PALYNOLOGIC INVESTIGATIONS ON THE LOWER EOCENE LAYERS IN THE SURROUNDING COUNTRY OF ISZKASZENTGYÖRGY I

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Introduction

In the course of two previous palynologic investigations (3,4) I came to the conclusion that the Hungarian Lower Eocene (Sparnat) flora can be divided into several districts. The observations made in the basin of Tatabánya (5) have led in this respect to interesting results, and have urged me on to study other territories on the same principles for maximum possible information. It seemed to me essential to investigate palynologically the Lower Eocene coal deposit overlying the bauxite in the country surrounding Iszkaszentgyörgy. I am much obliged to Dr. B. MOLNÁR, and to the Board of Directors of the Bauxite-Mines of the comitat Fejér who supplied me with material.

For the geognosy of the surrounding country of Fehérvárcsurgó, Isztmér, and Iszkaszentgyörgy the statements of GŐBEL (2) are decisive. Accordingly, the Lower Eocene coal complex is the immediate top-layer of the bauxite. Between teh argillaceous, slaty brown-coal deposit and the bauxite there is a bed of clay the top-stratum of which consists of greyish-black, grey or light grey molluscous clay.

Material and Method

The first sample I investigated had been taken by Dr. B. MOLNÁR from the grey clay situated immediately above the bauxite, in the „Kincses" mine. This first sample proves that the clay top-layer is relatively rich in spores and pollen. To be able to carry out the investigations on a broader basis I asked the Board of Directors of the Bauxite Mines of the comitat Fejér to send me samples of the above mentioned complexes from the shafts „Kincses" and „József" near Iszkaszentgyörgy. In answer to my request I was supplied with several samples of the clay lying immediately above the bauxite, of the coal deposit, and of the molluscous clay on top of them. The investigation of these samples resulted enough data to establish the relation of these strata to the Lower Eocene flora of other territories of Hungary. In this preliminary study the up till now obtained quantitative results are summed up.

Results

The composite of the spores and pollen in the samples investigated qualitative and quantitative is represented according to the statements of GŐBEL (2)

about the succession of sedimentary material. Three samples of the clayey bed immediately above the bauxite had been investigated. Only two of them were suitable for counting. The average result is shown in fig. I/1. Figure I/2 shows

