

A NEW SPECIES OF ASCIDIAN (Genus *Culeolus* Herdman, Family *Pyuridae*) FROM THE WEST COAST OF TASMANIA

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(Figures 1-4.)

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SUMMARY

A new species of ascidian *Culeolus littoralis*, from the intertidal region of the coast of Tasmania is described. Its relationship to other species of the genus *Culeolus* Herdman known only from deep waters is discussed.

I. DESCRIPTION

Location.—Between Lighthouse Point and Cutter Rock, Cuivier Bay, west coast Hunter Is., N.W. Tasmania, in intertidal rock cave; growing on and around *Pyura stolonifera* (Heller). The holotype and paratypes of the species are lodged in the Australian Museum.

Externally.—Individuals (Fig. 1) of this species are found clumped together in a similar fashion to *Pyura spinosa* Q. & G. (Kott 1954; *P. leeuwinia* Kott 1952). They are about 2.0 cms long, 1.5 cms wide and 1-1.5 cms high. They may be very irregular in shape, as is usual with those forms which are closely clumped together. The test is tough and leathery but not very thick and it is produced externally into pointed papillae which give the species the general appearance of *Halocynthia hispida* (Herdman) f. *crinitistellata* (Herdman) (Kott 1952, 1954). These papillae are of varying lengths all over the body; however they do not branch as they do in the latter species nor are they in any way modified in length or form in the region around the apertures. Posteriorly the test is produced into root-like processes.

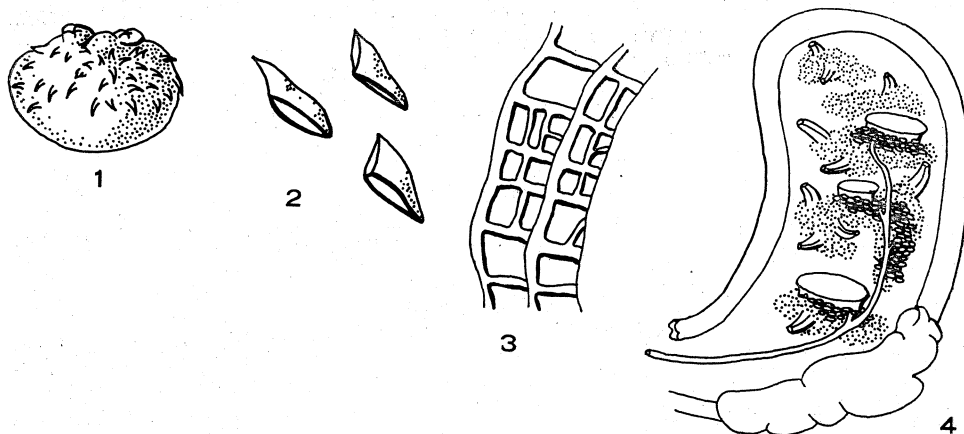
In life the test is rose red in colour, reminiscent of *Microcosmus claudicans* Savigny (Kott 1952).

The external layer of test and the papillae are thickly packed with "mulberry" formed siliceous spicules of varying sizes giving the test its external hardness. These are exactly similar to the spicules found in the test of *P. spinosa* (see above). They project slightly into the internal lining of the siphons and there overlap an area of pointed spines (Fig. 2) lining the distal part of the siphons. The apertures are on adjacent "wart"-like siphons, both anterior.

Internally.—There are 12 compound tentacles, with primary, secondary and tertiary branches; the dorsal tubercle has a large "S"-shaped opening. There are strong muscles radiating out from the siphons but these are limited to the anterior region of the body. Strong circular muscles are present in the same region, deep to the longitudinal muscles. The dorsal lamina is represented by moderately long, pointed languets. There are six branchial folds with a single longitudinal vessel between the folds. Longitudinal vessels are arranged according to the following formula: DL 1(11)1(12)1(14)1(11)1(9)1(5)1E. Stigmata (Fig. 3), however, rarely occur and then never on the folds; when present they are most commonly found in the dorsal and posterior parts of the branchial sac where there may be 2 to 3 regular stigmata in a mesh, but more often they are completely irregular or are absent altogether leaving the open meshes characteristic of the genus. Parastigmatic vessels are usually present. The alimentary canal forms a single open loop around the ventral part of the left side of the branchial sac. There is a large liver in the proximal part of the alimentary canal but no stomach enlargement is present. The anus is fringed by 3 to 4 not very clearly demarcated lobes.

The gonads (Fig. 4) are most distinctive. On the right side of the branchial sac the body wall is covered with irregularly shaped, sometimes branched and ramifying, thick tubular or circular cushion-like ovaries with many oviducts opening from each into the peribranchial cavity. These oviducts are not orientated in any particular direction; some open ventrally, some dorsally, some anteriorly and some posteriorly. Testes are present, superficial to some of the ovaries on the more dorsal and posterior part of the body wall; they are not present antero-ventrally where the ovaries only occupy the body wall. The testes lobes are usually covered by endocarp and are linked by two vas deferens which extend, in parallel, from the most anterior ovary to a point considerably dorsal to any of the oviducal openings. On the left side of the branchial sac the gonads are present in the gut loop, and are much less numerous than on the right side. There is here only one vas deferens opening in the region of the anus; and the testes are absent from the more anterior clumps of ovary. The organisation of the gonoducts is such as to prevent self fertilisation.

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FIGURES 1 TO 4.

1. External appearance (nat. size).
2. Siphonal spicules ($\times 400$).
3. Portion of branchial sac from between folds ($\times 5$).
4. Left body wall showing gonads and alimentary canal ($\times 3$).

II. DISCUSSION

The branchial sac and the gonads of this species are quite distinctive. The branchial sac most closely approaches that of *Culeolus wyville-thomsoni* Herdman 1882, in that the meshes are not so completely open as in the other described species of this genus. The condition of the gonads with numerous oviducts and common vas deferens is similar to that described by Herdman for *Culeolus recumbens* Herdman 1882.

The species has not the usual stalk, nor were any spicules detected in the branchial sac; but although the stalk has without exception been present in previously described forms, the spicules are occasionally absent (*C. stuiteri* Ritter, Van Name 1945), and it is probable that these characters are variable within the genus. The present littoral species, therefore, may be considered as morphologically intermediate between *Culeolus* and *Pyura*, and less differentiated from *Pyura* than other species of *Culeolus*, all recorded from water deeper than 600 fms, with the exception of one species off the coast of Malaya taken in 204 m.

The wide meshed branchial sac has previously been considered characteristic of deeper water forms.

III. ACKNOWLEDGMENTS

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