

The hopper gold crystals from Serra do Caldeirao, Mato Grosso (Brazil)

I received a beautiful sample of native gold for its quantitative analysis. The sample is not the typical nugget. Instead, it is a complex inter-growth of rough hopper crystals of isometric symmetry. The sample was collected in the Serra do Caldeirao claims (a crowded grouping of small pits and explorations where the *garimpeiros* rush to find the precious metal) in the town of [Pontes e Lacerda](#), not too far from Copacabana. Regarding this locality, I strongly recommend to read [this text by Roger Warin](#).



Gold sample forming hopper crystals. From Serra do Caldeirao claims. Photo: Roger Warin. Specimen from Jordi Fabre.

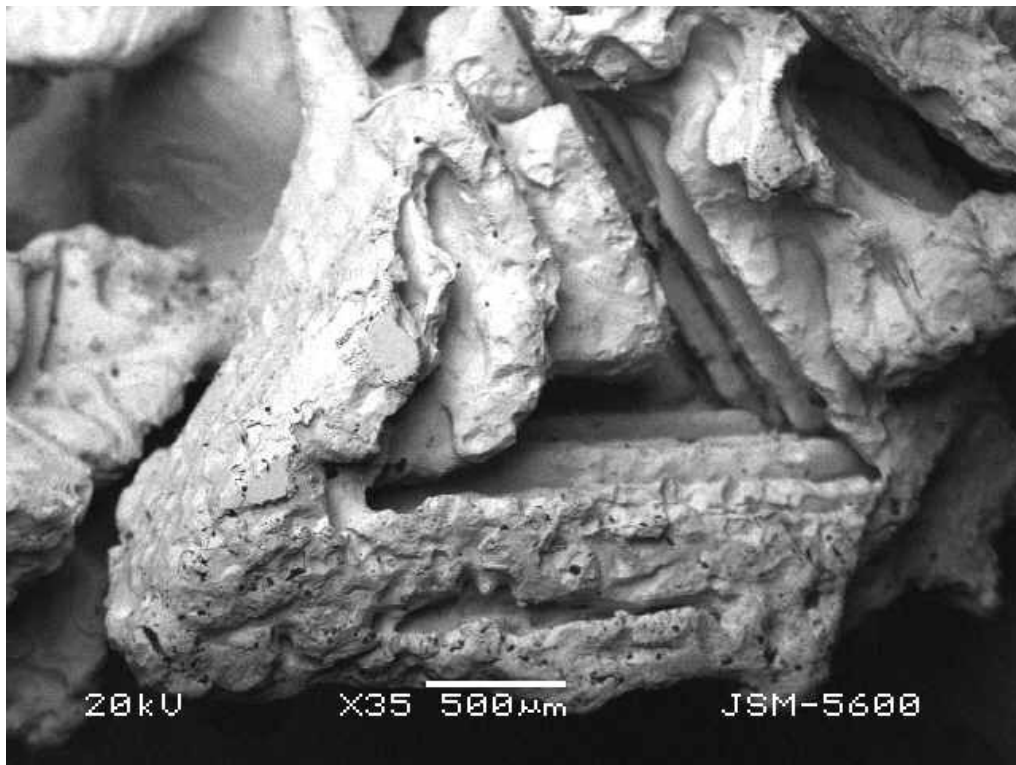
The region of Pontes e Lacerda hosts about 23 gold deposits, which are lateritic, placer type and hydrothermal. According to [Geraldes et al. \(1997\)](#), the gold mineralization is related to [mylonitization](#) or hydrothermal alteration of metabasalts and metandesites, dated during the Sunsás orogeny, in the Mesoproterozoic (around 1.3 Gy), which produced circulation of hydrothermal fluids at the Amazonia craton, leading to gold- quartz veins. The vein mineralization consist in pyrite, gold and accessory chalcocopyrite, galena and sphalerite. After the formation of hydrothermal veins, mobilization of gold in the form of chemical complexes (with chloride and nitrate from surface waters, for example) or organic complexes, followed by reprecipitation and recrystallization in laterites or accumulation in placers leaded to the several claims exploited in the zone .



