

RED TIDES, ANOXIC EVENTS AND BIOTIC CRISES

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Crises of marine biota in the Phanerozoic coincided with eustatic fluctuations and accompanied anoxic events and accumulation of layers with a high percentage of organic matter (OM). Hallam & Bradshaw (1979) showed that the formation of organic-rich horizons correlates with short time transgressive cycles. These are the so-called black shales, black band, black marls. The composition of these black sediments is mixed of terrestrial and marine organic carbon. However not all transgressions were accompanied by the accumulation of layers rich in C_{org}. The general scheme of the events may be as follows: Short time eustatic transgressions (3. order) were replaced by more shorter regressive cycles. During this time large territories with lowland surfaces were opened in epicontinental basins and on the shelves. Lowland surfaces and warm climate resulted in the development of lakes/bogs landscapes. There were favourable conditions for the accumulation of terrestrial OM, and in the weakly acidic waters different biophil elements and first of all phosphor concentrated. Interrelations of these landscapes and new transgressive pulses contribute: 1) input of terrestrial OM into the basins 2) input of dissolved OM, phosphor and other biophile elements 3) biophile elements, especially phosphor rapidly enter in the biological cycle. Depending of these processes the primary productivity will increase. Especially the rapidly growing bioproduction of phyto- and piquoplantic species will form blooms that are comparable to the modern "red tides", which have great toxic influence on all marine biota, including calcareous zooplankton (foraminifers). Phytoplankton without shells will increase the deposition of OM but the depositions of calcareous tests will decrease. Anaerobic diagenesis and diffusion of H₂S into the bottom waters will create stagnant conditions. The benthic fauna will be killed. Thus "red tides" as a consequence of transgressive cycles lead to a negative influence on both planktonic and benthonic assemblages, although the mechanisms are different.

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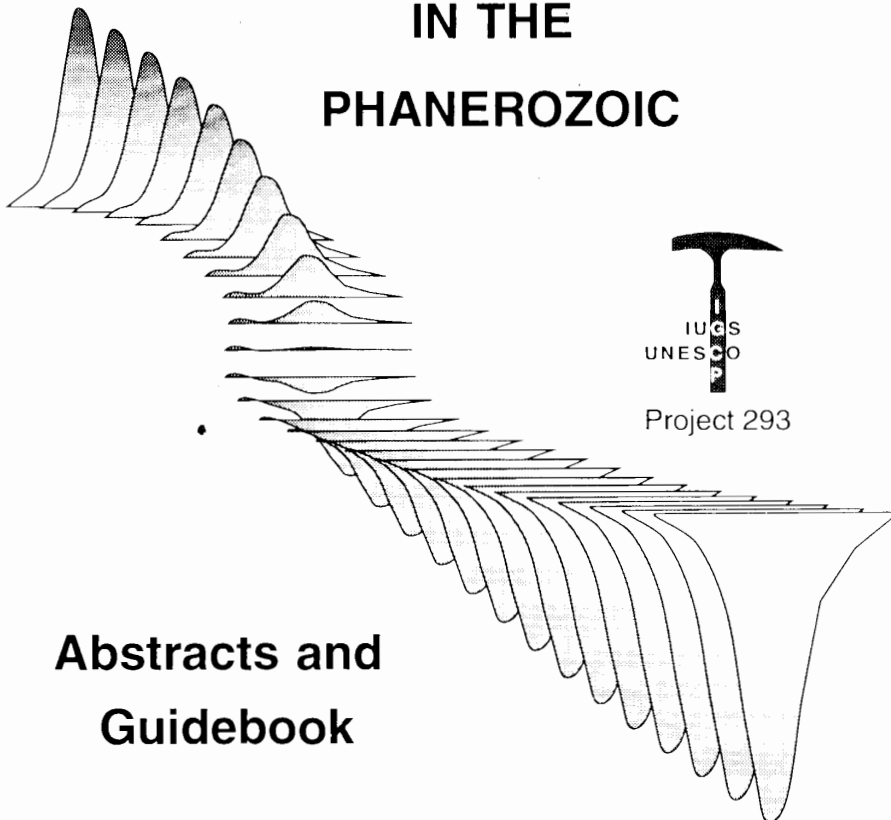
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