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The balance between orogenic building and subsequent collapse during the Tertiary evolution of the NE Dinarides: Constraints from low-temperature thermochronology

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One classical continental back-arc basin is the Pannonian basin of Central Europe that formed during Miocene times in response to the retreat of a slab situated at the exterior of the Carpathians. Within this overall framework, much less is known on the kinematics and exhumation of the NE Dinarides at their contact with the Pannonian basin. This area is key to understanding the mechanics of the formation of the Great Hungarian Plain part of the basin in terms of coupling between basin subsidence and coeval orogenic exhumation. Three areas were selected as key sites for this exhumation study, i.e. Cer, Bukulja and Fruška Gora Mountains, which are located in the Serbian part of the Dinarides. The low-temperature thermochronological study has demonstrated that the formation of the Pannonian basin in this sector of the orogenic chain was associated with coeval large-scale exhumation in the footwall of large scale detachments. This rapid exhumation took place during late Early to early Late Miocene times in response to asymmetric crustal stretching forming the SE part of the Pannonian basin and its southern prolongation along the Morava corridor. In footwalls of detachments, this process has exhumed rocks that were previously buried to intermediate crustal depths by the subduction of the Sava ocean and the subsequent collision that took place between European- and Adriatic-derived units. This exhumation was associated with decompressional melting and local emplacement of genetically related plutons. The top-E extension cannot be associated with an E-ward movement of the intervening Carpathians units in this sector of the chain. The only other possible genetic option is the roll-back of a Dinaridic slab, a hypothesis that would be compatible with the large-scale extension that was recently quantified in this segment of the orogenic chain.