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Preliminary Notes on *Coeloplana*.

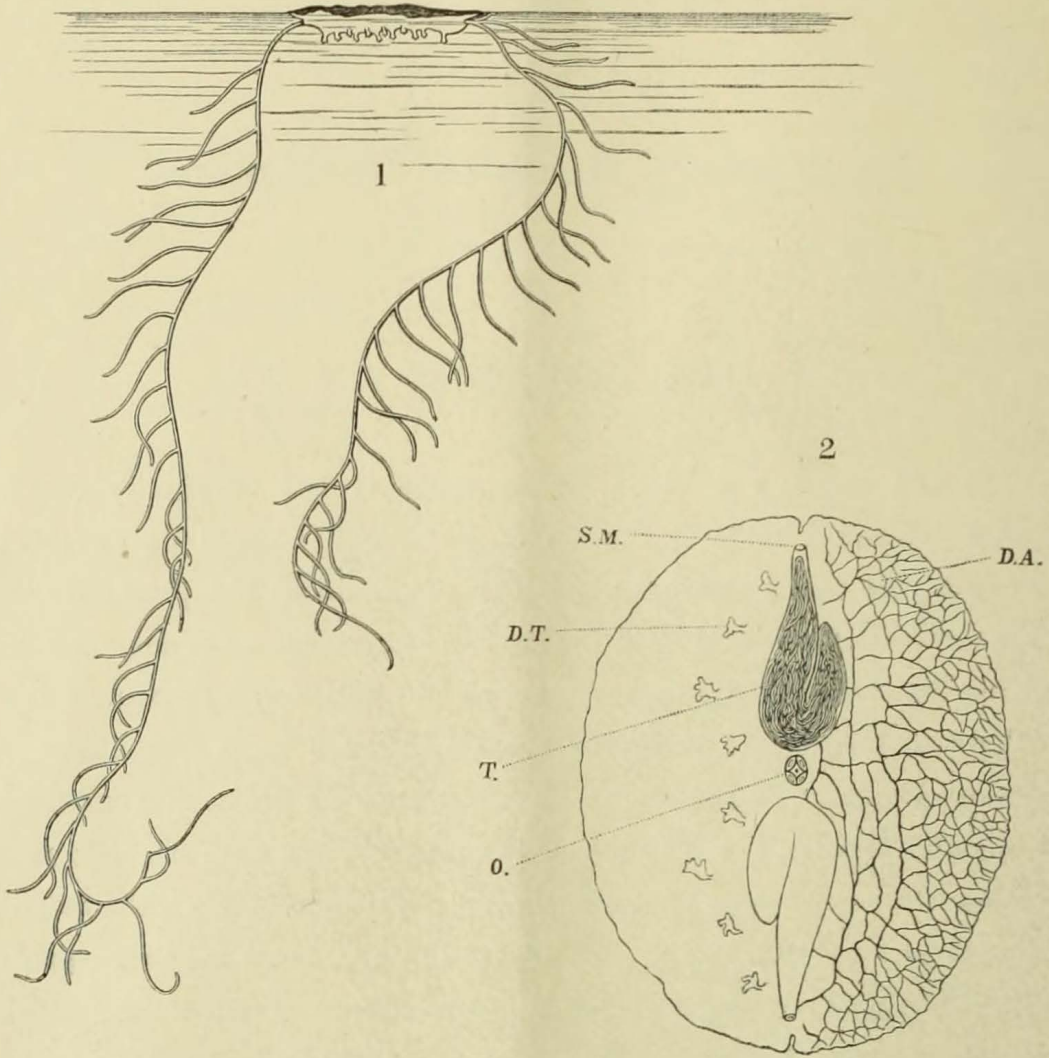
BY

James Francis Abbott, A.B.

In the summer of 1901, while enjoying the hospitality of the Misaki Marine Biological Station of the Tōkyō Imperial University, I was fortunate enough to find a number of specimens of a planarian-like form very closely resembling KOWALEVSKY'S *Coeloplana*. The next summer my renewed search was rewarded by the discovery of several more, so that altogether some thirty or more specimens have been obtained. As unavoidable circumstances will prevent me from publishing extended results immediately, it has seemed best to briefly announce the discovery and describe some points of superficial observation, reserving the details of structure for a later paper. While doing so I must take the opportunity to express my gratitude to Dr. K. MITSUKURI, Dean of the Science College of the University, and Director of the Laboratory, for the unfailing kindness and courtesy with which he has aided me through out my visits to Misaki.

