

## Additions to the Opisthobranch Fauna of Nicobar Group of Islands, India

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Opisthobranchia (Phylum: Mollusca) are one of the least studied groups in India, and very little is known from remotely located islands like Nicobar. Recent marine faunistic surveys conducted at Nicobar Group of Islands in the intertidal and subtidal zones revealed the presence of four opisthobranchs viz. *Phanerophthalmus smaragdinus* (Ruppell and Leuckart, 1828), *Dendrodoris nigra* (Stimpson, 1855), *Phyllidiopsis krempfi* Pruvot-Fol, 1957 and *Herviella mietta* Marcus & Burch, 1965 which are herein reported as new distributional records to Nicobar group of Islands and morphological descriptions of all the four reported species are enumerated.

[**Keywords:** Gastropoda; Marine slug; Mollusca; New record; Nicobar]

### Introduction

Gastropoda is the highest represented Class in the Phylum Mollusca, which is divided into three subclasses viz. Prosobranchia (Marine snails with shells), Pulmonata (Land snails and slugs) and Opisthobranchia (Marine slugs) of which, Opisthobranchia is the most sparsely studied in Andaman and Nicobar Islands. Opisthobranchia are marine slugs that exhibit reduction, internalization and the complete loss of shell. Studies on Opisthobranchian diversity in the Islands date back to the early 20<sup>th</sup> century<sup>1</sup> when Dr. Charles Eliot studied preserved specimens from the collections of Zoological Survey of India then known as the Indian Museum, after which there was a paucity of studies till early 21<sup>st</sup> century when Subba-Rao and Dey<sup>2</sup> reported 29 species distributed under 11 families and 4 orders. Following which several works have been published in the recent past from 2010 onwards<sup>3,4,5,6,7,8,9,10,11,12</sup>.

Nicobar group of Islands has not been explored adequately in terms of marine faunal biodiversity attributable to its geographical isolation and poor accessibility, which has resulted in much lower faunal estimates than that of Andaman group of Islands. A total of 54 opisthobranch species distributed under 30 genera and 15 families have been reported from the Nicobar group of Islands so far<sup>8,9,10</sup>. Recent marine faunistic surveys conducted at Nicobar group of Islands in the intertidal and subtidal zones revealed the presence of four opisthobranchs viz. *Phanerophthalmus smaragdinus* (Ruppell and Leuckart, 1828),

*Dendrodoris nigra* (Stimpson, 1855), *Phyllidiopsis krempfi* Pruvot-Fol, 1957 and *Herviella mietta* Marcus & Burch, 1965 which are herein reported as new distributional records to Nicobar group of Islands and morphological descriptions of all the four reported species are enumerated.

### Materials and Methods

Marine faunistic surveys have been carried out at Nicobar group of Islands namely Nancowrie, Car Nicobar and Great Nicobar (Fig. 1) through rocky shore exploration in the intertidal and through SCUBA in the subtidal zones. Altogether, a total of 26 survey sites were covered under 18 locations. *In-situ* photographs of the animals were taken in the field using Sea & Sea DX-1G digital camera. All possible taxonomic features were noted and data with respect to habit and habitat were collected.

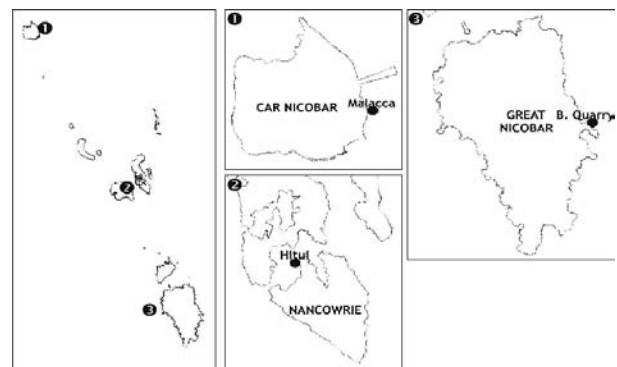


Fig. 1—map of Nicobar Islands showing the sites where the new records were observed

