

## JURASSIC FLORAL GRADIENTS AND CLIMATES

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Fossil plants provide an important means of determining the spectrum of terrestrial climate conditions between lithological end-members such as evaporites and coals. We have determined climate zones (biomes) for the Jurassic by exploring the relationship between foliar physiognomy and climate using correspondence analysis (CA). The genus plots show that microphyllous forms rarely co-occur with macrophyllous and deciduous ones while the corresponding locality plots show a strong correlation between leaf type and palaeolatitude. Such general observations have been made previously, but here we derive a standard means of calibrating the floras in order to compare them and their climate signals through successive time intervals.

A floral gradient was compiled by averaging the Early, Middle and Late Jurassic CA Axis 1 scores for the plant genera common to all three intervals. Some 700 Jurassic plant localities were then assigned a floral gradient score based on their component genera and their positions plotted on palaeogeographic maps. As with the Present, vegetation change is gradational but Jurassic biomes can be defined on the basis of locality gradient scores. Three main vegetational/climatic biomes are recognised; seasonally dry, warm and cool temperate. Their boundaries remained at near-constant palaeolatitudes while the continents moved south, in the case of Asia, and north, in the case of North America. The net global climate change therefore appears to have been minimal. The floral gradient approach enables more detailed studies of variation (both spatial and temporal) within the terrestrial climate spectrum and provides higher-quality data for testing palaeoclimate models and interpretations.