

An Updated View on the Tectonic Structure of Non-Metamorphosed Variscan Units at the Eastern Margin of the Bohemian Massif

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A multitude of research case studies carried out in non-metamorphosed rock successions of the eastern margin of the Bohemian Massif over the last decade yielded several important results. These include: (i) – revision of stratigraphy, carbonate facies and tectonic fabric of the Konice-Mladeč Belt (KMB) in the

northern part of the Drahany Upland, which resulted in definition of two tectonostratigraphic units: the Basinal (“Drahany”) Facies Unit and the Transitional Facies Unit, the former being thrust over the latter (Bábek, 1997, Bábek and Janoška, 1998); (ii) – detection of gradual vertical transitions from Devonian and

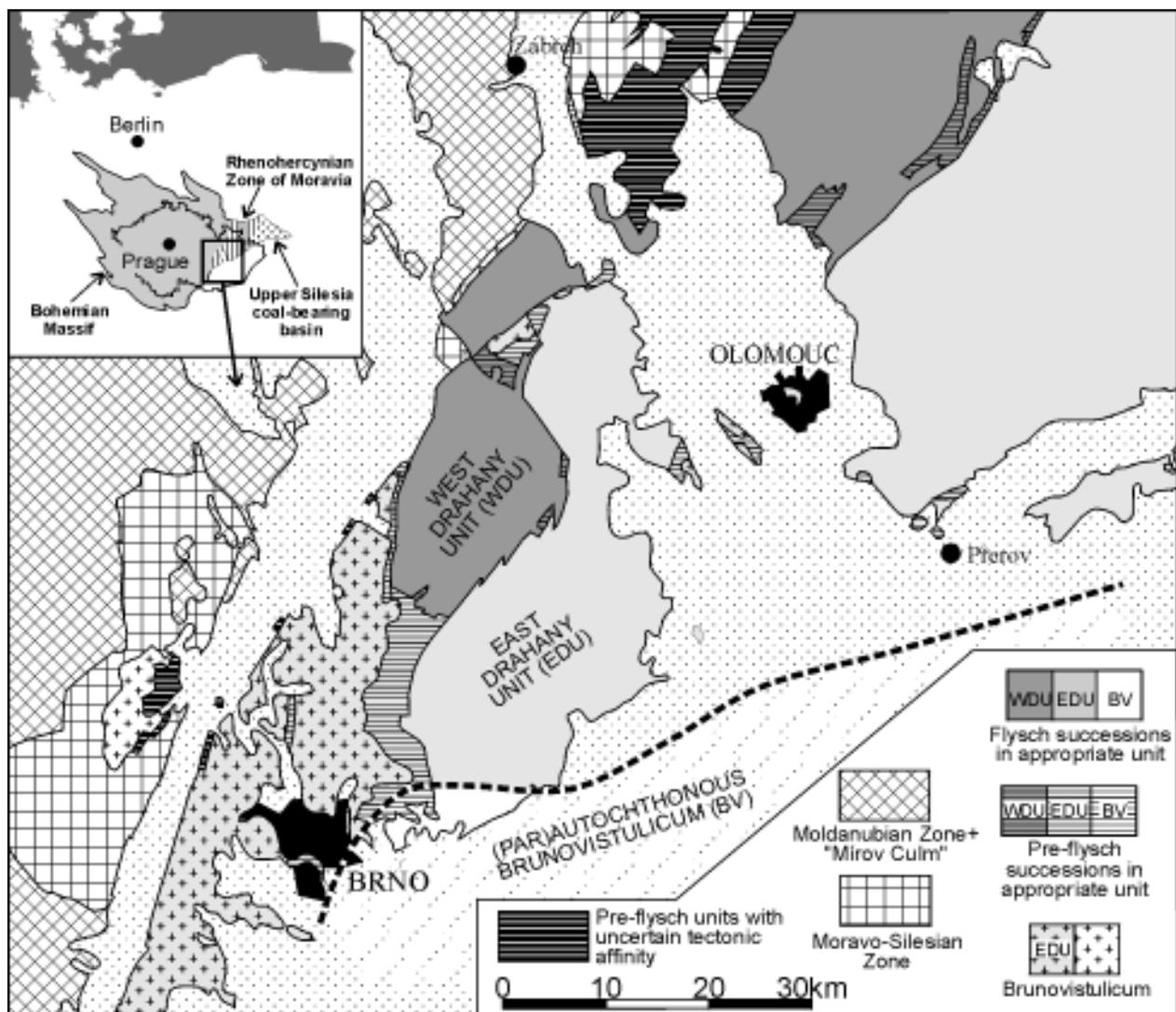


Fig. 1. Simplified sketch of non-metamorphosed Variscan tectonostratigraphic units at the eastern margin of the Bohemian Massif.

