

Field campaign 6 – early Kimmeridgian – late Tithonian unconformity (April 27-30, 2021)

In the sixth field campaign, the PALEO team explored and sampled the first unconformity (Late Kimmeridgian - Early Tithonian). The main focus of this field campaign was to sample the Rovinj 1 bauxite pit and to find further outcrops of the first unconformity. Bauxite pit sampling, which was extensive and detailed, comprised most of this field campaign. The main profile in the pit was sampled using alpine climbing techniques. Although the GEO team was not present during this field campaign, the hanging wall of the first unconformity in the bauxite pit was sampled. From the limestone samples of the hanging wall, $\delta^{18}\text{O}$ and $\delta^{13}\text{C}$ will be analyzed together with thin section study. Out of green-grey palaeosols from the hanging wall of the unconformity and the bauxites a large number of analyses and studies are going to be performed such as SEM, ICP-MS, XRD, micromorphological study, U-Pb zircon dating, $\delta^{34}\text{S}$ along with heavy and light mineral analysis.

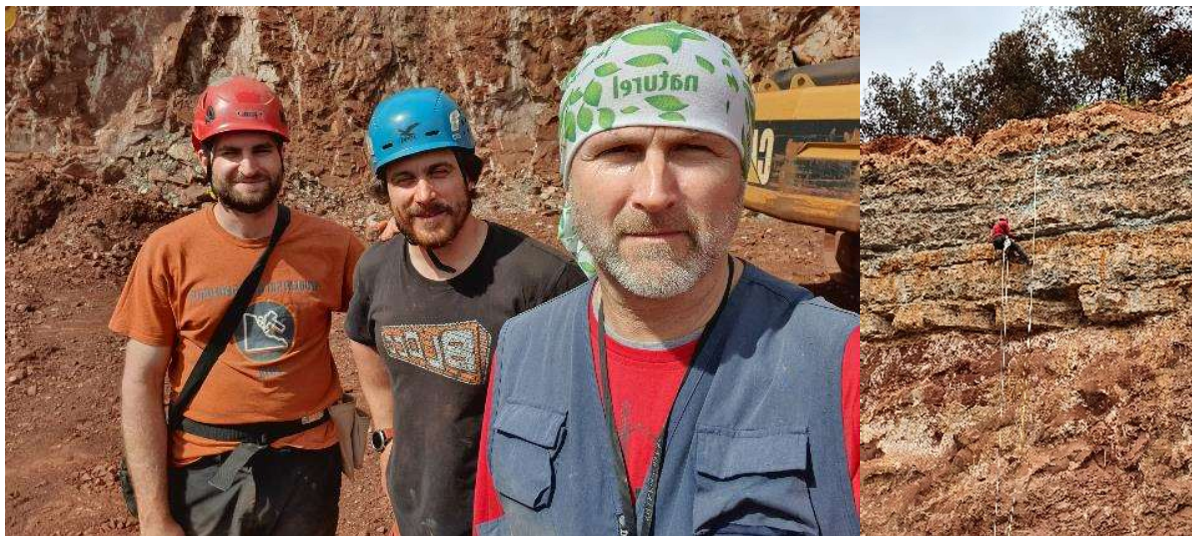


Figure 1. left - PALEO team in the bauxite pit, right – sampling of the main profile

On the last day of the field campaign, another sampling site was found for the first unconformity, with a possible bauxite occurrence yet to be analytically verified. Only some footwall, hanging wall and unconformity samples were taken, because GEO team is going to revise and sample this outcrop in detail.

Rovinj 1 bauxite pit

Fieldwork at this site included sampling of the bauxite and its hanging wall, which comprise a cyclic alternation of greenish gray palaeosols, limestones, brecciated regolith and sporadic occurrences of black pebble breccia. Several features were observed in the overburden, such as desiccation cracks and burrowing traces, which were not observed or difficult to observe on the sampled profiles. The main profile was selected in the thickest exposed section of the pit, where it was sampled using alpine climbing techniques. Hanging wall limestones were sampled every 10 cm through the 2 m section above the bauxite. The bauxite was sampled at least every 0.5 m, with additional samples taken as needed. The bauxite types observed were clastic (fine to coarse grained) and pelitomorphic in texture and white, gray and red in color. A further, smaller profile was sampled, encompassing the uppermost section of bauxite and its immediate hanging wall, as this section is important and was difficult to sample in detail using alpine climbing techniques. This also allowed us to observe distinctive features that could only have been observed laterally in this section. The most notable features were preserved and pyritized rhizoconcretions, pyritized root remains, rhizohaloes, pyrite crusts along with pyrite and calcite veins in the limestones of the immediate hanging wall of the bauxite.



