Epibiotic mites associated with the invasive Chinese mitten crab *Eriocheir sinensis* – new records of Halacaridae from Poland*

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Abstract

Seven epibiotic halacarid mites (*Caspihalacarus hyrcanus*, two species of *Copidognathus*, *Halacarellus petiti*, *Porohalacarus alpinus*, *Soldanellonyx monardi* and *S. chappuisi*), two oribatid mites (*Hydrozetes lacustris* and *Trhypochthoniellus longisetus*) and one water mite (*Piona pusilla*) were found on the setae-covered claws of eighteen Chinese mitten crabs (*Eriocheir sinensis*) collected from fresh and brackish waters in Poland and Germany. The most abundant of the 111 mite individuals recorded was one of the *Copidognathus* species ($N = 52$); this was followed by *H. petiti* ($N = 38$) and *C. hyrcanus* ($N = 13$). This is the first record of *H. petiti* and of the genus *Copidognathus* from Polish waters. The possibility of migrating over long distances assisted by catadromous mitten crabs enhances mite dispersal, as well as their introduction to new environments.

1. Introduction

The Chinese mitten crab *Eriocheir sinensis* (Crustacea, Brachyura, Varunidae) has a catadromous life cycle, involving several life stages that are characterized by different levels of tolerance to salinity: the most euryhaline are sexually mature specimens that can live in fresh and brackish waters as well as in the sea (Anger 1991, Veilleux & Lafontaine 2007). This invasive species, a native of East Asian waters, has colonized the coastline and rivers of Europe and North America during the last hundred years (Panning 1938, Cohen & Carlton 1997). In Europe, the oldest and largest self-sustaining population of *E. sinensis* inhabits the River Elbe and its tributaries in Germany. Nevertheless, because they are able to migrate long distances, adult specimens from this population have spread to neighbouring countries (Herborg et al. 2003, Czerniejewski et al. 2012). During the last few years mitten crabs have also increased in abundance in Baltic coastal brackish waters, where they probably encounter better trophic conditions than in their riverine habitats (Normant et al. 2002, Ojaveer et al. 2007, Drotz et al. 2010, Normant et al. 2012).

The exoskeleton of decapod crustaceans has been documented to represent an attachment surface for sessile epibionts which might appear there accidentally or intentionally (e.g. for masking the crab from foraging predators), some being either commensal or pathogenic (e.g. Abelló & Corbera 1996, McGaw 2006). In *E. sinensis*, not only the massive carapace but also the characteristic dense patches of setae covering the claws of adult specimens may well provide a habitat for many different organisms (Normant et al. 2007). Among them are mites belonging to the family Halacaridae, which made up 32.4% of the 1280 associated organisms found on thirteen such crabs collected in the River Havel in Germany (Normant et al. 2007). Being benthic throughout their life, halacarids may occur on different substrates, including basibionts (Bartsch 2008a). Unfortunately,