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Early Devonian Biostratigraphy with ostracodes: Problems, Progress und Possibilities

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More than 10 years ago, GROOS-UFFENORDE, LETHIERS & BLUMENSTENGEL (2000) presented a state of the art on Devonian ostracodes and stratigraphy for the Subcommission on Devonian Stratigraphy. Since then, several more sections, areas and faunas have been studied. In this talk, a summary of data on Early Devonian ostracodes published in the last decade will be given, and the problems, progress and possibilities concerning their use in biostratigraphy will be commented.

Up to now, no international standard ostracode zonation for the Devonian exists, although interbasinal correlations are possible with Late Devonian pelagic entomozoids or assumed nectobenthic spinose ostracodes of the so-called Thuringian Mega-assemblage. However, so far Early Devonian ostracodes are used for regional correlations only, and are therefore considered of little biostratigraphical significance. But why should the Early Devonian ostracodes be useless for this purpose, whereas the Late Devonian ones provide partly excellent data for detailed biostratigraphical subdivisions?

A general problem in using ostracodes for correlations is their strong facies dependence, which affects their stratigraphical and correlative value. But besides the facies dependence three main problems are hindering the biostratigraphical use of Early Devonian ostracodes: (1) the absence of suitable sections without facies change, but rich in conodonts and ostracodes (2) high variability, and (3) an inadequate knowledge as regards geographical and stratigraphical distribution and precise age of many localities. In order to meet these problems future work has to consider: (1) sections which may not be without facies change, but where the disruption of biostratigraphical interpretation is minimal and sampling of these sections with new methods to get calcareous ostracodes from the limestones; (2) Morphometric analysis to inquire variation and unravel morphotype distribution and evolutionary patterns; (3) improvement of information to fill up our knowledge at the at present scattered stratigraphical and geographical data. And as many beds without conodonts are rich in ostracodes, the ostracodes can become a vital source of auxiliary information for biostratigraphical correlation once a conodont-dated baseline with ostracodes is erected.

A good improvement is already noticeable regarding the available information. Since GROOS-UFFENORDE *et al.* (2000) several additional ostracode faunas have been studied. Outstanding is the work from Bakharev describing large faunas e.g. from the Emsian of the Salair and the Kuznik basin in Russia (BAKHAREV 1998, BAKHAREV & BAZAROVA 2000). Large faunas are also published from the Spanish Peninsula, such as from the Pyrenees, the Guadarrama, Aragón (e.g., DOJEN 2005, DOJEN *et al.* 2009) and the Cantabrian Mountains (e.g., BECKER 2000, 2001). Further new data are available for example from Morocco (e.g., BECKER *et al*. 2004; DOJEN *et al*. 2010), from Nevada (DOJEN *et al*. 2009) and from Turkey (DOJEN *et al*. 2004). However, the taxonomical, geographically and stratigraphically crossovers are still small, but some taxa are already regarded as possible supraregional biostratigraphical markers such as various species of *Miraculum* POLENOVA, *Polyzygia* GÜRICH, and the species *Placentella heraultiana* GROOS-UFFENORDE.

Future studies on calcareous ostracodes e.g. from the Carnic Alps and analysis with morphometric methods should provide us with conodont-correlated ostracode zonation with interbasinal application potential, which will greatly strengthen our ability to correlate early Devonian strata.

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