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Occurrence of *Microtralia ovula* and *Creedonia succinea* (Gastropoda: Pulmonata: Ellobiidae) in South Carolina

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Abstract - Gastropods in the family Ellobiidae are a cryptic and easily overlooked component of intertidal habitats in South Carolina salt marshes. Recent and archived collections reveal the presence of two ellobiid species, *Microtralia ovula* and *Creedonia succinea*, which are established and occasionally abundant in the mid- to upper-intertidal zone on oyster reefs and under wrack on washed shell banks. These species are previously known to occur only in Bermuda, southern Florida, the Bahamas, the Greater Antilles, and Mexico. This note reports a significant northward extension of their known range and acknowledges that similar distributional shifts are being more widely recognized for estuarine benthic fauna along the US Atlantic coast.

Observations and Discussion

The faunal diversity and distribution of ellobiid snails in estuarine environments of coastal South Carolina are poorly known. This undoubtedly reflects, in part, a lack of collecting effort in estuarine marshes in the area, rather than the low level of diversity sometimes assumed to prevail in this part of the Carolinian province (Morrison 1951a). This note reports the occurrence in South Carolina of two species of ellobiids previously documented only from Bermuda, southern Florida, the Bahamas, the Greater Antilles, and Mexico. Representative specimens of both species have been deposited into the collections of the Southeastern Regional Taxonomic Center in Charleston, SC (*Creedonia*: SERTC # S2192, S2193, S2194, S2195, S2196, S2307, S2308, and S2309; *Microtralia*: SERTC # S2306) and of the National Museum of Natural History in Washington, DC (*Creedonia*: NMNH # 1083053; *Microtralia*: NMNH # 1083054). The following abbreviations have also been used in this note: MCZ is the Museum of Comparative Zoology, Harvard University, Cambridge, MA; USNM is the former designation used for material in the United States National Museum, now known as the NMNH.

At least three species of ellobiids are previously known or presumed to occur within the state of South Carolina: *Melampus (Melampus) bidentatus* Say; *Melampus* (*Detracia*) *floridanus* Pfeiffer; and *Myosotella myosotis* (Draparnaud) (Abbott 1947, Martins 1996, Mazÿck 1913 [as

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Melampus lineatus], Shoemaker et al. 1978). Mazÿck (1913) collected one specimen of *M. myosotis* (listed by him as *Alexia mysotis* [sic]) from Sullivans Island, SC, and there are three additional lots of this species from the city of Charleston in the Mazÿck shell collection at the Charleston Museum. Martins (1996) also recorded occurrences of *M. myosotis* from Charleston (MCZ, uncatalogued) and McClellanville (USNM 663059). To date, however, no additional specimens of this species have been found within the state. Two additional species, *Melampus obliquus* Say and *Blauneria heteroclita* (Montagu), reported from South Carolina by Mazÿck (1913), were based upon literature records; the former was described by Say (1822) from specimens collected in South Carolina. *Melampus obliquus* is now considered a junior synonym of *M. bidentatus* (Martins 1996). The collection locality in Mazÿck's (1913) report of *B. heteroclita* was uncertain, and Martins (1996) considered that uncertainty and the lack of further confirmation to warrant exclusion of South Carolina from the range he reported for that species.

Microtralia ovula (Pfeiffer) was first observed in South Carolina in 1976 at Leadenwah Point and nearby in the North Edisto River, Charleston County (32°36.5'N, 80°13.8'W). Between 1976 and 1978, 117 specimens (seven of which were alive) were collected by one of us (J.R. Harrison) from beneath oyster shells, driftwood, and *Spartina* wrack on shell banks adjacent to intertidal *S. alterniflora* Loisel salt marsh. Specimens averaged 2.2 mm in length (range of 1.02–2.89), 1.2 mm in diameter (range of 0.72–1.67), and 6.5 whorls (range of 5–7) (Fig. 1). Mollusks most frequently found with *M. ovula* were *Assiminea succinea* (Pfeiffer) and juvenile or subadult *Melampus bidentatus*. *Microtralia ovula* is otherwise known in the United States only from Clearwater, FL, south to the Florida Keys (Martins 1996). However, there is an unpublished report of this species from northeast Florida, specific locality not given (Lee 2005). Outside of the US, it is known to occur in Bermuda, the Bahamas, Cuba, Jamaica, and Hispaniola (Morrison 1951b). Prior to the nomenclatural review of Faber (2004), many authors referred to the species by its invalid junior synonym *Microtralia occidentalis*.

