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Tectonic setting and provenance of the Capané Antiform, Porongos Complex, Dom Feliciano Belt, Brazil: Evidence from U-Pb ages

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Western Gondwana is a collage, started in the early Neoproterozoic [1], of several nucleii generated during the diachronous fission of the Rodinia Supercontinent formed at ca. 1000 Ma [2]. In the meridional Brazilian shield, the Dom Feliciano Belt has a key role to shed light on connections with the Pan-African mobile belt system during the formation of this collage. The purpose of this study is to provide new information to unravel the geological evolution of the Porongos Complex (PC), with a focus in its northernmost region, which crops out in the central region of the Rio Grande do Sul shield. Regardless an extensive research effort over the last several decades, this geological sector, the Capané Antiform (CA) has produced controversial tectonic models due to obliterated stratigraphic relationships caused by intense metamorphism and deformation processes. Thus, we present new (LA-IPC-MS) U-Pb zircon ages from the CA, as well a summary of data from previous works, in an attempt to establish a jigsaw puzzle of paleogeography: merging the temporal relationship between the sequences of the Porongos belt in this area with the potential source areas in the surrounding geotectonic terranes. The CA is grouped in three sectors defined as western and eastern limbs and a central axial area. The western limb is dominated by metavolcanic sequences intercalated with metapelites, with minor staurolite–garnet schist lenses. The western limb and the hinge zone have also sheets of alkaline gneiss, quartzite and meta-ultramafic bodies, the later interpreted as a dismembered ophiolite [3]. The eastern limb is composed of mainly metapelites, intercalated with granitic bodies, lenses of quartz mylonites and marble. The axial area includes ultramylonites, muscovite schists and quartz mylonites. Zircon ages from the metamorphosed volcano-sedimentary sequences from both limbs reveal Paleoproterozoic, Mesoproterozoic and a significant Neoproterozoic provenance and suggested the Edicarian as the maximum deposition age of the basin, in agreement to previous data from [4]. However, all mylonite samples from the central axial area yield mainly a Paleoproterozoic peak of ages, similar to patterns described in the Santana Fm [5]. The notorious difference among the geological features, such as distinct lithological sequences and the geochronological results, suggest that the central part of the CA represents a different terrain. The axial area of the CA can be considered a basement fragment imbricated during the tangential deformation phase of the PC. Further work is ongoing to better understand the origin of the mylonites, provenance patterns and their sources.

References:

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