

## **Lower Permian Mafic Lavas from the Mersin Mélange (Southern Turkey): Geochemical Evidence for the Evolution of Northern Neotethys**

K. SAYIT<sup>1\*</sup>, Y. BEDİ<sup>2</sup>, U.K. TEKİN<sup>3</sup>, M.C. GÖNCÜOĞLU<sup>1</sup>,  
C. OKUYUCU<sup>4</sup>

<sup>1</sup> METU, Geological Engineering, Ankara, Turkey

(\*correspondence: ksayit@metu.edu.tr)

<sup>2</sup> MTA, Dept. of Geological Research, Ankara, Turkey

<sup>3</sup> Hacettepe University, Geological Engineering, Ankara, Turkey

<sup>4</sup>Selcuk University, Geological Engineering, Konya, Turkey

The Mersin Mélange is one of the exotic units within the Tauride-Anatolide Composite Terrane. The Mersin Mélange shows essentially block-matrix character, including blocks and tectonic slices of diverse sizes and origins. Mafic volcanics are common as blocks within the mélange, and in some places these lithologies are found to be intercalated with pelagic sediments, such as mudstone and chert. In this study, we focus on such occurrences in the Mersin Mélange, where the mafic volcanic rocks are interbedded with Lower Permian mudstone-chert alternations.

The studied Permian lavas are all altered to varying degrees and exhibit aphanitic and porphyritic textures. The primary mineralogy is largely characterized by clinopyroxene, apatite and to a lesser extent biotite. Olivine occurs as pseudomorphs of calcite and chlorite. These extrusives are extremely enriched in terms of incompatible trace elements (e.g. Nb = 124.4-272.3 ppm), and they display strongly fractionated trace and REE patterns ( $[La/Yb]_N = 28.2-48.0$ ).

The very high Nb/Zr and Nb/Yb ratios of the Permian lavas suggest their derivation from an enriched mantle source region, probably associated with very low degrees of partial melting. The extreme elemental enrichment requires a metasomatized sub-continental lithospheric mantle source. The fractionated HREE patterns of the extrusives indicate melting depths where garnet was a residual phase. The lack of relative enrichment of Th and La over Nb suggests that metasomatizing agents are not subduction-related. Combined with the geological features, overall geochemical characteristics of the lavas are consistent with generation at a continental-rift setting, possibly associated with a mantle plume. Such data may indicate the rupturing of northern Gondwanan margin during the Lower Permian and may further constrain the opening of northern Neotethys before the end of Permian.

This study was funded by TUBITAK 112Y370.