1. TYPES OF SPOROMORPHS FROM THE AJKAITE CONTAINING BROWN COAL SAMPLES FROM AJKA (HUNGARY)

TIPOS DE ESPOROMORFOS DETERMINADOS EN MUESTRAS DE LIGNITO DE LAS MINAS DE AJKA (HUNGRIA)

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Abstract

This paper present the quantitative data of the spore pollen types of the two amber-containing brown coal samples from among which the Ajkaite material is under transmission electron microscope investigations. The two samples are from the same level of the brown coal layers, but the composition of the sporomorphs is completely different. The brown coal forming vegetation based on the palynological data was not the same in the different part of this kind of sedimentary basin. It may be supposed, that the "amber tree" of the Ajkaite during the Upper Cretaceous period in the brown coal basin of Ajka, Hungary was not always the same.

Key words: Palynology, Upper Cretaceous types, Ajkaite containing brown coal.

Resumen

Se dan a conocer los datos cuantitativos de tipos de esporas y pólenes hallados en las capas de lignito del Cretácico Superior de las Minas de Ajka, donde se encuentra el ámbar (Ajkaite) que está siendo investigado al Microscopio Electrónico de Transmisión.

Las dos muestras analizadas proceden de un mismo nivel de lignitos, aunque los porcentajes de esporomorfos son diferentes.

La vegetación que originó el carbón que contenía las muestras de ámbar no era uniforme como se desprende de los datos palinológicos, lo que hace suponer que los árboles que originaron el ámbar en los lignitos estudiados, no formaban un bosque homogeneo.

Palabras clave: Palinología, Cretácico superior, lignitos de Ajka (Hungría).

Introduction

In our previous papers (KEDVES, SZÓNOKY, MADARÁSZ and KOVÁCS, 2000, KEDVES, BORBOLA and PRISKIN, 2001) the first results of the new programme of our Laboratory were published. After beginning, the most important result was that the ultrathin sectioning of the Ajkaite was succesful. To obtain informations on the origin of the "amber tree", the fragments of the secondary xylem remnants were investigated qualitatively and quantitatively. Important differences were established between the two

samples with this method. Following this kind of LM studies, detailed spore-pollen analyses were carried out. LM pictures were taken from all microfossils from 25 slides per samples. Taking into consideration the problems in the taxonomy of the Upper Cretaceous sporomorphs, the detailed taxonomy will be elaborated by groups and will be published later.

The aim of this contribution is, present the quantitative data of the sporomorphs, to have a general overview concerning the spore-pollen composition of the two samples in comparison with the data of the secondary woody fragments.

Materials and Methods

The material for our investigations was published previously in our first paper (KEDVES, SZÓNOKY, MADARÁSZ and KOVÁCS, 2000) the method of the types of the sporomorphs for characterizing the sediments, introduced by KRUTZSCH (1957/58) was used. The advantages of this method were backed up later during the study of the spore-pollen assemblages of the Lower Tertiary layers of Europe, and to the Paris Basin (KEDVES, 1967,1968).

Results

The quantitative data of the two samples investigated are presented in fig. 1.1. Within the represented groups the following types were observed: 1. Spores - Schizaeaceae *Lygodium, Anemia* type, Gleicheniaceae, (laevigate, toriate forms), Pteridaceae, Lycopodiaceae, Selaginellaceae (echinate microspores). 2. Gymnosperm pollen grains - as new data the hiatus group of the Taxodiaceae-Cupressaceae may be emphasized. 3. Monosulcates represents also different types, some of them represents the Arecales (*tranquillus* type, *Retimonosulcites*) but the Cycadales may also be presumed. Interesting further forms with reticulate sculpture are also present in this material. Araceae may be presumed with a striate monosulcate form. 4. Tricolpates are represented with *liblarensis* and further more or less smooth pollen grains and one probably African-Australian group of *Dettmannaepollenites/Phimopollenites* (KEDVES, 1999). 5. Tricolporates represents in the first place of the small Fagaceae types of *Pasania, Castanea* types. There are further types of Longaxones reticulate of polycolpates. 6. Pronormapolles is represented with the *Complexiopollis* form-species. 7. *Hungaropollis* described first by GÓCZÁN (1964) is a very particular Eunormapolles type of the Carpathian Basin with a restricted geographical and time-table distribution. 8. "Oculata Normapolles", mostly of the *Oculopollis* PFLUG 1953 fgen., but further form-genera described in the monograph of GÓCZÁN, GROOT, KRUTZSCH and PACLTOVÁ (1967). 9. Further Eunormapolles, such as *Interporopollenites, Vacuopollis, Suemegipollis, Trudopollis.* 10. "*Momipites* group", small triaperturate pollen grains. Prof. Dr. S. NILSSON was kindly wrote to us his opinion of this kind of fossil pollen grains as follows: "Regarding the pollen grains I immediately got the family Myrtaceae in my mind. However, similar grains also occur in the Sapindaceae or, less probably, the Loranthaceae. So Myrtaceae is my first guess". 11. Further Postnormapolles (PFLUG. 1953), triporate (probably early type of the Betulaceae), subtriporate, caryoide forms, polyporate types. 12. Incertae - the damaged forms and the peculiar form of *Pseudoschizaea* (*Concentricystes*) was classed here.

