

Chapter 47

Mollusca : Heterobranchia

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INTRODUCTION

Heterobranchia refers a sub-class of gastropoda which includes the snails and slugs. They are colourful animals and are represented from all the marine regions of the world. The previously valid group clade of gastropoda, opisthobranchia belongs to this sub-class. Taxonomy of the group of opisthobranchia still unresolved and dramatic changes are still being happened (Zapata *et al.*, 2014). Currently the taxonomy of opisthobranchia has undergone a major revision and all the previously know opisthobranch groups are included under sub-class heterobranchia. (Wagele *et al.*, 2014). Heterobranchia is a monophyletic group which includes the most diverse groups of gastropoda, such as Tectibranchia, Pulmonata, Gymnomorpha, Acteonoidea, Allogastropoda, Ringiculoidea etc (Haszprunar, 1985). The currently followed taxonomy or the gastropod mollusca in this work is the latest version of the “Classification and Nomenclator of Gastropod Families” (Bouchet *et al.*, 2017).

LITERATURE REVIEW

Marine Heterobranch research from the Indian subcontinent began with the taxonomical work on a collection by Walter Elliot made from the Waltair coast (Visakhapatnam, Andhra Pradesh) (Alder and Hancock 1864). Some of the early works were dealing generally on the molluscs in which few opisthobranchs are also included (Melvill and Abercrombie, 1893; Smith, 1894). Another major contribution to the knowledge of opisthobranchs of India by Eliot (1903, 1906a, b, 1909, 1916) from different parts of India such as Chilka Lake in Odisha, Andhra Pradesh, Tamil Nadu, Lakshadweep Islands and Gujarat. Gravely, an eminent British scientist was the first to work on the ecology of opisthobranch (*Cuthona annandalei* Eliot, 1910) from India. Subsequent to the report of Eliot (1916) in Chilka Lake; Sewell and Annandale also carried

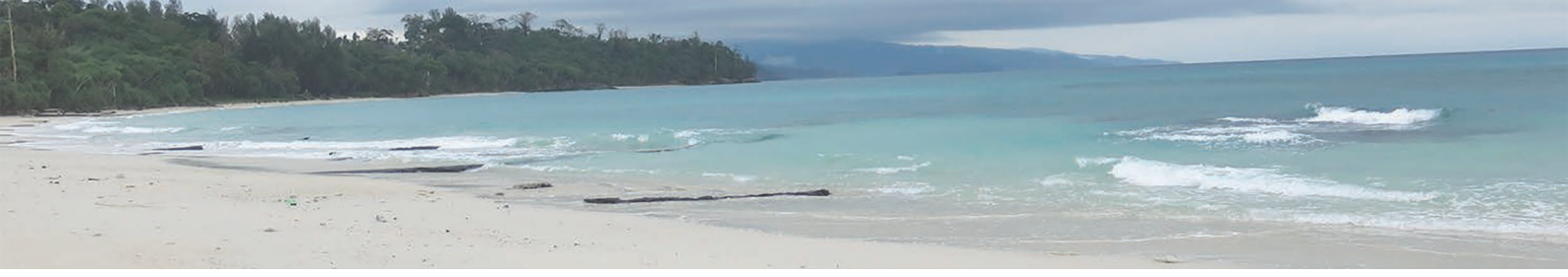
out work on the invertebrate fauna of the lake which dealt with a new species of opisthobranch *Stiliger pica*. Later, a work on a collection from Gulf of Mannar has resulted with 19 species including description of 5 new species (O’ Donoghue, 1932). During this period the first opisthobranch work by the Indian researcher came out in 1936 by K. Virabhadra Rao from Madras University, Zoological Research Laboratory on *Kalinga ornata* and subsequently he described asacoglossan, *Stiliger gopalai* in 1937 from the Coovam waters of Madras. Later, Gravely (1942) worked on the molluscs of the Madras beach which dealt with opisthobranchs. Meanwhile, Winckworth (1946a, b) described few species of *Goniodoris* and *Glossodoris* from the coastal regions of Bombay. During 1949, Hornell published a work on the study of Indian molluscs which was the first compilation work of mollusks in India.

During early opisthobranch research by Indian researchers, very few researchers were involved and majority of the works were done by Rao (1952, 1962a, b, 1963, 1967a, b, 1970, 1973), Rao and Alagarswami (1960, 1961); Rao and Krishna Kumari (1973a, b, 1974); Rao *et al.* 1974; Rao (1965a, b, 1968); Rao and Rao (1963). Another major work from the area during this period was by Satyamurti (1952) on the molluscs of Krusadai Island, which dealt with 30 species of opisthobranchs. In the same period the opisthobranch research from the Gujarat region also received attention. The major contributions were made by Menon *et al.*, 1961 and Narayanan (1968a, b, 1969, 1970, 1971). Work on the bivalve gastropods and other algae associated opisthobranchs from Indian coast were carried out by Ganapati and Sarma (1968), Sarma and Ganapati, 1972 and Sarma (1974, 1975), which even had descriptions of two new species of bivalve gastropods such as *Berthelinia ganapati* and *Berthelinia waltirensis*. The first genetic study of opisthobranchs from India carried out by Patterson (1969). Following this few works

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on the genetic study and biochemical work were carried by Natarajan (1970). Few other opisthobranch records from the country during this period were made by various researchers (Burn, 1970; Kasinathan *et al.*, 1975; Marcus and Marcus, 1970; Mookherje and Barua, 1989; Russel, 1971; Subba Rao and Surya Rao, 1980; Panigrahi, 2000; Rudman, 1973, 1980; Subba Rao *et al.*, 1980; Sundaram *et al.*, 1969; Valdes *et al.*, 1999).

Most of the recent works on marine heterobranchs from India are mainly new distributional records, with an exception of few. Some of the works were on the chemocology as well as extraction of bio-active components (Fontana *et al.*, 2001; Rajaganapathi and Kathiresan, 2002; Wahidullah *et al.*, 2006; Ciavitta *et al.*, 2006; Giji *et al.*, 2013). Hylleberg and Kilburn (2002) made a detailed inventory on the molluscs of Tamil Nadu coast and recorded 866 species including opisthobranchs. In the same period another major publication on the mollusc diversity of India was published by Subba Rao (2003). The work reported the occurrence of eight orders and as many as fifty families consisting of about 150 species of marine heterobranchs, which is considerably a less representation of the richly diversified sea slugs in India compared to 3400 species estimated to occur in the Indo-West Pacific Province. Simultaneously Subba Rao *et al.* (2004) and Subba Rao and Sastry (2005) also contributed to the knowledge of marine heterobranchs. One of the major marine heterobranch research along the coast of India in recent times was carried out by Apte (2010 – Published for 2009) which recorded 52 new regional records from Lakshadweep Islands, of which 40 were new for the Indian waters. Followed by this, the marine Heterobranch fauna of India got a wide attention and many researcher had contributed towards the knowledge about these colourful organisms (Apte *et al.*, 2010; Bhave and Apte, 2011; Yogeshkumar *et al.*, 2011; Swennen, 2011; Bhave and Apte, 2012; Bhave and Apte, 2013; Apte and Bhave, 2014; Carmona *et al.*, 2014; Bhave, A.*et al.*, 2015; Apte *et al.*, 2016; Gavas *et al.*, 2016; Sneha Chandran *et al.*, 2016, 2017a, 2017b;). The book on the Indian marine fauna dealt with as many as 103 marine Heterobranch species from India (Apte, 2012).

Many new regional records of opisthobranchs were also published by different researchers during this period (Jagtap, 2009; Ganesh *et al.*, 2009; Kamalakkannan *et al.*, 2010; Matwal and Joshi, 2011; Apte and Salahuddin, 2011; Sankar *et al.*, 2011; Srinivasulu *et al.*, 2012; Sethi and

Pattnaik, 2012; Shrinivaasu *et al.*, 2013a, b; Subburaman *et al.*, 2013; Ravinesh *et al.*, 2013; Parasharya and Patel, 2014; Parasharya *et al.*, 2014; Ravinesh *et al.*, 2014; Sheeja and Padmakumar, 2014; Sonia *et al.*, 2015; Ramya *et al.*, 2014; Sethi and Otta, 2014; Tudu *et al.*, 2015; Poriya *et al.*, 2015; Dhanya *et al.*, 2017; Ravinesh *et al.*, 2017; Carmona *et al.*, 2017; Vadher and Kardani, 2018; Bharate *et al.*, 2018a, 2018b).

Bhave and Apte (2013) was the first to review the status of opisthobranchs from India which included 311 species belonging to 7 orders, 53 families and 141 genera. Eventhough this work lacked a species checklist, most of the details on the distribution, status, synonymy were dealt in detail. Raghunathan *et al.* (2016) has compiled the marine heterobranch molluscs till date which accounted for 389 species. Apte and Desai (2017) published a field guide to the sea slugs of India which contained as many as 361 species so far recorded from India.

RESULTS

The current work has resulted in 292 species of marine heterobranchia along the coast of India which are belonging to 6 orders and 53 families (Table 1). Species diversity was very high in the coral reef areas along the coast such as Tamilnadu (123 species), Lakshadweep Islands (113 species) and Gujarat (88 species). The number of species is significantly less in the East Indian coast states (Odisha [9 species] and West Bengal [2 species]). Among the 6 marine heterobranch orders represented in Indian waters, the order Nudibranchia showed in domination (194 species), followed by Cephalaspidea (26 species); whereas the superorder Sacoglossa (previously, Order Sacoglossa) comprises of 37 species. The order Umbraculida and Pteropoda are represented only by single species. In the order Nudibranchia the most contributing family was Chromodorididae (47 species), followed by Discodorididae (34 species) and Facelinidae (13 species). The current work reviews the distribution of marine heterobranch diversity along the coast of India; i.e. East coast, West coast and Lakshadweep Islands. All the available literature were scrutinized for compilation of checklist and distribution of opisthobranch fauna. Scientific names were validated with World Register of Marine Species (WoRMS) database for taxonomic status (accepted/status unknown, emendations, synonyms, alternate representations, *nomen nudum*, *nomen dubium*) and all the corrected names were updated. The checklist is arranged alphabetically from the higher taxon to the species level.

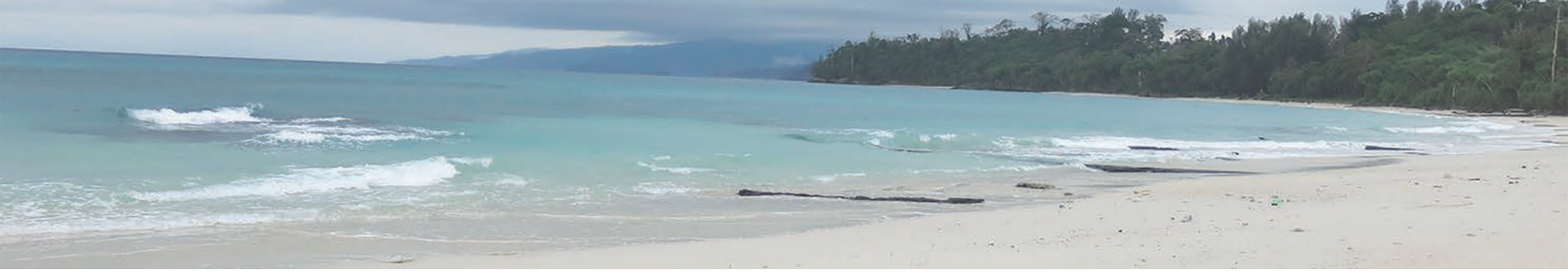


Table 1. Heterobranchs of Coasts of India

| Sl. No. | Species | West Bengal | Odisha | Andhra Pradesh | Tamil Nadu | Kerala | Karnataka | Goa | Maharashtra | Gujarat | Lakshadweep |
|---------|--|-------------|--------|----------------|------------|--------|-----------|-----|-------------|---------|-------------|
| | Phylum MOLLUSCA Class GASTROPODA Cuvier, 1795 Subclass HETEROBRANCHIA Burmeister, 1837 Infraclass EUTHYNEURA Subterclass ACTEONIMORPHA Superfamily ACTEONOIDEA d'Orbigny, 1842 Family ACTEONIDAE d'Orbigny, 1843 | | | | | | | | | | |
| 1 | <i>Pupa affinis</i> (A. Adams, 1855) | | | | • | | | | | | |
| 2 | <i>Pupa solidula</i> (Linnaeus, 1758) | | | | • | | | | | | |
| | Family APLUSTRIDAE Gray, 1847 | | | | | | | | | | |
| 3 | <i>Aplustrum amplustre</i> (Linnaeus, 1758) | | | | • | | | | | | |
| 4 | <i>Hydatina physis</i> (Linnaeus, 1758) | | | | • | | | | | • | |
| 5 | <i>Hydatina zonata</i> (Lightfoot, 1786) | | | • | • | • | • | • | • | • | • |
| | Subterclass RINGIPLEURA Superorder NUDIPLEURA Wägele & Willan, 2000 Order NUDIBRANCHIA Cuvier, 1817 Suborder CLADOBRANCHIA Superfamily AEOLIDIOIDEA Gray, 1827 Family AEOLIDIIDAE Gray, 1827 | | | | | | | | | | |
| 6 | <i>Anteaeolidiella fijensis</i> Carmona <i>et al.</i> , 2014 | | | | | | | | | | • |
| 7 | <i>Anteaeolidiella indica</i> (Bergh 1888) | | | | | | | | • | | |
| 8 | <i>Anteaeolidiella orientalis</i> (Bergh, 1888) | | | | • | | | | | | |
| 9 | <i>Anteaeolidiella poshitra</i> Carmona <i>et al.</i> , 2014 | | | | | | | | | • | |
| 10 | <i>Baeolidia palythoae</i> Gosliner, 1985 | | | | • | • | • | • | • | • | • |
| 11 | <i>Baeolidia salaamica</i> (Rudman, 1982) | | | | | | | | | • | |
| | Family FACELINIDAE Bergh, 1889 | | | | | | | | | | |
| 12 | <i>Facelina lineata</i> Eliot, 1905 | | | | | | | | • | • | |
| 13 | <i>Hervia ceylonica</i> Farran, 1905 | | | | • | | | | | | |
| 14 | <i>Herviella affinis</i> Baba, 1960 | | | | | | | | | | • |
| 15 | <i>Herviella albida</i> Baba, 1966 | | | | | | | | | | • |
| 16 | <i>Herviella yatsui</i> (Baba, 1930) | | | | | | | | • | | |
| 17 | <i>Moridilla brockii</i> Bergh, 1888 | | | | • | | | | | | |
| 18 | <i>Noumeaella isa</i> Ev. Marcus & Er. Marcus, 1970 | | | | | | | | | • | |
| 19 | <i>Phidiana anulifera</i> (Baba, 1949) | | | | | | | | • | | |
| 20 | <i>Phidiana militaris</i> (Alder & Hancock, 1864) | | | • | • | • | • | • | • | • | • |
| 21 | <i>Phidiana unilineata</i> (Alder & Hancock, 1864) | | | • | | | | | | | |
| 22 | <i>Phidiana semidecora</i> (Pease, 1860) | | | | | | | | | | • |
| 23 | <i>Pteraeolidia ianthina</i> (Angas, 1864) | | | | • | | | | | • | • |
| 24 | <i>Sakuraeolis gujaratica</i> Rudman, 1980 | | | | | | | | | • | |

