



First record of an early pea crab stage on *Tonicia chilensis* (Frembly, 1827) (Mollusca, Polyplacophora)

ROLAND R. MELZER¹ & ENRICO SCHWABE

Bavarian State Collection of Zoology, Münchhausenstrasse 21, D-81247 München, Germany

¹ Corresponding author. E-mail: melzer@zi.biologie.uni-muenchen.de

Publication # 36 of the Huinay Scientific Field Station

Pea crabs, or pinnotherids (Crustacea, Decapoda), known since Aristoteles from mussels like *Pinna nobilis* Linnaeus, 1758, can be found in association with various marine invertebrates, such as tunicates, tube worms, sea urchins and others. Among molluscs, they are not only found in bivalves, but also in several gastropods (see Geiger & Martin 1999). However, there is only one report to date of a pea crab-polyplacophoran association, that of *Opisthopus transversus* Rathbun, 1893 and *Cryptochiton stelleri* (von Middendorff, 1847) from the Californian coast (Webster 1968).

Studying the polyplacophoran fauna of Southern Chilean fjords in cooperation with the Huinay scientific field station (Schwabe *et al.* 2006), we found one specimen of *Tonicia chilensis* (Frembly, 1827) hosting altogether three very small pinnotherid crabs (Fig. 1a). The specimens are deposited at the Bavarian State Collection of Zoology, (ZSM Mol 20060970, Chile, Muelle Dichato 36°33'S 72°56'W, 1 m)

They were very small, having a carapace width (CW) of approx. 1.3 mm and length (CL) of approx. 1.4 mm (Figs 1b, c) and showed other features also uncommon for pea crabs: the carapace was very narrow and roundish (Figs 1b, c), the eyes very large (Figs 1b, c), and the abdomen slender, male-like (Fig. 1f) and relatively short, terminating approx. 200 µm posterior to the 3rd maxillipeds, and only the somite border between the two last segments was clearly visible. As gonopods and/or gonopores could not be detected, the studied specimens seemed to be juveniles rather than adults.

Characteristics typical of pinnotherids were the shape of the pereopods (Fig. 1b), including the chelipeds (Fig. 1d), where a distinct tooth pattern on the immovable finger was found, and the 3rd maxilliped consisted of a fused ischium and merus, a 3-segmented palp and a short exognath with some long hairs at the tip (Fig. 1e). In addition, the dactylus articulated terminally with the propodus, and was very small. Thus, the carpus of the 3rd maxilliped was longer than dactylus and propodus together (Fig. 1e).

In addition of the observed features, the small size and the relatively big eyes suggest that our pinnotherids are very early, juvenile crabs still close to the megalopa stage (see e.g. Bolanos *et al.* 2004; Lima *et al.* 2006 for descriptions of pinnotherid megalopas). Our specimens, however, differ from a megalopa in carrying their pleon in the typical way crabs do, and in being deprived of pilose hairs on the legs. With *Parapinnixa beaufortensis*, Rathbun (1918) described a very small pinnotherid with quite large eyes and carapace similar to our specimens stating that “it is possible that the tiny specimen represents a postlarval stage of an unknown adult” (see also Thoma *et al.* 2005).

It is suggested that the pea crabs we found on *Tonicia* represent another example of a very young pinnotherid crab that can not unequivocally be associated with one of the species either known in their adult form or in the megalopa stage. To which pinnotherid taxon might our juvenile crabs belong? The structure and proportions of the third maxilliped with the ischium and merus fused, the terminal articulation of the dactylus, and the length of the carpus with respect to dactylus and propodus suggests a closer relationship of our juveniles to pea crabs of the genus *Orthotheres* Sakai, 1969, while the only slightly curved dactylus of the walking legs as well as the armature of the immovable finger of the chelipeds do not support this notion (see diagnostic features in Campos 1989 and Geiger & Martin 1999). At least, *Orthotheres unguifalcula* (Glassell, 1936) is the only species of this genus previously described for the eastern Pacific (Geiger & Martin 1999).

Only little is known about the life habits of early postlarval pinnotherids. Our findings suggest that they are not necessarily found exclusively on the adult stage's hosts, but may also use other, paratenic hosts such as *Tonicia chilensis* that would otherwise be too small to host the adult crabs in their mantle cavity.