

Recovery of marine faunas after the P/T mass extinction: Recovery as a community

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At the end-Permian mass extinction, more than 90% of marine animals were thought to have become extinct, and many hypotheses have been proposed about the cause(s) of this mass extinction. There are also many unsolved questions remain about the pattern and process of recovery of marine animals in the Early and Middle Triassic. It has not been clarified what kind of marine faunas firstly invaded vacant niches after the extinction and how these showed their adaptive radiations. In order to solve these questions, we studied recovery patterns of different marine faunas; crinoids (echinoderms), trace fossils (*Rhizocorallium* and *Arenicolites*) and sharks from various localities of Japan, Prymorye, Oman, western United States, Spitzbergen, southern Europe, and traced their paleogeographic pattern of recovery. As a result, these faunas showed a common pattern of recovery in each area; firstly they showed a rapid recovery in the Neotethys in the Griesbachian, then in eastern Tethys (Japan and Prymorye) in the Smithian, and finally in southern Europe and western United States in the Spathian. Thus these animals showed their recovery in different ages geographically, but in each area they showed a synchronous recovery. This result shows that these animals (crinoids, some trace fossil-producers, sharks) showed their recovery as a community, not recovering individually in different ages.