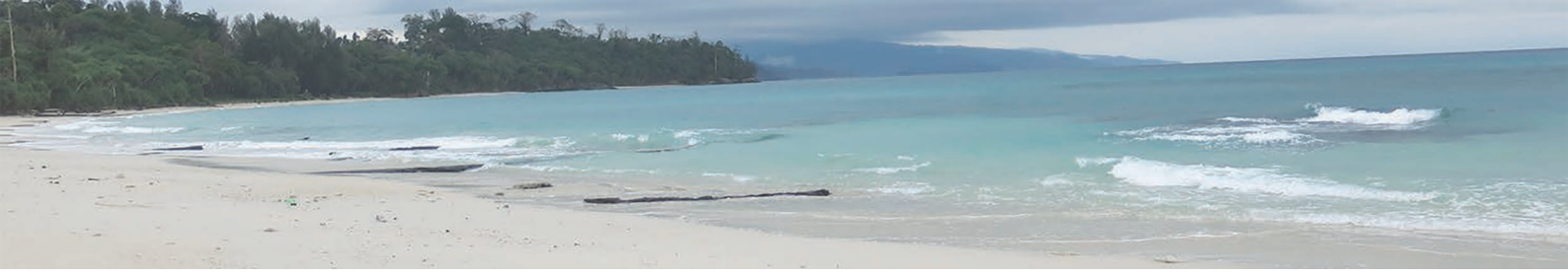


Table 1 contd.

| Sl. No. | Species | West Bengal | Odisha | Andhra Pradesh | Tamil Nadu | Kerala | Karnataka | Goa | Maharashtra | Gujarat | Lakshadweep |
|--|---|-------------|--------|----------------|------------|--------|-----------|-----|-------------|---------|-------------|
| Family GLAUCIDAE Gray, 1827 | | | | | | | | | | | |
| 25 | <i>Glaucus atlanticus</i> Forster, 1777 | | | • | • | | | | | | • |
| 26 | <i>Glaucilla marginata</i> Reinhardt & Bergh, 1864 | | | | • | | | | | | |
| Family MYRRHINIDAE Bergh, 1905 | | | | | | | | | | | |
| 27 | <i>Phyllodesmium poindimiei</i> (Risbec, 1928) | | | | | | | | • | | |
| 28 | <i>Phyllodesmium serratum</i> (Baba, 1949) | | | | | | | | | • | |
| Superfamily ARMINOIDEA Iredale & O'Donoghue, 1923 (1841) Family ARMINIDAE Iredale & O'Donoghue, 1923 (1841) | | | | | | | | | | | |
| 29 | <i>Armina babai</i> (Tchang, 1934) | | • | | • | | | | | | |
| 30 | <i>Armina californica</i> (J.G. Cooper, 1863) | | | | • | | | | | | |
| 31 | <i>Armina cinerea</i> (Farran, 1905) | | | | • | | | | | • | |
| 32 | <i>Armina formosa</i> (Kelaart, 1858) | | | • | • | | | | | | |
| 33 | <i>Armina gracilis</i> (Bergh, 1874) | | | | | | | | | | • |
| 34 | <i>Armina marmorata</i> (Kelaart, 1859) | | | • | | | | | | | |
| 35 | <i>Armina taeniolata</i> (Bergh, 1860) | | | • | | | | | | | |
| 36 | <i>Dermatobranchus fortunatus</i> (Bergh, 1888) | | | | | | | | | • | |
| 37 | <i>Dermatobranchus semistriatus</i> Baba, 1949 | | | | | | | | | • | |
| 38 | <i>Pleurophyllidiella paucidentata</i> (O'Donoghue, 1932) | | | | • | | | | • | | |
| Superfamily DENDRONOTOIDEA Allman, 1845 Family BORNELLIDAE Bornellidae Bergh, 1874 | | | | | | | | | | | |
| 39 | <i>Bornella stellifer</i> (Adams and Reeve in Adams, 1848) | | | • | • | • | • | • | • | • | • |
| Family HANCOCKIIDAE MacFarland, 1923 | | | | | | | | | | | |
| 40 | <i>Hancockia papillata</i> (O'Donoghue, 1932) | | | | • | | | | • | | |
| Family LOMANOTIDAE Bergh, 1890 | | | | | | | | | | | |
| 41 | <i>Lomanotus vermiformis</i> Eliot, 1908 | | | | | | | | • | • | |
| Family SCYLLAEIDAE Alder & Hancock, 1855 | | | | | | | | | | | |
| 42 | <i>Scyllaea pelagica</i> Linnaeus, 1758 | | | • | • | | | | | | • |
| Family TETHYDIDAE Rafinesque, 1815 | | | | | | | | | | | |
| 43 | <i>Melibe viridis</i> (Kelaart, 1858) | | • | • | • | | | | | • | |
| Superfamily FIONOIDEA Gray, 1857 Family CUTHONIDAE Odhner, 1934 | | | | | | | | | | | |
| 44 | <i>Cuthona henrici</i> (Eliot, 1916) | | • | | | | | | | | |
| Family EMBLETONIIDAE Pruvot-Fol, 1954 | | | | | | | | | | | |
| 45 | <i>Embletonia gracilis</i> Risbec, 1928 | | | | | | | | • | • | • |
| Family EUBRANCHIDAE Odhner, 1934 | | | | | | | | | | | |
| 46 | <i>Eubranchnus virginalis</i> (Baba, 1949) | | | | | | | | • | • | |
| 47 | <i>Eubranchnus echizenicus</i> Baba, 1975 | | | | | | | | • | | |
| 48 | <i>Eubranchnus mandapamensis</i> (Rao, 1968) | | | | • | | | | • | | |



Table 1 contd.

| Sl. No. | Species | West Bengal | Odisha | Andhra Pradesh | Tamil Nadu | Kerala | Karnataka | Goa | Maharashtra | Gujarat | Lakshadweep |
|---|---|-------------|--------|----------------|------------|--------|-----------|-----|-------------|---------|-------------|
| 49 | <i>Eubranthus mimmeticus</i> Baba, 1975 | | | | | | | | • | | |
| 50 | <i>Eubranthus ocellatus</i> (Alder & Hancock, 1864) | | | • | | | | | | | |
| 51 | <i>Eubranthus productus</i> (Farran, 1905) | | | | • | | | | | | |
| 52 | <i>Eubranthus rubropunctatus</i> Edmunds 1969 | | | | | | | | • | | |
| Family SAMLIDAE Korshunova <i>et al.</i> , 2017 | | | | | | | | | | | |
| 53 | <i>Samla bicolor</i> (Kelaart, 1858) | | | • | • | | | | | • | • |
| Family TRINCHESIIDAE F. Nordsieck, 1972 | | | | | | | | | | | |
| 54 | <i>Phestilla lugubris</i> (Bergh, 1870) | | | | | | | | | • | • |
| 55 | <i>Phestilla melanobranchia</i> Bergh, 1874 | | | | | | | | | | • |
| 56 | <i>Phestilla minor</i> Rudman, 1981 | | | | | | | | | • | • |
| 57 | <i>Tenellia adspersa</i> (Nordmann, 1845) | | | | | • | | | | | |
| 58 | <i>Trinchesia ornata</i> (Baba, 1937) | | | | | | | | • | | |
| 59 | <i>Trinchesia sibogae</i> (Bergh, 1905) | | | | • | | | | | | |
| 60 | <i>Trinchesia yamasui</i> (Hamatani, 1993) | | | | | | | | • | • | |
| Family UNIDENTIIDAE Millen & Hermosillo, 2012 | | | | | | | | | | | |
| 61 | <i>Unidentia angelvaldesi</i> Millen & Hermosillo, 2012 | | | | | | | | • | | |
| Superfamily PROCTONOTOIDEA Gray, 1853 Family PROCTONOTIDAE Gray, 1853 | | | | | | | | | | | |
| 62 | <i>Janolus toyamensis</i> Baba & Abe, 1970 | | | | | | | | | • | |
| Superfamily TRITONIOIDEA Lamarck, 1809 Family TRITONIIDAE Lamarck, 1809 | | | | | | | | | | | |
| 63 | <i>Marianina rosea</i> (Pruvot-Fol, 1930) | | | | | | | | | | • |
| 64 | <i>Marionia pambanensis</i> O'Donoghue, 1932 | | | | • | | | | • | | |
| Superfamily (Unassigned) CLADOBRANCHIA Family MADRELLIDAE Preston, 1911 | | | | | | | | | | | |
| 65 | <i>Madrella ferruginosa</i> Alder and Hancock, 1864 | | | • | • | | | | | | |
| Suborder DORIDINA Infraorder DORIDOIDEI Superfamily DORIDOIDEA Rafinesque, 1815 Family ACTINOCYCLIDAE O'Donoghue, 1929 | | | | | | | | | | | |
| 66 | <i>Actinocyclus verrucosus</i> Ehrenberg, 1831 | | | | | | | | | | • |
| 67 | <i>Hallaxa michaeli</i> Gosliner & Johnson, 1994 | | | | | | | | • | | |
| Family CHROMODORIDIDAE Bergh, 1891 | | | | | | | | | | | |
| 68 | <i>Ardeadoris angustolutea</i> Rudman, 1990 | | | | | | | | | | • |
| 69 | <i>Ceratosoma trilobatum</i> (J. E. Gray, 1827) | | | • | | | | | | | |
| 70 | <i>Chromodoris aspersa</i> (Gould, 1852) | | | | • | | | | | | • |
| 71 | <i>Chromodoris elisabethina</i> Bergh, 1877 | | | | | | | | | | • |
| 72 | <i>Chromodoris inopinata</i> Bergh, 1905 | | | • | | | | | | | |
| 73 | <i>Chromodoris pustulans</i> Bergh, 1877 | | | • | | | | | | | |

