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PŮVODNÍ PRÁCE/ORIGINAL PAPER

# Charakteristika měděného slitku ze zlatého dolu na Zlatém vrchu v Mníšku pod Brdy (střední Čechy, Česká republika)

## Characterization of a copper pig from a gold mine at Zlatý vrch Hill in Mníšek pod Brdy (central Bohemia, Czech Republic)

ZDENĚK DOLNÍČEK<sup>1)\*</sup>, DALIBOR VELEBIL<sup>1)</sup> A RADEK VODRÁŽKA<sup>2)</sup><sup>1)</sup>Mineralogicko-petrologické oddělení, Národní muzeum, Cirkusová 1740, 193 00 Praha 9 - Horní Počernice;  
\*e-mail: [zdenek.dolnicek@nm.cz](mailto:zdenek.dolnicek@nm.cz)<sup>2)</sup>Česká geologická služba, Klárov 131/3, 118 00 Praha 1

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### Abstract

A copper pig with dimensions 3.3 × 2.3 × 1.7 cm and weighing 25 g was found together with few iron artefacts (several mining chisels, several fragments of mining hoes, a hook) in dump material of ancient gold mine at the Zlatý vrch Hill near Mníšek pod Brdy town, central Bohemia, Czech Republic. The gold mines were in operation in the surrounding area in the 15-16<sup>th</sup> centuries with some later attempts in 18<sup>th</sup> century. A material characterization of the copper artefact, based on reflected light microscopy and electron microprobe study, is presented in this paper. The composition can be roughly approximated as an As-poor Cu-As alloy, with predominating matrix composed of low-As copper and most impurities being concentrated in intergranular spaces of low-As copper grains, where domeykite and inclusions of native lead were identified. The copper matrix contains 1.54 - 2.23 wt. % As, and low Sb and Ni. Strongly substituted domeykite (Cu<sub>3</sub>As) contains high Sb (9.3 - 15.6 wt. %) and lesser amounts of Pb, Ni, S, Ag, Sn, and Fe. Metallic lead is characterized by elevated contents of Bi, Ag, Sb, Cl, and S. In addition, a discontinuous rim with composition close to cuprite (Cu<sub>2</sub>O), locally containing inclusions of a Sb-As oxide, was identified on the surface of the copper pig. The element assemblage observed in the studied metallic artefact may indicate the source of the copper ore in the neighbouring base-metal (Ag-Pb-Zn) Příbram ore area, however, there are not known indications of historical smelting of sporadically occurring copper ores in the Příbram area. Therefore, we suggest that the studied artefact likely has more distal provenance.

**Key words:** historical metallurgy, archaeology, Cu-As alloy, arsenical copper, chemical composition, provenance, Bohemian Massif

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