



## ***Potamalpheops tyrymembe* sp. n.: the first southwestern Atlantic species of the shrimp genus *Potamalpheops* Powell, 1979 (Caridea: Alpheidae)**

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### **Abstract**

A new species of the alpheid shrimp genus *Potamalpheops* Powell, 1979, *P. tyrymembe* sp. n., is described based on several specimens collected from burrows of the ucidid crab *Ucidides cordatus* (Linnaeus, 1763) and other, unknown burrowing decapods, on a mangrove flat between the Baiano and Serra rivers, Povoado de Tremembé, Maraú, state of Bahia, Brazil (14°08'51.9"S, 39°05'04.4"W). The new species belongs to the *P. monodi* (Sollaud, 1932) species group, based on the presence of two pairs of spiniform setae on the distal margin of the telson and non-enlarged male chelipeds. It is characterized by a short rostrum and absence of setae on the pterygostomial angle of the carapace.

**Key words:** Decapoda, Alpheidae, *Potamalpheops*, Brazil, new species, cryptic lifestyle, mangrove

### **Introduction**

The shrimps of the alpheid genus *Potamalpheops* Powell, 1979 presently comprise 13 species distributed in marine and brackish waters of the Atlantic and Indo-West Pacific, with several species penetrating into freshwater systems in Central America, West Africa and South-East Asia (Coutière 1906; Sollaud 1932; Hobbs 1973; Powell 1979; Bruce 1991, 1993; Bruce & Iliffe 1992; Yeo & Ng 1997; Cai & Anker 2004; Anker 2003, 2005). The West African species, ranging from Senegal to Congo, are *P. haugi* (Coutière, 1906), *P. monodi* (Sollaud, 1932) and the type species *P. pylorus* Powell, 1979 (Coutière 1906; Powell 1979). The Indo-West Pacific species are *P. amnicus* Yeo & Ng, 1997, *P. darwiniensis* Bruce, 1993, *P. galle* Anker, 2005, *P. johnsoni* Anker, 2003, *P. hanleyi* Bruce, 1991, *P. miyai* Yeo & Ng, 1997, *P. palawanensis* Cai & Anker, 2004, *P. pininsulae* Bruce & Iliffe, 1992 and *P. tigger* Yeo & Ng, 1997 (Bruce 1991, 1993; Bruce & Iliffe 1992; Yeo & Ng 1997; Cai & Anker 2004; Anker 2003, 2005). These species range from Sri Lanka to New Caledonia, including Malaysia, Indonesia, Singapore, Philippines and northern Australia. Until now, the only American species was *P. stygicola* (Hobbs, 1973) from freshwater caves of southern Mexico (Hobbs, 1973).

Most species of *Potamalpheops* inhabit marine or brackish waters, e.g., tidally influenced portions of rivers, brackish peat swamps, and mangrove mudflats (*P. pylorus*, *P. darwiniensis*, *P. hanleyi*, *P. miyai*, *P. tigger*, *P. johnsoni*). Three species of the genus are known exclusively from freshwater streams and lakes (*P. monodi*, *P. haugi*, *P. amnicus*), and three others colonized freshwater and anchialine caves (*P. pininsulae*, *P. palawanensis*, *P. stygicola*). Because of their small size, inconspicuous coloration and cryptic lifestyle, these shrimps may be easily overlooked (Anker 2005). Consequently, most species are known only from their type localities or from only a few localities.

Sampling in the mangrove area of rivers of Camamu Bay on the central coast of Bahia, Brazil, yielded very small, semi-transparent, banded shrimps that had all diagnostic features of the genus *Potamalpheops*, such as dorsally exposed eyes (often with anteromedian setae), diaeresis of the uropodal exopod with a finely toothed lamella, and meri of the third to fifth pereopods armed with spiniform setae (Powell 1979; Anker 2005). Moreover, these specimens were recognized as an undescribed species of *Potamalpheops*, representing the first of the genus in the southwestern Atlantic and the first estuarine species in the western Atlantic. The new species is described and illustrated below.

However, it differs specifically from *P. monodi* in the carpus / palm ratio of the chelipeds (carpus as long as palm in *P. tyrymembe* **sp. n.** vs. longer than palm in *P. monodi*), and the ratios of carpal segments in the second pereiopod (3.3: 1: 1.2: 1.1: 2.4 in *P. tyrymembe* **sp. n.** vs. 2.27: 1.07: 1.38: 1 : 1.25 in *P. monodi*).

The currently known distribution of *Potamalpheops* is tropical, with the highest concentration of species in the Indo-Malayan and Australian regions of the Indo-West Pacific. A smaller hotspot of *Potamalpheops* is West Africa, with three described species (*P. haugi*, *P. pylorus* and *P. monodi*) and a fourth undescribed one (see Powell 1979).

The distribution of *Potamalpheops* suggests that this genus is possibly a relict group from a marine stock that was widespread in the Tethys Sea (Bruce 1991). The ancestral lineages of *Potamalpheops* may have reached the South Atlantic via the trans-Saharan seaway (Upper Cretaceous, 90 Mya) (Bruce 1991). The role of this seaway in dispersing the Tethyan fauna to the South Atlantic has also been noted (see Manceñido 2002). This would explain the existence of species in the South Atlantic (Brazilian coast and the western coast of Africa).

The morphological similarity between *P. tyrymembe* **sp. n.** and *P. monodi* strengthens a hypothesis of a closer phylogenetic relationship, once more pointing to the former unity of Africa and South America. However, no further comments on the possible divergence between these two taxa can be made without an exhaustive phylogenetic assessment of the entire *Potamalpheops*, using morphological as well as molecular data.

The finding of several individuals of *P. tyrymembe* **sp. n.** in burrows of *Ucides cordatus* is noteworthy, although it does not necessarily indicate a commensal-type association. The shrimps may just use the more superficial areas of the crab's burrow as a permanent or temporary refuge, for instance, sheltering there at low tide. In addition, specimens of *P. tyrymembe* **sp. n.** were also collected from other burrows, e.g., what appeared to be burrows of *Alpheus pontederiae*. Nonetheless, this is the first report of a shrimp from the genus *Potamalpheops* using burrows of other crustaceans.

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