THREE SPECIES OF POLYCLINID ASCIDIANS — NEW RECORDS TO INDIAN WATERS

ABSTRACT

Three species of ascidians of the family Polyclinidae are reported for the first time from the south east coast of India.

THE OCCURRENCE of three species of the genus *Polyclinum - Polyclinum madrasensis* Sebastian, 1952; *Polyclinum indicum* Sebastian, 1954 and *Polyclinum constellatum* Savigny, 1816 has been reported by earlier workers from India. (Sebastian, 1952; 1954; Krishnan *et al.*, 1989). The present report adds 3 more species — *Polyclinum fungosum* Herdman, 1886; *Polyclinum sundaicum* (Sluiter, 1909) and *Polyclinum nudum* Kott, 1992 to Indian waters.

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DESCRIPTION

Systematic position : Class : Ascidiacea; Order : Enterogona; Suborder Aplousobranchia; Family : Polyclinidae; Genus : *Polyclinum.*

Polyclinum fungosum HERDMAN *(1886)*

Occurrence : Collected from the littoral zone of Tuticorin, found attached to rocks and pieces of corals.

Distribution : New record — India (Tuticorin). Previously recorded from Victoria (Bass Strait-Kott 1992, Western Port-Kott 1976), New South Wales (Port Jackson-Herdman 1886).

External appearance : Colonies rounded, smooth cushions, 1-3 cm in diameter and 1 cm thick. Upper surface completely encrusted by a thin layer of sand interrupted only by the common cloacal apertures (4-5 mm apart). Colour varies from purple brown to greenish brown 8-12 zooids grouped around the cloacal opening.

Internal structure : (Fig. 1) Zooids about 4-5 mm long with a transparent narrow thorax, horizontal gut loop and a sac like posterior abdomen with a short neck. Branchial siphon with six triangular pointed lobes. Atrial languet has a pointed or flat serrated tip. Fine longitudinal muscles in the anterior part of the thorax. 10-15 branchial tentacles. Wide prestigmatal area. Branchial sac narrow with 11 rows of 12 long oval stigmata. Dorsal languets large, curved. Branchial papilla shallow, flat one for each stigmata. Oesophagus curved, directed posteriorly, stomach smooth, oval. Sac like posterior abdomen connected to the thorax by a short neck. The shape and size of the posterior abdomen and the number of male follicles vary (17-22 male follicles and 6-7 ova). Male follicles are arranged towards the periphery with the ova in the centre. 2-3 embryos in the right peribranchial cavity. Larval trunk measures 0.5 mm with a tail wound three quarter of the way, 3 anterior adhesive papillae and 8 ectodermal ampullae.

Remarks : Polyclinum indicum, a sandy species from India is distinguished from the present species by their larger size, absence of branchial papillae, broader and longer thorax (13-15 rows with 14-16 stigmata/row). The specimen studied agrees well with the description of *P. fungosum* Herdman, 1886 in all respect except for the presence of branchial papillae. Herdman has not mentioned about the presence of the branchial papillae in his

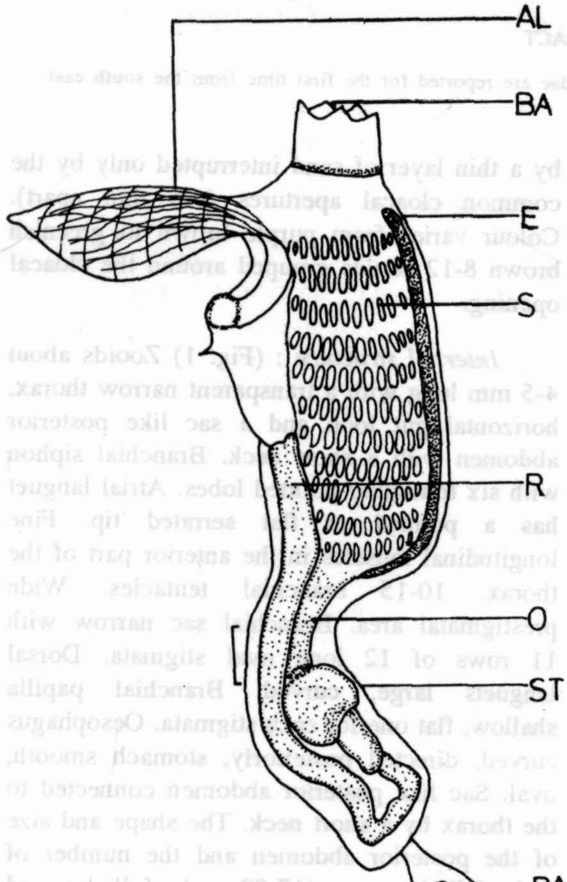

FIG. 1. *Polyclinum fungosum — Zooid showing branchial sac, gut loop and posterior abdomen with gonads.*
AL. Atrial languet, BA. Branchial aperture, E. Endostyle, EM. Embryo, S. Stigmata, R. Rectum, O. Oesophagus, ST. Stomach, PA. Posterior abdomen. Scale: 1 cm - 0.25 mm.

description. As suggested by Kott, (1992) Herdman might have overlooked them as they are difficult to detect.

