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Short Communication

A new record of Opisthobranch, *Tayuva lilacina* (Gould, 1852) and notes on *Euselenops luniceps* (Cuvier, 1816) from the Andaman Sea, India

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The present study reports occurrences of two sea slugs namely, moon headed side-gilled slug *Euselenops luniceps* (Cuvier, 1816) and spotted foot nudibranch *Tayuva lilacina* (Gould, 1852) from the Andaman Sea. *Euselenops luniceps* (Cuvier, 1816) is a very rare species previously recorded from the Andaman and Nicobar Islands without any precise geographical location details, and this study confirms the occurrence of *E. luniceps* (Cuvier, 1816) from the North & Middle Andaman Islands. The spotted foot nudibranch, *T. lilacina* (Gould, 1852) is first time recorded from the Andaman Sea. Previously, these two species were recorded from both the east and west coasts of mainland India. These species are illustrated, described, and their distribution details in the Islands are provided.

[**Keywords**: *Euselenops*, Opisthobranch, Range extension, *Tayuva*]

Introduction

Opisthobranchs are commonly known as sea slugs due to their slow and sluggish behavior. Several species of Opisthobranchs exhibit bright colors, patterns, and obvious shapes, associated with the possession of chemical defense[1]. The shape of rhinophores, gills, external morphology, and colors are very important taxonomic characters which are used for species identification[2]. They are mostly found in shallow waters and in proximity to coral reefs. They live in almost all marine environments from the tropical waters, Indo-pacific reefs to Antarctic waters[3,4].

The Andaman and Nicobar (A&N) Islands situated in between the Bay of Bengal and the Andaman Sea (North to South between 6°45' − 13°40' N latitudes and 92°12' - 93°55' E longitudes) possess diverse coral reefs. The Andaman Sea is surrounded by Burma, Thailand, Malaysia on the East, and Andaman and Nicobar Islands on the West. As most of the areas of the Andaman and Nicobar Islands are still unexplored, there is a whole lot of scope to conduct scientific studies and research in these islands and surrounding sea. Until now, 214 species of opisthobranchs under 36 families were reported from A&N Islands[2]. Recent survey findings yielded a very rare opisthobranch, *Euselenops luniceps* (Cuvier, 1817) and spotted foot nudibranch *Tayuva lilacina* (Gould, 1852) from the Andaman Sea which are new records to the Andaman Islands; although *E. luniceps* was previously reported along the region but without any precise location details.

Materials and Methods

Specimens were hand-picked from the subtidal regions on the reefs of the Andaman Islands by employing scuba diving (Fig. 1). The specimens were narcotized using few drops of magnesium chloride solution (72 g/L) and transferred into a 5 % formalin solution. The formalin-fixed animals were later transferred to 95 % ethanol for long time preservation. Identification was carried out based on the external morphology following Gosliner *et al.*[4], Apte[5], Chandran *et al.*[6], and the Sea Slug Forum website[7]. All the specimens are deposited in the holdings of national zoological collections of the Zoological Survey of India, Andaman and Nicobar Regional Centre (ZSI/ANRC), Port Blair.

Results

Systematics

Class: GASTROPODA Cuvier, 1795
Subclass: HETEROBRANCHIA Burmeister, 1837
Superorder: NUDIPLEURA Wägele & Willan, 2000
Order: PLEUROBRANCHIDA
Superfamily: PLEUROBRANCHOIDEA Gray, 1827
Family: PLEUROBRANCHAEIDAE Pilsbry, 1896
Genus: *Euselenops* Pilsbry, 1896

1. ***Euselenops luniceps* (Cuvier, 1816)**

One example, Durgapur (Lat: 12°29.293′ N; Long: 92°57.167′ E), North Andaman, 30.05.2018; depth range 5 m, size 75 mm, registration number ZSI/ANRC-22089. One example Nimbutala (Lat: 12°29.293′ N; Long: 92°57.167′ E), Middle Andaman, 25.12.2018; depth range 5 – 7 m, size 70 mm, registration number ZSI/ANRC-22085.

