

Layered alkaline mafic-ultramafic rocks from the São Sebastião Island, SP: preliminary data

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ABSTRACT: Mesozoic to Cenozoic alkaline magmatism has been recognized to occur along the southeast Brazilian coast in the **Serra do Mar Igneous Province**, made up by a series of undersaturated to saturated syenite rocks and minor layered mafic intrusions of alkaline character, emplaced during the opening of the Atlantic Ocean (ca. 80-90 My). In the São Sebastião Island (northern coast of Sao Paulo), the Precambrian basement (**Complexo Costeiro**) is intruded by a three-stage Mesozoic magmatism. The first stage (120 -140 My) is characterized by the emplacement of tholeiitic dykes related to the **Parana-Etendeka Igneous Province**. After, between 80-95 My, an alkaline magmatism begins with the emplacement of layered mafic-ultramafic intrusions (mainly gabbros and pyroxenites) followed by a felsic magmatism represented mainly by syenitic rocks that constitutes the Serraria, São Sebastião and Mirante Massifs. The final magmatic stage, (78-83 My) is recorded by the intrusion of a dyke swarm of varying composition from mafic to felsic.

In the northern part of the island, blocks of layered gabbros and pyroxenites are spread along the coastline while to the south some *in situ* expositions can be found. This work presents some preliminary geological and petrography data obtained in our ongoing research in the southern area and discusses their implications.

The gabbros comprise a sequence of layered cumulates ca. 400 m thick made up of plagioclase (labradorite) and clinopyroxene (Ti-augite) with olivine, kaersutite, biotite, apatite and opaque minerals in varying proportions. Towards the base, relatively enriched layers of plagioclase or clinopyroxene, define a good stratification (N40°W/30°NE) together with a cross-bedding layering with no evidence of a mineral lamination. In contrast, to the top of the intrusion (roof-zone), near the contact with the São Sebastião Massif, layering is poorly developed, if not absent, and can be locally associated with a subtle mineral lamination defined by the planar arrangement of tabular plagioclase, clinopyroxene and olivine. Layers with clinopyroxenitic compositions are rare, occurring at a scale of 2-5 cm along the intrusive. The presence of kaersutite and phlogopite as intercumulus phases and as rims surrounding clinopyroxenes and opaque minerals, indicate that such minerals represent the late stage products of a crystallizing magma of alkaline affinity.

Felsic dykes and veins closely related to the syenitic rocks from the São Sebastião Massif cross cut the mafic-ultramafic intrusives and suggests a late emplacement for the massif. In turn, trachyte dikes cross cut both the syenitic and gabbroic rocks, indicating that the alkaline magmatism continued after their emplacement.

The contact between the mafic-ultramafic rocks and the granitic basement is abrupt and both mafic enclaves and pegmatitic pods of gabbroic composition are widespread. Granophyric-like intergrowths between quartz and alkali feldspar in these rocks and some amount of interstitial quartz in the gabbros at contact zones, point to local melting of the country rocks and assimilation processes.

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