GEODYNAMIC EVOLUTION OF THE TIMOK MAGMATIC COMPLEX (TMC) BASIN IN THE SERBIAN CARPATHIANS

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ABSTRACT

The Timok Magmatic Complex (TMC) represents part of the wider Late Cretaceous Apuseni-Banat-Timok-Srednogorie (ABTS) belt of calc-alkaline magmatics. The ABTS magmatic belt was formed due to the retreat and steepening of the NE-dipping Neotethys slab located beneath the Carpatho-Balkanides orogen of SE Europe. The basin hosting the TMC was formed on the Getic Unit of the Serbian Carpathians, which belongs to the Dacia tectonic Mega-Unit with European continental affinity. The opening of the TMC basin, associated with an extensional regional tectonic regime, occurred since Cenomanian times. The subsequent peak of the extension was characterized by the interplay between magmatic and sedimentary processes resulting in the emplacement of numerous (sub)volcanic bodies and mixed volcano-sedimentary deposition. In addition, the calc-alkaline system of the TMC basin was instrumental in generating world-class porphyry copper-gold deposits, which have been actively exploited in this region for more than a century.

Within the scope of the TMCmod project, supported by the Science Fund of the Republic of Serbia (GRANT No TFC1389-YF/PROJECT No 7461), we are conducting a combined field kinematic and high-resolution geochronological study. U-Pb zircon geochronology will provide the emplacement ages and geochemical affinities of the several major (sub)volcanic bodies in the TMC basin. Coupled with the results of kinematic analysis this will enable new constraints on the age and mechanisms of extension, which controlled the formation of this basin. The obtained results will be subsequently validated through a series of analogue models and integrated into a coherent geodynamic model coupling the TMC basin with its Neotethys subduction driver.

Keywords: Serbian Carpathians, Timok Magmatic Complex, tectonics, geochronology, analogue modelling.