Conglomerates of the Boskovice Furrow – an indicator of tectonic evolution of the eastern margin of the Bohemian Massif

(2 fig.)

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Introduction

Sedimentary rocks, mainly conglomerates and sandstones of the Permo-Carboniferous Boskovice Furrow have been studied in order to shed a light on the tectonic evolution of the eastern margin of the Bohemian Massif.

The Boskovice Furrow (BF) is an elongated asymmetrical basin oriented in the SSW–NNE direction filled with Permo-Carboniferous sediments. The basin is formed along the main SSW–NNE trending marginal fault (the main fault of the BF) and can be classified as an extensional half graben with several stages of development. The present width of the basin is only 5–12 km and the length of about 90 km, but its original extent was greater. The deposition in the basin started in its southern part (Rosice-Oslavany area) during Stephanian C with coarse-grained red conglomerates and breccias and spread towards the N and NE. The end of the sedimentation was different in various parts of the basin but the deposition in its major part finished during Lower/Middle Autunian. A strongly asymmetric distribution of sedimentary facies and depositional environments is typical of opposite (E and W) limbs of the basin. Profiles in the basal formation, overtaking both limbs were studied in the area of the Boskovice Furrow (Figs 1 and 2).

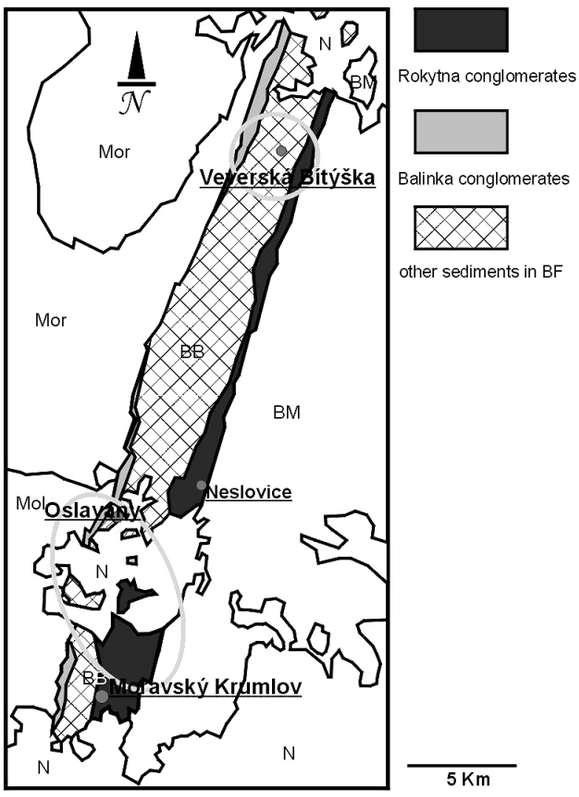

Fig. 1 A schematic map of southern part of the BF with studied areas (Mor – Moravicum, Mol – Moldanubicum, BB – Boskovice furow, BM – Brunovistulian, N – Neogene)

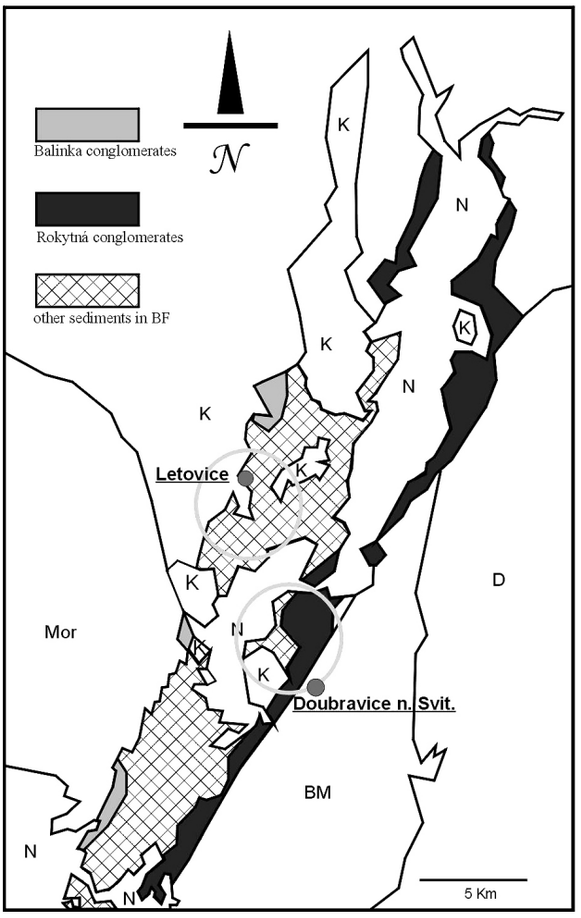

Fig. 2 A schematic map of northern art of the BF with studied areas (N – Neogene, K – Cretaceus, BM – Brunovistulian, D – Devonian, Mor – Moravicum)

Results of the study

The eastern limb of the BF is characterised by monotonous deposition of the Rokytná conglomerates, which form dominant filling of this part of the basin. These conglomerates represent a classical proximal facies (sediments of alluvial fans) and they are typical of rapid unsorted sedimentation. Clasts of older sediments like the Lower Carboniferous greywacke and shales together with the Devonian limestones dominate in the pebble composition. A petrographic character of some clasts indicates, that they were derived probably from the Upper Visean Luleč conglomerates.

The basal formation of the western limb of the BF is characterised by the Balinka conglomerates, which grades upward into fine-grained sediments. Rocks with local provenance derived from the close vicinity are always present in the material at the base of all studied profiles. Clasts of greywackes, which were found in the highest members of the Balinka conglomerates, can be interpreted as resedimented material of the eastern provenance. This feature documents an important role of axial and transversal transport within the basin.

Conclusions

The basal sedimentation of the western limb of the BF is developed in the form of local alluvial fans. The clasts were derived from local material, presently mapped at the basement of studied profiles, in the whole length of the western margin of the BF. The sedimentation of the eastern margin of the BF is, on the other hand, connected with tectonic processes along the eastern marginal fault, which was the main faault in evolution of the depositional environment of the whole basin. The sedimentation is developed here in the form of alluvial fans too, but the Carboniferous sediments (greywackes, etc.), which form a substantional portion of the Rokytná (eastern) conglomerates, could not be found at the basement of these deposits. The granitic rocks of the Precambrian Brno Batholith are locally thrust over the Rokytná conglomerates. Only small relics and tectonic slices of Carboniferous sediments are sandwiched between Permian deposits and Precambrian basement.

The observed features with undisturbed transgressions contact of the BF sediments on the western limb, but with the highly tectonised eastern limb indicate strong, syn- and postsedimentary movements along the marginal fault. The erosion probably reached the present day level on the west of the BF already in Carboniferous or at the beginning of Permian, whereas the eastern limb was strongly modified in the post-Autunian time.

Acknowledgement. This study was supported by research project No. CZ J07/98: 143100004.