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NORTHERN RANGE EXTENSIONS FOR *CAPRELLA SCAURA* TEMPLETON, 1836 (CRUSTACEA: AMPHIPODA: CAPRELLIDAE) ON THE FLORIDA GULF COAST AND IN SOUTH CAROLINA

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ABSTRACT Previous northwestern Atlantic records for the caprellid amphipod *Caprella scaura* Templeton, 1836 were confined to St. Croix (US Virgin Islands), St. Barthélemy, and Puerto Rico, islands bordering the northern Caribbean Sea. Based on recent collections, *C. scaura* is now reported from the Gulf of Mexico (St. Andrew Bay, Florida) and the US east coast (Charleston Harbor, South Carolina). These constitute the first records for this apparently non-indigenous species in waters of the continental eastern United States, establishing considerable northern range extensions for *C. scaura* in the northwest Atlantic.

INTRODUCTION

During the past 2 years we collected specimens of *Caprella scaura* Templeton, 1836 from the Gulf of Mexico (GOM) and east coast of North America, which represent the first Atlantic records for this caprellid amphipod in the continental United States. The purpose of this report is to document these new records.

Caprella scaura was originally described from Mauritius in the Indian Ocean (Templeton, 1836). Unfortunately, the authors have not been able to determine if the type material is extant. McCain (1968) lists numerous records for this widely distributed species, giving locations from the mid-latitudes to the tropics, in both northern and southern hemispheres, in all oceans except the Arctic, and reports its habitat as red and brown algae, seagrass, bryozoans, and on a sea urchin. There have been no published records for this large caprellid amphipod from the coastal waters of the eastern United States. In the northwestern Atlantic, the only records for *C. scaura* are from the tropical waters of St. Croix (US Virgin Islands), St. Barthélemy, and Puerto Rico, all islands bordering the Caribbean Sea (McCain 1968).

Representative specimens of *C. scaura* collected during this study have been deposited in the Gulf Coast Research Laboratory Museum (GCRL), Ocean Springs, Mississippi, and in the reference collection of the Southeastern Regional Taxonomic Center (SERTC), South Carolina Department of Natural Resources (SCDNR), Charleston, South Carolina.

MATERIAL EXAMINED

West Florida, Panama City Beach. 12♂♂, 19 subadult ♂♂, 19♀♀ (4 ovig.), 10 subadult ♀♀, 7 juveniles, GCRL 2054, West Pass jetties, 30°08.60'N 85°42.20'W, wash of submerged rocks, 23 June 1998, coll. J. Foster; 8 subadult ♂♂, 4 ovig. ♀♀, 8 subadult ♀♀, 1 juvenile, GCRL 2053, West Pass jetties, St. Andrew State Park, among algae on submerged rocks, 20 February 1999, coll. J. Foster; 2♂♂, 1 subadult ♂, 1♀, 1 ovig. ♀, GCRL 2051, West Pass, scrape of channel marker R16, 9 July 1999, coll. J. Foster; 11♂♂, 11 subadult ♂♂, 2♀♀, 10 ovig. ♀♀, 12 subadult ♀♀, 1 juvenile, GCRL 2052, St. Andrew Bay, Florida, on submerged rocks adjacent to seawall, Panama City Marina, 30°09.84'N 85°39.77'W, 28 December 2002, coll. J. Foster.

South Carolina, Charleston Harbor at Ft. Johnson, in scrapings from floating dock, SCDNR boat slip, 32°45.15'N 79° 53.94'W, 30♂♂, 15♀♀ (5 ovig.), 8 intermediate juveniles (SERTC Catalogue Number S-87), 4♂♂, 4♀♀ (GCRL 2063), 28 February 2002, coll. D. Knott and R. Heard; 3♂♂, 4♀♀ (SERTC Catalogue Number S-88), 12 July 2002, coll. D. Knott; 21♂♂, 5♀♀ (4 ovig.), GCRL 2062, 21 February 2003, coll. R. Heard, B. Thoma, and J. Thoma.

