Lavra Velha is a high Au-Cu grade deposit in veins and hydrothermal breccia that shares several characteristics with deposits of the IOCG class. The deposit is hosted in strongly altered granitic rocks of the Ibitiara Plutonic Suite (c. 2.17-2.09 Ga). The deposit is located 500 km west from Salvador, Bahia state, northeast Brazil, on the central portion of São Francisco craton and was exposed at the north hinge of the Ibitiara Anticline, a structural window within Proterozoic sedimentary cover.

The basement of the region is formed by the oldest rocks of São Francisco craton. In the study area, the basement is composed by the Paramiri m complex, the Ibitiara granite and mafic dikes. The Espinhaço Supergroup represents the Proterozoic sedimentary cover and was deposited directly over metamorphic and granitic rocks, as an intracratonic rift basin at c. 1.74 Ga. In the deposit area, the volcanic rocks of the Novo Horizonte Formation directly overlay Ibitiara altered granite and the mineralization. Mylonites that crosscut the deposit were dated by Ar-Ar method on sericite and returned plateau age of 516.19 ± 2.73 Ma, considered the age for the inversion of Espinhaço rift-basin, during Brasiano-Pan African orogeny.

Breccia types were classified as calcic-silicate, sulfide, hematite and sericite breccia. The different breccia types display zoning from the base to the top as a result of the evolution of physicochemical conditions along the deposit formation. Geochemical results indicate the Au and Cu mineralization is typified by anomalous values of Ag, As, Co, Bi, U, Ba, Mn, Ce, and La.

Calcic-silicate breccia represents the root of the system and is evidenced by calcite-epidote-chlorite association, locally related to sodic alteration. Sulfide breccia form the main mineralized zone, related to potassic alteration. This breccia type shows a sulfide-magnetite-chlorite association. Hematite breccia occurs on the top of the mineralization and is related to strong iron-metasomatism as oxygen fugacity of the system strongly increases. The hematite breccia zone is characterized by near-total to total replacement of magnetite by hematite with hematite-tourmaline association. Sericite breccia represents the outer most hydrolytic alteration zone of the system, and is characterized by sericite-tourmaline-hematite association. At sericite breccia zone often occurs green barium-rich muscovite. Iron oxide from different breccia zones were analyzed and showed low vanadium content (≤0.24 wt.% ) and very low titanium content (≤0.06 wt.%). Discriminant diagrams using oxide geochemistry (Ni/Cr+Mn vs. Ti+V and Ca+Al+Mn vs. Ti+V) were used to classify Lavra Velha as an IOCG deposit.