

THE GUARDA CIRCULAR STRUCTURE: A POSSIBLE COMPLEX IMPACT CRATER. José Fernando Monteiro. Departamento de Geociências, UTAD, 5000 Vila Real, Portugal.

In the central part of Portugal, NE of the Guarda city, not far from the border with Spain, exist a peculiar structure, with 35 Km diameter, well evident in the topographic and hydrographic pattern. The structure is centered at $\approx 40^{\circ} 37' N$ and $7^{\circ} 6' W$ in the Beira Alta province. The anomalous circular area was originally noted on ERTS 1 and ERTS 3 satellite images and, more recently, a Landsat mosaic in multi spectral scanner colour composition of channels 7, 5, 4 (with spatial resolution of 80 meters) of Central Portugal shows clearly the circular structure which resembles a deeply eroded complex multi-ring impact crater (Fig. 1).

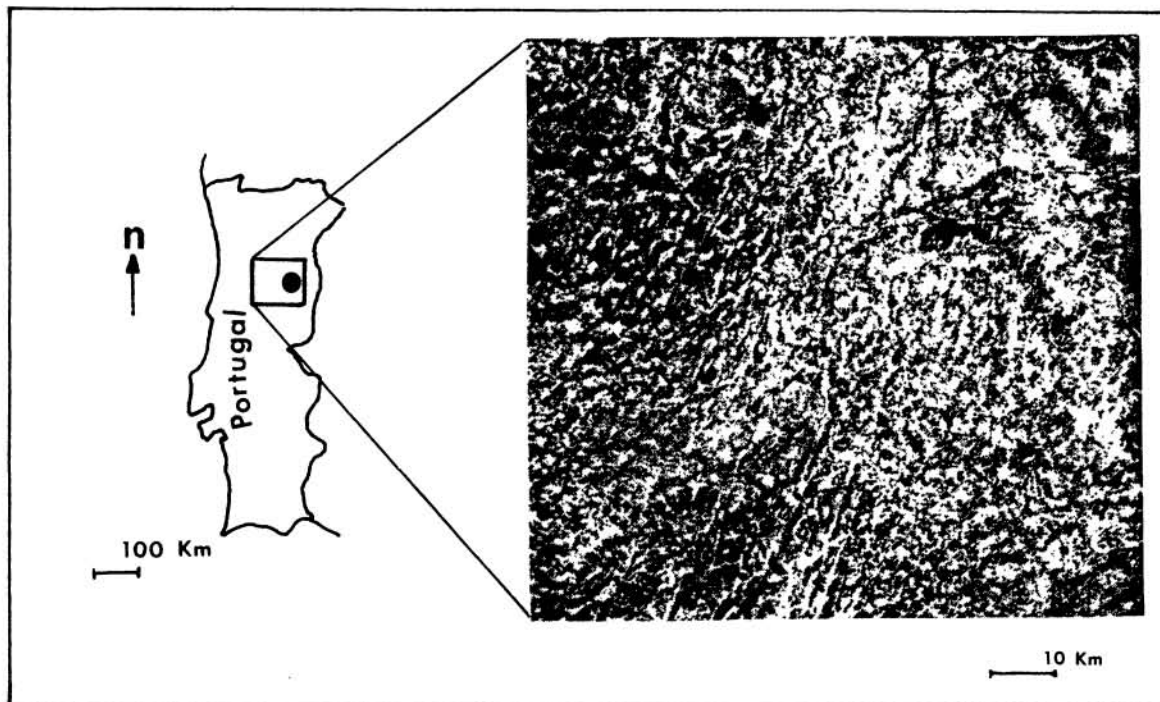


Fig. 1 Landsat mosaic of Central interior of Portugal exhibit the Guarda circular structure.

Geologically, the structure is situated in the Central Iberian Geotectonic Zone of the hercynian basement and its age is clearly post-hercynian orogeny. The country rocks are dominated by different types of alkaline and calc-alkaline hercynian granites and the edge of the circular structure doesn't coincide with the granite intrusions. Other less representative formations are present: pre-ordovician meta-sedimentary rocks (slates and grauwackes), small gabbroic intrusions from the permo-triassic frontier, several quartz veins and basalt-dolerite dykes.

THE GUARDA CIRCULAR STRUCTURE. J. F. Monteiro

In the central area of the structure we found a breccia probably associated with the dolerite dykes. The breccia also forms dykes with various thicknesses and irregular attitude crosscutting the biotitic calc-alkaline granite. The breccia contains several fragments of the country rocks: granites, minerals and fragments of the gabbroic and dolerite rocks and slates from the pre-ordovician formation. The matrix is dominated by very fine material of different mineralogical composition and sometimes with glassy texture. It was in several granite fragments of that breccia that we found planar elements and decorated planar features in some quartz grains (Fig. 2).

The granite in the central region of the structure also shows evidence of shock metamorphic features with monomict brecciation and remnants of decorated planar elements in quartz. The quartz grains are intensely fractured with some rotation and displacement. The resulting spaces between individual fragments are filled with matrix of sericitic composition.

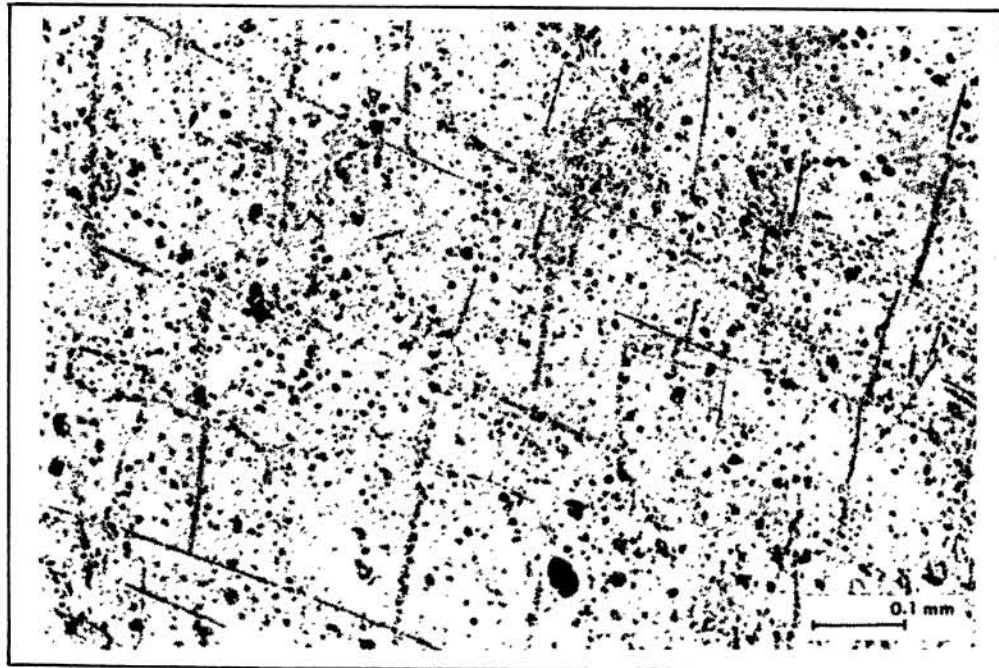


Fig. 2 Planar elements and decorated planar features in a grain of quartz from the granite clast in the breccia sample.

This work was only a preliminary note. We are engaged with a detailed geological mapping of the structure, the petrological and chemical study of the rocks in the area as well as the verification of all aspects of brecciation and shock metamorphism in the rocks. Any collaboration are welcome.