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RELATIONSHIP BETWEEN TRANSVERSE AND OROGEN-PARALLEL TECTONIC FLOWS IN THE DOM FELICIANO BELT, SOUTHERN BRAZIL

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Structural mapping of key areas in the southern Brazilian portion of the Brasiliano/Pan-African Dom Feliciano belt supported the investigation of relationships between transverse and orogen-parallel movements in the tectonic evolution of this belt.

Five key areas were selected as representative of the main lithotectonic assemblages of the Dom Feliciano Belt in the Rio Grande do Sul State (Fig. 1-Fernandes et al., 1991). These orogen-parallel oriented assemblages consist of:

1. a "Magmatic Arc Assemblage I" (MAA I), typified by the earlier granitoids (orthogneisses and migmatites) of the Pelotas Batholith (*sensu* Fragoso-Cesar et al., 1986), studied in Quitéria-Capivarita and Piratini key areas;
2. a deformed back-arc basin - the "Marginal Basin Assemblage" (MBA) cropping out in Santana da Boa Vista and Caçapava key areas;
3. an "Ophiolite-mélange Assemblage" (OMA), corresponding to the vulcano-sedimentary sequences of the western part of the Sul-rio-grandense Shield;
4. a "Magmatic Arc Assemblage II" (MAA II) represented by the calc-alkaline magmatic association cropping out in the western part of the Sulriograndense Shield, both (OMA & MAA II) registered in Lavras key area and;
5. syn-collisional granites, which were emplaced during the orogen-parallel movement in the MAA I and MBA.

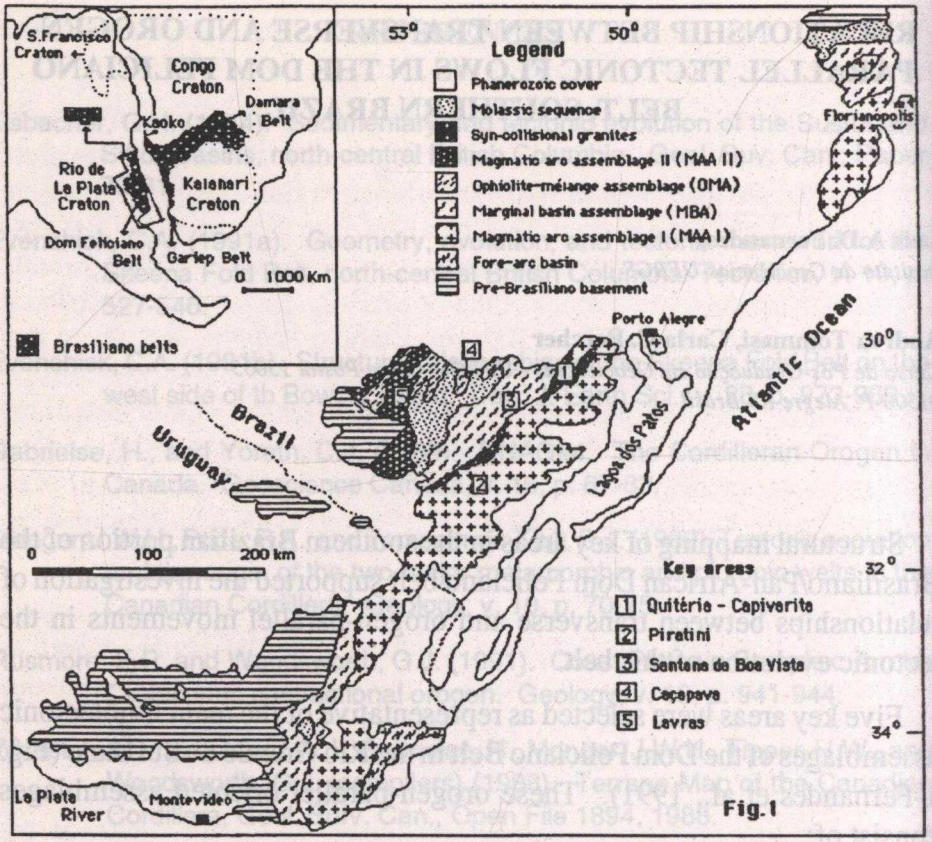

Fig. 1: Distribution of the main lithotectonic assemblages of the evolution of the Dom Feliciano Belt. Inset shows pre-Mesozoic drift location map of the Dom Feliciano Belt.

