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Short Communication

The first record of *Lysmata rauli* Laubenheimer and Rhyne, 2010 (Decapoda: Caridea: Lysmatidae) from the tropical eastern Atlantic

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ABSTRACT

Here we report the first record of the shrimp *Lysmata rauli* Laubenheimer and Rhyne, 2010 in the eastern Atlantic, from the intertidal at Kere Island, Bijagós archipelago, Guinea-Bissau.

KEYWORDS

Africa, Bissagos, Guínea-Bissau, invasive species, Lysmatidae

The genus *Lysmata* Risso, 1816 occurs in the Atlantic, Indian, and Pacific Oceans (Anker and Cox, 2011). In the Atlantic Ocean, more than 16 species are currently recorded from the western Atlantic (De Grave and Anker, 2018; Aguilar et al., 2022; Guerón et al., 2022; 2023), three species from the central Atlantic Islands (De Grave and Anker, 2018), and eight species from the eastern Atlantic and Mediterranean Sea (Wirtz, 2023).

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Lysmata rauli Laubenheimer and Rhyne, 2010 was described from a single individual collected in central Brazil (Laubenheimer and Rhyne, 2010). Much uncertainty surrounded the validity of this species until detailed work by Guerón et al. (2022) and Aguilar et al. (2022) resolved the *Lysmata vittata* species complex. It now appears clear that *L. rauli* is native to the subtropical and tropical Indo-West-Pacific and has invaded the western Atlantic. An individual from the Mediterranean coast of Egypt (Abdelsalam, 2018) may also belong to the species *Lysmata rauli*, but this specimen's status is still unresolved (Guéron et al. 2022).

Here we report on numerous specimens of *L. rauli* from Kere Island, Bijagós archipelago, Guinea-Bissau, extending the species' known range to the eastern Atlantic. The specimens were collected in May 2023 by turning over stones during low tide in a mixed muddy-rocky area at 11°32'01.40"N 16°13'06.27"W. Thirteen specimens are now deposited at the Naturalis Biodiversity Center, Leiden, The Netherlands, with the registration number RMNH.CRUS.D.59353, and thus available for a more detailed morphological study. Many of them are ovigerous.

The color pattern of living individuals of *Lysmata* Risso, 1816 is species-specific and diagnostic (e.g., Rhyne and Lin, 2006; Baeza and Behringer, 2017; Wirtz, 2023). The specimens from Kere Island have a pattern of red stripes on the dorsal side, with pronounced red transverse bars at the anterior edge of the first somite and between the third and fourth somites, which is diagnostic for *L. rauli* (Fig. 1). Such pronounced transverse bars are missing in the closely related *Lysmata vittata* (Stimpson, 1860).

A DNA barcode of COI with 658 bp, available in Genbank (accession number PP825755), was generated for one *Lysmata* specimen from Kere Island, through a single run with a MinION nanopore sequencer (©Oxford Nanopore Technologies), using a flow cell R10.4, adopting the methodology described by Moura et al. (2022). Sequence reads were demultiplexed and DNA barcodes were assembled with the ONTbarcoder v2.2 (Srivathsan et al., 2021). The COI sequence of the Kere specimen clusters closely with two DNA barcodes in BOLD (https://v4.boldsystems.org), of specimens collected in Hong Kong waters (BIN ID: BOLD:AEI7066), with accession number MGHK340-21 (99.54% COI sequence similarity) and MGHK361-21 (99.33% COI sequence similarity), the latter one being identified as *L. rauli* (Fig. 2). Genetic analysis thus confirms the morphological identification of the specimens from Kere Island as *L. rauli*.

It is currently unknown how the Indo-Pacific species *Lysmata rauli* has managed to settle at both sides of the Atlantic Ocean. It may well have arrived in the eastern Atlantic even before its discovery in the western Atlantic. A more detailed genetic comparison of all Atlantic populations could address this question.