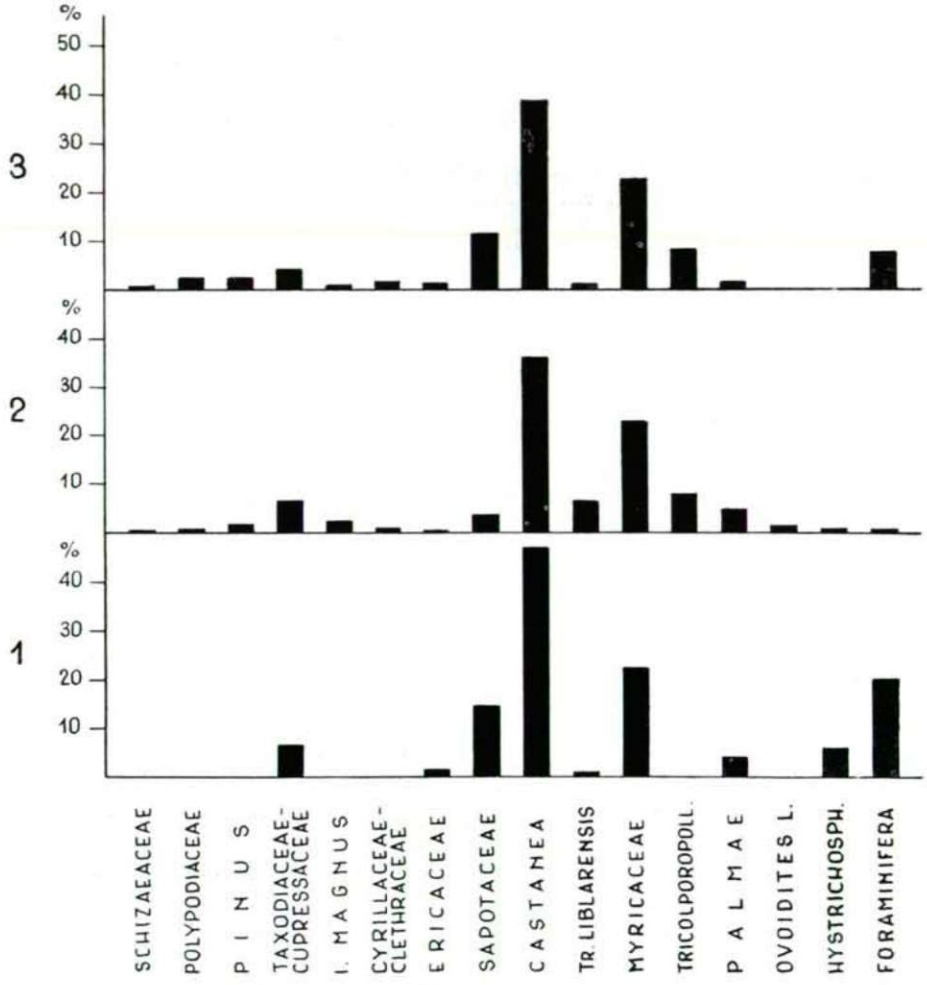

Fig. 1
Contracted average spectra of spores and pollen of the investigated samples. Average assemblage of spores and pollen in the 1. clayey, 2. coal, 3. molluscous clay layer.

the average of 4 coal deposit samples, fig. I/3 that of 3 samples of the molluscous clay.

It is equally characteristic for all the average results that pollen related to the *Castanea* genus occur in the biggest quantity. Besides this genus, *Myricaceae* show generally a high percentage, especially *Triatriopollenites excelsus* (R. Pot.) Th. & Pf. 1953 with its different subspecies is worth attention. *Sapotaceae* are also to be found in bigger quantities especially in the clayey bed. The *Gym-*

nospermae Taxodiaceae-Cupressaceae is represented by a low percentage, the number of spores of ferns and other until now not mentioned taxons has little significance. I have also shown the *Tricolporopollenites* in the diagram, a pollen form which is not yet sufficiently known, because this form occurs in the coal deposit and in the molluscous clay in notable quantity, but we do not know its significance in the Lower Eocene of Hungary. I will describe this pollen and publish the qualitative results of the investigations in an other paper.

The quantities of *Hystrichospaeridae,* and the remains of *Foraminifera* are shown in relativity to the total number of the spores and pollen. Their quantity, chiefly that of *Foraminifera,* is especially in the clayey bed relatively big.

Discussion

Taking into consideration also the statements of COUPER (1) and SITTLER (6) I discuss the spores and pollen at the evaluation of the quantitative results in three groups:

1. Dominant spores and pollen, the form which occurs in every sample in the highest percentage.

2. Characteristic spores and pollen, which occur in a quantity of at least 5%, generally in narrow vertical and horizontal extension.

3. Forms which occur sporadically or in small quantities but are significant from stratigraphical point of view.

1. Dominant are the *Castanea* pollen. These pollen proved to be a dominant form also in some coal deposits of Dudar and Tatabánya, and the supposition is near at hand that the trees belonging to the *Cupuliferae* played a significant role in the formation of some coal deposits. The presence of *Castanea* pollen in dominant quantity was also stated by us in the Lower Eocene coal deposits of Halimba (3).

2. *Triatriopollenites excelsus* (R. POT.) TH. & PF. 1953 can be regarded as the most important characteristic form, as it is to be found in significant quantities not only in the Lower Eocene of Halimba but occurs also relatively regularly in that of Dudar, though in the latter only in small quantities. It is interesting that, while in the Lower Eocene of Halimba *Tricolpopollenites liblarensis* (THOMS.) (=*quisqualis* R. POT.) TH. & PF. 1953 is the characteristic form, the up to now obtained results about Iszkaszentgyörgy are in this respect not uniform.

3. Of the sporadically occuring pollen *Monocolpopollenites tranquillus* (R. POT.)TH. & PF. 1953, of spores *Cicatricosisporites dorogensis* (R. POT. & GELL. 1933) KDS. 1961, and *Leiotriletes dorogensis* (KDS. 1960) KDS. 1961 are the most significant. These spores and pollen are especially in the coal complexes of Dorog but also in some coal deposits of Tatabánya dominant or characteristic forms.

Comparing this pollen flora with that of other Lower Eocene pollen floras known up to now we can state:

1. Taking into consideration the dominant pollen, the flora of Iszkaszentgyörgy is doubtless identifiable with the flora of Halimba and Dudar. The relation to the flora of Halimba is supported also by the characteristic occurence of *Triatriopollenites excelsus* (R. POT.) TH. & PF. 1953. That

is to say that the flora of Iszkaszentgyörgy is most closely related to the floral assemblage of Halimba, and can be roughly identified with it, but it is also very similar to the assemblage of spores and pollen in Dudar.

