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315. METHANE COAL FIELDS OF THE UKRAINE

In the Ukraine coal reserves are concentrated in Carboniferous deposits of Donetsk and L'viv-Volyn basins. In the Donetsk basin, coal reserves are 102 billion tons including exploited reserves (43 billion tons). In L'viv-Volyn basin, total coal reserves are estimated as 2.2 billion tons (including exploited reserves of 1.0 billion tons).

For the last years, coal production in the Ukraine is 115 - 135 million tons per year and it tends to decrease. Great depths of coal mining (more than 600 - 1000 m) and methane content in coal seams and enclosing rocks make exploitation problems. In individual mines, bottom methane emission reaches 150 - 200 cubic metres per ton of coal exploited and therefore the coal fields especially in the Donetsk basin should be considered as methane coal fields.

Methane in coal seams is in sorbent state. Its presence increases from coal with low-intensity metamorphism and reaches its maximum in zone of semianthracite and anthracite formation, and decreases down to null within superanthracite spreading. Moreover, methane presence in coal seams increases with a depth of coal occurrence. Statistic relation exist between methane occurrence, metamorphism of coals and coal depth, and a high correlation ratio may be used to predict the methane presence and to estimate the methane reserves.

Coal seams in the Donetsk basin contain more than 1 billion cubic metres of methane. Methane distribution in the enclosing rocks does not have such a distinct pattern as is observed in coal seams, and it depends upon the presence of gas traps, porosity and permeability of the massif, hydrogeological conditions and tectonic position in the structure of the Donetsk basin. It was established that coal-bearing series of the Donetsk basin is saturated with methane and it contains 1.5 - 2 trillion cubic metres of methane. Methane reserves in coal seams and the enclosing rocks of the L'viv-Volyn basin are 7 - 10 billion cubic metres and thus the Ukrainian coal basins contain 2.5 - 3 trillion cubic metres of methane. This is a significant hydrocarbon reserve in the Ukraine. It is planned to extract methane during preparation of an area for mine building and coal production what would result in obtaining additional high-calory fuel, improvement of the conditions during coal mining and decreasing the methane emission into the atmosphere.

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316. THE FOSSIL FAUNA, MEGA- AND MICROFLORA OF THE KRKONOŠE PIEDMONT BASIN

The Krkonoše Piedmont Basin located in the N.E. part of the Czech Republic is a depression of W.-E. direction, 55 km long. It contains sediments of Westphalian D to Lower Triassic age. Organic remains are concentrated on horizons of Stephanian and Autunian strata. Very rare plant fossils were also discovered in Westphalian D (e.g. Kumburk Formation-*Praecallipteridium costei*).

Over 60 plant species, 80 microsporas species and 60 animal species and trace fossils are known from the Krkonoše Piedmont Basin.

The selection of stratigraphic important species follows:

Stephanian B (Syřenov Formation). Fauna - *Spinarichthys dispersus*; Megaflora - *Alethopteris zeilleri*, genera *Pecopteris*, *Annularia*; Microflora - abundant *Laevigatosporites*, common *Verrucosiporites sinensis* and *Endosporites formosus*.

Stephanian C (Semily Formation, Ploužnice and Štěpanice- Čikvásky horizons). Fauna - *Sphaerolepis kounoviensis*, genera *Carbonicola*, *Pseudestheria*, *Neorthroblattina*, *Acanthodes*, sharks and trace fossils; Megaflora - *Callipteridium pteridium*, genera *Odontopteris*, *Pecopteris*, *Sigillaria*, *Calamites* and *Walchia*; Microflora - *Spinoporites spinosus*, genera *Thymospora*, *Laevigatosporites*, *Punctatosporites*.

Lower Autunian (Vrchlabí Formation, Rudník and Háje horizons). Fauna - *Acanthodes gracilis*, genera *Pseudestheria*, *Xenacanthus*, *Paramblypterus*, *Archegosaurus* and trace fossils; Megaflora - *Neurodontopteris auriculata*, *Arnhardtia scheibei*, *Autunia conferta*, genera *Pecopteris*, *Odontopteris*, *Cordaites*, *Walchia*, etc.; Microflora - *Vittatina*, *Potonieisporites*, *Protohaploxipinus*, *Jugasporites* etc..

The floral assemblage of the Kozinec Horizon from the top of the Vrchlabí Formation is characterized by lack of "Callipterids". Fauna - molluscs and tetrapod.

The Kalná Horizon of the Prosečné Formation (Lower Autunian). Fauna - *Xenacanthus decheni*, genera *Palaeonodonta*, *Protolimnadia*, "*Amblypterus*", *Apateon* and trace fossils. Megaflora - abundant *Autunia conferta*, rare *Pecopteris*, *pteridosperms*, *Cordaites* and *Walchia*; Microflora - genus *Potonieisporites*.

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ABSTRACTS



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