description: Shell is ovate with the front end slightly wide and hind end is rounded. The spire is convex, smooth, and glossy. It is pale cream or greyish in colour and speckled with numerous brown spots. The edge is thickened, pale cream in colour with large purplish brown spots. The aperture is slit-like and wide. The inner lip bears teeth that are blunt and extend up to the columella. The outer lip has smaller teeth and is pointed.

Tribe: Bistolidini

140. *Palmadusta lentiginosa* (J. E. Gray, 1825) Plate 20

Original name: *Cypraea lentiginosa*

Description: The shell is oval; the spire is elevated and convex. It is white in colour and speckled with brown spots. Three brownish obscure wavy bands span the width of the spire. The edges are thickened. The base and edges also have distinct brown spots scattered. The aperture is wide. The inner and outer lips appear ribbed. The juvenile has a white coloured shell with orange spots placed spirally.

Family: Ovulidae

Subfamily: Prionovolvinae

141. *Cuspivolva* sp. (C. N. cate, 1973) Plate 21

Original name: N/A

Description: The shell is ovoid, white in colour. Very fine transversal lines can be seen on the shell. The mantle is translucent and speckled with small and distinct black spots.

142. *Primovula* sp. (Thiele, 1925) Plate 21

Original name: N/A

Description: Ovoid shell, orangish red in colour. The transversal lines are distinctly visible on the shell. The mantle is pale orangish red in colour and speckled with black spots and white raised spots.

143. *Crenavolva striatula* (G. B. Sowerby I, 1828) Plate 21

Original name: *Ovulum striatulum*

Description: The shell is ovoid and pale orangish red with a cream-coloured band. The mantle is orangish pink in colour with raised dark pink and white spots.

Family: Velutinidae

Subfamily: Lamellariinae

144. *Lamellaria* sp. (Montagu. 1816) Plate 21

Original name: N/A

Description: The snail is oval in shape; the surface shows black spots on a translucent circular patch and the rest is covered by specks of irregular pale yellow and white. The circular shell is visible in the centre and is translucent white in colour.

Family: Littorinidae

145. *Littoraria sp. 1* (Gray, 1833) Plate 21

Original name: N/A

Description: Conical shell, spire elevated and long. The whorls are slightly impressed at the suture, convex, and rounded. The colour is black with irregular zig zag or oblique off-white lines.

146. *Littoraria* sp. 2 (Gray, 1833) Plate 21

Original name: N/A

Description: The shell is conical, spire is elevated, apex pointed. Whorls are straight, are cream in colour with longitudinal marks of red and purple in an irregular spiral.

147. *Littoraria* sp. 3 (Gray, 1833) Plate 21

Original name: N/A

Description: The shell is light greyish white in colour, spire is elevated, conical in shape, whorls slightly inflated and bears brown longitudinal marks which appear to be spirally arranged.

148. *Littoraria* sp. 4 (Gray, 1833) Plate 21

Original name: N/A

Description: The shell is conical and pale cream in colour. The whorls are flat, sutures are tight and impressed. The whorls show spiral and flat bands which show orange coloured longitudinally arranged spots. The aperture is circular and the outer and inner lip is smooth.

149. *Echinolittorina malaccana* (R. A. Philippi, 1847) Plate 21

Original name: *Littorina malaccana*

Description: The shell is very small, conical and is deep grey in colour. The spire is elevated, the body whorl is convex and bears two rows of rounded nodules.

Family: Naticidae

Subfamily: Naticinae

150. *Paratectonatica tigrina* (Roding, 1798) Plate 22

Original name: *Cochlis tigrina*

Description: Shell characteristics are similar to *T. lineata*. Shell is pale white in colour with light to dark brown spots. The egg case is flat and collar like dark grey in colour speckled with tiny white microscopic eggs.

151. *Tanea lineata* (Roding, 1798) Plate 22

Original name: *Cochlis lineata*

Description: The shell is globose; whorls are inflated, and the spire is slightly raised. Colour is pale white with closely placed transverse wavy pale orange colour lines. The umbilical region is white in colour. The surface is glossy. The aperture is large, both the lips are smooth. A short funicle spirally enters into the umbilical depression. A U-shaped space separates it from parietal callus.

152. *Neverita didyma* (Roding, 1798) Plate 22

Original name: *Albula didyma*

Description: Shell characteristics are like *T. lineata*. It is brownish in colouration and bears whitish grey transverse lines. Surface is smooth and glossy. The interior of the aperture and callus has purplish brown colouration.

