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NOTES ON THE DIDEMNIDAE (ASCIDIACEA)

I. THE PRESENCE OF *DIDEMNUM* (*LEPTOCLINIDES*) *FAERÖENSE* (BJERKAN) IN THE PLYMOUTH AREA

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(Text-figs. 1, 2)

Leptoclinides faeröensis Bjerkan (1905) is a little-known boreal species which has been found only in the Atlantic Ocean (Fig. 1). The most northerly record is from a little south of Spitzbergen, the most southerly from 37° 08′ N., off the North American coast. It occurs on the coast of Norway and in the Faeroe Islands, but it has not been reported nearer to Plymouth than these two localities. Most records are from deepish waters, though it occurs in the sublittoral zone along the Norwegian coast. It was in this zone, at Looe Island (50° 20′ 24″ N., 4° 26′ 53″ W.) near Plymouth, that we found a specimen of this species growing on a rock about 80 cm. below O.D.—just sufficiently low for it to remain covered by a few centimetres of water at the lowest tide of the year, the equinoctial spring tide.

The colony was 13 × 8 mm. across and 3 mm. thick. It was attached by the whole of its lower surface. The position of each zooid was marked by an area of sparse spicules showing darker against the white opacity of the spicule-packed common test. The spicules were concentrated in the upper layers of the colony. The deeper test was yellowish and of a firm consistency, almost free of spicules. The spicules were remarkably even in size, much more so than in most colonies of didemnids; they were 40–50 μ in diameter with a few long conical points; the formula was usually 1, 6, 9 or 3, 6, 9. They are illustrated by van Name (1945, p. 96, fig. 43). There was a single common cloacal cavity which was at the level of the abdomina of the zooids. The thoraces were completely embedded in the test while the abdomina had each a thin sheath of test-substance. Correspondingly, the atrial siphon of each zooid was prolonged backwards into a long funnel to reach the common cloacal cavity. This is the diagnostic generic character. The zooids were arranged vertically to the surface of the colony and each had six lobes to the branchial siphon. There were thirty-two oral tentacles of four orders of size arranged 1, 4, 3, 4, 2, 4, 3, 4, 1. The zooids varied from 1·1 to 2·1 mm. in length. The smallest had only three rows of stigmata, the majority four rows and the few largest had an incipient fifth row as shown in Fig. 2. The number of stigmata in each half-row was 9–12; in the fifth row, where present, this

number was only 3–5. There were usually three dorsal languets; a fourth was occasionally present if there was a fifth row of stigmata, though not always even then. The lateral thoracic organ was small, a little less than the height of a single row of stigmata, and lay between the third and fourth rows.

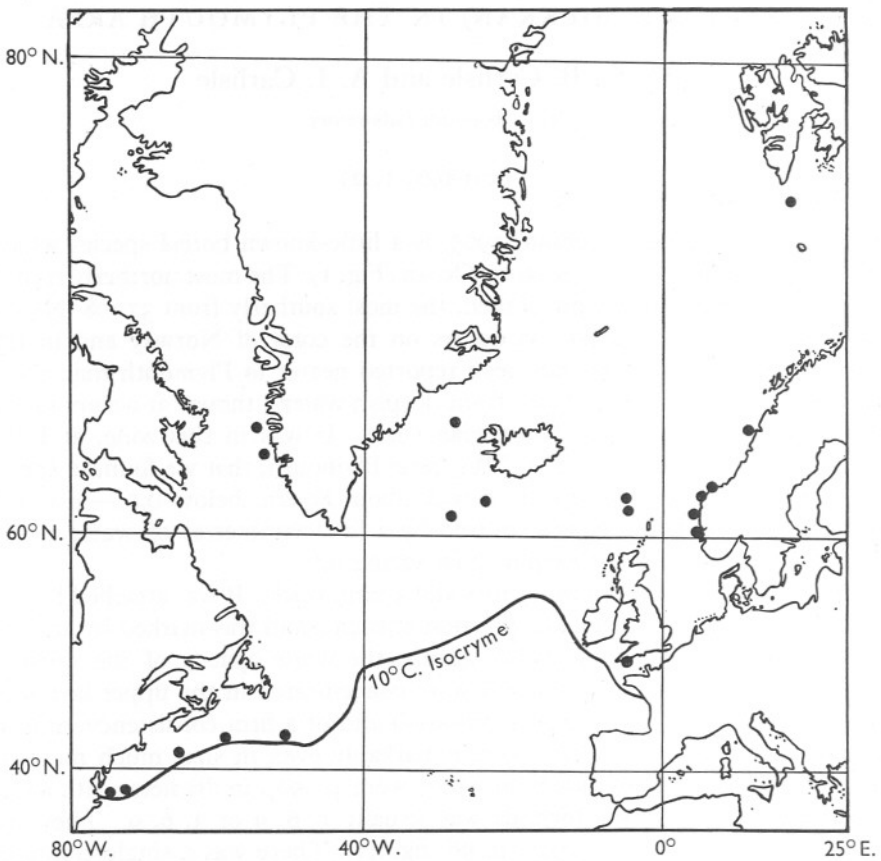

Fig. 1. The recorded distribution of *D.* (*Leptoclinides*) *faeröense*, showing agreement between the most southerly records of the species and the mid-winter sea temperature of 10° C.

The abdomen was little, if at all, larger than the thorax. The neck was sharply constricted. The oesophagus was straight and opened into a globular or squarish stomach. The post-stomach was horizontal and formed the bottom of the gut loop. The mid-intestine was short and sharply delimited from the post-stomach and from the rectum by grooves. The rectum was curved into an abrupt S; the final bend lay to the left of the stomach. The ovary lay entirely within the intestinal loop, the testis to the left side of the loop extending rather behind the mid-intestine. It was undivided. The sperm duct made four

or five turns around it before running to the atrium. The atrial siphon was very long and possessed a strong sphincter muscle.

