

## ZIRCON U–Pb DATINGS TO UNRAVEL LATE PALAEOZOIC MAGMATIC EPISODES IN THE TISZA MEGA-UNIT: A REVIEW

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### Introduction

During Late Palaeozoic times several magmatic events occurred in the Central European Variscides associated with a collisional to extensional tectonic environment. The Tisza Mega-unit is not an exception in the broader region, where various Permian–Carboniferous plutonic and volcanic formations are known, cropping out in the Apuseni and the Mecsek Mts. or drilled by exploration wells in the basement. Despite the rapidly spreading method of zircon U–Pb geochronology, quite a few of these rocks were dated so far; however, precise and reliable age results (besides whole-rock trace element and isotope geochemical data) have a key role in the local to regional correlations. In our recent and ongoing studies, a wide range of felsic volcanic and plutonic rocks were dated, representing southern Transdanubia, the basement of the eastern Pannonian Basin (Hungary) and the Apuseni Mts. (Romania) to place Variscan igneous processes in time and to correlate among Late Palaeozoic formations at local (Tisza Mega-unit) to (sub)regional scale (Carpathian–Pannonian region or the broader area of the Central European Variscides). The aims of this abstract are to highlight the new age results and their regional geological significance as well as to provide an insight into ongoing investigations.

### Materials and methods

Studied samples included the following formations: Permian felsic volcanic rocks in southern Transdanubia and the basement of the eastern Pannonian Basin (the so-called Gyűrűfü Rhyolite Formation) as well as in the Apuseni Mts.; Permian A-type granitoids, felsic dykes, and diorites in the SW Apuseni Mts. (Highiş massif); and Variscan S-type granitoids (the so-called Battonya granites) in the basement of the eastern Pannonian Basin. In-situ U–Pb zircon age determinations were performed at the GÖochron Laboratories, University of Göttingen by LA–SF–ICP–MS. To gain eruption ages for volcanic rocks, we applied the TuffZirc Age algorithm of ISOPLOT software (LUDWIG, 2002) on <sup>206</sup>Pb/<sup>238</sup>U ages, selecting the youngest coherent age group of zircon crystals. In case of plutonic rocks, the same calculation method was used as well, that referred to the main period of zircon crystallization in the magma system.

### A summary of the results

Zircon U–Pb datings of Permian felsic volcanic rocks in the Tisza Mega-unit revealed a Guadalupian (~270–259 Ma) voluminous volcanism, the products of which occur from southern Transdanubia to the Apuseni Mts. (SZEMERÉDI *et al.*, 2020). So far, these formations were considered to form a Lower Permian marker horizon (representing a single event) in the local to subregional lithostratigraphy, therefore such former interpretations should be revised. Besides connecting Permian felsic volcanic rocks to each other from various parts of the Tisza Mega-unit, zircon U–Pb geochronology (supported by whole-rock geochemistry) helped to reveal plutonic–volcanic connections between them and the A-type granitoids in the Highiş massif (~268–263 Ma; SZEMERÉDI *et al.*, 2021). The possibility of similar connections between the Permian volcanic rocks and the underlying S-type granitoids in the basement of the eastern Pannonian Basin was rejected, as the latter showed Tournaisian (~356 Ma) age. As Variscan S-type granites (the so-called Codru granitoids) occur in the Apuseni Mts. too, exploring their connection with basement formations is in the focus of ongoing studies. Our aim is to incorporate all these geochronological results in the local to regional correlation of the Tisza Mega-unit.

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