

A Neoproterozoic flare-up magmatic event in Northeastern Brazil: the case of the Santana do Ipanema Batholith

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The Santana do Ipanema batholith (7000 km²; 35 plutons) in the Pernambuco-Alagoas Domain of the Borborema province, northeastern Brazil, is composed of several Cryogenian–Ediacaran granitic plutons. Main mafic minerals in these plutons are represented by biotite, calcic amphibole and ± clinopyroxene. These rocks are metaluminous to peraluminous I-type granites of the high-K calc-alkalic to shoshonitic and magnetite-series, and exhibit characteristics of magnesian Cordilleran-type granites. The presence of comagmatic microgranular dioritic enclaves are an evidence of comingling and eventually magma mixing to a certain extent. The chemical composition of these plutons overlap and they exhibit enrichment in some incompatible and depletion in HFS elements, with variable initial ⁸⁷Sr/⁸⁶Sr ratios ranging from 0.70511 to 0.71071. This batholith was formed by amalgamation of small magmatic additions by diking over 30 m.y., with no large crystallization age gap among the intrusions. In spite of this, the plutons form two Nd-isotope groups, the ones older than ≥ 625 Ma show slightly negative to positive eNd values, and the younger ones have distinctly more negative eNd values, suggesting that the generation of the oldest granitic magmas involved larger participation of mantle-derived material. The estimated magma supply rate for construction of this batholith, together with two other batholiths of similar ages in the Pernambuco-Alagoas Domain suggests a flare up magmatic event in the main stage of the Brasiliano (Pan-African) orogeny, probably triggered by repeated basaltic underplating stalled in the lower crust, in magmatic-arc setting, during convergence of the São Francisco craton and the Pernambuco-Alagoas block.