

***RANGE EXTENSION OF THE ALPHEID SHRIMP
Potamalpheops tyrymembe SOLEDADE, SANTOS AND
ALMEIDA, 2014 (DECAPODA: ALPHEIDAE)***

Extensão na distribuição do camarão alfeídeo
Potamalpheops tyrymembe Soledade, Santos e Almeida,
2014 (Decapoda: Alpheidae)

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ABSTRACT

The occurrence of the alpheid mangrove shrimp *Potamalpheops tyrymembe* Soledade, Santos and Almeida, 2014, is here extended from 8°41'S (Rio Ariquindá, state of Pernambuco) to 7°01'S (Rio Paraíba do Norte, state of Paraíba) in northeastern Brazil, enlarging the northern known range of this shrimp. Moreover, we provide additional locality records for this tiny and poorly known shrimp which has been observed in burrows of the mangrove crab *Ucides cordatus* (Linnaeus, 1763).

Keywords: Caridea, estuarine fauna, mangrove fauna, new records, western Atlantic.

RESUMO

A ocorrência do camarão alfeído de manguezal *Potamalpheops tyrymembe* Soledade, Santos e Almeida, 2014, é aqui estendida de 8°41' S (rio Ariquindá, estado de Pernambuco) a 7°01' S (rio Paraíba do Norte, estado da Paraíba) no Nordeste do Brasil, ampliando a distribuição conhecida do norte desse camarão. Além disso, nós fornecemos registros de localidade adicionais para esse minúsculo e pouco conhecido camarão que foi observado em tocas do caranguejo de mangue *Ucides cordatus* (Linnaeus, 1763).

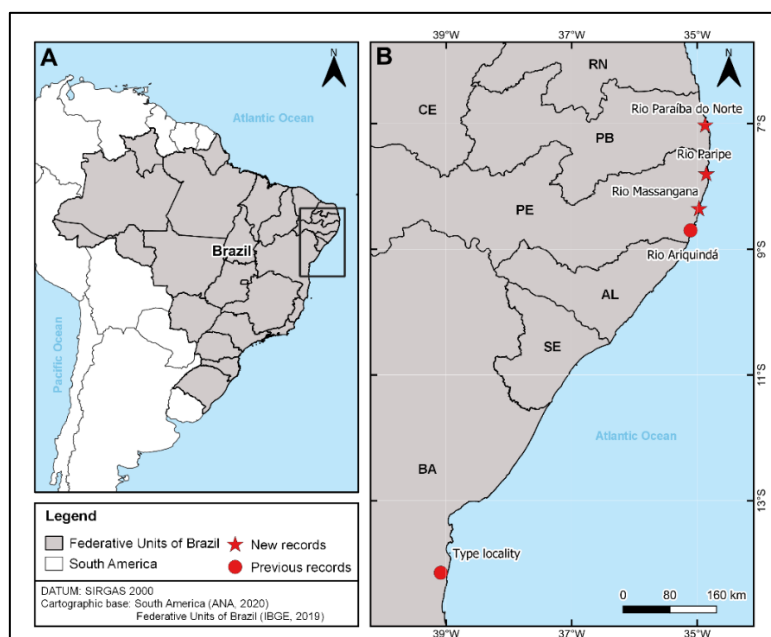
Palavras-chave: Caridea, fauna estuarina, fauna de manguezais, novo registro, Atlântico ocidental.

INTRODUCTION

The alpheid genus *Potamalpheops* Powell, 1979 currently comprises 13 species (Worms, 2022) of marine, brackish and freshwater shrimps distributed in the Atlantic and Indo-West Pacific oceans (e.g., Powell, 1979; Yeo & Ng, 1997; Cai & Anker, 2004; Anker, 2005; Soledade; Santos & Almeida, 2014). These small-sized, cryptic and semi-translucent shrimps may be easily overlooked (Anker, 2005) and, consequently, their biodiversity may be underestimated. *Potamalpheops tyrymembe* Soledade, Santos and Almeida, 2014 is the sole species of genus known from the southwestern Atlantic and has been recorded only twice: southern Bahia (type locality), and subsequently Pernambuco, northeastern Brazil (Soledade; Santos & Almeida, 2014; Bochini & Almeida, 2019). Herein, we provide a new northern record of this tiny and poorly known shrimp (Figure 1).