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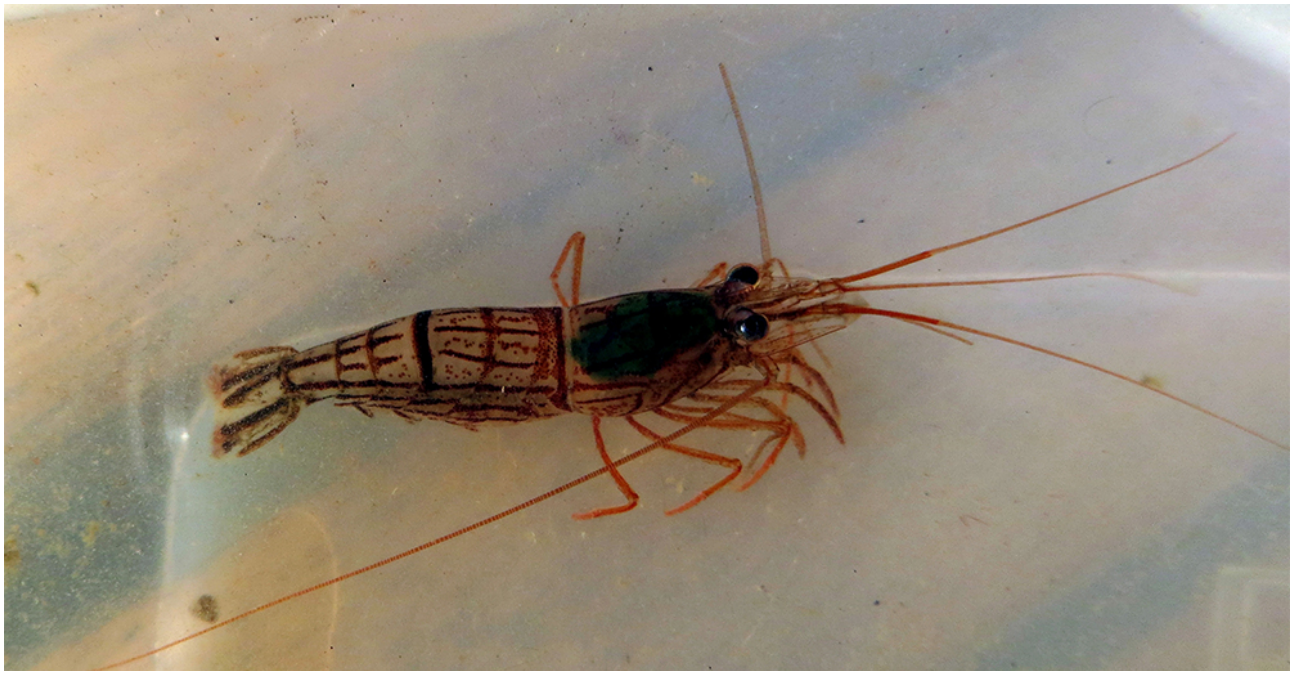

Figure 1. *Lysmata rauli* Laubenheimer and Rhyne, 2010 from Kere Island, Bijagós archipelago, eastern Atlantic. Photo: Peter Wirtz.

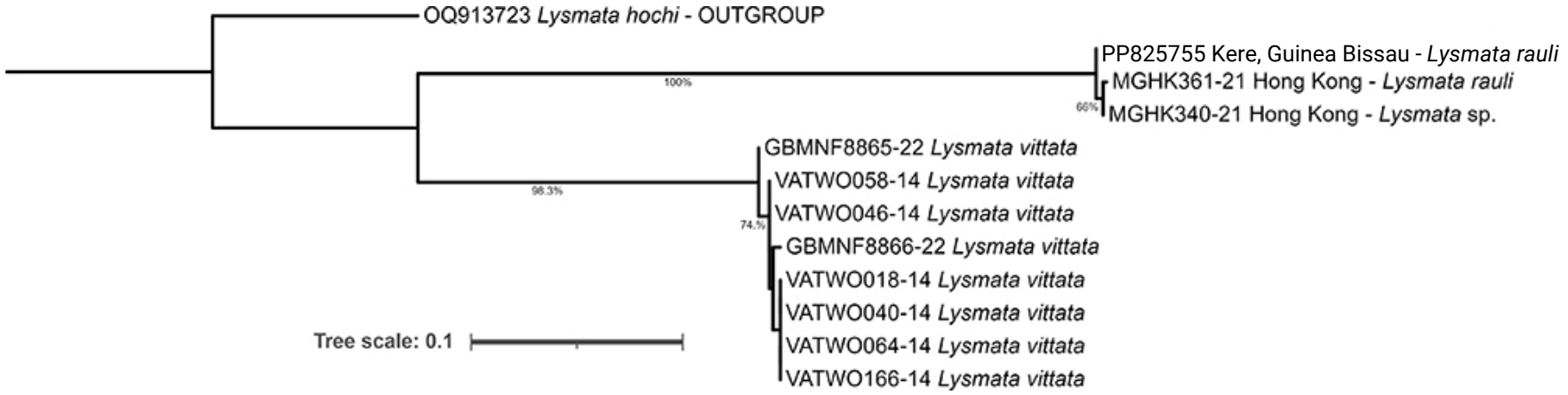

Figure 2. Maximum-likelihood phylogenetic tree including the available COI barcodes of *Lysmata rauli* Laubenheimer and Rhyne, 2010 and *Lysmata vittata* (Stimpson, 1860)

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ADDITIONAL INFORMATION AND DECLARATIONS

Author Contributions

Sample collection: PW, FTN, and Sylvie Dias. DNABarcoding: CJM. Manuscript preparation and editing: all authors.

Consent for publication

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

Competing interests

The authors declare no competing interest.

Data availability

All study data are included in the article and available on request from the corresponding author. All specimens are deposited at the Naturalis Biodiversity Center, Leiden, The Netherlands, with the registration number RMNH.CRUS.D.59353.

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Study permits

IBAP and INIPO declarations.