

The development of the Carboniferous accretionary wedge in the Moravian-Silesian Paleozoic Basin

Vývoj karbonského akrečního klínu v moravskoslezské paleozoické pánvi (Czech summary)

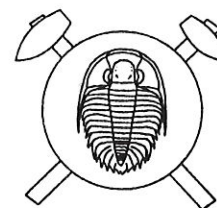
(15 text-figs.)

OTAKAR KUMPERA – PETR MARTINEC

*Vysoká škola báňská – Technická univerzita, Tř. 17. listopadu, 708 33 Ostrava-Poruba, Czech Republic
Ústav geoniky Akademie věd ČR, Studentská 1768, 708 00 Ostrava-Poruba, Czech Republic*

A complicated development of the erosion remnant of the sedimentary part of the Carboniferous accretionary wedge in the Moravian-Silesian region of the Bohemian Massif is comprehensively analyzed on the basis of a great number of data. Results rest upon a lithologic analysis of the flysch and molasse formations, analysis of thicknesses, analysis of the chemical and lithologic composition of sediments of individual lithostratigraphic units, analysis of cannibalism phenomena and extensive resedimentation of Carboniferous siliclastics, and upon the structural-tectonic analysis. A review of remnant and foreland basins is given, and the influence of an oblique collision and prograding thrust fold belt upon the changing geometry of the basin and upon the composition and structure of the sedimentary part of the wedge is interpreted.

Key words: Foreland basins, oblique collision, thrust-fold belt, megafacies, flysch, molasse, turbidites, fans, cannibalism, redeposition, chemical composition, heavy minerals, tectonic reworking, retro wedge, stack wedge



Introduction

The sedimentary part of the Carboniferous accretionary wedge forms a post-erosional remnant of the filling of the Czech part of Moravian-Silesian Paleozoic Basin (Fig.1). This large basinal structure developed from the Devonian up to the Westphalian at the eastern border of the Bohemian Massif under the control of a collision of two plates of continental crust. In the west, the internal orogenic zones of the Bohemian Massif are interpreted as a hanging wall unit (Fritz et al. 1993). The eastern Cadomian block of the Bruno-vistulicum played the role of the footwall unit which gradually disintegrated and subsided (Kumpera 1988) during an oblique collision (Grygar 1992). The deeply eroded roots of the collision suture are located in the Silesicum and Lugicum crystalline units in the north and in the Moravicum and Moldanubicum units in the south (Kumpera – Foldyna 1992). The collision of two units of contrasting crustal character conditioned a rapid uplift in the central parts of the Bohemian Massif and the origin and development of subsiding and migrating foreland basins in the Bruno-vistulicum. This consequently led to the origin of a thick sedimentary accretionary wedge of a complex composition and structure. The preserved filling of the basin is a rather small denudation remnant of a far larger basinal structure.

The Moravian-Silesian Paleozoic Basin belongs to polyhistory basins (Klein 1987). It underwent the following stages:

- rift basin (Hladil 1988) of the Devonian – Tournaisian age,
- carbonate platform (Devonian – Viséan),
- remnant basin with flysch (mostly Viséan),
- foreland basin with flysch,
- foreland basins with marine (Viséan) paralic coal-bearing sediments and continental molasse sediments (Namurian-Westphalian).

Sediments of the Carboniferous accretionary wedge crop out only in the Drahaný Upland (Drahaný block) and in the Nížký Jeseník Hills (Jeseník block) (Fig. 1). The major parts of the Carboniferous wedge are covered by younger sediments in the Polish lowlands and the autochthonous and nappes of the Outer Carpathians, and are here partly known only from deep mines and boreholes. The easternmost and southernmost parts of the basin are deeply immersed and unknown.

Materials and methods

In the paper, a great number of data, stored mostly in a computer data base, are summarized. The material comprises thicknesses, lithologic data, pebble analyses and chemical analyses of Carboniferous sediments, structural-tectonic observations and biostratigraphic determinations,