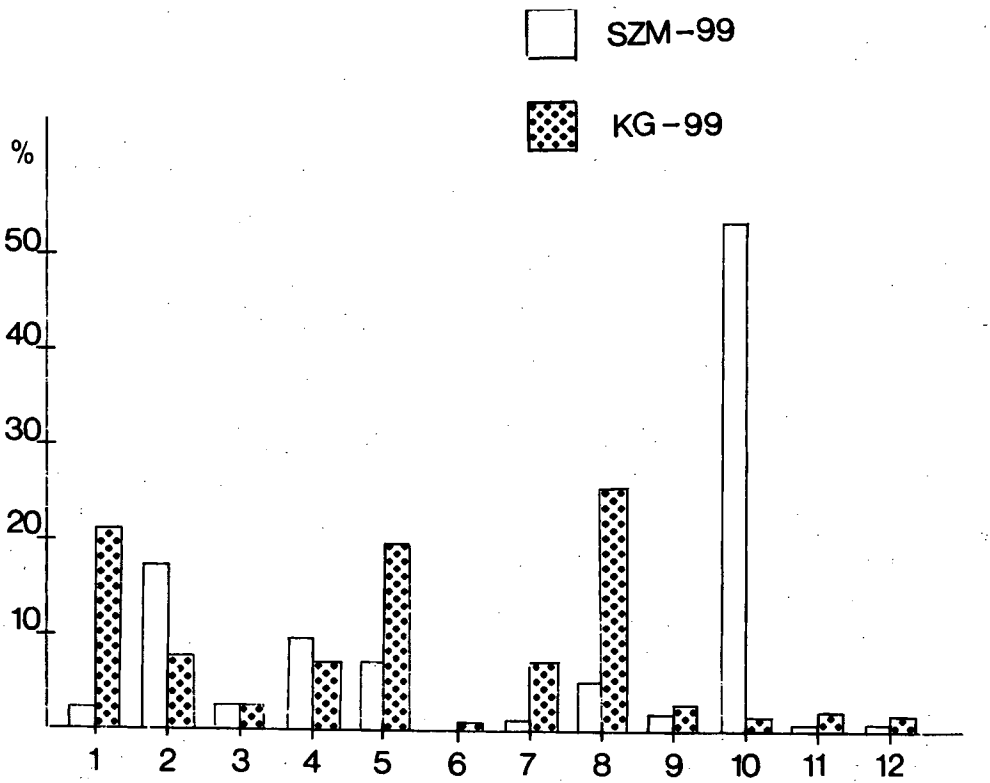

Fig.1.1.

The percentages of the different spore and pollen types from the two Ajkaite containing brown coal samples from Ajka. 1. Spores, 2. Gymnosperm pollen grain, 3. Monosulcates, 4. Tricolpates, 5. Tricolporates, 6. Pronormapolles, 7. *Hungaropollis* fspp., 8. Oculata group, 9. Different taxa of further Eunormapolles, 10. Momipites group, 11. Postnormapolles fgen. et fspp., 12. Incertae.

As regards the distribution of the different types of the two investigated samples we can establish the following:

Sample: SZM-99. - Extremely high quantity of the *Momipites* group, with gymnosperms and Longaxones types (tricolpate and tricolporate). The quantity of the Normapolles is relatively low.

Sample: KG-99. - Pteridophyte spores, Longaxones mostly tricolporates and the "Oculata Normapolles" are in a high, more or less in equal quantity. In contrast to the previous sample, the *Momipites* group is infrequent.

Discussion and Conclusions

1. The brown coal-forming vegetation in the two samples investigated was different. In this way it is presumed, that the origin of the amber (Ajkaite) was also not the same.

2. The extremely high quantity of the *Momipites* group in the sample SZM-99 together with the high quantity of the „Type L" woody remnant („Resinous remnant with the pattern of scalariform vessel perforation" cf. KEDVES, BORBOLA and PRISKIN, 2001, p. 26) is important. An attempt was made to establish the presumed botanical affinity of this kind of vessel, and its evolutionary significance.

3. During our further studies the detailed taxonomy and the botanical affinities will be elaborated.

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