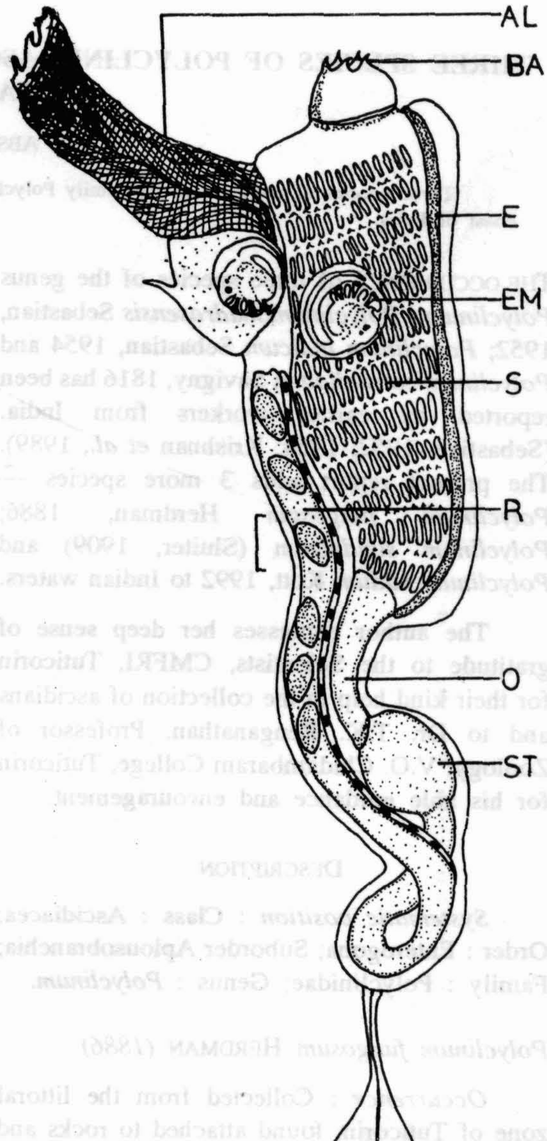

FIG. 2. *Polyclinum sundaicum — Zooid with embryos.*

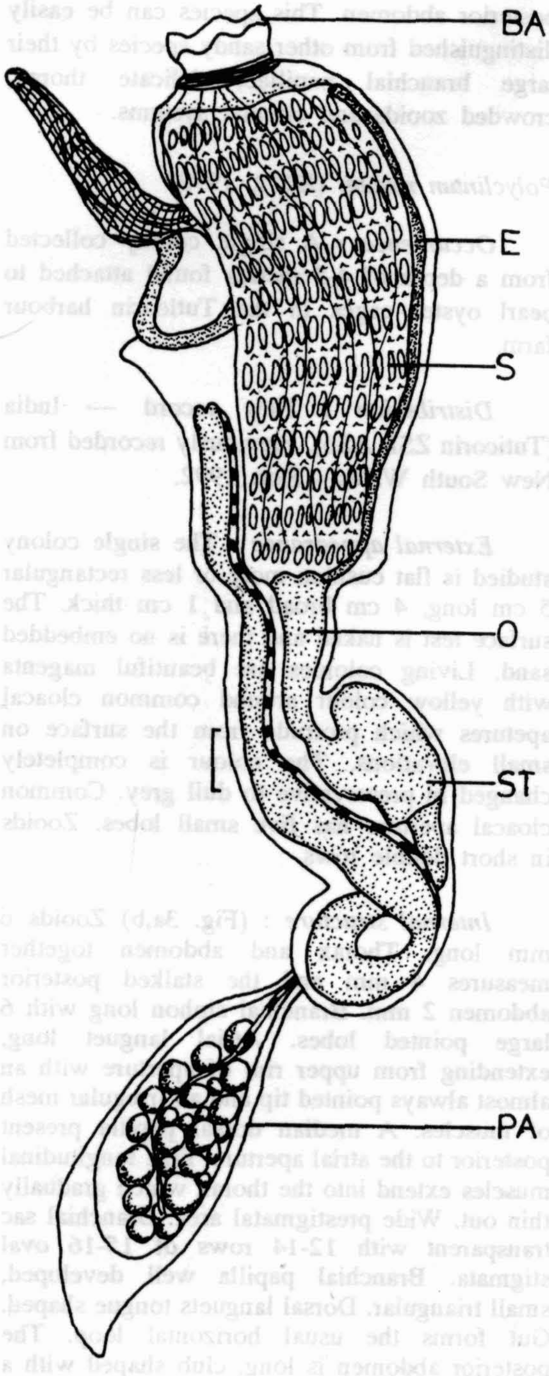

FIG. 3a. *Polyclinum nudum — Zooid showing branchial sac, gut loop and posterior abdomen with gonads.*

Polyclinum sundaicum (SLUITER, 1909)

Occurrence : Seen attached to the rocks in the littoral zone of Mandapam and Tuticorin.

