

**Early Cretaceous (Valanginian) unique polychelidean lobsters (Decapoda, Polychelidae) as autochthonous fauna of deep-sea flysch environments (Carpathians, Czech Republic)**

**Krobicki, M.<sup>1,\*</sup>, Audo, D.<sup>2</sup>, Charbonnier, S.<sup>3</sup>**

1) Polish Geological Institute - National Research Institute, Krakow, Poland,

\*E-mail: [michal.krobicki@pgi.gov.pl](mailto:michal.krobicki@pgi.gov.pl)

2) UMR CNRS 6118 Géosciences, Université de Rennes I, Rennes, France

3) Muséum national d'Histoire naturelle, Sorbonne Universités, Paris, France

Polychelidan lobsters are one of the rare groups of decapod crustaceans which were first discovered as fossil long before being identified in extant deep-sea palaeoenvironments. In 1863, Ludwig Hohenegger discovered in Dolní Líštná village near Třinec (Czech Republic) in the Moravian part of the Flysch Carpathians, a unique specimen of polychelidan lobster, "*Eryon neocomiensis*". In the fossil record, most species of Eryonidae are associated with shallow-water environment. Our reinvestigation has shown this specimen is in fact one of the rare example of Polychelidae, the family to which all extant deep-dwelling species are ascribed. This prompted us to study its palaeoenvironmental and sedimentary context. In the Dolní Líštná region, the Outer Western Carpathians are dominated by the Silesian Unit, and in this area the so-called Godula Subunit occurs and is represented by very thick (up to 6,000 m) turbidite system. The surroundings of Dolní Líštná are formed mainly by the so-called Hradiště Formation, and especially its lower part, which has been known earlier as Upper Těšín (Cieszyn) Shales (= Obere Teschener Schiefer or Obere Těšín-Schichten), belongs recently to the Cisownica Shale Member of the Hradiště Formation. The sedimentological character of this unit indicates typical flysch features, including dark brown-grey, variably silty-sandy claystones and marly shale-type deposits intercalated with rare thin-bedded fine-grained calcareous sandstones and marlstones, representing classical fan-shaped submarine lobes and their outer, more distal, parts of deep-sea turbiditic system. A few finds of ammonites in this interval are mainly connected with the Dolní Líštná area which is also the type locality of *Busnardoites campylotoxus* (UHLIG, 1902). *B. campylotoxus* is a valuable taxon for the Early Valanginian biostratigraphy in Mediterranean province which was until recently an index taxon for upper part of the lower Valanginian (*Busnardoites campylotoxus* Zone). If *E. neocomiensis* indeed co-occurs with this ammonite (it could also correspond to another horizon, although the lithology is similar), this implies it comes from the upper part of the middle Early Valanginian (= *V. dolioliformis* Subzone of the *N. neocomiensiformis* Zone of the Lower Valanginian), according to recent biozonation.

Interestingly, *E. neocomiensis* seems to be autochthonous in its host rock. Indeed, it is preserved complete and articulated, with very fine morphological details such as delicate spines. It was also probably quickly buried, perhaps by fine-grained silty muds of weak turbiditic suspension clouds. As modern polychelids, *E. neocomiensis* presents reduced ocular incision, perhaps an adaptation to deep-sea dwelling. *E. neocomiensis* is therefore probably one of the rare and interesting deep-sea macrofossil providing evidence for a relatively deep bathymetry of the Silesian Basin during Early Valanginian times.