Figure 2. Rovinj 1 bauxite pit.

Rovinj 1 bauxite pit

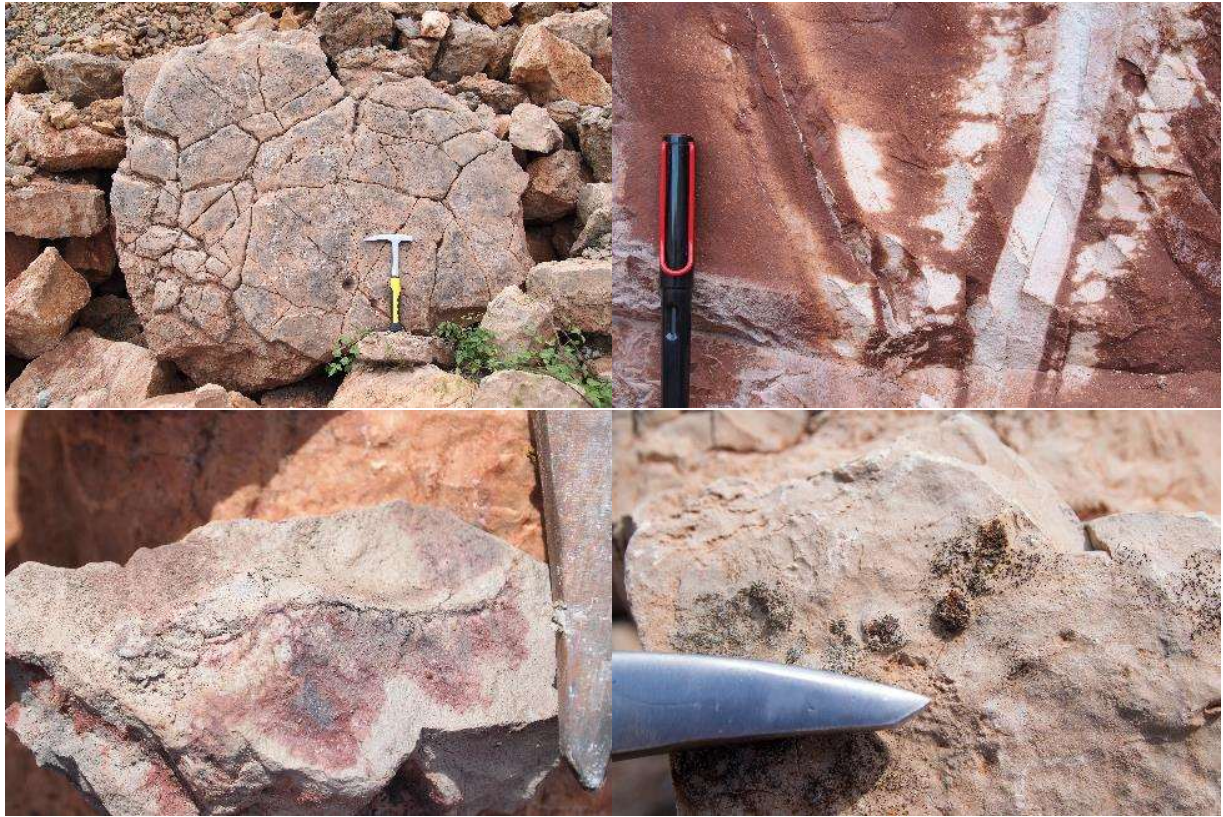


Figure 3. upper left – dessication cracks, upper right – white bauxite veins in red bauxite, lower left – pyritized root remains, lower right – pyrite veins and occurrences in limestone.

Zlatni rat (Rovinj)

The first unconformity sequence at this site is much thinner than that at the Rovinj 1 bauxite pit, but it is also important because it provides valuable insight into the lateral variation of the unconformity. Well-preserved anthozoan fossils were found in the footwall of the unconformity at this site. The unconformity itself consists of greenish gray clays with interbedded limestone fragments and black pebbles. Pyrite veins and occurrences were found in the hanging wall, as those observed in the Rovinj 1 bauxite pit. For the preliminary investigation of this site, a sample of each of the above features was taken, as sampling will be carried out in detail during a further field campaign.



Figure 4. outcrop of the first unconformity on Zlatni rat.



Figure 5. lower left - anthozoan fossil, lower right - embedded limestone fragments and black pebbles in a clayey matrix.