Family: Rostellaridae

153. *Tibia curta* (G. B. Sowerby II, 1842) Plate 22

Original name: *Tibia curta*

Description: The shell is elongated. Spire is conical, pointed, and elevated. It is pale cream to light brown in colouration which gets darkened at the sutures. Aperture is oval and tapering at both ends and white in colour. The outer lip is thick and bears 3 - 4 short and rounded finger-like projections. The inner lip is also thick, white and is turned outwards.

Family: Bursidae

154. *Bufonaria echinata* (Link, 1807) Plate 22

Original name: *Gyrineum echinatum*

Description: The shell is elongated and is light brown in colour and dark brown markings can be found occasionally. The spire is elevated and bears granular spiral ribs that are closely placed and has peripheral rows of small nodules. Adjacent to the interior canal is a strong recurved spine. The outer lip's inner margin is flared and bears irregular shaped teeth on the outer margin.

Family: Cymatiidae

155. *Gyrineum natator* (Roding, 1798) Plate 23

Original name: *Tritonium natator*

Description: The shell is dorso-ventrally compressed and is conical in shape. The spire is elevated, and the apex is pointed. The body whorl is structured by granulation and lines in spiral cords. The spire whorls too have spiral cords. The aperture is round, white and its interior is toothed. The outer lip is varixed, strong and thick. The shell displays bands of grey, orange, pale black with reddish tinge

and cream on the lateral thickened and curved sides. The egg cases are spherical and laid in a tight spiral.

Family: Assimineidae

156. *Assiminea* sp.1 (J. Fleming, 1828) Plate 23

Original name: N/A

Description: The shell is uniformly pale light brown in colour, convex whorls and tight sutures. The snail is red in colour.

157. *Assiminea* sp.2 (J. Fleming, 1828) Plate 23

Original name: N/A

Description: The shell features are the same as *Assiminea* sp.1, except that the body whorl is yellow in colour. The snail is white in colour.

Family: Iravadidae

158. *Iravadia bombayana* (Stoliczka, 1868) Plate 23

Original name: *Fairbankia bombayana*

Description: The shell is pale cream in colour, whorls are convex, and the spire is elevated. The snail's tentacles show alternate bands of white and black.

Family: Vermetidae

159. *Thylacodes* sp.1 (Guettard, 1770) Plate 23

Original name: N/A

Description: The shell spirals loosen and almost straightens towards the aperture, pale cream in colour with slight pinkish, orange, and brown tinge. Faint ribs are visible on the shell.

The snail is purplish black in colour. Oval, concave and black operculum can be seen.

160. *Thylacodes sp. 2* (Guettard, 1770) Plate 23

Original name: N/A

Description: The shell spirals appear somewhat flattened, and it is concentrically arranged. Ribs are visible on the surface and several longitudinal ridges are also seen in the centre of the shell. No operculum is visible.

161. *Thylacodes* sp. 3 (Guettard, 1770) Plate 23

Original name: N/A

Description: The snail has a blackish maroon colour, speckled with white. Operculum is black in colour, showing a spiral pattern.

Family: Calyptraeidae

162. Unidentified – Plate 23

Original name: Calyptraeidae (Lamarck, 1809)

Description:

These shells were usually observed inside the dead shells. They are chalky white in colour and convex in shape. The spire is keeled posteriorly. Very fine concentric lines can be seen on the shell.

Family: Epitoniidae

163. *Janthina* sp. (Roding, 1798) Plate 24

Original name: N/A

Description: The shell is smooth, purple in colour and the spire is flat with rounded shoulders.

- DISCUSSION:

The study reports that *Pelagella modesta* (Alder & Hancock, 1864) from Visakhapatnam, Andhra Pradesh, *Cuthona annandalei* (Eliot, 1910) from Port Canning, West Bengal, *Aplysia* cf. *rudmani* (Bebbington, 1974) originally described from Bayt island, Gujarat (present day Beyt Dwarka) have all been recorded for the first time after their description and require revision given the significant advancements in taxonomic studies since their discovery. Additionally, five other individuals of *Aplysia* sp. were documented, the identification of which as *Aplysia rudmani* remains tentative due to the lack of anatomical studies of the species from the region. This paper further highlights the rediscovery of seven species from their type locality nearly 7 decades after their discovery. Among these, *Glossodoris poecila* is classified as a taxon inquirendum (WoRMS, 2025) indicating the necessity for a re-evaluation of its taxonomic status.

