



**Stewart R. Wallace Fund Report  
UFPR Student Chapter  
Fieldtrip to “Vale do Ribeira”**

**UFPR SEG**  
Student Chapter

## 18.07.2019 - Serrinha Mine

In the visit of Serrinha mine, which belongs to Intercement company, a very complex limestone deposit used for cement production was covered. The mine has several mining operation to balance Fe, Mg and Ca quantities as it is needed in the industry they supply - being fundamental the knowledge about the structural-chemical control of the mine. In the limestones, hydraulic fractures occurred which resulted in big non-economic deposits of Cu due to the Itaoca granite accommodation.



Figure 1 - Intercement's Serrinha mine.

## 19.07.2019 - Sampling Techniques

In that day, the UFPR and UNESP members of the field trip took part in classes about solo sampling techniques, drainage active sediments and *bateia* concentrate metallic sediments (Figure 2 and 3), ministered by Francisco Ferreira de Campos, geologist of CPRM (Company of Research and Mineral Resources). He has taught them the procedure that could be released collecting samples, the best places for doing it, the needed scales and field observations as the possible contaminations and symbology that could be used for describing the samples



Figure 2 - Chapters learning soil sampling techniques (left) and sampling techniques with *bateia* concentrate (right).

After collecting the samples, the geologist has taught the students about the procedures that should be released to do a true geochemistry analysis using an X-ray portable diffractometer (Figura 4).



Figure 3 - Geochemistry analysis using an X-ray portable diffractometer

### 20.07.2019 - Canoas Underground Mine

In that day, the members of the trip visited an underground mine (Canoas), which was abandoned approximately 20 years ago. The Canoas deposit is an epigenetic deposit of Pb-Zn (Ag) hosted in limestone (Figure 5). On that occasion, the students had access to underground tunnels and galleries where were possible to relate geological profiles in the region with the model deposit expected and the rocks there exposed.



Figure 4 - Chapters during visit to the Canoas Underground Mine (Pb, Zn), that is inactive.

### 21.07.2019 Itaoca – “Skarn”

Later in that day, the members returned to the São Paulo State to visit copper mineralization in the city of Itaoca. The route to the point of interest included ferryboat on the Ribeira River and a long walk in the grasslands until a small abandoned quarry (Figures XA and XB). There, we had observed malachite and azurite associated with metacarbonate rocks (Figure XC), which are commonly considered roof pendant skarn bodies within the Itaoca Granite. With a Neoproterozoic age (~626 My), this batholith covers an area above 200 km<sup>2</sup> between the

states of São Paulo and Paraná, southeastern-southern Brazil. During its emplacement, thermal metamorphism and hydrothermal activity generated W-Mo-Cu bearing ore bodies that are enriched in wollastonite, scheelite-powellite, and sulfide minerals, in which malachite and azurite represent late products.



Figure 5 - A) Ferryboat on the Ribeira River, which delimits the boundary between the states of Paraná and São Paulo (cities of Adrianópolis and Itaoca, respectively). B) Walk in the grasslands of the city of Itaoca with the typical rugged relief of Ribeira Valley on the background. C) Malachite and azurite associated with metacarbonate rock composed by wollastonite and grossular.

### 21.07.2019 - Morro do Ouro

At the last day of the field trip, both UFPR and UNESP SEG Student Chapters members, guided by the CPRM geologist, Francisco, visited the Morro do Ouro gold deposits (Figure 6). The visit extended all morning and consisted mainly of walking up the hill trails, with some stops at outcrops and small galleries.

The Morro do Ouro, nowadays, is a Natural Park of Apiaí City, funded in 2004 by the town hall intending to promote the geotourism and nature preservation in the region. The gold exploration in this area is known to have begun at least around 1675, with the extraction of coluvial gold by slave labor. At the entrance of the park, a sculpture in honor to this dark period of slavery in Brazil's history can be seen. Since the foundation of Apiaí City, partly due to the Discovery of these Au occurrences, until the end of the 19th century, the mineral exploration in Morro do Ouro was discontinuously performed. From 1889 to 1942 the gold was underground mined by various groups and institutions, worth mentioning the Antonio Melchert e Cia and the Cia de Mineração Apiahy enterprises. One of the latest registers of the exploration in Morro do Ouro accounts 10,000 tons of ore with average Au content of 5 grams by tonne. From the compulsorily closure of the mining in 1942 to 1998, the área was abandoned. This scenario was reversed by diversives projects and laws that culminated in the foundation of the Morro do Ouro Park in 2004.

The primary gold deposit in Morro do Ouro is settled on schists intercalated with metasedimentary rocks of Água Clara Formation, a Mesoproterozoic unit of the Vale do

Ribeira's geology. Two types of ore are found in the área: 1) Quartz veins crossing the metasedimentary rocks containing Au in its metallic sulfides and 2) Limonitic ore in quartzites containing free gold associated to its oxides. Both types could be seen in abandoned galleries along the park's main trail to the top, but because of the structural instability and reduced space, only the entrance of them were visited by the group. The whole experience was advantageous in both historical and geological knowledge of the exploration in Apiaí region, encompassing the two states where the Student Chapters are located.



Figure 6 - A) UFRP SEG Chapter Student at Morro do Ouro's top view. B) Quartz vein in gallery's roof.

### Workshop\*

From October 17 to 19, 2019, our chapter will promote the I Workshop on Economic Geology of Paraná, a pioneer initiative in our state. The main subject of the event will be the “Mineral Potential of Ribeira Valley”, which was the destination of our members in the last field trip. Based in the knowledge acquired during the trip and the contact that we had with CPRM employees, members of the UNESP SEG Student Chapter, and researchers, we aim to share all that to the maximum of students we are able to achieve. The workshop is going to take place for three days. Mornings are all filled with courses, while in the afternoons we will have lectures held by professionals from southern and southeastern Brazil. The subjects of the lectures vary; although most of them will be regarding Ribeira Valley mineral deposits and its complexities.

\*The event had to be postponed for logistic reasons but is being funded partially by this Stewart R. Wallace Fund award. Its expenses will be described at our 2020 report as the annual report submission deadline does not include the date of our workshop.



# I WORKSHOP PARANAENSE DE GEOLOGIA ECONÔMICA

POTENCIAL MINERAL DO VALE DO RIBEIRA

CURITIBA, PR | UFPR, CAMPUS CENTRO POLITÉCNICO  
17 A 19 DE OUTUBRO DE 2019

REALIZAÇÃO



SEG UFPR  
Student Chapter

