Zootaxa 3368: 229–244 (2012)
www.mapress.com/zootaxa/

Article

ISSN 1175-5326 (print edition)
ZOOTAXA
ISSN 1175-5334 (online edition)

A new *Pseudodiaptomus* (Copepoda, Calanoida) from Korea supported by molecular data

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**In:* Karanovic, T. & Lee, W. (Eds) (2012) Biodiversity of Invertebrates in Korea. *Zootaxa*, 3368, 1–304.

Abstract

A new species, *Pseudodiaptomus koreanus* **sp. nov.** (Calanoida, Pseudodiaptomidae), which has so far been identified as *P. inopinus* Burckhardt, 1913, is described from Korean estuaries. This new species differs from *P. inopinus* in the broad and short posterior process of the female genital flap, rounded posteriocentral projection between the gonopores, presence of a posterodorsal spinule on the fifth pediger of the male, and a row of fine ventral spinules on the male second urosomite. The new species is also distinguishable from *P. nansei* Sakaguchi and Ueda, 2010 by the presence of a row of fine spinules along posterior margins of the second and third pedigers in both sexes, rounded posteromedial projection between the gonopores, separation of ancestral segment XXI and compound segments XXII–XXIII of the male right antennules, and a row of fine ventral spinules on the male second urosomite.

Their ribosomal internal transcribed spacer 1 (ITS 1) and mitochondrial gene cytochrome oxidase subunit I (mtCOI) sequences supported the conclusion based on morphological data, with considerable divergence values between *P. koreanus* and *P. inopinus*: 12–14% for ITS 1 and 14–22% for mtCOI. The ITS 1 and mtCOI sequences of specimens of two morphs of *P. koreanus* with different male fifth legs differed by <1.2% for ITS1 and <3.5% for mtCOI, suggesting that these morphological differences represent interspecific variability.

Key words: Pseudodiaptomidae, copepods, taxonomy, new species, ITS 1, mtCOI, estuary

Introduction

Pseudodiaptomus inopinus Burckhardt, 1913 has been known as one of the major components of the copepod assemblages in the fresh and brackish waters of northeastern Asia (Suh et al. 1991; Oka et al. 1991; Shen & Song 1979). However, Sakaguchi and Ueda (2010) verified that *P. inopinus* from the Nansei Islands, southernmost Japan was a new species, *P. nansei* Sakaguchi and Ueda, 2011. They also suggested that *P. inopinus* in western Japan may comprise two morphological groups. On the other hand, *P. inopinus* has two morphs with a finger-shape or paddle-shape terminally on the distal exopodal segment of the left fifth leg of male (Burckhardt 1913; Shen & Song 1979; Chang & Kim 1986; Chang 2009). In calanoid copepods the morphological differences of the male fifth legs play a very important role in the classification and identity of species. In spite of these facts two morphs of *P. inopinus* have still been considered as a single species, even though Shen and Tai (1962) established the latter of two morphs as a separate subspecies *P. inopinus saccupodus* Shen and Tahi, 1962, because they can be found to live simpatrically.

Recently, many studies show that genetic characters can be used to provide unambiguous taxonomic discrimination when morphological characters are not practical for routine identification at the species level (Bucklin et al. 1996; Bucklin & Wiebe 1998; Lindeque et al. 1999). The internal transcribed spacer (ITS) regions of the nuclear ribosomal DNA and the mitochondrial gene cytochrome oxidase subunit I (mtCOI) are appropriate

Accepted by T. Karanovic: 3 May 2012; published: 4 Jul. 2012