SAP6

MOLECULAR AND MORPHOLOGICAL EVIDENCE FOR THE EXISTENCE OF SEVERAL SPECIES WITH RESTRICTED RANGE WITHIN THE COSMOPOLITE EURYBATHIC DEEP-SEA LYSIANASSOID AMPHIPOD *EURYTHENES GRYLLUS* SENSU LATO

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Introduction

Eurythenes gryllus (Lichtenstein, 1822) is a presumed cosmopolitan eurybathic bentho-pelagic giant deep-sea amphipod. However, previous studies already highlighted genetically divergent lineages in the Atlantic and Pacific Oceans, which appeared to be vertically stratified, and minor morphological differences between populations were also recorded.

Material and methods

With an aim to quantify the geographic and bathymetric patterns of genetic variations, the genetic diversity in *Eurythenes gryllus* was investigated at the global scale (Arctic, Atlantic, Pacific and Southern Oceans) using three different genes (COI, 16S rRNA, 28S rRNA). This genetic analysis was followed by a thorough morphological study.

Results

Phylogenetic and phylogeographic analyses revealed the existence of at least seven well-supported clades, two bathyal and five abyssal, which were separated by genetic distances at the level of usual interspecific divergences. Furthermore, a clear genetic break was observed between specimens sampled above and below 3000 m. One clade comprised specimens from several bathyal sites in the Arctic and Southern Oceans. A subsequent morphological analysis confirmed the genetic findings and revealed small but consistent differences between the different clades, which will be described as separate species.

Discussion

This bathymetric break below 3000 m has already been reported for several organisms and regions, suggesting its role as a ubiquitous phylogeographic barrier for barophysical tolerance. The widely distributed *Eurythenes* clade, which is presumably the true *E. gryllus*, is, to our knowledge, the first molecular evidence for a bipolar distribution in a macro-benthic deep-sea organism. The present results clearly highlight the difficult nature of research on the systematics of deep-sea crustaceans and shows that the abyss is a more complex environment than previously assumed, which is likely to harbour an important hidden diversity.

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Abstracts

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