According to Nudibranch Systematic Indices published online by Mc Donald (2006, 2009, 2021), *Glossodoris semeion* had been synonymised with *Glossodoris diardii* by Pruvot-Fol (Pruvot-Fol, 1951a, b) and subsequently classified as *Hypselodoris semeion* by Rudman, (Rudman, 1983). It was also erroneously regarded as a synonym of *Hypselodoris infucata* by Bhave & Apte, (Bhave & Apte, 2013), likely based on the data presented in Nudibranch systematic indices. Since the current

study relies on taxonomical information from WoRMS, the species is listed as *Glossodoris semeion* in the checklist.

Multiple species of *Atagema*, *Carminodoris* and *Cratena* are recorded as new species records, because although these genera have been previously reported from the Mumbai Metropolitan Region (MMR), the species encountered in the present study differ morphologically from those described earlier and thus require further taxonomic evaluation.

In addition to the gastropods listed in this study, empty shells of *Monetaria annulus* and *Conasprella dictator* were reported from the Carter Road shore. The pelagic marine gastropod *Janthina sp.* has also been included in the checklist, having been discovered washed ashore at Girgaon beach. Furthermore, some shelled gastropods from the presented checklist namely *Ellobium* sp., *Physella* sp., *Murex* sp., *Turritella* sp., *Bullia* sp., *Littoraria* sp.1, *Littoraria* sp.2, *Littoraria* sp.3, *Littoraria* sp.4, *Assiminea* sp.1, *Assiminea* sp.2, *Thylacodes* sp.1, *Thylacodes* sp.2, *Thylacodes* sp.3; and unidentified specimens belonging to families Muricidae, Turridae, Columbellidae, and Calyptraeidae remain unidentified to the species level due to the paucity of published literature from the region.

On assessing the conservation status of species listed in the present study, it was found that seven species - *Cassidula aurisfelis*, *Melampus sincaporensis*, *Telescopium telescopium*, *Melanoides tuberculata*, *Conus achatinus*, *Conus biliosus*,

Conus hyaena are classified as least concern. The remaining have not been evaluated in the IUCN Red List of Threatened Species. Furthermore, none of the species included in the present study are listed under any Schedules of the Wildlife Protection Act, 1972. The presence of numerous new species records highlights a significant knowledge gap regarding marine molluscan fauna in the region. The present checklist provides gastropod distribution patterns observed in intertidal habitats of the Mumbai Metropolitan Region during data collection (Table 4). A sustained long-term effort is essential to systematically assess the population status of various groups in the region.

The coastline of the Mumbai Metropolitan Region is a highly altered one, continuously reshaped to accommodate the demands of its population and industry. The intertidal habitats are heavily impacted by anthropogenic activities such as coastal construction, untreated sewage disposal, oil spills, and land reclamations, rendering the nearshore waters one of the most degraded in the country. The presence of 163 species from the region indicates a thriving gastropod community but also highlights the lack of ecological studies from such an anthropogenically altered habitat. This checklist draws attention to one of the largest yet highly overlooked groups from the intertidal region, which serve as crucial indicators of their habitats (Kulkarni, 2017). The authors recommend the need for fine-scale ecological studies to better understand species-habitat relationships in the region. Such studies are vital to elucidate the role of gastropods in maintaining ecological stability and to

assess resilience thresholds these and other species possess amid ongoing habitat alterations.

This checklist represents a decade-long dataset of gastropod diversity and distribution, generated by the citizen science project Marine Life of Mumbai. Between February 2014 and January 2024 this effort has collectively documented 163 records of gastropods from the rocky, sandy and muddy intertidal habitats of Mumbai (iNaturalist. Available from https://www.inaturalist.org/projects/marine-life-of-mumbai. Accessed February 2024). Analysis of this dataset has revealed several new records and rediscoveries for the region, underscoring the significance of long-term citizen science efforts in uncovering biodiversity. Voluntary initiatives such as these, especially across previously unrecorded habitats, remain among the most cost-effective approaches to addressing data gaps and establishing essential baselines. The outcomes of this research highlight the immense value of such findings and further emphasise the necessity for finer-scale, taxonomic and ecological studies in a complex and dynamic urban coastal ecosystem like Mumbai.

