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The Fanos granite in the Axios Zone: structure, emplacement and geodynamic setting (Northern Greece)

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The Fanos granite, a Late Jurassic (158±1 Ma), N-S trending pluton, occurs in the Peonia Subzone of the Eastern Axios-Vardar Zone in Northern Greece. This granite intrudes the Mesozoic back-arc Guevgueli ophiolitic complex (Peonia Subzone). For the better understanding of the geotectonic evolution of the broader area, the Fanos granite is compared with the Mid-Late Jurassic Kastaneri volcano-sedimentary formation allocated on the eastern part of the Paikon Massif, on which the Guevgeuli ophiolites were obducted. The major topics we address in our study are: a) the origin of the Fanos granite and b) the relationship of the granite with the remnants of an oceanic island-arc or an active continental margin geotectonic setting situated in the Neotethys (=Axios/Vardar ocean). The rock samples of the area where analyzed by X-ray fluorence for major and trace elements. The granite shows peraluminous characteristics, high-K calc-alkaline affinities and I-type features. The Sr initial isotopic ratios of the granite range between 0.70519 and 0.70559, while the Nd initial isotopic ratios range between 0.51236 and 0.51239, reflecting EM-I (Enriched Mantle-I) component. The trace element patterns along with the isotopic composition of the rocks indicate absence of continental crustal material contamination. Taking into account our structural and geochemical data, we suggest that the studied granitic rocks were formed during an intraoceanic-subduction within the Axios-Vardar ocean (=Neotethys) while in the Late Jurassic, a general westward ophiolite obduction on the Pelagonian continental margin, resulted to the thrusting of the Fanos granite together with the obducted ophiolites.