Zootaxa 2834: 1–16 (2011)
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

Sponge-dwelling snapping shrimps (Alpheidae: *Synalpheus*) of Barbados, West Indies, with a description of a new eusocial species

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Abstract

Sampling of eight sites along the west coast of Barbados, West Indies, yielded 14 species of sponge-dwelling shrimps in the *gambarelloides* group of the genus *Synalpheus*, including one new species described here as *Synalpheus microneptunus* **n. sp.** The new species is a member of the *S. paraneptunus* Coutière species complex and is distinguished from other species in that group by the combination of four carpal segments in the second pereopod, uropodal exopod with 2nd disto-lateral tooth smaller than the other two teeth and set in line with movable spine, and a small blade on the scaphocerite. *Synalpheus microneptunus* **n. sp.** is the smallest species in the complex (2.2-2.9 mm CL) and lives in small colonies, usually with fewer than 10 individuals, often with a single breeding female. *Synalpheus thele* Macdonald, Hultgren & Duffy is reported for the first time from outside its type locality in Jamaica. Sampling in Barbados produced fewer species than did similar efforts in Jamaica and Curaçao, possibly due to the relatively isolated position of the island at the eastern (windward) edge of the Caribbean Sea.

Key words: Decapoda, Caridea, *Synalpheus*, shrimp, symbiotic, coral reef, eusociality, new species, new records

Introduction

Alpheid shrimps associated with sponges have emerged as a model system for studying several general questions in evolutionary and behavioral ecology (Duffy 2007). Most previous research on sponge-dwelling alpheids has focused on the *gambarelloides* species group within the genus *Synalpheus* Bate, 1888. All species in the *S. gambarelloides* group inhabit the interior canals of sponges and molecular data strongly suggest that this group is monophyletic (Duffy *et al*. 2000; Morrison *et al*. 2004; Hultgren & Duffy 2011). The majority of species in the *S. gambarelloides* group live in the western Atlantic, with most taxonomic studies conducted on the Belize Barrier Reef in the vicinity of Carrie Bow Cay, in the western Caribbean Sea. This area has been extensively sampled and has produced numerous new species (Macdonald *et al*. 2006; Ríos & Duffy 2007). To better characterize the regional diversity and biogeography of sponge-dwelling *Synalpheus*, we undertook a series of collections at sites spanning the Caribbean Sea, including the centrally located Jamaica (Macdonald *et al.* 2009); Curaçao in the southern Caribbean (Hultgren *et al.* 2010); Bocas del Toro, Panama, in the southwestern Caribbean (Hultgren & Duffy, unpublished data); and Barbados at the eastern-most margin of the Caribbean. In this contribution, we report on collections from the last of these four sites.

Material and methods

Shrimps were sampled at eight sites along the west (leeward) coast of Barbados (Fig. 1) between 17 and 22 October 2008 (see site descriptions below). Sponges bearing shrimp were collected by hand while SCUBA diving or snorkeling. We concentrated our efforts on sponges previously known to host *Synalpheus* species (Macdonald *et al.*

Accepted by J. Goy: 25 Mar. 2011; published: 27 Apr. 2011