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First Records of *Hypleurochilus geminatus* and *Centropristis philadelphica* from Chesapeake Bay

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ABSTRACT

During the fall of 2007, *Centropristis philadelphica* (rock seabass) and *Hypleurochilus geminatus* (crested blenny) were collected from Chesapeake Bay. These captures are significant as they represent the first substantiated record *of C. philadelphica* from Chesapeake Bay and only the second and third validated records of *H. geminatus*. Additionally, the first record of *H. geminatus* from Chesapeake Bay was only recently recognized since the specimen had been previously misidentified as *Parablennius marmoreus* (seaweed blenny). The collection of seven individuals of *H. geminatus* in 2007, from two locations, indicates that the species may be resident within the Chesapeake Bay estuary.

INTRODUCTION

The Chesapeake Bay, an ecotone between the Atlantic Ocean and the rivers of Maryland and Virginia, experiences extreme seasonal temperature changes and contains a range of habitats. Species richness is typical of such ecological systems and is evident by the estuary's diverse and dynamic fish fauna, which includes permanent residents, spawning migrants, and seasonal visitors (Murdy et al. 1997). The fish fauna of Chesapeake Bay has been surveyed extensively since the early 1900's (Hildebrand and Schroeder 1928; Massman 1962; Massman and Mansueti 1963; Musick 1972; Murdy et al. 1997) yet warmwater species uncommon to the estuary continue to be encountered (Halvorson 2007). Two such species, *Centropristis philadelphica* (rock seabass) and *Hypleurochilus geminatus* (crested blenny), were collected in Chesapeake Bay during the fall of 2007 by the Virginia Institute of Marine Science (VIMS) Juvenile Fish and Blue Crab Trawl Survey.

MATERIALS AND METHODS

Five-minute bottom tows were conducted in lower Chesapeake Bay with a 9.14 m otter trawl (38.11 mm stretched mesh body, 6.35 mm cod-end liner, and a tickler chain) off the 8.5 m R/V Fish Hawk. Fish were identified and measured to the nearest mm (total length for *H. geminatus* and total length centerline for *C. philadelphica*). Voucher specimens were deposited in the Ichthyological Collection, Virginia Institute of Marine Science, Gloucester Point, Virginia (*H. geminatus*-VIMS 11776, *C. philadelphica*-VIMS 11979). Hydrological measurements (water temperature, salinity) were taken with a YSI 600Q (YSI Incorporated, Yellow Springs, Ohio).

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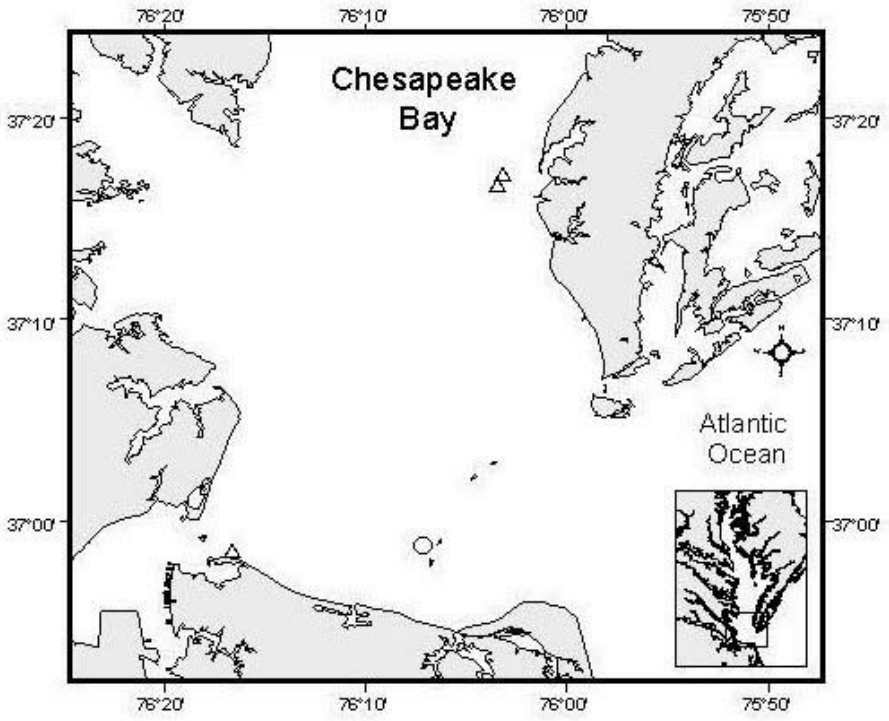

FIGURE 1. Collection locations of *Centropristis philadelphica* (○) in 2007 and *Hypleurochilus geminatus* (Δ) in 1993 and 2007 in Chesapeake Bay.