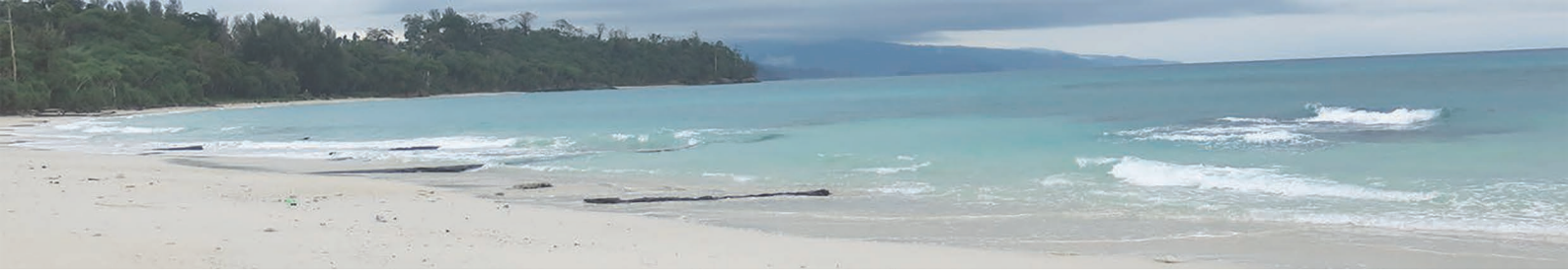


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|---------|--|-------------|--------|----------------|------------|--------|-----------|-----|-------------|---------|-------------|
| 74 | <i>Chromodoris tenuilinearis</i> Farran, 1905 | | | | • | | | | | | |
| 75 | <i>Doriprismatica atromarginata</i> (Cuvier, 1804) | | | • | • | • | | | | | |
| 76 | <i>Glossodoris cincta</i> (Bergh, 1888) | | | | • | | | | | | • |
| 77 | <i>Glossodoris humberti</i> (Kelaart, 1858) | | | | • | | | | | | |
| 78 | <i>Glossodoris pallida</i> (Ruppell and Leuckart, 1828) | | | | | | | | | • | • |
| 79 | <i>Glossodoris poecila</i> Winckworth, 1946 | | | | | | | | • | | |
| 80 | <i>Glossodoris rufomarginata</i> (Bergh, 1890) | | | | | • | | | | | |
| 81 | <i>Glossodoris semeion</i> (Winckworth, 1946) | | | | | | | | • | | |
| 82 | <i>Goniobranchus alius</i> (Rudman, 1987) | | | | | | | | | | • |
| 83 | <i>Goniobranchus annulatus</i> (Eliot, 1904) | | | | | • | | • | | | |
| 84 | <i>Goniobranchus bombayanus</i> (Winckworth, 1946) | | | | • | • | | | • | • | |
| 85 | <i>Goniobranchus cavae</i> (Eliot, 1904) | | | | | • | | | | | |
| 86 | <i>Goniobranchus conchyliatus</i> (Yonow, 1984) | | | | | • | | • | | | • |
| 87 | <i>Goniobranchus decorus</i> (Pease, 1860) | | | | | | | | | | • |
| 88 | <i>Goniobranchus fidelis</i> (Kelaart, 1858) | | | • | • | | | | | • | • |
| 89 | <i>Goniobranchus geminus</i> (Rudman, 1987) | | | | • | | • | • | | | |
| 90 | <i>Goniobranchus gleniei</i> (Kelaart, 1858) | | | • | | | | | | | • |
| 91 | <i>Goniobranchus mandapamensis</i> (Valdés, Mollo & Ortea, 1999) | | | | • | • | | | | | |
| 92 | <i>Goniobranchus preciosus</i> (Kelaart, 1858) | | | | • | | | | | | |
| 93 | <i>Goniobranchus rufomaculatus</i> (Pease, 1871) | | | | | | | | | | • |
| 94 | <i>Goniobranchus setoensis</i> (Baba, 1938) | | | | | • | | | | | • |
| 95 | <i>Goniobranchus tennentanus</i> (Kelaart, 1859) | | | • | | | | | | | |
| 96 | <i>Goniobranchus tinctorius</i> (Rüppell & Leuckart, 1830) | | | | • | | | | | • | |
| 97 | <i>Goniobranchus trimarginatus</i> (Winckworth, 1946) | | | | • | | | | • | | |
| 98 | <i>Hypselodoris bullockii</i> (Collingwood, 1881) | | | | • | | | | | | |
| 99 | <i>Hypselodoris capensis</i> (Barnard, 1927) | | | | | | | | | • | |
| 100 | <i>Hypselodoris carnea</i> (Bergh 1889) | | | | | | | | | • | |
| 101 | <i>Hypselodoris infucata</i> (Ruppell & Leuckart, 1828) | | | • | • | | | | • | • | • |
| 102 | <i>Hypselodoris kanga</i> Rudman, 1977 | | | | • | | | | • | | |
| 103 | <i>Hypselodoris maculosa</i> (Pease, 1871) | | | | | | | | | | • |
| 104 | <i>Hypselodoris maridadilus</i> Rudman, 1977 | | | | | | | | | | • |
| 105 | <i>Hypselodoris nigrostriata</i> (Eliot, 1904) | | | • | • | • | | | • | | |
| 106 | <i>Hypselodoris pulchella</i> (Ruppell and Leuckart, 1828) | | | | • | | | | | | |
| 107 | <i>Hypselodoris rosans</i> (Bergh, 1889) | | | • | | | | | | | |
| 108 | <i>Hypselodoris tryoni</i> (Garrett, 1873) | | | | • | | | | | | |
| 109 | <i>Hypselodoris zebrina</i> (Alder & Hancock, 1864) | | | • | | • | | | | | |
| 110 | <i>Mexichromis mariei</i> (Crosse 1872) | | | | | | | | | • | |

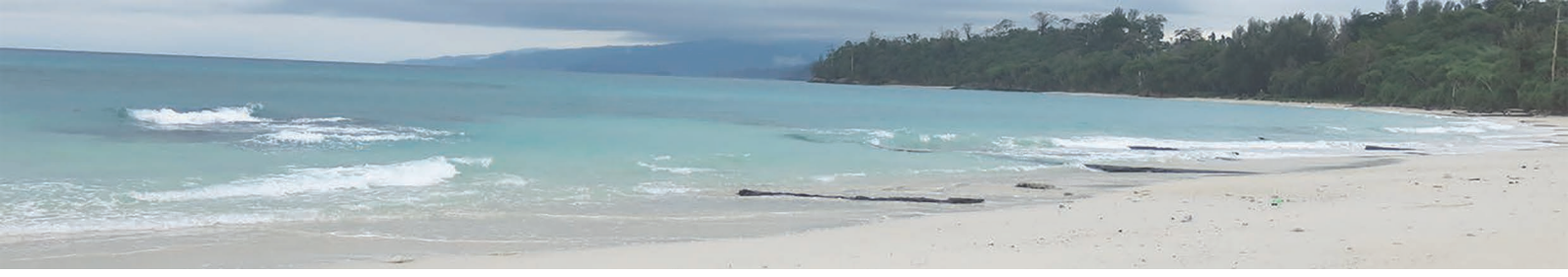


Table 1 contd.

| Sl. No. | Species | West Bengal | Odisha | Andhra Pradesh | Tamil Nadu | Kerala | Karnataka | Goa | Maharashtra | Gujarat | Lakshadweep |
|---------|--|-------------|--------|----------------|------------|--------|-----------|-----|-------------|---------|-------------|
| 111 | <i>Mexichromis multituberculata</i> (Baba, 1953) | | | | • | | | | | | |
| 112 | <i>Mexichromis pusilla</i> (Bergh, 1874) | | | | | | | | | | • |
| 113 | <i>Verconia norba</i> (Er. Marcus & Ev. Marcus, 1970) | | | | | | | | | | • |
| 114 | <i>Thorunna australis</i> (Risbec, 1928) | | | | | | • | | | | |
| | Family DISCODORIDIDAE Bergh, 1891 | | | | | | | | | | |
| 115 | <i>Asteronotus cespitosus</i> van Hasselt, 1824 | | | • | • | | | | | | • |
| 116 | <i>Asteronotus raripilosus</i> (Abraham, 1877) | | | | | | | | | • | |
| 117 | <i>Atagema intecta</i> (Kelaart, 1858) | | | • | | | | | | | • |
| 118 | <i>Atagema osseosa</i> (Kelaart, 1859) | | | | | | | | • | | |
| 119 | <i>Atagema rugosa</i> Pruvot-Fol, 1951 | | | | | | | | • | • | |
| 120 | <i>Atagema spongiosa</i> (Kelaart, 1858) | | | • | | | | | | • | |
| 121 | <i>Atagema tristis</i> (Alder and Hancock, 1864) | | | • | • | | | | • | • | |
| 122 | <i>Carminodoris bifurcata</i> Baba, 1993 | | | | | • | | | | | |
| 123 | <i>Carminodoris flammea</i> (Fahey & Gosliner, 2003) | | | | | • | | | | | |
| 124 | <i>Carminodoris grandiflora</i> (Pease, 1860) | | | | | | | | • | • | |
| 125 | <i>Discodoris boholiensis</i> Bergh, 1877 | | | | • | | | | | • | • |
| 126 | <i>Discodoris labifera</i> (Abraham, 1877) | | | | • | | | | | | |
| 127 | <i>Doriopsilla miniata</i> (Alder and Hancock, 1866) | | | | | | | | • | • | |
| 128 | <i>Halgerda punctata</i> Farran, 1902 | | | | • | | | | | | |
| 129 | <i>Halgerda tessellata</i> (Bergh, 1880) | | | | | | | | | | • |
| 130 | <i>Jorunna funebris</i> (Kelaart, 1858) | | | • | • | • | | | | • | • |
| 131 | <i>Jorunna rubescens</i> Bergh, 1876 | | | | • | | | | | | • |
| 132 | <i>Montereina pardalis</i> (Alder & Hancock, 1864) | | | • | | | | | | | |
| 133 | <i>Platydoris cruenta</i> (Quoy and Gaimard, 1832) | | | | | | | | | | • |
| 134 | <i>Platydoris ellioti</i> (Alder and Hancock, 1864) | | | • | • | • | | | | | |
| 135 | <i>Platydoris formosa</i> (Alder & Hancock, 1864) | | | • | | | | | | | |
| 136 | <i>Peltodoris murrea</i> (Abraham, 1877) | | | | | | | | | • | |
| 137 | <i>Platydoris scabra</i> (Cuvier, 1804) | | | • | | • | | | | | • |
| 138 | <i>Platydoris striata</i> (Kelaart, 1859) | | | • | | | | | | | |
| 139 | <i>Rostanga arbutus</i> (Angas, 1864) | | | | | | | | • | | |
| 140 | <i>Sclerodoris apiculata</i> (Alder and Hancock, 1864) | | | • | • | | | | | • | • |
| 141 | <i>Sclerodoris coriacea</i> Eliot, 1903 | | | • | | | | | | | |
| 142 | <i>Sclerodoris tuberculata</i> Eliot, 1904 | | | | | | | | | • | |
| 143 | <i>Sebadoris fragilis</i> (Alder & Hancock, 1864) | | | • | • | | | | • | | |
| 144 | <i>Sebadoris nubilosa</i> (Pease, 1871) | | | | • | | | | | | |
| 145 | <i>Taringa sublutea</i> (Abraham, 1877) | | | • | | | | | | • | |
| 146 | <i>Tayuva lilacina</i> (Gould, 1852) | | | • | • | • | | | • | • | |
| 147 | <i>Thordisa sanguinea</i> Baba (1955) | | | | | | | | | • | |

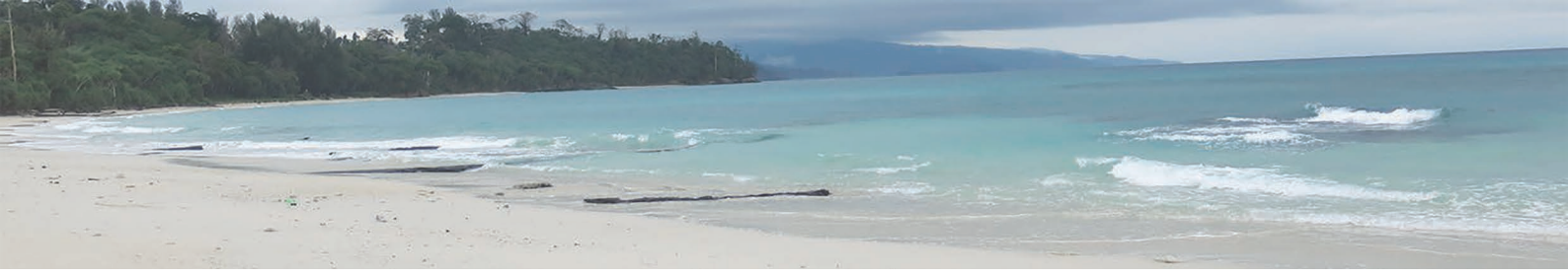


Table 1 contd.

