

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



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1. introduction

There has been a significant amount of studies on megalithic tombs, commonly known as anta or dolmen in the region of Alentejo (Portugal). However the geological characterization and sourcing of the monoliths used in the construction of those tombs has not been a priority among researchers with rare exceptions (Dehn, Kalb and Vortisch, 1991; Boaventura, 2001). Past studies on 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 origin.

2. setting and objectives

This work aims to test and expand the knowledge about the source of slabs used in the construction of megalithic tombs. Several lithic samples from those dolmen slabs and outcrops located in their vicinity were collected for analysis and comparison.

The samples were characterized by petrographic studies in situ and by thin section as well with a geochemical analyses performed by XRF that gives major elements as well some trace elements.

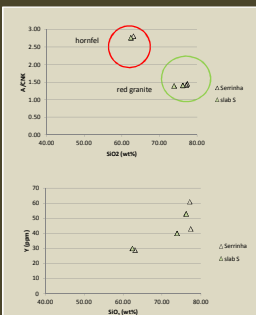


3. dolmens and geochemistry

SERRINHA



Geological bedrock: porphyroblastic hornfels



The petrography and geochemical analyses (major and trace elements) are similar between slabs and probable outcrop.

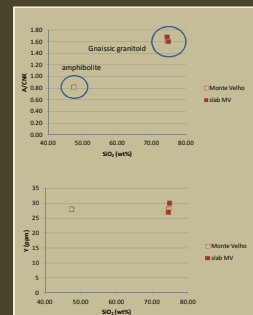


There should have been some transport (1 km) because the the slab material is diferent from the bedrock. Just one interstitial small slab (porphyroblastic hornfelsis) is similar to the bedrock.

MONTE VELHO



Geological bedrock: Gnaissic granitoids



The petrography and geochemical analyses (major and trace elements) are similar between slabs and probable outcrop.

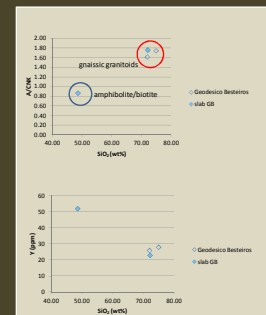


Very reduced tansport because the geological bedrock is equal to the slabs (few meters: 3-4 meters).

GEODÉSICO DE BESTEIROS 3



Geological bedrock: Eigen orthogneisses

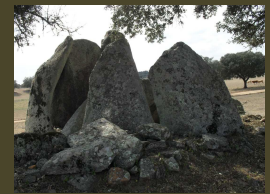


The petrography and geochemical analyses (major and trace elements) are similar between slabs of granitoid and probable outcrop.

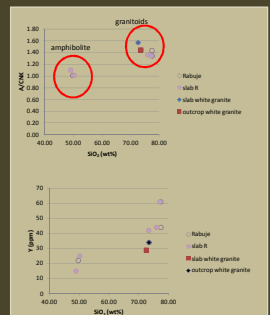


Reduced transport for the gnaissic slabs because they are equal to the bedrock. The amphibolitic slab has its nearest visible outcrop about 500 meters away.

RABUJE 1



Geological bedrock: Red granites



The petrography and geochemical analyses (major and trace elements) are similar between slabs of red granites, white porphyritic granite and amphibolites and respective probable outcrops.



The red granite slabs used for the dolmen have their nearest outcrops about 100-200 meters away. The white granite slab used as capstone has its closest known outcrop about 8 km away.

4. conclusions

This project:

- allowed a better characterization of the rocks used in these megalithic tombs;
- seems to corroborate an opportunistic use of appropriate slabs for construction of dolmens by Neolithic populations;
- allowed to infer that the megalithic slabs were likely collected from the nearby stratum (distances traveled were small: in situ or less than 1-2 km);
- allowed to infer that when the type/size of stone needed was not available in the vicinity (e.g. fracturing provided only smaller orthostats) it seems that appropriate slabs were sourced at longer distances (up to 8 km).



- A – schists and meta-greywacke
- B – medium to coarse grained red granite
- C – gnaissic granitoids
- D – Precambrian with interlained amphibolites
- E – eigen orthogneisses
- F – hiperalkaline rocks
- G – porphyritic white granite
- Red circle: Proposed largest distance traveled with 1km ray (dolmen in the center)
- Green circle: Proposed distance traveled for white granite around 8 km

References

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