Sigmadocia caerulea

Hechtel, 1965

Blue Caribbean sponge

Phylum Porifera
Class Demospongiae
Subclass Ceractinomorpha
Order Haplosclerida
Family Chalinidae

Photo by R. DeFelice

Description

Growth Form

Thickly encrusting or massive (irregular, solid form) sponge with raised thick-walled volcano-shaped oscules, up to several centimeters in height.

Color

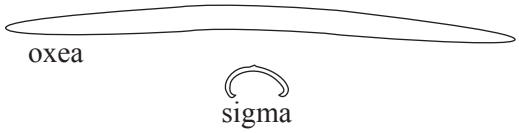
Exterior is pale blue-green, interior color is a dirty yellow.

Texture and Surface Features

Specimens are soft and easily torn. Surface is even, somewhat smooth, like fine sandpaper.

Spicules

Megascleres: bent oxeas (170-230 μm). Microscleres: sharply curved C-shaped sigmas (25 μm).



Spicules of *Sigmadocia caerulea*.

Habitat

In the Hawaiian Islands, *S. caerulea* is mainly restricted to shallow-water fouling communities (i.e. pier pilings, floating docks) of the major harbors on Oahu or associated disturbed habitats (i.e. dredged channels and artificial lagoons). It is also found on the roots of the nonindigenous Red Mangrove, *Rhizophora mangle*, native to Florida, West Indies, and South America, which is abundant in Pearl Harbor and Keehi Lagoon. In Kaneohe Bay, *S. caerulea* is found on patch reefs in southeast corner of the bay as well as the fouling community on Coconut Island floating docks.

Distribution

Hawaiian Islands

Oahu – Pearl Harbor, Honolulu Harbor, Keehi Lagoon, Kewalo Basin, Ala Wai Harbor, and Kaneohe Bay.
Kauai – Nawiliwili Harbor.
Midway Atoll – main harbor.

Mechanism of Introduction

Unintentional introduction, most likely as fouling on ships' hull.

Native Range

Caribbean or Eastern Pacific (Panama)

Present Distribution

Caribbean, eastern Pacific at Panama, main Hawaiian Islands, and Guam.

Impact

Fouling organism. Ecological impact unstudied, but probably some competition for space with native species.

Ecology

Feeding

Like all shallow-water sponges, *S. caerulea* is a filter feeder, continuously circulating water through their bodies. Microscopic food particles are removed from water by specialized collar cells. Digestion is intracellular.

Reproduction

S. caerulea is capable of asexual reproduction by fragmentation of the adult. Details regarding sexual reproduction of this species are unstudied. Many sponges are sequentially hermaphroditic. These sponges reproduce sexually by capturing sperm that has been released into the water column by adjacent individuals and transporting it to an awaiting egg deep within the sponges aquiferous system. The embryo may be released shortly after fertilization or held for further development. The embryo released is typically a motile larva, which after a time in the plankton, settles to the bottom and develops into a young sponge.

Remarks

This sponge is considered to be a recently unintentionally introduced species due to its sudden appearance in the islands and widespread disjunct geographic distribution (Caribbean and Hawaiian Islands). De Laubenfels (1950) and Bergquist (1967) both conducted sponge surveys on the floating docks on Coconut Island in Kaneohe Bay, Oahu where *S. caerulea* is now abundant. It is unlikely that this conspicuous species was present but overlooked by these researchers.

Sigmadocia caerulea from the Caribbean, was first described from Jamaica by Hechtel (1965). He reports this species as common on pilings and mangrove roots, as well as in a sandy turtle grass bed. Van Soest (1980) reports the species from mangrove roots and intertidal rocks in the Caribbean. Wulff (1996) also collected *S. caerulea* from mangrove roots in the Caribbean, but noted that eastern Pacific specimens were only found associated with the bases of branching pocilloporid corals.

Introduction to Hawaii was most likely by means of fouling on a ship's hull. *S. caerulea* was previously only known from the Caribbean and the eastern Pacific at Panama. The initial inoculation point was probably Honolulu or Pearl Harbor on Oahu. It now also occurs in the main harbor on Kauai, but was not found on any other neighboring main islands when surveys were conducted in 1997. *S. caerulea* was recently transported from Pearl Harbor to Guam on the hull of a floating dry dock. It remains to be seen whether this sponge will become established there.

References

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