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The Late Cretaceous flowering plant expansion in the context of the transgression of the Central European Sea

The Cretaceous (approximately 145 to 65 million years ago) was a period when land fauna was still dominated by dinosaurs, whereas the land flora underwent a major change. At the beginning of this period flowering plants were still unknown, whereas at the end forest were broadly alike the present ones – built mainly by flowering plants. The details of this major change are still unknown. The aim of the present project consists in using a poorly known Late Cretaceous fossil flora from the North Sudetic Basin (Lower Silesia, Poland; near Bolesławiec and Lwówek Śląski) to check whether the tempo of forest community change in the Late Cretaceous was lower if compared to the Early Cretaceous. At that time, the global sea level was much higher than today (indeed one of the highest in the entire Earth's history), so the climate was, generally speaking, mild and stable. Such a stability of the environment probably explains that changes in the forest vegetation were relatively slower.

The North Sudetic Basin is an area especially adapted for such a study because the Cretaceous rocks contain fossils of both land plants (leaves, fruits, and pollen) and of marine dinocysts (cysts of marine algae), thanks to which a precise dating of the flora studied will be possible.

Research will consists in studying the existing collections of fossil leaves (collected since the 19th century) and in drilling two shallow boreholes to find well preserved (not weathered) fruits and pollen. Study techniques will be quite diverse, including light and scanning electron microscopy as well as X-ray microtomography.

The methodology of the present project follows the modern standards of taphonomic, taxonomic, and palaeoecologic research.

Co-occurrence of land plant leaves, fruits, and pollen and of marine dinocysts in the same sites, like in the North Sudetic Basin, is a relatively rare situation all over the world. Usually fossil sites yield one or at most two of the three kinds of land plant fossils. This study will thus be a significant contribution to palaeobotany at world's scale.

Sites having yielded such a scientifically important fossil flora are an important element of the natural history national heritage. They may become geotouristic sites and thus be of societal and potentially economic significance (tourism development).