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➢ DECLARATION OF INTEREST:

The authors declare that there are no relevant financial or non-financial competing interests related to this study. Furthermore, the research was conducted independently, without any external funding or financial support. All conclusions drawn are solely based on the authors' analysis and interpretation of the data.

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- APPENDIX:

Tables

Table 1: Study sites divided into Zones (Source: Authors)

Table 2: Zone Wise distribution of Gastropods. (provided separately as another document) (Source: Authors).

Table 3: New Records of Gastropods from MMR. (Source: Authors)

Table 4: Rediscoveries of species originally described from Mumbai. (Source: Authors)

Table 5: Record of shelled Gastropods if they were observed live. (Source: Authors)

Figures

Figure 1: Map of MMR region showing the Study sites. (Source: Authors)

Intertidal Gastropods of the Mumbai Metropolitan Region

Family: Aplysiidae

Aplysia cf. *rudmani*

Bursatella leachii

Family: Haminoeidae

Bakawan rotundata

Haloa pemphis

Haloa wallisii

Family: Haminoeidae

H. wallisii egg mass

Smaragdinella sieboldi

S. sieboldi egg mass

Family: Onchidiidae

Paromoionchis penangensis

Peronia verruculata

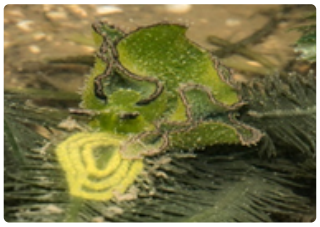
Platevindex tigrinus

PLATE 1

Family: Plakobranchidae

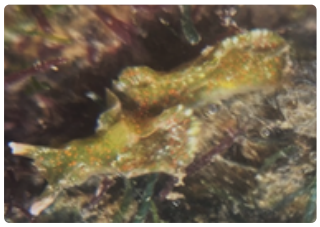
Elysia bangtawaensis

Elysia cf. *hirasei*



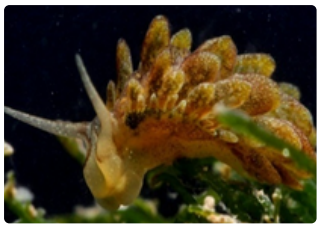
Elysia tomentosa

Family: Plakobranchidae

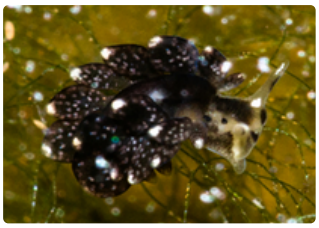


Elysia sp.

Family: Limapontiidae



Ercolania sp. 1



Ercolania sp. 2

Ercolania sp. 3

Family: Limapontiidae

Unidentified

Family: Costasiellidae

Costasiella sp.

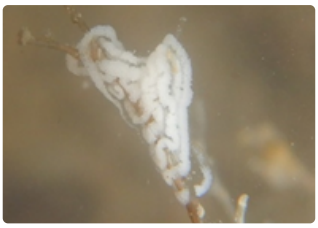
Family: Pleurobranchidae

Berthella sp.

Family: Facelinidae

Cratena lineata

Cratena pawarshindeorum



C. pawarshindeorum egg mass

Family: Facelinidae

Cratena sp. 1

Cratena sp. 2

Family: Facelinidae

Herviella yatsui

Phidiana sp.

Noumeaella sp.

Family: Flabellinidae

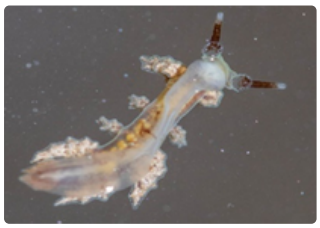
Coryphellina sp.1

Coryphellina sp.2

Family: Bornellidae

Bornella stellifera

Family: Dotidae



Doto sp.1

Doto sp.1 *egg ribbon*

Doto sp.2

Family: Eubranchidae

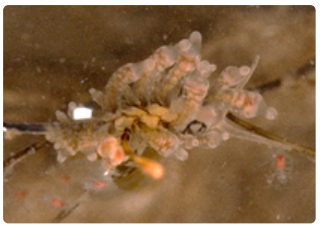
Eubranchus sp.