| Sl. No. | Species | West Bengal | Odisha | Andhra Pradesh | Tamil Nadu | Kerala | Karnataka | Goa | Maharashtra | Gujarat | Lakshadweep |
|---------|--|-------------|--------|----------------|------------|--------|-----------|-----|-------------|---------|-------------|
| 148 | <i>Thordisa villosa</i> (Alder and Hancock, 1864) | | | • | • | | | | • | • | |
| | Family DORIDIDAE Rafinesque, 1815 | | | | | | | | | | |
| 149 | <i>Doriopsis granulosa</i> Pease, 1860 | | | | | | | | • | • | • |
| 150 | <i>Doris immonda</i> Risbec, 1928 | | | • | | | | | • | | |
| | Superfamily ONCHIDORIDOIDEA Gray, 1827 Family GONIODORIDAE H. Adams & A. Adams, 1854 | | | | | | | | | | |
| 151 | <i>Goniodoris aspersa</i> Alder & Hancock, 1864 | | | • | | | | | | | |
| 152 | <i>Goniodoris citrina</i> Alder and Hancock, 1864 | | | • | | | | | | | |
| 153 | <i>Goniodoris joubini</i> Risbec, 1928 | | | | | | | | • | • | |
| 154 | <i>Goniodoris kolabana</i> Winckworth, 1946 | | | | | | | | • | | |
| 155 | <i>Goniodoris modesta</i> Alder & Hancock, 1864 | | | • | | | | | | | |
| 156 | <i>Okenia barnardi</i> Baba, 1937 | | | | | | | | • | | |
| 157 | <i>Okenia echinata</i> Baba 1949 | | | | | | | | • | | |
| 158 | <i>Okenia pellucida</i> Burn 1967 | | | | | | | | • | | |
| 159 | <i>Okenia pilosa</i> (Bouchet & Ortea 1983) | | | | | | | | • | | |
| 160 | <i>Trapania euryeia</i> Gosliner & Fahey, 2008 | | | | | | | | | | • |
| | Family ONCHIDORIDIDAE Gray, 1827 | | | | | | | | | | |
| 161 | <i>Knoutsodonta brasiliensis</i> (Alvim, Padula & Pimenta, 2011) | | | | | | | | • | • | |
| | Superfamily PHYLLIDIOIDEA Rafinesque, 1814 Family DENDRODORIDIDAE O'Donoghue, 1924 (1864) | | | | | | | | | | |
| 162 | <i>Dendrodoris areolata</i> (Alder & Hancock, 1864) | | | • | | | | | | | |
| 163 | <i>Dendrodoris atromaculata</i> (Alder & Hancock, 1864) | | | • | | | | | | • | |
| 164 | <i>Dendrodoris coronata</i> Kay & Young, 1969 | | | | | | | | | | • |
| 165 | <i>Dendrodoris fumata</i> (Rüppell and Leuckart, 1828) | | | • | • | • | • | • | • | • | |
| 166 | <i>Dendrodoris fusca</i> (Alder & Hancock, 1864) | | | • | | | | | | | |
| 167 | <i>Dendrodoris goani</i> Rao & Kumary, 1973 | | | | | | | • | | | |
| 168 | <i>Dendrodoris grisea</i> (Kelaart, 1858) | | | • | | | | | | | |
| 169 | <i>Dendrodoris krusensternii</i> (Gray, 1850) | | | • | | • | | • | | | • |
| 170 | <i>Dendrodoris nigra</i> (Stimpson, 1855) | | | • | • | • | | | | • | • |
| 171 | <i>Dendrodoris punctata</i> (Alder & Hancock, 1864) | | | • | | | | | | | |
| 172 | <i>Dendrodoris pustulosa</i> (Alder & Hancock, 1864) | | | • | | | | | | | |
| 173 | <i>Dendrodoris tuberculosa</i> (Quoy & Gaimard, 1832) | | | • | | | | | | | • |
| | Family PHYLLIDIIDAE Rafinesque, 1814 | | | | | | | | | | |
| 174 | <i>Phyllidia alyta</i> Yonow, 1996 | | | | • | | | | | | • |
| 175 | <i>Phyllidia coelestis</i> Bergh, 1905 | | | | | | | | | | • |
| 176 | <i>Phyllidia marindica</i> (Yonow & Hayward, 1991) | | | | • | | | | | | • |
| 177 | <i>Phyllidia multituberculata</i> Boettger, 1918 | | | | • | | | | | | |
| 178 | <i>Phyllidia varicosa</i> Lamarck, 1801 | | | | • | • | • | | | | • |



Table 1 contd.

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|---|--|-------------|--------|----------------|------------|--------|-----------|-----|-------------|---------|-------------|
| 179 | <i>Phyllidiella pustulosa</i> (Cuvier, 1804) | | | | • | | | | | | • |
| 180 | <i>Phyllidiella rosans</i> (Bergh, 1873) | | | | • | | | | | | • |
| 181 | <i>Phyllidiella zeylanica</i> (Kelaart, 1859) | | | • | • | • | • | | | • | • |
| 182 | <i>Phyllidiopsis gemmata</i> (Pruvot-Fol, 1957) | | | | | | | | | | • |
| 183 | <i>Phyllidiopsis krempfi</i> Pruvot-Fol, 1957 | | | | | | | | | | • |
| 184 | <i>Phyllidiopsis phippiensis</i> Brunckhorst, 1993 | | | | | | | | | | • |
| 185 | <i>Phyllidiopsis xishaensis</i> (Lin, 1983) | | | | | | | | | | • |
| Superfamily POLYCEROIDEA Alder & Hancock, 1845 Family AEGIRIDAE Fischer, 1883 | | | | | | | | | | | |
| 186 | <i>Aegires villosus</i> Farran, 1905 | | | | • | | | | | | |
| 187 | <i>Notodoris gardineri</i> Eliot, 1906 | | | | | | | | | | • |
| Family HEXABRANCHIDAE Bergh, 1891 | | | | | | | | | | | |
| 188 | <i>Hexabranchnus sanguineus</i> (Ruppell and Leuckart, 1828) | | | | • | • | | | | | • |
| Family POLYCERIDAE Alder & Hancock, 1845 Subfamily TRIOPHINAE Odhner, 1941 | | | | | | | | | | | |
| 189 | <i>Plocamopherus ceylonicus</i> (Kelaart, 1858) | | | | • | | | | • | • | • |
| 190 | <i>Plocamopherus ocellatus</i> (Ruppel and Leuckart, 1828) | | | | | | | | | • | |
| Subfamily NEMBROTHINAE Burn, 1967 | | | | | | | | | | | |
| 191 | <i>Nembrotha kubaryana</i> Bergh, 1877 | | | • | | | | | | | |
| Subfamily KALINGINAE Pruvot-Fol, 1956 | | | | | | | | | | | |
| 192 | <i>Kalinga ornata</i> Alder and Hancock, 1864 | | | • | • | | | | | | |
| Subfamily POLYCERINAE Alder & Hancock, 1845 | | | | | | | | | | | |
| 193 | <i>Gymnodoris alba</i> (Bergh, 1877) | | | | | | | | | • | • |
| 194 | <i>Gymnodoris bicolor</i> (Alder and Hancock, 1864) | | | • | • | | | | | | |
| 195 | <i>Gymnodoris ceylonica</i> (Kelaart, 1858) | | | • | | | | | | | • |
| 196 | <i>Gymnodoris citrina</i> (Bergh, 1875) | | | | | | | | | • | • |
| 197 | <i>Gymnodoris okinawae</i> Baba, 1936 | | | | | | | | | | • |
| 198 | <i>Gymnodoris striata</i> (Eliot, 1908) | | | | | | | | | | • |
| 199 | <i>Thecacera pennigera</i> (Montagu, 1815) | | | | | • | | | • | • | |
| Order PLEUROBRANCHIDA Superfamily PLEUROBRANCHOIDEA Gray, 1827 Family PLEUROBRANCHIDAE Gray, 1827 | | | | | | | | | | | |
| 200 | <i>Berthella stellata</i> (Risso, 1826) | | | • | • | | | | • | • | • |
| 201 | <i>Berthellina delicata</i> (Pease, 1861) | | | | | | | | | | • |
| 202 | <i>Berthellina citrina</i> (Ruppell & Leuckart, 1828) | | | | • | • | • | | • | • | • |
| 203 | <i>Berthellina minor</i> Bergh, 1905 | | | | | | | | | • | |
| Family PLEUROBRANCHAEIDAE Pilsbry, 1896 | | | | | | | | | | | |
| 204 | <i>Euselenops luniceps</i> (Cuvier, 1817) | | | | • | | | | | | • |
| 205 | <i>Euselenops winckworthi</i> Satyamurti, 1946 | | | | • | | | | | | |
| 206 | <i>Pleurobranchaea brockii</i> Bergh, 1897 | | | | • | | | | | | |

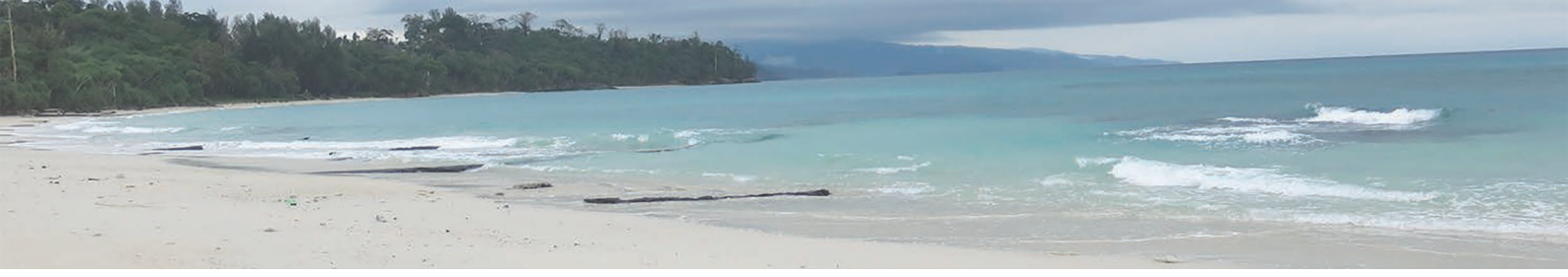


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| Sl. No. | Species | West Bengal | Odisha | Andhra Pradesh | Tamil Nadu | Kerala | Karnataka | Goa | Maharashtra | Gujarat | Lakshadweep |
|---------|---|-------------|--------|----------------|------------|--------|-----------|-----|-------------|---------|-------------|
| 207 | <i>Pleurobranchaea morula</i> Bergh, 1905 | | | | | | | | | • | |
| 208 | <i>Pleurobranchus albiguttatus</i> (Bergh, 1905) | | | | | | | | | | • |
| 209 | <i>Pleurobranchus forskalii</i> (Ruppell & Leuckart, 1828) | | | | • | | | | | | • |
| 210 | <i>Pleurobranchus mamillatus</i> Quoy & Gaimard, 1832 | | | | • | | | | | | |
| 211 | <i>Pleurobranchus peronii</i> Cuvier, 1804 | | | | | | | | | | • |
| | Superorder RINGICULIMORPHA Superfamily RINGICULOIDEA Philippi, 1853 Family RINGICULIDAE Philippi, 1853 | | | | | | | | | | |
| 212 | <i>Ringicula propinquans</i> Hinds, 1844 | | • | • | | | | | | | |
| 213 | <i>Ringicula encarpiferens</i> de Folin, 1867 | | | | • | | | | | | |
| | Subterclass TECTIPLEURA Superorder SACOGLOSSA Superfamily OXYNOOIDEA Stoliczka, 1868 (1847) Family JULIIDAE E.A. Smith, 1885 Subfamily BERTHELINIINAE Keen & A.G. Smith, 1961 | | | | | | | | | | |
| 214 | <i>Berthelina ganapati</i> Sarma, 1975 | | | • | | | | | | | |
| 215 | <i>Berthelina limax</i> (Kawaguti & Baba, 1959) | | | • | • | | | | | | |
| 216 | <i>Berthelina waltirensis</i> Sarma, 1975 | | | • | | | | | | | |
| | Family OXYNOIDAE Stoliczka, 1868 (1847) | | | | | | | | | | |
| 217 | <i>Lobiger viridis</i> Pease, 1863 | | | | | • | • | | | • | • |
| 218 | <i>Oxynoe viridis</i> (Pease, 1861) | | | • | • | • | | | | • | |
| | Family VOLVATELLIDAE Pilsbry, 1895 | | | | | | | | | | |
| 219 | <i>Volvatella ventricosa</i> Jensen & Wells, 1990 | | | | | | | | | | • |
| 220 | <i>Volvatella vigourouxii</i> (Montrouzier in Souverbie, 1861) | | | | • | | | | | | • |
| | Superfamily PLAKOBRANCHOIDEA Gray, 1840 Family COSTASIELLIDAE K.B. Clark, 1984 | | | | | | | | | | |
| 221 | <i>Costasiella kuroshimae</i> Ichikawa, 1993 | | | | • | | | | • | | |
| | Family HERMAEIDAE H. Adams & A. Adams, 1854 | | | | | | | | | | |
| 222 | <i>Cyerce elegans</i> Bergh, 1870 | | | | | | | | | | • |
| 223 | <i>Cyerce nigra</i> Bergh, 1871 | | | | | | | | | | • |
| 224 | <i>Polybranchia orientalis</i> (Kelaart, 1858) | | | • | • | • | | | | | • |
| 225 | <i>Sohgenia palauensis</i> Hamatani 1991 | | | | | | | | | | • |
| | Family LIMAPONTIIDAE Gray, 1847 | | | | | | | | | | |
| 226 | <i>Ercolania gopalai</i> (Rao, 1937) | | | | • | | | | | | |
| 227 | <i>Ercolania irregularis</i> (Eliot, 1904) | | | | • | | | | | | |
| 228 | <i>Ercolania pica</i> (Annandale & Prashad, 1922) | | • | | | | | | | | |
| 229 | <i>Ercolania raorum</i> (Marcus & Marcus, 1970) | | | | • | | | | | | |
| 230 | <i>Ercolania varians</i> (Elliot, 1904) | | | | • | | | | | | |
| 231 | <i>Sacoproteus smaragdinus</i> (Baba, 1949) | | | | | | | | | • | |
| 232 | <i>Stiliger viridis</i> (Kelaart, 1858) | | | • | | | | | | | |
| | Family PLAKOBRANCHIDAE Gray, 1840 | | | | | | | | | | |
| 233 | <i>Elysia bangtawensis</i> Swennen, 1997 | | | • | | | | • | • | | |



