GEOLOGICA BALCANICA, 46 (2), Sofia, Nov. 2017, p. 40.

Geochronology of the so-called South Bulgarian granitoids – a review (1836–2000)

Vasil Arnaudov

Geological Institute, Bulgarian Academy of Sciences, Acad. G. Bonchev Str., Bl. 24, 1113 Sofia, Bulgaria; e-mail: varnaudov_@abv.bg

(Accepted in revised form: October 2017)

This review treats the concepts concerning the age of granitoid magmatism in southern Bulgaria and considers the age assessments of the large granite intrusions in the metamorphic complexes known as "South Bulgarian granites". In terms of the available contributions, this analysis encloses a long period, from 1836, the time of Ami Boué, the first geologist who visited Bulgarian land, to 2000. The review discusses both ideas and geochronological data on a large time-span, from the Archean to the "Tertiary". The emphasis is on the progress of Bulgarian researchers' views that had been made prior to the first pioneering attempts at radiological determinations (*i.e.*, using He and Pb quantitative methods), and especially after the advent of modern equipment for radioisotope dating, based on various isotope systems (*e.g.*, K-Ar, U-Th-Pb, Rb-Sr) and mathematical models of lead isotopes (Pb-Pb) following the basic model of "plumbotectonics" and the fission track method.

The bulk of radioisotope data (more than 300 dates on feldspar and 500 dates on galena and other ore minerals) have been made by using the Pb-Pb method, which was introduced by Blagoy Amov and improved by the same worker via his "dynamic model of a continuous lead-isotope evolution" in the Earth's crust. From 1969, when pegmatites that are genetically linked to granite intrusions of southern Bulgaria were dated as "Tertiary", until 2000, all of the above-mentioned methods were tested. These methods confirmed the "Tertiary" ages of the granitoids of the Rhodope Massif and their difference in age from the Hercynian granitoids of the Srednogorie Zone. Owing to this, two groups of granitoids of dissimilar ages, previously referred to as "South Bulgarian granites", were determined. This distinction was corroborated by varieties of mineralogical, petrological and geochemical studies, which were carried out by collaborators from the Department of Geochemistry of the Geological Institute. The "magical boundary", defined by Acad. Strashimir Dimitrov and followed by the majority of Bulgarian geologists, that "the South Bulgarian granites are pre-Mesozoic in age, since fragments of them are present in the Permian–Triassic conglomerates of the Lozen Mountain" has been overcome, mainly due to the results of geochemical studies. Also, the absence of Archean and Proterozoic metamorphism in the Rhodope Massif has been revealed by U-Th-Pb and Pb/Pb radiogeochronological investigations. The analysis of available mineralogical, geochemical and radiogeochronological data, supported by the ages of the migmatites from Ardino area (63–32 Ma), allowed to assume that both migmatized gneisses and the South Bulgarian granites of the Rila and Rhodope Mountains, as well as the volcanic rocks and associated intrusions and ore mineralizations, were a product of a single and prolonged stage of the Alpine activation of the Rhodope crystalline complex that started during the Cretaceous.

Arnaudov, V. 2017. Geochronology of the so-called South Bulgarian granitoids – a review (1836–2000). *Geologica Balcanica* 46 (2), p. 40.