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A NEW HYDROID FROM LONG ISLAND SOUND.

CHAS. P. SIGERFOOS.

DURING the summer of 1898, while enjoying the facilities of the seaside laboratory of the Brooklyn Institute of Arts and Sciences at Coldspring Harbor, Long Island, the writer found a hydroid which possesses special interest on account of the peculiar features which characterize it. The specimens collected last year were obtained on a single day, and a description has been delayed that new data might be added through wider observations during the present summer.

Early in August, 1898, while exploring the east end of Lloyd's Harbor, a part of Huntington Bay, small flocculent masses of different colors were observed in considerable numbers on the eelgrass which forms a dense growth on the bottom. Again this year the same locality was visited several times from July 8 to August 16, and each time numerous specimens were collected. The small cove in which they were found is a few acres in extent and well sheltered from high winds, so that the surface is usually smooth. During high tide the water may be ten feet deep, but at low tide the grass forms more or less of a mat upon the bottom.

Casually examined, the flocculent masses appeared quite similar to the well-known hydroid Hydractinia, found abundantly on our Atlantic coast, including Long Island Sound. But examined more carefully, it was found that the inhabitants of the shells on which the hydroid lives are living snails (*Ilyanassa obsoleta*), and not the hermit crabs with which Hydractinia is most frequently associated. Also, that the make-up of the colony as a whole and the character of the individuals are different from those of Hydractinia.

A general view of a female colony, natural size, is shown in Fig. 1, in which the snail is represented as moving slowly over a blade of eelgrass. Though the colonies are rather small, the

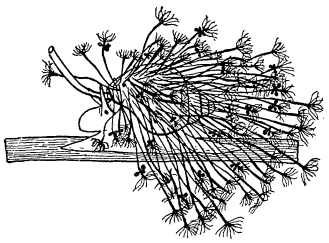

FIG. 1.—Colony of *Stylactis Hooperii* on the shell of a living *Ilyanassa obsoleta*, which is represented as crawling over a blade of eelgrass. Natural size.

larger ones may contain as many as two or three hundred individuals. In a figure it is not feasible to represent more than a third of those found in a dense colony.

The colony includes two, and only two, kinds of individuals, the nutritive and the reproductive. The protective spiral zoöids found in Hydractinia are not present.

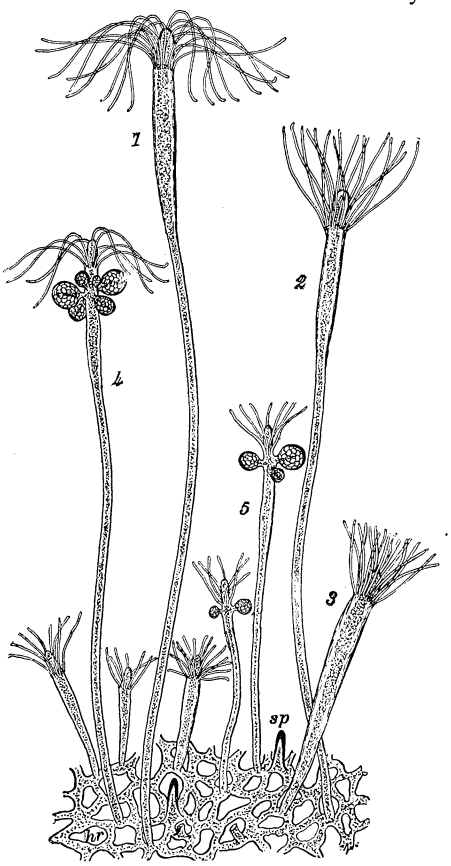

FIG. 2.—Part of a colony magnified six diameters. (1) large nutritive hydranth fully expanded; (2) same slightly contracted; (3) same fully contracted; (4) large reproductive hydranth fully expanded; (5) smaller reproductive hydranth, slightly contracted; *Hr.*, tubes of hydrorhiza; *sp.*, spines.

A small part of a colony, enlarged six diameters, is represented in Fig. 2. The hydranths or individuals are sessile, arising directly from the complicated system of tubes, the hydrorhiza, which closely invest the surface of the snail shell. These tubes (Figs. 2 and 3) form a network lying in a general way in one plane. From this network arise the hydranths and also a few small spines (sp., Figs. 2 and 3), which seem to be homologous with those found in such forms as Hydractinia and Podocoryne. The tubes differ from those of these two genera, however, in not having the continuous layer of flesh (the cœnosarc) which covers the superficial surface of

the hydrorhiza in Hydractinia and Podocoryne. But there is a thick cushion of diatoms, simple algæ, and other detritus which forms a mat over the surface of the shell and around the attached ends of the hydranths. It seems to collect because the colonies are not tumbled about as in Hydractinia. The spines do not project beyond the surface of the mat and seem not to be efficient structures in protecting the colony. They are probably vestigial.

