

First record of Ragged Sea Hare *Bursatella leachii* Blainville, 1817 (Opisthobranchia: Euopisthobranchia: Aplysiidae) in Pulicat Lake, east coast of India

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Specimens of Bursatella leachii Blainville, 1817 were collected from Pulicat Lake along the east coast of India at depths of up to 1 m and the maximum number of this species were recorded at a depth of 20 cm (13°33'57"N 80°10'29"E) on a sandy soil bed. A thorough literature survey on the species revealed this study to be the first report of its occurrence from this region. The present investigation describes a review on the occurrence and morphological features of this specimen.

Keywords: Ragged Sea Hare, *Bursatella leachii*, new records, Pulicat Lake, East coast of India

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INTRODUCTION

Nudibranchs are molluscan groups, commonly known as 'sea hares' and are best known for displaying a fascinating range of colours and body forms. The Ragged Sea Hare *Bursatella leachii* is a marine opisthobranch gastropod mollusc belonging to the family Aplysiidae and the order Anaspidea. They are circumtropical, found worldwide in warm temperate to tropical marine environments (Rudman, 1998). Kruczynski & Porter (1969) have listed North Carolina as the northern limit of this species along the US east coast. Information on sea hare distribution and description from the Indian subcontinent is scanty and, therefore, an investigation into this aspect is necessary and important. *B. leachii* is the only species described under the genus *Bursatella*. The distribution of this species has generally been reported from the inter-tidal zone and down to depths of at least 10 m in coastal areas of the Indo-West Pacific oceans, the Caribbean Sea and the Mediterranean Sea. A significant number of reports on the opisthobranch fauna of India have been made during recent times. The purifying and anti-HIV properties of the protein from the purple fluid of sea hare samples collected in India have been recorded (Rajaganapathi *et al.*, 2002). The occurrence of the sea slug *Kalinga ornata* along the inshore waters of the Bay of Bengal off Chennai, India was reported by Sethi & Pattnaik (2012). Similarly, there have been new records of the occurrence of the black-margined nudibranch

Doriprismatica atromarginata from the inshore waters of the Bay of Bengal along the Karaikal coast (Sethi and Otta, 2014). Specimens of the Wedge Sea Hare *Dolabella auricularia* from Kayalpatinam, Gulf of Mannar, on the south-east coast of India (Sethi *et al.*, 2014), and the side-gilled slug *Pleurobranchus mamillatus* off the coast of Tuticorin (Ranjith *et al.*, 2014) have been described. The present finding is the first record of the *B. leachii* species from the east coast of India.

MATERIALS AND METHODS

While carrying out a general survey on marine molluscs in Pulicat Lake, we noticed the presence of the sea hare *Bursatella leachii* along with other molluscan species, which is uncommon for this part of the coast. The specimens were caught approximately 3 km from the south-east side of Pulicat lake (13°33'57"N 80°10'29"E) in a sandy substrate. They were identified based on the presence of their characteristic taxonomic features. The collected specimens were preserved in 70% (v/v) ethanol and deposited in the National Biodiversity Referral Museum at CMFRI, Kochi. For photographic documentation, a Cyber-Shot Sony 16.2 megapixel camera was used.

RESULTS

Based on the specific taxonomic features of this mollusc, it was identified as *Bursatella leachii*.

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Fig. 1. Study sites of Ragged Sea Hare *Bursatella leachii* collected from Pulicat Lake, the Bay of Bengal, along the east coast of India.

SYSTEMATICS
 Phylum MOLLUSCA
 Class GASTROPODA
 Clad EUOPISTHOBRANCHIA
 Super-family APLYSIOMORPHA
 Genus *Bursatella*
Bursatella leachii Blainville, 1817

The samples were found near to the estuaries with higher frequencies on sandy bottoms (Figure 1). While less numbers of specimens were recorded at depths of about 1 m, the maximum occurrence was found at depths of approximately 20 cm. Dense concentrations, as high as 14–25/m² and in groups (Figure 2), were also observed. The specimens were found on seaweed beds of *Gracilaria verrucosa*. The eggs of this sea hare, found in long green strings resembling spaghetti noodles, were also observed to be attached to seaweed (Figures 3–5).

