

small variations of heavy minerals. They contain white mica (14 %), clinozoisite (14 %), Ti minerals (sphen and rutile 40 %) and, only subordinately, biotite, garnet, apatite and turmaline. Sample J3 from Jedlina Zdrój has a wider spectrum of minerals, including abundant chlorite (50 %), white mica (11 %), clinozoisite (10 %) and minor epidote, biotite, garnet and Ti phases. The difference between heavy mineral spectra in the sediments of the Wałbrzych and Jedlina Zdrój area may reflect the influence of volcanic activity in the vicinity of Wałbrzych at that time.

Summary

The heavy mineral spectra of the Wałbrzych Formation and Biały Kamień Member consist mainly of opaques (hematite and ilmenite), while transparent minerals are represented by white mica (flaky aggregates of colourless and greenish mica and chlorite), epidote, clinozoisite and Ti minerals (rutile, sphen, brookite and occasionally anatase).

Comparing the new results with data coming from the Lower Carboniferous sediments (Felicka 1997 a, b) it appears that the Upper Carboniferous deposits contain more Ti minerals and less mica (white mica, chlorite and biotite), while the contents of epidote-clinozoisite and garnet is generally the same.

Based on the results of heavy mineral analysis, it is difficult to determine the source areas for the analysed sediments because of a rather small number of samples, their considerable variation and the lack of microprobe analyses. Most of the material could have come from the redeposition of Lower Carboniferous deposits and sedimentary rocks similar to those exposed in the Świebodzice Depression; transport from the Sowie Mts. is still unlikely because of the lack of some indicative minerals such as kyanite and sillimanite.

References

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Fault-propagation Fold and Thrust Tectonics of the Upper Silesian Coal Basin

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From the stratigraphical point of view The Upper Silesian Coal Basin (USCB) sedimentary sequence represents the uppermost (Namurian A – Westphalian B) levels and, from the structural and deformation polarity point of view, the outermost zone of the Moravo-Silesian region of the Bohemian Massif. In this area, the Variscan accretion wedge tapers out and the Variscan collision deformations progressively but slowly disappears. Almost all authors define the longitudinal (NNE-SSW) Orlová fold-thrust structure as an easternmost (which in this case contemporaneously mean outermost) limit of late Variscan "folding" of the Variscan foreland foredeep and coal-bearing molasses. The continental molasses of the Karviná formation, outcropping eastwards of the Orlová structure were, or by some authors still are, considered as the post-erosion and post-deformational sedimentary sequence, affected only by normal faulting.

Our recent structural studies in the Czech part of USCB verified relatively extended thrusting (the thrusts mostly striking NE-SW up to NNE-SSW) more than 7-10 km eastwards from the Orlová fold-thrust structure. These mostly flat lying thrusts, were recorded in the seams of the Saddle member on the 9. květen Mine and also in the stratigraphically identical seams of the 5th. block of the Darkov Mine, more north-eastward from the Karviná graben. In higher seams of the Suchá Member (above all in its upper part) these thrust systems disappear, which together with their listric geometry indicate imbricated upward-blinding thrust systems of the outermost

apical domain of the Variscan accretion wedge (Grygar et al. 1996, 1997). The vertical amplitude of these thrusts does not overreach first meters. This structure is clearly related to the major deeper-level detachment fault of the accretion prism.

In a SW part of the easternmost excavated areas of the Paskov Mine we have studied similar fault-related fold and thrust imbricated systems with the NE-SW to NNE-SSW orientation and typical listric geometry (Grygar et al. 1997, Welser 1998). In addition, Foldyna et al. (1982) presented cross-sections with the very similar flat geometry of the Michálkovice fold-thrust structure. Nearly the same is valid for the Polish part of the USCB (e.g. Kotas 1983).

All these systems are genetically related to an extensive layer parallel faulting and flexure-slip deformation mechanism, predetermined by typical lithology of the coal-bearing molasses and flysch foredeep sediments with high layer-parallel anisotropy. Also our studies more westwards in the Upper Visean flysch facies of the Kyjovice Member indicate the same tectonic style of the fault-propagation fold in the sense of e.g. Mitra (1990).

On the basis of the above presented investigations and many others unpublished colliery reports we came to the conclusion, that both main fold-thrust (Michálkovice and Orlová) structures of the USCB correspond to the **fault-propagation fold** type genetically related to the detachment thrusts on the base of the Variscan accretion wedge. This major thrusting was in early stage syngenetic in relation to the coal-bearing

