

In pursuit of the age of Variscan metamorphism in the Sakar Unit (Strandja Zone, SE Bulgaria)

**MRS. ANNA GUMSLEY, PHD¹, IANKO GERDJKOV²,
ASHLEY PAUL GUMSLEY³ AND DAVID M. CHEW⁴**

¹Institute of Geological Sciences Polish Academy of Sciences

²Sofia University "St. Kliment Ohridski"

³University of Silesia in Katowice

⁴Trinity College Dublin

The Strandja Zone is a NW-SE-trending mountain belt in SE Bulgaria and NW Turkey, comprising pre-Late Cretaceous autochthonous and allochthonous units. Its western part, the Sakar Unit, consists of metamorphic rocks and granitoids covered by Permian and Triassic metasedimentary rocks. This unit is typically regarded as a separate tectonic entity due to its higher degree of Early Alpine metamorphic overprinting compared to the rest of the zone. Although Variscan metamorphism was previously reported from the Strandja Zone, its exact timing remains debated (>319 Ma to 271 Ma) [1, 2]. We have undertaken U-Pb dating on various accessory minerals on pre-Late Carboniferous para- and orthogneisses to constrain the Variscan and post-Variscan history. Monazite inclusions in garnet from a paragneiss yielded a ca. 154 Ma U-Pb age, while U-Pb detrital zircon ages from the same rock are >486 Ma. Rutile from orthogneisses also yielded a ca. 154 Ma U-Pb age, whereas zircon provided a protolith age of ca. 614 Ma. Additionally, detailed studies of melt patches in orthogneiss interpreted as pre-Variscan because of the high degree of metamorphism and deformation yielded a ca. 250 Ma U-Pb zircon crystallization age, a ca. 147 Ma apatite age interpreted as recording an Early Alpine event and a ca. 64 Ma monazite age recording a fluid-related Alpine overprint. Finally, a migmatite, with a detrital zircon population >454 Ma, was selected for depth-profiling U-Pb dating of zircon, as most of the crystals have thin (up to 5-10 µm) metamorphic zircon rims. Although we obtained a ca. 327 Ma age from these zircon rims interpreted as the timing of the Variscan metamorphic event in the Strandja Zone, some very thin outermost rims also record Early Alpine ages. It indicates that the Early Alpine event in the Sakar Unit is widespread and significantly overprinted the area, making structural interpretations problematic.

Okay et al. (2001), *International Journal of Earth Sciences* 90, 217-233.

Śalacińska et al. (2022), *Gondwana Research* 109, 253-273.