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ABSTRACTS / ABSTRAKTE

LATE PROTEROZOIC TO CAMBRIAN TECTONIC HISTORY OF EASTERN AND SOUTHERN BRAZIL

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Two major tectonic domains characterize the geology of southeastern Brazil: the eastern spupracrustal fold belts and the western foreland landmasses. This pattern was produced by successive orogenies from Mid-Proterozoic to Cambrian times, when the Brasiliano (Late Proterozoic) and Rio Doce (Cambrian) orogenies were the most important in the constitution of the present geometry.

The western tectonic domain has as major components, from N to S, the Sao Francisco Craton and surrrounding marginal belts, the Parana Craton (a geotectonic unit covered by the Paleozoic Parana Basin), and the Rio de la Plata Craton. This domain acted as foreland during the Proterozoic and Cambrian tectonic events that had affected the eastern mobile domain. In the Sao Francisco and Rio de la Plata Cratons Archean to Early Proterozoic medium to high grade rocks predominate.

In the mobile belts domain three different tectonic segments can be identified. The northern branch includes many parallel supracrustal belts with northeastern structural trends and several basement inliers. Separating the northern branch from the southern one there is a gneissic-migmatite terrain representing two microplates, Curitiba and Louis Alves, whose agglutination took place during the orogenies that affected the adjacent fold belts. The southern segment, called the Dom Feliciano Belt shows a foredeep molasse basin (Itajai and Camaqua Groups), a supracrustal fold belt (Brusque and Porangos Groups) and an internal granitoid belt.

The Late Proterozoic portion of the northern branch is composed of metamorphic-plutonic rock assemblages, cordilleran type batholiths and syn- to post-collision granitoids that intruded the supracrustal sequences. As the most important Brasiliano mega-structure the Socorro-Guaxupe Thrust Nappe shows a NW vergence. In the nappe deep crustal levels are exposed, with granulite-migmatite and granite- migmatite rocks ranging in age from 950 to 850 Ma.

The Brasiliano Orogeny in the central part of the fold belt domain is characterized by calc-alcaline granitoids that separate the Early Proterozoic (2.1 Ga) banded gneisses of the Curitiba Microplate from granulite gneisses of the southern Louis Alves Microplate (3.2 to 2.1 Ga). These granitoids represent the roots of a Late Proteroozoic magmatic arc (700-650 Ma) involved in the collision between the two microplates c. 610 Ma ago. A belt of mafic to ultramafic rocks helps to identify the suture between these two microplates.

In the southern branch the Brasiliano cycle is well represented through structural, metamorphic and magmatic events affecting the thick volcano-sedimentary pile of the Dom Feliciano Belt. The climax of these processes was around 650 Ma.

The ages of the sedimentary processes for most of the supracrustal sequences are not known. Therefore, taking into account the importance of the allochthonous structures in the fold belts domain, the Brasiliano tectonic units are considered as Late Proterozoic suspect terrains.

The Rio Doce Orogeny affects the entire easternmost part of the Brazilian coastline. It is represented by a dis- continuous belt of calc-alkaline batholiths with north-south trend cross-cutting the Brasiliano terains. In the Jequi- tinhonha area these gnneisses, granitoids and charnokites are very well exposed and yield ages from 550 to 500 Ma. This orogenic process is recognized in a large area extending from Espirito Santo to Parana coastal areas. In the southern states (Rio Grande do Sul and Santa Catharina) this orogeny is well represented in the granitoid domain of the Dom Feliciano Belt by the more alkalic granitoids. During the Rio Doce orogeny the Itajai and Camaqua molasse basins were finally deformed.

Based on available geological data three major conclusions can be stated:

- There are no indication of sedimentary sequences of Late Proterozoic or younger age. All the supracrustal rocks are considered to be Early to Mid Proterozoic in age, strongly deformed and metamorphosed during the Brasiliano (Late Proterozoic) and Rio Doce (Cambrian) orogenies.
- The most characteristic lithotypes formed during these orogenies are granitoids, ranging from pre-collisional to post-collisional types.
- During Late Proterozoic to Cambrian times crustal reworking appears to have predominated over accretion, in a subduction-collision environment related to the final assembly of Gondwanaland.

Fig. 1. Geotectonic outline of eastern and southern Brazil.