Distribution : New record — India (Tuticorin, Mandapam). Previously recorded from Fiji - Kott 1981, Philippines, Palau and Gilbert Is - Tokioka 1967, Japan - Tokioka 1954, Indonesia - Sluiter 1909.

External appearance : Smaller colonies sessile, rounded (1 cm diameter), larger colonies flat cushions with a collapsed upper surface (4-5 cm dia). Surface sandy with common cloacal apertures 3-4 mm apart. Living colonies are dark black. Zooids crowded probably arranged in circular systems.

Internal structure : (Fig. 2) Zooids 5-6 mm long with a broad thorax, small horizontal gut loop and a long posterior abdomen connected by a long neck. Thorax delicate and transparent. Branchial lobes small, triangular and pointed. Atrial lip separate from aperture and has a flat, leaf like, smooth or serrated margin. 7-8 fine longitudinal muscles in the anterior half of the thorax. Prebranchial area narrow. Branchial sac has 12-13 rows of 12-15 long oval stigmata. Branchial papilla flattened tongue, one for each stigmata. Gut with the usual horizontal loop with a short smooth stomach and a long duodenal area. The posterior abdomen is long with 15 male follicles and 4 ova 14 embryos in the right peribranchial cavity. Larval trunk measures 0.5 mm. The larva has a row of median ampullae alternating with the adhesive organs and 4 lateral ampullae.

Remarks : Though the present colonies resemble *P. indicum* in the presence of a sandy surface for the colonies they differ in the colour, shape of colonies, atrial lip separate from apertures, presence of branchial pappilla and a long posterior abdomen connected to the abdomen by a long neck fully packed with male follicles and a few ova. It also differs

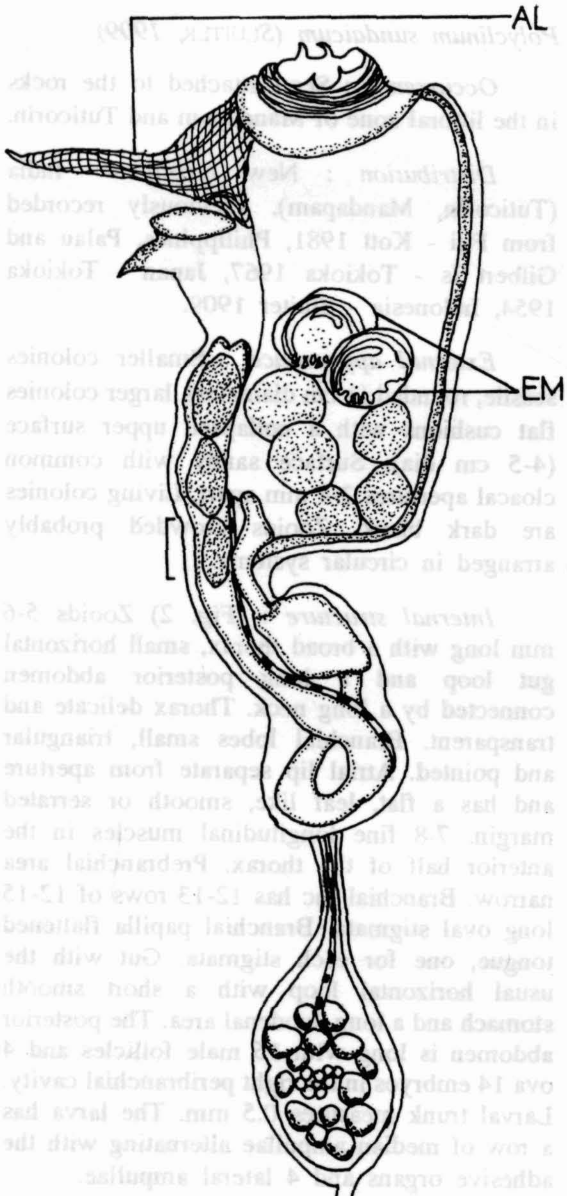

FIG. 3b. ***Polyclinum nudum* — *Zooid with embryos in atrial cavity.***

from *P. fungosum* another sandy species in having larger crowded zooids, atrial lip separate from rim of aperture, flat tongue shaped branchial papilla, broader thorax with long oval stigmata, narrow prestigmatal area and a long posterior abdomen. This species can be easily distinguished from other sandy species by their large branchial papillae, delicate thorax, crowded zooids and circular systems.

