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PALYNOLOGY OF THE MŠENO BASIN

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In the past there was the idea that the Carboniferous, well known in its development in the Kladno-Rakovník Basin in Central Bohemia, may continue in a northearstern direction underlying the Cretaceous. Generally the boreholes in this territory, did not reach the Carboniferous, so that we had no idea about its stratigraphy and coal content.

Ten years ago the Geological Survey in Prague began to carry out a systematic deep-boring research programme of Late Palaeozoic deposits underlying the Bohemian Cretaceous. The first boreholes in the region new called the Mšeno Basin in the basal part of the Upper Grey Formation recorded coal seams of surprisingly good quality at the base of the Upper Grey Formation. This group of seams of Stephanian age is not known in the Carboniferous with the exception of an unimportant occurrence in the Plzeň Basin.

This oldest unit of the Upper Grey Formation was designated as the Jelenice Member and the coal seams as Mělník seams (the Main and the Upper Mělník seams).

Coal seams were found in the Nýřany Member of the Lower Grey Formation, whilst the Radnice coal seams do not occur, however the Radnice Member is developed in a single borehole L 20 (Obříství).

The question aroses whether the spore distribution in this region corresponds with that known in the basins situated in the assemblages in the two regions mentioned above are generally of similar composition but certain differences, caused by the geographical differenciation, have been revealed.

In the single borehole with the Radnice Member some thin coal layers were found. They contained the following megaspores : *Calamospora* sp., *Triletisporites bohemicus* KALIBOVÁ, *Lagenoisporites rugosus* (LOOSE) POTONIÉ & KREMP, *Triangulatisporites triangulatus* ZERNDT, *Bentzisporites tricollinus* (ZERNDT) POTONIÉ & KREMP, *Cystosporites giganteus* (ZERNDT) SCHOPF and *Cystosporites verrucosus* DIJKSTRA. The species *Triletisporites bohemicus* determines the Radnice age of this Member and occurs commonly in the Central Bohemian Carboniferous complex whereas in the other basins it is met only as single grains, eg. at Žacléř in the Intrasudetic basin. The occurrence of the species *Cystosporites verrucosus* is interesting as in Czech basins this species is known only from the lower Radnice seam in the Plzeň basin.

In all other boreholes of the Mšeno Basin the Lower Grey Formation is represented only by the Nýřany Member.

The megaspore assemblage is characterised mainly by the species *Lagenoisporites rugosus* (LOOSE) POTONIÉ & KREMP and locally by *Triangulatisporites triangulatus* (ZERNDT) POTONIÉ & KREMP. Some layers in the seams of the Nýřany Member are rich in *Valvisisporites auritus* (ZERNDT) LACHKAR, a rare species in the Nýřany Member but ranging into coals of Stephanian age. *Laevigatisporites glabratus* (ZERNDT) POTONIÉ & KREMP, *sensu* DIJKSTRA, has a very limited occurrence. The typical representative of the Nýřany Member in other coal basins of the Central Bohemian Carboniferous complex, *Cystosporites varius* (WICHER) DIJKSTRA, was found only in one sample. The presence of the megaspore *Triletisporites tuberculatus* (ZERNDT) POTONIÉ & KREMP, which is also known from the highest Nýřany seam in the Plzeň basin, suggest a very high position in the Nýřany Member in the Mšeno basin.

The most abundant miospore genus is *Lycospora* which comprises nearly 50 % of the assemblage. Following the conception of CIMP (SOMERS, 1972) most of the spores belong to *L. pusilla* (IBRAHIM) SOMERS and *L. orbicula* (POTONIÉ & KREMP) SMITH & BUTTERWORTH. Also the species *Laevigatosporites* and *Punctatosporites* (*P. oculus* SMITH & BUTTERWORTH and *P. specious* KALIBOVÁ) are very abundant. Spores stratigraphically characteristic of the Nýřany Member are *Vestispora* (*V. fenestrata* KOSANKE

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& BROK) WILSON & VENKATACHALA, *V. quaesita* (KOSANKE & BROK) WILSON & VENKATACHALA and *V.* sp., *Cirratriradites saturni* (IBRAHIM) S.W. & B. and *Westphalensisporites irregularis* ALPERN. Other important elements are *Triquitrites bransonii* WILSON & HOFFMEISTER and *T. exiguus* WILSON & KOSANKE. A very high position in the Westphalian D is indicated by the occurrence of the species *Potoniéisporites novicus* BHARDWAJ, *Latensina* sp. and single grains of dissaccate spores. The absence of the genus *Torispora* is in contrast with its frequency in other basins of the same age.

