# THE PERMO–TRIASSIC TRANSITION AND ITS EFFECT ON PLANT DIVERSITY AND DISTRIBUTION

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The Permian and Triassic periods were important for the evolution of terrestrial ecosystems. Not only was this the time of the end-Permian mass extinction event (EPME) and subsequent recovery, there was a change from icehouse to hothouse climatic conditions that caused aridification in the palaeotropics. This shaped the landscape, changed the local and regional environmental conditions, and influenced plant palaeodiversity. Hundreds of papers, popular books and TV documentaries discuss the mass extinction, mostly from a marine and terrestrial animal perspective. The scale and pattern of species loss, the environmental and climatic changes during that time, as well as dynamics and pattern of the biotic recovery of the plant communities are still matters of an ongoing discussion and have become a hot topic in the last few years, since the scientific community accepted that not all groups of organism followed the same dynamics within the extinction interval. Due to scarce and impoverished fossil megafloras from the latest Permian and earliest Triassic, the common perception has been that land plants suffered a mass extinction like the terrestrial and marine animals. Early Triassic macroplant assemblages are indeed often markedly impoverished and dominated by opportunistic taxa such as the iconic lycophyte *Pleuromeia*, although some megafloras were more diverse and gymnosperm-dominated. There are very few regions worldwide where macrofloras provide a detailled and unbiased fossil record from the early Permian up to the Middle-Late Triassic. A strong taphonomic bias, along with the fact that the macrofossil record is considerably undersampled for the Early Triassic, gives the impression of an increased gymnosperm extinction during the latest Permian. Recent discoveries of nearly all major post-extinction plant groups, including bona fides Corystospermales, Cycadales, Bennettitales, Czekanowskiales, Podocarpales, and Araucariaceae in the middle to late Permian and the presence of “mixed” floras indicates that these groups did not evolve in response to the EPME, but rather that the mass extinction and correlated changes in climate and environmental conditions gave origin to their major radiation afterwards. The palynological record, not as deeply affected by the taphonomic bias due to the higher preservation potential of spores and pollen, reflects a series of ecological disturbances and climatic changes around the Permian–Triassic boundary and during the Early Triassic. The exceptional preservation of delicate plant tissues such as exceptionally preserved cuticles from the Permian, Middle Triassic seedlings from France, and in situ spores and pollen from the Permian and Triassic give unprecedented insights into the biology, evolution, as well as stratigraphic and paleogeographic distribution of the various plant groups. This affects not only our understanding of the plant evolution through time but also of their ability to react to present and future climatic crises.