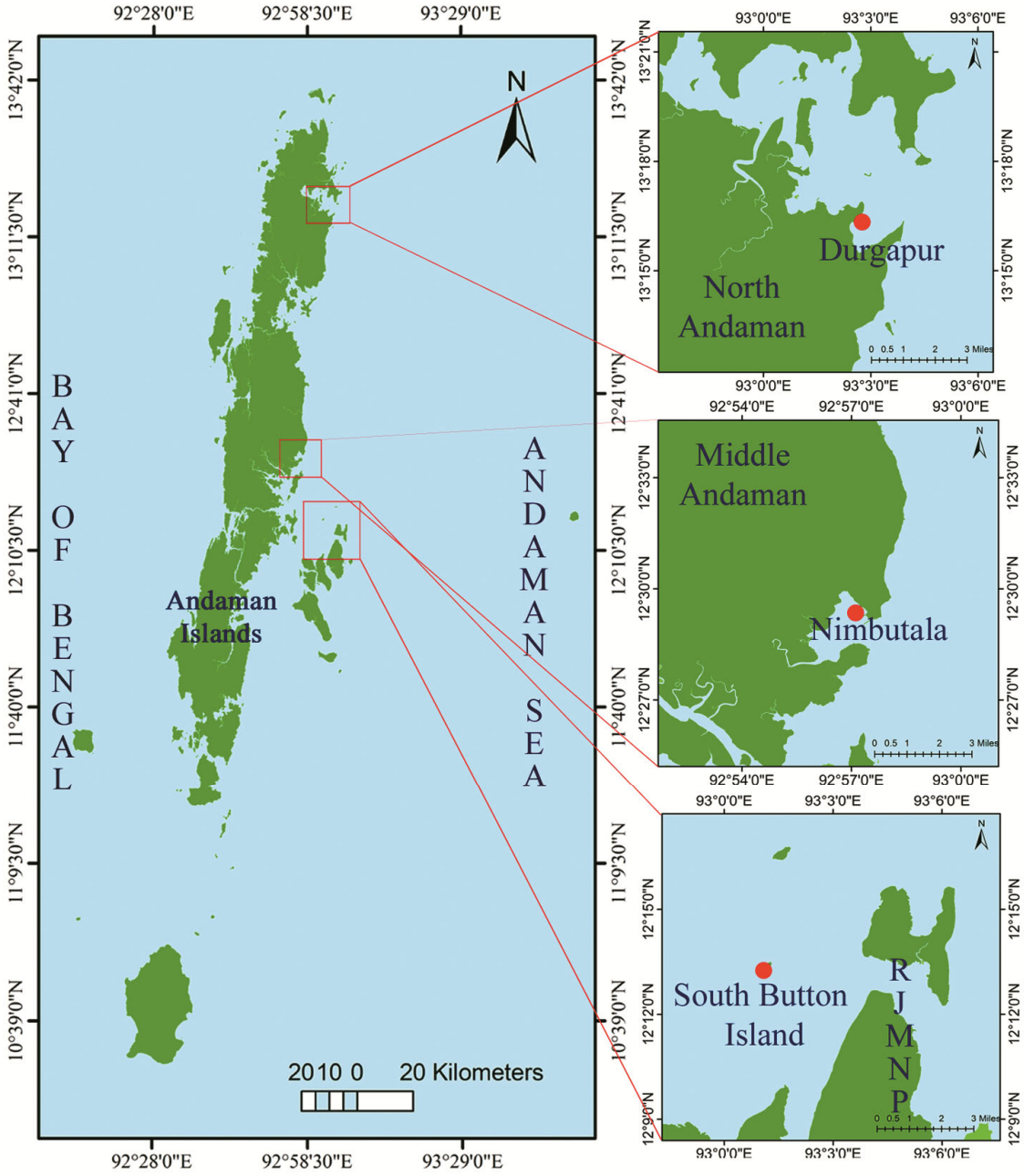

Fig. 1 — Map showing the study area and specimen collection sites from the Andaman Sea

Diagnosis: Body flattened, wide rounded in shape, and large veil, fringed with sensory papillae. Foot considerably larger than the mantle region. Posteriorly, the mantle folds into a relatively long siphon or tube, allowing the mantle cavity and gills to remain in contact with seawater while living in the sand. The white-colored body is abundantly dotted with deep brown spots (Fig. 2a & b). The colour blends with the surroundings and intimidates the predators, demonstrating no succulence with the help of bright colors. In disturbed conditions quickly disappear under the sand and camouflage making it difficult to sight. It can swim short distances.

