

lected from the Dry Tortugas. Henderson reported it from Loue Key, near Key West,⁸ and Patterson records it from Carysfort Reef. The range, then, of *Mitra florida* seems to be from Miami, Florida, to Panama, if the record for *Mitra fergusonii* is not erroneous.

The characters of the newly examined radula thus place this lovely species without doubt in the genus *Mitra*, and the uncertainty as to its position is finally removed.

OBSERVATIONS ON THE FEEDING OF *AEOLIDIA*
PAPILLOSA L., WITH NOTES ON THE HATCH-
ING OF THE VELIGERS OF *CUTHONA*
AMOENA A. & H.

BY HENRY D. RUSSELL

At 10:35 A.M. on December 9, 1937, a sea anemone (*Metridium marginatum* Oken) $\frac{1}{8}$ in. in diameter was placed in a finger bowl with an *Aeolidia papillosa* L. $1\frac{1}{2}$ in. long. Twice at this time the oral tentacles of the nudibranch touched the column of the anemone. Then with cerata characteristically bristling when initiating an attack, the mollusk opened the mouth, swelled the lips and completely enveloped the anemone. The prey was alternately drawn into and slightly extruded from the mouth. Each time it was drawn in, it was extruded less and less until after 22 minutes it was only visible as a dark mass within the mouth of the nudibranch. One minute later a small part of the prey appeared as continuous tissue. After six more minutes a brown fluid, presumably the macerated parts of the anemone appeared for a moment and were then quickly sucked back into the mouth. During the process of feeding the lips remained in a bloated condition and only returned to their normal size at 11:06 A.M. when the animal started crawling about the dish with no sign of the anemone in its mouth. During the attack, a few nematocysts bearing acontia were thrown out by the anemone, but these were sucked into the mouth of the nudibranch. No

⁸ J. B. Henderson, Jr., Extracts from log of the *Eolis*, NAUTILUS 25: 6, page 71.

nematocysts were observed to explode. The total time of feeding was 31 minutes.

In the case of nudibranchs feeding upon larger *Metridium* the author has observed that the base of the anemone is attacked first. A great quantity of mucous is extruded about the fore parts of the mollusk and in it are caught many of the acontia of the anemone. The author has never noted that the nematocysts of acontia thus caught were exploded. Eventually many of these and much of the mucous is eaten by the mollusk along with parts or all of the anemone itself.

The rate, amount eaten and length of time involved, will prove of interest here and experiments concerned with this are cited below. Both the nudibranch and the anemone were dried with paper towels before and after the feeding to rid them of excess water and weighed at the same time.

An *Aeolidia papillosa* $1\frac{1}{2} \times \frac{1}{2}$ in. weighing 1.88 grams ate .68 grams of a sea anemone (*Metridium marginatum*) weighing 4.02 grams in 10 hours.

Another *A. papillosa* $1\frac{3}{4} \times \frac{1}{2}$ inches weighing 2.03 grams ate .40 grams of a *M. marginatum* weighing .50 grams in $10\frac{3}{4}$ hours.

It appears from these results that there is a considerable difference in the rate of feeding and of the amount eaten among animals of almost the same size.

HATCHING OF THE VELIGERS OF *Cuthona amoena* ALD. & HANC. On December 14, 1937, while the author was observing an egg capsule of *Cuthona amoena* that was attached to the main stalk of the hydroid *Obelia commissuralis* McCrady, the veligers contained in the capsule started to break out as noted below. The temperature of the surrounding sea water was 45° F. One veliger continually worked the cilia of the labial palps against the gelatinous wall of the capsule in one place while the others swam about within the capsule. Suddenly the wall yielded to the scratching action of the cilia and as if under the influence of pressure from within the capsule the veliger was forced into the hole with its anterior end slightly protruding into the surrounding sea water. Several times it contracted into its shell only to emerge again and furiously beat the cilia. During this performance the other veligers were swimming about and occasionally

colliding with the one that had broken through the capsular wall. Each collision forced it out a little farther into the sea water until after three or four such contacts it burst out of the capsule and swam about freely. The veliger was literally hurled from the capsule as if forced out by some internal pressure. As soon as the first one left, a second took its place in the opening and was blown or forced out into the surrounding sea water. The internal pressure within the capsule seemed to grow weaker as each veliger left the capsule until finally only one remained swimming about inside. No substance was observed to be extruded from the capsule with the veligers. It is entirely possible that osmotic pressure increases within the capsule as the veligers develop and that this is the force that propels them through the opening in the capsular wall and into the surrounding sea water.

THE AMERICAN SPECIES OF *VIVIPARUS*

BY CALVIN GOODRICH

Mr. T. Van Hyning of the Florida State Museum has recently submitted an accumulation of Floridian *Viviparus* for comparison with examples of the genus in the Bryant Walker Collection. It was made clear very quickly that a good deal of basic information had first to be acquired. So all the available material having its source within the United States was examined, shell by shell. The literature on the subject was read. The geographical distribution of the several species was brought into such order as was possible. Since the study developed facts which appear not to have been published, or if so in scattered form and perfunctorily, I am venturing to set forth the findings.

The genus *Viviparus* illustrates what may be a natural law governing molluscan nomenclature, namely, that the more simple the shells of a group may be, the fewer and the least definite its characters and the more difficult to describe lucidly, then the heavier burden of specific names the group is compelled to carry. In this matter, *Viviparus* lags a great way behind Pleuroceridae or perhaps the French Anodontinae, but it is probably abreast of some of the genera of Zonitidae and even with the currently expanding *Cerion*. Reeve recognized about seventy species of



Russell, H D. 1942. "Observations on the feeding of *Aeolidia papillosa* L., with notes on the hatching of the veligers of *Cuthona amoena* A. & H." *The Nautilus* 55, 80–82.

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