OBSERVATIONS

Florida Gulf Coast (St. Andrew Bay)

On 23 June 1998, during routine examination of rock washings from West Pass jetties, St. Andrew Bay, Florida, a previously unobserved species of amphipod, *Caprella scaura*, was identified. Specimens were collected at a depth of 1–2 m, where they were associated with algae and hydroids on the jetties, along with another large caprellid

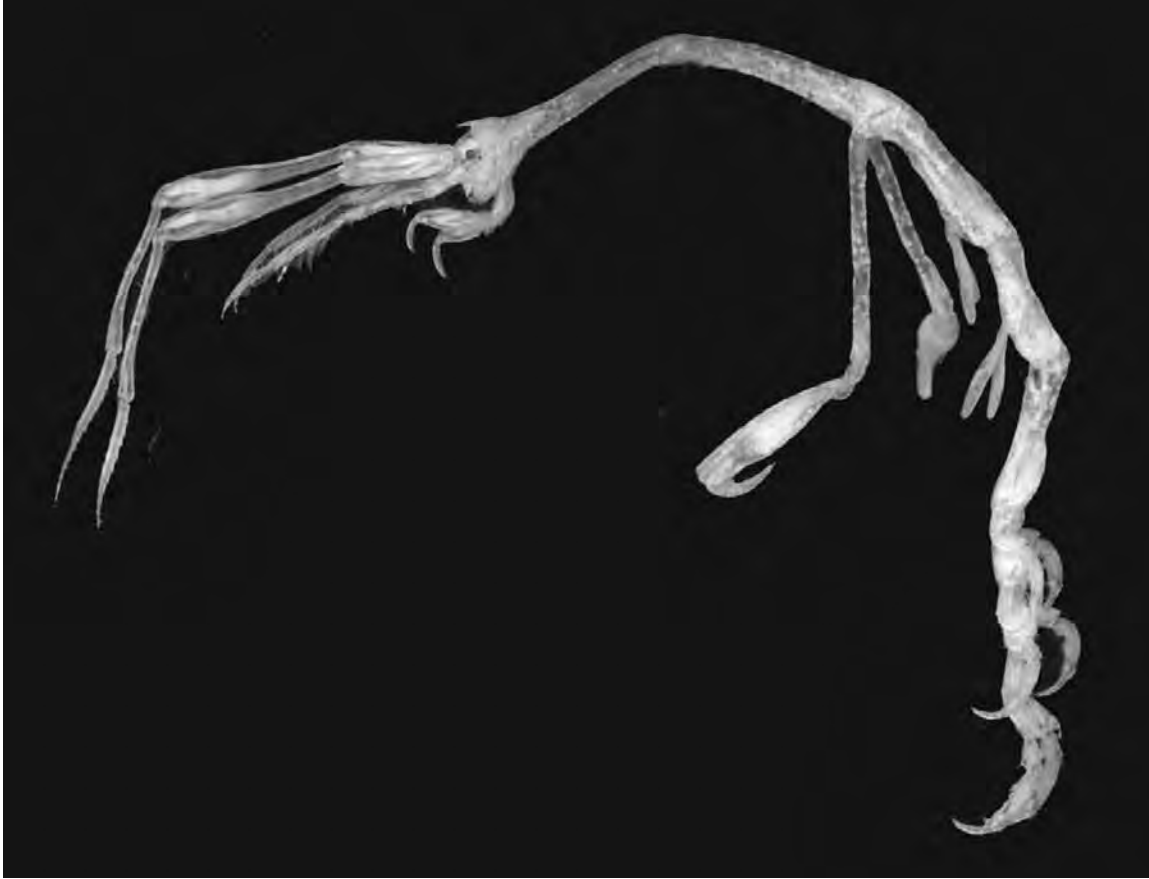


Figure 1. *Caprella scaura*. Adult male (10 mm) from rock jetties at entrance of St. Andrew Bay, Florida, 23 June 1998. Scanned image, lateral view.

