Evidence of Variscan Accretionary Wedge in the Eastern Part of Upper Silesian Basin in OKR

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The problems of tectonic development in the Karviná District of the Upper Silesian Coal Basin (USCB) were repeatedly discussed here. New information on thrust structure presenting apical part of the accretionary wedge of Variscan orogenic front in the easternmost part will be introduced in this contribution.

Thrust structures are significant elements from the viewpoint of kinematic development of the Karviná District of the USCB. The analysis of these structures is continuously supplemented. We would like to present some new information on thrusts found in the USCB east of Karviná during the last two years.

We should start with the works of Grygar (1993, 1996, 1997), Grygar and Welser (1994), etc. They document that thrust tectonics is present east of the Orlová structure, too. Many authors (Dvořák 1994, Brieda et al. 1975, Kumpera et al. 1990, Dopita et al. 1997) referred to the opinion that the compression tectonics known in the western part does not reach across the Orlová structure. Our new information on the thrust east of the Orlová structure support the new approach to the kinematics of the Variscan orogenic front given by Grygar (opus cit). We analysed data obtained from the geological evidence of thrusts from the mines of the Ostrava-Karviná Coal Field (OKR). We were able to verify some of them in situ in exposures.

According to the data from the 9. květen Mine many thrust planes were registered in the Sedlové Member (from seam 36a down to stratigraphically lower seams to the basal seam of the Sedlové Member - seam 40 Prokop). Thrusts were observed along the distance of over 1.5 km. Their planes have variable dip directions, generally to the NNW, forming structures more than 20 m wide. Their amplitudes increase to reach 15 m in the NE direction. Thrust planes are very flat and some of them approach bedding planes. They are usually divided into more parallel planes.

We constructed a similar sketch map based on the data from the ČSM Mine and Darkov Mine. In the ČSM Mine thrusts were investigated in the whole exploited region. So far, they were registered from seam 23 (Upper Suchá Member) to seam 32. The parameters of the thrusts there are similar to those of thrusts in the 9.květen Mine. It can be stated that they are the continuation of the latter. Bending of thrusting direction to the north is significant in the northern part of the Darkov Mine area.

Construction of the thrust structures in the coalfield of the Darkov Mine was based on the data from coal-seam maps. The structure has an opposite dip direction to those of both the above mentioned structures. We suppose that the structure is a continuation of the thrust structures in the western part of the Karviná Subbasin of the USCB (in the Gabriela Mine) and reaches to the Central Karviná Thrust in the Doubrava Mine area next to the Orlová structure.

The thrust structure in the Darkov Mine is probably connected with the thrust structures of the 9. květen Mine and ČSM Mine in the upper part of the Sedlové Member. The variation in thrusting directions at the border between the Darkov Mine and ČSM Mine argue for this hypothesis. This way we can formulate an idea of a homogeneous thrust plane. It is possible to consider this plane as a component of the apical part of the Variscan accretionary wedge in the eastern part of the Karviná District of the OKR.