**Results**

Class: Gastropoda Cuvier, 1797

Subclass: Opisthobranchia Milne-Edwards, 1848

Order: Cephalaspidea Fischer, 1883

Family: Smaragdinellidae Thiele, 1925

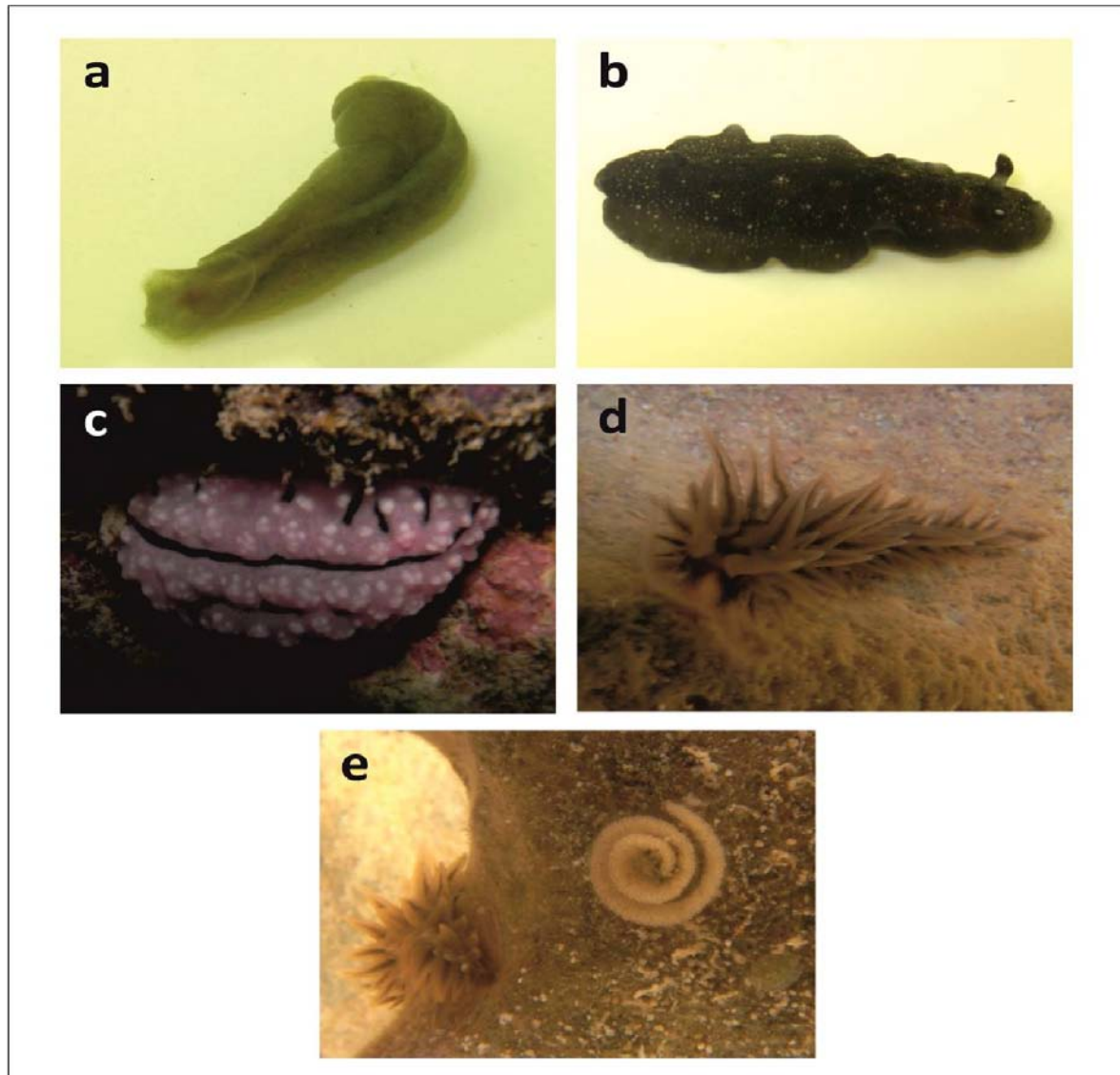
*Phanerophthalmus smaragdinus* (Ruppell and Leuckart, 1828)

Fig. 2—*In-situ* photographs of Opisthobranchs; a. *Phanerophthalmus smaragdinus* (Ruppell and Leuckart, 1828); b. *Dendrodoris nigra* (Stimpson, 1855) c. *Phyllidiopsis krempfi* Pruvot-Fol, 1957; d. *Herviella mietta* Marcus & Burch, 1965; e. Egg case of *H. mietta*.

The opisthobranch is commonly known as a headshield slug and it closely resembles an Aglajid in appearance though the genus *Phanerophthalmus* belongs to Cephalaspidea, an opisthobranch clade that is closely associated with the shelled prosobranchs. These headshield slugs are most primitive of the least modified form of gastropods, and exhibit great morphological diversity<sup>13</sup>. The specimen (Fig. 2a) measured 2.6 cm in length at full stretch and the head measured around 0.5 cm. The animal was green in colour throughout the body with a

slightly paler colouration on the ventral surface or the foot. The foot extended into parapodial folds to enclose the body from just below the head till the posterior end. The posterior end encloses a small remnant of the mantle cavity body. There is a very clear round opening in the posterior end which is the exhalant siphon of the mantle cavity.

