ACTA PALAEONTOLOGICA POLONICA

The Frasnian-Famennian events in a deep-shelf succession, Subpolar Urals: biotic, depositional, and geochemical records

Alexandra B. Yudina, Grzegorz Racki, Norman M. Savage, Maria Racka, and Krzysztof Małkowski
Acta Palaeontologica Polonica 47 (2), 2002: 355-372

The Frasnian-Famennian (F-F) boundary is well biostratigraphically documented in the *Palmatolepis*-rich deposits exposed along the Sywiu River in the lower slopes of the Subpolar Urals. The thin-bedded calcareous-clayey-siliceous deep-slope succession of the Vorota Formation appears to represent continuous Domanic-type deposition throughout the world-wide carbonate crisis time, without evidence for the basal Famennian hiatus or a large-scale sedimentary perturbation within a regressive setting. The northernmost Laurussian sequence exhibits many well known signatures throughout the broad F-F timespan: the appearance of organic- and clay-rich deposits, icriodontid and radiolarian blooms, and a correlative shift of several geochemical proxies towards hypoxic and high-productivity regimes, perfectly recorded by positive d13Ccarb excursions of +3.5 o/oo. Integrative biotic, microfacies and geochemical data substantiate a longer-term oceanographic destabilization, attributable to multiple Earth-bound triggering factors in (episodically enhanced?) greenhouse climate and punctuated eustatic sea-level highstands, superimposed on the elevated deposition of organic carbon-rich sediments during the Upper Kellwasser Event. Unsteady eutrophicated, and oxygen-depleted ecosystems during the F-F biotic crisis interval could be assumed, especially when intensified by various spasmodic tectono-volcanic phenomena in the incipiently closing Ural Ocean.

Key words: Frasnian; Famennian; Kellwasser Crisis; conodonts, microfacies, carbon isotopes; geochemistry; Timan– Pechora Basin.

Alexandra B. Yudina [alexa_geo@yahoo.com], Institut Geologii, Komi Nauchnyj Tsentr, Uralskoye Otdeleniye, Syktyvkar, Russia; Grzegorz Racki [racki@us.edu.pl], Maria Racka [racka@ultra.cto.us.edu.pl], Wydział Nauk o Ziemi, Uniwersytet Śląski, ul. Będzińska 60, PL–41–200 Sosnowiec, Poland; Norman M. Savage [nmsavage@oregon.uoregon.edu], Department of Geological Sciences, University of Oregon, Eugene, OR 97403, USA; Krzysztof Małkowski [malk@twarda.pan.pl], Instytut Paleobiologii PAN, ul. Twarda 51/53, PL–02–089Warszawa, Poland.

This is an open-access article distributed under the terms of the Creative Commons Attribution License (for details please see creativecommons.org), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.


Full text (1,854.3 kB)