# Sedimentological and mineralogical reconstruction of a Quaternary sequence in Val Rosandra (Trieste, NE Italy)

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The Rosandra torrent is the only surface river in the Trieste karst area. The river springs are located in the Eocenic Flysch (Slovenia); then, it flows at first toward NE, then to SW, carving a gorge in the Cenozoic limestone of the southeastern sector of the Karst of Trieste, up to the Gulf of Trieste (NE Adriatic Sea). At the end of the Rosandra gorge, along the northern side, roughly 12 m high of loose and weakly cemented deposit (Fig. 1) outcrops [Cucchi et al., 2009].
The deposit is composed by a number of alternating silt, sand and gravel levels. The lower part is mainly composed by fine-grained sediments, while the upper part is coarser. Nine samples were collected to determine the sedimentological and mineralogical characteristics of the sequence and to define the related sedimentary processes and the paleo-environmental setting.

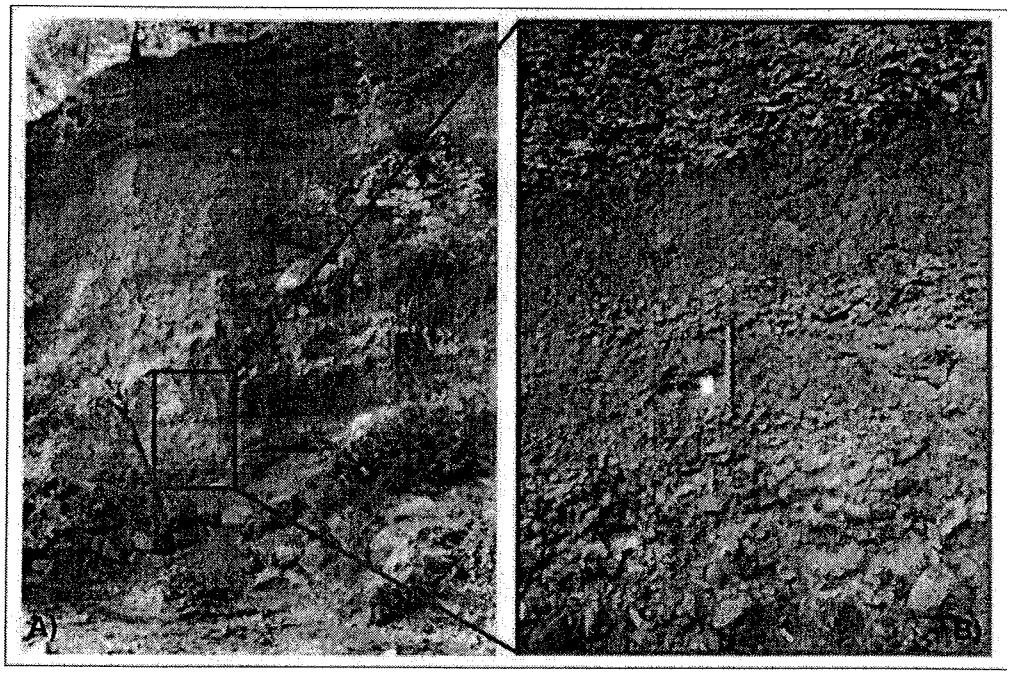


**Figure 1.** A) general view of the outcrop; B) location of the $^{14}C$ sample.

Most of the sequence is characterized by alluvial levels which reflect different energy environments. Alluvial levels are characterized by high percentage of gravel together with sandstone and marls clasts. The sand and silty fraction are both characterized by high value of quartz and feldspar; in particular, quartz ranges between 50 and 70 %. The origin of quartz and feldspar could be related to the Flysch related to the Beka – Ocizla sincline, located upstream from the deposit, close to the Rosandra springs.
Level 3.1, which is composed mainly by gravels and sands and is characterized by subangular limestone clasts. This sediment is similar to debris deposits locally outcropping. Some blocks, up to 1 meter in size, are included in the level 7 related to gravitational processes and landslides. In correspondence of the lower part of the sequence, the level 6 is a coarse silt with fine gravel and very high percentage of quartz (93%). The compositional and sedimentological features of the level suggest the occurrence of a loess or reworked loess deposit. Its reddish hue suggests some degree of soil development. In the Trieste karst area, Middle

Pleistocene loess was found, usually reworked by colluvia, in the infilling deposits at the "Riparo di Visogliano" [Falguères et al., 2008], whereas Late Glacial loess commonly occurs in several caves [Boschian 1998; Boschian and Desantis 2011].
From a genetical point of view, the deposit can be roughly divided (Fig. 2) in three parts. I) A basal part, at the cliff toe (Lev. 1 and 2), which is composed by medium and high energy alluvial levels. II) a middle part, which is characterized by fine loess sediments, gravitational deposits (debris and landslides deposits) and, to a lesser extent, alluvial deposits. III) the upper part of the sequence is again alluvial, from middle to high energy.