**Remarks**

This species is a new distributional record for Nicobar group of Islands from Great Nicobar at B. Quarry (06°59.845' N; 093°56.781' E). The

species has previously been reported from the Andaman Islands from Burmanallah<sup>11</sup>. However, the specimen described by them is very small measuring around 6 mm at full stretch and also has a very prominent “W” shaped white mark on the posterior end of the headshield, which is a characteristic feature of *P. albocollaris*. More detailed studies are imperative on *P. smaragdinus* and *P. albocollaris* to essentially establish distinguishing characters between these two.

Order: Nudibranchia De Blainville, 1814

Suborder: Doridina Odhner, 1934

Family: Dendrodorididae O'Donoghue, 1924

*Dendrodoris nigra* (Stimpson, 1855)

The species is known to exhibit several colour variations and is known also to be confused with *D. fumata* which exhibits similar types of colourations. However, in the present study, two very typical black coloured *D. nigra* specimens with white spots (Fig. 2b) were observed from the intertidal zones underneath a rock. The smaller specimen measured 1.6 cm long and 0.6 cm wide while the larger 2.4 × 1 cm. The rhinophores are also black for the most part but have white tips. The rhinophores are lamellate with 12-14 lamellae. Though morphologically similar, the position and the nature of the gills are characteristic in distinguishing *D. nigra* from *D. fumata*. The gills on *D. nigra* are at the extreme posterior and form a compact circle around the anus in contrast to the much larger and much more anterior gills on the mantle of *D. fumata*.

#### Remarks

This species is a new distributional record for Nicobar group of Islands from Great Nicobar at B. Quarry (06°59.845' N; 093°56.781' E). It is important to note that this species has also been recorded from Hitui (08°01.423' N 093°31.726' E) of Nancowrie during the present study. It has been previously reported from Gulf of Mannar<sup>14</sup> and Andaman Islands<sup>4</sup>.

Family: Phyllidiidae Rafinesque, 1814

*Phyllidiopsis krempfi* Pruvot-Fol, 1957

The species is characterised by the typical pink colouration of the body with pronounced broad based multicomponent tubercles which have paler apices (Fig. 2c). Two primary continuous longitudinal black lines run along the body from end to end. There are discontinuous longitudinal lines of various sizes usually between the two primary lines. There are also quite a few short striations at right angles to the mantle edges on either side. The specimen was observed at a

depth of 4 m near a rocky outcrop. The specimens measured 3 cm at full stretch and were around 1.5 cm wide. The rhinophores are black but have translucent pink colour toward the base.

#### Remarks

This species is a new distributional record for Nicobar group of Islands from Great Nicobar at B. Quarry (07°00.212' N; 093°56.976' E). The species has been previously recorded from the Andaman Islands<sup>10</sup>.

Suborder: Aeolidina Odhner, 1934

Family: Glaucididae Gray, 1827

*Herviella mietta* Marcus and Burch, 1965

The animal is translucent cream to light brown in colour (Fig. 2d) measuring around 2.5 cm at full stretch. There is a dark brown streak running down the dorsal side till the posterior end and it is typically bifid at the anterior region near the head and the black stripes traverse onto the oral tentacles. The rhinophores have a black stripe running on them longitudinally. There is a translucent white region in between the oral tentacles. The cerata are translucent cream to white coloured with a longitudinal black stripe running down the middle. It has been reported to be feeding on anemones by Gosliner<sup>15</sup> and hypothesised to mainly feed on hydroids by Young<sup>16</sup>. The specimen was found underneath a rock in the intertidal zone. A white coloured spiral egg case (Fig. 2e) was also observed in close proximity, which probably belongs to the animal. Small hydroids were also spotted on the same rock quite close to the region where the eggs were present possibly an indication that they feed on hydroids as it would be best to lay eggs where food is accessible for the young ones.

#### Remarks

This species is a new distributional record for Nicobar Group of Islands from Car Nicobar near Malacca Lighthouse (09° 10. 029' N; 092°49.838' E). It has been reported previously from the Andaman Islands<sup>12</sup>. It has been first described from the Hawaii region “Eniwetok”<sup>17</sup> after which it has only been mentioned in few reports from Hawaii. However, recent records in the web based online repository (Sea Slug Forum) reveals its presence from Japanese waters.

#### Conclusion

There is a paucity of information on the opisthobranch fauna of Nicobar group of Islands, which could be attributed mainly to the geographical isolation and lack of taxonomical

expertise in the past. Recent intensive works gave rise to the most comprehensive account on the Opisthobranchiate fauna of the Nicobar Islands by Sreeraj et al<sup>9</sup> wherein 52 species were described out of the 54 species previously reported from the Islands. The present study elucidates 4 new locational records of Recent increase in expertise as well as growing interest in this group would lead to a better understanding of their diversity and it is envisaged that a plethora of species would be discovered from these lesser known locations.

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