

XXV.—Notes on *Lucernaria quadricornis*, Müller, and related Species. By RICHARD ELMHIRST, F.L.S., Superintendent of the Millport Marine Biological Station.

Lucernaria quadricornis, O. F. Müller, Haeckel, System der Medusen, p. 390 (1880).

Lucernaria quadricornis, Müller, Beaumont, VI. Ann. Rep. L. M. B. C. p. 31 (1892).

Halichystus sp. (? n. sp.), Beaumont, L. M. B. C. Reports upon the Fauna of Liverpool Bay, p. 159 (1895), reprinted from Trans. Liverp. Biol. Soc. vol. vii. pp. 253-263 (1894).

The original Clyde record for this species is given by Dr. Johnston (1847) as found by Mr. Joshua Alder "adhering to stones at low-water mark at Ardrossan, in May, 1846." This record has since been repeated in various lists etc. In the Annual Report of the Millport Station for 1904 Dr. Russell records *Lucernaria* sp. ?, from Bennan Head, S. Arran. In 1909, when collecting *Depastrum* near this station, I found several specimens of a Lucernarian which could not readily be assigned to any known species, owing to the presence of single capitate tentacles in some of the marginal bays. In 1919 Prof. Gemmill found a similar specimen, and I procured another in Vidlin Voe, Shetlands, in Feb. 1916.

In 1894 the late W. I. Beaumont, in a note on Lucernarians occurring in the neighbourhood of Port Erin, Isle of Man, describes three specimens from "undersides of stones on the S. side of Port Erin Bay, where *Depastrum* also occurs." These, in view of the paucity of material, he refers "provisionally to the genus *Halichystus*, as "*Halichystus* sp. (? n. sp.)." He based this identification on the presence, apparently only definitely observed in one specimen, of "primary tentacles (retaining the original tentacular structure instead of being modified into marginal anchors)," which occurred in the eight marginal bays, and on the rather complicated structure of the gonads, although he had already referred them to *Lucernaria quadricornis*, Müller (L. M. B. C. Rep. 1892, p. 31), and despite the fact that they had single-chambered stalks—a character distinctive of the genus *Lucernaria*. No further specimens of this species have occurred at Port Erin.

The accompanying table (p. 222) shows the characters of the specimens available.

The erratic occurrence of these "primary tentacles" surely indicates that they are negligible as diagnostic characters, and of small significance when compared with an important

Date.	Locality.	Length in mm.	Tentacles per arm.	Primary tentacles.
1892.	Port Erin.	7 alive.	7	1 in each bay.
1904. vii. 11.	S. Arran.	8 preserved.	10	None seen; specimen much crumpled.
1909. v. 13.	Cumbræ.	8 "	8/9	2 in opposite perradii.
"	"	9 "	9	1 perradial external; 1 in next interradius internal; 3 of one arm placed internally away from the rest.
1919. vii. 11.	"	10 "	12	1 in each bay.
1909. v. 13.	"	10 "	10	2 interradian and 1 on radial slope of an arm.
"	"	10 "	14	1 radial and 1 in adjacent interradius.
"	"	10 "	19	2 in opposite radii and 1 interradian; specimen rather contracted.
"	"	11 "	15/21	2 radial.
"	"	13 "	15	1 radial; 3 interradian; all external to the margin.
"	"	14 "	18	1 radial and 1 in adjacent interradius.
1916. ii. 10. }	Vidlin Voe, Shetlands.	{ 20 " 40 alive.	100	3 interradian.

morphological character like the coelenteron of the stalk being single- (*Lucernaria*) or four-chambered (*Halicylistus*)—especially as variations, numeral and other, so frequently occur in Lucernarian tentacles (Clark, Beaumont, Hornell, Browne). Antipa (1892) has described a young *Craterolophus tethys* which had a single tentacle in each of four neighbouring octants. Browne (1895, p. 4) mentions two *Halicylistus octoradiatus* having "capitate tentacles on the margin of the umbrella in an abnormal position." Further, Hornell (1893, p. 208) has noted the presence of "marginal bodies" in the young of *L. campanulata*. Variations of this type must, I think, be regarded as "vestiges of the tentaculocyst-rudiments of ancestral scyphistomata" (Hurst, p. 214); it is noteworthy that these vestigial characters occur chiefly in young specimens, just as the presence of tentacles on the marginal anchors is a normal condition of young *Halicylistus* (Beaumont, 1900).

These Clyde specimens I regard as young *Lucernaria quadricornis*, Müller, and they agree with that species in the following characters:—Funnel-shaped, slightly four-sided; stalk single-chambered, from equal to to twice the length of the body, cylindrical, annular in contraction; perradial bays twice as broad and deep as the interradian; gonads extending to the ends of the arms; arms ending in a cluster of capitate tentacles, eight to twenty-one in number.

The smaller Clyde specimens were yellow in colour, like the Port Erin ones; the larger were olivaceous brown, like the Shetland one.

These specimens also are, I think, referable to *L. quadricornis*, Müller. The structure of the gonads is very similar to that of *Halicylistus* (Clark, 1878, p. 67). They form eight adradial bands, composed of "hollow spheroidal saccules . . . attached to the inner faces of the circumoral parietes. They are totally disconnected from each other, but usually so crowded that their peripheries come in contact and mutually mould themselves into polygonal shapes." The saccules open, each by a short oviduct, into the radial pouches. The specimen which Beaumont sectioned was ripe, but rather crumpled, which makes the details difficult to follow; but, after a careful comparison, I think they agree with a Clyde specimen (1919. vii. 11) which is as described.

My thanks are due to the Director of the Plymouth Laboratory for his courtesy in lending Mr. Beaumont's sections to me.

Lucernaria quadricornis.

Breeds in the summer months:—Clyde, ova in May and July; Port Erin, between June and Sept. (*Beaumont*); Shetland, Feb., unripe.

Lucernaria campanulata, Lamouroux.

By the courtesy of Prof. Dakin I have been able to examine two specimens taken on the south end of the Isle of Man at Easter 1920. They agree closely with Haeckel's description, except that some of the arms have more than 40 tentacles (46-48).

This is the first Manx record of this species, although it is recorded from the east of Ireland.

Breeding:—Leith, ripe in April (*Dr. Johnston*); Scarborough, ripe in May, spent in Sept., young July and August (*Dr. Irving*); English Channel, summer (*Hornell and Hurst*).

Halicystus octoradiatus, Clark (following Beaumont, 1900, and regarding *H. auricula* and *H. octoradiatus* as forming "a series belonging to one species").

Scarborough, ripe in July, young in July, August, and September (*Dr. Irving*); Valencia, ripe in May (*Beaumont*); English Channel, ripe in summer, half-grown in June (*Hornell and Hurst*); ripe, March and April, 1919, at Plymouth (M. B. A. record in *litt.*); Welsh coast, half-grown and ripe in August (*R. E.*). This indicates two generations in the year, the second mature at four or five months old.

Depastrum cyathiforme, Gosse.

Clyde, ripe, April to August; very young, July to Sept. Port Erin, summer (*Beaumont*).

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