

Permian and Triassic terrestrial ecosystems and the P/T crisis in the Southern Alps

Irreversible loss of species is perhaps the most alarming symptom of a possible ongoing mass extinction. In order to understand long-term consequences of present-day biodiversity decline, it is important to investigate past mass extinctions and understand the patterns of species response to global environmental deterioration.

The Permo-Triassic is a period of important evolutionary processes for terrestrial ecosystems, with a change from the primitive flora and fauna of the Palaeozoic to the "modern" ancestral groups of the Mesozoic. It also includes the most severe extinction event of the Earth history, happened about 251 million years ago at the Permian-Triassic boundary. During this event up to 95% of all marine species and about 70% of terrestrial vertebrate species became extinct. Nonetheless, surprisingly little is known about the causes, effects and timing of this mass extinction and successive biotic recovery in terrestrial ecosystems, because our knowledge of the event is mainly based on the study of marine successions.

The Southern Alps are one of the few localities in the world where an integrated study of the different components of the terrestrial ecosystems is possible. An in depth study of this area may thus shed new light on the ongoing debates about the causes and effects of environmental changes on the terrestrial ecosystems. Modern studies of terrestrial ecosystems cannot be based on single taxonomical groups or methods, but need to have a multidisciplinary approach integrating paleontological studies, sedimentology and geochemistry. Studies should be conducted both on the fossils and to the stratigraphical sequences in order to integrate paleoclimatic signals from different proxies in a reconstruction of the evolution of terrestrial ecosystems.

Here we propose a multidisciplinary study of Permian and Early-Middle Triassic outcrops from the Dolomites and nearby areas, in order to estimate the dynamics of the extinction and biotic recovery of different plant groups during and after the catastrophic event, and to compare terrestrial ecosystems before and after. The obtained data will provide also an important contribution to the worldwide project of the Palaeobiology Database (www.paleodb.org), that constitutes the biggest and most valuable source of online palaeontological data.

Within these broad goals, we encourage the submission of research projects aimed at the paleobotanical, palynological, sedimentological and/or geochemical reconstruction of specific time intervals from the Permian to the middle Triassic, with emphasis on multidisciplinary.

Research funded in part by the Naturmuseum Soudtirol (Bolzano/Bozen)