

Faunal and facies changes at the Early-Middle Frasnian boundary in the north-western East European Platform

Andrey V. Zhuravlev, Elena V. Sokiran, Irina O. Evdokimova, Ludmila A. Dorofeeva, Galina A. Rusetskaya, and Krzysztof Małkowski
Acta Palaeontologica Polonica 51 (4), 2006: 747-758

Multidisciplinary study of the Early-Middle Frasnian boundary in the north-western East European Platform (Main Devonian Field) allows evaluation of changes in facies, brachiopod, ostracod, and conodont associations, as well as carbon isotope composition. Brachiopod and ostracod faunas, characterized by predominance of rhynchonellids, spiriferids, podocopids, and platycopids in the Early Frasnian, and by predominance of spiriferids, palaeocopids, and kloedenellocopids in the Middle Frasnian, demonstrate significant changes in dominance and diversity likely caused by regression-transgression couplets in the extremely shallow-water environment. Changes in diversity of the conodont associations, represented mainly by shallow-water polygnathids and spathognathids, are controlled by sea-level fluctuations as well; however significant evolutionary turnover is absent. Deepening pulses lead to an increasing in diversity of both the benthic and nektic groups, whilst regressions cause diversity fall due to progressive habitat reduction. Most prominent decreasing in the fauna diversity is observed in the late Early Frasnian (Dubnik time) coinciding with the regressive phase of the Late Givetian to Early Frasnian eustatic cycle. Positive-negative $\delta^{13}\text{C}$ excursion, detected in brachiopod calcite from the early interval of the Middle Frasnian, can be correlated with global isotopic perturbations near the Frasnian substage boundary: the positive 2.60 $\delta^{13}\text{C}$ excursion is probably linked with enhanced primary production in high-nutrient regimes in the epeiric sea.

Key words: Conodonta, Brachiopoda, Ostracoda, facies, correlation, carbon isotopes, Frasnian, Main Devonian Field, East European Platform.

Andrey V. Zhuravlev stratigr@mail.wplus.net, Palaeontology Department, St. Petersburg University, 16th Line 29, 199178 St. Petersburg, Russia; Elena V. Sokiran elena_sokiran@mail.ru, Irina O. Evdokimova Irina_Evdokimova@vsegei.ru, Galina A. Rusetskaya, and Ludmila A. Dorofeeva, Russian Geological Research Institute (VSEGEI), 74 Srednii Pr., 199026 St. Petersburg, Russia; Krzysztof Małkowski malk@twarda.pan.pl, Instytut Paleobiologii PAN, ul. Twarda 51/53, PL-02-089 Warszawa, 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 \(302.2 kB\)](#)