Lower Carboniferous pre-flysch successions to Lower Carboniferous flysch (Culm facies) successions in both tectonostratigraphic units of the KMB (Crha et al., 1989); (iii) – general revision of Silurian to Devonian sediments and volcanics near Stínava, central Drahany Upland (Chadima and Melichar, 1998; Melichar, 1999), which were assumed by the same authors to represent tectonic slices cropping out at the base of the western Drahany Culm nappe thrust over the eastern Drahany Culm nappe (cf. Cháb, 1984; Buček and Melichar, 1994 for analogous situation in the Šternberk – Horní Benešov Zone); (iv) – considerable differences in sediment composition between the Mírov Culm, the flysch successions located west of the Stínava – Ptení Belt (Protivanov Fm.) and those located east of this belt (Rozstání and Myslejovice Formations), which suggest different source areas for each unit (Špaček and Kalvoda, 2000; Schneider, 2001, unpublished data); (v) – considerable differences in diversity, abundance and distribution of body fossils and trace fossils between the flysch successions located west of the Šternberk – Horní Benešov Zone (Andělská Hora and Horní Benešov Formations) and those located east of the Zone (Moravice and Hradec-Kyjovice Formations), which imply the depositional environments of either unit being largely different (Zapletal and Pek, 1999); and last but certainly not least (vi) – stepwise decrease in thermal alteration across the Drahany Upland (Franců et al., 1999), from its northwestern part (KMB, 240 to 300 °C) through its central part (Moravian Karst, 170 to 200 °C) to the southernmost part of the Moravian Karst and subsurface occurrences below the Western Carpathians (130 to 170 °C). Taking the results of these studies into consideration we attempted to define the following tectonostratigraphic units (listed in ascending order from the uppermost to the lowermost, Fig. 1):

1. “Mírov Culm” nappe, which is assumed by the present authors to represent a non-metamorphosed equivalent of the Moldanubian Zone, being thrust over the Moravo-Silesian Zone and then exposed during an orogen-parallel extension.

2. Moravo-Silesian Zone (Svinov-Vranová Crystalline Unit), which is thrust over the West Drahany Upland Unit.

3. West Drahany Upland Unit, which comprises Protivanov Formation and slices of its pre-flysch rock successions of the Basinal Facies. This unit provides a material record of deposition on extremely thinned continental crust in distal parts of the Brunovistulian (Laurussian) continental margin or on oceanic crust during the extensional phase of its evolution (pre-flysch Basinal Facies). The extensional phase of deposition was replaced by deposition of synorogenic flysch (Protivanov Fm.) in deep-sea trench/deep-water foreland basin evolving above the zone of subduction/underplating of the Basinal Facies. This unit is thrust over the East Drahany Upland Unit.

4. East Drahany Upland Unit. This unit comprises the Rozstání and Myslejovice Formations with their underlying pre-flysch successions of the Transitional Facies (Ludmírov and Němčice) and the Platform (Moravian Karst) Facies s.s. (northern and central parts of the Moravian Karst). This unit provides a record of deposition on the Brunovistulian passive continental margin during the extensional phase, which was replaced by deposition of synorogenic flysch of the Rozstání and Myslejovice Formations in a typical deep-water peripheral foreland basin.

The East Drahany Upland Unit is thrust over the Brunovistulian Platform.

5. Brunovistulian Platform Unit. This is essentially an (par)-autochthonous unit, which comprises shallow-water and continental coal-bearing molasse (Ostrava and Karviná Formations), thin, undeformed or poorly deformed flysch successions of the upper parts of the Myslejovice Formation and their underlying pre-flysch successions of the eastern part of the (Platform) Moravian Karst Facies s.l. (southernmost closure of the Moravian Karst near Mokrý, pre-flysch successions in boreholes below the Western Carpathians). Material record of evolution from deposition in the Brunovistulian passive margin during the extensional phase to deposition of flysch in final phases of deep-water foreland basin and deposition of shallow-marine to continental molasse in shallow-marine to non-marine foreland basin during the compressional phase is preserved in this unit.

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