Scent of a coral: Symbiosis between two new barnacle species and a gorgonian host

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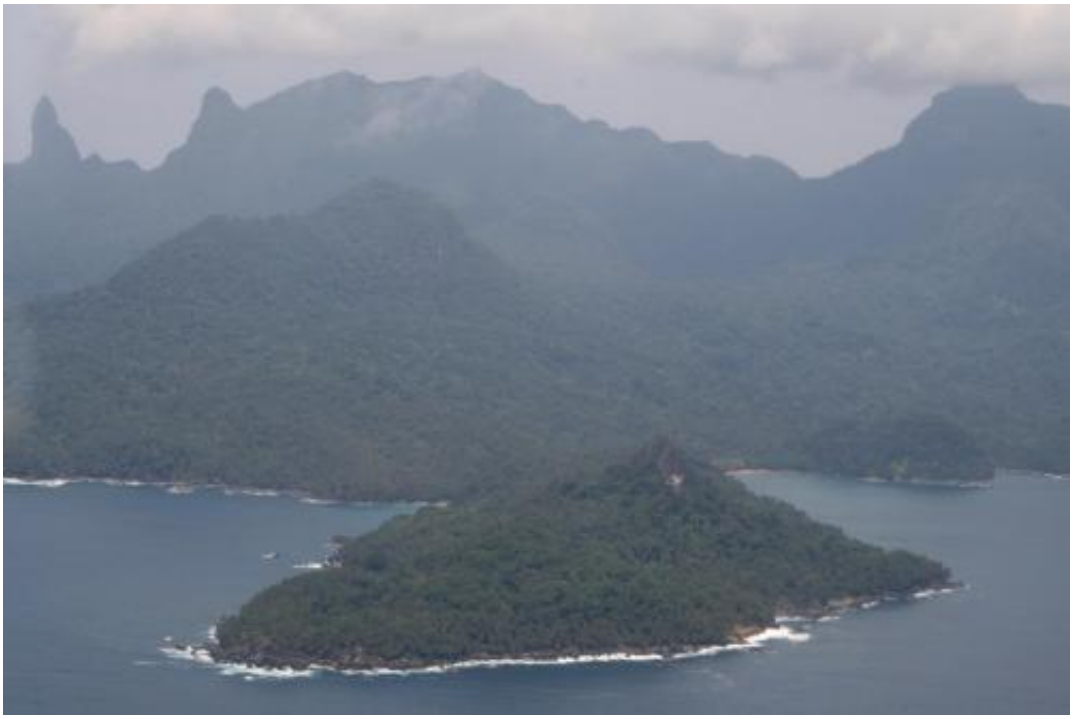

This picture shows a view from the extraordinarily beautiful islands of São Tomé and Príncipe. Credit: Dana Carrison-Stone

Two new species of the gorgonian inhabiting barnacles—Conopea saotomensis and Conopea fidelis—have been collected from the area surrounding the historically isolated volcanic islands of São Tomé and Príncipe. The barnacles of this genus are widely spread across the temperate and tropical oceans, but what makes them special is that they

occur exclusively in a symbiotic relationship with a gorgonian or black coral hosts. Observations suggest that the barnacles might have a unique ability to recognize and choose a specific host of their preference. The study was published in the open access, peer-reviewed journal *ZooKeys*.

The islands near which the two new species of *Conopea* were found are the products of large shield volcanoes originating 3,000 m below the ocean's surface along the Cameroon line. São Tomé and Príncipe are particularly old islands, 13 and 30 millions of years old, respectively, and form part of the Gulf of Guinea island chain known for its remarkable natural beauty. The islands are home to a large number of endemic birds and plants such as the world's smallest ibis, the São Tomé Ibis, and the world's largest sunbird, the Giant Sunbird. Being of volcanic origin and 274 km west of northern Gabon, the islands have never been connected to the African mainland. Such a historical isolation of the area where the new species are found suggests the possibility of endemism.

This image shows *Muriceopsis tuberculata*, the gorgonian host of the new species *Conopea fidelis*. Credit: Dana Carrison-Stone

The newly discovered barnacles are both gorgonian inhabiting. Observations by the authors suggest that they also demonstrate preference to a particular gorgonian hosts. This peculiar behavior is reflected in the name of one of the newly described species, *Conopea fideli*, referring to the 'fidelity' of the barnacle towards its host of preference. The host gorgonians are a particular type of beautiful octocoral, also known as sea fans. Once locating the host, the barnacle then lives in complete symbiosis with the gorgonian, almost fully covered by host tissue.

To date, not all the details of barnacle larvae settlement and interaction with the gorgonian host are known, but it seems that barnacle larvae are able to choose between the different gorgonians in their search for a host. This rather high degree of symbiotic relationship, almost like a love story, is believed to be mediated by pheromones. It has been demonstrated that barnacle larvae can determine where to settle by recognizing pheromone cues from their host. It has also been shown that gorgonians produce barnacle settlement inducers as well as inhibitors.

This picture shows Dr. Dana Carrison-Stone, California Academy of Sciences, in search of the new species, *Conopea saotomensis* and *Conopea fidelis*. Credit: Dana Carrison-Stone

The lead author of the article, Dana Carrison-Stone from the Department of Invertebrate Zoology and Geology, California Academy of Sciences, comments: "Although the details of the settling barnacle larvae and gorgonian interaction are not completely known, it appears, from our observations (specifically that Conopea fidelis was found only on Muriceopsis tuberculata) that barnacle larvae may be capable of distinguishing between gorgonian species. Of course, more collections, identifications, and laboratory work testing settlement preference would be needed to answer this question."

More information: Carrison-Stone D, Syoc RV, Williams G, Simison

WB (2013) Two new species of the gorgonian inhabitingbarnacle, Conopea (Crustacea, Cirripedia, Thoracica), from the Gulf of Guinea. *ZooKeys* 270: 1–20, doi: 10.3897/zookeys.270.3736