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ABSTRACTS

ALTERNATIVE PALEOGEOGRAPHY OF LATE PALEOZOIC GLACIAL ROCKS OF NW STATE OF MINAS GERAIS

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Interpretation of a glacially influenced origin for the late Paleozoic rocks of the Santa Fé Group in NW Minas Gerais (Sanfranciscana Basin) is mainly supported by their occurrence on striated pavements eroded on Precambrian slate of the Três Marias Formation and the finding of abundant dropstones of varied lithologic composition including some far-traveled rocks dispersed in silty-clayey rhythmites of the Group (Fig. 1). The unit is made up of diamictite bearing faceted and striated clasts (subglacial tillite and flow-tillite; Brocotó Member, Floresta Formation), glacio-lacustrine laminite with abundant dropstones and invertebrate trails (Brejo do Arroz Member, Floresta Formation, Fig. 2), fluvio-glacial sandstone (Lavado Member, Floresta Formation) and eolian sandstone (Tabuleiro Formation). Thickness of the Santa Fé Group is still undetermined, but may reach over 100-200 m.

Previous interpretation of sense of movement of the glacier toward SSW in the area (Campos & Dardenne, 1994) was mainly based on orientation of striae and friction cracks on the striated pavements. In addition, lithological composition of dropstones from the rhythmites and of heavy minerals was found compatible with provenance of the sediments from a highland situated in northern Espinhaço Range in northern State of Minas Gerais and southern State of Bahia.

Re-examination of extensive and well-preserved striated pavements at Santa Fé de Minas demonstrated that they are formed by several topographically low, little convex, roches *moutonnées* (Fig. 3). Shape of the *moutonnées* is clearly controlled by the subhorizontal bedding of the Precambrian slate. The abraded stoss sides of the erosional landforms are profusely striated and contain several types of crescentic marks (crescentic fractures, crescentic gouges, chatter marks, nail head).

Two sets of intersecting, parallel, straight striae are recognized oriented N19° (oldest) and N29° (youngest). Stoss sides have a low step-like appearance resulting from removal of slabs of slate by quarrying.

Orientation of the stoss and lee faces of the *moutonnées* (respectively toward NNE and SSW) and re-examination of orientation of friction cracks and other minor abrasional features on the structures suggest to us the possibility of a sense of movement of the late Paleozoic glacier in the area toward NNE and thus reverse from the previous interpretation. Use of these geographically limited data for large-scale ice flow reconstruction in NW Minas Gerais is, as we know, problematic from the glacier dynamics point of view. One has also to take into account other geological evidence as the question of a possible southern source for the rock types of clasts and heavy minerals found in the glacial rocks of the Santa Fé Group (Fig. 4). Preliminary search of available geological data points to the existence of areas in southeastern Minas Gerais capable of furnishing the variety of rock types identified in the dropstones from rhythmites of the Santa Fé Group.

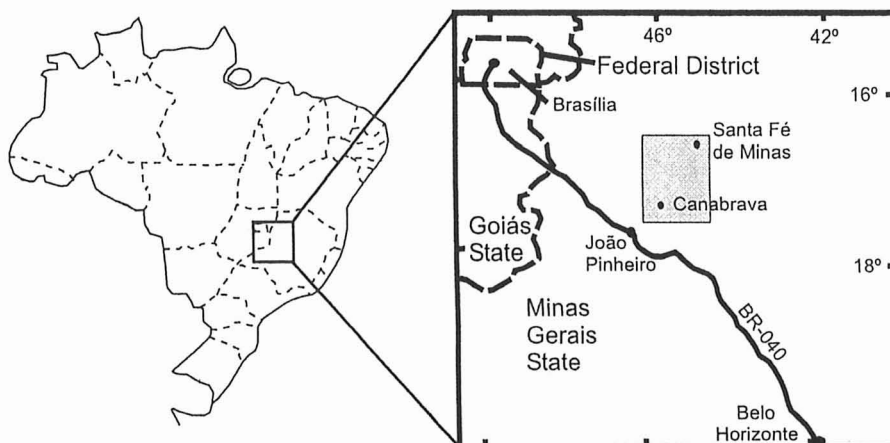


Fig. 1: Localization of study area.