Family: Cuthonidae

Cuthona annandalei

Family: Trinchesiidae

Tenellia sp.1



Tenellia sp.2

Family: Tritoniidae

Marionia pambanensis

Family: Janolidae

Janolus mirabilis

Family: Actinocyclidae

Hallaxa sp.1

Hallaxa sp.1 *egg ribbon*

Hallaxa sp.2

Family: Actinocyclidae

Actinocyclus sp.

Family: Chromodorididae

Glossodoris poecila

Glossodoris semeion

Goniobranchus bombayanus

Family: Chromodorididae

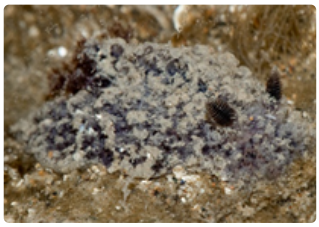
Goniobranchus trimarginatus

Hypselodoris zebrina

Family: Discodorididae

Atagema osseosa

Atagema tristis



Atagema sp.

Family: Discodorididae

Carminodoris cf. *grandiflora*

Carminodoris cf. *grandiflora egg ribbon*

Carminodoris sp.1

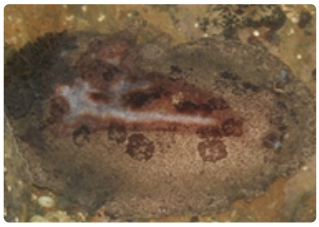
Family: Discodorididae

Carminodoris sp.2

Family: Dorididae

Doris immonda

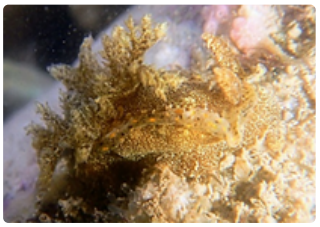
Doris sp.



Sebadoris fragilis

Family: Goniodorididae

Pelagella kolabana

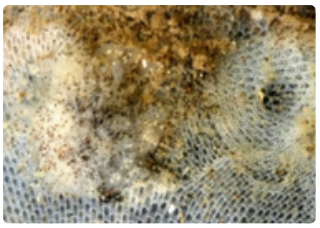


Pelagella modesta

Murphydoris puncticulata

Family: Goniodorididae

Trapania japonica



Ceratodoris sp.1

Ceratodoris sp.2

Family: Goniodorididae

Ceratodoris sp.3

Family: Onchidorididae

Atalodoris sp.

Family: Dendrodorididae

Dendrodoris fumata

Doriopsilla miniata

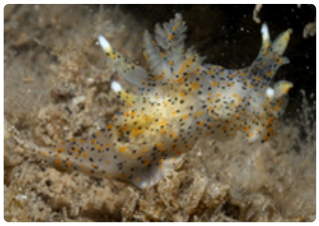
D. miniata egg ribbon

Doriopsilla sp.

Family: Polyceridae

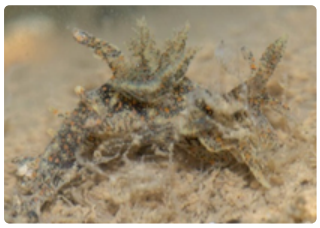
Plocamopherus ceylonicus

Polycera sp.



Thecacera pennigera

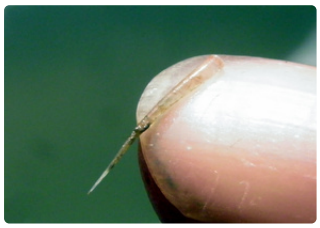
Family: Polyceridae



Thecacera sp.1

Thecacera sp.2

Family: Creseidae



Creseis sp.

Family: Neritidae

Neripteron violaceum

Nerita albicilla

Nerita chamaeleon

Family: Neritidae

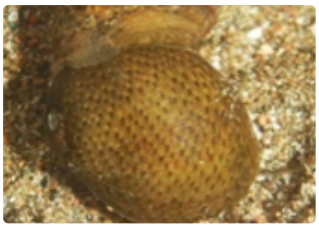
Nerita oryzarum

Clithon colombarium

Clithon colombarium

Family: Neritidae

Clithon colombarium



Clithon colombarium

Clithon colombarium

Family: Cylichnidae

Cylichna cylindracea

Family: Ellobiidae

Cassidula aurisfelis

Cassidula nucleus

Ellobium sp.

