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## A new species of crinoid-associated *Periclimenes* from Honduras (Crustacea: Decapoda: Palaemonidae)

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### Abstract

A new species of crinoid associated *Periclimenes*, *P. rincewindi* sp. nov. is described from the Bay Islands (Honduras) in the Caribbean. The species associates with the swimming crinoid, *Analcidometra armata* and displays a unique colour pattern. Morphologically, the new species is closely related to the other known crinoid associates in the Caribbean, specifically *Periclimenes crinoidalis*, from which it can be distinguished by a suite of relatively minor morphological features.

**Key words:** *Periclimenes*, new species, Palaemonidae, Honduras, Caribbean, echinoderm-associate

### Introduction

Tropical caridean shrimps of the family Palaemonidae are well known as associates or symbionts of a wide range of marine taxa, including echinoderms. Bruce (1982) tabulated the known number of Palaemonidae associated with Indo-Pacific echinoderms to be 51 species, a number which has since increased considerably, due to new discoveries and an increased number of new taxa. The echinoderms hosts belong to several classes, but the highest number of shrimps is associated with crinoids (26 species in 1982). Six genera are now known to be exclusively associated with crinoids, *Araiopontonia* Fujino & Miyake, 1970 (1 species), *Brucecaris* Marin & Chan, 2006 (1 species), *Crinotonia* Marin, 2006 (2 species), *Lipkebe* Chace, 1969 (1 species), *Pontoniopsis* Borradaile, 1915 (1 species), *Unguicaris* Marin & Chan, 2006 (4 species) and *Laomenes* Clark, 1919 (11 species). Within the Palaemonidae, representatives of two further genera are also encountered on crinoids, *Periclimenes* Costa, 1844 (7 species) and *Palaemonella* Borradaile, 1915 (1 species).

In contrast to the rich fauna of the Indo-West Pacific associated with crinoids, this particular association appears poorly represented in the western Atlantic, with to date only four species known, three of which are in the genus *Periclimenes*. *Periclimenes crinoidalis* Chace, 1969 was described on the basis of material associated with *Nemaster grandis* Clark from Curaçao (Chace, 1969). The only further report of this species is by Criales (1984) from Santa Marta, Colombia on the same host. *Periclimenes meyeri* Chace, 1969 was described from two specimens associated with *Nemaster* sp.? from Curaçao (Chace, 1969), with the only further record being Criales (1984) from Santa Marta, Colombia. Criales (1984) also considers this species to be an obligate commensal of *Nemaster grandis*.

*Periclimenes bowmani* Chace, 1972 was described from Saint Lucia, occurring with “..either *Nemaster rubiginosa* or *Tropiometra carinata*,..” (Chace, 1972). Criales (1984) provides a further record of this species from Santa Marta (Colombia), exclusively occurring on *Nemaster rubiginosa*, now called *Davidaster rubiginosus* (Pourtalès). Escobar & Villalobos (2003) mention *Periclimenes* sp 2 (near *bowmani*) from a fine sandy bottom at a depth of 113–240 m off Banco Chinchorro, Quintana Roo, Mexico, but the summary description and lack of illustrations makes this identification unconfirmed.

The only other species known to associate with crinoids in the western Atlantic, *Lipkebe holthuisi* Chace, 1969 was described from an unknown host in deeper water, 119 m off the Dry Tortugas, Florida. Although Bruce (1976) when recording a further specimen from off Brazil speculated this species to be associated with gorgonians or

**Remarks.** In general morphology, *P. rincewindi* **sp. nov.** appears closely related to the other three crinoid dwelling species of the genus in the western Atlantic, *P. crinoidalis*, *P. meyeri* and *P. bowmani*, sharing a similar ornamentation of the distolateral angle of the basal segment of the antennular peduncle, as well as similar chelipeds. The new species differs from *P. bowmani* in that the third abdominal somite is posteriorly produced into a low hump or cap (a feature it shares with the other two species), the feebly developed chelipeds, differences in the molar structure of the mandible, as well as the proportions of the carpus of the first pereopod. The new species differs from *P. meyeri* primarily by the different structure of the mandibular incisor process, being flared in *P. meyeri* and not flared in *P. rincewindi* **sp. nov.** Further differences are the absence of a minute tubercle on the dactyls of the ambulatory pereopods (vs. present in *P. meyeri*) and the carpus of the first pereopod being twice as long as the chela (vs. carpus being only slightly longer in *P. meyeri*).

Morphologically, the new species is most closely related to *P. crinoidalis*, a known symbiont of *Nemaster grandis*, sharing a similar rostral morphology, presence of a posterodorsal hump on third abdominal somite, a very similar ornamentation of the distolateral angle of the basal segment of the antennular peduncle, similar incisor process and weakly developed chelae. Both species can be distinguished on the basis of the following characteristics: 1) carpus of first pereopod twice as long as chela in *P. rincewindi* vs. at most 1.2 times as long in *P. crinoidalis*; 2) denticle on carpus of ambulatory pereopods absent in *P. rincewindi* vs. minute, but always present in *P. crinoidalis*; 3) terminal process on telson present in *P. rincewindi* vs. absent in *P. crinoidalis* and 4) pleuron of fifth somite bluntly angular in *P. rincewindi* vs. rounded in *P. crinoidalis*. A further difference may lie in the number of ventral rostral teeth, with Chace (1969) indicating only a single, often inconspicuous subapical tooth is present in most specimens, with however three being distinct in larger females. The holotype specimen of *P. rincewindi* (of similar size to adult *P. crinoidalis*) harbours four ventral teeth, whilst the paratype male has two. This character will need to be confirmed in more material, before its utility can be confirmed.

Both species also differ in their host preference, as *P. crinoidalis* appears to exclusively associate with *Nemaster grandis* (see Chace, 1969; Criales, 1984) whilst the new species has only been recorded from *Analcidometra armata*.

The colour pattern of *P. rincewindi* is very distinctive and will likely prove a useful identification aid in the field and be fully species specific. However a comparison with *P. crinoidalis* can currently not be made, as colour photos in several guide books (e.g. Humann *et al.*, 2013) of *P. crinoidalis* appear to refer to the related *P. bowmani*, which is exclusively known from *Davidaster rubiginosa* (see Criales, 1984).

**Ecology.** All known individuals were inhabiting *Analcidometra armata* (Pourtalès) (Crinoidea: Colobometridae) in water depths of 10–18 m.

**Distribution.** Currently only known from the type locality, Roatán Island, Islas de la Bahía, Honduras. As the host species is however, relatively widespread, if rare, across the wider Caribbean, it is anticipated that *P. rincewindi* will prove to be more widespread.

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