

## Background

The Roman gold mining district Karth 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 (Fig. 1), which is composed of clay and embedded coarse gravel layers (Cech et al. 2019).

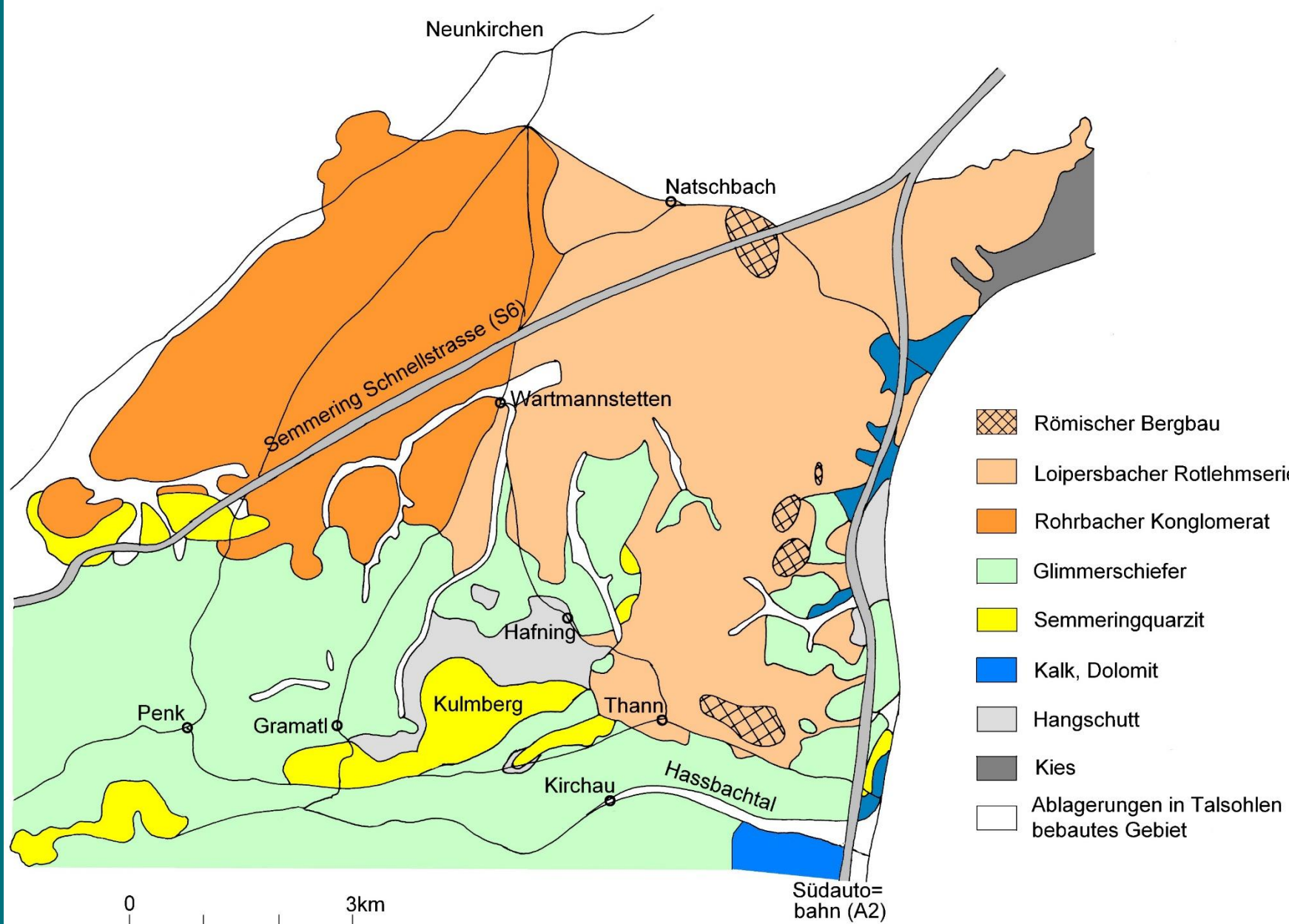


Figure 1: Geological map of the Karth area (Cech et al. 2013).