Family: Ellobiidae

Melampus sincaporensis

Family: Chilodontoidae

Euchelus asper

Family: Fissurellidae

Diodora lima

Diodora ruppellii

Scutus unguis

Family: Trochidae

Trochus radiatus

Clanculus depictus

Umbonium vestiarium

Family: Turbinidae

Turbo intercostalis

Astralium semicostatum

Family: Nacellidae

Cellana radiata

Cellana rota

Patelloidia lentiginosa

Family: Siphonariidae

Siphonaria basseinensis

Family: Planaxidae

Planaxis sulcatus

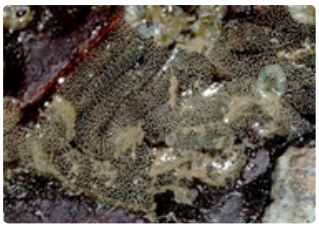
Family: Potamididae

Pirenella cingulata

Telescopium telescopium

Family: Cerithidae

Clypeomorus batillariaeformis



C. batillariaeformis egg mass

Family: Thiaridae

Melanoides tuberculata

Family: Cancellaridae

Turritella duplicata

Turritella sp.

Family: Babyloniidae

Babylonia spirata

B. spirata egg cases

Family: Muricidae

Unidentified

Chicoreus brunneus

Chicoreus torrefactus

Family: Muricidae

Murex sp.

Indothais lacera

I. lacera egg cases

Family: Muricidae

Indothais sacellum

I. sacellum egg cases

Indothais blanfordi

Family: Muricidae

Purpura bufo

P. bufo egg cases

Purpura persica

Family: Muricidae

P. persica egg cases

Semiricinula tissoti

S. tissoti egg cases

Family: Muricidae

Reishia cf. bitubercularis

Ergalatax contracta

Lataxeina bombayana

Family: Muricidae

Arakawania granulata

Family: Clavatulidae

Turricula javana

Family: Conidae

Conus achatinus

Conus biliosus

Conus hyaena

Family: Turridae

Annulaturris amicta

Unidentified

Family: Terebridae

Duplicaria spectabilis

Family: Columbellidae

Anachis terpsichore

Unidentified

Family: Melongenidae

Volegalea cochlidium

V. cochlidium egg cases

Family: Nassariidae

Nassarius stolatus

Nassarius jacksonianus

Nassarius foveolatus

Family: Plakobranchidae

Nassarius nodiferus

Bullia sp.

Family: Pisaniidae

Cantharus spiralis

C. spiralis egg cases

Family: Cancellariidae

Scalptia scalarina

Family: Mitridae

Psesudonebularia proscissa

P. proscissa egg cases

Family: Olividae

Agaronia gibbosa

Family: Cypraeidae

Mauritia arabica

M. arabica juvenile

M. arabica egg mass

Family: Cypraeidae

Monetaria moneta

Naria turdus

Erronea pallida

Family: Cypraeidae

Palmadusta lentiginosa

P. lentiginosa juvenile

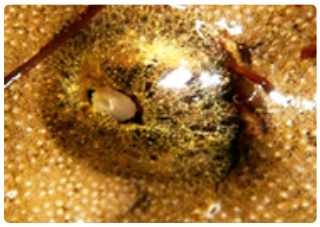
Family: Ovulidae

Cuspivolva sp.

Primovula sp.

Crenovola striatula

Family: Velutinidae



Lamellaria sp.

Family: Littorinidae

Littoraria sp. 1

Littoraria sp. 2

Littoraria sp. 3

Family: Littorinidae

Littoraria sp. 4

Echinolittorina malaccana

Family: Naticidae

Paratectonatica tigrina

P. tigrina egg mass

Tanea lineata

Family: Naticidae

Neverita didyma

Family: Rostellaridae

Tibia curta

Family: Bursidae

Bufonaria echinata

Family: Cymatidae

Gyrineum natator

G. natator egg mass

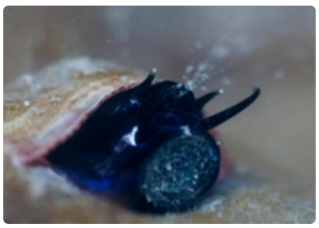
Family: Assimineidae

Assiminea sp. 1

Assiminea sp. 2

Iravadia bombayana

Family: Vermetidae



Thylacodes sp. 1

Thylacodes sp. 2

Thylacodes sp. 3

Family: Calyptraeidae

Unidentified

Family: Epitoniidae

Janthina sp.