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Evidence for cryptic species in the tadpole shrimp *Triops granarius* (Lucas, 1864) (Crustacea: Notostraca)

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Abstract

We used three ribosomal DNA markers to investigate the genetic divergence of *Triops granarius* (Lucas, 1864) populations from Tunisia, Namibia and Japan. The comparison of the genetic distances between these samples and those found among other species of Notostraca (both *Triops* and *Lepidurus*) strongly suggests that the three *Triops granarius* populations investigated belong to different, possibly cryptic species.

Key words: *Triops numidicus*, *Lepidurus*, molecular phylogeny, 16S, 12S, 28S, ribosomal gene

Introduction

Triops granarius shows one of the largest geographical distributions among all Notostraca. It ranges from Africa through the Middle East to India, China and Japan (Longhurst 1955; Suno-Uchi *et al*. 1997) and extends north as far as Mongolia (Brtek *et al*. 1984) and Transbaikalia (Vekhoff 1993). It is thus not astonishing that the list of synonyms for this species is high, with 19 species group names (Brtek 1997). In addition, morphological variability is higher than in other congeneric species. Among *Triops* species, Longhurst (1955) reported the highest range in the number of segments and in the number of apodous segments in *T. granarius* (see Table 1). This high variability is due to the fact that populations of considerably different morphology were grouped together, such as the former species *Apus granarius* Lucas, 1864 sensu Uéno (1940) and *Apus sinensis* Uéno, 1925, both occurring in Manchuria. Uéno (1940) reported much lower numbers of apodous segments in *A. sinensis*, apparently with no overlap with *A. granarius* or intermediate forms. *A. sinensis* was synonymised with *A. granarius* on evidence of the

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