In the MAA I, km-thick flat-lying mylonitic sequences with a E-W stretching lineation affecting orthogneisses and migmatites under upper to middle amphibolite facies metamorphic conditions were cut by a NE-oriented strike-slip shear zone of upper greenschist-lower amphibolite facies. This strike-slip deformation was mostly accomodated by two syn-tectonic granitic batholiths of calc-alkaline and peraluminous compositions in Quitéria-Capivarita key area, while in Piratini key area an extensive reworking of the migmatites was observed. Thus, the kinematic evolution of the MAA I is characterized by an early transport transverse to the belt length in flat-lying shear zones probably related to a crustal thickenning episode, that is followed by an orogen-parallel movement in strike-slip shear zones with an important magmatism associated.

The kinematic pattern of the MBA was analysed in Santana da Boa Vista and Caçapava key areas. In these, flat-lying shear zones with NE-oriented stretching lineations affected supracrustal rocks and syn-tectonic sheet-like granites, locally promoting their tectonic interleaving with gneisses of the Transamazonian basement under amphibolite to greenschist metamorphic conditions. Therefore, the deformation in the MBA was dominated by orogen-parallel movement in flat-lying shear zones.

Ongoing research in the Lavras key area (OMA & MAA II) has identified a calc-alkaline magmatic association (diorites, tonalites and trondhjemites) tectonically interleaved with peridotites. The magmatic association shows flat-lying high-strain zones with E-W stretching, while the harzburgites are retrogressed to serpentinites and Mg-schists showing a flat-lying foliation, which characterizes the lowest metamorphic conditions of the shearing event (greenschist facies).

The kinematic evolution of the Dom Feliciano Belt (Fig. 2) has started with tectonic flow transverse to the belt length under metamorphic conditions of upper to middle amphibolite facies, recognized only in the MAA I. This

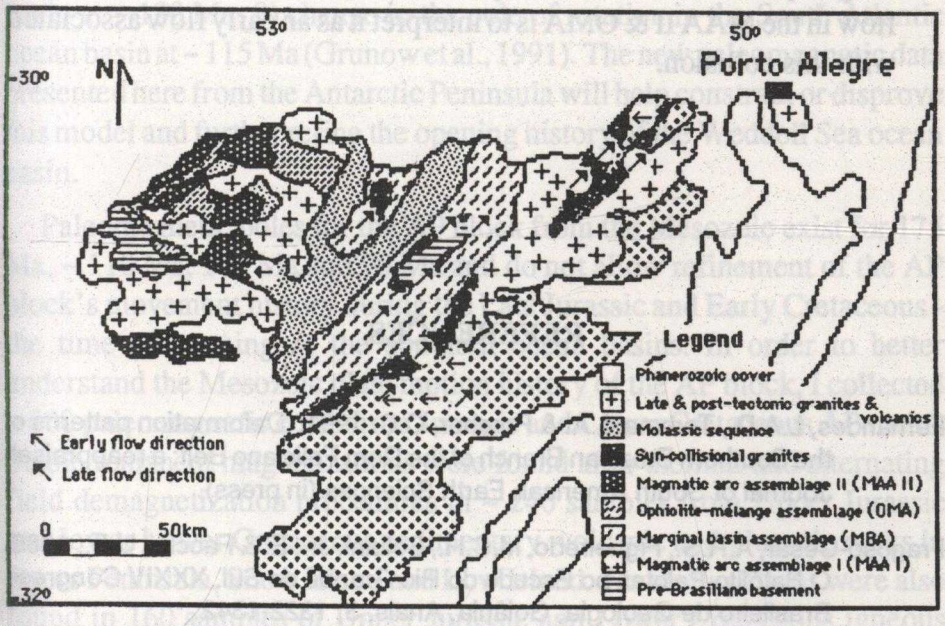

Fig. 2: Flow directions in the main lithotectonic assemblages of the Dom Feliciano Belt in the Rio Grande do Sul State.

event was followed by an important orogen-parallel flow developed under amphibolite to greenschist metamorphic facies. The latter was partitioned into strike-slip and flat-lying shear zones in the MAA I and MBA respectively. Although the kinematic pattern in the MAA II & OMA appears to be similar to the one showed by the MAA I, their mutual relationships are still unknown, requiring additional geochronological and kinematic studies.

A preliminary tectonic model to assemble the proposed kinematic evolution with the nature and distribution of the lithotectonic assemblages consists of a two-stage collision between the Rio de La Plata and Kalahari Cratons:

1. Collision between the Kalahari Craton and the MAA I (produced by westward subduction of the Adamastor Ocean under the Rio de La Plata Craton), resulting in crustal thickenning in these units and promoting westward subduction in the marginal basin (giving rise to the MAA II);
2. Collision between the Kalahari Craton-MAA I assemblage and the Rio de La Plata Craton, with most of the deformation accomodated by orogen-parallel movement. A possible explanation to the transverse flow in the MAA II & OMA is to interpret it as an early flow associated with this collision.

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