COMPOSITION OF GOLD IN THE ROMAN GOLD MINING DISTRICT KARTH, LOWER AUSTRIA

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The Roman mining district Karth is located between Semmering Schnellstraße S6 and Südautobahn A2 southwest of Wiener Neustadt, Lower Austria. It is situated on a wooded plateau in a hilly territory and comprises an area of about 6 km length and 2.5 km width. The terrain shows remarkable formations like tanks and leat channels which are the remains of hydraulic mining of placer gold by the Romans as described by Pliny the Elder (CECH et al., 2013). The placer gold occurs in the Loipersbacher Rotlehmserie (also termed Loipersbach Formation), which is composed of clay and embedded coarse gravel layers (CECH et al., 2019). The data presented were collected as part of a master thesis (ELMER, 2020) in the context of FWF Project P30790-G25 (www.karthgold.com). Morphological investigations of gold particles from Karth using a digital microscope Keyence VHX-6000 based on the classification scheme from YOUNGSON & CRAW (1999) show mainly equant and complex outlines as well as mixed forms, whereas branched particles are unusual. Flattening, rounding and folded edges of the gold particles indicate a distal primary mineralisation, but a statement about the transported distance is not possible. Back-scattered electron images of polished sections using a scanning electron microscope Zeiss EVO MA10 show the zoning of gold with high fineness near the surface, in contrast the interior is rich in Ag; further elements have hardly been detected. Additional LA-ICP-MS analysis at the CEZA Mannheim, Germany, provide trace element data and help to gain more information about the composition of this placer gold. Even though a wide range of elements was analysed, only a few reached the limit of detection. For comparison with placer gold from Mur, Mürz, and Feistritz, core data of Cu, Cd, Sb, and Hg are used as these elements are above the detection limit most frequently. Gold from the different locations contain similar contents of Cu and Sb and therefore do not show cluster to discriminate one from another. In the core areas of Karth gold, Cd is mainly above the detection limit, whereas it is generally below in the comparison samples. Even though the reliability of Hg data by LA-ICP-MS has been discussed (ŽITŇAN et al., 2010) there are significant differences between the data from Karth and the compared rivers. Gold from Karth contains mainly <1000 ppm, in the Mürz values are around 660 ppm, in contrast Feistritz and Mur contain higher contents of Hg that are usually >1000 ppm. Thus, in the data so far the greatest geochemical similarities occur between gold of the Karth and that of the Mürz.

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