

## Co-Ni mineralization in the Punta Corna hydrothermal vein system (Piemonte, Italy): preliminary results

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The Punta Corna polymetallic hydrothermal vein system is located in the municipalities of Usseglio and Balme, Lanzo Valleys (Piemonte, Italy). The area has been well known since the Middle Ages for the exploitation of Ag, Fe, and minor Co (commonly used for pigments production), until the 20<sup>th</sup> century.

The global concern about the *green transition* and critical raw materials (CRMs) supply, such as Co, which is critical for the manufacture of electric vehicles and storage power stations, has raised a renewed exploration interest in old mining sites, where the CRMs economic potential was not fully investigated. Since 2018 the Junior Exploration Company AltaMin ltd. owns the exploration license of the Punta Corna area, for assessing the economic viability of the ore.

The deposit consists of a complex vein system interpreted as the product of late Alpine hydrothermal events (Castelli et al., 2011) and it is hosted in the metaophiolitic suite of the Internal Piedmont Zone (IPZ), representing a portion of oceanic lithosphere and its sedimentary cover of the Jurassic Alpine Tethys (Dal Piaz et al., 2003). The IPZ recorded eclogite-facies metamorphism during the early phases of the Alpine orogeny and a re-equilibration under greenschist facies conditions during exhumation. The mineralized veins are almost exclusively hosted in metabasic rocks, locally preserving primary basaltic structures.

Based on literature data, the vein system can be divided into two different areas of geochemical significance: i) the western sector, where Fe mineralization prevails, and ii) the eastern sector, dominated by Co-Ni-Fe arsenides + Fe carbonates, quartz and calcite gangue ± Zn-Cu-Pb-Ag sulfides ± baryte. Mineral assemblage and deposition below 200°C from metal-rich brines (from preliminary fluid inclusion analyses) suggest analogies with five element-vein deposits (Moroni et al., 2019).

The present work is part of a Ph.D. project focused on the geological, geochemical, and mineralogical investigation on the Punta Corna mineralized veins aimed to deepen the knowledge of the structural control of the ore bodies and metal distribution. New field campaigns (Spring-Summer 2022) planned to collect samples and data, are particularly aimed to understand the brittle deformation stages related to the mineralizing events. Petrographic, mineralogical and chemical characterization were performed on 23 new samples collected from different hydrothermal veins by means of optical microscopy, XRD, wet-chemical analyses and SEM-EDS techniques at the University of Torino.

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