

KAMAFUGITE AFFINITY OF THE TAPIRA ALKALINE-CARBONATITE COMPLEX (MINAS GERAIS, BRAZIL)

1BROD, J.A.; 2THOMPSON, R.N.; 3GIBSON, S.A.; 1JUNQUEIRA-BROD, T.C. and 1BOAVENTURA, G.R. 1Instituto de Geociências, Universidade de Brasília, Brasília, Brazil. 2Department of Geological Sciences, University of Durham, Durham, UK. 3Department of Earth Sciences, University of Cambridge, Cambridge, UK.

Together with similar carbonatite-bearing intrusions (Araxá, Serra Negra, Salitre and Catalão), the Tapira complex forms part of the Late-Cretaceous Alto Paranaíba Igneous Province (APIP), which also include kimberlites, lamproites and large volumes of kamafugites. The complex is dominated by alkaline silicate rocks (bebedourites, subordinately dunites, wehrlites, melilitolites and syenites), intruded by carbonatites and ultramafic fine-grained dykes (phlogopite-picrite, bebedourite). Phlogopite-picrites represent parental magmas, giving rise to the other Tapira rock-types through a complex interplay of fractional crystallisation and liquid immiscibility processes. They are typically composed of olivine phenocrysts set in a groundmass of phlogopite, carbonate, perovskite, apatite and chromite. Flow-differentiation and exsolution of carbonate globules are common. Phlogopite-picrites are peralkaline (molecular $K_2O+Na_2O/Al_2O_3 = 1.04-3.02$) ultrapotassic ($K_2O = 2.68-5.87$ wt.%, $K_2O/Na_2O = 2-15$) rocks. The high MgO (8.73-21.34 wt.%), Ni (82-932 ppm) and Cr (134-1012 ppm) contents indicate that they represent primitive, mantle-derived liquids. They are strongly SiO_2 -undersaturated (24.3-33.4 wt.%), Al_2O_3 -poor (1.63-4.69 wt.%) and rich in CO_2 (3.29-21.9 wt.%), CaO (9.31-19.41 wt.%) and TiO_2 (3.24-5.37 wt.%). Th/Yb, Ta/Yb, Th/Zr, and Nb/Zr ratios of phlogopite-picrites are similar to those of Toro-Ankole kamafugites. Their Sr- and Nd-isotope composition is within the range of other APIP magmas and their multi-element diagram patterns are similar to those of APIP kamafugites. This results establish a strong kamafugitic affinity for Tapira magmas and suggest a link between carbonatitic and kamafugitic magmatism in the remainder of the APIP.