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Gondwana's climate history inferred from the palynological record of South Africa's coal deposits: the Early Triassic wet intermezzo

Annette E. Götz
Rhodes University, Grahamstown, South Africa (a.gotz@ru.ac.za)

Permian-Triassic coals of the South African Karoo Basin play a central role in the study and interpretation of Gondwana's climate history and related vegetational changes in time and space. The palynological record of the coal-bearing formations reveals major phases of climate amelioration succeeding the Permo-Carboniferous Gondwana glaciations. Subsequent to the melting of the Dwyka ice, cold to cool-temperate climate conditions prevailed during the Early Permian and a continuous change to hot and dry climate conditions of the Late Permian and Triassic was inferred from sedimentological and palaeontological data so far. The here presented new palynological and geochemical data from the Early Triassic Molteno coal (Stormberg Group) point to a short-term switch from dry to wet climate conditions. To date, this wet intermezzo of Gondwana's early Mesozoic climate history has been overlooked in the Molteno coal of the Karoo Basin. The spore/pollen ratios, used as a proxy for humidity changes, indicate a significant climatic change corresponding to a prominent C-isotope excursion. Ongoing studies will provide a detailed palynological inventory of the Early Triassic coal deposits on an intra-Gondwanic scale, contributing to the interpretation of early Mesozoic palaeoclimates.