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|---------|---|-------------|--------|----------------|------------|--------|-----------|-----|-------------|---------|-------------|
| 234 | <i>Elysia bengalensis</i> Swennen, 2011 | | | • | • | • | • | • | • | | |
| 235 | <i>Elysia chilensis</i> Eliot, 1916 | | • | | | | | | | | |
| 236 | <i>Elysia expansa</i> (O'Donoghue, 1924) | | | | • | | | | • | • | |
| 237 | <i>Elysia cf hirasei</i> Baba, 1955 | | | | | • | • | • | • | • | |
| 238 | <i>Elysia obtusa</i> Baba, 1938 | | | | | | | | | • | |
| 239 | <i>Elysia ornata</i> (Swainson, 1840) | | | • | • | | • | | • | • | • |
| 240 | <i>Elysia punctata</i> Kelaart, 1858 | | | • | | | | | | | |
| 241 | <i>Elysia pusilla</i> (Bergh, 1871) | | | | • | | | | • | • | • |
| 242 | <i>Elysia rufescens</i> (Pease, 1871) | | | | | | | | | | • |
| 243 | <i>Elysia thompsoni</i> Jensen, 1993 | | | | | | | | | • | |
| 244 | <i>Elysia tomentosa</i> Jensen, 1997 | | | | • | | • | • | • | • | • |
| 245 | <i>Plakobranthus ocellatus</i> Van Hasselt, 1824 | | | | • | • | | | | • | • |
| 246 | <i>Thuridilla carlsoni</i> Gosliner, 1995 | | | | | | | | | | • |
| 247 | <i>Thuridilla coerulea</i> (Kelaart, 1858) | | | • | | | | | | | |
| 248 | <i>Thuridilla gracilis</i> (Risbec, 1828) | | | | • | | • | | | | • |
| 249 | <i>Thuridilla livida</i> (Baba, 1955) | | | | | | | | | | • |
| 250 | <i>Thuridilla vataae</i> (Risbec, 1928) | | | | | | | | | | • |
| | Order APLYSIIDA Superfamily APLYSIOIDEA Lamarck, 1809 Family APLYSIIDAE Lamarck, 1809 | | | | | | | | | | |
| 251 | <i>Aplysia cornigera</i> G.B. Sowerby I, 1869 | | | | • | | | | | | |
| 252 | <i>Aplysia argus</i> Rüppell & Leuckart, 1830 | | | • | • | • | • | • | • | • | • |
| 253 | <i>Aplysia fasciata</i> Poiret 1789 | | | | | | | | | • | |
| 254 | <i>Aplysia juliana</i> Quoy and Gaimard, 1832 | | | | | | | | | • | |
| 255 | <i>Aplysia oculifera</i> (Adams & Reeve, 1850) | | | | • | | | | • | • | • |
| 256 | <i>Aplysia parvula</i> Morch, 1863 | | | | • | | | | | • | • |
| 257 | <i>Bursatella leachii</i> Blainville, 1817 | | | | • | | | | • | | |
| 258 | <i>Dolabella auricularia</i> (Lightfoot, 1786) | | | | • | | | | | | • |
| 259 | <i>Dolabrifera dolabrifera</i> (Rang, 1828) | | | | • | | | | | | • |
| 260 | <i>Notarchus indicus</i> Schweigger, 1820 | | | | • | | | | | | |
| 261 | <i>Petalifera krusadaiae</i> O Donoghue, 1930 | | | | • | | | | | | |
| 262 | <i>Petalifera ramosa</i> Baba, 1959 | | | | | | | | • | | |
| 263 | <i>Stylocheilus striatus</i> (Quoy & Gaimard, 1832) | | | • | • | | • | | • | • | • |
| 264 | <i>Syphonota geographica</i> (Adams & Reeve, 1850) | | | | • | | | | | | |
| | Order CEPHALASPIDEA Fischer, 1883 Superfamily BULLOIDEA Gray, 1827 Family BULLIDAE Gray, 1827 | | | | | | | | | | |
| 265 | <i>Bulla ampulla</i> Linnaeus, 1758 | • | • | • | • | • | | | • | • | • |
| | Family TORNATINIDAE P. Fischer, 1883 | | | | | | | | | | |
| 266 | <i>Acteocina estriata</i> (Preston, 1914) | | • | | | | | | | | |

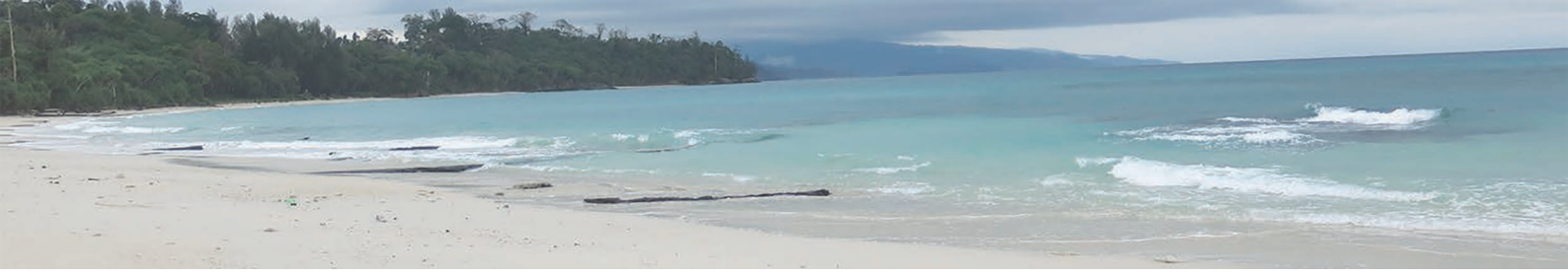
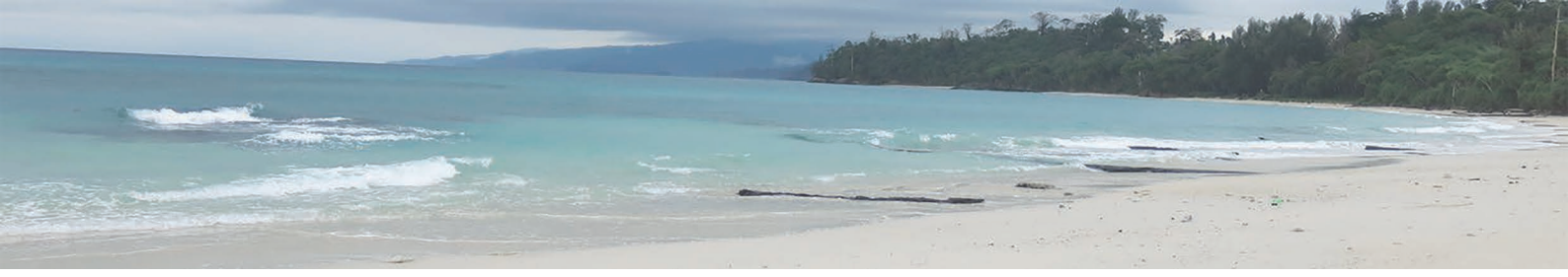


Table 1 contd.

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|--|---|-------------|----------|----------------|------------|-----------|-----------|-----------|-------------|-----------|-------------|
| Superfamily HAMINOEOIDEA Pilsbry, 1895 Family HAMINOEIDAE Pilsbry, 1895 | | | | | | | | | | | |
| 267 | <i>Atys semistriata</i> Pease, 1860 | | | | | | | | | | • |
| 268 | <i>Haminoea alfredensis</i> (Bartsch, 1915) | | | | | | | | | • | |
| 269 | <i>Haminoea aptei</i> Bharate. <i>et al.</i> , 2018 | | | | | | | | | | • |
| 270 | <i>Haminoea crocata</i> Pease, 1861 | • | • | | • | | | | | | |
| 271 | <i>Haminoea cymbalum</i> (Quoy and Gaimard, 1832) | | | • | • | | | | | | • |
| 272 | <i>Haminoea elegans</i> (Gray, 1825) | | | • | • | | | | | • | |
| 273 | <i>Haminoea galba</i> Pease, 1861 | | | | • | | | | | • | |
| 274 | <i>Haminoea ovalis</i> Pease, 1868 | | | | • | | | | | • | |
| 275 | <i>Haminoea vitrea</i> (A. Adams, 1850) | | | | | | | | • | | |
| 276 | <i>Haminoea tenera</i> (Adams, 1855) | | | | • | | | | | • | |
| 277 | <i>Phanerophthalmus olivaceus</i> (Ehrenberg, 1828) | | | | • | | | | | | • |
| 278 | <i>Smaragdinella calyculata</i> (Broderip & G.B. Sowerby I, 1829) | | | | | | | | • | • | • |
| 279 | <i>Smaragdinella sieboldi</i> A. Adams, 1864 | | | | • | | | | • | | |
| Superfamily PHILINOIDEA Gray, 1850 (1815) Family AGLAJIDAE Pilsbry, 1895 (1847) | | | | | | | | | | | |
| 280 | <i>Chelidonura electra</i> Rudman, 1970 | | | | | | | | | | • |
| 281 | <i>Chelidonura pallida</i> Risbec, 1951 | | | | | | | | | | • |
| 282 | <i>Chelidonura punctata</i> Eliot, 1903 | | | | | | | | | | • |
| 283 | <i>Philinopsis speciosa</i> Pease, 1860 | | | | • | | | | | • | • |
| 284 | <i>Tubulophilinopsis gardineri</i> (Eliot, 1903) | | | | | | | | | | • |
| Family COLPODASPIDIDAE Oskars, Bouchet & Malaquias, 2015 | | | | | | | | | | | |
| 285 | <i>Colpodaspis thompsoni</i> G.H. Brown, 1979 | | | | | | | | | | • |
| Family GASTROPTERIDAE Swainson, 1840 | | | | | | | | | | | |
| 286 | <i>Sagaminopteron psychedelicum</i> Carlson and Hoff, 1974 | | | | | | | | | | • |
| 287 | <i>Siphopteron tigrinum</i> Gosliner, 1989 | | | | | | | | | | • |
| Family PHILINIDAE Gray, 1850 (1815) | | | | | | | | | | | |
| 288 | <i>Philine aperta</i> (Linnaeus, 1758) | | | • | • | | | | | | |
| 289 | <i>Philine orientalis</i> A. Adams, 1854 | | | | • | | | | | | |
| Family SCAPHANDRIDAE Sars, 1878 | | | | | | | | | | | |
| 290 | <i>Scaphander andamanicus</i> Smith, 1894 | | | • | | | | | | | |
| Order PTEROPODA Suborder EUTHECOSOMATA Meisenheimer, 1905 Family CRESEIDAE Rampal, 1973 | | | | | | | | | | | |
| 291 | <i>Creseis acicula</i> (Rang, 1828) | | | | • | • | | | | | |
| Order UMBRACULIDA Odhner, 1939 Superfamily UMBRACULOIDEA Dall, 1889 (1827) Family UMBRACULIDAE Dall, 1889 (1827) | | | | | | | | | | | |
| 292 | <i>Umbraculum umbraculum</i> (Lightfoot, 1786) | | | | • | | | | | | |
| Total number of species | | 2 | 9 | 79 | 123 | 38 | 18 | 15 | 70 | 88 | 113 |



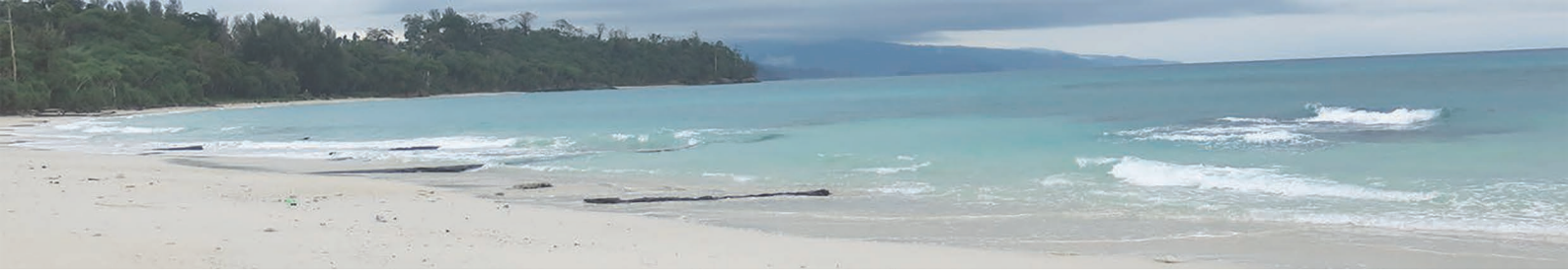
DISCUSSION

Diversity of marine heterobranchia is very fewer in comparison to the diversity in the Islands of Andaman and Nicobar (354 species) (Sreeraj, unpublished data). Most of the coral and rocky sub-tidal regions and the intertidal areas of the country still remain to be unexplored for its marine heterobranch diversity. Based on the data available from other parts of the world, it is expected to have more than 1000 species of marine heterobranchia in Indian waters. The level of knowledge on the marine heterobranch diversity from different regions of the country also varies considerably, which is a major hurdle for the biogeographic studies. Faunal surveys and taxonomic identifications are the basic information required for the applied research in the field of ecology,

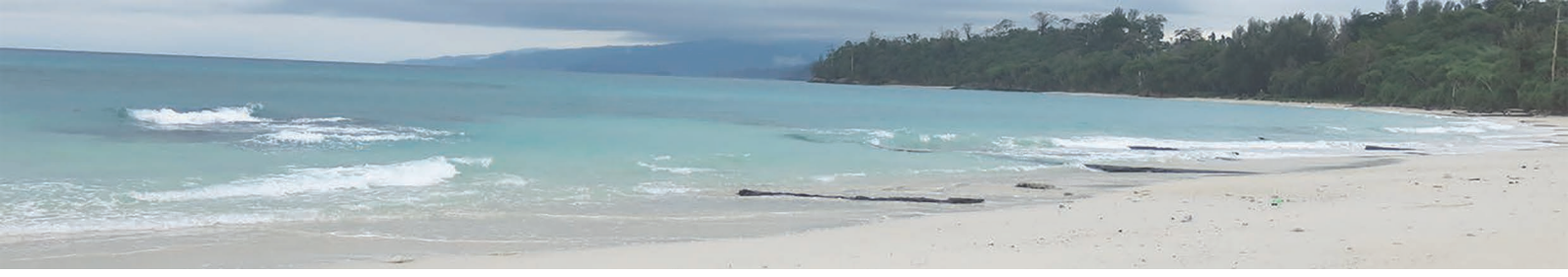
biogeography etc (Stork and Samways, 1995). Still the major knowledge gap in the work is about the species described from India; as most of them have not been revised or revisited since original description, hence their present status is in question. Only generic changes happened in global level has been applied to them. Hence the status of those species remains uncertain. It is noteworthy that the first opisthobranch survey area in India research (Waltair, Andhra Pradesh) has not been revisited after 155 years of the Indian marine heterobranch (previously, opisthobranch) research. Survey has to be strengthened in the vast stretch of intertidal as well as subtidal regions of Indian coast, and also in the coral reef, mangrove and seagrass areas in the country to get the actual status of the marine heterobranch diversity in the country.

