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A new hermit crab (*Anomura*, *Paguroidea*) from the upper Albian (Cretaceous) of Annapol, Poland

RENÉ H. B. FRAAIJE^{1,5}, BARRY W. M. VAN BAKEL^{1,2}, JOHN W. M. JAGT³ & MARCIN MACHALSKI⁴

¹*Oertijdmuseum De Groene Poort, Bosscheweg 80, 5283 WB Boxtel, the Netherlands. E-mail: info@oertijdmuseum.nl*

²*Naturalis Biodiversity Center, P.O. Box 9517, 2300 RA Leiden, the Netherlands. E-mail: barryvanbakel@gmail.com*

³*Natuurhistorisch Museum Maastricht, de Bosquetplein 6-7, 6211 KJ Maastricht, the Netherlands. E-mail: john.jagt@maastricht.nl*

⁴*Instytut Paleobiologii, Polska Akademia Nauk, ul. Twarda 51/55, 00-818 Warszawa, Poland. E-mail: mach@twarda.pan.pl*

⁵*Corresponding author*

Abstract

A new diogenid paguroid, *Paguristes liwinskii* sp. nov., is described from upper Albian phosphorite-bearing deposits near Annapol, along the east bank of the River Vistula (Wisła), east-central Poland. This new species constitutes an additional example of Early–Mid-Cretaceous macrofaunal shift, from marine reefal limestone to siliciclastic facies, triggered by the worldwide radiation of planktonic organisms. The species described here is the earliest known member of the genus *Paguristes*, previously recorded from the upper Santonian/lower Campanian to the Recent.

Key words: Europe, condensed sections, new species

Introduction

During the Middle and Late Jurassic, hermit crabs thrived mainly in shallow-marine, reefal environments. In fact, on some reefs during this time interval, paguroid diversity even exceeded that of brachyurans. For example, Fraaije (2014) described 17 paguroid taxa from a sponge-dominated reef of Kimmeridgian (Late Jurassic) age, the number of associated crab taxa not exceeding a dozen. So far, only a handful of paguroids have been recorded from coeval deeper-water, offshore environments (e.g., Schweigert *et al.* 2013).

During the Early Cretaceous, a radiation of marine planktonic organisms such as calcareous nannofossils, planktonic foraminifera and radiolarians occurred (e.g., Erbacher & Thurow 1997; Larson & Erba 1999; Leckie *et al.* 2002). Because of the increase in continuous ‘snowfall’ of planktonic remains to the sea floor, benthic organisms flourished as well, including anomurans and brachyurans amongst decapod crustaceans.

From the Early Cretaceous onwards, hermit crabs, and members of the families Diogenidae Ortmann, 1892 and Paguridae Latreille, 1802 in particular, radiated across the globe in such nutrient-rich environments. In view of increased competition between paguroids and brachyurans in shallow-water settings many of the Late Mesozoic paguroid families either migrated into deeper-water environments or went extinct. In short, the move from a reefal to other habitats by early paguroids and other anomurans was facilitated, from the late Early Cretaceous (Aptian) onwards, by a marked increase in diversity and biomass of planktonic organisms (foraminifera, coccolithophores, silicoflagellates and diatoms) with mineralised skeletons.

Here we add another example of paguroid from the upper Albian of Annapol, east-central Poland. Near the town of Annapol, on the right bank of the River Vistula (Wisła in Polish), a highly condensed succession of phosphorite-bearing lower Albian to lower Turonian strata is exposed (Fig. 1A, B). A detailed overview of the intricate stratigraphy of this succession has recently been provided by Machalski & Kennedy (2013). Previous records of decapod crustaceans (e.g., Collins 1969; Marcinowski & Radwański 1983) included glypheid lobsters (see Charbonnier *et al.* 2013) and brachyurans, but no paguroids. Newly collected material comprises several fragmentary specimens of *Hoploparia* cf. *longimana* (G.B. Sowerby, 1826), *Trachysoma sanctaerucis* (Collins, 1969), *Necrocarcinus* sp. (n. sp.), *Plagiophthalmus* n. sp., and two types of currently indeterminate claws. This material is now under study and will be published in a forthcoming note.