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Study of a peperitic basalt occurrence of the Vardar-zone (Doboj-Jug, Bosnia and Herzegovina)

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The surrounding area of the Bosanski Ozren Mountain in northern Bosnia and Herzegovina is a tectonically complex region. The Zagreb-Tuzla line is situated in this terrain, which separates the two former oceanic branch of the Balkan-peninsula: the Dinaridic Ophiolite Belt and the western belt of the Vardar Zone (Karamata, 2006). These belts consist of two fundamental allochthonous components; the ophiolitic mélange and the variably dismembered, mainly ultramafic-mafic bodies related to ophiolitic series. The massif of the Bosanski Ozren was previously listed among the mafics of the Dinaridic Ophiolite Belt, but nowadays it is considered to be the part of the adjacent Vardar Zone western belt (Bazylev *et al*., 2006; H. Hrvatović, pers. comm.). A locality next to Doboj-Jug with Triassic peperitic basalts was studied. It is situated west from the ultramafic body of the Bosanski Ozren, probably in its accretional mélange. This rock suit shows several similar textural features to the well-known peperitic basalt occurrences of the Dinaridic Ophiolite Belt (Kiss *et al*., 2012). As by far the presence of the peperitic facies in Doboj Jug was not evidenced, one of the main aims of this project was to prove it.

The Triassic extrusive mafic succession and the coupled sedimentary rocks are studiable in a 40 m long outcrop, and are interpreted as part of a subaqueous basaltic lava flow with two main volcanological facies. The first is a greenish, spilitised, closely packed pillow facies which is in contact with the second, reddish siltstone, marlstone, mudstone and reddish grey basalt containing rock suit along a tectonized zone.

Petrological examination of the basalt of each facies showed intersertal texture and a strong hydrothermal alteration. However, this alteration is more intense on the peperitic facies. Both basalts consist of hipidiomorphic albitized plagioclase, cracked pieces of pyroxene with diopsidic core and augitic rim, idiomorph ilmenite, limonitized hematite and mainly chloritized groundmass. Furthermore, frequent calcite veins and iron-bearing secondary mineral rims around the pyroxene grains could be found in the reddish grey basalt. According to the similar mineralogical composition and textural features, both basalts have a similar origin, i.e. are most likely comagmatic.

The studied clastic sedimentary rock, which occurs together with the reddish grey basalt, was siltstone. This rock consists of mica and well-rounded quartz grains and contains albite fragments identical to the ones found in the basalt, thus their appearance can be interpreted as a result of the lava-unconsolidated sediment mingling, i.e. the presence of the *s.s*. peperitic facies.

Chemical analysis of the pillow basalt resulted in slightly high MgO, P_2O_5, Na_2O, TiO_2 and lower FeO, CaO and K_2O concentration compared to average MOR basalt samples (Wilson, 1989). The pepritic facies is more enriched in CaO and K_2O, most likely because of the presence of the sediment. The rather high MgO content of the closely packed pillow basalt can be the result of the more intense chloritization. The bulk rock analyses, as well as the composition of the clinopyroxene crystals show petrogenetical conditions related to oceanic island alkali basalt volcanism.

Though macroscopically several similarities were found, the characteristics of the Triassic, Neotethyan rifting related peperitic basalt occurrences of the Dinaridic Ophiolite Belt (Kiss *et al*., 2012) differ from the studied ones. As a contrary, several similarities can be observed with the peperitic basalt occurrence of the Kozara Mountains, which formed related to the opening of a Cretaceous back-arc basin in the western belt of the Vardar Zone (Grubić *et al*., 2009; Ustaszewski, 2009). In spite of the observed similarities, the age and the geotectonic position contradict this relationship. Thus, finding evidences to an oceanic island type, subaqueous alkali basalt volcanism coupled with peperitic basalt facies shows us a new episode of the evolution of the Vardar Zone during the Triassic time.

Bazylev, B., Popević, A., Karamata, S., Kononkova, N. N., Simakin, S. G., Olujić, J., Vujnović, L., Memović, E. (2009): Lithos, 108: 37-71.

Grubic, A., Radocic, R., Knezevic, M., Cvijic, R. (2009): Lithos, 108: 126-130.

Karamata, S. (2006): *In*: Robertson, A. H. F., Mountrakis, D. (*Eds*.), Tectonic Development of the Eastern Mediterranean Region. Geol Soc, London, Spec Publ, 260: 155–178.

Kiss, G., Molnár, F., Palinkaš, L. A., Kovács, S., Hrvatović, H. 2012): Int J Earth Sci, 101: 1503-1521.

Ustaszewski, K., Schmid, S. M., Lugović, B., Schuster, R., Schaltegger, U., Bernoulli, D., Hottinger, L., Kounov, A., Fügenschuh, B., Schefer ,S. (2009): Lithos, 108: 106-125.

Wilson, M. (1989): Igneous Petrogenesis. A global tectonic approach. Harper Collins Acad, London: pp. 466.