2. But we must not neglect the more significant sporadically occurring species. They are presumably of allochtonous origin and have probably been carried to this place from the Lower Eocone flora of Tatabánya or Dorog. This points to the possibility that the formation of the above mentioned Lower Eocene deposits has taken place at the same time or, at least, there could not have been great time difference.

The territorial distribution of the Hungarian Lower Eocene pollen floras is to be seen in fig. 2. Besides the dominant forms and the characteristic ones a schematic drawing shows the dominant plants of the vegetation at the habitat. It is interesting that up to now Palm flora is known only in the basin of Dorog, respesctively in the basin of Tatabánya. For the Lower Eocene vegetation in the basins of Dudar, Halimba, Iszkaszentgyörgy, and partly for that of Tatabánya the *Cupuliferae,* especially *Castanea,* are typical. These differences in vegetation can be ascribed in the first line to different ecological

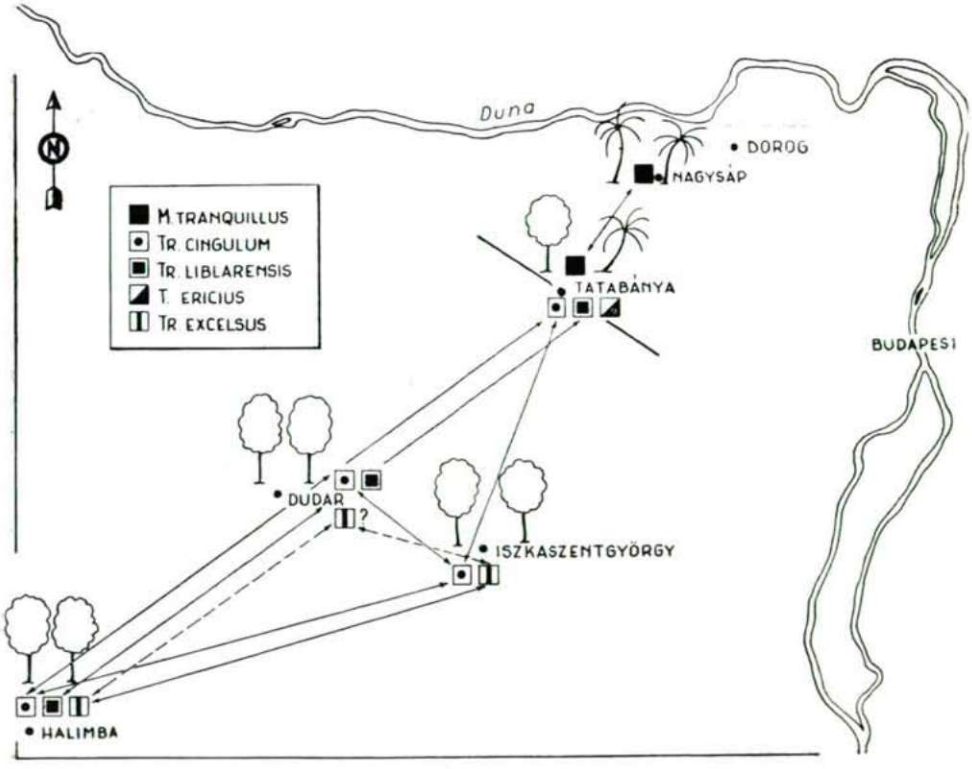

Fig. 2

Sketch of the dominant spores and pollen and some charasteristic ones, known in the Lower Eocene floras of Hungary.

factors, but as it has been said before, the possibility of time difference can also not be excluded, and in this case the *Cupuliferae* wood is more ancient than the Palm wood.

Summary

1. Palynologic investigations have been carried out on several samples of the clayey, coal, and molluscous layer of the Lower Eocene coal complex near Iszkaszentgyörgy.

2. The demonstrated assemblage of spores and pollen is identifiable in the first line with that of Halimba, but is also very similar to the pollen flora of Dudar.

3. Some of the presumably allochtonous spores and pollen point to the floral assemblage of the basin of Dorog and partly to that of Tatabánya. This supports the opinion that the formation of these deposits has taken place at the same time.

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