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The sponge-dwelling snapping shrimps (Crustacea, Decapoda, Alpheidae, *Synalpheus*) of Discovery Bay, Jamaica, with descriptions of four new species

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Abstract

Twenty-two species of sponge-dwelling shrimp in the genus *Synalpheus* were collected in the vicinity of Discovery Bay, Jamaica. Four of these species are new to science. *Synalpheus thele* **n. sp.**, *S. corallinus* **n. sp.**, and *S. plumosetosus* **n. sp.** belong to a group of morphologically similar species that also includes *S. brooksi*, *S. bousfieldi*, *S. carpenteri*, and *S. chacei*. *Synalpheus irie* **n. sp.** is a highly distinctive shrimp most similar to *S. mcclendoni*, but can be distinguished from the latter by the unique bowl-shaped fingers of the major chela and the two-pronged distal protuberance on the palm of the major chela. *Synalpheus belizensis* and *S. regalis* are reported for the first time from outside their type localities in Belize, while *S. bocas* and *S. duffyi* are reported for the first time outside their type localities in Caribbean Panama.

Key words: *Synalpheus*, *Zuzalpheus*, gambarelloides group, Alpheidae, Decapoda, symbiotic, coral reef, eusociality, sponges

Introduction

Snapping shrimps of the genus *Synalpheus* Bate, 1888 are a diverse component of the cryptic fauna of shallow tropical marine ecosystems worldwide (Felder and Chaney 1979; Reed et al. 1982). The genus includes more than 150 species (Chace 1988; Ríos and Duffy 2007) that inhabit the interstices of coral rubble, the internal spaces of sponges, and (in the Indo-Pacific) hard and soft corals, ascidians and crinoids (Beebe 1928, Pearse 1932; Banner and Banner 1975; Bruce 1976; Duffy 1992).

In the Caribbean, the diversity of the genus *Synalpheus* is dominated by a group of obligate sponge-dwelling species, designated the "*S. laevimanus* group" by Coutière (1908, 1909), and subsequently changed to the "*S. gambarelloides* group" (Holthuis and Gottlieb 1958), which currently contains at least 38 species. This group is monophyletic in the western Atlantic (Morrison et al. 2004) and, based on molecular results and several morphological synapomorphies, was raised to a generic level, as *Zuzalpheus* Ríos and Duffy. Subsequently, Anker and De Grave (2008) argued that the *S. gambarelloides* group was not distinctive enough to warrant recognition as a genus, although it may well represent a subgenus and that such an action should wait for a more comprehensive analysis of *Synalpheus*; they thus concluded that *Zuzalpheus* should be recognized as a junior synonym of *Synalpheus*. In the interest of minimizing taxonomic confusion, we follow the latter suggestion pending such a revision, and henceforth refer to the group as the *Synalpheus gambarelloides* species group.

Investigations of the sponge-dwelling *Synalpheus* in new localities have allowed new insights into the ecology of these shrimps, as well as yielding many new species (see Macdonald and Duffy 2006; Ríos and Duffy 2007; Anker and Tóth 2008). For example, >14 years of collecting on the Belize Barrier Reef substantially changed our understanding of host association and specificity patterns of *Synalpheus* shrimps in sponges (Duffy 1996b; Macdonald et al. 2006), and doubled the number of described species in the group. Yet few comparable surveys have been conducted elsewhere.

Here we report results of a survey of the sponge-inhabiting *Synalpheus* of the Discovery Bay region on the north coast of Jamaica, West Indies. Despite pioneering research conducted at Discovery Bay on coral reef ecology (Goreau 1959; Edmunds and Bruno 1996; Lehnert and van Soest 1998a,b; Hughes and Tanner 2000; Wulff 2006) and evolutionary ecology of snapping shrimps in the genus *Alpheus* Fabricius (Knowlton 1980), the sponge-dwelling *Synalpheus* of the region have not been systematically sampled. The goals of this study were to characterize the sponge-dwelling *Synalpheus* shrimp fauna of the Discovery Bay region area and to assess how comprehensively the diversity of a region can be estimated with a single, intensive sampling survey.