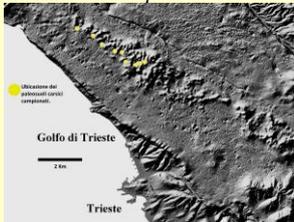


**Enrico Merlak.**  
**Commissione Grotte "E. Boegan", Società Alpina delle Giulie,**  
**Sez. C.A.I. Trieste.**

**Occurrence and significance of Karstic Paleosols in the Stratigraphic Sequence of the Classic Karst near Trieste and their role in the explanation of the Paleogeography in the region.**  
 Karstic paleosols are made up of levels of rocks which have undergone an intense action of weathering and pedogenesis in a different climate compared to the current one. They formed in an ancient "landscape".



**-Map of classic Karst near Trieste.**

**-Mudstone: it's a very particular of soft sediment developed during a stage of the sediment's consolidation. Contact between micrites with different mineralization (Sales-classic Karst)**

The easiest system to identify the development of ancient surfaces is the paleosols' survey. An evidence for karstic paleosols are the cracks formed in the sub-aerial exposure, cracks filled with sediments (micrite), fragments of rocks, iron-rich clay intercalations, calcite cement and brecciated fabric. Frequent are the laminated crusts and the rock inclusions coated by discontinuous crystalline calcite.

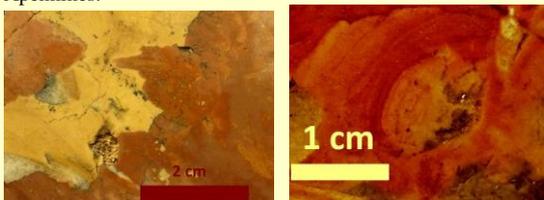


**-Soft sediment. The stylolitic structure is an irregular surface parallel to bedding plane, interpreted to result diagenetically by pressure solution during the form of paleosol (Samatorza-classic Karst).**

**-Wavy shape "flame structure"; structure consist of different rock fragments, typically in karstic paleosols (M.Lanaro-classic Karst).**

In classic Karst near Trieste (Friuli-Venezia Giulia, Italy), between Rupingrande (Repen) and Duino (Devin), are detectable at least three levels of paleosols linked to as many episodes of emersions (sea level changes) occurred between the upper Albian and the Cenomanian. They extend regularly and are included between limestones and dolomitic limestones. As well as on the surface, they were also detected during explorations and openings of new underground cavities.

Karstic paleosols of the upper Albian - Cenomanian period are also recorded in the slovenian Karst, Balkans and in the central Apennines.



**-Tectonic breccia make up of very angular fragments with different mineralization (Repen-classic Karst).**

**-Concentric laminated crusts of micrite around a fragment of limestone (Sales-classic Karst).**

The study of these rocks occurs through different methodologies: XRD (X-ray diffractometry), thin microscopic sections, ESEM (environmental scanning electron microscopy), polished cuttings, chemical analysis, micromorphological characteristics.

These limestones and dolomitic limestones show intense phenomena of tectonic breccias, differentiations in mineralogy and accumulations of residual clay. However, in order to analyse the succession of the paleosol levels, it is necessary to recognise the lithofacies of the rocks.

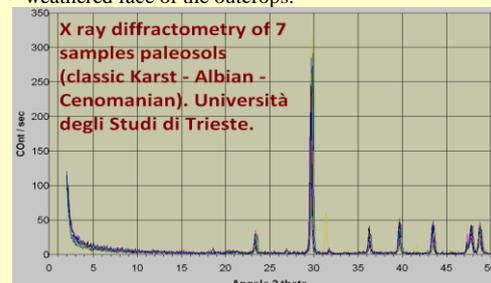


**-A result of the displacement and movement of unconsolidated sediments with recrystallization of calcite and different mineralization of micrite (Repen-classic Karst).**

**-Layers of very compact fine laminated crusts of micrite and sparry calcite are common features of calcareous paleosols. The mudstone may form dense layers with different mineralization (M.Lanaro-classic Karst).**

In the morphological studies of Cenomanian and upper-Albian karstic paleosols, it is possible to examine very well the sedimentary feature consisting of:

- trapped fluid inclusions
- layers and lenses of very compact fine material and laminated crusts
- Fe and Al rich clay intercalations
- grains and subangular fragments, rocks and crystals inclusions in micrite
- orientation of the cracks
- crystal and fibers of calcite, calcite spar filling
- dark micrite
- concentric encrustations around the rock fragments
- autoclastically brecciated fabric
- weathered face of the outcrops.



**X-Ray diffractometry of the collected samples of karstic paleosols (Università degli Studi di Trieste- Laboratorio di Geochimica e Mineralogia).**

The karstic paleosols consist of calcite and dolomite, as well as of oxides and hydroxides of Al, Mn and Fe that give the rock the colors ranging from beige to dark red, and of traces of phyllosilicates. The colours of a part of the sediments have been used to identify the mineralogy: red or brown for hematite, beige or yellow for goethite and black for organic matter. The depth of penetration of the karstic features in the examined levels is not relevant and restricted in one meter.

These paleosols play an important role for the interpretation of the geological and paleogeographic evolution of the area and surrounding regions and for the history of changes in sea level. The stratigraphic discontinuities, the cementation, the growing of calcite, the fluid and solid inclusions identify the events in the ancient surfaces to sub-aerial exposure with paleo-topographic structure characteristic of karstic phenomena in upper Albian and Cenomaniano in Karst near Trieste.



*photos: Enrico Merlak*