## Microscopic investigations

Morphological investigations of gold particles from Karth using a digital microscope show mainly equant and complex outlines as well as mixed forms, whereas branched particles are unusual (Fig. 2). Flattening, rounding and folded edges of the gold particles indicate a distal primary mineralisation.

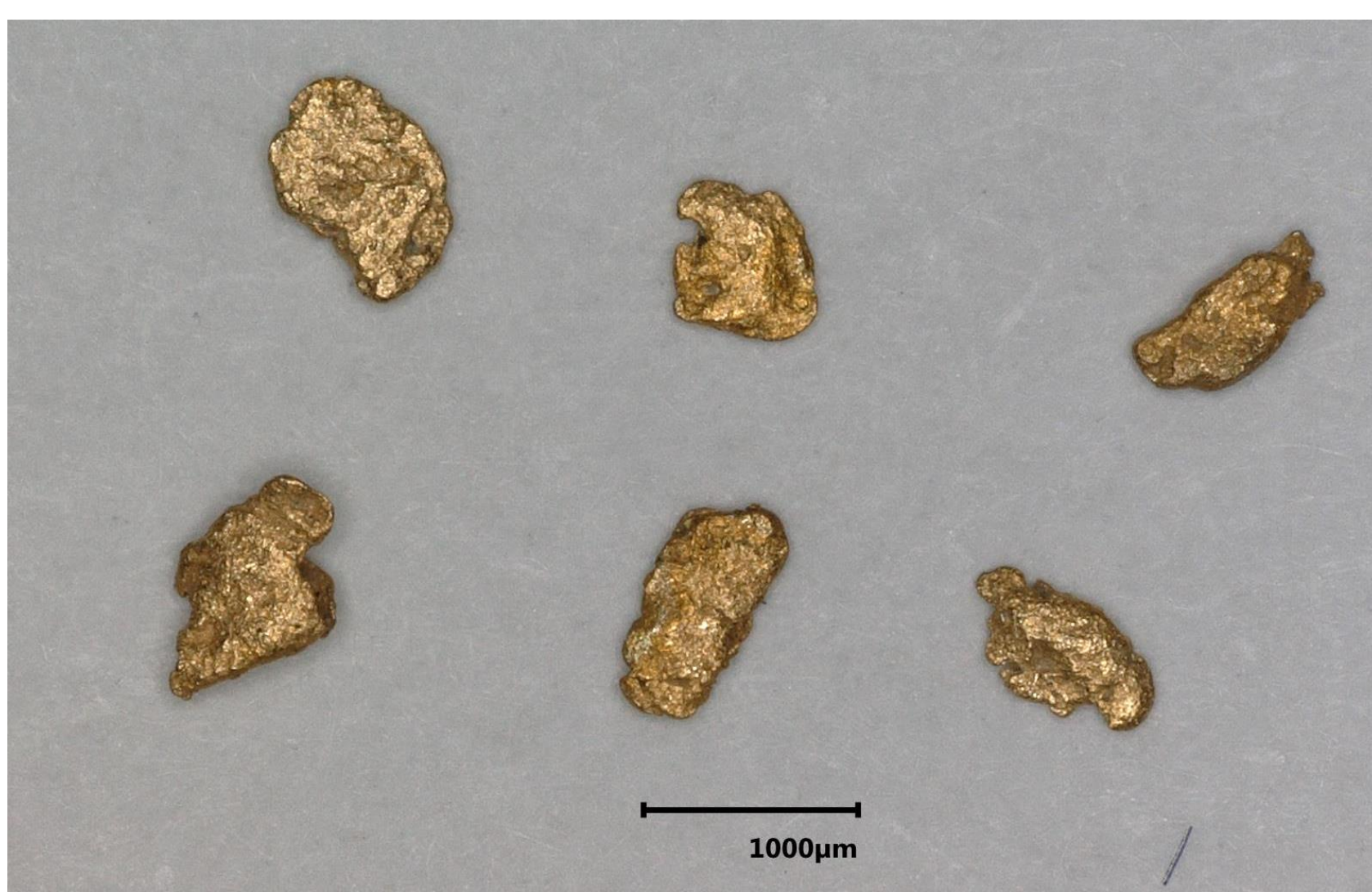


Figure 2: Microscopic image of gold particles from the Karth.

