



Romanian heritage stone with international historical significance - the ooidal limestone from Măgura Călanului pre-Roman quarry

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The monumental structures of Sarmizegetusa Regia, the capital of the Dacian Kingdom, and the ensemble of fortresses and fortifications around them, erected by the Dacians during the 1st century BC and destroyed by the Romans at the beginning of the 2nd century AD, were built of ooidal limestone blocks from Măgura Călanului hill. These fortresses are situated in a mountainous area, over 1000 m altitude, which overlaps a schistous or a hard limestony geological substratum. For this reason, they had to use a different building material than the local one, with a good workability and suitable for use as dimension stone. Located at 30-50 km away from the fortresses and at about 500 m altitude, Măgura Călanului limestone quarry is the most important preserved ancient quarry on the Romanian territory.

The quarry lies on an area of at least 30 hectares and today is covered by forest. Fortunately, it was only exploited during the building of the Dacian fortresses and it is well preserved, being probably one of the most spectacular ancient monuments of its kind outside the Greek-Roman world. However, while the above mentioned fortresses has been inscribed on the World Heritage List 20 years ago, the Sarmatian limestone from Măgura Călanului quarry, although having a real heritage significance, has never been systematically studied, nor the geosite protected or valued. The only specific researches were carried out as an extension of the archaeological investigations of the Dacian fortresses from Orăștie-Șureanu Mountains. However, these data seldom passed the general descriptions of the geological substratum in the historical sites or the petrographic analyses of the lithic elements.

Independent geo-archaeological investigations have been carried out during the past five years by the authors of this paper, within the framework of the "Dacian stone quarries" project. The petrographic and optical microscopy analyses have highlighted several limestone varieties in the Măgura Hill, differentiated through the mineralogical constituents and physical characteristics:

- a. oolithic limestone (more than 80% ooids from the total allochems);
- b. clastic limestone (maximum 20% ooids from the total allochems);
- c. fossiliferous-ooidal limestone (more than 50% fossils and maximum 20% ooids from the total allochems);
- d. bio-peloidal limestone/grapestone (10-35% peloids or/and grapestone from the total allochems).

Following these first investigations, a project has been initiated at the end of 2018 in order to develop a wider multidisciplinary research of this important geosite, associated with historical monuments defining national identity. This ancient quarry needs to be preserved and protected, both for its heritage value and for the ongoing availability of the stone for potential restoration purposes.

Since the ooidal limestone from Măgura Călanului fulfills all the requirements to candidate for designation as global heritage stone resource (<http://globalheritagestone.com/>), totally deserves the scientific recognition of its importance for the world culture and civilization.