Individuals were sampled during the spring low tide, with a PVC pump (50 mm in diameter), in burrows of the ocypodid crab *Ucides cordatus* (Linnaeus, 1763). Each specimen collected was sexed and photographed to measure the carapace length (CL, from the tip of the rostrum to the posterior margin of the carapace). Voucher specimens were deposited in the crustacean collections of the Museu de Oceanografia da Universidade Federal de Pernambuco, Recife, Brazil (MOUFPE) and at the Departamento de Zoologia da Universidade Federal do Rio Grande do Sul (UFRGS).

Figure 1 – Distribution of *Potamalpheops tyrymembe*



Source: Whanderson Machado Nascimento

SYSTEMATICS

Order Decapoda Latreille, 1802

Family Alpheidae Rafinesque, 1815

Genus *Potamalpheops* Powell, 1979

***Potamalpheops tyrymembe* Soledade, Santos and Almeida, 2014**

Material examined. **Brazil:** 1 male (CL 3.42 mm) (MOUFPE 21020), Paraíba, Cabedelo, rio Paraíba do Norte, near Praia do Jacaré (7°01'47.6" S 34°51'17.4" W), 11 October 2022, coll. Almeida, A.O., Modesto, E.P., Pasinato, K., Paixão, P.H., Guéron, R. and Nascimento, W.M.; 1 female (CL 4.01 mm) (MOUFPE 21019), Pernambuco, Ilha de Itamaracá, Vila Velha, rio Paripe (7°48'25.1" S 34°51'14.8" W), 25 October 2022, coll. Pasinato, K., Melquiades, L., Paixão, P.H. and Nascimento, W.M.; 2 males (CL 3.52, 3.08 mm) and 1 female (CL 3.79 mm) (MOUFPE 21018), Pernambuco, Cabo de Santo Agostinho, rio Massangana (8°21'38.82" S 34°58'11.82" W), 11 August 2022, coll. Almeida, A.O., Rios, A.S., Figueiredo, E., Modesto, E.P. and Pasinato, K.

Additional material (not measured). 2 males, 4 females (2 ovigerous and 2 non-ovigerous), Brazil, Paraíba, Cabedelo, rio Paraíba do Norte near Praia do Jacaré, same collection data as MOUFPE 21020. These specimens are being kept alive in the laboratory for larval studies and will be deposited in the crustacean collection of the Departamento de Zoologia da Universidade Federal do Rio Grande do Sul (DZ/UFRGS 6939) (Figure 2A).

Remarks. The occurrence of *P. tyrymembe* in rio Paraíba do Norte increases the known range of this shrimp from 8°41' S (rio Ariquindá, state of Pernambuco) to 7°01' S (state of Paraíba) and represents the new northernmost record of the species in the Atlantic Ocean.

The present material was collected in mangroves inside burrows of the mangrove crab *U. cordatus*, as observed in previous accounts on *P. tyrymembe* (Soledade, Santos & Almeida, 2014; Bochini & Almeida, 2019). Soledade, Santos and Almeida (2014) also suggested potential occurrence of *P. tyrymembe* in burrows of *Alpheus pontederiae* de Rochebrune, 1883. During our study, burrows of *Alpheus estuariensis* Christoffersen, 1984 were sampled, but no individuals of *Potamalpheops* was collected. Most of the material was retrieved from burrows of *U. cordatus* located in more protected mangrove areas (e.g. situated among rhizophores and pneumatophores of mangrove trees). Burrows from mudflats or areas covered with unidentified grasses were also sampled and yielded no *Potamalpheops*. Overall, the shrimps were more easily captured from burrows filled with water. Sometimes *A. estuariensis* was collected accidentally in burrows of *U. cordatus* from a contiguous alpheid burrow (Figure 2B, 2C).

