Zootaxa 3347: 36–62 (2012)
www.mapress.com/zootaxa/

Article

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

The early life history of *Chiromantes ortmanni* (Crosnier, 1965) (Decapoda: Brachyura: Sesarmidae): morphology of larval and juvenile stages

GUILLERMO GUERAO[1,4], KLAUS ANGER[2], RICCARDO SIMONI[3] & STEFANO CANNICCI[3]

[1]*Institut de Recerca i Tecnologia Agroalimentària (IRTA), UOCA, Ctra. Poble Nou Km 5.5, Sant Carles de la Ràpita, Tarragona, Catalonia, Spain*
[2]*Alfred-Wegener-Institut für Polar- und Meeresforschung; Biologische Anstalt Helgoland, Meeresstation, 27498 Helgoland, Germany*
[3]*Department of Evolutionary Biology "Leo Pardi", University of Florence, Via Romana 17, I-50125 Florence, Italy*
[4]*Corresponding author. E-mail: guillermo.guerao@irta.cat*

Abstract

The early life history of the sesarmid crab *Chiromantes ortmanni* (Crosnier, 1965) was studied at constant laboratory conditions, and the complete larval and early juvenile development are described. *Chiromantes ortmanni* shows intraspecific variability in the pattern of larval development, which typically includes 5 or, less frequently, 6 zoeal stages preceding the megalopa. The regular pathway (with 5 zoeal stages) required ca 18–20 days. During this time span, zoeal size (carapace length) increased by a factor of 2.2 from 0.33 to 0.73 mm, while biomass (measured as zoeal dry mass and contents of carbon, nitrogen and hydrogen) showed an 8-fold increment. The megalopa moulted after 10–12 days to the first juvenile crab stage, the total larval development from hatching to metamorphosis taking approximately one month (or ca. 4 days longer in larvae passing through an additional zoeal stage). First egg-laying was observed 8.5 months later, at a female carapace width of 14.4 mm. After an embryonic development time of 26–27 days, a total of 3,470 larvae hatched during two subsequent nights. Hence, the minimum generation time (from hatching to first offspring release) comprised slightly more than 10 months. Unlike the regular zoeal stages, the supernumerary stage VI showed atypical characters for Sesarmidae larvae, especially in the setation pattern of the first maxilliped and the segmentation of the endopod of the second maxilliped. Some characteristics presented an intermediate morphology between that of the zoea V and the megalopa. The first juvenile stage (crab I) is described in detail, while only the most relevant morphological changes and sexual differentiation are highlighted for subsequent crab stages (II–IX). Males and females can be distinguished from instar V onward, based on sexual dimorphism in the pleopods and the presence of gonopores in the females. The morphological characters of all larval stages and of the first juvenile crab are compared with those of other *Chiromantes* spp.

Key words: Brachyura, Sesarmidae, *Chiromantes*, larval development, zoea, megalopa, supernumerary stage, juvenile, morphology, sexual dimorphism, growth

Introduction

The East-African sesarmid crab *Chiromantes ortmanni* (Crosnier, 1965), occurs in large numbers in high-shore mangrove habitats with extreme salinity fluctuations, ranging from the upper terrestrial fringe to periodically inundated zones with mixed *Avicennia marina* (Forsk.) Vierh. and *Ceriops tagal* (Perr.) C.B. Rob. vegetation (Crosnier 1965; Hartnoll 1975; Gillikin 2004). *Chiromantes ortmanni* is semi-terrestrial living mostly in burrows dug by other crab species such as *Neosarmatium meinerti* De Man, 1887 (Gillikin 2004), but it is also able to construct its own burrows (Gillikin & Kamanu 2005). It is omnivorous, feeding also on mangrove leaf litter (Dahdouh-Guebas *et al.* 1999). Moreover, it is able to colonise polluted peri-urban mangrove habitats, tolerating human-driven environmental impacts (Cannicci *et al.* 2009).

The larval development of *Chiromantes* species has been described for *C. dehaani* (H. Milne Edwards, 1853) (Yatsuzuka 1957; Baba & Miyata 1971; Terada 1974), *C. haematocheir* (De Haan, 1833) (Terada 1974; Fukuda & Baba 1976; Muraoka 1980; Oh *et al*. 2007), and *C. eulimene* (Pereyra Lago 1993; Flores *et al*. 2003; Guerao *et al*. 2011), comprising in all cases five zoeal stages and a megalopa. However, only the development of *C. eulimene*

 Accepted by P. Castro: 12 Mar. 2012; published: 15 Jun. 2012