Fig. 2: Far-traveled dropstones dispersed in silty-clayey rhythmites of the Santa Fé Group, Minas Gerais State.

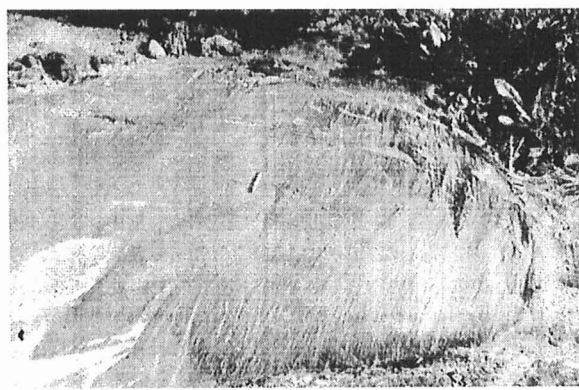


Fig. 3: Roche moutonnée with two sets of intersecting striae in Santa Fé de Minas, Minas Gerais State.



Fig. 4: Far travelled itabirite boulder from glacial sediments of the Santa Fé Group, Minas Gerais State.

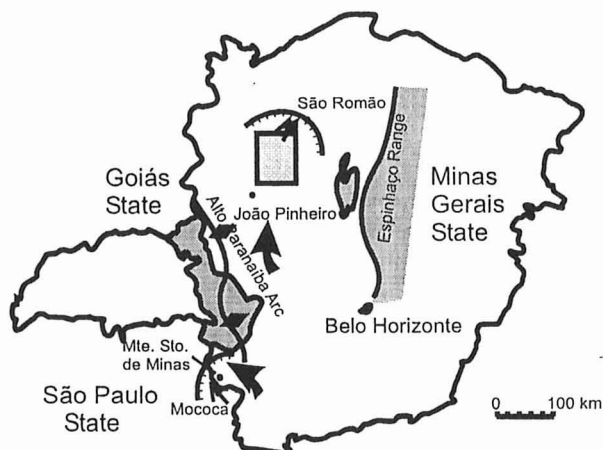


Fig. 5: Paleogeographic interpretation of the neopaleozoic in Minas Gerais State. Dashed arcs: glacier margin; arrows: ice flow sense; dark gray areas: neopaleozoic highlands; light gray box: studied area.

This alternative view of the sense of ice flow has also very exciting implications on the reconstruction of location and general flow pattern of the late Paleozoic glaciers in Southeastern Brazil, particularly in Southeastern Minas Gerais and northern Paraná Basin. Our preliminary interpretation depicts the Windhoek ice sheet that reached Southeastern Brazil during the Gondwana glaciation bifurcating into two lobes, around a divide represented by the Alto Paranaíba arch (Fig. 5). The northern lobe, here denominated Minas Gerais lobe, turned north and flowed toward NNE along an ample trough confined by the Alto Paranaíba arch to the west and the Espinhaço range to the east. Retreat of the glacier left a relatively thin carpet of glacial rocks, largely removed by subsequent erosional episodes. The above hypothesis has yet to be confirmed by additional fieldwork. At the moment it provides an initial, alternative conceptual model that may be useful for the examination of distribution of facies and glacial features of the Santa Fé Group in the Sanfranciscana Basin.

Campos, J.E.G. and Dardenne, M.A. (1994) A glaciação neopaleozóica na porção meridional da Bacia Sanfranciscana. *Revista Brasileira de Geociências*, **24**, 65-76.

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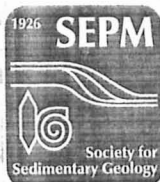
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