Geophysical Research Abstracts
Vol. 14, EGU2012-5251, 2012
EGU General Assembly 2012

Sea-level changes and the Middle-Upper Devonian sequence in the Baltic basin

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Lithostratigraphic succession of the Middle-Upper Devonian of Baltic, represented by siliciclastic and carbonate deposits of the wide shallow epeiric sea, is well-established. The sequence of biotic and sea-level changes has been studied in detail for about half a century. However, it was rarely tried to compare the sea-level curve for the Baltic with the curve of the global sea-level changes and correlate the succession with the sequence of the Devonian global events well established mainly in the marine record.
New facies analysis and biostratigraphical and taphonomical studies together with the re-evaluation of signatures of the world-wide events using sedimentological and palaeontological data enables better understanding of the development of the Middle-Late Devonian basins of the Baltic area. Indications of such events as eustatic fall of the sea-level close to the Givetian-Frasnian and Frasnian-Famennian boundaries, several small-scale transgressions during Famennian interglacials are rather clearly traceable within the sequence. Distribution of deposits, biotas and facies suggests diminishing of the depositional area since the maximum transgression in the earliest Frasnian thus demonstrating good coincidence with the global sea level curve (Haq & Schutter 2008). The retreat of depocentre of the palaeobasin in westerly direction during the late Frasnian and the Famennian likely was caused by tectonic subsidence at the western part of the east Baltics. The most significant event levels identified within the section are the extended Taghanic onlap (middle Givetian) evidenced by dolocretes in the upper part of the Burtnieki Fm; significant drop of the sea level during the earliest Frasnian indicated by widely distributed dolocretes in the top of the Amata Fm that points to the possible position of the Givetian/Frasnian boundary below the Amata; level of the Dubnik RS with extensive gypsum deposits and non-oxidised organic matter of the Salaspils Fm evidencing arid climate and hypoxic pulse; fast eustatic rise (event No. 5 in nomenclature of Sandberg et al. 2002) at the base of the Stipinai Fm and continued eustatic rise (event No. 6) at the base of the Bauska Member of the Stipinai Fm; eustatic fall (event No. 7) at the base of the Amula Fm; storm deposits and possible tsunami breccias (events No. 10 and 11) represented by coarse grained conglomerates within the Upper Amula Member (event No.11 coincides elsewhere with the Frasnian-Famennian boundary); eustatic rise (event No. 12), reflected within the sequence of the Eleja Fm, is evidenced by dramatic changes of miospore, vertebrate and invertebrate assemblages; the Tervete Fm yields traces of the most significant drop of the sea level in the middle-late Famennian; the Skervelis Fm shows signatures of the long-lasting subaerial exposition of the rocks, thus corresponding to the start of the major eustatic fall, coinciding with the Latest Famennian mass extinction.
However, some time spans of the sea level changes and a few events are traceable with difficulties, mainly due to peculiarities of facies distribution, lack of conodonts in the vast majority of units composing the sequence and restricted connection of the Baltic Devonian basin with the ocean.