Status: Very rare.

Ecology: One specimen is found on the sandy region (seagrass area) up to 5 m (Durgapur, Fig. 2a) and the second specimen was found on sand and silty region of mangrove habitat (Nimbutala, Fig. 2b).

Geographical distribution: India - Gulf of Mannar, Lakshadweep[5], and Andaman and Nicobar Islands[9];

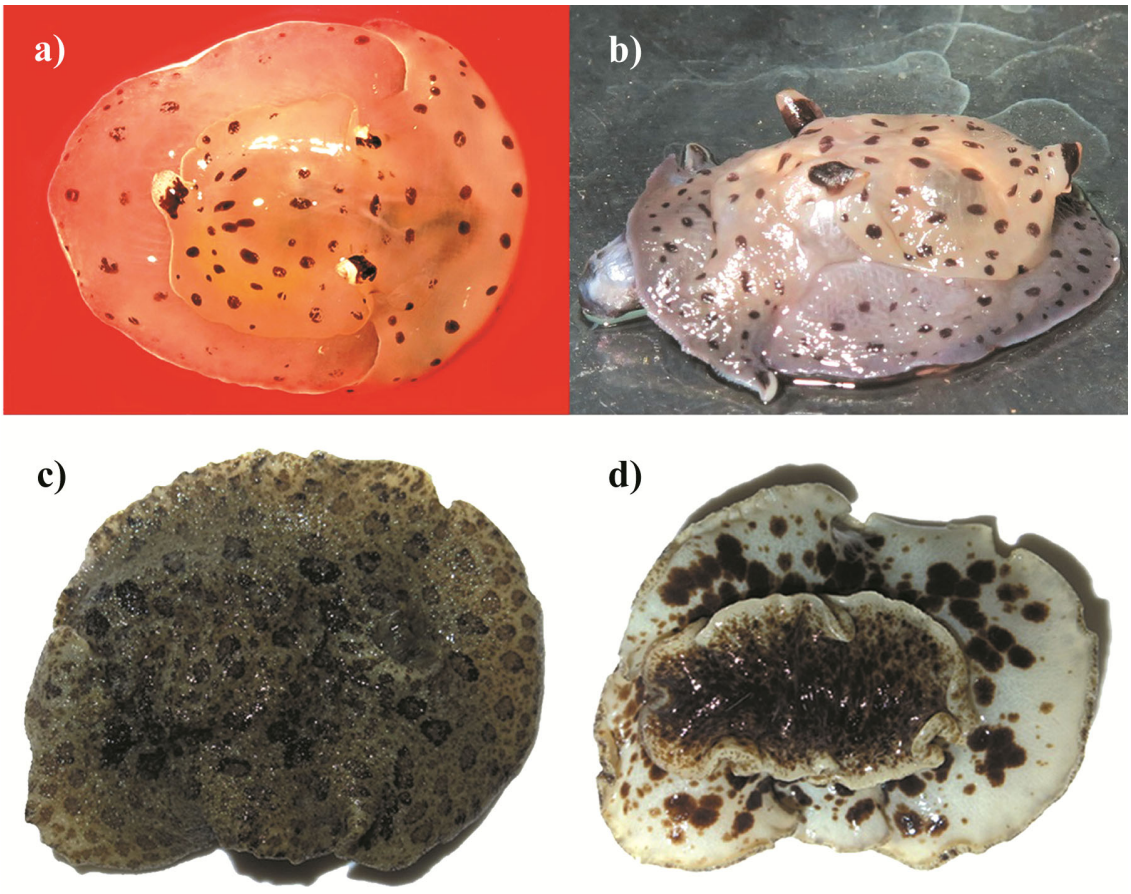

Fig. 2 — a, b) *Ex-situ* photographs of *Euselenops luniceps* (Cuvier, 1817): a) ZSI/ANRC/22089 (ventral view), and b) ZSI/ANRC/22085 (dorsal view); and c, d) *Ex-situ* photographs of *Tayuva lilacina* (Gould, 1852) ZSI/ANRC/M/24893: c) dorsal view, and d) ventral view