Hopper crystal. Native gold from Sierra do Caldeirao (Brazil). FOV 0.6 cm.

The analysis published by Geraldes et al. informs about pure gold in most of the deposits. Our analysis agree with that,

showing that the sample analyzed from the Serra do Caldeirao claims is composed by 98-99% gold.



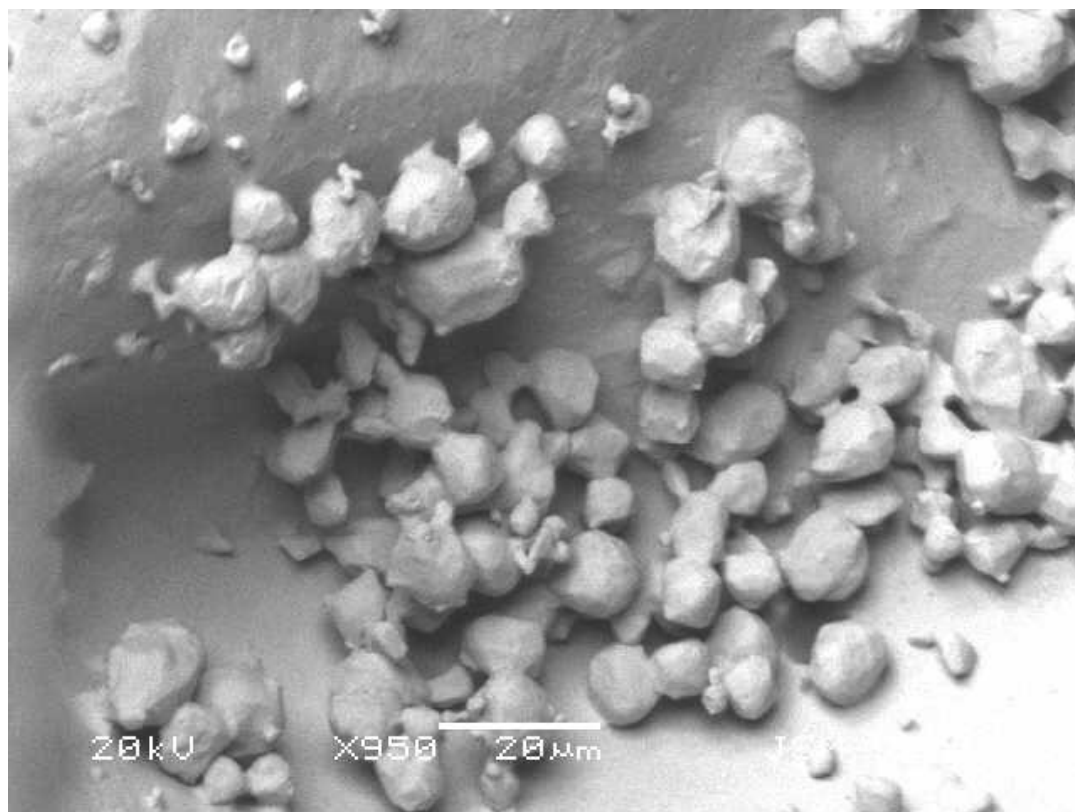
Scanning electron microscope of a hopper crystal of gold.



Gold crystal (FOV 0.6 cm) from Serra do Caldeirao claims.

Occasionally, the surface of the gold crystal is covered by gold grains of 5 to 10 microns, some of them showing apparent crystal faces. We cannot explain the origin of these gold particles.

Deposition by biological activity or precipitation of mobile gold complexes could be the origin?.



Tiny gold crystals on the surface of a bigger hollow crystal of gold.
Are the biological deposition the origin of these small forms?.



Detail of a gold nugget from Pontes e Lacerda (FOV 1 cm)