species, *Caprella equilibra* Say, 1818. *Caprella scaura* was collected subsequently on 20 February 1999, 9 July 1999, and 28 December 2002 from another site on the West Pass jetties, and from channel markers in association with the barnacle *Megabalanus antillensis* (Pilsbry, 1916) and other fouling organisms, e.g., the amphipods *Laticorophium* cf. *baconi* (Shoemaker, 1934), *Podocerus brasiliensis* (Dana, 1853), *Stenothoe* spp., *Erichthonius brasiliensis* (Dana, 1853), *Cymadusa compta* (Smith, 1873), *Ampithoe valida* Smith, 1873, and the tanaidacean *Leptochelia dubia* Krøyer, 1842.

US east coast (Charleston Harbor, South Carolina)

As part of a survey of peracarid crustaceans in Charleston Harbor and surrounding waters, numerous individuals of *Caprella scaura* (including mature males, females, and juveniles) were recovered from scrapings off a floating dock in the boat slip of the South Carolina Department of Natural Resources, Ft. Johnson (28 February 2002, 12 July 2002, and 21 February 2003). Other epibenthic invertebrates found associated with *C. scaura* included: the amphipods *Caprella equilibra* Say,

1818, *Paracaprella tenuis* Mayer, 1903, *Jassa* cf. *marmorata* Holmes, 1903, *Gammarus mucronatus* Say, 1818, *Gammarus palustris* Bousfield, 1969, *Elasmopus levis* Smith, 1873, *Stenothoe* sp., *Laticorophium* cf. *baconi* (Shoemaker, 1934), and *Monocorophium acherusicum* (Costa, 1857); the decapod crustaceans *Palaemonetes vulgaris* (Say, 1818), *Petrolisthes armatus* (Gibbes, 1850), *Dyspanopeus sayi* (Smith, 1869), *Eurypanopeus depressus* (Smith, 1869), and *Zaops ostreum* (Say, 1817); the isopod *Paradella diana* (Menzies, 1962); and the polychaetes *Nereis succinea* (Frey and Leukart, 1847), *Nereiphylla fragilis* (Webster, 1879), *Sabellaria vulgaris* (Verrill, 1873), and an undetermined syllid. These motile species inhabited a thick growth of solitary ascidians [*Molgula manhattensis* (DeKay, 1849), *Styela plicata* (Lesueur, 1823)], hydroids [*Obelia* sp.], bryozoans [*Bugula neritina* (Linnaeus, 1758), *Amathia* spp.], sponges [*Hymeniacidon heliophila* (Parker, 1910)], and bivalve mollusks [*Brachidontes exustus* (Linnaeus, 1758), *Crassostrea virginica* (Gmelin, 1792)].



Figure 2. *Caprella scaura*. Adult male (18 mm) and ovigerous female (8 mm) from floating dock near entrance of Charleston Harbor, South Carolina, February 2002. Digital photograph, lateral views.

REMARKS

Records established in this study extend the range of *Caprella scaura* northward to the northeastern GOM (St. Andrew Bay) and the coast of South Carolina (Charleston Harbor). This represents an extension of greater than 2500 km.

Caprella scaura is remarkable because of its size. McCain (1968) reported males and females as long as 21 mm and 12 mm, respectively; however, the adult males we collected during the summer from rock jetties at the entrance to St. Andrew Bay had lengths (anterior end of cephalon, excluding antennae, to posterior end of abdomen) of 10 mm (Figure 1), and adult females were distinctly smaller, with maximum lengths of 6–8 mm. The largest male and female specimens from Charleston Harbor were collected during the winter (lengths of 18 mm and 8 mm, respectively) (Figure 2), while the corresponding sizes of those collected there during the summer were 10 and 5 mm. These size differences may be due to seasonal effects, as one of us (R. Heard, pers. comm.) noted for *Caprella equilibra*. For example, individuals, especially males, in winter populations reach much larger sizes than those observed during the summer months in Georgia coastal waters. These apparent ecophenotypic differences in size may be related to a decrease in predation during the colder months, in conjunction with the dampening effects

