Paper Number: 4545

Collapse and rebuilding of marine ecosystems during the P-Tr transition in Gondwana world

Zhong-Qiang Chen[1*]

[1]State Key Laboratory of Biogeology and Environmental Geology, China University of Geosciences, Wuhan 430074, China [e-mail: zhong.qiang.chen@cug.edu.cn]

Life on Earth experienced the greatest depletion at the end of the Permian. Although global data show a catastrophic extinction pattern, actual fossil record shows that this biocrisis may comprise two phases, more importantly, biotic extinction patterns may be different in various latitudes. In the Gondwana marine settings, the latest Changhsingian (= *Clarkina yini* conodont zone) faunas seem to be very rare, and thus this fossil gap is across the main phase of the end-Permian extinction defined by the *C. meishanensis* Zone. Surprisingly, a few faunas migrated to the Gondwanan seas immediately after the main extinction. They, however, became extinct soon after when the 2nd extinction phase took place in low-latitude regions (defined by *Isarcicella staescheri* Zone). The latter extinction horizon has been treated as the mass extinction level in Gondwana by earlier authors. Accordingly, the end-Permian mass extinction seems not be contemporaneous globally. After the biocrisis, marine faunas were very rare in Griesbachian-Dienerian time, and marine ecosystems were characterized by microbial proliferation and low-diversity, high abundance shelly communities (i.e., Claraia-dominated communities). Biotas rebounded in Smithian when many invertebrate and vertebrate clades diversified in some marginal seas, although benthos (i.e., brachiopods) still remained rare. Some fresh-water animals (i.e., insects) also proliferated in some relatively restricted waters near the shoreline. In particular, some predatory fishes and reptiles occurred in Madagascar, indicating the presence of high-trophic predators in marine ecosystem. Meanwhile, ichnofaunas appeared considerably diverse and abundant, although microbialites and MISS-related microbial mats were also widespread in that time. Proliferation of biotas of various strophic levels indicate the establishment of a relatively complete ecosystem structure, marking a final recovery in Smithian, about 1.5 myr after the end-Permian mass extinction, exhibiting a much earlier recovery of marine ecosystem than that in tropic regions.