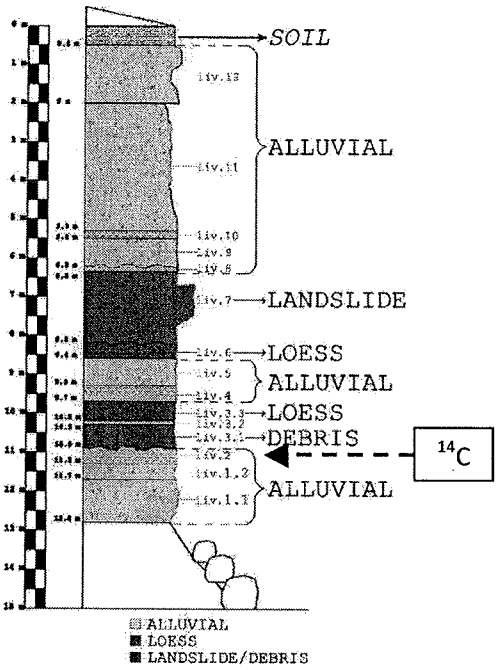


**Figure 1.** Genetic interpretation of the sequence.

The changes in sedimentary processes and the occurrence of debris and loess indicate a relatively cold and dry environment, which is opposed to the relatively wet and hot environment related to the alluvial deposits. Further studies are needed to define the absolute age of the sequence. $^{14}C$ dating on a frustule plant collected on Level 2 (> 45.000 yrs BP) suggested that the lower part of the sequence (alluvial levels and loess) could be related surely pre LGM, while only the upper alluvial sequence could be LGM in age.

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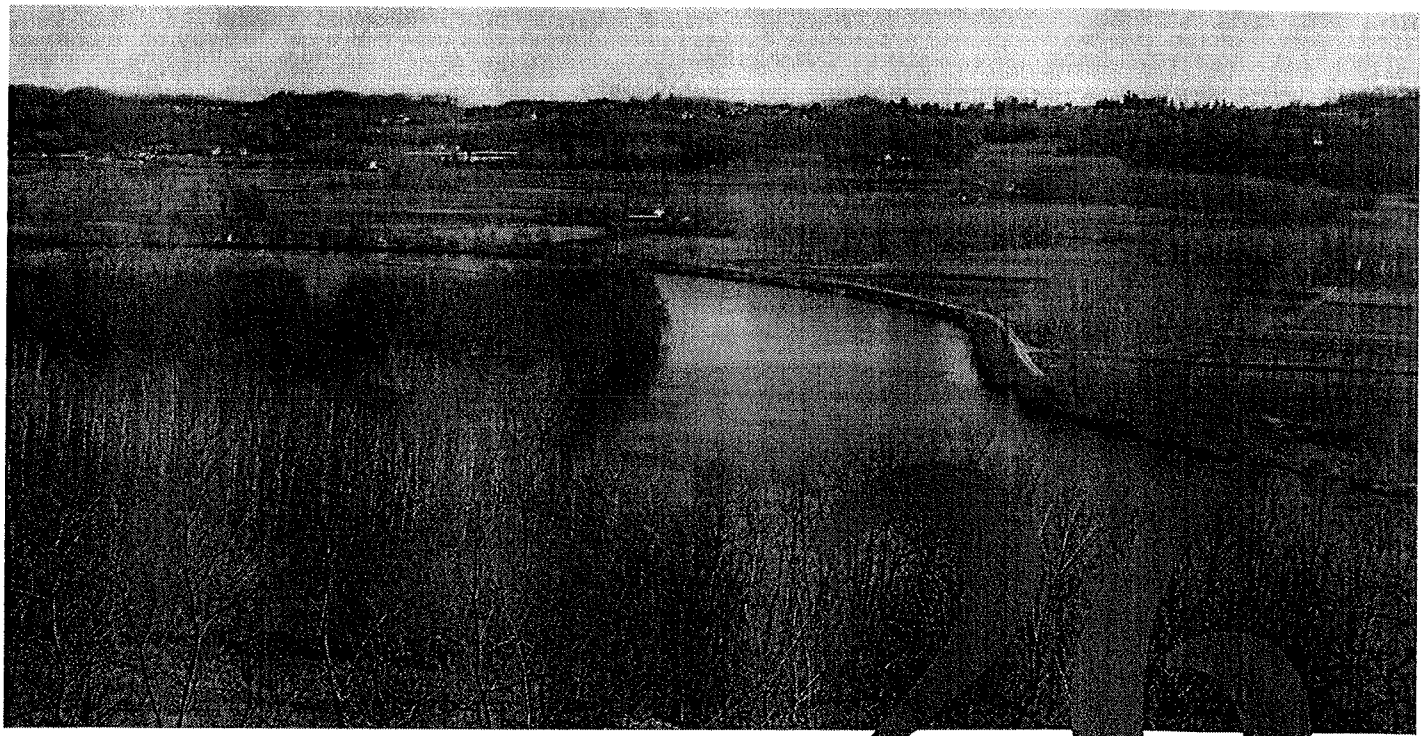

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