THE TIN MINERALIZATION AT THE SANTA BÁRBARA MASSIF, RONDÔNIA TIN PROVINCE, BRAZIL.

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The Rondônia Tin Province includes seven rapakivi granite suites emplaced between 1600 and 970 Ma. The Younger Granites of Rondônia, with ages varying from 998 to 974 Ma, are the last of them, and intruded 1.75 to 1.30 Ga crust during the waning stages of a collisional 1.1 to 1.0 Ga orogeny (Sunsás/Aguapeí).The Santa Bárbara Massif belongs to the Younger Granites of Rondônia. Its geochemical characteristics are typical of rapakivi, A-type, subalkaline and within-plate granites. It comprises three subsolvus reduced biotite granite facies. Two of them are peralkaline to metaluminous, albite-oligoclase and annite-bearing syenogranites exhibiting medium equigranular to seriate, and medium to fine porphyritic texture. The last facies, which hosts tin mineralization, is a peralkaline to peraluminous siderophyllite-albite-microcline granite with fine to medium equigranular, seriate or porphyritic texture. Wiborgitic and pyterlitic features characterize the annite-bearing porphyritic and siderophyllite-albite-microcline granites, respectively. Allanite, zircon, fluorite, xenotime and monazite are common accessory phases. Tin mineralization occurs in a 500 x 150 m zone, associated with horizontal and lensoid topaz-protolithionite-quartz greisen bodies up to 40 m thick, a unique tin deposit so far known in Brazil. Greisenization caused intense sodic alteration along the greisen body borders, represented by substitution of microcline by patchwork and chessboard albite, and an external potassic alteration halo, expressed by incipient mica for feldspars and microcline for plagioclase substitutions. A pervasive substitution of minerals by zinnwaldite + fluorite affects all the previous alteration products. A late greisen stockwork system is locally expressive. Clay stockworks are also present.