

On the Occurrence of *Phoronis australis* HASWELL near Misaki.

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As is well known, *Phoronis australis* HASWELL is a species hitherto recorded only from Port Jackson in Australia. It has been known to inhabit deserted *Cerianthus* tubes at a depth of 27 m. in the locality mentioned.

Of late years a large and beautiful *Phoronis*, quite different from *P. ijimai* OKA, was discovered as one of the commonest animals near the Misaki Marine Laboratory. A remarkable fact it is that it so long remained without attracting the attention of the workers in the Laboratory. Possibly it was seen by many but was taken for tentacles of expanded Actinians, an illusion which, as will soon be seen, is not at all unlikely to happen.

After a careful study the *Phoronis* in question was found to agree quite well with the descriptions of *P. australis* as given by writers, especially BENHAM.* So that, I take no heed in considering it as specifically identical with that species. The fact is of interest as showing the wide geographical distribution of that species.

The circumstances of the discovery of the *Phoronis* near Misaki were as follows :

On August 10th, 1901, MR. HAYATA, then working in the Laboratory, obtained and brought in what he thought as a specimen of a gigantic Actinian. On our examining it together, I was agreeably surprised to find it to be simply a large gelatinous tube containing a large colony of

* Quart. Journ of Micros. Sci., 1890.

a species of *Phoronis* which was quite unknown to me before. On visiting at once the spot where it was obtained and which was only about four feet deep at a distance of a few minutes' rowing from the Laboratory, we have found the very Actinian, a *Cerianthus*, which was before supposed to have been captured, but which in fact remained behind, having been divested of only its gelatinous tube together with the *Phoronis* inhabiting it. The latter, being similarly colored as the tentacles of the *Cerianthus*, might easily be mistaken for these.

About a month later, after I have left the Laboratory, KUMA, the collector, reported that the same *Phoronis* turned out to be something very common, almost every individual of the *Cerianthus* being found in company with a more or less large colony of it.

During July in the following year (1902), I have had opportunities of verifying the truth of KUMA's report and of myself observing the *Phoronis* in its native habitat.

In the inlet of Moroiso, at the mouth of which is situated the Misaki Marine Laboratory, as well as in that of Koajiro, next north to the one just mentioned, the *Cerianthus*—a large species with deep reddish brown tentacles—inhabits the shallow muddy bottom at places in such abundance that one can not help treading upon it with every step. The gelatinous tube, in which it lives, may be as thick as one's arm. Excepting the smaller tubes, almost every one may be said to be tenanted by the *Phoronis*, as was reported by KUMA. At low tides the bottom is nearly exposed or is covered by only a few inches of water. The *Cerianthus* is then invariably retracted deep into the tube, but the upper end of this remains visible above the mud surface, together with the *Phoronis* colony, which radiates forth from the tube-opening simulating in a way the appearance of the expanded *Cerianthus* tentacles. Moreover, as before indicated, the *Phoronis* is of the same color as these; so that, we seem to have here a case of mimicry in which the helpless *Phoronis* not unlikely benefits itself, in an indirect way, of the protective influence of the nestle-organs possessed by the host, which at other times of the day will be found expanded at the identical spot. It is difficult to say if

the host derives any advantage from the presence of the commensal worms.

These are found, usually close together in a large number, near the upper end of the *Cerianthus* tube. The greater part of the body, covered by its own, loosely fitting, chitinous tube, lies imbedded in the gelatinous tube of the host in such a way that the posterior worm-end which is free from that of the neighbors, is directed downwards and somewhat obliquely outwards, while the anterior slender portion with the tentacular crown projects into the lumen of the host-tube, and thence outwards through the opening of the same.

The worm may reach 90 mm. in total length and 4 mm. in breadth at the broadest part. The tentacles are 12—15 mm. long; they are arranged in two and a half double coils on each side. That part of the body which lies within the tube-wall of the host is of a pink color, while the remaining parts are, as already indicated, deep reddish brown.

Closely behind the aboral lophophoral cleft are situated the anal ridge and the nephridial ridges, both showing the same characteristic features as were described by BENHAM. Over these ridges, as in fact over the entire deeply pigmented portion of the body proper, the skin in the fresh state exhibits closely set circular wrinkles.

The lophophoral chamber contains segmenting eggs and different developmental stages reaching up to such larvæ as are in possession of four pairs of tentacles. These larvæ are of a moderately large size, being on the whole relatively thick and short. The anal ciliated belt is disproportionately large; the collar and the tentacular bases are shaded with reddish brown pigments. In a few cases examined of free-swimming larvæ, evidently belonging to the species and which were obtained by means of a surface-net in the neighbourhood of the spot inhabited by the mother-animals, I have found the number of tentacles increased to 8—10 pairs; in other respects they were strictly comparable to those still contained in the lophophoral chamber. And, in these peculiar larvæ found at large, I recognize a form which, long before the mother-animal became known to me, once came under my observation in a limited

number of specimens among the plankton captured near the Laboratory. In the stage of development in which the free larvæ stand, it is unlike any of the four types of *Actinotrocha* which I have described from the waters near Misaki in 1901 (Jour. Sci, Coll, XIII, p. 534); but whether it should really be made into a distinct type, remains to be seen.