Five specimens of *Creedonia* (= *Marinula*) *succinea* (Pfeiffer, 1854) were also found at Leadenwah Point in July 1977, although none were alive. These specimens averaged 2.2 mm in total length and 1.4 mm in diameter; of these, three had four whorls and two had five whorls. The most northerly record of this species previously reported is that of a specimen (USNM #663054) collected by Leslie Hubricht at the Isle of Hope, Chatham County, GA, and it was known elsewhere in the US only from the Florida Keys (Martins 1996). The Georgia record was discounted by Martins (1996), who stated that it could be better explained as a consequence of waif distribution, perhaps as a result of accidental transportation by currents, due to the great distance from its "normal range." Water from the Mississippi River dis-

charge plume was previously observed off Georgia (Atkinson and Wallace 1975), and Walker (1994) suggested that the simultaneous occurrence of oceanic current anomalies and meteorological conditions may deliver water from remote locations to the east coast of the United States more often than has been previously recognized.

Although the source and pathway of the introduction and subsequent establishment of *C. succinea* in South Carolina is unknown, one of us (D.M. Knott) recently documented the occurrence of persistent reproducing populations of that species near Charleston, SC. A large number of individuals were obtained from 430 mid-intertidal samples taken on 24 occasions between March 1995 and January 1998 at two sites near Charleston Harbor: a) 2063 individuals from natural oyster clusters, shell trays, and associated sediments at Toler's Cove, off the Intracoastal Waterway behind Sullivan's Island (32°46.6'N, 79°50.8'W), and b) 2841 individuals from similar substrates on oyster flats near the head of Inlet Creek, landward of Sullivan's Island and Isle of Palms (32°47.9'N, 79°49.7'W). The abundance of *C. succinea* appeared to be greater during the fall and winter than during the rest of the year, and it was among the

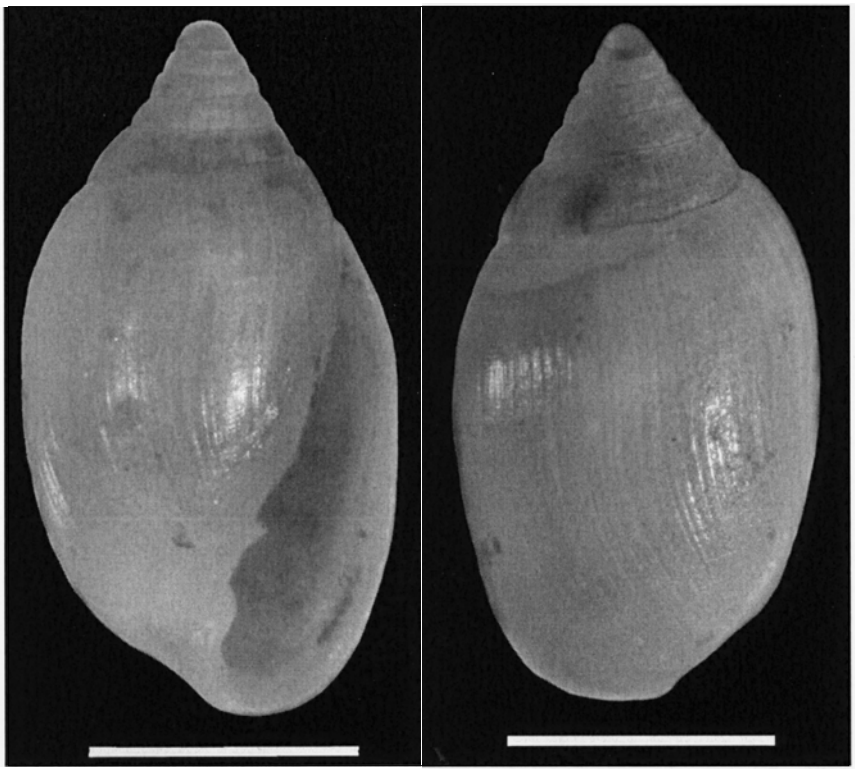

Figure 1. Left: *Microtralia ovula* shown in ventral aspect. Scale bar = 1mm. Right: *Microtralia ovula* shown in dorsal aspect. Scale bar = 1mm.

