



<http://dx.doi.org/10.11646/zootaxa.4007.3.4>

<http://zoobank.org/urn:lsid:zoobank.org:pub:63C0147F-0B9E-44EC-874D-13227EB0961E>

Insights on the biology and ecology of the deep-water shrimp *Parapontophilus occidentalis* (Faxon, 1893) (Crustacea: Caridea: Crangonidae) in the eastern Pacific with notes on its morphology

MICHEL E. HENDRICKX^{1,2} & VANESA PAPIOL¹

¹Laboratorio de Invertebrados Bentónicos, Unidad Académica Mazatlán, Instituto de Ciencias del Mar y Limnología, Universidad Nacional Autónoma de México, P.O. Box 811, Mazatlán, Sinaloa, 82000, Mexico

²Corresponding author. E-mail: michel@ola.icmyl.unam.mx

Abstract

The deep-water crangonid *Parapontophilus occidentalis* (Faxon, 1893) is endemic to the eastern Pacific and has been reported from Mexico to Chile, in depths of 837–4082 m. Material collected off the west coast of the Baja California Peninsula (BCP) during the TALUD XV, XVI and XVI-B cruises consists of a series of 136 specimens (M:F = 1:3.6) with 30 % of ovigerous females. The material examined was captured in depths of 1296–2093 m. Size ranged from 8.4 to 16.1 mm CL, with females being significantly larger than males. Number of eggs carried by ovigerous females ranged from 7 to 998, without a significant relationship between female size and number of eggs. Using only data of females carrying at least 100 eggs, egg mass weight varied from 0.036 to 0.181 g. Size of oval-shaped eggs also varied considerably (0.515 to 0.922 mm). Larger densities of *P. occidentalis* were observed between 1700 and 2100 m, where larger individuals were collected, and sex proportions differed across all depth strata. At the northern BCP, *P. occidentalis* was collected at dissolved oxygen concentrations from 0.76 to 1.83 ml l⁻¹, at temperature from 2.1 to 3.4°C, and salinity from 34.54 to 34.63 kg g⁻¹. Density of *P. occidentalis* was positively correlated with dissolved oxygen, salinity, and silt contribution to sediments, and negatively correlated with temperature and primary productivity five months before sampling.

Key words: Deep water, *Parapontophilus*, fecundity, environmental drivers, eastern Pacific

Introduction

Caridean shrimps are well represented in deep-water megafaunal communities below 200 m (see Pequegnat 1970; Wicksten 1989; Gage & Tyler 1992; Hendrickx 2001; 2012a; Campos *et al.* 2005; Escobar–Briones *et al.* 2008; Legall & Poupin 2014). The family Crangonidae belongs to the infraorder Caridea and is highly diverse worldwide, with a total of 219 species known to date (De Grave & Franssen 2011). Crangonid shrimps consist mainly of benthic predators (e.g., *Pontophilus norvegicus* (M. Sars, 1861); Cartes *et al.* 2007a; *Crangon hakodatei* Rathbun, 1902; Mahera *et al.* 2013) that usually inhabit the continental shelf (e.g., Retamal & Gorny 2003; Campos *et al.* 2012) but can also be found in deep waters (Guzmán & Quiroga 2005; Komai 2008; Hendrickx 2012b), where they can even dominate megafauna communities (Cartes *et al.* 2007b; Papiol *et al.* 2012). Therefore, they are important in the transfer of organic carbon between trophic levels in food webs in a variety of environments (Cartes *et al.* 2007a; Campos *et al.* 2012; Papiol *et al.* 2013). Besides, some species are very important for regional (e.g., *Crangon crangon* Linnaeus, 1758) or local (e.g., *Crangon alaskensis* Lockington, 1877) fisheries (Holthuis 1980; Campos *et al.* 2012).

In the Mexican Pacific, five crangonid species belonging to five different genera have been recorded at depths greater than 350 m (Hendrickx 2012b). Among these is the genus *Parapontophilus*, proposed by Christoffersen (1988), which currently includes 18 species (De Grave & Franssen 2011). Ten of these species were described by Komai in 2008, emphasizing the lack of early knowledge on this group. Komai (2008) also gave the species-rank to six subspecies previously included in the *P. gracilis* (Smith, 1882) complex by Chace (1984). The general lack of information on species of *Parapontophilus* can also be concluded from the relatively recent finding of *P.*