The colony was collected on 18 March 1953, and was not then breeding. The larva is unknown.

The species does not appear to have any synonyms, other than misspellings of the trivial name, and is clearly distinguishable from any other species. For references to the literature see van Name (1945).

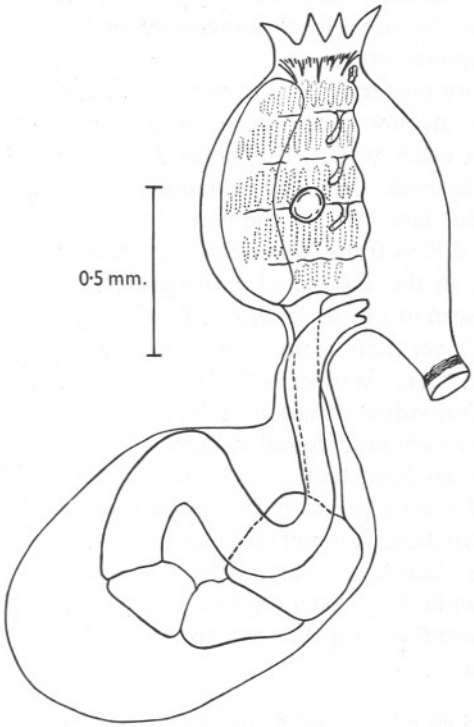

Fig. 2. Drawing from the left side of a large zooid of *D. faeröense*, omitting the reproductive system. Note especially the incipient fifth row of stigmata only present in the largest zooids.

Six species of the genus *Leptoclinides* are known, the north Atlantic *L. faeröensis*, the south Atlantic *L. brasiliensis*, known only from Michaelsen's (1923) description of his type specimen, *L. glauerti* Michaelsen (1930), likewise known only from the type specimen, *L. dubius* (Sluiter), *L. ocellatus* (Sluiter), and *L. madara* Tokioka. The last three of these species are not significantly different, except in the condition of the atrial system, from the subgenus *Polysyncraton* of *Didemnum*. Sluiter's species were indeed described under this genus, but they were separated from it by Michaelsen (1930) and Tokioka (1953). *Leptoclinides madara*, according to its author,

may be merely a colour variant of *L. ocellatus*. *L. brasiliensis* is rather similar to *L. faeröensis*, but has an unlobed branchial siphon, and the common cloacal cavity is completely below the level of the zooids so that the atrial siphon is even more prolonged. Michaelsen suggests that the common cloacal cavity may open on the lower side of the colony, but this cannot happen in *L. faeröensis* because the whole lower surface is attached to the substratum. In *L. glauerti* the atrial siphons open direct on to the lower surface of the colony and the common cloacal cavity system is abolished altogether, or represented at most by small local depressions on the lower side into which individual atrial siphons open.

If, then, the more posterior level of the common cloacal system is worthy of generic distinction, how much more should be the complete abolition of the system. If, in other words, the genus *Leptoclinides* has any validity as separate from *Didemnum*, then *Leptoclinides glauerti* should be in a further separate genus. But how valid is the genus *Leptoclinides*? *L. faeröensis*, the type of the genus, differs from *Didemnum* only in the position of the common cloacal cavity and in the associated prolongation of the atrial siphon. The same condition is seen to a lesser extent in *Trididemnum tenerum* and *T. niveum* (see Carlisle, 1953), yet there is no suggestion that the condition is worthy of generic distinction there. Within both *Didemnum* and *Trididemnum* there is great specific and individual variation in the degree of development, the extent and the level of the common cloacal system, and it is for this reason that the genus *Leptoclinum* has been abandoned—the character on which it is based is too variable. Now it is on precisely this character that the genus *Leptoclinides* is based. The distinction does not hold so the genus collapses. *L. faeröensis* and *L. brasiliensis* should be received into the genus *Didemnum*, retaining subgeneric rank, while *L. glauerti* requires a new genus for its reception. The name *Sinecloaca* seems appropriate as expressing the lack of common cloacal cavity in this form.

Sinecloaca n.gen.: an ascidian genus presenting typical didemnid characters possessing usually four rows of stigmata; sperm duct coiled around testis; differing from *Didemnum* Savigny in the reduction, apparently secondary, of the common cloacal cavity system to a few local depressions on the lower surface of the colony into which individual atrial siphons open direct to the sea, and in the corresponding elongation of the atrial siphons to open in this manner on the side of the colony opposite to the branchial siphons.

Type species: *Sinecloaca glauerti* (Michaelsen) (= *Leptoclinides glauerti* Michaelsen, 1930).

The remaining species of the abandoned genus *Leptoclinides* Bjerkan become *Didemnum* (*Leptoclinides*) *faeröense* (Bjerkan) and *D.* (*Leptoclinides*) *brasiliense* (Michaelsen), while *L. dubius*, *L. ocellatus*, and *L. madara* go back to *Polysyncraton* where they belong—*Didemnum* (*Polysyncraton*) *dubius* (Sluiter), *D.* (*P.*) *ocellatus* (Sluiter), and *D.* (*P.*) *madara* (Tokioka) or *D.* (*P.*) *ocellatus* (Sluiter) forma *madara* (Tokioka).

SUMMARY

Didemnum (*Leptoclinides*) *faeröense* Bjerkan is present in Plymouth waters. The adult is briefly described. The genus *Leptoclinides* Bjerkan is not valid and two of its six species should be included in *Didemnum* as a separate subgenus, a third species, *L. glauerti*, must remain separate in a genus of its own for which the name *Sinecloaca* n.gen. is proposed, while the remaining three species are returned to the subgenus *Polysyncraton*.

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