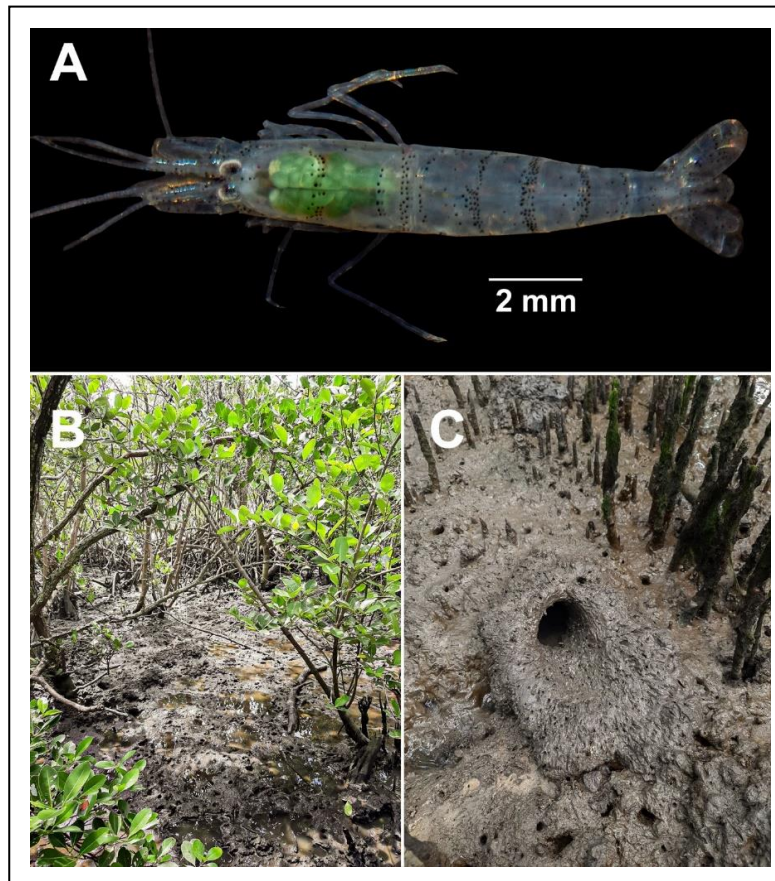
Marin (2021) described *Potamalpheops kisi* Marin, 2021, from Vietnam, which likely inhabits a continuous system of crustacean burrows. However, unlike *P. tyrymembe*, the species is not particularly associated with a specific host. Among the potential hosts are burrowing alpheid, stomatopod and varunid crabs (Marin, 2021). Field observations carried out at night revealed that *P. kisi* can move quickly inside burrows of unidentified crabs located over the water level, a possible adaptive behavior to the anoxic sediment mangroves. Interestingly, *P. tyrymembe* and *P. kisi* are tiny semi-translucent shrimp found in crustacean burrows. Such color patterns might be convergent and adaptive considering the cryptic lifestyle of these small mangrove inhabitants.

We retrieved a maximum of three individuals per pumped burrow. Bochini and Almeida (2019) stated that *P. tyrymembe* seems to live in crowds, since their specimens were obtained from only two burrows of *U. cordatus*, but this behaviour remains to be confirmed in future studies.

The females examined (CL 3.79, 4.01 mm) were larger than males (CL 3.08-3.52 mm). Females larger than males were also observed in previous studies of Soledade, Santos and

Almeida (2014: females 4.07 ± 0.36 mm, males 2.95 ± 0.37 mm in CL) and Bochini and Almeida (2019: females 2.83 ± 0.24 mm, males 2.50 ± 0.24 mm in CL). Further studies with a larger sample are required to confirm whether females tend to be larger than males in populations of *P. tyrymembe*.

Figure 2 - Living coloration and habitat of *Potamalpheops tyrymembe*. A) Non-ovigerous female (UFRGS 6939) photographed moments after being brought to the laboratory. B) Typical biotopes of Rio Paraíba do Norte where *P. tyrymembe* was collected. C) Burrow of *Ucides cordatus* from where *P. tyrymembe* was retrieved



Source: Rodrigo Guéron

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Additional Information and Declarations

Author contributions

Conceptualization and Design: AOA; Performed research: AOA, EPM, KP, PHP, RG, WMN; Acquisition of data: AOA, EPM, KP, PHP, RG, WMN; Analysis and interpretation of data: AOA, EPM, KP, PHP, RG, WMN; Preparation of figures/tables/maps: RG, WMN; Writing – original draft: AOA; Writing - critical review & editing: AOA, EPM, KP, PHP, RG, WMN.

Consent for publication

All authors declare that they have reviewed the content of the manuscript and gave their consent to submit the document.

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Conflicts of interest

The authors have no conflicts of interest to declare.

Data availability statement

All data generated and analyzed during this study are presented in this article.

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