A RECORD OF BLACK SEA SQUIRTS, Herdmania momus (SAVIGNY, 1816) (FAMILY: PYURIDAE) AND Phallusia nigra (SAVIGNY, 1816) (FAMILY: ASCIDIIDAE) OFF THOOTHUKUDI, SOUTHEAST COAST OF INDIA (08º 35' 22.5" N lat. 78º 27' 40.9" E long and 08º 31' 91.2"N lat. 78º 25' 32.7"E)

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ABSTRACT

A new record of sea squirts, Herdmania momus (Savigny, 1816) and Phallusia nigra (Savigny, 1816) off Thoothukudi coast of Gulf of Mannar, southeast coast of India is reported. H. momus and P. nigra of which, only one specimen of the first species and four specimens of second species were caught at the depth of 310 m as an incidental by-catch. It was recorded from about 08º 53.6'N 78º 16'E and 08º 53.8'N 78º 32'E/310 m from Thoothukudi fishing harbour, southeast coast of India.

Keywords: Ascidiidae, Herdmania momus and Phallusia nigra, Thoothukudi coast of Gulf of Mannar

INTRODUCTION

"If you do not know the names of things, the knowledge of them is lost, too" (Linnaeus, 1751). Fundamental to understanding the scale and impacts of biological invasions in the sea is a clear and accurate resolution of the identification of invasive species. There is perhaps no better example of this need than the saga of the global spread of a species of ascidian (sea squirt) of the genus Herdmania and Phallusia, whose appearance in both inshore and offshore areas around the world during the period between 1970s and 1980s has been greeted with labyrinthian and obfuscated taxonomy.

Following the original classification of Lahille (1886), the class Ascidiacea is now divided into three orders based on the structure of the adult branchial sac: Aplousobranchia (simple), Phlebobranchia (vascular) and Stolodobranchia (Folded) (Shenkar and Swalla, 2011). The systematic list includes 2,815 valid species of ascidians. The highest number of species and families is found in the order Aplousobranchia, with approximately 50 percent of the species (1,480) in the class Ascidiacea (Shenkar and Swalla, 2011). Based on the classification of the Ascidiacea world database, there are currently 26 families in the class Ascidiacea, of which 13 belong to the Aplousobranchia, with the Didemnidae having the highest number of species (578). The genera with the highest number of described species are Aplidium (259) and Didemnum (228), in the Aplousobranchia. However, the highest number of genera per family was found in the Styelidae (38),

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order Stolidobranchia, which also has the second highest number of species (535). The majority of described species in the Ascidiacea are colonial (1730) (Shenkar and Swalla, 2011).

Adult ascidians are sessile, inhabiting a wide variety of habitats such as soft sediments, coral reefs and rocky substrates. They successfully foul various artificial substrata such as jetties, ship hulls, floating docks and other man-made structures all over the world (Lambert, 2001; Lambert, 2005). In contrast, several species of ascidians are cultured for food primarily in Japan, Korea and France. The two most important aquaculture species in Korea are the edible sea squirt Halocynthia roretzi and the Pacific oyster Crassostrea gigas. The longline method for sea squirt production was expanded in 1980 and peaked at 42,800 tonnes in 1994, declining to 4,500 tonnes in 2004 and 10,819 tonnes in 2006 (Chang Keun Kang et al., 2009). The solitary ascidian Halocynthia roretzi has long been popular seafood in Japan and Korea, with a market value of $18 million in 2006 (Nguyen et al., 2007). Taxonomical studies on the Ascidians of sea squirts of India are dealt by Renganathan, 1981; Krishnan et al., 1989; Meenakshi, 2005; Meenakshi and Renganathan, 1997; Meenakshi and Senthamarai, 2006. Ascidians are a rich source of biologically-active nitrogenous substances with high chemical diversity (Blunt et al., 2011). More than 80 percent of new compounds from ascidians contained nitrogen, and about 70 percent of nitrogenous compounds are alkaloids (Wang and Namikoshi, 2007).

