



## **Close or not so close? Provenance studies of megalithic monuments from Alentejo (Portugal)**

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There has been a significant amount of studies about megalithic tombs conducted in the Alentejo region. However the geological provenance of monoliths used in the construction of those tombs usually was not a priority among researchers with rare exceptions (Dehn, Kalb and Vortisch, 1991; Boaventura, 2000). Recent studies of dolmens (Oliveira, 1997 and 2006; Gonçalves, 2003) refer only to a brief characterization of rocks, such as "granite or schist slabs", highlighting certain types if the geological stratum is identical or not to the stone blocks. On the other hand, when the type of raw material appears to be similar with the bedrock, it is common and empirically assumed its local provenance.

With the aim of testing and expand the knowledge about the provenance of the slabs used in the construction of megalithic tombs, several lithic samples from dolmen slabs and outcrops in their surroundings were collected for analysis and comparison. The samples were characterized by petrographic studies in thin section as well with a geochemical analyses performed by XRF that gives major elements as well some trace elements.

The dolmens tested for this project are located roughly between the northeast to west of the town of Monforte (Upper region of Alentejo, Portugal) and are named, from south to north, as Serrinha, Rabuje group (1 to 5), Geodésico de Besteiros 3 and Velho. The field work and petrographic studies revealed that the slabs are constituted mainly by several types of granitoids (gnaissic, red, white, tonalitic), amphibolites and mottled schist shale.

The comparison of chemical analyses between slabs and selected outcrops revealed that the provenances are in most of the cases from the nearby geological stratum. In fact, major elements (e.g. MgO, SiO<sub>2</sub>, CaO) as well trace elements (e.g. Sr, Y, Zr, Nb) compositions are similar on slab samples and in rocks from the outcrops. If in terms of major elements a similarity was already expectable, or easier to obtain, the trace elements (namely immobile elements such as Y or Nb) compositions corroborated that slabs and geological bedrock were alike. The capstone slab that covers the dolmen of Rabuje 1 group does not belong to the nearby geological stratum. Nevertheless, a probable matching source-outcrop was located sampled and characterized in terms of geochemistry and petrography and compared with the megalithic capstone.

This work allowed a better characterization of the rocks used in megalithic tombs as well as corroborat a pragmatic attitude of Neolithic populations in the search of the appropriate slabs for construction as proposed previously (Boaventura, 2000). When available, the megalithic stones were likely collected from the nearby stratum and therefore the distances traveled were small (in situ or less than 1-2 km). Nevertheless, when the type of stone needed was not available in the vicinity (e.g fracturing provided only smaller stones) it would be necessary to travel longer distances, up to 8 km (Boaventura, 2000), as in the case of the dolmen of Rabuje 1.

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