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Maximum Size Revision and Chesapeake Bay Distribution for Striped Burrfish, *Chilomycterus schoepfi*

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ABSTRACT

A 330-mm TL striped burrfish, *Chilomycterus schoepfi*, was captured on August 21, 1995 during otter-trawl sampling in shallow-water eelgrass (*Zostera marina*) beds near Cape Charles, Virginia. The specimen was 30% larger than the previously recorded maximum length of 254 mm. Records from specimens captured between 1988 and 1996 indicated that *C. Schoepfi* were found in the lower Chesapeake Bay between the months of May and October. Peak abundance of striped burrfish occurred in shallow-water eelgrass (*Zostera marina*) during August, followed by a peak in deeper Chesapeake Bay water in September and October. Individuals were most numerous in the eastern half of the Bay, in water of 14.3 - 30 oC and salinities of 17 - 28 ppt.

INTRODUCTION

Striped burrfish, *Chilomycterus schoepfi* (Fig. 1), have eluded much research because they lack commercial and recreational fishing value. Consequently, information in the literature concerning maximum size and occurrence of *C. schoepfi* within Chesapeake Bay is wanting. This paper updates zoogeographical patterns within Chesapeake Bay and draws together life-history characteristics of *C. schoepfi*.

C. Schoepfi extends from New England to Brazil (Robins, et al., 1986; Murdy, et al., 1997). It inhabits water of 6.9 - 47 ppt salinity and temperatures of 12.4 - 38.0 ^{o}C (Martin and Drewry, 1978). Striped burrfish are common in the lower to middle Chesapeake Bay from late spring to autumn (Murdy, et al., 1997). Previous studies indicated that they occur in deep flats and channel edges (Hildebrand and Schroeder, 1928; Musick, 1972), but also frequent the shallow-water eelgrass (*Zostera marina*) beds along the eastern and western Bay shores (Orth and Heck, 1980). Franks et al. (1972) found striped burrfish most commonly associated with seagrass beds around barrier islands in the Gulf of Mexico. Chesapeake occurrences extend into the upper Bay as far as Point Patience on the Patuxent River, where both adults and juveniles (38 mm) have been reported (Schwartz, 1960). Hildebrand and Schroeder (1928), Robins, et al. (1986), and Murdy, et al. (1997) cited the maximum total length as 254 mm.

Striped burrfish occurrence within seagrass beds is not unusual since they consume a variety of hard-shelled invertebrates, including gastropods, bivalves, barnacles, and crabs (Motta et al., 1993). Adams (1976) found that 95% of their diet by weight was composed of bay scallops, *Argopecten irradians*, and the small gastropod, *Bittium varium*. The Chesapeake Bay no longer has a viable population of *A. irradians*, but *B. varium* is found in the upper meso- and polyhaline regions (Wass, 1972).

Figure 1. A 330 mm striped burrfish captured August 21, 1995 in eelgrass (*Zostera marina*) near Cape Charles, Virginia. Photograph by author.

Hildebrand and Schroeder (1928) found the stomachs of six striped burrfish specimens filled with hermit crabs.

METHODS

Information about striped burrfish was obtained from two projects conducted by the Virginia Institute of Marine Science (VIMS). The first survey used an otter trawl to sample sites with depths greater than 3.7 m. The stations were randomly chosen from three latitudinally-equal regions, each divided into four depth strata. The survey made two to four trawls per stratum, per month, with the exception that since 1991 a single cruise was made between the months of January-March. Cumulative histograms of length-frequency and monthly abundance were produced for the period from 1988-96, and all capture locations were plotted.

A second project provided information about maximum *C. Schoepfi* size and evaluated months of residency in a shallow-water, vegetated habitat. This otter trawl survey was performed monthly from February to September 1995 in seagrass beds (< 1.5 m depth) near Cape Charles, Virginia (Fig. 2).

RESULTS

Thirty-two *C. Schoepfi* were caught in water deeper than 3.7 m between the years 1988 and 1996. Most were found in the eastern half of the Bay (Fig. 2), and salinities

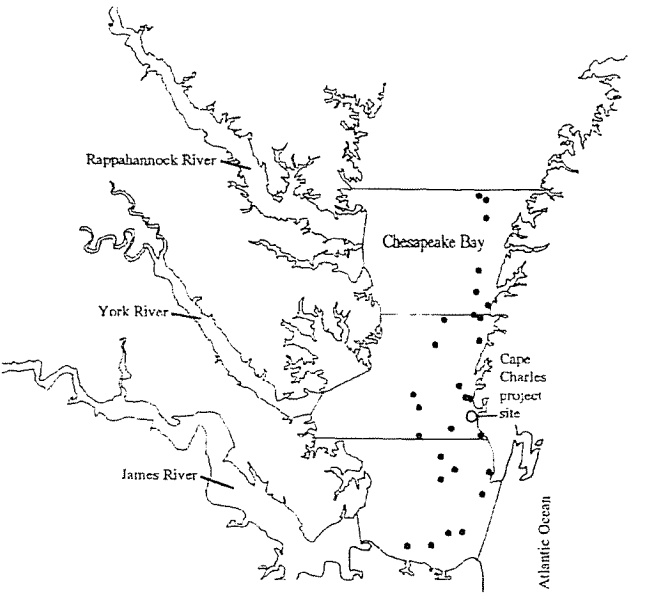

Figure 2. Map of the Virginia portion of the Chesapeake Bay. Filled circles represent all *C. Schoepfi* captured from 1988 through 1996 in depths greater than 3.7 m. Straight lines delineate the three latidude-based strata sampled, and the location of the Cape Charles project is indicated.

varied from 17 to 28 ppt. The total length mean was 191 mm, range 63 to 274 mm (Fig. 3). Abundance was bimodal, with a minor peak in July and a major peak in September and October (Fig. 4).

