Late Cretaceous supra-subduction magmatism in North Kozara (northern Bosnia and Hercegovina): Implications for the Cretaceous to Paleogene collision between Europe and the Dinaric margin of the Adriatic plate


Introduction
Ophiolites are a distinctive feature of the internal Dinarides (Fig. 1). Formed in the Neotethys, they were incorporated into Jurassic mélangé (Meliata) or obducted onto the passive margin of the Adriatic plate during the Late Jurassic (Vardar). These ophiolites occupy a structurally high position within the SW-verging nappe stack of the Dinarides. The Dinarides formed in Late Cretaceous to Paleogene times in response to closure of a remnant ocean between Adriatic plate and Europe-derived units. The very first evidence for Late Cretaceous intra-oceanic magmatism in the Dinarides was reported by Karamata et al. (2000).

Results
This study provides additional evidence for Late Cretaceous igneous activity between the internal Dinarides and Europe-derived units. In the N Kozara Mountains (Figs. 2, 3), a bimodal igneous succession is thrust onto the Dinaric ophiolite succession of S Kozara, obducted in the Late Jurassic (Figs. 2, 4, 5). Pelagic limestones, intercalated with pillow lavas, contain Campanian globotruncanids (Fig. 3). This is in agreement with U-Pb ages of zircons from dolerites (Fig. 6). REE concentrations suggest an intra-oceanic island-arc origin of the N Kozara mafic rocks (Fig. 7). The initial isotopic values for 80 Ma are 4.4 to 6.3 for cNd and 0.70346 to 0.70507 for $^{87}Sr/^{86}Sr$, respectively. With respect to MORB these values indicate only a very low degree of crustal contamination, again suggesting an intra-oceanic origin (Fig. 8).

Conclusions
Our results document the existence of a Campanian island-arc between the Adriatic plate and Europe-derived units (Fig. 10). Subsequent closure of this oceanic domain occurred during the Maastrichtian to earliest Paleogene (Figs. 3, 5). This Late Cretaceous oceanic domain may represent a remnant of either the Vardar ocean (i.e. Neotethys), or alternatively, of the Alpine Tethys.

References: