

Foraminifers from the early basin of the Polish Outer Carpathians: relationship with the Western and Eastern Tethys (Tithonian)

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The formation of the Polish part of the Outer Carpathian Basin was initiated by the rifting process which led to the collapse and disintegration of the southern margins of the European Platform in the Late Jurassic. Fragments of carbonate platform were incorporated into the basin structures which divided the area into several sedimentary zones located at different depth. Under these conditions, most of the carbonate sediments were transported to the basin in the form of submarine landslides and gravity flows of varying densities, or accumulated during pelagic sedimentation. These deposits belong to two formations exposed in the westernmost part of the Polish Outer Carpathians, located near the Polish-Czech border. The first is mainly represented by the Tithonian marls (Vendryne Fm.) which also contain redeposited carbonate rocks and fossils (Oxfordian-Tithonian), the second is composed of limestones and marly shales of the late Tithonian-Berriasian (Cieszyn Limestone Fm.). These oldest sedimentary rocks in the Polish Outer Carpathians contain mainly benthic foraminifers and very scarce plankton occurring in exotic blocks and sometimes directly in sediments forming both formations. The first group includes forms with calcareous walls and also cemented with siliceous or calcareous material. Calcareous benthic forms belong mainly to Vaginulidae (*Vaginulina*, *Vaginulinopsis*, *Astacolus*, *Citharina*, *Citharinella*, *Lenticulina*, *Palmula*), Nodosariae (i.e. *Frondicularia*, *Nodosaria*, *Dentalina*), Epistominidae (*Epistomina*), and Polymorphinidae (*Guttulina*), while agglutinated taxa are represented by Verneulinidae (*Uvigerinammina*, *Paleogaudryina*, *Beorussiella*, *Verneuilina*), Andercotrymidae (*Praedorothia*,

Protomarssonella, *Pseudomarssonella*) and Textulariopsidae (*Bicazammina*, *Hagimashella*, *Textulariopsis*). They can be related to the Jurassic shelf microfauna, which are known both from the Tethys and the European Platform. Among foraminiferal benthos there are also very rare agglutinated taxa belonging to several genera: *Melathrokerion*, *Buccicrenata*, *Alveosepta*, *Pseudocyclammina*, and the more common calcareous forms of *Andersenolina*, *Neotrocholina*, *Trocholina*, *Paalzowella*, as well as of *Discorbis*, which inhabited shallow marine environments formed around the elevations within the basin as well as on its coast.

Recently, apart from the benthic microfauna isolated Globigerina-like forms have been also found in the Tithonian deposits. These few forms resemble early planktonic foraminifera of the Western Tethys (*Gl. oxfordiana*, *F. hoterivica*) as well as the taxa known epicontinental and sub-Tethyan seas located north ("*Gl.*" *stellapolaris*) and east (*Gl. balakhmatovae*, *G. terquemi*) of the studied area.

The taxonomy, abundance and state of preservation of the described foraminifera from the early basin of the Polish Outer Carpathians indicate a connection with the gradually degraded areas of the platform inhabited by benthic and plankton communities from both the Tethyan and Boreal seas. The studied foraminifera resemble the microfauna of Western and Eastern Tethys and adjacent platforms.

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