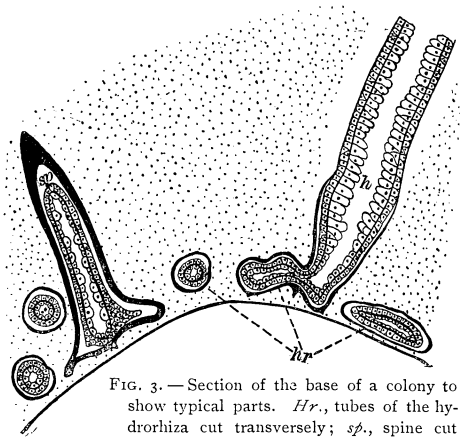

FIG. 3. — Section of the base of a colony to show typical parts. *Hr.*, tubes of the hydrorhiza cut transversely; *sp.*, spine cut longitudinally; *h.*, proximal part of a hydranth arising from a tube of the hydrorhiza. The dotted area represents the diatoms and other detritus which surround the base of the hydranths. × 30.

As stated above, there are but two kinds of hydranths, the nutritive and reproductive. They are present in approximately equal numbers, and uniformly distributed among each other throughout the colony. Both were found in all stages of development. I have no evidence that either ever becomes transformed into the other. As in other hydroids, the sexes are separate, the male colonies apparently being much more numerous than the female. Of eighty-three colonies observed at different times, sixty were male and but twenty-three female.

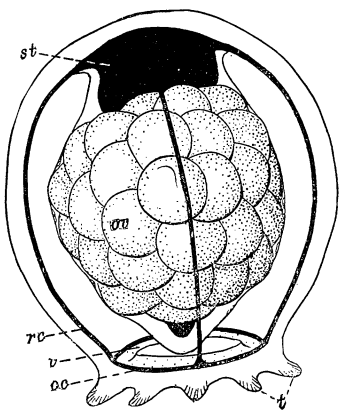

FIG. 4. — Recently liberated female medusa, before extrusion of the eggs. *C.c.*, circular canal; *r.c.*, radial canal; *st.*, stomach; *t.*, tentacles; *v.*, velum; *ov.*, ova. × 50.

The nutritive hydranths (Fig. 2, (1)–(3)), when fully extended, are perhaps more elongate than those of any other marine hydroid heretofore observed. Each arises directly from the tubes of the hydrorhiza, and at the base is covered for a very

short distance only by a continuation of the chitinous perisarc. Each hydranth is essentially a very long tube, consisting of two layers, the ectoderm and entoderm. It is of uniform diameter below, but somewhat swollen at the distal end below the circlet of tentacles. The latter are arranged in a single verticel and number from fifteen to thirty, or even thirty-five. There are usually between eighteen and twenty-five. The tentacles are solid, the entodermal core consisting of a single row of cells. Throughout the length there are stinging cells, but they are more abundant near the tips. The same applies to the hydranth body, in which the stinging cells are much more abundant around the hypostome. The tentacles are frequently bifid.

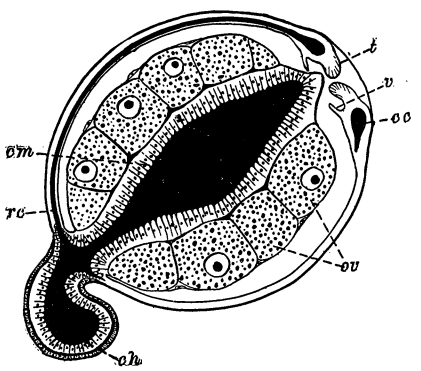

FIG. 5. — Longitudinal section of nearly mature female gonophore. *C.c.*, circular canal; *r.c.*, radial canal; *t.*, tentacle; *v.*, velum; *c.m.*, digestive cavity of gonophore, and *c.h.*, of the hydranth; *ov.*, ova. × 50.

