



A high-resolution angiosperm pollen reference record covering Albian mid-latitude coastal deposits (Lusitanian Basin, Portugal)

Maurits Horikx (1), Jorge L. Dinis (2), and Ulrich Heimhofer (1)

(1) Leibniz Universität Hannover, Institute for Geology, Hannover, Germany (horikx@geowi.uni-hannover.de), (2) Departamento de Ciências da Terra, Universidade de Coimbra, Coimbra, Portugal

The Lusitanian Basin in Portugal is one of the most important areas to investigate the rise and radiation of early angiosperms. Here, important micro-, macro- and mesofossil remains including pollen, reproductive organs, fruits and seeds have been found.

In this study, a high-resolution Early to Late Albian pollen record from a thick (~160m) coastal succession in the Lusitanian Basin containing mixed carbonate-siliciclastic near-shore deposits is generated. The outcrop is located near the town of Ericeira (São Julião) and exhibits some important new features compared to existing records from the Lusitanian basin. The comparatively proximal depositional setting and high sedimentation rate of the São Julião outcrop is well suited for high-resolution palynological sampling compared to previously studied, more distal outcrops. In addition, the succession covers almost the entire Albian including a thick interval representing Late Albian strata. Dating of the succession was obtained using dinoflagellate cyst biostratigraphy, bulk C-isotope analysis and strontium isotope analysis of low-Mg oysters and rudist shells.

The high-resolution pollen record shows a distinct radiation pattern of early angiosperm pollen as well as significant changes in the accompanying palynoflora. During most of the section gymnosperm pollen types such as *Classopollis* spp., *Inaperturopollenites* spp. and *Exesipollenites* spp. are dominant. Angiosperm pollen abundances do not exceed 20%, although angiosperms increase slightly from the Early Albian onwards. Monoaperturate grains of magnoliid or monocot affinity remain the most dominant angiosperm pollen type, both in abundances and diversity. Tricolpate and zonoaperturate pollen grains are also present. In addition, the occurrence of several odd-shaped *Dichastopollenites*-type pollen types is intriguing. The palynological results indicate a warm and dry climate during most of the Albian, although a rise in the spores over pollen ratio in the second half of the section may suggest more humid conditions.

In summary, the combined approach of Sr- and C-isotope stratigraphy together with marine biostratigraphy gives an accurate age assessment, which enables precise dating of the angiosperm pollen pattern emerging during the Albian.