

Post-Collisional Magmatism in the Sergipano Orogenic System, NE Brazil: The Glória Norte Stock

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The Glória Norte Stock (GNS) shows a 45 km² area. It is intrusive in metasedimentary rocks of the Macururé Domain (MD) of the Sergipano Orogenic System, NE Brazil. The host rocks show a NW-SE foliation which is not present in the GNS rocks, indicating magma emplacement after the end of regional deformation. The stock is composed of quartz-monzonites and monzogranites, showing discrete variation in hornblende and biotite modal volume. The coarse-grained porphyritic quartz-monzonites predominate over ≈95% of the area, and the monzogranites with fine-grained texture, occur in the northeastern part of the body. The GNS stands out from other MD intrusions due to the great abundance and diversity of enclaves. Three sets of enclaves (mafic microgranular, lamprophyric and cumulatic) have been identified. In several outcrops, the enclaves show a common alignment resulting from magmatic flow.

The U–Pb SHRIMP age of zircons from a quartz-monzonite of the GNS is 588 ± 5 Ma. The Th/U ratio in the crystals range from 0.26 to 0.69. The monzonites of the GNS have shoshonitic affinity, and the enclaves are related to ultrapotassic suites (MgO > 3%, K₂O > 3%). LREE are enriched as compared to HREE, and there are remarkable negative anomalies of Ta, Nb, Ti, P, Sr and Eu, mostly in the enclaves. The observed evolution from MME to quartz-monzonites and monzogranites is essentially linked to a process of fractional crystallization. The relations between Ta/Yb and Th/Yb ratios suggest enriched mantle as a possible source of this magmatism. The relative Rb, Th, Ce and Sm enrichment and Ba, Nb and Hf depletion point out to subduction – related magmas generated in a postcollisional setting. Potassic and ultrapotassic magmas with arc signature, as the ones identified in the GNS, are usually formed after the subduction event, being coeval to uplift, extension or transcurrent motions. The identification of a post-collisional tectonic setting in the GNS indicates that the K-rich magmas of the MD formed by breaking off the subducted oceanic plate slab by the rise of hot asthenosphere. This would cause the partial fusion of previously enriched lithospheric mantle. [Acknowledgments: CNPq, FAPITEC, CAPES].