dominant resident macroinvertebrates in the 430 samples, ranking 6th out of more than 80 species. The mollusks most commonly occurring in samples with high numbers of *C. succinea* were the bivalves *Geukensia demissa* (Dillwyn, 1817) and *Sphenia antillensis* (Dall and Simpson, 1901). Eighteen of these live-collected specimens of *C. succinea*, selected at random, averaged 2.5 mm (2.1–2.8) in length, 1.4 mm (1.0–1.5) in diameter, and all except one had four whorls (Fig. 3).

The new records of *Creedonia succinea* and *Microtralia ovula* presented here provide evidence that the two species are now established in South Carolina waters. Further collecting within their newly extended range should reveal their occurrence in additional localities. Similar northward expansion of the ranges of the anomuran decapod *Petrolisthes armatus* (Gibbes, 1850) and the amphipod *Caprella scaura* Templeton, both from south Florida and northwestern Atlantic tropical waters into South Carolina, have recently been documented (Foster et al. 2004, Knott et al. 2000). These observations conform to the speculation of Engle and Summers (1999) that distributional shifts of estuarine benthic fauna are likely to occur along the Atlantic coast, given current climate-change scenarios that predict increased

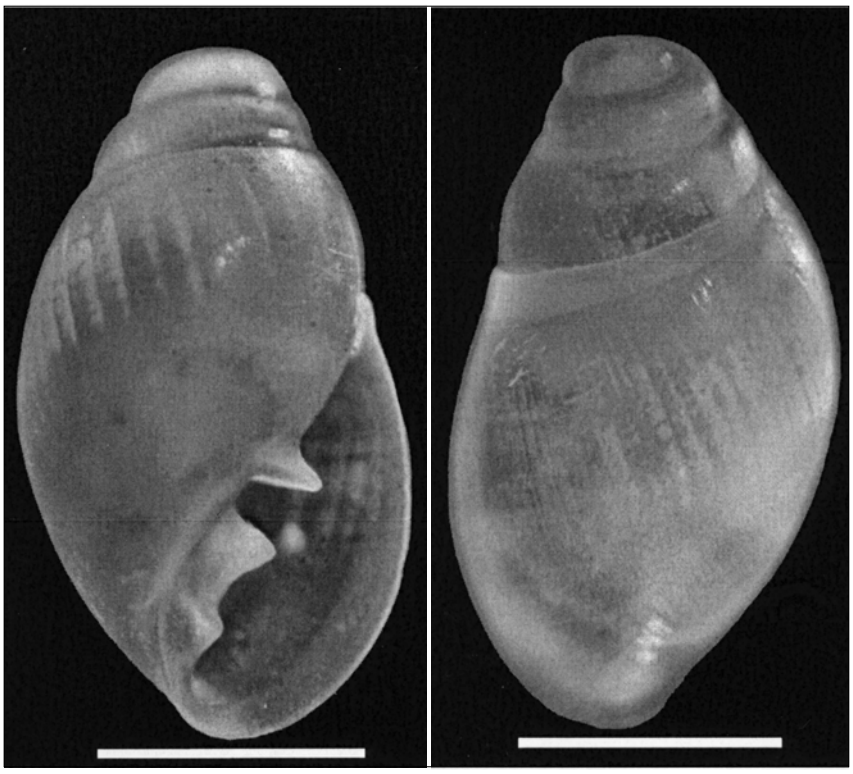

Figure 2. Left: *Creedonia succinea* shown in ventral aspect. Scale bar = 1mm. Right: *Creedonia succinea* shown in dorsal aspect. Scale bar = 1mm.

global temperatures of up to 2 °C. It is also likely that the ranges of some species will be extended into South Carolina simply as a result of increased scrutiny of the biodiversity of that region.

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