THE GREAT ORDOVICIAN BIODIVERSIFICATION: ESTABLISHMENT AND GLOBAL EXPANSION OF NEW ECOLOGICAL GUILDS IN MARIN ECOSISTEMS

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The evolution of biosphere can be presented as a process of (1) spatial expansion of life on the Earth and (2) appearance of new more efficient ecological specializations (guilds). From this point of view, the Ordovician period was a turning point in the evolution of marine ecosystems. In the Ordovician many groups of filtrating organisms with framework skeleton, such as tabulates, rugoses, bryozoas, crinoids and stromatoporoids, appeared for the first time and reached maximum flourish since the Middle Ordovician. At the lowest trophic level the dominant position was occupied by ostracodes. In the Ordovician the pelagium for the first time became permanent (not optional as previously) sphere of life of zooplankton and nektonic organisms: graptolites, nautiloidea, conodontophoridia, pelagic forms of trilobites and ostracodes, the first fish. In the Ordovician the spatial redislocation of the producers has also occurred. Prior to the beginning of the Middle Ordovician cyanobacteria and benthic algae were the main producers in the epicontinental seas. Later phytoplankton became dominating. Thus, in the Ordovician marine ecosystems became multi-stage and for the first time the global closed biogeochemical cycle has formed within the limits of the entire seas. The existence of permanent zoopelagium is suggested to become possible due to the appearance of ozone screen in atmosphere. Two major types of biotic crises are proposed to be distinguished: taxonomic (catastrophic decrease in diversity) and ecological (extinction of ecological guilgs). The Late Ordovician crisis of ecosystems was taxonomic, as at this time not a single ecological quild extincted, but the earlier monopoly groups (particularly trilobites) mainly underwent taxonomic reduction.