

HERCYNIAN ACID MAGMATISM AND MINERALIZATIONS IN NORTHERN PORTUGAL

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This study aims to be a contribution to one of the most discussed topics concerning the spatial and genetical relationship between mineralizations and acid magmatism. Cabeceiras de Basto (CB), Vieira do Minho (VM) and Vila Pouca de Aguiar (VPA) granite plutons are located in the Central Iberian Zone, famous for the occurrence of important W, Sn and Au deposits. U-Pb zircon and monazite geochronology yielded the ages of 311Ma for CB and VM and 299Ma for VPA, constraining the time interval of the third Hercynian deformation phase, D3, relatively to which each massif is grouped as follows: syn- to late- (CB), late- (VM) and post-tectonic (VPA) granites. CB is a composite peraluminous two-mica granite pluton occupying the core of a N130°E antiform. Geochemical and isotopic studies suggest a heterogeneous crustal source of mid-Proterozoic age (1,2 Ga). The granites are specialized in Sn, Li and W and spatially related to Sn in pegmatites. Fractional crystallization is the main concentrator mechanism. Late-magmatic hydrothermal alteration processes enhance the concentration promoted by magmatic differentiation. VM and VPA composite plutons are biotite granites generated in the lower crust, controlled by regional deep faulting zones and installed in high structural crustal levels. They are responsible for a thermal metamorphism (P:2kbar; T:500-600°C) capable of generating convection of fluids from several origins. They are spatially related to important Sn, W and Au mineralizations. Although they are not specialized in these elements they have performed a relevant role as heat source for the genesis of ore concentrations.