Geophysical Research Abstracts
Vol. 12, EGU2010-2530, 2010
EGU General Assembly 2010

Dating intrusion and cooling of Cenozoic granitoids in the Dinarides of Southern Serbia and discussion of the geodynamic setting of Paleocene-Miocene magmatism in the Balkan Peninsula

Schefer Senecio (1), Vladica Cvetković (2), Bernhard Fügenschuh (3), Alexandre Kounov (4), Maria Ovtcharova (5), Urs Schaltegger (6), and Stefan Schmid (7)

(1) Geologisch-Paläontologisches Institut, Basel, Switzerland (senecio.schefer@unibas.ch), (2) Univerzitet u Beogradu - Rudarsko Geološki Fakultet, Beograd, Republika Srbija (cvladica@rgf.bg.ac.rs), (3) Institut für Geologie und Paläontologie, Innsbruck, Austria (Bernhard.Fuegenschuh@uibk.ac.at), (4) Geologisch-Paläontologisches Institut, Basel, Switzerland (A.Kounov@unibas.ch), (5) Département de Minéralogie, Genève, Switzerland (Maria.Ovtcharova@unige.ch), (6) Département de Minéralogie, Genève, Switzerland (urs.schaltegger@unige.ch), (7) Institut für Geologische Wissenschaften, FU Berlin, Germany (schmids@zedat.fu-berlin.de)

This paper presents the results of high precision single grain U–Pb dating and Hf isotope analyses of thermally annealed and chemically abraded zircons from the Kopaonik, Drenje, Željin, Golija and Polumir intrusions in the inner Dinarides of southern Serbia. In addition, new zircon and apatite fission-track data together with local structural observations, allow for constraining the subsequent exhumation history of these intrusions. Two age groups were determined for the granitoid intrusions: (i) Oligocene intrusive bodies (Kopaonik, Drenje, Željin) ranging in age from 31.7 to 30.6 Ma and (ii) Miocene Golija and Polumir intrusions which emplaced at 20.58–20.17 and 18.06–17.74 Ma, respectively. The apatite fission-track modelling combined with zircon central ages show rapid cooling from above 300 to ca. 80 °C between 16 and 10 Ma for granitoids of both age groups, followed by rather slow cooling to surface temperatures for the last 10 Ma. Fast Middle Miocene cooling between 16 and 10 Ma is caused by extensional exhumation of the plutons that are located in the footwall of core-complexes. This documents that Miocene magmatism and core-complex formation leading to formation of the Pannonian basin also affected a part of the mountainous areas of the internal Dinarides.

The discussion of an extensive set of age data from the literature and the geodynamic setting of the Balkan Peninsula reveals that there is no direct connection of the Dinaridic Late Eocene to earliest Miocene magmatic belt with contemporaneous Periadriatic intrusions in the Alps and along the Mid-Hungarian fault zone as proposed in the literature. We insist on the fact that the subduction polarity in the Alps, including that within the Western Carpathians north of the Mid-Hungarian fault zone, is opposite to that of the Dinarides during the given time span. Instead, we propose that Late Eocene to Oligocene magmatism, which affects the Adria-derived lower plate units of the internal Dinarides, may be caused by delamination of the Adriatic mantle from the overlying crust, associated with intra-plate convergence that propagates outward into the external Dinarides during this time interval. Miocene magmatism, on the other hand, is associated with core-complex formation at the southern rim of the Pannonian basin probably associated with the W-directed subduction of the European lithosphere beneath the Carpathians, possibly interfering with ongoing Dinaridic–Hellenic back-arc extension.