



Triassic magmatism along the Maritsa river valley, Sakar-Strandzha Zone, Bulgaria

Триаски магматизъм по долината на река Марица, Сакар-Странджанска зона, България

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Introduction

Granite-porphyrries and quartz-porphyrries intruding Triassic meta-sedimentary rocks between the towns of Haskovo and Dimitrovgrad along the Maritsa river valley have been interpreted as Early Triassic (Chatalov, 1961). These data were extended to the regional-scale (Chatalov, Stefanov, 1966; Kozhoukharov et al., 1969) for the Sakar-Strandzha Zone (SASTZ). The Triassic magmatism in this region was confirmed by Kozhoukharova and Kozhoukharov (1978), and the span of the Triassic magmatism was expanded into the Middle Triassic, because of the crosscutting relationships with a fossiliferous formation. However, the exact age of the Triassic magmatism remains unclear and might even be younger than the Triassic. For the SASTZ, a recent U-Pb zircon geochronology revealed an Early Triassic (ca. 249 Ma) magmatism (Aysal et al., 2018). This age finding reopens the question for the timing and significance of the Triassic magmatism in the SASTZ. In this contribution, our aim is to constrain the timing of Triassic magmatism using U-Pb zircon geochronology for magmatic rocks outcropping along the Maritsa river valley in the westernmost part of the SASTZ in Bulgaria (Fig. 1).

U-Pb LA-ICPMS zircon geochronology results

Sample S81 from a (meta)rhyolite yielded a concordant age of 237.8 ± 3.4 Ma, which confirms the Middle Triassic magmatic crystallization, in

line with the intrusive relationships with respect to the Early Triassic clastic-carbonate rocks in the Northern Maritsa river valley (e.g., Chatalov, 1961) (Fig.1). To the east, a sample S86 of a leucocratic granite, which has been described in detail by Ivanov (1964) south of the Permian Sakar granitoid batholith (ca. 295–296 Ma, Bonev et al., 2019a), yielded a concordant age of 242.1 ± 1.8 Ma for the magmatic crystallization. The leucocratic granite crosscuts the high-grade metamorphic basement. Sample S79 from a leucocratic (meta) granite and sample S83 from a K-feldspar porphyritic meta-granite from the so-called Harmanli block to the south (e.g., Boyanov et al., 1992) (Fig. 1), yielded concordant ages of 243.3 ± 5.8 Ma and 240.6 ± 2.3 Ma, respectively, for the magmatic crystallization. The concordantly dated zircons that yielded Triassic magmatic stage ages of the igneous/meta-igneous protoliths along the Maritsa river valley, all have Th/U ratios compatible with a magmatic crystallization process. The major elements of the dated samples reveal peraluminous acidic compositions, and a calc-alkaline to high-K-alkaline affinity for the studied Middle Triassic magmatic rocks along the Maritsa river valley.

Discussion

The U-Pb zircon age of the Middle Triassic magmatic phase (ca. 243–238 Ma) from the Maritsa river valley invading the high- to low-grade metamorphic basement of the SASTZ opens new questions about

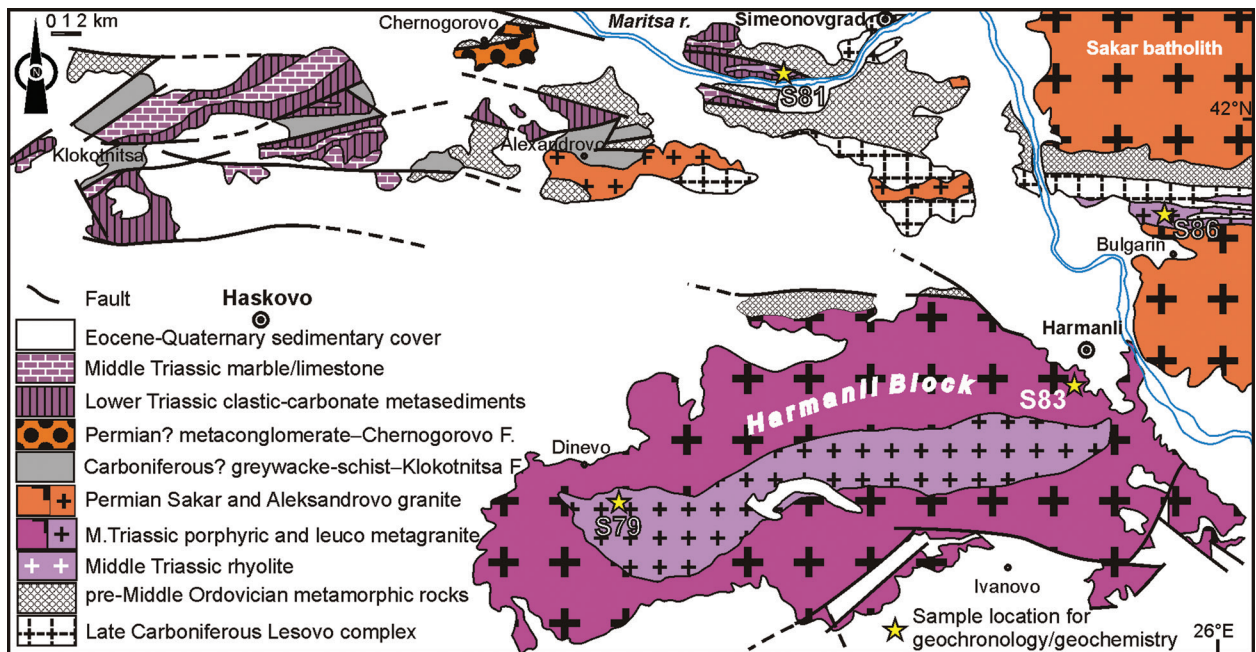


Fig. 1. Geological map of the Maritsa river valley area compiled after Boyanov et al. (1992, 1993). The new U-Pb zircon age data from this study, as well as published and unpublished age data are also shown.

the regional-scale link of this magmatism. On the one hand, it can be argued that the Middle Triassic magmatism followed Paleotethyan subduction and development of a Late Carboniferous–Permian continental magmatic arc in the SASTZ (Bonev et al., 2019a). On the other hand, it is also possible that the Middle Triassic magmatism was connected to a continental margin bimodal rift-related magmatism in the south, from the Rhodope Massif to the Vardar zone in Greece (Bonev et al., 2019b, and references therein). At present, the continental type and setting of the Middle Triassic acid magmatic rocks along the Maritsa river valley favours the scenario in which Middle Triassic magmatism followed Late Carboniferous–Permian magmatism in the SASTZ, related to Paleotethyan subduction under the Eurasian plate.

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