Mineral Deposits Formed During Gondwana Assembly: Tectonic Analysis for Brazilian Giants

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Brazilian Neoproterozoic palaeocontinental margins buttressed against the Amazon, São Francisco, São Luis and Paraná Shields, during 750-450-Ma Brasiliano Gondwana assembly, producing metallic, gem and industrial resources. Processes of pre-collisional margin installation, basin closure, arc generation, orogenesis, and post-collisional, intracratonic-basin onset are separated. Quantifying the productive mineral capacity of each, for assessment of prospective potential, is hampered by incomplete datasets and imprecise geotectonic analyses. Statistical classification of deposits as giants and districts as "elephant country" identifies terranes apt for investment. District correlation across Gondwana fronts is recommended.

We analyse outstanding districts. Mesothermal, orogenic schist-belt Au is mined from the Brasília Belt, at the Paracatu giant and at *garimpos*. The Archaean Crixás Belt contains major mesothermal Au mineralisations, controversially attributed to Brasiliano deformation-induced activity. That metamorphism generated greenschist emeralds. Hybrid Irish-sedex/epithermal Zn mines at Vazante, occur in both platformal and intracratonic sediments, with Au/Pb-Cu-F showings. Pb-Zn-Ag deposits comprise numerous occurrences and mines, principally in the intracratonic, foreland Irecê Basin. Small mines, occurrences and exploration in the Ribeira-Mantiqueira Orogen, reveal significant epithermal Au/Pb-Zn-Ag-Au/clay potential in restricted, orogenic collapse basins. Limited mesothermal Au potential is indicated in the Brusque back-arc basin, although magmatic-arc erosion has reduced orogen-wide potential for magmatic-hydrothermal mineralisation. The northern orogenic extension to the Araçuaí Belt hosts expanding dimensionstone production, and renowned semi- and precious gem / collector's specimen production.