

## Abstract

This thesis is focused on symbiotic associations of caridean shrimps with a variety of marine animals of different phyla. Currently, five caridean families comprise symbiotic species. Palaemonidae (including the traditionally recognised subfamily Pontoniinae of predominantly symbiotic species) is the most species-rich and ecologically important of them. Its representatives live from temperate to tropical marine or brackish waters, with the highest diversity in the Indo-West Pacific biogeographic area and the western Atlantic.

The thesis is composed of two parts, one focusing on ecology and evolutionary biology, the other on systematics. The first part consists of three studies providing new knowledge on the evolution of symbioses in palaemonid shrimps. We confirmed that inter-phylum host-switching events and colonization of new hosts likely played a major role in the evolution of palaemonid symbiotic shrimps and these evolved multiple times (**Chapter 1**). Similarly, the switching from ecto- to endosymbiotic mode, associated with new body forms and ecological adaptations, occurred several times in palaemonid evolution. Reversal back to a free-living mode is rare, occasionally observed among ectosymbiotic lineages. Our results also confirm the necessity of systematic revision of this group, demonstrating that some of the wide-ranging taxa are polyphyletic. In the **Chapter 2**, we highlight a striking parallelism in evolution of unrelated phylogenetic lineages of fish-cleaning palaemonid shrimps from different biogeographical regions. Despite their morphology, colouration and behaviour via specific signals to fish clients are similar, minor but important distinctions may be observed in all those aspects. The **Chapter 3** is focused on elucidation of relation among sponge-associated shrimps and their hosts. We proved a parasitic character of trophic relation in sponge-associated shrimps. Based on detailed morphology using the scanning electron microscopy, we documented that their shear-like claws show evidence of intensive shearing of host tissues and, according to analyses of stomach contents, we demonstrate feeding on host tissues.

The second part includes descriptions of seven new species of caridean shrimps. Majority of them comprise symbiotic species of Palaemonidae (5 spp.), Pandalidae (1 sp.), and Alpheidae (1 sp.). Two new coral-associated species of the palaemonid genus *Hamodactylus* (*H. paraqabai*, *H. pseudaraqabai*) are described based on specimens from Papua New Guinea, the Great Barrier Reef, Indonesia and Malaysia (**Chapter 4**). Their systematic position is confirmed by molecular analyses. The new alpheid shrimp, *Salmoneus chadwickae*, from the Red Sea (**Chapter 5**) was probably associated with burrowing animals. It belongs to the *S. cristatus* species group and it is distinguishable from all congeners by morphology as well as molecular data. The **Chapter 6** contains description of a new antipatharian-associated pandalid shrimp *Anachlorocurtis occidentalis* from the Red Sea. Morphological differences and molecular analysis supported its separation from *A. commensalis* from the north western Pacific. Finally, three new sponge-associated shrimps of *Periclimenaeus* were described based on morphological features (**Chapters 7-9**); two species from the Indo-West Pacific region (*P. echinimanus* and *P. nufu*), and one from the Caribbean Sea (*P. pectinidactylus*).