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THE MOSLAVAČKA GORA MASSIF IN CROATIA: PART OF A LATE CRETACEOUS HIGH-HEAT-FLOW ZONE IN THE ALPINE-BALKAN-CARPATHIAN-DINARIDE COLLISION BELT

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The Moslavačka Gora Massif is located about 50 km east-south-east from Zagreb. It covers an area of about 180 km^2 and represents one of the major surface exposures of crystalline basement within the Tertiary sediments of the Pannonian Basin. The central part of the massif is made up of undeformed to slightly deformed, fine-grained granite. The peripheral parts are mainly built up by migmatites and various types of metamorphic rocks (paragneisses, amphibolites, metapelites). The whole complex shows the structural signatures of a dome with a granitic core and a metamorphic mantle (Pamić 1990, Pamić et al. 2002).

For a long time the Moslavačka Gora Massif has been considered as a major outcrop of Variscan crystalline basement of the South Tisia unit, like the Slavonian Mountains (Papuk, Psunj and Krndija). However, recent electron-microprobe-based monazite dating, carried out at Salzburg University, has shown that the core granite has a Cretaceous formation age (90±20 Ma), and that much of the metamorphic mantle records a high-grade metamorphism of Cretaceous age as well. This metamorphism was of the low-pressure type and reached, at least in places, granulite facies grade, with the formation of the paragenesis Crd-Grt-Kfsp in metapelitic lithologies.

It is not yet resolved, if this low-P, high-T metamorphism occurred contemporaneously with the emplacement of the granitic magmas or slightly before. Both, the granites and the high-T metamorphic rocks show sometimes a younger deformation and retrogression at upper greenschist/lower amphibolite facies conditions.

In amphibolitic lithologies mineral relics of a (possibly Variscan?) Barrovian type metamorphosis are preserved, which is not yet dated by geochronological methods. A search for Variscan monazite relics in the metapelitic rocks remained unsuccessful until now. The monazites in these rocks are generally of Cretaceous age except for in one sample, where relics of monazites with a Permian age were found. Due to the large error of electron-microprobe-based monazite dating of ca. ±20 Ma, the precise timing of the Cretaceous events (prograde low-P, high-T metamorphism, plutonism, retrograde overprint) could not be resolved by that method.

Ar-Ar amphibole dating on amphibolites yielded cooling ages of slightly above 80 Ma, whereas Ar-Ar plateau ages of muscovites from a pegmatite and a deformed granite were both slightly younger (around 75 Ma) (Balen et al. 2001). These ages provide a lower age limit for the Cretaceous high-T metamorphism and the intrusion of the Moslavačka Gora granite, respectively.

Due to the newly discovered Cretaceous formation ages of the granitic rocks, a correlation of the Moslavačka Gora Massif with the Banatite magmatic belt of southeastern Europe may be possible. According to Neubauer (2002) the Banatite belt may have formed as a consequence of post-collisional slab break-off, representing a long but narrow, Late Cretaceous zone with increased heat input from the astenospheric mantle. The high-T, low-P metamorphism recorded in the Moslavačka Gora Massif indicates a position within a Late Cretaceous high-heat-flow zone, and thus would be compatible with such a model.

Geochemical data indicate that the Moslavačka Gora granites are most likely derived from crustal sources, representing mainly slightly peraluminous, felsic I-type granites (s.s.) to

granodiorites. They may have formed as secondary magmas in the contact aureole of hot mafic mantle melts pounding at the base of the crust.

References

BALEN D, SCHUSTER R, GARAŠIĆ V (2001) *A new contribution to the geochronology of Mt. Moslavačka Gora (Croatia)*. PANCARDI 2001 Abstracts II: DP-2

NEUBAUER F (2002) *Contrasting Late Cretaceous with Neogene ore provinces in the Alpine-Balkan-Carpathian-Dinaride collision belt.* Geological Society Special Publications No. 204: 81-102.

PAMIĆ J (1990) *Alpine granites, migmatites and metamorphic rocks from Mt. Moslavačka Gora and the surrounding basement of the Pannonian Basin (Northern Croatia, Yugoslavia)*. Rad JAZU 10: 7-121 (in Croatian)

PAMIC J, BALEN D, TIBLJAS D (2002) *Petrology and geochemistry of orthoamphibolites from the Variscan metamorphic sequences of the South Tisia in Croatia – an overview with geodynamic implications.* Int J Earth Sci (Geol Rundsch) 91: 787-798.

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