

STUDENT REPORT ON OROGENIC GOLD TRAINING, PORTUGAL, SEPT 2020



Figure 1. Ultra-happy participants, of the Portugal Orogenic Gold course, at Limarinho. Note that the current Covid 19 restrictions of a maximum of 10 people per group was maintained. Photo taken by Christopher Eager.

Field training is fundamental to geologists. The more hands-on and boots-on days in exploration, the better prepared are young minds to tackle the challenges of finding new deposits and understanding past discoveries. Mud under their fingernails, scratches on their arms, sweaty clothes, no matter where the geologist finds the rocks, they always have their notebook, compass and hammer ready. Nonetheless, as in most aspects of modern life, increasing digitalization has had an impact. Therefore, the Portugal Orogenic Gold field trip, organized by Dr. Warren Pratt and Chris Gordon (Specialised Geological Mapping Ltd), aimed to cover advances in geological mapping and train the next generation of geologists. The challenge of Covid 19 meant postponing the June field trip, but a narrow window opened in September 2020, allowing it to take place with all 19 available places filled. A last-minute change in Portuguese Covid 19 regulations meant that we had to split into two groups of 10 for mapping and logging.

The Romans mined for gold in several places around Europe. Portugal was not exempt from this hunger for precious metals where the Romans left open pits and underground workings behind (now tourist attractions). We visited Castromil, near Porto, and Limarinho, in the north; both gold targets have been drilled in recent years. Due to the scarcity of data (few drill holes and surficial sampling), this field trip became an exciting challenge. Our 'parachuting' into areas without previous knowledge taught participants what to expect from a typical project

assessment in today's mining industry. It showed that rapid and optimal field measurements paired with characterization and mapping is fundamental.

The field trip ran from the 14-20th of September. The first days focused on Castromil, with core logging and GPS waypoint mapping. In drill core we identified key rock units, structural features and alteration minerals. Special emphasis was given to veins, whose alteration minerals (limonite) signaled the occurrence of sulphides. Participants were able to draw a clear correlation between surface and subsurface data to build a model using GIS mapping (e.g. QGIS), while understanding the role of each rock unit and vein occurrences. In the evenings, presentations on other examples of orogenic gold deposits were given by Dr. Pratt.

For the second part of the trip, Limarinho became the center of attention. The group was initially taught/retrained with 'old school' methods, including pacing, triangulation with compass and chain methods. We then mapped, using digital methods and measuring tape, the lithologies and vein systems. General consensus within the group was clear on the occurrence of *en echelon* along weak shear zones within the host granite. We also found through-going major quartz veins up to 3 meters wide, locally with scheelite. In conclusion, the Romans seem to have targeted the largest veins and the swarms of *en echelon* quartz veins. Finally, the two days were closed by more examples of orogenic gold deposits as well as good practices training with LeapfrogGeo projects. Examples of land reclamation after mining were discussed, with some beautiful examples of unexpected yet amazing landscapes.



Figure 2. Geologists hard at work on hard rock. This was one of the methods the participants were trained with. Photo taken by Christopher Eager.

The final day comprised a short visit to a pegmatite mine (for ceramics) where beautiful samples of folded tourmaline schists were encountered. This schist was cut by a pegmatite dike with spodumene and cookeite.

A big thanks to all participants who remained faithful even though the circumstances were quite adverse. Without all of you, this field trip would have been another disappointing

cancellation. Moreover, your input and curiosity made this event more than fruitful. Additionally, the international European mixture was a big plus to the discussions. The geological community can be proud of this team on the excellent results their new training will bring.

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