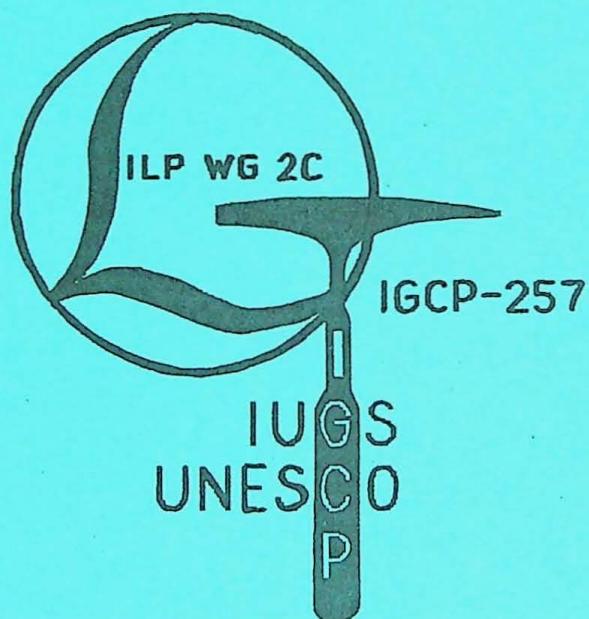


ABSTRACTS



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K/Ar GEOCHRONOLOGY AND TECTONIC SIGNIFICATION OF MAFIC
DYKE SWARMS IN THE SOUTHERN PART OF THE SÃO FRANCISCO
CRATON OF BRAZIL

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EXTENDED ABSTRACT

The São Francisco Craton in eastern South America corresponds to a large, ancient and tectonically stable geotectonic unit, surrounded by Late Proterozoic mobile belts (Almeida, 1977). The southern region of the Craton is made up of gneissic-granitoid terranes (mainly amphibolite facies) associated with supracrustals, which can be separated, in age, into two crustal provinces (Teixeira, 1985; Teixeira et al., 1987), the oldest formed during the Archean (3-2-2.6 Ga.), and the youngest in the Early Proterozoic (2.4-2.0 Ga.).

Mafic dyke swarms occur especially to the west and to the southwest of Belo Horizonte city, Minas Gerais state (Richter et al., 1975; Machado Filho, 1983; Cavalcanti et al., 1979; Sial et al., 1987). As showed on aeromagnetic coverage they inject the Archean and Early Proterozoic basement complexes but not the Late Proterozoic Bambui sedimentary cover. These dykes show NNW, NW, WNW, NNE and ENE trends, and locally are up to 25 km long, generally a few meters wide (some up to 20 m).

Basalts, diabases and gabbros are characteristic for these areas, some of them showing porphyritic fabric, but slightly metamorphosed dykes also occur, particularly within the Early Proterozoic terranes. The development of saussurite, sericite, albite, epidote and chlorite have been identified in the majority of these dykes, suggesting hydrothermal and/or deuterio transformations.

Several dozen K/Ar determinations have been performed during the last four years on plagioclases, amphiboles and whole rocks. They are interpreted combining the use of K/Ar diagrams and histogram, and according to the crustal evolution proposed for the craton, which is based on Rb/Sr and Pb/Pb whole rock isochrons, U/Pb Concordia diagrams, as well as the K/Ar cooling pattern for the basement rocks.

The available radiometric data suggest the existence of five epochs of emplacement (2.3 Ga., 2.1-2.0 Ga., 1.85-1.80 Ga., 1.65 Ga. and 0.66 Ga.) based on the apparent ages obtained for amphiboles. In addition, most of the plagioclases and whole rocks indicated the ~~present~~ incorporation of excess argon ^{Ar} around 720-500 m.y. ago.

The results are tectonically associated with crustal rifting of the continental mass during the Proterozoic. This period is characterized by the evolution of the Early Proterozoic crustal province and of the Middle Proterozoic intracratonic Espinhaço System. The youngest dykes (0.66 Ga.) are associated with the contemporaneous evolution of the Brazilian marginal mobile belt (Late Proterozoic) which is suggested also by the partial resetting of the K/Ar mica ages of the eastern part of the basement within the São Francisco Craton.

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