In their general features the reproductive hydranths (Fig. 2, (4) and (5)) are quite similar to the nutritive, the differences in the former being the somewhat smaller size, the smaller numbers of tentacles, and the presence of a variable number of buds which develop into medusæ. In fully developed individuals the number of tentacles varies from six to fifteen, the usual number being eight to twelve. Like those of the nutritive hydranths, they are filiform, of uniform diameter, and arranged in a single circle. The reproductive buds vary in number from one to seven, the usual number being four or five. The presence of buds in various degrees of development in all colonies collected from July 8 to August 16, indicates that the breeding season extends at least through July and August. It may be that it begins earlier and ends later. When mature, the buds are set free from time to time as free-swimming medusæ. Though chiefly concerned with reproduction, these hydranths are also capable of taking food, at least sometimes.

The medusa (Fig. 4) represents a stage in organization that occurs but seldom among the Hydromedusæ. When it is liberated the sexual products, borne on the very large manubrium, are fully matured, so that the medusa after its liberation does not nourish and develop the former, but only distributes them. This done, the medusa dies, after its free-swimming life of a few hours. Its organization is quite simple, a condition to be expected both in connection with the recent liberation and its transitory existence. So far as could be determined, from the very rudimentary condition or absence of the characters usually employed in classification, it belongs most nearly to Haeckel's Dysmorphosa type, in which the mouth parts and tentacles are simple, the latter eight in number.

Though the medusa has most of its structures degenerate, it is still distinctly a medusa. As seen in side view (Fig. 4), it is somewhat higher than wide, its vertical diameter being about 1 mm. Into the cavity of the bell hangs the very large manubrium, which is gorged with sexual cells. There is no mouth opening and no lips nor tentacles around the mouth region. From the upper part of the stomach pass the four radial canals which connect with the circular canal at the edge of the bell. From the outer edge of the umbrella project eight equal rudimentary tentacles, four paradial and four interradial. They bear numerous stinging cells, but eye-spots seem to be absent. From the inner edge of the bell projects the narrow velum. Lining the subumbrella there is a well-developed layer of muscle fibres, and though degenerate in most ways, the medusa swims actively during the few hours of its free life.

In my specimens the medusæ were liberated in the evening, soon after dark, and though it would not be safe to conclude that this always takes place, I am inclined to think that it does. In a species of another hydroid (Pennaria) which the writer observed in Jamaica, and in which the medusæ likewise lead a free life of but a few hours, the latter are liberated within an hour after dark, at almost exactly the same time from day to day. I think the same may be found to hold for the form here described.

The condition of the medusa in this species, when liberated, is of further interest from a systematic standpoint. Allman, in his monograph on the *Tubularian Hydroids*, made the organization of the medusa a diagnostic character for the separation of families within the group. His Hydractinidæ and Podocorynidæ differ only in details from each other, except that in the former the medusoid buds remain in a rudimentary condition in the form of sporosacs, while in the latter the medusæ are liberated and lead a free-swimming life of considerable duration. In the form here described we have an exactly intermediate condition. Should the characters used by Allman stand, a new family would have to be established to include the species here described. But it seems that they are too narrow at this point, and that this species should be included under his family Bimeridæ. If so, it becomes a species of Stylactis. For it I propose the name *S. Hooperii*, after Professor Franklin W. Hooper, the secretary of the Brooklyn Institute, who has contributed so much to the success of the laboratory at Coldspring Harbor.

The hydroid here described is one of the most beautiful and graceful that has been observed. The delicacy of the individuals seems correlated with the protection afforded the colony through association with the Ilyanassa and its habitat in a locality free from high winds. Though the color of most of the colonies is whitish, many are of a pink or olive green or yellowish tint. Its only American ally so far observed is *S. arge*, found in the Chesapeake Bay and described by S. F. Clarke. It differs from the latter, however, which is found attached to the stems of Zostera, in which the eggs develop into planulæ before being liberated; and in which the terminal portion of the hydranths are described as breaking off to establish new colonies.

Diagnosis of the Species S. Hooperii. — Hydrocaulus absent; hydrorhiza a network of tubes lying in one plane, from which arise small, simple spines and the sessile hydranths, which are of two kinds, nutritive and reproductive; they are similar to each other and extremely elongate. The nutritive hydranths may attain a length of two to two and a half centimeters and

bear usually about twenty tentacles, arranged in a single circle. The reproductive hydranths are slightly smaller and bear usually six to ten tentacles and four or five reproductive buds. Medusa becoming free, though degenerate, the sexual products mature when the medusa is liberated. Medusa with four radial canals; eight equal rudimentary tentacles; mouth opening and mouth parts absent; velum developed.

UNIVERSITY OF MINNESOTA,
August 21, 1899.