Samples of Phallusia nigra and Herdmania momus (Savigny, 1816) were caught at the depth of 310 m as an incidental by-catch. It was recorded from about 08º 53.6'N 78º 16'E and 08º 53.8'N 78º 32'E/310 m from Thoothukudi fishing harbour, southeast coast of India. The reference materials AS 2280 (H. momus) and AS 2284 (P. nigra) are deposited in the museum collections of the Department of New Drug Discovery, RARBIO Energies Private Limited, Chennai, Tamil Nadu, India.

TAXONOMY

Superfamily: Pycnogonoidea (Wilson, 1878)
(Pocock, 1904)

Family: Pyuridae

Genus: Herdmania Lahille, 1888

Herdmania momus (Savigny, 1816) (Fig. 1)

Cynthia momus Savigny, 1816

Cynthia papietensis
Herdman, 1882, 6(17): 1–296, p.143

Herdmania momus curvata
Kott, 1952, 3(3): 206–333, p.143

Herdmania contorta Monniot 1992, (4) 14 A (1): 3–22, p.18

Kott 2002, 32 134: 359–374, 366

DESCRIPTION

Only one specimen (total length 3.7 mm; weighing about 11.77 g), was caught which resembles in all characteristics given earlier by Savigny, 1816. H. momus has anterior pair of brightly-coloured, trumpet-shaped siphons decorated with longitudinal stripes. However, throughout the species pan-tropical distribution a bewildering array of polymorphisms occur. Stolidobrach (Stolido- Folded) (H. momus) the internal longitudinal vessels are numerous where they particularly crowd one another, the branchial wall are thrown into internal longitudinal folds. This elaboration of the branchial sac's wall is independent of variations in the stigmata's shapes. Folds occur both in solitary and colonial stolidobranches. The absence of folds in some species is probably a secondary loss which marks this line, can usually be seen. Even if indistinctly atleast in silhouette. Since the endostyle is where the branchial sac is most extensively attached to the mantle, this cut will open that sac along

with the mantle. The red-throated ascidians are comprised of relatively large, translucent, peach-coloured specimens found on the underside of dead coral plates. Although these animals are fairly common on the reef, distribution appears random and upturning. A colonised coral plate requires a bit of luck or a lot of persistence.

MATERIAL EXAMINED

H. momus specimen was collected from Thoothukudi fishing harbour between 08º 35' 22.5" N lat. 78º 27' 40.9" E long and 08º 31' 91.2"N lat. 78º 25' 32.7"E long at a depth of 310 m, Thoothukudi district, Tamil Nadu, India (Fig. 1). The reference materials AS 2280 (H. momus) were deposited in the museum collections of the Department of New Drug Discovery, RARBIO Energies Private Limited, Chennai, Tamil Nadu, India.

DISTRIBUTION

This species is widely distributed throughout the warm waters from Japan, Taiwan, Philippines, Indonesia, Palau, Hawaii, Fiji, South Africa, QLD (North East coast), WA (Central West coast, Lower West coast, North West coast) also West Indian Ocean, south China sea, Tahiti, Arafura sea. The species was collected from Thoothukudi coast of Gulf of Mannar, Southeast coast of India. Common in the Red Sea, H. momus was found in the Gulfs of Suez, Aqaba and Aden. The present record from Thoothukudi coast in Gulf of Mannar extends its distribution to the southeast coast of India.

REMARKS

The sample dissected here agrees with the descriptions, but differ in some characteristics from the specimens described from Guadeloupe and Martinique by Monniot (1983): animals from Bahia have fewer oral tentacles (around 25) and fewer longitudinal vessels in the pharynx. These differences may be explained by body size and other geographical specimens are smaller than those from the Caribbean.

TAXONOMY

Superfamily: Pycnogonoidea (Wilson, 1878) (Pocock, 1904)

Family: Ascidiidae

Genus: Phallusia

Phallusia nigra (Savigny, 1816) (Fig. 2)

Meenakshi, 1998: 27, 477-479

Abbott et al., 1997: B57-B58, fig. 4

Gopalakrishnan et al., 2013: 7 (1), 39-44, fig. 1

MATERIAL EXAMINED

The specimen (total length 3.5 mm; weighing about 11.65 g), was collected from Thoothukudi fishing harbour between 08º 35' 22.5" N lat. 78º 27' 40.9" E long and 08º 31' 91.2"N lat. 78º 25' 32.7"E long at a depth of 310 m, Thoothukudi district, Tamil Nadu, India (Fig. 2). The reference materials AS 2284 (P. nigra) were deposited in the museum collections of the Department of New Drug Discovery, RARBIO Energies Private Limited, Chennai, Tamil Nadu, India.