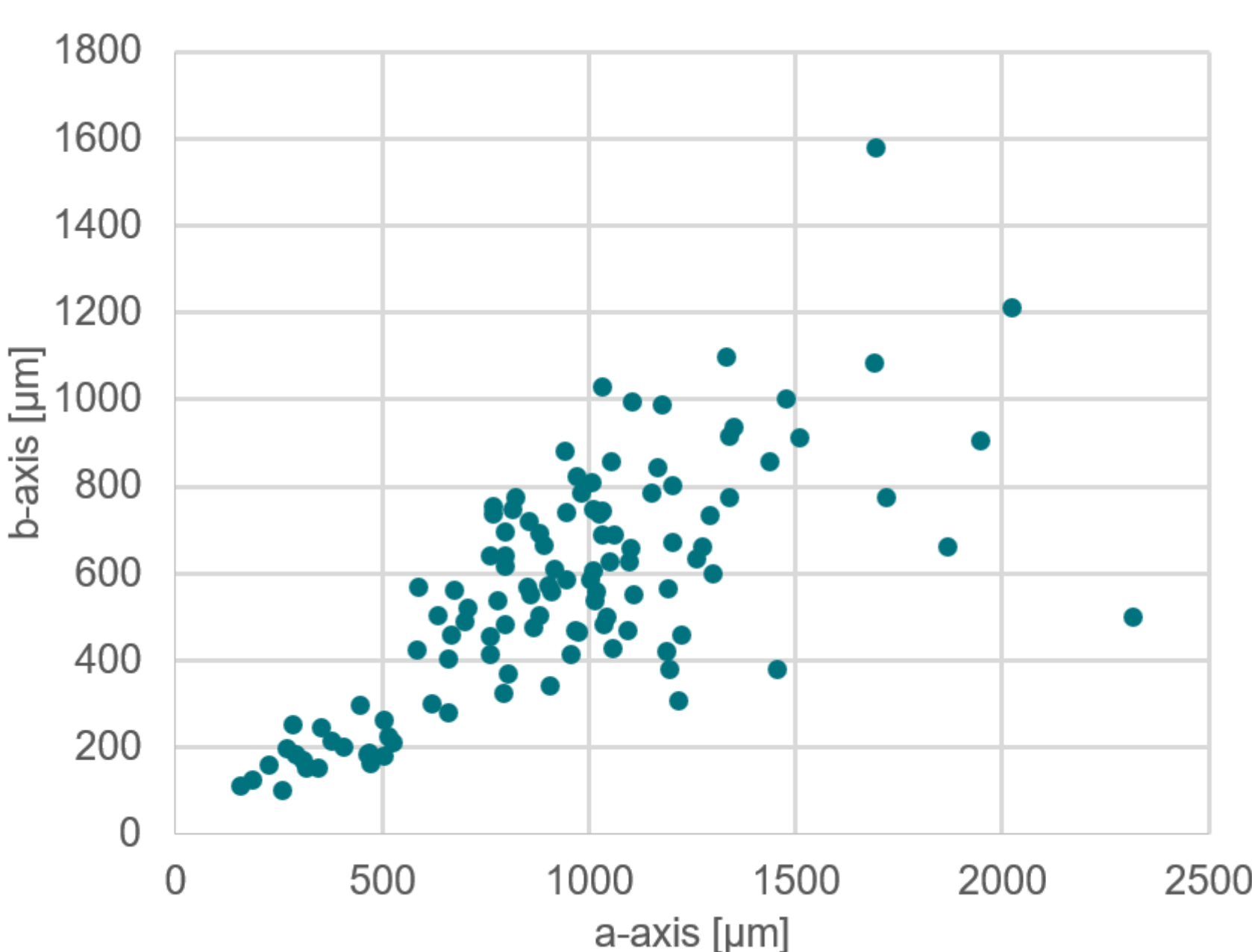


Figure 3: Measurement of length and width of gold particles from the Karth using a digital microscope.

