

# Biotic responses to large igneous province volcanism during the end-Triassic crisis: Mass rarity, mutations and extinctions

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Greenhouse gas emissions from large-scale volcanism in the Central Atlantic Magmatic Province is considered to have caused the end-Triassic mass extinction (201.5 million years ago). Abundance changes in spores and pollen and marine dinoflagellate cysts in the Danish and North German basins record the devastating effects this volcanic induced climate crisis had on both the terrestrial and marine environment (Lindström et al. 2019, Lindström 2021, Gravendyck et al. 2020, Lindström et al. 2023, Bos et al. 2023, Lindström 2023). Combined stress from global warming, volcanic pollution and sea-level changes resulted in mass rarity, mutations and extinctions in land plants, as well as severely decimated phytoplankton diversity with the extirpation of many dinoflagellate species. The devastation of the terrestrial habitats was further amplified by increased wildfire activity and enhanced soil erosion in NW Europe (Belcher et al. 2010, Petersen & Lindström 2012, van de Schootbrugge et al. 2020). Here, we demonstrate how two high-resolution palynological data sets; Stenlille in the Danish Basin and Schandelah in the North German Basin, that together cover the entire Rhaetian to Sinemurian succession allows a more comprehensive view on the ecosystem changes on land as well as phytoplankton changes in the ocean during the end-Triassic crises and how these changes correlate to the volcanic activity in the Central Atlantic Magmatic Province.

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