

Evolutionary Model for Exhumation of the Meliata Blueschists, Western Carpathians (Slovakia)

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Convergence of the African related continental blocks with southern margin of the European plate resulted in closure of the Tethyan Triassic oceanic basins and formation of suture zone with occurrences of high-pressure rocks that can be traced from the Western Carpathians through Rhodopian to Taurid in West and Central Turkey. Structural analyses and paleogeographic reconstructions from most of these high-pressure terrains indicate an eastward motion of the Apulian promontory and subduction of oceanic basins beneath the European related continental blocks. Based on the present nappe structure in the Western Carpathians, subduction of the Meliata oceanic basin and subsequent exhumation of blueschists have been interpreted to occur along the south-dipping thrusts plans that are coincident with main convergence direction of Cretaceous collision. In this contribution we present new data on a westward exhumation mechanism for the Jurassic blueschists that were overprinted by northward Cretaceous collisional processes in the Western Carpathians.

The Eastern boundary of the Meliata accretionary wedge is situated along the southern margin of the West Carpathians in Slovakia and northern Hungary. It is a thrust over the crystalline basement consolidated during Variscan orogeny. The Meliata accretionary wedge is a complex stack of crustal and oceanic units, which is formed from bottom to top by: (1) Lower Thrust Sheet composed of sub-blueschist facies (8–10 kbar 350–400 °C) quartz phyllite and conglomerate of Permian age. (2) Upper Thrust Sheet consisting of blueschist facies (10–13 kbar 400–450 °C) marbles with metabasites and phyllites, which are derived from Triassic oceanic materials, but some Variscan amphibolite-facies basement rocks with blueschist overprint are also part of this sheet. According to geochronological dating, the blueschist facies rocks, formed during Middle Jurassic time (156 Ma) were exhumed in time space of 125–145 Ma. (3) Very

low-grade (4–6 kbar 300–350 °C) Meliata Mélange composed of Permian evaporates and Jurassic shales, marls and sandstones that contain blocks (olistoliths) of Triassic radiolarites, cherts, limestones, serpentinites, gabbros and blueschists. (4) Very low-grade to non-metamorphosed Turna and Silica nappes derived from Apulian shelf and formed by Upper Permian – Jurassic limestones, shales, sandstones and some volcanic rocks.

Structural and metamorphic evolution of the Meliata accretionary wedge is characterized by fabrics and mineral assemblages testifying HP stage, retrogression during exhumation and emplacement of thrust sheets and late shortening of whole wedge during buttressing stage. The HP deformation stage D₁₋₂ in the Lower and Upper Thrust Sheets is manifested by development of penetrative SE dipping metamorphic fabric, bearing intense stretching lineation plunging to the southeast. The S₁₋₂ metamorphic fabric in the Meliata mélange that related to accretionary metamorphism (Upper Jurassic/Lower Cretaceous) is only preserved within competent Triassic marbles forming olistostromes. D₃ deformation stage – buttressing is developed in all thrust units of the Meliata wedge as well as in the underlying parautochthonous Paleozoic basement. It is characterized by N-S trending buckle and striking folds and steep ESE dipping slaty or spaced axial plane cleavage. The Cretaceous overprint was a polyphase process controlled by indentation of southern block actively moving to the north. The new structural data in combination with petrologic and geochronologic results allow to constraint a tectonic model for exhumation that is good agreement with paleogeographic reconstructions considered for the suture zones in the Rhodop massif, Aegean Sea and in West Turkey. Our new results fit well with paleomagnetic record of Jurassic drifting and subsequent anticlockwise rotation of African plate during Cretaceous.

Biotic Response of Mid-Cretaceous Palaeoceanographic Changes: Data Sets from Planktic Foraminiferal Analysis of Red Beds (Ukrainian Carpathians)

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Mid- to Late Cretaceous changes in global oceanic regime are marked by black- to red-bed transition in the Ukrainian Carpathians. Two sections of red beds have been studied in order to determine a high-resolution biostratigraphy and life mode of planktic foraminifers (Tissalo and Dragovo sections). Red coloured sediments produced in well oxygenated environment appeared here in the Early Cenomanian during the Rotalipora brotzeni Zone. The red beds recorded short-timed fluctuations in composition of

foraminiferal associations (Fig. 1), mainly in ratio of opportunists (e.g. hedbergellids, whiteinellids, etc.) and keeled foraminifers (e.g. rotaliporids, dicarinellids). Distribution of these habitats depends on productivity changes in surface or intermediate waters. Generally, the foraminifers living in the thermocline (deep sea dwellers) and adapted to oligotrophic feeding mode (large keeled rotaliporids) gradually increased to the maximum in the Rotalipora greenhornensis and R. cushmani zones. This