

PROTEROZOIC DIKES OF THE BOM SUCESSO REGION, MINAS GERAIS, BRAZIL

J. J. G. Quéméneur¹

GEOLOGICAL SETTING

The Bom Sucesso region is located on the border of the São Francisco Craton, approximately 200 km south of Belo Horizonte. The geology includes medium- and high-grade metamorphic and igneous rocks, with gneisses, amphibolites, migmatites, charnockites and granites. These have a probable Archean age and were reworked in the Transamazônico cycle, with folding of the Bom Sucesso range, followed by granitic intrusions. The Bom Sucesso range corresponds to a shear zone trending $N20^{\circ}$ - $N35^{\circ}$ (MORAES & MALAMPHY, 1937; QUEMÉNEUR, 1987). Another important shear zone is related to a series of E-W faults, which is part of the Lavras shear zone. In this latter zone, Transamazônico rocks were recently dated at 1932 ± 21 Ma by P. Vidal in France.

ORIENTATION AND DISTRIBUTION OF DIKES

The largest number of dikes occurs in the NW Archean block of the Bom Sucesso range. They are relatively scarce within Transamazônico granites, abundant in Archean granites and absent in the late Proterozoic São João Del Rei Group. These dikes occur in very many directions. However, three main directions can be pointed out: 1) $N10^{\circ}$ - $N30^{\circ}$ group: these are parallel to the Bom Sucesso range, appearing in large number on the NW side of the range; 2) NW-SE group; 3) ESE-WNW: $N110^{\circ}$ - $N130^{\circ}$ direction. Besides these, there are also a number of N-S and E-W dikes, associated with the E-W fault zone.

The dikes have variable dimensions and thicknesses from a few decimeters up to 80 m, with an average of 10-30 m. The longest dikes (>10 m thick) are on the order of a few kilometers, reaching 30 km, in one case, in the Taboões granite.

PETROGRAPHY

Doleritic textures dominate, with a mineralogy characterized by plagioclase, pyroxene and/or amphibole, quartz and rare biotite. Mafic minerals range from 25 to 85%. Narrow dikes and borders of wide dikes are fine grained. Some dikes are porphyritic.

The $N110^{\circ}$ - $N120^{\circ}$ group of dikes exhibits relict Ti-rich pyroxene, with irregular alteration to fine hornblende crystals. K-feldspar frequently forms myrmekitic and micrographic intergrowths with quartz.

In other dikes hornblende and actinolite appear in mafic aggregates of varied grain size. A 10-km-long porphyritic dike shows prisms 2-10 cm in diameter. These have pericline

¹Universidade Federal de Minas Gerais, Caixa Postal 1621, 30161 Belo Horizonte, MG, Brasil.

twinning and contain many acicular amphibole inclusions oriented according to plagioclase crystallographic directions. Plagioclase in most dikes is labradorite and may be zoned.

Two chemical analyses indicate a tholeiitic composition.

AGE

These dikes were formerly attributed to the Cretaceous by ERICHSEN (1929) and on the 1:1.000.000 scale map of Minas Gerais (TEIXEIRA DA COSTA & ROMANO, 1976). K/Ar dating by TEIXEIRA (1985) indicated a Precambrian age for dikes north of the Bom Sucesso region, despite a dispersion of dates.

Detailed field geology showed that the dike which cuts the Tabuões granite in the north is cut by aplitic and pegmatitic veins related to late-stage crystallization of the granite. Therefore, they are probable synchronous with an age of 1930 Ma. These characteristics are also noted on the northern border of the Bom Sucesso range and in the E-W dike cutting the Tabuões granite.

In relation to the late Proterozoic folding of the São João Del Rei Group, it is clear that most dikes cross-cutting the Ritópolis granite were partially or completely schistified by this event. Such dikes are probably younger than the São João Del Rei Group.

The different number of dikes occurring in Precambrian rocks and in Transamazônico granites suggests the existence of pre-Transamazônico dikes. Although age dating of the dikes is not completely resolved, it is possible, however, that most of them are Transamazônico in age.

REFERENCES

- ERICHSEN, A.J. (1929) Geologia da Folha de São João Del Rei, Estado de Minas Gerais. *Boletim. Divisão de Geologia e Mineralogia*, (36):1-26.
- MORAES, L.J. & MALAMPHY, M.C. (1937) Geologia e movimentos sísmicos de Bom Sucesso, Minas Gerais. *Boletim Divisão de Fomento da Produção Mineral D.N.P.M.* (17):1-60.
- QUEMENEUR, J.J.G. (1987) Esboço estratigráfico, estrutural e metamórfico da Serra de Bom Sucesso, MG. In: SIMPÓSIO DE GEOLOGIA DE MINAS GERAIS, 4., Belo Horizonte, 1987. *Anais. Boletim*, 7:135-148.
- TEIXEIRA, W. (1985) A evolução geotectônica da porção meridional do cráton do São Francisco com base em interpretações geocronológicas. São Paulo, 207p. (Tese de Doutorado, Instituto de Geociências/USP).
- TEIXEIRA DA COSTA, M. & ROMANO, A.W. (1976) Mapa geológico do Estado de Minas Gerais. Belo Horizonte, Instituto de Geociências Aplicadas. Escala 1:1.000.000.