RESULTS

On September 6th, 2007, five individuals of *H. geminatus* (39-78 mm) were captured in Chesapeake Bay at 37º17.13'N, 76º 03.11'W, near Cape Charles, Virginia (Figure 1; Table 1). Water depth at this station was 7 m and the bottom water temperature and salinity were 26.59ºC and 23.64‰, respectively. Two additional specimens (34-37 mm) were collected on November 14th, 2007, at 36º58.43'N, 76º16.59'W, near the entrance to Hampton Roads, in 5.5 m of water (Figure 1; Table 1). The bottom water temperature was 13.63ºC and bottom salinity was 22.79‰.

A single specimen of *C. philadelphica* (210 mm) was collected November 5th, 2007 at 36º58.76'N, 76º07.16'W, approximately 1 km upstream of the first tunnel of the Chesapeake Bay Bridge-Tunnel (Figure 1; Table 1). Water depth was 13.4 m and the bottom water temperature and salinity were 17.22ºC and 24.54‰, respectively.

DISCUSSION

The crested blenny (*Hypleurochilus geminatus*) is a subtropical species often found in association with oyster reefs, shell bottoms (Dahlberg 1972; Crabtree and Middaugh 1982; Lehnert and Allen 2002), and marine growths attached to pilings and rocks (Hildebrand and Cable 1938). They feed on free swimming organisms as well as sessile

Table 1. Table of species showing the number of specimens, year collected, and collection location (latitude and longitude).

Species	Year Collected	Number of specimens	Latitude	Longitude
Centropristis philadelphica	2007	1	36º58.76N	76º07.16W
Hypleurochilus geminatus (reported by Murdy et al. 1997 as *Parablennius marmoreus*)	1993	1	37º16.63N	76º03.43W
Hypleurochilus geminatus	2007	5	37º17.13N	76º03.11W
Hypleurochilus geminatus	2007	2	36º58.43N	76º16.59W

growths (Hildebrand and Cable 1938), with their diets primarily consisting of crustaceans and algae, followed by hydroids and polychaetes (Lindquist and Chandler 1978; Lindquist and Dillaman 1986). Hildebrand and Cable (1938) determined that North Carolina specimens of *H. geminatus* spawn from May to September and the larvae are mainly surface dwelling until 10-15 mm in length, at which time they change their habitat preference. The largest fish collected in their study was a 72 mm male, with the largest female measuring 58 mm (Hildebrand and Cable 1938).

Although the range of *H. geminatus* encompasses the waters of New Jersey to the eastern central coast of Florida (Williams 2002), the only collections north of North Carolina have occurred sporadically off New Jersey (Fowler 1914; Allen et al. 1978; Able 1992; Able and Fahay 1998). *Hypleurochilus geminatus* was not reported in earlier studies of Virginia waters, including Chesapeake Bay and its tributaries (Hildebrand and Schroeder 1928; Massman 1962; Massman and Mansueti 1963; Musick 1972; Murdy et al. 1997) and the seaside coasts and inlets (Schwartz 1961; Richards and Castagna 1970; Cowan and Birdsong 1985; Norcross and Hata 1990; Layman 2000). Ditty et al. (2005) erroneously reported that Hildebrand and Cable (1938) obtained larvae of *H. geminatus* from Chesapeake Bay. Ongoing baywide surveys, including the Chesapeake Bay Multispecies Monitoring and Assessment Program (ChesMMAP) (James Gartland, Virginia Institute of Marine Science, Gloucester Point, Virginia, personal communication) and the Chesapeake Bay Fishery-Independent Multispecies Survey (CHESFIMS) (Miller and Loewensteiner 2008), have yet to encounter this species, nor do specimens from Chesapeake Bay exist in the VIMS Ichthyological Collection or the U. S. National Museum (USNM) fish collection (L. Palmer, Smithsonian Institution, pers. comm.).

The captures in 2007 are not the first records of *H. geminatus* collected from Chesapeake Bay. Murdy et al. (1997) reported a single specimen of *Parablennius marmoreus* (seaweed blenny) captured in June 1993 (VIMS specimen 09086). Upon

further evaluation in 2007, it was determined that this specimen had been misidentified and is indeed *H. geminatus*. Interestingly, this specimen was collected at 37º16.63'N, 76º03.43'W (Figure 1; Table 1), within 1 km from the location where five individuals were collected in September 2007. The collection of a single misidentified *H. geminatus* in 1993 is the first documented occurrence of this species in Chesapeake Bay and the subsequent capture of seven individuals during 2007 indicates that not only has this species extended its range to include the estuary, but that an established population might exist off Cape Charles, VA .