## REM and LA-ICP-MS analysis

Back-scattered electron images of polished sections using a scanning electron microscope show the zoning of gold with high fineness near the surface, in contrast the interior is rich in Ag (Fig. 4). Using LA-ICP-MS trace element analysis, only a few elements 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 (Fig. 5):

- Gold from the different locations contain similar contents of Cu and Sb.
- Cd is mainly above the detection limit in gold from Karth, whereas it is generally below in the comparison samples.
- Gold from Karth contains mainly <1000 ppm Hg, in the Mürz values are around 660 ppm, in contrast Feistritz and Mur contain higher contents.
- Thus, the greatest geochemical similarities occur between gold of the Karth and that of the Mürz.

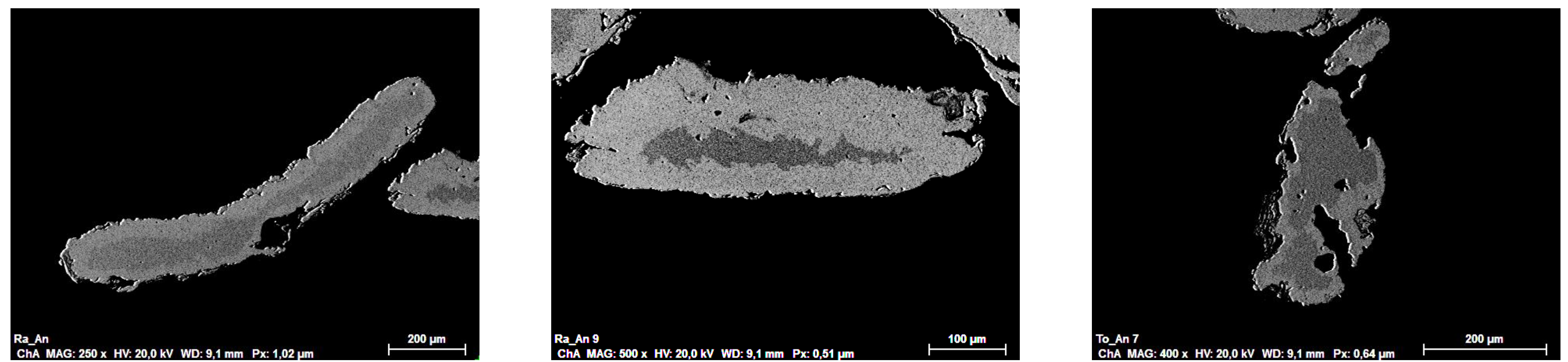


Figure 4: Backscattered electron images (scanning electron microscope) of polished sections of Karth gold. The dark core areas are rich in Ag, whereas the brighter areas are of high fineness.

