doi:10.5697/oc.56-4.805
OCEANOLOGIA, 56 (4), 2014.
pp. 805–824.

KEYWORDS
North American
Harris mud crab
Introduced
Crustacean
Invasive
Poland
Condition factor

Population structure, morphometry and individual condition of the non-native crab *Rhithropanopeus harrisii* (Gould, 1841), a recent coloniser of the Gulf of Gdańsk (southern Baltic Sea)*

Joanna Hegele-Drywa*
Monika Normant
Barbara Szwarc
Anna Podłuska

Department of Experimental Ecology
of Marine Organisms,
University of Gdańsk,
al. Marszałka J. Piłsudskiego 46, 81–378 Gdynia, Poland;

e-mail: ocejhd@ug.edu.pl

*corresponding author

Received 22 October 2013, revised 26 February 2014, accepted 20 March 2014.

Abstract

The aim of this study was to characterise the introduced North American Harris mud crab *Rhithropanopeus harrisii*, which occurs in the Gulf of Gdańsk, Poland (southern Baltic Sea). Of the 920 specimens caught between 2006 and 2010, males and females made up 44 and 40% respectively, whereas juveniles (< 4.4 mm carapace width) comprised 16%. Overall carapace widths ranged from 1.96 mm to 21.40 mm (mean 9.03 ± 4.11 mm). Ovigerous females (mean 11.12 ± 2.76 mm) were present in the population from June to October. Most of the adult specimens

* This research was funded by the Polish National Science Centre, grant No. 3016/B/P01/2011/40.

collected ($n = 158$) had carapace widths between 10.1 and 12.0 mm. The wet weight of *R. harrisii* varied from 0.005 to 4.446 g (mean 0.410 ± 0.569 g). Females exhibited a negative allometric increase in weight ($b = 2.77$), males an isometric increase in weight ($b = 3.02$). The condition factor (K) in *R. harrisii* varied from 0.02 to 0.08 (mean 0.05 ± 0.01).

1. Introduction

Biological invasions are ongoing processes that represent a growing problem, mostly due to the unpredictable impacts of non-native species (Floerl et al. 2005). Specific to marine systems, the risk of unintentional introductions of many species outside their native ranges has increased significantly owing to the rapid development of ship transport (Ruiz et al. 1997, Bij de Vatte et al. 2002). Brackish water, strong anthropogenic influence and a relatively small number of native species make the Baltic Sea conducive to harbouring many introduced species. Although the total number of alien species in the Baltic Sea has reached 119, only a few of them have been documented to negatively impact the environment and economy (Gollasch et al. 2011).

A recent newcomer to the Baltic Sea, the North American Harris mud crab *Rhithropanopeus harrisii* was probably introduced to European waters in ballast tanks (Wolff 1954, Rodriguez & Suarez 2001, Leppäkoski 2005, Projecto-Garcia et al. 2010) and was first recorded in the Netherlands in 1874 (Maitland 1874). Rapid colonisation over the past 130 years has led to established populations in Germany (Nehring & Leuchs 1999), Denmark (Jensen & Knudsen 2005), Poland (Demel 1953, Kujawa 1957, Michalski 1957), the Black and Caspian Seas (Zaitsev & Öztürk 2001), and most recently, Finland (Fowler et al. 2013) and Estonia (Kotta & Ojaveer 2012). In the last decade the sudden appearance of *R. harrisii* has been observed in many coastal sites of the Baltic Sea, for example, the Curonian Lagoon (Bacevičius & Gasiūnaitė 2008), the Odra River estuary (Czerniejewski & Rybczyk 2008, Czerniejewski 2009), the north-eastern Gulf of Riga (Kotta & Ojaveer 2012) and Finnish coastal waters (Fowler et al. 2013). In the Gulf of Gdańsk it was first noted in the 1960s, but since the early 2000s a reproducing population with abundances exceeding 19 indiv./100 m^2 has become established there (Hegele-Drywa & Normant 2014). Successful colonisation of new regions by *R. harrisii* was possibly due to this species' broad tolerance to abiotic factors, especially temperature and salinity, a broad omnivorous diet, a high rate of reproduction, and the presence of a pelagic larval stage that allows for long-distance transport in ballast waters (Turoboyski 1973, Gollasch & Leppäkoski 1999, Normant & Gibowicz 2008, Forward 2009, Hegele-Drywa & Normant 2009).