



New host for a homeless shrimp: Records of native symbiotic shrimps living on a non-indigenous octocoral

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Abstract: Anemone shrimps are known to associate with several cnidarian species. We present the first record of two anemone shrimps, *Periclimenes yucatanicus* and *Ancylomenes pedersoni*, associated with the non-indigenous octocoral *Chromonephthea braziliensis*. This record might show host change due to the absence of the original hosts *Condylactis gigantea*.

Key words: anemone shrimp, symbiotic relationship, Cabo Frio, Brazil.

Novo hospedeiro para um camarão sem lar: Registro de camarões simbióticos vivendo em um octocoral não-nativo. Resumo: Camarões de anêmona são conhecidos por viver associados a diversas espécies de cnidários. Nós apresentamos aqui o primeiro registro destes camarões (*Periclimenes yucatanicus* e *Ancylomenes pedersoni*) associados ao octocoral não nativo *Chromonephthea braziliensis*. Este registro indica possível troca de hospedeiro por ausência do hospedeiro original *Condylactis gigantea*.

Palavras-chave: camarão de anêmona, relações simbióticas, Cabo Frio, Brasil.

Several decapod shrimp species are known to be involved in associations with other marine animals, particularly cnidarians. The *Periclimenes* genus, an obligate symbiont, is commonly found associated to anemones, but it has also been recorded on corallimorphans and scyphozoans (Silbiger and Childress 2008). More recently, *Periclimenes yucatanicus* (Ives, 1891) has been registered on the scleractinian coral *Montastraea cavernosa* (Linnaeus, 1767) (González-Muñoz *et al.* 2019). In Brazil, this genus (including *Ancylomenes pedersoni* (Chace, 1958), previously known as *P. pedersoni*) has been registered associated with the giant anemone *Condylactis gigantea* (Weinland, 1860), and the octocorals *Muricea flamma* Marques & Castro, 1995 and *Plexaurella grandiflora* Verrill, 1912 (Wirtz *et al.* 2009).

Prior to 1990, anemone shrimps were commonly seen in Arraial do Cabo associated to *C.*

gigantea. Each anemone could host up to 10 shrimps. The giant anemone was quite common in this region, with records of 1-2 individual per 10-15 m². However, after 20 years of over-exploitation from the ornamental trade, these hosts are no longer found in Arraial do Cabo (Gasparini *et al.* 2005).

The first record of the octocoral *Chromonephthea braziliensis* van Ofwegen, 2005 in the Brazilian Coast was in 1995, in Arraial do Cabo, Southeastern Brazil (Ferreira 2003). This species is native from the Indo-Pacific and its introduction was probably by oil platforms that were commonly seen stationed in the region at the time (Ferreira 2003, Ferreira *et al.* 2006). *Chromonephthea braziliensis* is a soft coral with pink arborescent colonies and yellow polyps (van Ofwegen 2005). Today, its colonies are established in Arraial do Cabo (-22.9665, -42.0013) and have already been detected in two other nearby areas, Cabo Frio (-22.8963, -

