

Meliata type locality revisited: Evidence for the need of reinvestigation of the Meliata Unit and redefinition of the Meliata Mélange

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The Meliata Mélange and the origin of the different blocks in a cherty matrix (radiolarites, cherty limestones, cherty marls, argillaceous marls) are crucial not only for the interpretation of the geodynamic history of the south-eastern part of the Western Carpathians. Similar mélange complexes do exist in the southern Northern Calcareous Alps and in the Dinarides, Albanides and Hellenides. The Meliata Mélange, and especially its type locality at the Muráň river in the small village Meliata (Slovak Karst Mts.), stands as a synonym for the suture of the Meliata Ocean. According to the widely accepted paleogeographic reconstructions, the Meliata Ocean, sometimes also named Meliata-Hallstatt Ocean, should strike originally from the Northern Calcareous Alps to the Western Carpathians. In this classical model, the Northern Calcareous Alps and the Western Carpathians form its northern shelf, whereas the Transdanubian Range and the Bükk Mts. should have formed its southern margin. On the contrary in our model, which is based on investigations of different mélanges in the Alpine/Carpathian/Dinaride realm, the “Meliata Ocean” does not represent an independent ocean, but the northernmost part of the single Neotethys Ocean. This started to open in the Anisian and was partly closed in the late Middle Jurassic times. During this orogenic phase, which formed the Neotethyan Belt, several types of ophiolitic and radiolaritic mélanges were created. One of them is the Meliata Mélange. However, the understanding and interpretation of the Meliata Mélange differ in the literature and no clear definition of the Meliata Mélange was presented until now. Consequently, an exact definition of a succession or unit should start at the type locality located tectonically south-west and above the Gemic Superunit, which has the “Meliata Mélange” remnants preserved from both sides. This fact has led some authors to the opinions about two branches of the Meliata Ocean surrounding the Gemic Superunit, whereas others inferred that the northern occurrences do not represent a true suture, but

they were transported to its recent position tectonically by thrusting (obduction). By this, an exact definition of the Meliata Mélange will not only lead to a better understanding of the geology of the southeastern Western Carpathians, it will also help for a better understanding and reconstruction of the geodynamic processes in the whole Neotethys realm.

For that reason we have started with a reinvestigation of the type-locality, particularly the Late Middle Jurassic matrix between the olistostromes and slide blocks of the upper part of the succession recognized in earlier investigations. The lower part of the type section was interpreted as a continuous Anisian to Carnian sequence originally. A sample from the basal part of the section, below the Ladinian cherty limestones and radiolarites and above the Anisian limestones, yielded the Callovian to Early Oxfordian age indicated by the microfacies resembling the silicified Bositra limestone with radiolarians. In the upper part of the Meliata type section, several grey limestone and dolomite fragments resting in a late Middle Jurassic sedimentary matrix occur. Besides Carnian limestones, also the Norian grey limestones occur that represent components derived from the typical grey Hallstatt facies. The different carbonate blocks in the Jurassic matrix show also different thermal overprint based on the Conodont Colour Alteration Index measurements, indicating transported metamorphism. Ophiolite components and slides are missing in the Meliata type section, but occur in the mélange areas in the nearby surroundings of the village. In fact, the Meliata Mélange represents originally a deep-water basin fill in front of advancing ophiolite and sedimentary cover nappes, which was later deformed by incorporation in the nappe stack. As a result, a typical mélange was formed.

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