



Paleoenvironmental reconstructions of the n8 coal bed of the Lviv-Volyn basin by palynological data (Western Ukraine)

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Lviv-Volyn Basin (LVB) is situated in the Volyn-Podyllia part of the East-European platform and it is the south-eastern part of the Lviv-Lublin basin. About 98 coal beds in the Carboniferous coal-bearing formation of LVB are determined, and about 30 of them have working thickness (0,6 cm). The main industrial coal-bearing zone of the basin is Buzhans'ka suite. About 20 coal beds and layers are defined in this suite, including exploiting bed n8.

Considerable content of dispersed plant organics is one of the coal-bearing formation's feature. However its study in the coal beds of LVB by palynological method is conducted for the first time. At this stage of investigation the microorganics of coal bed n8 in the sections of mines № 1-Novovolynska and № 4-Velykomostivska are studied by one of the varieties of palynological analysis: palynoortocenosistic method. It is a complex of the vegetable, animal and problematic the origin, buried under certain paleogeographical conditions and timed to a concrete facial type of the rocks. Palynoortocenosic, as a complex of microscopic mainly vegetative remnants represents the paleogeotektonical and paleofacial conditions of deposition, and the plant evolution.

Three types of palynoortocenosic in the coal bed of n8 are determined. They are: lycosporic (L); densosporic (D) and mixed (M). The lycosporic type of palynoortocenosic is characterized by dominating of treelike Lycopodium-likes miospores – Lycospora (near 80-90 %); miospores of grassy Lycopodium-likes (Selaginels) – Densosporites (10-15 %), Cingulizonates (3-5 %) and spores of ferns (Granulatisporites, Leiotriletes, Convolutispora, Cyclogranisporites, Acanthotriletes and others) – are less than 1-2 %. Miospores of Equisetophyta (Punctatisporites, Calamospora, Vestispora) and pollen (Cordaitina, Schulzospora, Potonieisporites) not numerous. Among other components of dispersed organic matter (DOM) there are humic components among which predominate vitrinite, less the inertinite, moderate amount of tracheids and cuticles (tissue). Correlation of components of DOM is various. The densosporic (D) palynoortocenosic is characterized by prevailing of miospores of grassy Lycopodium-likes – Densosporites (70–90 %). Miospores of treelike plants (Lycospora) range from 5 to 15 %. Spores of ferns, calamites, arthrostems are not numerous. Characteristic feature of spectrums is predominate of humic components, especially vitrinite. Fragments of vegetable tissue are not numerous. In the mixed type of palynoortocenosic miospores of main vegetable groups is in equal correlations, or the spores of ferns are dominated, but rarely. The humic components of DOM are presented vitrinite, the fragments of inertinite are rare, tracheids and cuticles are not numerous. Prevailing of humic DOM type is typical.

The vertical spreading of palynoortocenosic in the section of coal bed n8 is uneven, cyclic. In the bed section of mine № 1-Novovolynska, that is characterized by simple geological structure with only one layer of humic coal with thickness up to 128 cm, such vertical palynoortocenosic sequence is defined (from below to up): L (thickness of layer with lycosporic type is 30 cm), M (5 cm), D (15 cm), L (13 cm), M (5 cm), D (16 cm), L (45 cm), M (8 cm).

In the section of mine № 4-Velykomostivska the coal bed n8 has more thickness (150 cm) and complicated structure. It has one layer of humic coal (down), and one layer of sapropelitic-humic coal (above), and the argillite layer between them. Change of palynoortocenosic sequence has another character. From the bottom to the surface: in the humic coal layer – M (thickness of layer with lycosporic type of palynoortocenosic is 3 cm), L (18 cm), M (3 cm), D (25 cm); rock layer (with thickness to 35 cm) and sapropelitic-humic coal with densosporic type of palynoortocenosic are distinguished.

Such alteration of palynoortocenosic is corresponded to the model of A. Smith about the terms of forming of coal peat bogs of the Yorkshire coal basin in England. Analogically, for this model, during forming of coal bed of n8 of LVB it is possible to pick out such phases: lycosporic, densosporic and intermediate.

Lycosporic phase is corresponded to the classic picture of peat bogs. There was a thin layer of water above peat at that time when there was mainly treelike vegetation. Movement of water was weak, and the vegetable matter decay took place in anaerobic environment. Densosporic phase is corresponded to peat bogs, surface of which were above the water level and which were developed due to high humidity of atmosphere. Intermediate phase,

when follows the lycosporic, is corresponded to the progressive shallowing of water. When it changes densosporic, then, opposite, it is corresponded to the gradual deepening.

During the accumulation of origin vegetative organics of coal bed n8 of mine № 1-Novovolynska in time there was the cyclic change of conditions from "lots of water" environment to shallow environment. Two lycosporic phases were long and conditions' change was quick.

Formation conditions of coal bed n8 of mine № 4-Velykomostivska had some differences. At first the accumulation of vegetative remnants took place in the environment with a lot of water. At this time treelike Lycopodium predominated among the plants of land. After shallowing densosporic phase began. And than formation of sapropelitic-humic coal proceeded in the peat bog with shallow environment and decay of vegetable matter in anaerobic environment.

So, the layer palynological study of coal bed n8 of LVB allowed to find out a regular alternation in the palynooric-tocenosis section. And on their basis to carry out the environmental reconstruction and to pick out three phases of forming of initial matter coal layer.