

NEW RECORD OF *Plakobranchnus ocellatus* VAN HASSELT, 1824 FROM KERALA COAST, INDIA**M. S. SHEEJA^a AND K. PADMA KUMAR^{b1}**^aDepartment of Aquatic Biology and Fisheries, Kerala University Campus, Kariavattom, Thiruvananthapuram, Kerala, India^bCentre for Marine Biodiversity, Kerala University Campus, Kariavattom, Thiruvananthapuram, Kerala, India**ABSTRACT**

Plakobranchnus ocellatus Hasselt, 1824 (Sacoglossa, Opisthobranchia) is a marine tropical shallow water herbivorous mollusc. They are found well camouflaged in the silty substratum. Body colour and ornamentation tremendously varies with the locality. The genus *Plakobranchnus*, belonging to its own family, Plakobranchnidae has unique morphological and anatomical characters i.e., truncate body, small admedian eyes, lateral parapodia, longitudinal dorsal lamellae, anterodorsal anus, large ocellate spots, penial stylet etc. The present study is the new record of *Plakobranchnus ocellatus* from Vizhinjam coast of southwest India.

KEYWORDS : Mollusca, Opisthobranch, Sacoglossa, *Plakobranchnus ocellatus*, Vizhinjam, Kerala

Sacoglossan molluscs are specialized herbivores feeding suctorially on marine macroalgae (Jensen, 1980; 1997; Williams and Walker, 1999). These opisthobranchs do not have jaws and consists of uniseriate teeth (radula) and an ascus within which the older worn teeth are reabsorbed (Pruvot-Fol, 1954). They feed on algae belonging to the orders Caulerpales and Bryopsidales and considered as 'specialist herbivores' (Jensen, 1997; Williams and Walker, 1999). Various sacoglossan molluscs have been reported from several regions of the Indian coast (Rao, 1962; Rao and Rao, 1963; Apte, 2009; Apte et al., 2010; Ramakrishna et al., 2010; Bhave and Apte, 2011; Sreeraj et al., 2012). Among which *Plakobranchnus ocellatus* was recorded only from Palk Bay, Andaman and Nicobar Islands, Gulf of Kutch and Lakshadweep Islands. It is the lone valid species representing the family Plakobranchnidae. Jensen (1992) listed numerous synonyms for this species from the tropical seas, stating that colour pattern and distribution of ocelli are highly variable. *P. ocellatus* has unique ability to sequester photosynthetically active chloroplasts (kleptoplasty) from the algal food and live photosynthetically for a long period without feeding (Evertsen et al., 2007; Wägele et al., 2011; Christa et al., 2013). Diversity and distribution of such opisthobranchs from Kerala coast is quite scanty and hence this study.

MATERIALS AND METHODS

Eight specimens were collected from the intertidal regions of Vizhinjam (8°22' N; 76°59' E), southwest coast of India during December 2012 to September 2014. The

samples were collected by snorkeling and SCUBA diving at a depth of ~3 - 6 m. Digital photographs were made and morphological features were recorded with live specimens. Sacoglossans were relaxed by placing them in a solution of 7% MgCl₂ solution in seawater and subsequently fixed in 5% formaldehyde. The voucher specimen is deposited in the Museum of the Centre for Marine Biodiversity, University of Kerala (CMB-MOL7). Pharynx, radular teeth, and details of the digestive and reproductive systems were studied.

RESULTS**Systematics**

Kingdom: Animalia

Phylum: Mollusca

Class: Gastropoda

Subclass: Heterobranchia

Infraclass: Opisthobranchia Milne-Edwards, 1848

Order: Sacoglossa Ihering, 1876

Family: Plakobranchnidae Gray, 1840

Genus: *Plakobranchnus**Plakobranchnus ocellatus* van Hasselt, 1824**Synonyms**

Plakobranchnus ianthobaptus Gould, 1852; *Plakobranchnus guttatus* Stimpson, 1855; *Elysia ocellata* Pease, 1860; *Plakobranchnus gracilis* Pease, 1871; *P. variegatus* Pease, 1871; *P. argus* Bergh, 1872; *P. cominguinus* Bergh, 1872; *P. chlorophagus* Bergh, 1873.

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Distribution

Widely distributed in the Indo-Pacific, Red Sea (Heller and Thompson, 1983), Thailand, Guam (Jensen, 1992), Tahiti (Pease, 1871), Marshall Islands (Johnson and Boucher, 1983), Japan, Hawaii (Bergh, 1872), Solomon Island, South Africa, Philippines, Indonesia. In India it was reported from Gulf of Kutch, Andaman Islands, Tamil Nadu, Lakshadweep Islands (Rao, 1961; Apte, 2009; Ramakrishna et al., 2010; Sreeraj et al., 2012; Shaktivel et al., 2014).

Habitat

Most of the organisms are living camouflaged and half hidden in the sandy or silty substratum. The body of the animals is partly covered with detritus especially on its head and outer margin of parapodia.

Live coloration

Body color of the live organism is pale-green. The dorsal Parapodial flaps were grayish-green colour with numerous bluish green dots (ocelli) (Figure 1). The foot sole (ventral side) has several solid black coloured ocelli distinctly different from the dorsal side (Figure 2). Beneath the parapodia are longitudinal dark green lamellae, which consist of branches of digestive diverticula. Color of the rhinophore is creamy in nature.

Description

Animal is dorso-ventrally flattened with broad parapodia folding up on the dorsal side. The head is wide and flat. Length of animal varies between 2.0 and 4.4 cm,

with an average body width of 0.9cm. Rhinophores are short, smooth, and folded/grooved and extend horizontally from the edges of head. Eyes are very small and seen in the middle region of head. Pericardium is very small and without renal ridge. The anus opens at the right anterodorsal side. The foot is smooth and broad at the anterior side and narrow at the posterior side.

