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Analyser av pollen og sporer har blitt benyttet til å skaffe informasjon om vegetasjonsutvikling, stratigrafiske lag, og klimaforhold i sedimenter av øvre triassisk alder fra Storbritannia, Ungarn og USA. Vegetasjonsanalysene viser at klimaet i trias i hovedsak var tørt og kun avbrutt av korte perioder med økt fuktighet i Carnian etasjen før klimaet igjen ble tørt i Norian. En bedre forståelse av fortiden kan hjelpe oss til å skjønne mer av fremtidens klimaendringer i landbaserte økosystemer.

Microscopic plant remains (spores and pollen) allow us to trace vegetation and detect environmental, especially climatic changes from deep time in the geological past. The Late Triassic (237-201 Ma) period is marked by an array of environmental changes such as large scale volcanism, a meteorite impact and global climate change. This study describes the response of vegetation from two periods of the Late Triassic, the Carnian (237-227 Ma) and Norian (227-209 Ma), from three locations: the UK, Hungary and SW USA.

Vegetation data from terrestrial sections from the UK and marine sections from Hungary show that the dry climate of the Late Triassic was interrupted by a short humid episode with higher rainfall during the Carnian (approx. 230 million years ago). The humid phase can be linked to changes in the global carbon cycle and the comparison of the vegetation data to clay mineral and elemental climate proxies suggest that chemical weathering was also more intense on the continents due to increased moisture and runoff.

About 15 million years later in the middle Norian, the vegetation of the SW USA had to face new challenges: a shift to drier climate and the Manicouagan impact event. Our new pollen and spore data record from the famous Petrified Forest National Park (Arizona, USA) suggest that a significant vegetation turnover occurred between 213 and 217 Ma in tandem with an extinction of several reptile groups. The drier climate and floral changes affected terrestrial vertebrate communities as the loss of wetland habitat and new plants may have dwindled the food supply for herbivores.

The results of this thesis will help in understanding the response of past terrestrial ecosystems to environmental change, particularly climate change. A better understanding of past climate variations could help predicting environmental and ecological changes in the future greenhouse world.