

A METHOD OF DETERMINING THE SEX OF THE STRIPED BASS (*Roccus saxatilis*) (Walbaum)

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ABSTRACT

A method is described for sexing striped bass through use of serrated jaw ear forceps. The instrument is used to extract gonads from dead fish in samples of commercial catches, without incurring damage to the fish which affects the market quality. The gonads are examined later in the laboratory and are identified as male or female. The technique has proven satisfactory in large scale sampling of commercial catches. This method also holds promise for use on other species of fish in which sex ratio studies are important.

INTRODUCTION

In a recent study of striped bass *Roccus saxatilis*, Walbaum, undertaken by the United States Fish and Wildlife Service, it became necessary to determine the sex ratio in North Carolina populations for adequate interpretation of data on population dynamics, fish movement, and spawning activity.

Raney (1952) and Merriman (1941) state that no valid way has been found to determine the sex of striped bass by the use of external characters and that the gonads must be inspected if differentiation is to be made. Workers in the past have sexed dead striped bass by examining their reproductive organs. Gonads were obtained by dressing fish for sportsmen, from fish being dressed in commercial fish houses (Merriman, 1941; and Morgan and Gerlach, 1950), and by purchasing fish especially for sex ratio studies or for studies concerning reproductive cycles (Vladykov and Wallace, 1952). The sex of ripe fish, living or dead, can be readily determined since reproductive products are exuded upon application of digital pressure in the region of the genital pore. However, samples are rarely taken from a population, even on the spawning ground, in which all fish are fully ripe. Consequently a method of internal sexing is required even here.

Vladykov and Wallace (1952) found that the numerical relationship of males to females does not remain static through all seasons of the year. Therefore, a complete picture of the relationship of the sexes of striped bass requires sampling throughout the year in all regions occupied by a given population.

It is a common practice in North Carolina as in other states for striped bass to be marketed as whole fish. An internal sexing method was devised which is completely accurate and does not reduce the market value of the fish.

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METHOD OF SEXING

After experimentation with several types of surgical instruments it was found that gonadal tissue could be extracted through the vent by use of ear forceps having serrated jaws.*

A thin blade knife or a scalpel is inserted in the vent and a slit is made through the dorsal wall of the intestine (Fig. 1). The closed forceps are then passed through the incision, opened, moved forward, and closed to grasp the gonad.

Once the gonad is grasped, a firm, constant pull is exerted on the forceps with one hand while the other hand is used to make short, lateral movements of the fish to break the membranes surrounding the gonads. At times a portion

* The instrument was supplied by the American Hospital Supply Corporation, Atlanta Division, Chamblee, Georgia, and is catalogued as Hartman Ear Forceps, serrated jaw, item No. 330-25.

of the gonad is torn away and at other times, particularly in small fish, an entire testis or ovary is pulled free (Fig. 2). The vent is not noticeably enlarged even after the removal of an entire, relatively large gonad. A fragment of gonadal material large enough to be identified as such in the field is sufficiently large for laboratory identification as to sex. Practice is required in locating gonads with the forceps, and in separating gonadal material from adipose and intestinal tissue which are also frequently withdrawn from the body cavity. It has been noted that fewer mistakes are made and greater speed is achieved when working with relatively small (9 to 15 inch) striped bass. Frequently tissue can be extracted with great facility from fish over 20 inches in length by inserting the instrument directly into the genital pore, grasping the gonadal tissue, and extracting the material through the same opening. This is impractical in smaller fish because of the size of the genital pore which prohibits insertion of the instrument without mutilation of the fish. Thus far, forceps have not been used to sample gonads which are in other than the resting stage.

After extraction, each gonad or fragment thereof is placed in a 4 milliliter vial containing 5 percent formalin and a coded label. Code numbers corresponding to those on scale envelopes upon which length, weight, date and location of capture, gear employed, and other pertinent data are recorded.

Later the sex of the tissue is determined in the laboratory by means of a binocular dissecting microscope. Identification in this manner presents no difficulty since the granular oocytes in ovarian tissue are readily distinguishable from the fine-textured spermatocytes.

Field examination of striped bass gonads showed that the tissue from testes is usually pale or whitish in appearance and that ovarian tissue is usually reddish and somewhat translucent. A sample of gonads was tentatively identified as male and female on the basis of appearance when sampled. Re-examination of this material in the laboratory showed that microscopic examination of the gonads is necessary for 100 percent accuracy in distinguishing sexes from resting gonads.

The rapidity of sexing by this method varies considerably, depending upon the experience of the operator, the conditions under which he is working, and the size of the fish. One operator and a recording assistant sexed 125 striped bass in approximately three hours. In addition they took scales and measurements and recorded these data.

It is possible that this method may be applied to other species of fish in which determination of sex by external inspection is difficult or impossible and in which sex ratio studies are prerequisite to the solution of research problems.

LITERATURE CITED

- Merriman, Daniel. 1941. Studies on the Striped Bass (*Roccus saxatilis*) of the Atlantic Coast. Bull. 35, U. S. Fish and Wildlife Service, Vol. 50, pp. 1-77.
- Morgan, Alfred R. and Arthur R. Gerlach. 1950. Striped Bass Studies in Coos River, Oregon, in 1949 and 1950. Oregon Fish Commission. Contribution No. 14, pp. 1-31.
- Raney, Edward C. 1952. The Life History of the Striped Bass, *Roccus saxatilis* (Walbaum). Bulletin of the Bingham Oceanographic Collection, Vol. XIV, Article 1, pp. 5-97.
- Vladykov, Vadim D. and David H. Wallace. 1952. Studies of the Striped Bass, *Roccus saxatilis* (Walbaum), with Special Reference to the Chesapeake Bay Region During 1936-1948. Bulletin of the Bingham Oceanographic Collection, Vol. XIV, Article 4, pp 132-177.