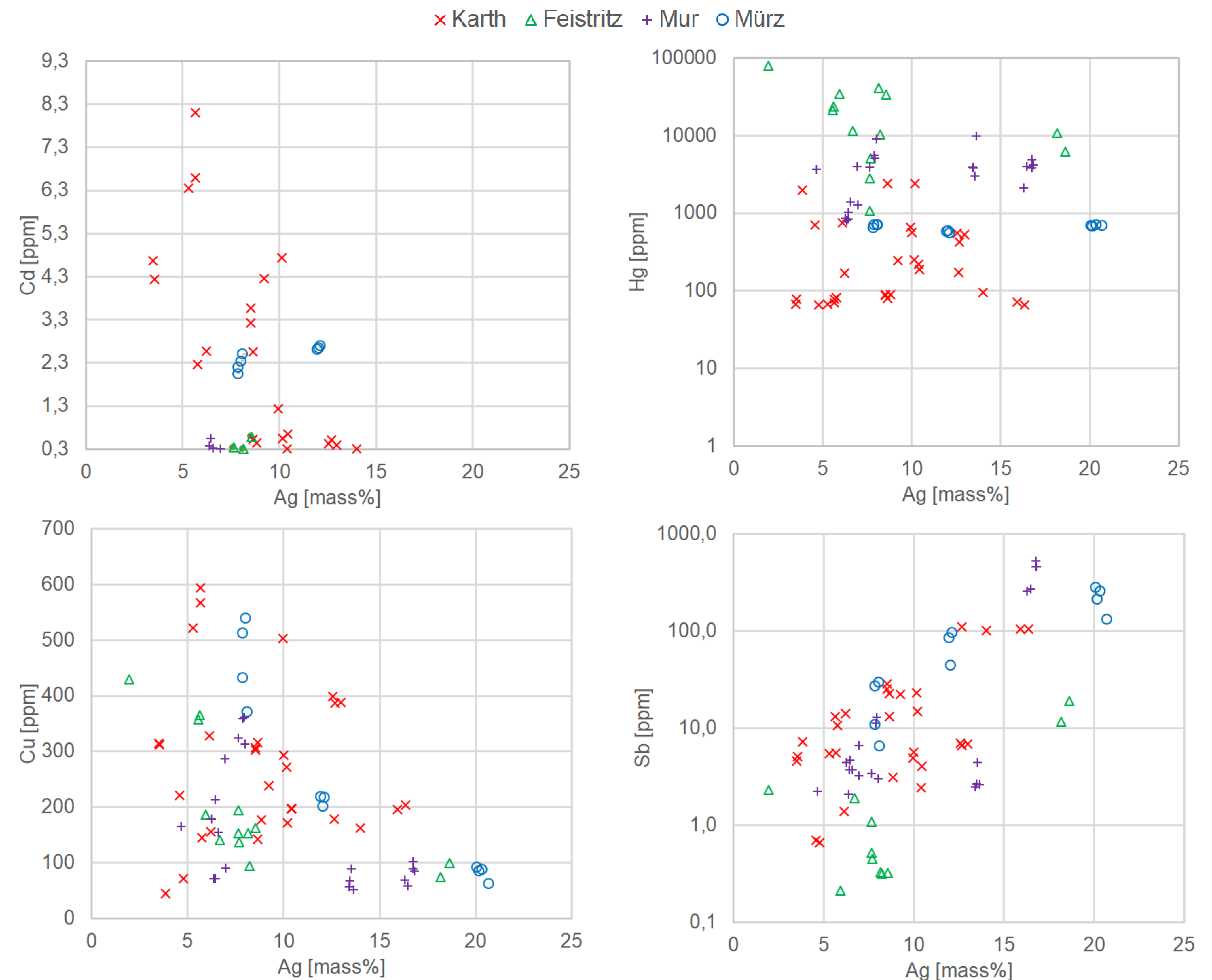


Figure 5: LA-ICP-MS data of gold from Karth, Feistritz, Mur and Mürz.

CECH, B.; KÜHTREIBER, T. (2013): In: P. SCHERRER (Hg.): Römische Österreich. Graz: Uni-Press Graz Verlag GmbH (Jahresschrift der Österreichischen Gesellschaft für Archäologie, 36), S. 1–94.

CECH, B.; SCHOLGER, R.; STREMEKE, F.; WEIXELBERGER, G. (2019): In: M. FRASS, J. KLOPF und M. GABRIEL (Hg.): Erfinder - Erforscher - Erneuerer. 1. Auflage. Salzburg: Paracelsus (Salzburger Kulturwissenschaftliche Dialoge, 5), S. 83–114.

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<sup>1</sup>Montanuniversität Leoben, Leoben, Austria (Peter-Tunner-Straße 5, 8700 Leoben, Austria)

<sup>2</sup>Curt-Engelhorn-Zentrum Archäometrie (D6, 3, 68159 Mannheim, Germany)

<sup>3</sup>Independent researcher (Quaringgasse 22/3/7, 1100 Wien, Austria)