

Brazilian gem provinces

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Brazil is one of the world's largest producers of gems, principally those gems containing Be, B, F and the quartz group. The principal gems produced are aquamarine, alexandrite, emerald, tourmaline, topaz, amethyst, agate and opal. The main deposits are genetically related to pegmatite and pneumatolitic-hydrothermal fluids in mafic-ultramafic rocks; to hydrothermal fluids in psammitic metasediments; and to volcanogenic concentrations in continental basaltic flows. The main pegmatitic provinces are situated in the structural provinces of Mantiqueira, Borborema and Tocantins within Neoproterozoic mobile belts affected by intense granitic intrusion and gem mineralization. The gems rich in Be (aquamarine and other varieties of beryl, chrysoberyl, alexandrite) are mainly related to Neoproterozoic granitic intrusion. Gem-quality tourmaline is found mainly in pegmatite intruded into metasediments. Emerald occurs in ultramafic schist in the vicinity of granitic bodies. Gems of the quartz group (rock crystal, citrine, amethyst, chalcedony, and agate) are related to hydrothermal veins, principally in Proterozoic quartzose rocks and in druses in Mesozoic basaltic flows of the Paraná and Parnaíba basins. The deposits of Brazilian coloured gems are related mainly to two geotectonic events: (i) consolidation of the Gondwana supercontinent during the Brasiliano/Pan-African Cycle, when there occurred intense granitic intrusion in the Brasiliano mobile belts; and (ii) the opening of the South Atlantic with related extrusion of plateaux basalt in the Paraná and Parnaíba basins.