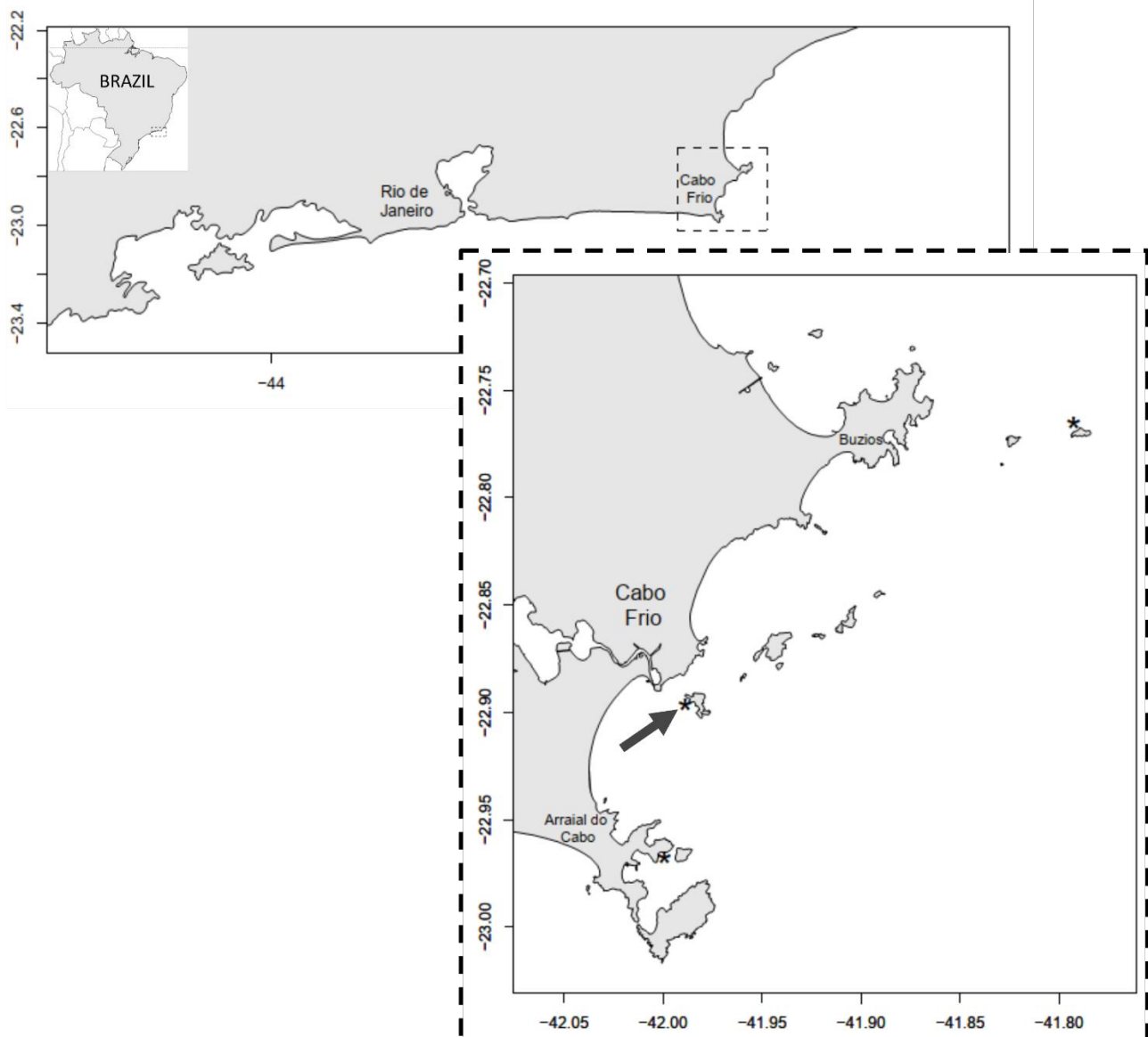


Figure 1. Distribution of *C. braziliensis* in the Brazilian Coast. * indicates the known locations of *C. braziliensis*; arrow indicates this record.

41.9838) and Armação dos Búzios (-22.7690, -41.7927), both in Rio de Janeiro Coast (Fig 1).

During a survey at Ilha dos Papagaios (Cabo Frio, RJ), we found two species of Palaemonidae shrimp, *Ancylomenes pedersoni* (two individuals) and *Periclimenes yucatanicus* (one individual, Fig. 2), associated to the non-indigenous octocoral *Chromonephthea braziliensis*. The shrimps were associated to the octocoral branches and often used these structures to hide from the observer as it approached too close.

This is the first record of these species living in association to this soft coral. The establishment of benthic exotic species into a new ecosystem usually affects the local biodiversity. Although few studies

focused specifically on facilitation interactions, non-native species frequently facilitated native or other exotic species, increasing the abundance and species richness (Bruno *et al.* 2005). Many organisms are known to live closely associated to cnidarians; e.g. copepods (Humes 1985), decapods (Wirtz *et al.* 2009), isopods (Nogueira Junior & Silva 2005), pycnogonids (Genzano 2002, Lovely 2005, Bettim & Haddad 2013), among others. The arborescent morphology of *C. braziliensis* makes it a great host to a variety of organisms. In addition to the shrimps, other species of fish, mollusks and echinoderms are commonly seen in association to *C. braziliensis* (Altvater *et al.* unpublished data). Papagaios Island is located west of Cabo Frio and is frequently visited



Figure 2. The anemone shrimp *Periclimenes yucatanicus* associated to *C. braziliensis* branches. This individual was about 4 cm in total length. Photo: Marques, L. V.

by touristic boats. Colonies of the soft coral *C. braziliensis* are found in one cove, from 8 to 12 meters deep. Other introduced species also occur at this location. Invasive corals of the genus *Tubastraea* Lesson, 1830, known as sun coral, are abundant on the rocky shores of Papagaios Island. Another species, the ophiuroid *Ophiothela mirabilis* (Verrill, 1867) is commonly observed in association with *C. braziliensis* and other cnidarians, as the hydrocoral *Millepora alcicornis* Linnaeus, 1758 and the octocoral *Phyllogorgia dilatata* (Esper, 1806).

This record indicates the plasticity of these Palaemonidae shrimps when it comes to host choice, which could be driven by the absence of the natural host in the region. In this case, the non-native octocoral *C. braziliensis* could act as a refuge to these species.

Ethical statement

The present investigation did not involve regulated animals and did not require approval by an Ethical Committee.

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