Eleven striped burrfish were captured during the 1995 shallow-water project in a temperature range of 23 to 30 oC. Data from Cape Charles eelgrass beds generally agreed with the 1988 to 1996 data from deeper water, but abundance in the seagrass peaked in August, between the July and October modes observed in deeper water (Fig. 4).

One sizable burrfish specimen was captured at Cape Charles on August 21, 1995 (Fig. 1). The individual measured 330 mm TL, 76 mm larger than the maximum size listed in the literature (Hildebrand and Schroeder, 1928; Robins, et al., 1986; Murdy, et al., 1997). The fish was measured, photographed, and released.

DISCUSSION

The accepted maximum size of *C. schoepfi* is revised, as two fishes (330 mm, 274 mm) were captured that exceeded the previously-published maximum of 254 mm. The environmental parameters in which all specimens were captured fell well within the recognized limits for this species.

Most striped burrfish were caught near the main bay channel in the eastern half of Chesapeake Bay. This distribution may be shaped by salinity, which is higher in the eastern portion of the Bay, influenced by the Coriolus effect and freshwater river flow from the west. Evidence suggests that striped burrfish enter the Bay from May

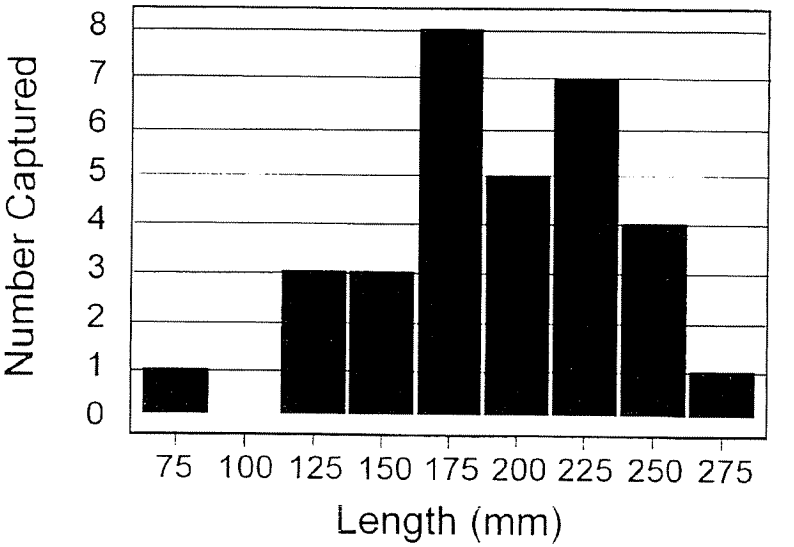

Figure 3. Length-frequency histogram for 32 striped burrfish captured from 1988 through 1996.

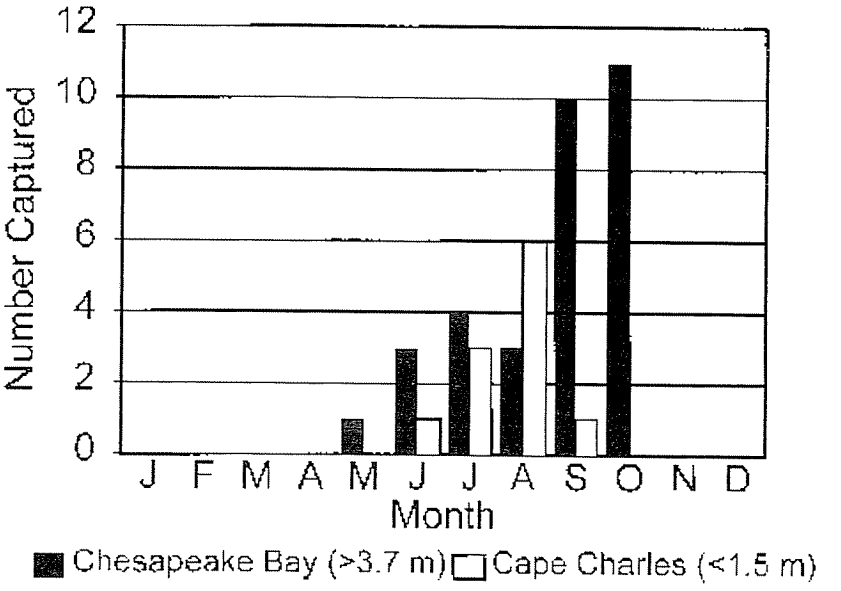

Figure 4. Frequency of occurrence, by month, for *C. schoepfi* captured from the Virginia portion of the Chesapeake Bay (1988-1996), and Cape Charles, Virginia (March-September 1995).

to July via the more saline water of the main channel before moving into shallow-water eelgrass beds along the eastern and western shores.

Hildebrand and Schroeder (1928) reported capturing fish with nearly mature gonads in October, but the 38 mm juveniles captured in late July by Schwartz (1960) suggest that spawning occurs in the spring or early summer. As temperatures cool in September and October, striped burrfish appear to migrate out of seagrass beds into deeper water in the middle to lower Chesapeake Bay prior to departure into the Atlantic Ocean.

The conclusions of this study in regard to *C. Schoepfi* habitat and distribution in Chesapeake Bay may not apply to southern populations of this species. Striped burrfish are quite common south of Virginia, but they clearly occupy different habitats since large beds of *Zostera marina* are rare. Further research is warranted to delineate *C. schoepfi* habitat, determine the timing and location of spawning, understand life-history characteristics, and explore significant interspecific interactions.

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