The smallest member of the genus *Centropristis, C. philadelphica* is a fast growing, short-lived species (Link 1980) that attains a maximum length of 300 mm (Heemstra et al. 2002). This protogynous hermaphrodite inhabits a range of depths over various substrates, including hard bottoms, rocky reefs, and the preferred softer mud bottoms (Miller 1959; Link 1980). Spawning occurs offshore between February and July (peak April-May) off North Carolina (Link 1980) and from late March to May in the Gulf of Mexico (Miller 1959). Ross et al. (1989) described *C. philadelphica* as a "euryphagic benthic carnivore" and their study of Gulf of Mexico specimens found a diet dominated by shrimps, crabs, mysids, and fishes, agreeing with Links' (1980) findings that crustaceans, fishes, and mollusks were the most frequent prey.

The range of *C. philadelphica* includes Cape Henry, Virginia, to Palm Beach, Florida, as well as the Gulf of Mexico (Miller 1959; Heemstra et al. 2002). *Centropristis philadelphica* was not reported in earlier studies of Chesapeake Bay and its tributaries (Hildebrand and Schroeder 1928; Massman 1962; Massman and Mansueti 1963; Musick 1972; Murdy et al. 1997) nor the Virginia seaside coasts and inlets (Schwartz 1961; Richards and Castagna 1970; Cowan and Birdsong 1985; Norcross and Hata 1990; Layman 2000). Ongoing baywide surveys including the ChesMMAP (James Gartland, Virginia Institute of Marine Science, Gloucester Point, Virginia, personal communication) and the CHESFIMS (Miller and Loewensteiner 2008) have yet to encounter this species, nor are there specimens from Chesapeake Bay in the VIMS Ichthyological Collection or the U. S. National Museum (USNM) fish collection (L. Palmer, Smithsonian Institution, pers. comm.).

The individual collected in November 2007 represents the first substantiated record for *C. philadelphica* from Chesapeake Bay. The Northeast Fisheries Science Center (NEFSC) trawl survey's most northerly validated record of *C. philadelphica* is a 100 mm standard length specimen from 37º28'N, 74º25'W, approximately 100 km east of Parramore Island, Virginia, in the Atlantic Ocean (William Kramer, NOAA Fisheries Service, Woods Hole, Massachusetts, personal communication). Both of these occurrences are slightly north of the published northern range boundary of Cape Henry, Virginia.

Nearly twenty years ago, Kennedy (1990) predicted that climate change would cause "poleward estuaries to resemble neighboring estuaries that are located in the direction of the equator." As such, he stated that Chesapeake Bay could become as warm as southeast Atlantic coast estuaries and that warmwater or subtropical species would move north from these neighboring estuaries and occupy Chesapeake Bay (Kennedy 1990). Interestingly, the VIMS Juvenile Fish and Blue Crab Trawl Survey, which has sampled Chesapeake Bay and its tributaries since 1955, has recently documented an increase in the diversity of Chesapeake Bay warmwater fishes. Three

previously unsubstantiated warmwater species were collected from the estuary during 2004 and 2005: *Trachinocephalus myops* (snakefish), *Citharichthys macrops* (spotted whiff), and *Mullus auratus* (red goatfish) (Halvorson 2007). In addition, the survey collected its first verified specimen of *C. philadelphica* and seven individuals of *H. geminatus* in 2007. These data are not only significant for monitoring such phenomena as climate change, but also for updating field guides; these substantiated reports from 2004-2007 include four species that have yet to be profiled in "Fishes of Chesapeake Bay" (Murdy et al. 1997) and documents range extensions for three species in "A Field Guide to Atlantic Coast Fishes" (Robins et al. 1986).

The collection of multiple unsubstantiated species also illustrates the importance of voucher specimens, whether to re-evaluate the identification of an individual or to verify that a species was indeed collected and documented correctly. Scientists should be aware that the fish fauna of Chesapeake Bay is dynamic and that vigilance is necessary to recognize uncommon species, many which appear similar to known residents. The knowledge of additional species (*e.g. H. geminatus*) inhabiting Chesapeake Bay is essential when studying ecological interactions such as predator-prey relationships and competition. The information gained from these collections demonstrates the importance of long-term monitoring surveys and their usefulness in documenting changes in marine and estuarine environments.

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