DESCRIPTION

The Indian specimen resembles in all characteristics the description of this species given earlier by Savigny (1816). They were tunic smooth and black (but in young individuals can be gray); musculature on right side of body a net of thick fibers; dorsal tubercle U-shaped, usually without inrolled ends; many papillae in prepharyngeal area; 16-36 accessory openings along neural gland duct; longitudinal vessels in pharynx converging to dorsal lamina in anterior region; 6-9 stigmata per

mesh; dilated posterior intestine; multilobed anal margin. The siphons were separated by a third to half the body length. Abbott et al. (1997) has been revealed that these records represent morphological variants of P. nigra, while a consistent velvety black in the tropical western Atlantic Ocean, varies in the Hawaiian Islands, with individuals in shady places having translucent gray tunics.

DISTRIBUTION

This species is widely distributed throughout the warm waters from Bermuda, United States (Florida, Hawaii), Caribbean Sea, Gulf of Mexico, Brazil, Guinea, Angola, Mediterranean Sea, Red Sea, Gulf of Aden, and Indian Ocean, Japan. Gulf of Aden and other parts of the Arabian Coast (Van Name, 1945). The present record from Thoothukudi coast of Gulf of Mannar, southeast coast of India, extends its distribution to the southeast coast of India.

REMARKS

The specimens examined agree quite well with the original description and figures provided by (Kaplan, 1988). The body is bluish-black to brownish-black with a leathery texture. The body forms a long tube or sac shape, called a tunic, with two siphons at the top of the body. The openings of both siphons are round with fringed edges (Kaplan, 1988). The black tunicate is a sessile and benthic filter-feeder. The incurrent siphon takes water into a sieve-like pharyngeal basket that filters out food of the appropriate size class before water is pumped from the animal via the excurrent siphon.

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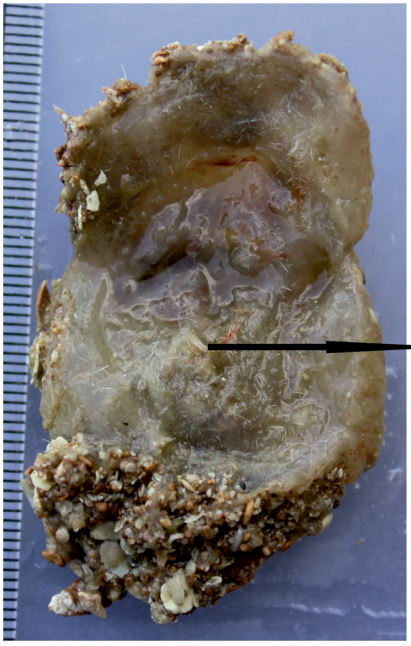

Fig.1:*Herdmania momus* (Savigny,1816)

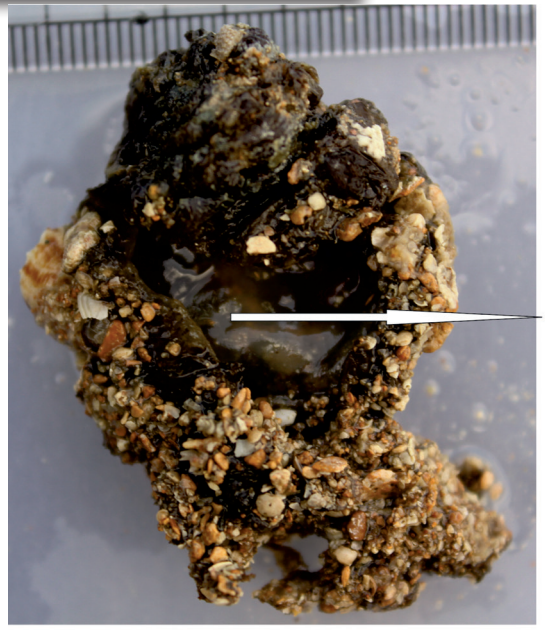

Fig.2:*Phallusia nigra* (Savigny,1816)