and elsewhere - Philippines to Australia, Fiji, Hawaii, tropical Indo-West Pacific. Also known from the South Africa and Tanzania[4].

Order: NUDIBRANCHIA Cuvier, 1817
Family: DISCODORIDIDAE Bergh, 1891
Genus: *Tayuva* Er. Marcus & Ev. Marcus, 1967

2. *Tayuva lilacina* (Gould, 1852)

Common name: Spotted foot nudibranch.

Two examples, South Button Island (Lat: 12°29.293′ N; Long: 92°57.167′ E), Rani Jhansi Marine National Park, South Andaman, 12.11.2019; depth 15 m, size 60 mm, registration number ZSI/ANRC/M/24893.

Diagnosis: A large sea slug, body ovate, broad and rigid (after preservation). Dorsal surface contains pale brown or grey numerous irregular dark spots. Each side of the notum contain dark patches and it is coated with little papillae that vary in length, and the branchia is creamy with white frosted edges. Large rhinophores and gathered gills. The pale underside has dark blotches and spots.

Status: Common.

Ecology: Two specimens (one adult 60 mm and one juvenile 8 mm) are found on coral rubble region of South Button Island (Rani Jhansi Marine National Park) up to 15 m depth (Fig. 2c & d).

Geographical distribution: India - Gujarat[8], Andhra Pradesh, Maharastra (Malvan, Ratnagiri), Tamil Nadu (Gulf of Mannar)[9], Kerala[6] and Andaman and Nicobar Islands (present report); elsewhere - Tropical and subtropical Indian and Pacific Oceans, Queensland, Philippines, Red Sea, South Africa, Turkey[4].

Discussion

The genus *Tayuva* and *Euselenops* are monotypic, belongings to families Pleurobranchaeidae (Pleurobranchida) and Discodoridae (Nudibranchia), respectively. The family Pleurobranchaeidae is characterized by a small internal shell or no shell; gills

are visible on the right side of the body and it may cover by the mantle. They are carnivores, closely related to nudibranchs and are normally active at night[10]. This family consists of three genera *i.e.*, *Euselenops* Pilsbry, 1896, *Pleurobranchaea* Leue, 1813, and *Pleurobranchella* Thiele, 1925(ref. 11) with 22 valid species[12]. Formerly, *Euselenops* genus is reported under the family Pleurobrachidae from Lakshadweep[5] but currently, this genus is moved under the family Pleurobranchaeidae[12]. The family Discodorididae is characterized by mantle covered by caryophyllidia or simple tubercles; gills commonly composed of multipennate leaves and sometimes by unipennate conical oral tentacles[4,13]. This family contains 24 genera with 283 species from world seas[12]. While a total of 16 species (including the present species) were recorded from the Andaman and Nicobar Islands.

Opisthobranchs, despite being colourful are still one of the lesser-known mollusc fauna from the Andaman and Nicobar Islands and also in the Indian scenario[14]. Therefore, a greater number of intensive ecological and taxonomic based explorations are required for this poorly known faunal group to understand their ecology and diversity in Andaman and Nicobar Islands and to conserve these rare known organisms efficiently.

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Conflict of Interest

The authors declare that there is no conflict of interest.

Ethical Statement

The specimens are not under the listed category of experimental animal or IUCN red list, which need ethical approval.

Author Contributions

SR & NKN: collection and identification of specimens; SR: preparation of manuscript; and CS: supervision, support and manuscript correction.

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