



A reexamination of adults and larval stages of *Diogenes nitidimanus* (Crustacea: Decapoda: Anomura: Diogenidae)

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Abstract

A redescription of adult and larval stages of diogenid hermit crab *Diogenes nitidimanus* Terao, 1913 is presented. Morphological similarities suggest that *D. nitidimanus* is allied to *D. avarus* Heller, 1865, *D. granulatus* Miers, 1880, *D. ova-tus* Miers, 1881, *D. pugilator* (Roux, 1838) and *D. rectimanus* Miers, 1884. *Diogenes nitidimanus* can be distinguished from the latter four species by different armature or ornamentation of the left chela and/or the shape of the ambulatory dactyli. Zoeal and megalopal stages of this species are described from laboratory-reared material hatched from parental individuals collected from Peter the Great Bay, Russian Far East. Larval development in the Russian population is compared with that described for a population of this species from southern Japan. The developmental morphology between the two populations is generally similar, but some minor differences, which might be attributable to variability, are found. Larvae of *D. nitidimanus* are morphologically closest to those of *D. avarus* among eight species of *Diogenes* for which larval descriptions are available.

Key words: Crustacea, Decapoda, Anomura, Diogenidae, *Diogenes nitidimanus*, morphology, adult, larva, zoea, megalopa, Sea of Japan

Introduction

The diogenid hermit crab genus *Diogenes* Dana, 1851 is represented by about 60 species chiefly occurring in temperate and tropical waters in the Indo-West Pacific region and the eastern Atlantic Ocean. In spite of recent studies (Morgan & Forest 1991; Rahayu & Forest 1995; McLaughlin & Haig 1996; Rahayu 1996; McLaughlin & Clark 1997; McLaughlin & Dworschak 2001; McLaughlin & Holthuis 2001; Rahayu & Hortle 2002; McLaughlin 2002, 2004, 2005; Siddiqui & McLaughlin 2003; Asakura 2006; Asakura & Goodwin 2006) the taxonomy of the genus remains inadequate. The taxonomic status of several species is unclear and discovery of new species is continuing. Morphology of larvae of *Diogenes* has been described for only eight species (MacDonald *et al.* 1957; Pike & Williamson 1960; Sarojini & Nagabushanam 1968; Sankolli & Shenoy 1975; Nayak & Kakati 1977; Nayak 1981; Nayak & Neelkantan 1983; Baba & Fukuda 1985; Siddiqui & Tirmizi 1988; Shenoy & Sankolli 1993).

The aim of this paper is a reexamination of adults and larval stages of *Diogenes nitidimanus* Terao, 1913 chiefly on the basis of material from waters from Far East Russia. *D. nitidimanus* was found in Peter the Great Bay for the first time in 2002 and it is possible that this species was introduced from southern Japan (Korn *et al.* 2007). The rather wide latitudinal range (Peter the Great Bay to Kyushu, Japan, see Asakura (2006)) and commonness in intertidal to subtidal zones of *D. nitidimanus* have made it one of the most extensively studied hermit crabs, particularly in its ecology (Asakura & Kikuchi 1984a, 1984b; Asakura 1987a, 1987c, 1991,