

# SAND INJECTITES PRODUCED BY HYDROTHERMAL PROCESSES IN THE SERRA GERAL GROUP, MATO GROSSO DO SUL, BRASIL

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**ABSTRACT:** Sand injectites observed in Mato Grosso do Sul, Brazil, occur in pahoehoe basalts from the Serra Geral Group and have their hydrothermal origin related to the ascent of loose sand from the underlying Botucatu erg. Injectites correspond to dykes, sills and 10-50 cm-thick flows of sand, and also breccias that contain angular, amygdaloidal basalt clasts and silicified sandstone. In all observed exposures, the sand flow was covered by a new basalt flow and is therefore an excellent stratigraphic guide. All breccias and sand flows occur in the upper amygdaloidal crust of the basalt flow; breccias were not observed in the lower amygdaloidal crust. The intense silicification of the injectites contrasts with the poorly lithified Botucatu Formation sandstones observed regionally and in direct contact with the first basalt flow. Several geological sections in the Campo Grande region and across the Serra de Maracaju (Nioaque region), reveal abundant sand injectites (1 mm – 50 cm thick) forming intrusive stockworks in the basalt. In many outcrops, thin (1-5 mm) sand dykes crosscut zeolite-filled amygdales, which indicates that the sand was injected into the basalt at low temperature (~130 °C). Abundant, small (1-50 mm), zeolite-filled amygdales are common in a few flows. Comparable sand injectites are widespread in the Serra Geral Group both geographically and stratigraphically, such as the world-class Ametista do Sul mining district (Brazil) and Los Catalanes gemological district (Uruguay). Injectites are closely related to amethyst and agate geodes. New provenance data on the sand will be presented in this work. The common presence of sand injectites and abundant small geodes make Mato Grosso do Sul a prime target for the discovery of new amethyst and agate geode deposits in the Serra Geral Group.

**KEYWORDS:** SAND INJECTITES, SERRA GERAL GROUP, HYDROTHERMAL PROCESSES.