REFERENCES

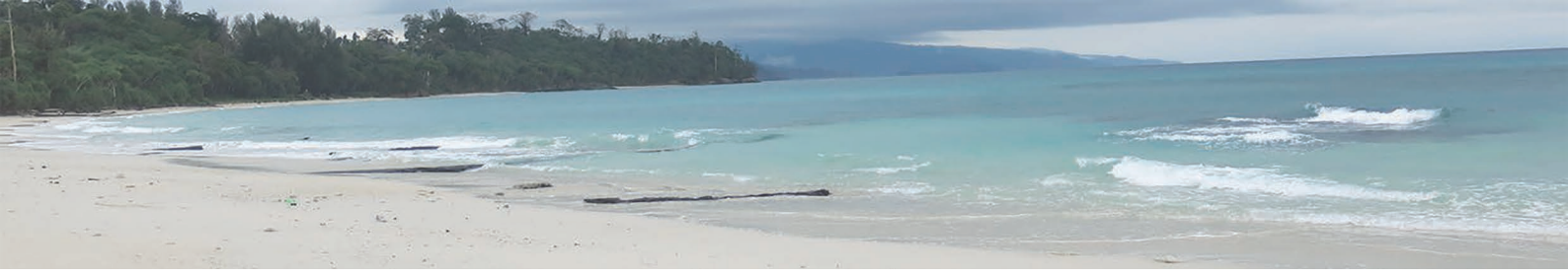
- Alder, J. and Hancock, A., 1864. Notice of a Collection of Nudibranchiate Mollusca made in India by Walter Elliot, Esq., with Descriptions of several New Genera and Species. *The Transactions of the Zoological Society of London*, **5**(3): 113-147.
- Apte, D., 2009. Opisthobranch fauna of Lakshadweep Islands, India, with 52 new records to Lakshadweep and 40 new records to India: Part 1. *Journal of Bombay Natural History Society*, **106**: 162-175.
- Apte, D. and Bhawe, V., 2014. New records of opisthobranchs from Lakshadweep, India (Mollusca: Heterobranchia). *Journal of Threatened Taxa*, **6**(3): 5562-5568.
- Apte, D., Bhawe, V., and Parasharya, D., 2010. An annotated and illustrated checklist of the opisthobranch fauna of Gulf of Kutch, Gujarat, India with 21 new records for Gujarat and 13 new records for India: Part 1. *Journal of Bombay Natural History Society*, **107**: 14-23.
- Apte, D. and Desai, D., 2017. *Field Guide to sea slugs of India*. Bombay Natural History Society, Mumbai, 459 pp
- Apte, D.A., Babu, I. and Salahuddin, V.K., 2015. Three new records of opisthobranchs (Mollusca) from Lakshadweep Islands, India. *J. Bombay Nat. Hist. Soc.*, **112**(3): 19-22.
- Apte, D.A., Kamboj, R.D. and Bhawe, V., 2016. First record of *Stiliger smaragdinus* Baba, 1949 (Mollusca: Sacoglossa: Limapontiidae) from India. *J. Bombay nat. Hist. Soc.*, **112**(2): 114-117.
- Baskaran, R., Anandavelu, I., Karpoora sundarapandian, N., Mohan, P.M. and Padmavati, G., 2013. First record of *Herviella mietta* from the Andaman Islands, Indian Ocean (Nudibranchia: Aeolidina: Glaucididae). *Marine Biodiversity Records*, **6**: e64, 4 pp.
- Bharate, M., Apte, D.A., Orkars, T. and Malaquias, M.A.E., 2018. *Diniatys callosa* (Preston, 1908), New combination name for *Haminoea callosa* from the Andaman Islands (India). *Journal of Conchology*, **43**(2): 213-215.
- Bharate, M., Oskars, T.R., Narayana, S., Ravinesh, R., Biju Kumar, A. and Malaquias, M.A.E., 2018. Description of a new species of *Haminoea* (Gastropoda: Cephalaspidea) from India, with an account of the diversity of the genus in the Indo- West Pacific. *Journal of Natural History*, **52**(37-38): 2437-2456.
- Bhawe, A., Bhawe, V., Apte, D. and Kale, P., 2015. Addition to the records of Discodorid sea slugs along the west coast of India. In: *Proceedings of National Conference on New and Emerging Trends in bioinformatics and Taxonomy-NETBT 2015*, 14-15th January, 2015, Dept. of Botany and Research Committee, Vidya Prasarak Mandal's B.N. Bandodkar College of Science, Mumbai, Maharashtra. pp. 151-154.
- Bhawe, V. and Apte, D., 2011. Illustrated checklist of opisthobranch fauna of Ratnagiri, Maharashtra, India, with eight new records to India. *Journal of Bombay Natural History Society*, **108**(3): 172-182.
- Bhawe, V. and Apte, D., 2012. First record of *Okenia pellucida* Burn, 1967 (Mollusca: Nudibranchia) from India. *Journal of Threatened Taxa*, **4**(14): 3362-3365.



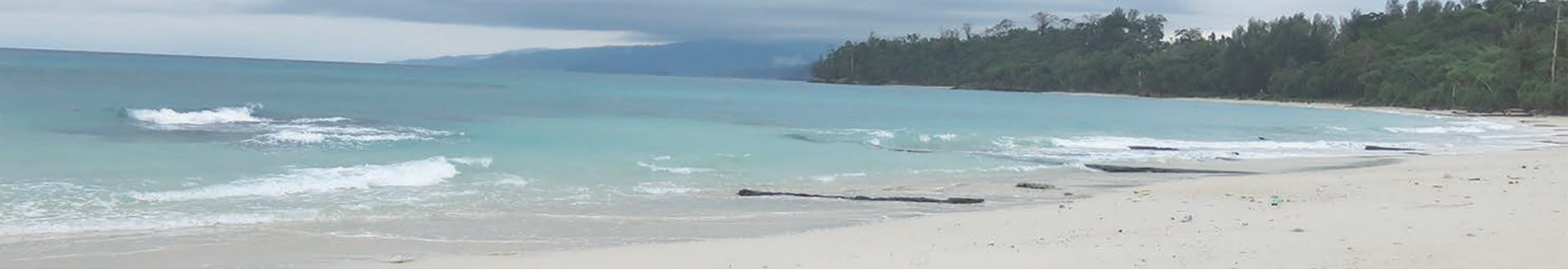
- Bhave, V. and Apte, D., 2013. Current status of Indian opisthobranch fauna. In: Venkataraman, K.; Raghunathan, C.; Sivaperuman, C. (Eds.), *Ecology and conservation of Tropical marine communities*. 481 pp. Springer, pp 63-79.
- Bouchet, P., Rocroi, J.P., Hausdorf, B., Kaim, A., Kano Y., Nützel, A., Parkhaev, P., Schrödl, M. and Strong, E.E., 2017. Revised classification, nomenclator and typification of gastropod and monoplacophoran families. *Malacologia*, **61**(1-2): 1-526. doi:10.4002/040.061.0201
- Bouchet, P. and Rocroi, J.P., 2005. Classification and Nomenclator of Gastropod Families. *Malacologia*, **47**: 1-397.
- Briggs, J.C. and Bowen, B.W., 2012. A realignment of marine biogeographic provinces with particular reference to fish distributions. *Journal of Biogeography*, **39**(1): 12-30.
- Burn, R., 1970. *Phyllidia (phyllidiella) zeylanica* Kelaart, a rare nudibranch from Indian subcontinent. *Memoirs of National Museum Victoria*, **31**: 37-40.
- Carmona, L., Bhave, V., Salunkhe, R., Pola, M., Gosliner, T.M. and Cervera, J.L., 2014. Systematic review of *Anteaeolidiella* (Mollusca, Nudibranchia, Aeolidiidae) based on morphological and molecular data, with a description of three new species. *Zoological Journal of the Linnean Society*, **171**: 108-132.
- Carmona, L., Cervera, J.L., Biju Kumar, A. and Sneha Chandran, B.K., 2017. First record of the Aeolid *Anteaeolidiella fijensis* (Nudibranchia, Aeolidiidae) from India. *Marine Biodiversity*, **47**(3): 823-830.
- Ciavatta, M., Pilar, M., Margherita, G., Emiliano, M. and Ernesto, M., 2006. New Caulerpenyne-derived Metabolites of an *Elysia* Sacoglossan from the South Indian Coast. *Molecules*, **11**: 808-816.
- Clarke, K.R., 1993. Non-parametric multivariate analyses of changes in community structure. *Australian Journal of Ecology*, **18**: 117-143.
- Dayrat, B. and Tillier, S., 2002. Evolutionary relationships of Euthyneuran Gastropods (Mollusca): a cladistic re-evaluation of morphological characters. *Zool. J. Linn. Soc.*, **135**: 403-470.
- Dhanya, A.M., Jayabaskaran, R., Prema, D., Chinnadurai, S., Abhilash, K.S., Saji Kumar, K.K. and Kripa, V., 2017. Non-indigenous sea slug *Tenellia adspersa* in the southeast coast of the Arabian Sea, India. *Current Science*, **113**(1): 24-26.
- Dishant, P., Bhavik, P. and Harshad, S., 2014. Further records to the opisthobranch fauna of India. *Cibtech Journal of Zoology*, **3**(1): 19-26.
- Eliot, C., 1906. On the nudibranchs of South India and Ceylon, with special reference to the drawings by Kelaart and the collection belonging to Alder and Hancock preserved in the Hancock museum at New Castle-on-Tyne North. *Proceedings of the Zoological Society of London*, II: 636-691 & 997-1008.
- Eliot, C., 1910. Notes on nudibranchs from the Indian Museum. *Records of the Indian Museum*, **5**(4): 247-252.
- Eliot, C., 1916. Mollusca. Nudibranchiate fauna of Chilka Lake. *Memoirs of the Indian Museum*, **5**: 377-379.
- Eliot, C.N.E., 1903. Nudibranchiata, with some remarks on the families and genera and description of a new genus, Doridomorpha, In: Gardiner, J.S. (Ed.), *The fauna and geography of the Maldive and Laccadive Archipelagoes, being the account of the work carried on and of the collections made by an expedition during the years 1899 and 1900*, **2**: 540-573.
- Eliot, C.N.E., 1909. *Report to the government of Baroda on the marine Zoology of Okhamandal in Kattiawar*. by James Hornell.
- Farran, G.P., 1905. Report on the opisthobranchiate mollusca collected by professor herdman, at Ceylon in 1902. In: Herdman, W.A. (Ed.), *Report to the government of Ceylon on the Pearl Oyster Fisheries of the Gulf of Mannar*. **3**: 329-364.
- Fontana, A., Maria, C.L., D'souza, L., Mollo, E., Chandra, G., Naik, P.S., Parameswaran., Wahidulla, S. and Cimino, G., 2001. Selected chemo-ecological studies of marine opisthobranchs from Indian coasts. *Journal of the Indian Institute of Science*, **81**(4): 403-415.
- Ganapati, P.N. and Sarma, A.L.N., 1968. Occurrence of bivalve gastropods (Mollusca) in Visakhapatnam shore. *Current Science*, **37**: 689-690.
- Ganesh, T., Surya Rao, K.V. and Raman, A.V., 2009. Paper Bubble shell *Hydatina zonata* (Class: Gastropoda; Family: Hydatinidae) from the northeast coast of India. *Marine Biodiversity Records*, **2**: 161.