of low temperature on reproductive activity. *Caprella equilibra* collected in Georgia during the winter appeared to attain a much larger size prior to the onset of reproduction in spring; whereas, specimens collected during summer were sexually mature at a much smaller size (R. Heard, per. observations). Notwithstanding, examinations of additional winter and summer collections from St. Andrew Bay and Charleston Harbor, respectively, are needed to determine if these seasonal size differences consistently occur in *C. scaura*.

The acute anteriorly directed cephalic spine on *Caprella scaura* clearly distinguishes this species from the sea turtle associate *C. andreae* Mayer, 1890, and the common near shore GOM species, *Caprella penantis* (Leach, 1814), both of which possess a triangular cephalic process. Another distinguishing character for males of *C. scaura* is the equivalence in the length of the basis of gnathopod 2 and the length of pereonite 2. The only western Atlantic species that approximates this ratio is *C. linearis* (Linnaeus, 1767), but in this species, the head bears no process. Additional distinguishing characters include the fused articles of the flagellum of antenna 1 in males and the raised dorsomedial processes located on the abdomen of both sexes.

Caprella scaura was not listed in previously published studies of the caprellid fauna inhabiting all or part of the northwestern Atlantic (Steinberg and Dougherty 1957,

McCain 1968). It is also absent from records of more extensive surveys of the South Atlantic Bight invertebrate fauna (Pearse and Williams 1951, Dörjes 1972, 1977, Frankenberg and Leiper 1977, Zingmark 1978, Wenner et al. 1983, 1984, Fox and Ruppert 1985, Wendt et al. 1985, Prezant et al. 2002) and from unreviewed faunal checklists and reports (Heard and Heard 1971, Calder et al. 1976, Kirby-Smith and Gray 1977, Vittor and Associates 2000).

Caprella scaura is also missing from previous studies that deal with caprellids from the GOM, particularly those of Steinberg and Dougherty (1957) and Caine (1974). Camp et al. (1998), in an extensive checklist of malacostracans from the GOM, did not list *C. scaura*. The species was not listed in a faunal study of St. George Island, Florida, by Menzel (1956), an inventory of Texas jetty communities (Whitten et al. 1950), or from reports on the near shore coastal habitats of Perdido Key, Florida (Rakocinski et al. 1993, 1996). *Caprella scaura* is absent from several unpublished reports dealing with the fauna of St. Andrew Bay, Choctawhatchee Bay, and Perdido Key, Florida (Saloman, 1976, Saloman et al. 1982, Livingston 1986, Foster 2000). Future investigations of the amphipod fauna of the northern GOM and the eastern US coast should include efforts to recover more specimens and to observe the seasonality, breeding behavior, and the northward encroachment and establishment of this apparently introduced and widely distributed species. One explanation for recent occurrence of *C. scaura* in both St. Andrew Bay and Charleston Harbor may be passive transport of individuals in ship-fouling communities or in ballast water. Both Charleston and Panama City (at St. Andrew Bay) are active ports for international maritime transport and commerce.

The first published report of *C. scaura* from the coasts of North America was made by Marelli (1981), who documented the occurrence of this species in Humboldt Bay, San Francisco Bay, California, and in Elkhorn Slough, a small estuary associated with Monterey Bay, California. Marelli (1981) also reported *Caprella mutica* Schurin, 1935, a species described from the Sea of Japan, from the same region. Subsequent reports of *Caprella mutica* from Massachusetts (Pederson 2002) and Maine (S. LeCroy, pers. comm., GCRL, Ocean Springs, MS) added to the understanding of the distribution of non-indigenous members of the family Caprellidae in North America.

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