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Communication

Bivalves Pinnidae are typical hosts of Pontoniinae shrimps. Several species of this family were documented to harbor these decapods inside their shells, especially shrimps from the genus *Pontonia* [1,2].

The present record is the first ecological study on the symbiotic association between the fan mussel *Pinna rudis* Linnaeus, 1758 and the shrimp *Pontonia pinnophylax* (Otto, 1821) in European Atlantic shallow waters – Azores (Portugal). During a series of exploratory dives to a maximum depth of 20m, along 13 sites on the south coast of Terceira Island, a total of 28 bivalves were checked for the presence of *P. pinnophylax* between August and October of 2004. The occupancy rate by the shrimp was 57%, and each host harboured one or two symbionts (Figure 1). From these, 92% were sexual pairs and the other 8% males. Also, *P. pinnophylax* was found living within the largest bivalves and at deeper sites. Although sexing *P. pinnophylax* is easy since males have longer pincers [3], we opted, in this work, not to



Figure 1: Symbiotic association between *Pinna rudis* and *Pontonia pinnophylax* in Terceira Island (Azores, Portugal). (a) *Pinna rudis* buried in a rocky surface; (b) Male (left) and female of *Pontonia pinnophylax* found in one bivalve *P. rudis*.

Short Communication

A New Insight on the Symbiotic Association between the Fan Mussel *Pinna Rudis* and the Shrimp *Pontonia Pinnophylax* in the Azores (NE Atlantic)

collect fan mussels which implied that the presence of the shrimps was evaluated through underwater observation of the shell (when slightly opened) or through counter light (by means of pointing a lamp). A previous note on this work was reported by the authors [4]. Presently, the authors are indeed collecting specimens of *P. rudis* in the same areas referred here for a more comprehensive project on symbiotic mutualistic/ relationships in several subtidal Azorean animals (work in progress).

Pinna rudis is widely distributed along Atlantic and Mediterranean waters but previous records of the association between this bivalve and *P. pinnophylax* were unknown, despite the existence of association records with *Pinna nobilis* [1,3,5]. The high occupancy rate of the symbiont observed in *P. rudis* from the Azores, suggests the existence of an association between both species, while their life cycles may be linked. This symbiont benefits from their hosts by obtaining food resources [3], but also by gaining protection and shelter on the bivalves' mantle cavity [1]. However, the possibility of the symbiont providing benefits to the bivalve (e.g. removal of amorphous organic materials from the mantle cavity, production of stimulus that alert the bivalve to the presence of predators), should not be excluded. Although it is believed that this is a mutualistic association, the exact relationship between the two species is unclear and needs further investigation.

The shrimp may present a higher ability to associate with *P. rudis* largest individuals since these present higher filtration abilities and larger mantle cavities, providing more food and more space for shelter to the endosymbiont. Higher incidences of the association at deeper waters may potentially be related with a prevalence of larger bivalves at higher depths. If so, bivalves and their symbionts would be less vulnerable to the changing hydrodynamic conditions of the shallower depths.

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