

Summary of thesis

MIOCENE FLORAS FROM COAL FORMATIONS OF THE KONIN AREA (CENTRAL POLAND)

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The present investigation concerns fossil carpological remains collected by the author in the years of 2002-2006 from three sites of the “Lubstów” brown coal open-pit mine as well as the previously unstudied collection of remains obtained by Prof. J. Raniecka-Bobrowska from the “Gosławice” and “Pątnów” brown coal open-pit mines. All the above-mentioned mines are currently closed.

Within all fossil assemblages of the examined area, a total of over 3000 specimens were found, 2991 of which were identified. The “Lubstów” fossil assemblage was composed of 47 species of 23 families, however including 17 species of 15 families already described by Kowalski (2008). Additionally, 18 species of 14 families were recorded in “Gosławice” and 14 species of 10 families in “Pątnów”.

The study resulted primarily in the discovery of a new Ericaceae (Arbutoideae) genus, *Carbococcus* n. gen., four new Ericaceae species, *Lyonia polonica* n. sp., *Rhododendron polonicum* n. sp., *Enkianthus maii* n. sp., and *Calluna miocenica* n. sp., as well as one Cyperaceae species, *Cladiocarya kownasii* n. sp., in the Miocene sediments of “Lubstów”. It is also worth mentioning that 10 of the discovered fossil taxa have not been formerly known from Poland.

Another important achievement in the research was the identification of hygrophilous, azonal, Pinus-dominated mixed coniferous forests and Ericaceae-dominated shrub thickets. Both fossil plant communities, not previously described for Poland on the basis of macroremains, were characterised and compared with similar communities known from the Tertiary of Europe. Other types of fossil plant communities, e.g. assemblages with floating-leaved plants or reed and swamp forests with *Glyptostrobus* and *Nyssa*, were determined as well. Such azonal communities may have served as the main source of plant remains recorded in brown coal of the 1st Middle Polish seam group.

Zonal evergreen elements, typical of the subtropical evergreen broad-leaved sclerophyllous forests and the warm-temperate mixed mesophytic forest formations, were observed in low amounts.

Abundant charcoal samples provided basis for suggesting fire as one of important factors controlling the development of Miocene vegetation in the “Lubstów” area.

Azonal communities of mixed coniferous forests and shrub thickets prevailing in fossil assemblages of “Lubstów”, “Gosławice” and “Pątnów” were subsequently compared to the modern Atlantic white cedar (*Chamaecyparis thyoides*) swamp forests and pocosin shrub bogs, both located on the Atlantic Coastal Plain of North America.

Increased number of thermophilous taxa found at site A in “Lubstów” most probably is an effect of flood event not a warm climate oscillation. Intense rain and flood waters could have washed out plant remains from elevated or more distant areas overgrown with thermophilous mesophytic taxa. Under normal flow conditions, such elements would not be likely to become part of an orictocoenosis.

From the stratigraphic range of the identified taxa and absolute age of the tuffite horizon occurring in brown coal of the 1st Middle Polish seam group, age of the “Lubstów” floras was estimated as not older than 16.5 Ma BP, therefore corresponding to the Badenian, or slightly younger.

Biostratigraphically, floras of “Lubstów”, “Gosławice” and “Pątnów” were linked to the “Klettwitz-Salzhausen” floristic complex (sensu Mai 2001).

Climate was reconstructed using the Integrated Plant Record vegetation analysis (sensu Kovar-Eder & Kvaček 2003), results of which were correlated with climatic data suggested for floras of the “Klettwitz-Salzhausen” floristic complex. Both reconstructions indicated a similar humid, warm-temperate to subtropical climate, typified by a dry period within the cold part of the year, mean annual temperature between +13 and +17°C (possibly falling below zero during winter) and mean annual precipitation between 500 and 1500 mm.

Floras of “Lubstów”, “Gosławice” and “Pątnów” showed dissimilarity and uniqueness in comparison with other Polish fossil floras similar in age.

In terms of their floral composition, the discussed plant communities were considered most comparable with the Lower Rhenish Basin floras (Middle Miocene-Pliocene) of the Atlantic-Boreal bioprovince.

Proportions of particular geographical elements were also assessed for the “Lubstów”, “Gosławice” and “Pątnów” floras. The analysis indicated a relatively high value of tropical-subtropical and Mediterranean elements (32% in average), compatible with the general trend observed for Middle Miocene floras of Central Europe.