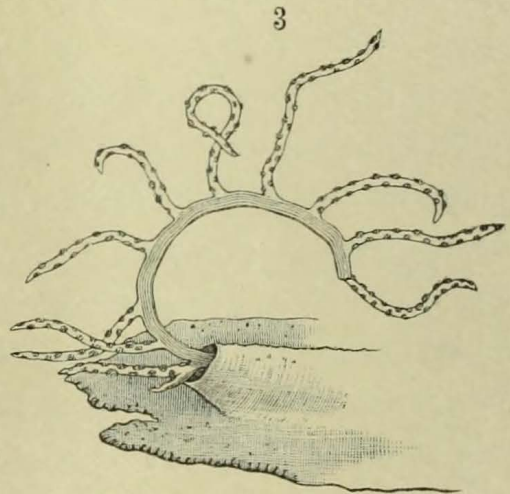
The animal, which—tentatively at least—will be considered a *Coeloplana*, occurs as two clearly distinct species. It is littoral in its habits and apparently wholly unfitted for life on the open sea. It possesses no vibratile plates or swimming cilia and cannot swim, tho in captivity it floats frequently on the surface of the water.

It is found principally on encrusting algae—*Zostera*, *Melobesia*, &c.,—which it resembles so closely as to make detection extremely difficult. When found on the rocks it is frequently stretched out to a thin mass of slime having little resemblance to anything animal. At such times



Explanation of Woodcuts.

- Fig. 1. *C. mitsukurii*, in floating position. The branches of the tentacle are represented disproportionately thick, for clearness' sake.
- Fig. 2. Diagram of gross anatomy of *C. mitsukurii*. *S.M.*, mouth of tentacle sheath. *D.T.* dorsal tentacles. *T.*, tentacle within sheath. *O.*, sense organ. *D.A.*, branches of digestive canals.
- Fig. 3. *C. willeyi*. Mouth of tentacle sheath, showing the manner of partially extruding the tentacle when the animal is irritated.



the larger species will frequently measure 5 or 6 cm. in longest diameter; the same animal contracted, shrinking to one centimeter across. It seems to adapt itself to its surroundings in color, and heavily pigmented individuals as well as nearly transparent ones will be found in appropriate surroundings.

It is very sluggish and apparently inhabits a very limited field. The ventral surface is heavily ciliated, the dorsal not at all. The ventral surface is flat, and it never doubles upon itself as described for *Ctenoplana*. When dropped into the water the edges curl in, all around, and it falls through the water in a shapeless lump.

It floats on the surface of the water with ease, and at such times moves along the surface, snail fashion, on a film of slime. This frequently extends beyond the periphery so that it is possible to push the animal all about the jar with a needle, without coming within a centimeter of touching the edge of the body. I have never seen it floating except in captivity and it tenaciously resists being taken from the rock on which it is found.

Where one is found, others are quite sure to be, and the situations in which they are found are sometimes strongly suggestive of multiplication by division, tho no evidence has been obtained yet as to that point.

It would be as misleading as it would be useless to speak of front or back or sides in connection with this animal, at least as regards locomotion. It not only crawls in any direction whatever but it frequently goes in more than one direction at once and the two halves, starting off for opposite sides of the dish, often stretch the middle part to the breaking point. At other times, it turns and twists upon itself until, tho the outline may be fairly regular, the turns and coils of the internal organs show that the interior is much confused.

When floating *C. mitsukurii* frequently drops down its long tentacles which wave about in the water in very graceful fashion (fig. 1).

The dorsal surface is ordinarily heavily pigmented, the pigment being contained in large cells. Where the animal contracts, these cells

are approximated but when extended they are separated by wide interstices so that the general color of the animal becomes much paler, approaching transparent. About the periphery are thickly scattered dull yellow or whitish cells, sometimes forming a rather prominent border.