*Polyclinum nudum (*KOTT*, 1992)*

Occurrence : A single colony collected from a depth of 4-5 metres found attached to pearl oyster cages in the Tuticorin harbour farm.

Distribution : New record — India (Tuticorin ZSI, AS6). Previously recorded from New South Wales - Kott 1992.

External appearance : The single colony studied is flat cushion more or less rectangular 5 cm long, 4 cm broad and 1 cm thick. The surface test is naked and there is no embedded sand. Living colonies are beautiful magenta with yellow colour around common cloacal apetures which protrude from the surface on small elevations. The colour is completely changed in preservative to dull grey. Common cloacal aperture has five small lobes. Zooids in short double rows.

Internal structure : (Fig. 3a,b) Zooids 6 mm long. Thorax and abdomen together measures 4 mm and the stalked posterior abdomen 2 mm. Branchial siphon long with 6 large pointed lobes. Atrial languet long, extending from upper rim of aperture with an almost always pointed tip and an irregular mesh of muscles. A median dorsal papilla present posterior to the atrial aperture. Fine longitudinal muscles extend into the thorax which gradually thin out. Wide prestigmatal area. Branchial sac transparent with 12-14 rows of 15-16 oval stigmata. Branchial papilla well developed, small triangular. Dorsal languets tongue shaped. Gut forms the usual horizontal loop. The posterior abdomen is long, club shaped with a long narrow neck. 20-24 male follicles surround a small overy with as many as 9-12 ova. 11-13 embryos crowded in the posterior half of the right peribranchial cavity. Larval trunk measures 0.4 mm to 0.5 mm. Lateral, median dorsal and median ventral ampullae are present.

Remarks : This species can be easily distinguished from *P. constellatum* and *P. madrasensis* two naked species already reported from India by the shape of the colony, common cloacal apertures on small elevations and a narrow branchial sac. The present species though closely resembles *P. nudum* Kott, 1992 in the nature of the colony, naked test, arrangement of zooids, atrial lip from upper border of opening, branchial papillae, nature of gonad, long posterior abdomen etc. a few differences like small size of zooids, lobes in the border of common cloacal aperture, lesser number of stigmata were also observed.

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REFERENCES

HERDMAN, W.A. 1886. *Zool. Chall. Exp.* **14** (38) 190.

KOTT, P. 1976. *Mem. natn. Mus.* Vict. **37** : 60.

———, 1981. *Proc. Linn. Soc. N.S.W.* **105**(3) : 158.

———, 1992. *Mem. Qd. Mus.* **32**(2) : 447.

KRISHNAN R, M.R. CHANDRAN AND T.K. RENGANATHAN 1989. *Geobios new Reports* **8** : 70.

SAVIGNY, J.C. 1816. *Memoires sur les animaux sans vertebres* pt. 2, 189.

SEBASTIAN, V.O. 1952. *Curr. Sci.* **21** : 316.

———, 1954. *Washington Acad. Sci.*, **44**(1) : 18.

SLUITER, C.P. 1909. *Siboga Exped.* **56B** : 97.

TOKIOKA, T. 1954. *Publs. Seto mar. biol. Lab.* **3**(3) : 240.

———, 1967. *Bull. U.S. natn. Mus.* **251** : 47.

COMPARISON OF THE GROWTH PATTERNS OF INDIAN MACKEREL AND OIL SARDINE

ABSTRACT

The growth parameters of Indian mackerel and oil sardine were estimated from the data collected during the period from April 1996 to March 1998 from fish landing centres in and around Calicut. The L-inf, K and amplitude (C) of mackerel were estimated as 265 mm, 2.4 and 0.7 respectively. The corresponding parameters for oil sardine were 200 mm, 2.1 and 0.6. Both the species showed a drastic reduction of growth rate during December to March, the period of low plankton abundance in the coastal waters. The fishable life span of both the species was estimated as around 16 months.

INDIAN MACKEREL, *Rastrelliger kanagurta* (Cuvier) and oil sardine, *Sardinella longiceps* Valenciennes are the two major species that sustain the pelagic fishery of the southwest coast of India. They inhabit the same area and are in the same trophic level. Both have similar biological periodicities. Hence, environmental variations can be expected to influence their growth and other biological processes similarly.

There are a number of publications on the growth of these two species and the estimated growth parameters differ markedly. Venkataraman (1970) compiled the different views expressed by mackerel workers. Yohannan (1979) while studying the growth pattern of the fish critically reviewed some of the earlier studies. Antony Raja (1969) made a indepth review of the work done on the