- Gavas, S., Shirke, B., Kulkarni, P. and Rajpurkar, S., 2016. Illustrative checklist of opisthobranchs from selected beaches of Mumbai. *Indian Journal of Geo-Marine Sciences*, **45**(8): 1024-1028.
- Giji, S., Arumugam, M., Vitthal, W.M., Abirami, P., Mohan, K. and Thangavel, B., 2013. In vitro antibacterial, alpha-amylase inhibition potential of three nudibranchs extracts from south east coast of India. *Journal of Coastal Life Medicine*, **1**(3): 186-192.
- Gravely, F.H., 1910. Note on ecology of *Cuthona annandalei*, Eliot (in Eliot, 1910a). *Records from the Indian Museum*, **5**(4): 249.
- Gravely, F.H., 1942. Shells and other animal remains found on the Madras beach. II. Snails, etc. (Mollusca Gastropoda). *Bulletin of the Madras Government Museum, New Series, Natural History Section*, **5**(2): 1-110.
- Haszprunar, G., 1985. The Heterobranchia – a new concept of the phylogeny of the higher Gastropoda. *Zool. Syst. Evol.*, **23**: 15-37.
- Haszprunar, G., 1988. On the origin and evolution of major gastropod groups, with special reference to the Streptoneura. *J. Moll. Stud.*, **54**: 367-441.
- Haszprunar, G., 1988. On the origin and evolution of major gastropod groups, with special reference to the Streptoneura. *J. Moll. Stud.* **54**: 367-441.
- Haszprunar, G. and Huber, G., 1990. On the central-nervous-system of Smeagolidae and Rhodopidae, 2 families questionably allied with the Gymnomorpha (Gastropoda, Euthyneura). *J. Zool.*, **220**: 185-199.
- Hornell, J., 1949. Indian molluscs. *Bombay Natural History Society*, 1-96.
- Huber, G., 1993. On the cerebral nervous system of marine Heterobranchia (Gastropoda). *J. Moll. Stud.*, **59**: 381-420.
- Hylleberg, J. and Kilburn, R.N., 2002. Annotated inventory of molluscs from the Gulf of Mannar and vicinity. *Phuket Marine Biological Centre Special Publication*, **26**: 19-79.
- Jagtap, T.G., Tirodkar, S.P.S., Savant, S.B., Kulkarni, V.A. and Ansari, Z.A., 2009. *Elysia bangtawaensis* Swennen (Nudibranch) from the mangrove habitat of Mandovi estuary, Goa (Central west coast), India. *Current Science*, **96**(1): 30-33.
- Kamalakannan, K., Kumaran, S., Balakrishnan, S., Thenmozhi, C., Sampathkumar, P. and Balasubramanian, T., 2010. Occurrence of *Glaucus atlanticus* and *Glaucus marginata* (blue ocean slug) from Nagapattinam coastal waters southeast coast of India. *International Journal Current Research*, **5**: 071-073.
- Kasinathan, R., Govindan, K. and Desai, B.N., 1975. On the Opisthobranch *Haminoea vitrea* (A. Adams, 1850) From Madh Island (Bombay). *J. Mar. Biol. Asso. Ind.*, **17**: 696-701.
- Marcus, E. and Marcus, E., 1970. Opisthobranchs from Curaçao and faunistically related regions. *Studies on the Fauna of Curacao and other Caribbean Islands*, **33**: 1-129.
- Matwal, M. and Joshi, D., 2011. Record of *Phyllidiella zeylanica* (Mollusca: Gastropoda: Opisthobranchia) after 42 years from Gujarat, India. *Journal of Threatened Taxa*, **3**(7): 1951-1954.
- Melvill, J.C. and Abercrombie, A., 1893. The marine mollusca of Bombay. *Memoirs of the Manchester Literary and Philosophical Society*, **47**: 17-51.
- Menon, P.K.B., Gupta, A.K.D. and Gupta, D.D., 1961. On the marine fauna of the Gulf of Kutch. *Bombay Natural History Society*, **58**(2): 475-494.
- Mookherjee, H.P. and Barua, S., 1989. Molluscan fauna of Manauli Island in relation to environmental niche. *Rec. zool. Surv. India*, **85**: 527.
- Narayanan, K.R., 1968. On the opisthobranchiate fauna of the Gulf of Kutch. *Proceedings of the Symposium on Mollusca held at Cochin from January 12 to 16, 1968, Marine Biological Association of India, Mandapam Camp, India, Symposium Series*, **3**: 189-213.
- Narayanan, K.R., 1968. On the opisthobranchiate fauna of the Gulf of Kutch. *Advance Abstracts Contributions Fisheries & Aquatic Science India*, **1**(3): 47-48.
- Narayanan, K.R., 1968. On the opisthobranchiate fauna of the Gulf of Kutch. *Symposium on Mollusca held under the auspices of the Marine Biological Association of India at Ernakulam (Cochin), 12-16 January 1968*, 4-5.



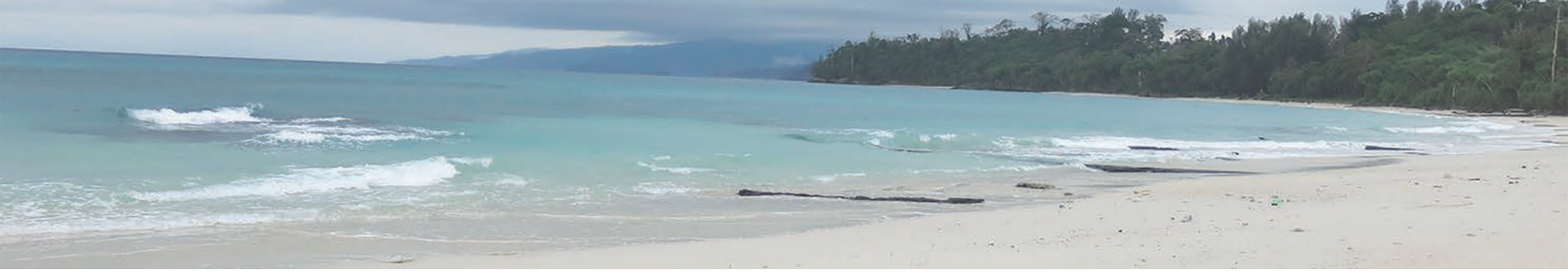
- Narayanan, K.R., 1968. On three opisthobranchs from the south-west coast of India. *Journal of the Marine Biological Association of India*, **10**(2): 377-380.
- Narayanan, K.R., 1970a. On two doridacean nudibranchs (Mollusca: Gastropoda) from the Gulf of Kutch, new to Indian coast. *Advance Abstracts of Contributions on Fisheries and Aquatic Sciences in India*, **4**(4): 313-314.
- Narayanan, K.R., 1970b. On three opisthobranchs from the south-west coast of India. *Advance Abstracts of Contributions on Fisheries and Aquatic Sciences in India*, **4**(2): 128.
- Narayanan, K.R., 1971. On two doridacean nudibranchs (Mollusca: Gastropoda), from the Gulf of Kutch, new to the Indian coast. *Journal of the Bombay Natural History Society*, **68**(1): 280-281.
- Natarajan, R., 1970. Cytological studies of Indian mollusks: chromosomes of some opisthobranchs from Porto Novo, South India. *Malacological Review*, **3**: 19-23.
- O'Donoghue, C.H., 1932. Notes on Nudibranchiata from southern India. *Proceedings of the Malacological Society of London*, **20**: 141-166.
- Panigrahi, A., 2000. Observations on chitons and slugs at Porbandar coast of Gujarat. *Environment & Ecology (Kalyani)*, **18**(2): 472-473.
- Parasharya, D. and Patel, B., 2014. Spawning aggregation of *Melibe viridis* Kelaart (1858) from Gulf of Kachchh - Western India. *International Journal of Scientific and Research Publications*, **4**(3): 1-5.
- Patterson, C.M., 1969. Chromosomes of Molluscs. *Proceedings of the Symposium on Mollusca held at Cochin from January 12 to 16, 1968, Marine Biological Association of India, Mandapam Camp, India. Symposium series 3, part 2*, 635-686.
- Ponder, W.F. and Lindberg, D.R., 1997. Towards a phylogeny of gastropod molluscs: an analysis using morphological characters. *Zoological Journal of the Linnean Society*, **119**: 83-265.
- Poriya, P., Vakani, B., Chaudhari, B., Kachhiya, P. and Kundu, R., 2015. Diversity and first record of heterobranch gastropods (opisthobranchs) from the Saurashtra coast of Kathiawar Peninsula, India. *Marine Biodiversity Records*, **8**: e82 (7pp).
- Rajaganapathi, J. and Kathiresan, K., 2002. Heparinase in purple fluid of the sea hare, *Bursatella leachii*. *Current Science*, **82**(3): 264-266.
- Ramya, M.S., Ravichandran, S. and Anbuhezhan, R., 2014. First discovery of *Armina babai* (Gastropoda, Nudibranchia, Arminoidea) from southeast coast of India. *Journal of Asia-Pacific Biodiversity*, **7**: 364-366.
- Rao, K.P., 1965a. *Moridilla brockii* Bergh 1888, redescribed with notes on anatomy and early development. *Journal of the Marine Biological Association of India*, **7**(1): 61-68.
- Rao, K.P., 1965b. Record of the bivalve gastropod *Berthelinia limax* (Kawaguti and Baba, 1959) from the Indian Ocean. *Nature*, **208**: 404-405.
- Rao, K.P., 1968. On a new genus and some new species of opisthobranchiate gastropods of the family Eubranchiidae from the Gulf of Mannar. *Proceedings of the Symposium on Mollusca held at Cochin from January 12 to 16, 1968. Marine Biological Association of India, Mandapam Camp, India. Symposium series 3, pt 1*, 51-60.
- Rao, K.P., 1968a. On a new genus and some new species of opisthobranchiate gastropods of the family Eubranchiidae from the Gulf of Mannar. *Advance Abstracts Contributions Fisheries & Aquatic Science India*, **2**(1): 27.
- Rao, K.P., 1968b. On a new genus and some new species of opisthobranchiate gastropods of the family Eubranchiidae from the Gulf of Mannar. *Symposium on Mollusca held under the auspices of the Marine Biological Association of India at Ernakulam (Cochin), 12-16 January 1968*, 6-7.
- Rao, K.V., 1937. Structure and habits and early development of a new species of *Stiliger* Ehrenberg. *Records of Indian Museum*, **39**: 435-464.
- Rao, K.V., 1952. [For 1951]. *Cuthona adyarensis*, a new nudibranch (Mollusca: Gastropoda) from Madras. *Journal of the Zoological Society of India*, **3**(2): 229-238.
- Rao, K.V., 1962a. [For 1961] On two opisthobranchiate molluscs, *Placobranchus ocellatus* Hasselt and *Discodoris boholiensis* Bergh, from Indian waters not hitherto been recorded. *Journal of the Marine Biological Association of India*, **3**(1,2): 253-256.



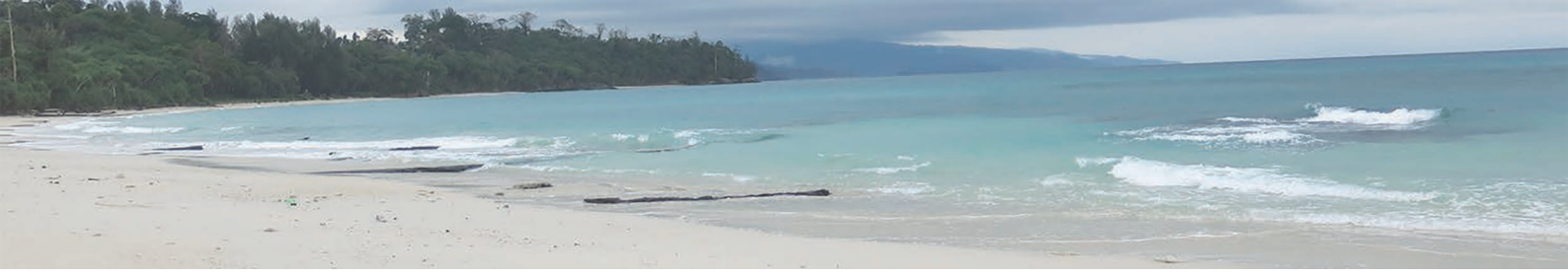
- Rao, K.V., 1962b. [For 1961] Development and life history of a nudibranchiate gastropod, *Cuthona adyarensis* Rao. *Journal of the Marine Biological Association of India*, **3**: 186-197.
- Rao, K.V., 1963. The morphology of *Kalinga ornata* (Ald. & Han.). *Records from the Indian Museum*, **38**(1): 41-79.
- Rao, K.V., 1967. On the structure and life history of a new aeolid *Favorinus argentimaculatus* from Palk Bay. *Advance Abstracts Contributions Fisheries & Aquatic Science India*, **1**(4): 41-42.
- Rao, K.V., 1967a. On a few little known opisthobranchiate Mollusca from the Palk Bay and the Gulf of Mannar with notes on their development. *Advance Abstracts Contributions Fisheries & Aquatic Science India*, **1**(4): 51.
- Rao, K.V., 1967b. On a few little known opisthobranchiate Mollusca from the Palk Bay and the Gulf of Mannar with notes on their development. *Symposium on Mollusca held under the auspices of the Marine Biological Association of India at Ernakulam (Cochin)*, 12-16 January 1968, 37.
- Rao, K.V., 1968. On the structure and life-history of a new aeolid, *Favorinus argentimaculatus* from Palk Bay. *Symposium on Mollusca held under the auspices of the Marine Biological Association of India at Ernakulam (Cochin)*, 12-16 January 1968, 7.
- Rao, K.V., 1970. On the structure and life-history of a new aeolid, *Favorinus argentimaculatus* from Palk Bay. *Proceedings of the Symposium on Mollusca held at Cochin from January 12 to 16, 1968, symposium series 3, pt 3*, 1009-1016.
- Rao, K.V., 1973. On dendronotacean nudibranch gastropods of the genera *Hancockia* and *Doto* from the Gulf of Mannar. Special publication dedicated to N. K. Panikkar., *Marine Biological Association of India, Cochin (India)*, 321-332.
- Rao, K.V. and Alagaraswami, K., 1961. External morphology and early development of *Pleurobranchus (Oscanus)* sp. from the Gulf of Mannar. *Journal of the Marine Biological Association of India*, **3**(1&2): 255-259.
- Rao, K.V., and Alagaraswami, K., 1960. An account of the structure and early development of a new species of a nudibranchiate gastropod, *Eolidina (Eolidina) mannarensis*. *Journal of the Marine Biological Association of India*, **2**: 6-16.
- Rao, K.V., and Krishna Kumari, L., 1973. On a new species of *Dendrodoris* Ehrenberg from Goa: Mollusca - Nudibranchiata. *Journal of the Marine Biological Association of India*, **15**(1): 242-250.
- Rao, K.V., and Krishna Kumari, L., 1973. Structure and early development of an opisthobranch mollusc, *Caloria militaris* (Alder & Hancock). *Indian Journal of Marine Science*, **2**(1): 32-37.
- Rao, K.V., and Krishna Kumari, L., 1974. On some aspects of taxonomy, structure and early development of the nudibranchiate gastropod, *Discodoris fragilis* (Alder & Hancock). *Journal of the Marine Biological Association of India*, **16**(3): 689-699.
- Rao, K.V., and Rao, K.P. 1963. *Stiliger nigrovittatus* sp. nov, a sacoglossan mollusc from the Gulf of Mannar. *Journal of the Marine Biological Association of India*, **5**(2): 232-238.
- Rao, K.V., Sivadas, P., and Krishna Kumari, L., 1974. On three rare doridiform nudibranch molluscs from Kavaratti Lagoon, Laccadive Islands. *Journal of the Marine Biological Association of India*, **16**(1): 113-125.
- Ravinesh, R., Jabir, T., Bijukumar, A., and Hatha, A.A.M., 2014. First record of sea slug *Polybranchia orientalis* (Sacoglossa: Caliphyllidae) from the south-west coast of India. *Marine Biodiversity Records*, **7**: e100, pp 2.
- Ravinesh, R., Sneha Chandran, B.K., and Bijukumar, A., 2013. Record of the dendrodorid slug, *Dendrodoris coronata* (Nudibranchia: Dendrodorididae) from Western Indian Ocean. *Marine Biodiversity Records*, **6**: e116, pp 2.
- Ravinesh, R., Jabir, T., Sneha Chandran, B.K., Biju Kumar, A. and Mohamed Hatha, A.A., 2017. First record of the alien sea slug *Thecacera pennigera* (Montagu, 1813) (Mollusca: Gastropoda: Nudibranchia: Polyceridae) from southwest coast of India. *Journal of Aquatic Biology & Fisheries*, **5**: 222-224.
- Rudman, W.B., 1980. Aeolid opisthobranch molluscs (Glaucidae) from the Indian Ocean and the south-west Pacific. *Zoological Journal of the Linnean Society*, **68**: 139-172.
- Russell, H.D., 1971. A list of the nudibranchs of India and adjacent seas. Abstracts of the Symposium on Indian Ocean and adjacent seas, their origin science and resources, Cochin, India, 12-18 January 1971, Marine Biological Association of India, Mandapam Camp, India. p. 91.
- Sankar, R., Raja, P., and Murugan, A., 2011. Occurrence of opisthobranch mollusc *Umbraculum umbraculum* in Tuticorin coast, Southeast coast of India. *Indian journal of Geo-marine Sciences*, **40**(4): 487-490.