The most prominent feature of the animal is the two long chalky white tentacles which lie in great writhing snake-like masses on either side of the sense organ, usually visible from the outside. These are very long and very contractile, quite similar to those described for *Ctenoplana*. The secondary branches are covered with batteries of nettle cells. Except when floating as described above, they are usually retracted in the sheaths, occasionally with the tip projecting like a tongue. At other times, however when the creature is more animated, it throws out the whole tentacle in a cloud of white filaments, while crawling. And to watch it at such a time, shooting out and retracting the tentacles, moving along the side of the aquarium like a battle-ship in action, is truly a remarkable spectacle.

Touching with a needle will also frequently cause it to throw out the tentacles. (fig. 3).

The sheath is raised in a log-like ridge along the dorsal surface, ending freely a trifle back of a notch in the periphery. The mouth of the sheath is separated from the body to form a short retractable tube.

Next to the tentacles the most prominent thing to be observed is the network of anastomosing digestive canals, which ramify throughout the body (fig. 2). The creature's habit of constantly twisting itself out of shape makes it extremely difficult to plot with any certainty the course of the canals. There are three or four long channels that run more or less parallel to the axis of the tentacles and send out branches peripherally. At a point about half-way to the edge these branch much more profusely. The inner portion thus appears paler and clearer when viewed from above. There is no peripheral canal. The canals end blindly in finger-like processes. I have not been able to make out with certainty any

vertical canal running up to embrace the sensory organ as described by KOROTNEF but what observations have been possible seem to point to its existence in this form also.

The mouth is large, quadrangular, with colorless lips, lying directly below the sense organ. It opens into a rather thin-walled pharynx, which apparently is roughly four lobed. The canals branch out from above it.

The circulation in the canals is very evident and may be observed readily with a low power. The colorless fluid carries a quantity of irregularly shaped bodies which frequently flow both ways in the same channel. The circulation is apparently controlled solely by the motions of the animal.

On the dorsal surface are a series of club shaped processes which may be called dorsal tentacles. They are either entire or digitate and fringed; hollow and thin walled, and communicate with the digestive canals. The circulating fluid enters into them and the particles carried by it whirl about in eddies within the tentacle. The tentacle itself is contractile and may be withdrawn. When the animal is extended they usually become obliterated. They do not seem to be particularly sensitive, however, and may be moved about with a needle without being withdrawn. At the base there is usually an aggregation of pigment cells, tho the tentacle itself is colorless. As a result of this the position of the tentacles may be noted on an extended specimen by the color, when there is no sign of the tentacle itself. The arrangement is hard to make out, owing to the amoeboid habits of the animal mentioned above, but in the smaller brown form, they follow roughly the outlines of a figure 8, covering the dorsal surface, with the intersecting lines crossing at the sense organ. When floating on the surface the tentacles are usually pendant and swinging in the water.

The otolith is very small,—almost insignificant in the larger form. It lies in a depression closed by fleshy lips, but there are no accessory sensory tentacles as described for *Ctenoplana*, and no external guide

to axial orientation. Two semicircular bands of yellow cells, probably glandular, surround the otolith at the base.

Coeloplana willeyi. *N. sp.*

Average size:—one to two centimeters across. Very contractile and extensible; amoeboid in movement. When killed, roughly circular in shape. In life, no consistent body-shape is maintained. Dorsal tentacles club shaped or cylindrical,—not branched or fringed. Color scarlet or carmine red, fading towards the edges to a yellowish pink. Chalky white spots about margins. Color deepest along the raised axis of the tentacle sheaths. Dorsal tentacles frequently with yellowish blotches at the bases.

Coeloplana mitsukurii. *N. sp.*

Smaller than the *C. willeyi*; average size one centimeter or less. Body firmer, not amoeboid, consistently oval or almost circular. Prominent notch opposite tentacles. Dorsal tentacles with two to five digitate processes. Not nearly so contractile as *C. willeyi*. Arrangement of dorsal tentacles approximately in a figure 8, with the extremities of the figure interrupted, the intersecting lines at the sense organ. Color;—dirty brown or brownish yellow. Less transparent than *C. willeyi*, frequently entirely opaque.

The two species are found together.

Oct. 1st, 1902.



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