The pharynx is small with distinct septate muscle on the dorsal side (Figure 3). It has a muscular pharyngeal pouch (Figure 4). The average length of the pharynx is 0.64 mm and 0.46 mm width. The uniseriate radula consists of an ascending and a descending limb. The ascending limb consists of 9 and descending limb consists of 8 teeth (Figure 5). The radular teeth of *P. ocellatus* consist of triangular cusps with 8 marginal denticles. The ascus is with densely packed teeth numbering about 37-58 teeth. Penis is rather large with a lengthy curved cuticular stylet (Figure 6). A large bilobed mucus gland is also seen.

DISCUSSION

The genus *Plakobranthus* was originally included in the family Plakobranthidae (Bergh, 1872; Marcus, 1982). But the presence of longitudinal dorsal lamellae with branches of the digestive gland, the absence of dorsal vessels, the small admedian eyes, and the long, curved penial stylet are considered characters separating *Plakobranthus* from the Elysiidae which may be of plesiomorphic characters. Hence Jensen (1992) transferred



Figure 1 : Underwater Picture of *Plakobranthus ocellatus*.

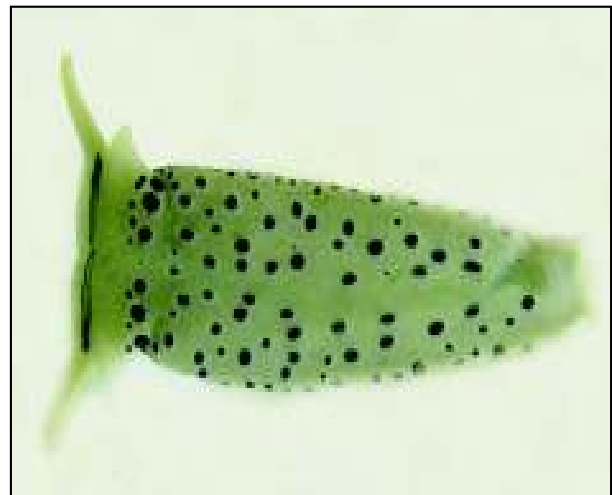


Figure 2 : Ventral Side of *Plakobranthus ocellatus*.



Figure 3 : Dorsal Side of the Pharynx With Distinct Septate Muscle.

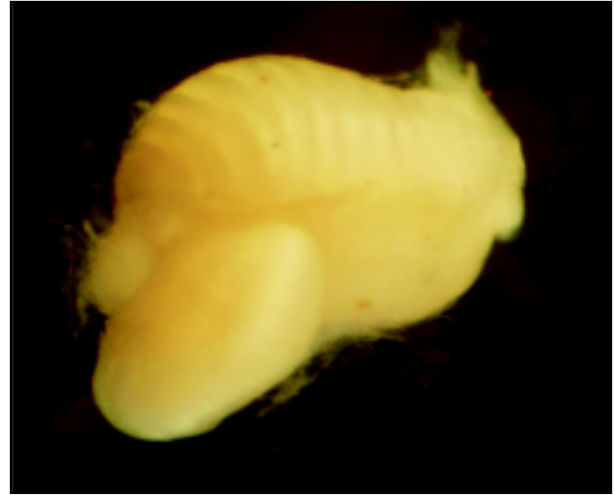


Figure 4 : Muscular Pharyngeal Pouch.

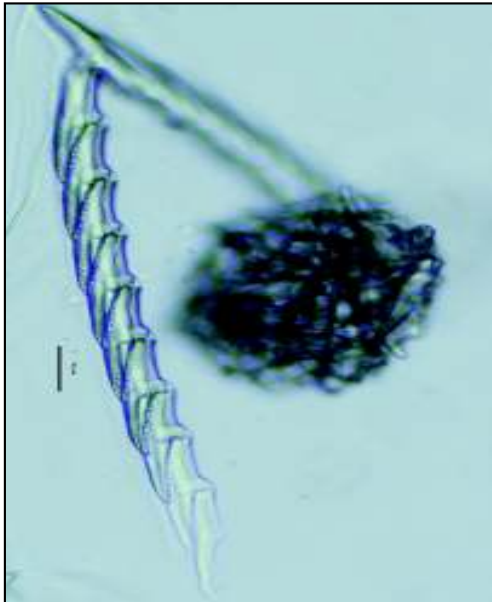


Figure 5 : Uniseriate Radula.



Figure 6 : Penis With Cuticular Stylet.

the genus *Placobranthus* into the family Elysiidae. But currently this species is still under a separate family Plakobranthidae.

The first record of *Placobranthus ocellatus* (= *Plakobranthus ocellatus*) from Indian coast was made from Palk Bay by Rao (1961). Apte (2009) reported *P. ocellatus* from Gulf of Kutch and Andaman with almost same morphological characters. The same species was also reported in Car Nicobar by Sreeraj et al., (2012). Recently Shakthivel et al., (2014) reported the species from

Andaman Islands. Most of the recent publications describe only morphological characters and anatomical characters are lacking.

A detailed description of the specimens collected from Indo-pacific region was reported by Jensen (1992). In the present study the ascending limb of radula consists of 9 and descending limb consists of 8 teeth. But Rao (1962) reported that both ascending and descending limbs of the radula had 8 teeth. The radular teeth also had only 8 marginal denticles in the present study. But the species

described by Eliot (1903) the marginal denticles on the teeth were about twelve. Marcus (1982) found a renal ridge in this species. But it was not seen in the present study. These may be considered as local variation within the species.

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