3. Respiration under Varying Temperatures.

A series of 18 snails was run for one hour at temperatures of 11°, 19°, 27°, and 35° C. during August, 1961. One hour was allowed for equilibration between 11° and 19°, two hours between 19° and 27°, and four hours between 27° and 35°. Average oxygen consumption of the 18 snails at each temperature is shown in Table 3.

Table 3:

Oxygen consumption (microliters per mg. dry weight) of *Tegula* at temperatures ranging from 11° to 35° C.

Temperature		11°	19°	27°	35°
Time (min.)	30	0.31	0.48	0.76	0.45
	60	0.54	0.95	1.45	0.92

Between 11° and 27° the respiratory rate appeared to increase directly with temperature. The upper limit of respiratory efficiency was reached between 27° and 35°, for the rate at 35° fell off to slightly less than the rate at 19°.

4. Effect of Starvation upon the Respiratory Rate.

The oxygen consumption of six animals collected 20 days previously was compared to the oxygen consumption of nine animals collected one day previously (August, 1961). The results are shown in Table 4.

Table 4:

Oxygen consumption (microliters per mg. dry weight) of *Tegula*, starved and fresh

		Starved	Fresh
Time (min.)	30	0.40	0.76
	60	0.84	1.47

Starved animals respired at slightly more than half the rate of the freshly collected animals. These results emphasize the importance, in experiments of this kind, of using animals collected at the same time and subjected to the same conditions.

Conclusions

These short determinations have indicated that respiratory activity of *Tegula* varies not unexpectedly with conditions of exposure, salinity, temperature, and starvation. Basic rates of oxygen consumption are comparable to those given for molluscan tissues by Zeuthen (1947). Additional factors which have been shown to affect respiratory activities of gastropods are seasonal variations (Berg, Lumbye and Ockelmann, 1958) and tidal and diurnal rhythms (Sandeen, Stephens and Brown, 1954). The shortness of the manometric determinations used here served to obscure rhythms that might have been present. Respiratory activity may also be expected to vary with the intertidal height from which the snails are collected. Manometric determinations of oxygen consumption, therefore, are useful only with snails collected at the same time and measured in the manometer simultaneously.

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A Study of Food Choices of Two Opisthobranchs, *Rostanga pulchra* McFarland and *Archidoris montereyensis* (Cooper)

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(4 Textfigures)

Several of the dorid nudibranchs of the west coast of North America feed on sponges which they resemble in color and texture. Rostanga pulchra MacFarland, a bright red nudibranch, 1.0 to 1.5 cm. long, feeds on an encrusting red sponge, Ophlitaspongia pennata Lambe, while Archidoris montereyensis (Cooper), a large yellow nudibranch, 6.0 to 10.0 cm. long, commonly feeds on a yellow sponge, Halichondria panicea (Pallas). Both the nudibranchs and the sponges on which they feed are found intertidally along rocky coasts.

In the Friday Harbor region (San Juan Island, Washington), where this work was done, the sponge, Ophlitaspongia pennata, is represented by the varietal form, O. pennata var. californiana de Laubenfels. In order to distinguish var. californiana measurements of the spicules must be made. Although this was not done, Mr. Gerald J. Bakus, who has worked on the sponges of the area, has assured me that the odds are about 100 to 1 that it will be the varietal form, since he has not found the typical form itself in the San Juan Archipelago.

In the field Rostanga pulchra is often found on red sponge and is seldom found far away from it. The sponge encrustations are 2 to 3 mm. thick and vary in area from 2 or 3 sq. cm. to over 100 sq. cm. It is scattered in its distribution along the coast.

Archidoris montereyensis is commonly found on Halichondria panicea but may be found where sponges appear to be absent. Halichondria panicea is a branching yellow sponge of a fairly loose composition, often found in large clumps. In the literature it is often referred to as the "bread crumb" sponge.

The purpose of this paper is to report on some aspects of feeding of Rostanga pulchra and Archidoris montereyensis.

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Materials & Methods

I. Three sets of experiments were done with Rostanga pulchra to determine factors important in location of food. A plastic bowl 10 inches in diameter was set up so that two currents could be directed into it. An overflow was placed between the two incoming currents (Figure 1). The bowl was covered with black rubber

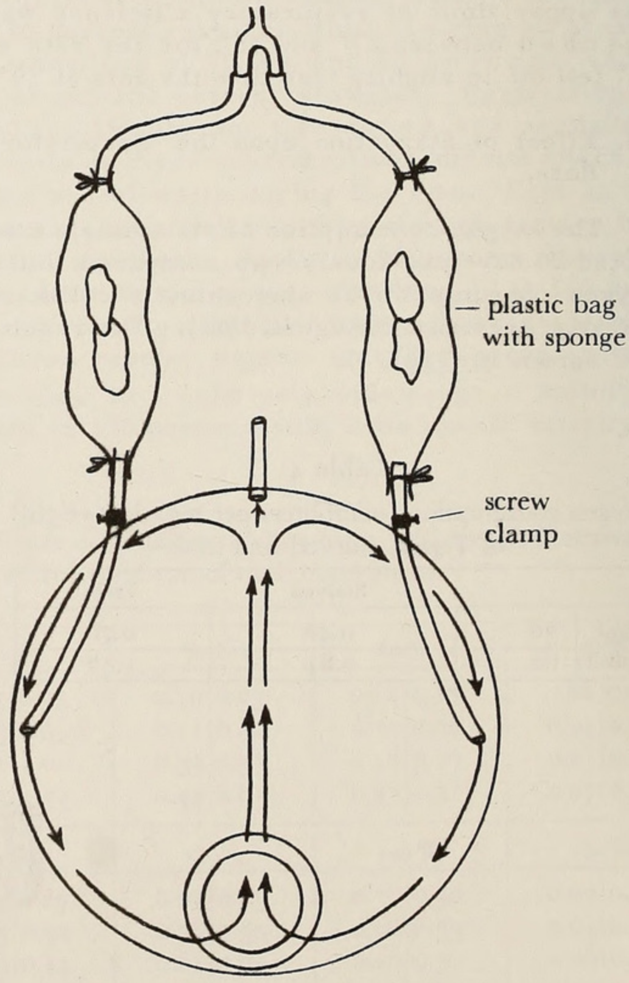

Figure 1

Apparatus used to test the response of *Rostanga pulchra* to food and current. The arrows indicate the direction of the current.