Geological setting of Turin shallow subsoil connected to Holocene deviation of the Po River

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Urban Geology is a topic of increasing interest in the last two decades. The present survey of the Turin subsoil (NW Italy) was carried out based on both natural outcrops (essentially located in the scarps along the Sangone and the Po river beds) and anthropic sites (excavations carried out for the building of large infrastructure and drilling of 33 boreholes for the construction of a new sewer collector by SMAT-Società Metropolitana Acque Torino). These geological investigations allow to evaluate facies, thickness and petrographic composition of fluvial sandy gravel forming the wide proglacial fan of the Rivoli-Avigliana end-moraine system (RAES), on which Turin is built (Turin Unit) (Forno et al., 2018; Forno & Gianotti, 2021). The local finding of a truncated palaeosol, buried under it, suggests that this unit lies on a significant erosional surface shaped in more ancient fluvial sediments (Bennale Unit in Balestro et al., 2009). This discontinuity was recognized both in the outcrops along the Sangone incision and in some cores, allowing a more extensive stratigraphic reconstruction. A new radiocarbon dating of woody macrorest from fine outwash sediments above the palaeosol proves a Last Glacial Maximum age of the Turin Unit. The same investigations suggest the presence in Turin, along the current Po river bed, of subsequent erosional terraces (Molinette T1 and Murazzi T2), shaped by the Po River in the RAES proglacial sediments, and depositional terraces (Vallere T3 and Parco Stura T4), essentially formed by a sandy sequence, also linked to the Po River. Therefore, the Turin Plain first was shaped by the proglacial streams (Dora Riparia basin) and subsequently was involved by erosional/sedimentary phenomena carried out by the Po River. Some dating of woody macrorest and gyttja into the fluvial sequence of Turin confirm the wide presence of RAES Upper Pleistocene fluvial sediments and the subsequent entrenched Po fluvial terraces, due to a significant fluvial deviation phenomenon during Holocene. This picture agrees with the research regarding the Quaternary fluvial terraces spread over the Turin Hill and suggests the involving of the Turin Plain in the Turin Hill quaternary uplift (Boano et al., 2004).

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