I paid most attention to the determination of megaspores and miospores of the Jelenice Member. In the study unpublished (1972 b), I assigned the spores to 61 genera and 130 species, of these one genus and 10 species are regarded as new. Also 6 new forms were proposed.

The megaspore content of the Mělník coal seams is characterised by the occurrence of *Valvisisporites auritus* (ZERNDT) BHARDWAJ and *Lagenoisporites levis* (ZERNDT) PIÉRART; these species have never been recorded from Czech basins lower than in the Stephanian. The species *Calamospora* sp., *Schopfipollenites ellipsoides* (IBRAHIM) POTONIÉ & KREMP and *Cystosporites giganteus* (ZERNDT) SCHOPF are rare.

In the miospore assemblages, the quantitatively predominate genera have fairly extensive stratigraphical ranges, for example *Laevigatosporites* (mainly *L. desmoinesensis* (WILSON & COE) S. W. & B.) and also the Stephanian species *L. maximus* (LOOSE) POTONIÉ & KREMP, *Punctatosporites* (for our coals typical *P. granifer* POTONIÉ & KREMP), *Lycospora*, *Cyclogranisporites* (*C. orbicularis* (KOSANKE) POTONIÉ & KREMP and one new species provisionaly determined as *C.* cf. *densus*), *Calamospora*, *Endosporites* (*E. formosus* KOSANKE), *Florinites* and *Conisporites*; this new genus (KALIBOVÁ, 1972 b) includes spores formerly determined as *Polymorphisporites* and *Triquitrites discoideus* KOSANKE and *T. spinosus* KOSANKE. Spores characteristic of the Mělník seam are *Verrucosisporites sinensis* IMGRUND and *Cadiospora magna* KOSANKE along with three new forms. *Thymospora*, a stratigraphically important genus in other coal basins, has not been found in this region.

There is very little difference between the miospore histograms of the Main and Upper Mělník seams, for in the Upper Mělník seam, *Laevigatosporites* and *Lycospora* predominate whereas the percentage of *Punctatosporites*, *Endosporites* and *Cyclogranisporites* is smaller than in the Main seam. *Crassispora* is a characteristic genus for the Upper seam.

A detailed study of whole seam profiles shows that the correlation of coal seams based on miospore associations can be made. Data derived from whole seam samples, or from a series of subsections representing the full seam thickness, was obtained and shows that the species of some genera, as for example *Calamospora*, *Cyclogranisporites*, *Verrucosisporites*, *Crassispora*, *Cadiospora* and *Punctatosporites* vary in abundance at different horizons within coal seams. It is therefore possible to subdivide the seam into a number of parts, each with a distinctive assemblage, that may be recognised in various boreholes.

The coal — bearing beds of the Kounov Member immediately overlie the Jelenice Member, and in contrast to the Kladno-Rakovník and Plzeň basin, they consist only of thin coals, or bituminous shales, which contain poor spore assemblage. The general aspect of these earlier recorded in the Plzeň and Kladno-Rakovník basins appears to be closely comparable with those found in Mšeno basin for the Jelenice Member.

The characteristic megaspores of the Kounov Member are *Valvisisporites auritus* (ZERNDT) BHARDWAJ and *Lagenoisporites levis* (ZERNDT) PIÉRART. The miospore assemblage contains *Lycospora* spp., *Punctatosporites granifer* POTONIÉ & KREMP, *Laevigatosporites desmoinesensis* WILSON & COE, *Cyclogranisporites* cf. *densus* — proposed as new species in 1972 b — and *Cadiospora magna* KOSANKE. *Verrucosisporites sinensis* IMGRUND and *Triquitrites discoideus* KOSANKE — assigned to new proposed genus *Conisporites* (1972 b) — appear to be especially characteristic of the Mělník seams.

Comparison has been made with some other basins of the same stratigraphical age and this shows that the spore assemblages from the Mšeno and Kounov seams are similar to those from the central French basins for seams at the same stratigraphical horizon. The main difference between the two regions is the absence, in the Czech area, of the taxa *Thymospora* and *Spinosporites spinosus* ALPERN; on the other hand the Czech assemblages contain *Endosporites formosus* KOSANKE and *Verrucosisporites sinensis* IMGRUND which are absent in the French area.

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