

# Mineralogical study of gold from the Serpont Massif, Belgium

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The Serpont Massif is a small Cambro-Ordovician Massif located in the centre of the Luxembourg province - between the cities of Libramont-Chevigny, Bras and Libin - in the South East of Belgium. The Massif is covered by many water streams mainly situated in the surrounding Lochkovian conglomerate of the “Fépin Formation”.

Ardennes’ gold was mined for the first time from the *V<sup>th</sup>* century B.C. to the *V<sup>th</sup>* century A.D., corresponding to the Celtic to Roman era. Between the end of the *XIX<sup>th</sup>* century and the early *XX<sup>th</sup>* century, a second phase of exploitation occurred thanks to Julius Jung, causing an “Ardennes gold rush”. Currently, this precious metal is still present in small amounts and we can always see numerous remains from these activities as mines or tailings. For this master thesis, gold was collected from alluvial deposits on the Cambro-Ordovician Serpont Massif and in surrounding conglomerates. A distribution map, a morphological description, as well as chemical analysis at the electron microprobe, scanning electron microscope (SEM) and X-ray diffraction (XRD) were performed. No gold occurrence was directly detected in quartz veins in Bras, Serpont and Bois-la-Dame, nor in Lochkovian conglomerate of the “Fépin Formation”.

Alluvial gold of Serpont Massif is dispersed with an appearance of grains and specks, most often in a "modified" form, containing sometimes quartz inclusions. Chemical analyses detected contents of silver below 7 weight %, except for a grain corresponding to electrum; traces of copper and iron were also observed. All these elements are distributed homogeneously in each grain. The origin of gold is probably related to the formation of veins, mostly set up during the Variscan metamorphic event (500°C and 300-400 MPa) in a “shear zone”, and its release from the lower Devonian conglomerates of the “Fépin Formation” by erosion. These events seem similar to those that occur in the Stavelot Massif in Belgium. Heavy alluvial minerals associated with gold are garnet (almandine - spessartine – grossular typical of Ardennes), magnetite, tourmaline (schorl - dravite), zircon, chloritoid, ilmenite, rutile and pyrite (sometimes with a very small amount of gold). A morphological description, as well as chemical and/or XRD analyses, were performed on each mineral.