

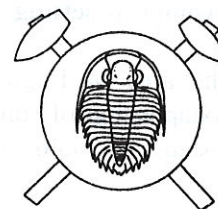
Evolution of Lugosilesian Orocline (North-eastern periphery of the Bohemian Massif): Kinematics of Variscan deformation

Vývoj lužicko-slezské orokliny (severovýchodní okraj Českého masívu): Kinematika variské deformace (Czech summary)

(11 text-figs. 2 plates)

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The north-eastern periphery of the Bohemian Massif was consolidated during long-lasting Variscan s.l. (Caledonian-Variscan) orogeny, in the conditions of the subequatorial oblique collision of more inner zones of the Variscan accretion wedge with the Brunovistulian terrane. This foreland corresponds to a mosaic of units most probably sutured, and jointly accreted, to the Baltica during the Caledonian orogeny.

Regional kinematic analysis of the more internal domains (the Orlice-Sněžník Unit and its footwall envelope) proved the early-Variscan top-to-N lower crust synmetamorphic (higher rank of amphibolite to granulite-eclogite facies) nappe shearing. The Lower Devonian collision caused ENE-WSW transtensional stretching – oblique rifting of the Brunovistulian foreland brittle crust. The top-to-N thrusting of the Variscan orogenic front is recorded by an a-type of stretching lineations in the gneiss of the Orlice-Sněžník Unit. Due to the NW-SE trend of the western indented edge of the Brunovistulian foreland, an oblique dextral wrench collision in the Moravosilesian Zone occurred. The mentioned NNW-SSE transpressional shortening resulted in crustal overthickening and the top-to-SE back thrusting, especially in the Zábřeh Unit and Silesicum. The late-Variscan transtension, with an ENE trend of stretching lineations, followed above mentioned crust overthickening. The gravitational collapse and out-ward lateral escape in the inner and deeper domains was contemporaneous with wide-spread intrusions of S-type granites and the growing of subperpendicular half-grabens, e.g. Boskovice and Orlice furrows.

The dextral late-Variscan, and post-Variscan strike-slip kinematics along the Sudetic WNW trending transcurrent faults resulted in a typical bend of orogen – the Lugosilesian orocline.

Key words: Bohemian Massif, Moravosilesian Zone, oblique collision, transpression, transtension, crustal overthickening, crustal extension

Introduction

The continental crust of the NE periphery of the Bohemian Massif was consolidated during the long-lived polyphase Variscan s.l. (Caledonian-Variscan) orogeny. In this area the Variscan orogenic belt seems to have a form of an orocline (orogenic bend – Figs. 1 and 2) as a consequence of a complex dextral oblique collision between the early consolidated cratonic foreland of the Baltica and accretion wedge of the Variscan front.

In spite of the recent NNE trend of the Moravosilesian branch of above mentioned orocline, which by most authors is interpreted to be the result of a simple W-E acting late-Variscan compression, we present the idea of a subequatorial long-termed oblique collision regime (Grygar 1988, 1992) in which the orocline was formed. From a dynamic viewpoint (the Variscan NW-SE to NNW-SSE maximal compression), the findings of our regional structural studies are consistent with the results

published by e.g. Le Gall and Darboux (1986), Eisbacher et al. (1989) etc. from the west European part of the Variscan orogenic belt. The complicated structural framework (bending) of the studied eastern domain of the Variscan collision belt – Lugosilesian orocline – resulted, amongst other things, from the complex structural role of the subducted Brunovistulian (Havlena 1976, Dudek 1980) foreland terrane. During the late Variscan tectogenic stages it was gradually detached and wrenched from a position adjacent to Baltica (Grygar 1991, 1992), especially from its elevated and towards south projected edge – the Ukrainian shield. Here we discuss the kinematics of the whole group of Lugosilesian orocline allochtoneous units in relation to its Brunovistulian foreland terrane.

Field studies were conducted in the area of Orlice-Sněžník Unit and its peripheral units: the Silesicum and the Zábřeh Unit, the Moravosilesian flysch foredeep, and the Upper Carboniferous coal-bearing molasse (all on the Czech territory only).