

# "BROWN-SPOTTING" IN THE SOUTHERN OYSTER<sup>1/</sup>

By Milton Fingerman\*

The bodies of Atlantic Coast oysters are normally creamy white except for some brown pigment deposited at the edges of the mantle. Southern oysters, in contrast, show varying degrees of body coloration from tan to deep brown. The pigment in tan oysters is homogeneously distributed over the mantle surface. Some

brown pigment is also concentrated at the edges of the mantle and quite frequently on the portions of the mantle surrounding the adductor muscle. In "brown-spotted" oysters, the quantity of brown pigment is markedly increased. The pigment may be uniformly distributed throughout the outermost portion of the mantle or concentrated in restricted regions of the mantle. Experiments are currently in progress to determine (1) the nature and origin of "brown-spottings" in Southern oysters, (2) why some Southern oysters produce more "brown-spots" than others, and (3) why Southern, and not Northern, oysters produce "brown-spots."

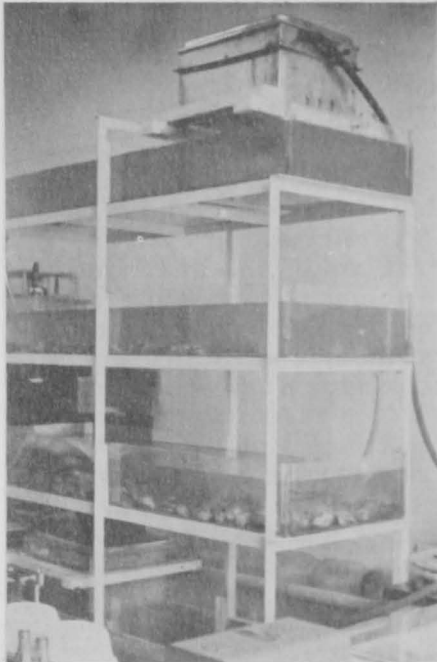


Fig. 1 - Large plexiglass aquaria used for holding live oysters for physiological study of Southern oysters being conducted at Tulane University.

and the amount of purple or brown pigment deposited in the shell. The pattern of pigment in the shell is mirrored by the distribution of "brown-spot" on the body of the oyster. Shells have been sectioned in order to determine the pattern of purple and brown-pigment deposition. The pigments are usually found distributed in the prismatic and nacreous layers of the shell. When the pigment is found on the inner surface of the shell, in the nacreous layer, sectioning reveals that the coloration extends at least two to three millimeters into the prismatic layer from the inner surface of the shell. There may be deeper layers of pigment not associated with the inner layers of pigment, indicating the formation

Histological sections of "brown-spotted" oyster tissues have been prepared. The "brown-spottings" appears to be restricted to epithelial cells of the mantle. The brown pigment may easily be scraped with a scalpel from the surface of a living oyster. The "brown-spotted" material has a mucoid appearance, probably due to the mucus always present on the oyster body surface. When observed with the microscope, this "brown-spotted" material appears to be composed of numerous golden-brown granules.

There is a positive correlation between the intensity of "brown-spottings" on the oyster body



Fig. 2 - Water bath with temperature control and stirrer. The kymograph to the right is for recording shell movements of oysters under test for reaction to higher temperatures.

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of "brown-spot" material need not be a continuous process. The presence of pigment throughout the shell suggests that "brown-spotting" first appears in oysters that are younger and smaller than those collected by commercial oystermen. Furthermore, if an imperfection in the form of a depression is present on the internal surface of the shell, the portion of the body lying immediately above the imperfection usually has brown pigment deposited in the form of an outline of the imperfection.

Body coloration of oysters from Delaware Bay and Chesapeake Bay was compared with Southern oysters. The Northern oysters showed no spotting nor was color evident on the shells to any extent except in the region where the adductor muscle attaches to the shell.

Experiments designed to induce spotting have not been successful. Oysters receiving implants of "brown-spotted" oyster tissue were placed in aquaria for a week when they were shucked and inspected for "brown-spot." Oysters were also maintained for one week in sea water containing homogenized "brown-spotted" oyster tissue. Neither group of oysters showed a significant increase of intensity of "brown-spotting." The lack of success of these experiments is further indication that "brown-spotting" is initiated early in the life of the Southern oyster.



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