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Conodont ecology in the Early-Middle Frasnian transition on the South Polish carbonate shelf

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Well exposed Early-Middle Frasnian (E-MF, *Palmatolepis transitans* to *Palmatolepis punctata* zonal interval) deposits of the Holy Cross Mountains, in particular the reference Wietrznia section at Kielce, were studied in terms of conodont biofacies dynamics. Frequency of the conodont elements has been controlled mostly by depositional rate in hemipelagic muddy lithofacies and post-mortem gravity sorting during lateral redeposition in storm-generated, talus-like and encrinite layers. The conodont assemblages are dominated by a highly varying proportion of polygnathid, icriodontid, and ancyrodellid fauna. Major biofacies turnovers coincided with the deepening pulses corresponding to Timan, Middlesex, and early Rhinestreet global events. Trends in the conodont dynamics, mortality, and diversity point that the biotic shifts also coincide with the large-scale ´13C excursions as a record of changing trophic conditions during the major biogeochemical perturbation. A gradual decline of the Early Frasnian *Ancyrodella* reef-dwelling community correlates with the minor positive and succeeding larger negative ´13C excursion, and this is paired with a replacement by mostly sparse, polygnathid and polygnathid-icriodontid biofacies, as well as with a short-term *Belodella* acme in mud-mounds areas. The distinctive habitat deterioration in pelagic and reef ecosystems is broadly correlative with the Domanik Crisis. The progressive biofacies unification is a conodont response to onset of the prolonged (ca. 0.5 Ma) ´13C enrichment, probably linked with high-stress life conditions due to eutrophication and partly anoxic regimes. A negative carbon isotope excursion in the late *Pamatolepis punctata* Zone is marked by the second major biofacies turning point during the Rhinestreet transgression, as recorded primarily in a final mesotaxid extinction, and highlighted also by decrease of conodont size and increased mortality of juveniles. After stabilization of ´13C values and a return to the background level across the *Palmatolepis punctata-Palmatolepis hassi* zonal transition, renewed biofacies diversification, in particular re-appearance of reef-related ancyrodellid fauna, took place. In addition, a large-scale migration event among palmatolepids and polygnathids during sea-level rise, mainly from the East European Platform, characterized this Middle Frasnian interval.

Key words: Conodonts, biofacies, palaeoecology, Devonian, Early Middle Frasnian boundary, Poland.

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