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barnacle the sensitivity to factors related to the hydrogen ion concentration is so great that its sensitivity to changes in the carbon chain is masked. In the killifish, however, the effect due to factors related to the hydrogen ion concentration does not predominate over the effect related to the length of the carbon chain and stimulation is a resultant of factors related to both polar and non-polar portions of the molecule. Thus the barnacle is apparently more sensitive to changes related to hydrogen ion concentration than is the killifish, while the latter is apparently more sensitive to changes related to the length of the carbon chain. This difference in sensitivity of the two animals is correlated with differences in the constitution and function of the receptive surfaces.

SEROLOGICAL RELATIONSHIPS OF THE MOLLUSCA

CORNELIUS T. KAYLOR, Rutgers University

A study of the serological relationships of the Mollusca by means of the precipitin test, was begun recently at Rutgers University. The first essentials in this work are proteins typical of the species whose interrelationships are to be studied. These proteins are obtained by extracting the whole bodies of the animals to be studied. During the summer of 1932, extracts of *Chrysodomus decemcostata*, *Mya arenaria* and *Venus mercenaria* were made at the Mt. Desert Island Biological Laboratory.

Methods employed in making these extracts were as follows: whole bodies were ground in a mortar when the animals were small or by using a meat-grinder and mortar when the animals were large. The extracts were made in 0.9% saline when body fluids were scarce or in body fluids themselves when they were of sufficient volume to make at least 100 c.c. of extract. All animals were starved before grinding. They were filtered through ordinary filter paper to remove large particles of flesh, and afterwards through a Seitz bacteriological filter using one asbestos pad. The fluid was thus cleared, and it was easier to pass through a second filtration. If more than 100 c.c. was present, it was reduced to the desired volume by evaporation (hastened by an electric fan). The extract was kept on ice at all possible times to prevent decomposition. Then it was refiltered through a sterile Seitz filter using two asbestos pads. The extract came through sterile as tested by allowing it to stand for 48 hours at room temperature after it had been bottled in sterile 5 c.c. vials. The filter, all instruments. pipettes, vials and rubber stoppers were sterilized by being subjected to a steam pressure of 15 pounds for one and a half hours. The extract was bottled immediately following filtration to insure against contamination.

These extracts, along with others, will be injected into rabbits to

prepare precipitating antisera. Each antiserum produced as a response to the injection of a specific antigen (body extract) will be tested against all the molluscan antigens. The degree of intensity of reaction between antigen and antiserum will be taken as the relationship of the species compared. By this method new light on the interrelationships of some common Mollusca may be obtained.

It would be well to mention that animals for these extracts must be obtained in abundance and *Chrysodomus* was found easily at Pretty Marsh. *Mya* was very abundant in the mud flats near the laboratory. Also two rare Mollusca, *Aporrhais* sp.? and *Dentalium pretiosum*, were found to be plentiful in the water around Sutton Island, near Seal Harbor.

REPORT OF WORK DONE AT THE MT. DESERT ISLAND BIOLOGICAL LABORATORY DURING THE SUMMER OF 1932

G. R. MENEELY, Princeton University

In the course of the summer, preliminary work on a study of the finer anatomy of the musculature of the digestive tract of *Squalus acanthias* was done. A series of preparations of portions of the tract were made. From these it would appear that the striated muscle of the oesophagus extends considerably further down than heretofore reported. The cardiac stomach certainly has striated muscle and this seems to extend in a gerater or lesser degree into the pyloric region.

The so-called "cramp striations" described by Dahlgren were produced by the electrical stimulation of strips of muscle from the stomach. These bands, which seem to bear no relation to the striation of the muscle, extending through the Z stripe as well as the M stripe frequently for a distance of many sarcomeres, give the appearance of being of the nature of typical smooth muscle contractions. There can be no doubt that they are due to swellings of the myofibrillae, as they are clearly visible, and distinctly parts of individual fibrils.

It is difficult to relate these contractions to the present physiological concept of the contraction process. The work of E. J. Carey lends substance to the hypothesis that the heavy contraction bands that have been observed in this striated muscle are really smooth muscle contractions, for, by his work on the bladder muscles, he has shown that there is no fundamental difference between the two types of cells. It seems reasonable to suppose that these contractions are involved in the as yet unexplained phenomenon of contractures.

With this in mind, the nervous innervation of the muscle is being examined, and a psysiological study is being made to determine the exact conditions which give rise to these bands, as well as to determine accurately the conduct of the muscle under the circumstances.