

Reinvestigation of the Miocene palynoflora from the Daotaiqiao Formation of north-eastern China using SEM

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Here we report the first results of an ongoing study on the Miocene palynoflora from the Daotaiqiao Formation of north-eastern China. Using the single grain technique, we examined individual pollen and spores using both light and scanning electron microscopy. A previous study by Grímsson et al. (2012) on Onagraceae pollen grains from this locality, using the same technique identified five different species. Such a variety of Onagraceae from a single palynoflora is unknown elsewhere. The ongoing study suggests a remarkably rich pollen and spore flora with at least 15 different types of spores, one *Ginkgo* and one *Ephedra* type pollen, 11 conifer pollen types and approximately 145 angiosperm pollen types. Spores are very rare in the samples ($\leq 1\%$). Conifer pollen grains are regularly observed but are not a dominant component (ca. 16 %). The samples yield a high quantity and diversity of angiosperm pollen (ca. 80%). The conifers include representatives of Cupressaceae (2 spp.), Pinaceae (*Larix*, *Picea*, *Pinus*, *Tsuga*) and Sciadopityaceae. The angiosperm pollen cover at least 40 families. Prominent elements are pollen of the Betulaceae (*Alnus*, *Betula*, *Carpinus*, *Corylus*), Cercidiphyllaceae (*Cercidiphyllum*), Ericaceae (8 spp.), Eucommiaceae (*Eucommia*), Fagaceae (*Fagus*, *Quercus* spp., Castaneoideae), Juglandaceae (*Carya*, *Cyclocarya*, *Juglans*, *Pterocarya*), Rosaceae (11 spp.), Sapindaceae (*Acer*, *Aesculus*) and Ulmaceae (*Hemiptelia*, *Ulmus*, *Zelkova*). The high angiosperm pollen diversity indicates a varying landscape with a relatively high variety of niches including riparian, dry and mesic forests. Most of the potential modern analogues of the fossil taxa are currently thriving under humid temperate (Cfa- and Cwa)-climates, pointing to paleoclimate conditions not unlike those found today in the lowlands and adjacent mountain regions of the (south-) eastern United States, the humid-meridional region of western Eurasia, and central and southern China, and Honshu (Japan).

References:

Grímsson F, Zetter R, Leng Q. 2012. Diverse fossil Onagraceae pollen from a Miocene palynoflora of north-east China: early steps in resolving the phylogeographic history of the family. *Plant Systematics and Evolution* 298: 671-687.