SPECIES DESCRIPTION AND MORPHOMETRIC MEASUREMENTS

The body of *Bursatella leachii* is greyish-green to white-tan with dark brown blotches and spots throughout the body. The body is compact and rounded, but the head and neck are distinctly separated. The head part is broad and short. The mantle has a network-like pattern with blue eyespots (ocelli) within black spots and green areas. The body is covered with numerous long, branching fleshy papillae,

giving the animal a ragged appearance. The gill is covered by a pair of fleshy parapodia. Two long retractile olfactory tentacles called rhinophores lie on the head and two fleshy enrolled oral tentacles appear at each side of the mouth. As it has been reported, we also observed that adults are



Fig. 3. Live Ragged Sea Hare *Bursatella leachii* collected at Pulicat Lake from the *Gracilaria verrucosa* seaweed beds.



Fig. 2. Density of Ragged Sea Hare *Bursatella leachii* at Pulicat Lake.



Fig. 4. Mass spawning of Ragged Sea Hare *Bursatella leachii* at Pulicat Lake from *Gracilaria verrucosa* seaweed beds.

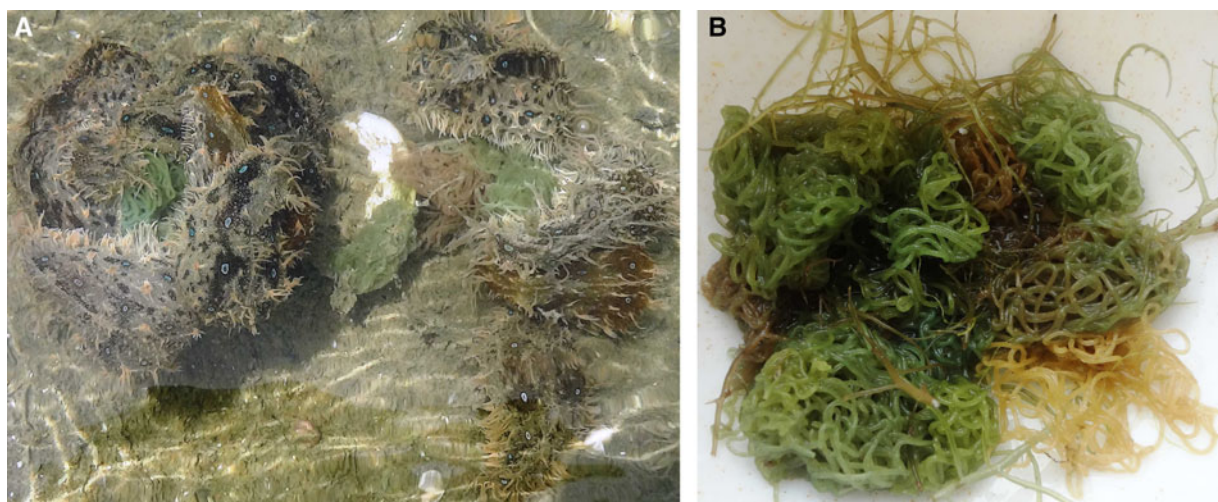


Fig. 5. Ragged Sea Hare *Bursatella leachii* Blainville, 1817 from Pulicat Lake: (A) Adults of *B. leachii* involved in the spawning process with green spaghetti-like egg strings; (B) Green- and yellow-coloured egg mass of *B. leachii*.

completely devoid of an internal shell (Voss, 1980; Kaplan, 1988; Rupert & Fox, 1998). In the present collection, the maximum length and weight of the animals recorded were 75 mm and 23 g, respectively. The average length and weight were 53.82 ± 6.32 mm and 15.2 ± 3.88 g, respectively.

Sea hares are not collected for human consumption in India and are, therefore, less popular. They are generally considered as low-value by-catch in trawls and, hence, are either discarded or used as manure or as an ingredient for fish feed. They are known to possess anti-cancer, anti-tumour and anti-viral compounds and are extensively used in pharmacological industries in other parts of the world. Soblidotin (Dolastatin-10 derivative), Synthadotin/ILX651, Cemadotin and Kahalalide F are marine natural compounds with anti-cancer qualities, derived from the sea hare, which are under various stages of clinical trials (Avila, 2006; Haefner, 2003). An anti-HIV protein, bursatellin-P, has been isolated from the purple ink secretion of the species, although it remains to be seen whether there will be tangible biomedical and economic benefits derived from this discovery (Rajaganapathi *et al.*, 2002).

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