



## Discussion

## Reply to D. Pană's discussion on "The Eastern Carpathians 'ophiolites' (Romania): remnants of a Triassic ocean" [Lithos 108 (2009) 151–171]

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### 1. Introduction

We welcome the discussion of our paper by D. Pană (2010-this issue), which gives us an opportunity to answer the points made by him and also to clarify some of our interpretations of the Eastern Carpathians 'ophiolites'. First, we wish to highlight that Pană envisages a traditional (fixistic) view of the lower Cretaceous "Wildflysch" in the Eastern Carpathians. He sees it as sediment, bounded by shear zones, that was deposited in a rift-related graben-like(?) structure overlying the Bucovinian metamorphic basement and its Permo-Triassic to Jurassic sedimentary cover (Pană and Erdmer, 1994; Pană, 1998). In this model the ultramafic lherzolites represent subcontinental mantle transported to the surface along subvertical shear zones. Additionally, he considers the basalts as intracontinental volcanics that were erupted as massive or pillowed lava flows (his "spilites"), either above or interlayered with the Cretaceous "Wildflysch" sediments. This model is not supported by our findings and consequently is not compatible with our interpretation.

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Pană draws on evidence unrelated to the content of our paper to support his very different point of view, e.g. concerning the Severin-Ceahlău ophiolites. His comments often appear to misrepresent the evidence or interpretations given in our paper.

### 2. Field and petrographic data and interpretations

Pană criticizes our use of the term "ophiolite", because no coherent ophiolitic sequence is preserved. The term "ophiolite" was intentionally marked with inverted commas throughout our paper, for three reasons: firstly as a short-hand for the various mafic and ultramafic rocks in the area; secondly, because many of the basalts show MOR-type chemical features, and thirdly, because some of the mafic extrusive rocks are closely associated with siliceous and carbonate sedimentary rocks containing oceanic fossil assemblages. In reality, some true ophiolitic fragments do occur, for example serpentinites associated with sheeted dykes in the Vârghiş area (Hoeck et al., 2009; pp. 156). This is consistent with more recent definitions and classifications of ophiolites (Robertson, 2002; Dilek, 2003).

In other orogenic belts complete ophiolites are again rare compared to the numerous examples of dismembered ophiolites (Anonymous, 1972; Nicolas and Boudier, 2003; Pearce, 2003), for example in the Dinaride Ophiolite Zone and the Vardar Zone (Pamić et al., 2002; Trubelja et al., 2004), in the Uralides (Spadea et al., 2003), and in the Central Pontides of northern Turkey (Robertson and Ustaömer, 2004). The dismembered ophiolites include examples related to the Meliata-