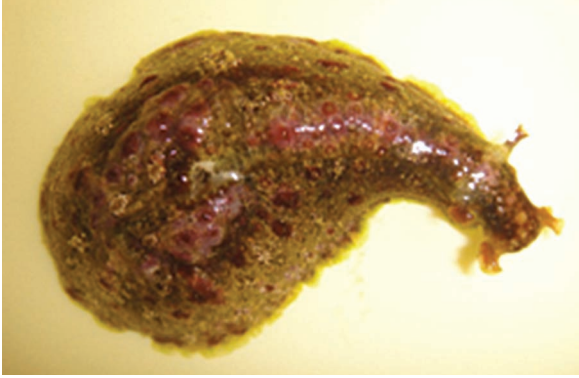
- Sarma, A.L.N., 1974. Phytal fauna of *Caulerpa taxifolia* and *Caulerpa racemosa* off Visakhapatnam coast. *Indian Journal of Marine Science*, **3**: 115-164.
- Sarma, A.L.N., 1975. Three new species of bivalve gastropods *Julia* and *Berthelinia* found in eastern Indian Ocean. *Japanese Journal of Malacology: Venus*, **34**(1 and 2): 11-25.
- Sarma, A.L.N., and Ganapati, P.N., 1972. Faunal associations of algae in the intertidal region of Visakhapatnam. *Proceedings of the Indian National Science Academy*, **38B**(5 and 6): 380-396.
- Satyamurti, S.T., 1952. The Mollusca of Krusadai Island (in the Gulf of Mannar). *Bulletin Madras Government Museum, New Series, Natural History Section*, **1**(2)**6**: 1-258.
- Sethi, S.N., and Pattnaik, P., 2012. Record of the sea slug, *Kalinga ornata* Alder and Hancock, 1864 from the inshore waters of Bay of Bengal along Chennai coast. *Indian journal of Fisheries*, **59**(1): 151-154.
- Sethi, S.N. and Otta, S.K., 2014. Report on new record of the black-margined nudibranch, *Doriprismatica atromarginata* (Cuvier, 1804) from the inshore waters of Bay of Bengal along Karaikal coast. *Indian Journal of Geo-Marine Sciences*, **43**(8): 1560-1561.
- Sewell, R.B.S., and Annandale, N., 1922. Fauna of Chilka Lake: The hydrography and Invertebrate fauna of Rhanbha Bay in an abnormal year – *Stiliger pica* Annandale and Prashad, sp. nov., *Memoirs of Indian Museum*, **5**: 700-702.
- Sheeja, M.S., Padmakumar, K., 2014. New record of *Plakobranthus ocellatus* van Hasselt, 1824 from Kerala coast, India. *Indian Journal of Life Sciences*, **4**(1): 1-5.
- Shrinivaasu, S., Venkataraman, C., Rajkumar, R., Padmanaban, P., Venkataraman, K., 2013. Abundance and spawning of *Kalinga ornata* (Mollusca: Gastropoda: Opisthobranchia). *Cibtech Journal of Zoology*, **2**(1): 56-60.
- Shrinivaasu, S., Venkataraman, K., Venkataraman, C., Manikandan, B., 2013. *Pleurobranchus forskalii* (Ruppell & Leuckart, 1828) - A new record for Indian coastal waters. *Global Journal of Bio-science and Biotechnology*, **2**(3): 456-457.
- Smith, E.A., 1894. Natural history notes from H.M. Indian Marine Survey Steamer "Investigator", Commander T.H. Heming R.N. Series II. No. 10. Report upon some Mollusca dredged in the Bay of Bengal and the Arabian Sea. *Annals of Magazine of Natural History*, **6**(14): 157-174.
- Sneha Chandran, B.K., Ravinesh, R. and Biju Kumar, A., 2017. Additions to the sea snail fauna (Mollusca: Gastropoda: Opisthobranchia) of Lakshadweep Islands, India. *Journal of threatened taxa*, **9**(12): 11045-11053.
- Sneha Chandran, B.K., Shrinivaasu, S., Ravinesh, R., Robert, P., Aneesha, A.B. and Biju Kumar, A., 2017. Opisthobranch (Mollusca: Gastropoda) fauna of Kerala, India: A citizen science initiative. *J. Mar. Biol. Ass. India*, **59**(1): 49-58.
- Sneha Chandran, B.K., Valdes, A., Ravinesh, R. and Biju Kumar, A., 2016. Confirmed report of *Aplysia argus* Ruppell & Leuckart, 1830 (Mollusca: Opisthobranchia: Aplysiidae) from Lakshadweep, with notes on its taxonomy in India. *Journal of Aquatic Biology & Fisheries*, **4**: 147-151.
- Sonia, K., Jaymesh, T., Sreenath, K.R., Koya, M., 2015. Record of striped paper bubble shell, *Hydatina physis* (Linnaeus, 1758), from Indian waters. *Marine Biodiversity Records*, **8**: e4, 4 pp.
- Srinivasulu, B., Srinivasulu, C., Chethan Kumar, G., 2012. First record of the blue sea slug (*Glaucus atlanticus*) from Andhra Pradesh-India. *Taprobanica*, **4**(1): 52-53.
- Stork, N.E., Samways, M.J., 1995. Inventorying and Monitoring. In: Heywood, V.H. (Ed.), *Global Biodiversity Assessment*. Cambridge University Press, Cambridge, UK, 453-544.
- Subba Rao, N.V., 2003. Indian Seashells (Part I) Polyplacophora and Gastropoda Ed. Director, Zool. Surv. of India 1-426
- Subba Rao, N.V., Surya Rao, K.V., 1980. On a rare nudibranch, *Thordisa crosslandi* Eliot (Mollusca: Dorididae) from the west coast of India. *Bulletin Zoological Survey of India*, **2**(2-3): 219.
- Subburaman, S., Adhavan, D., Gowtham, S., Dhires Josh, Kamboj, R.D., 2013). Checklist of Opisthobranch faunas at Mithapur reef, Gulf of Kachchh, Gujarat. *Asian Journal of Marine Sciences*, **1**(1): 39-42.
- Sundaram, K.S., Sarvessan, R., Mohamed, K.H. and Shanbhogue, S.L., 1969., Catalogue of molluscs, prawns, stomatopods and marine algae in the reference collections of the Central Marine Fisheries Research Institute. *Bull. Cent. Mar. Fish. Res. Inst.*, **9**: 1-23.



- Sundaram, K.S., Sarvessan, R., Mohamed, K.H. and Shanbhogue, S.L., 1969. Catalogue of molluscs, prawns, stomatopods and marine algae in the reference collections of the Central Marine Fisheries Research Institute. *Bull. Cent. Mar. Fish. Res. Inst.*, **9**: 1-23.
- Swennen, C., 2011. Large mangrove-dwelling *Elysia* species in Asia, with descriptions of two new species (Gastropoda: Opisthobranchia: Sacoglossa). *The Raffles Bulletin of Zoology*, **59**(1): 29-37.
- Tillier, A., 1984. Relationships of gymnomorph gastropods (Mollusca: Gastropoda). *Zool. J. Linn. Soc.*, **82**: 345-362.
- Tudu, P.C., Yennawar, P., Ghorai, N. and Mohapatra, A., 2015. A report of *Arminababai* (Tchang, 1934) (Nudibranchia: Arminoidea: Arminidae) along northern east coast of India. *Rec. zool. Surv. India*, **115**(3): 273-275.
- Udvardy, M.D.F., 1975. A classification of the biogeographical provinces of the world. *IUCN Occasional paper no.*, **18**: 48.
- Vadher, P. and Kardani, H., 2018. First record of *Dendrodoris atromaculata* (Alder & Hancock, 1864) from West coast of India. *Journal of Entomology and Zoology Studies*, **6**(2): 2663-2666.
- Valdés, A., Gosliner, T.M., 1999. *Miamira* Bergh, 1875 and *Orodoris* Bergh 1875: junior synonyms of *Ceratosoma* JE Gray, 1850 (Nudibranchia: Chromodorididae). *Journal of Molluscan Studies*, **65**: 33-45.
- Valdés, Á., Mollo, E., Ortea, J., 1999. Two new species of *Chromodoris* (Mollusca, Nudibranchia, Chromodorididae) from southern India, with a redescription of *Chromodoris trimarginata* (Winckworth, 1946). *Proceedings of the California Academy of Sciences*, **51**(13): 461-472.
- Vestal, A., 1914. Internal relations of terrestrial associations. *American Naturalist*, **48**: 413-445.
- Wagele, H., Klusmann-Kolb, A., Verbeek, E and Schrod, M., 2014. Flashback and foreshadowing—a review of the taxon Opisthobranchia. *Org. Divers. Evol.*, **14**: 133-149.
- Wahidullah, S., Guo, Y.W., Fakhr, I.M.I., Mollo, E., 2006. Chemical Diversity in Opisthobranch Molluscs from Scarcely Investigated Indo-Pacific Areas. In: Cimino, G. and Gavagnin, A.M. (Eds.), *Progress in Molecular and Subcellular Biology, Subseries Marine Molecular Biotechnology: Molluscs*. Springer-Verlag, 175-198.
- Winckworth, H.C., 1946. *Glossodoris* from Bombay. *Proceedings of the Malacological Society of London*, **26**(6): 155-160.
- Winckworth, H.C., 1946a. A new *Goniodoris* from Bombay. *Proceedings of the Malacological Society of London*, **27**(2): 59-61.
- Yogesh Kumar, J.S., Sreeraj, C.R., Sornaraj, R., 2011. Opisthobranchs of the Gulf of Mannar Biosphere Reserve, Tamil Nadu, India. *Indian Journal of Fisheries*, **58**(4): 105-114.
- Zapata, F., Wilson, N.G., Howison, M., Andrade, S.C.S., Jörger, K.M., Schrödl, M., Goetz, F.E., Giribet G. and Dunn, C.W., 2014. Phylogenomic analyses of deep gastropod relationships reject Orthogastropoda. *Proc. R. Soc. B*, **281**: 20141739. <http://dx.doi.org/10.1098/rspb.2014.1739>



PLATE



Dolabrifera dolabrifera (Rang, 1828)



Chelidonura pallida Risbec, 1951



Haminoea cymbalum (Quoy and Gaimard, 1832)



Goniobranchus gleniei (Kelaart, 1858)



Goniobranchus fidelis (Kelaart, 1858)



Discodoris boholiensis Bergh, 1877



Phyllidia varicosa Lamarck, 1801



Elysia ornata (Swainson, 1840)