

Pliocene and Pleistocene fluvial deposits in the Vienna Basin – Status of numerical age dating using the cosmogenic nuclide pair ^{26}Al and ^{10}Be

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Quaternary sediment transport via the Danube River into the Vienna Basin (VB) resulting in fluvial sediment deposition was largely influenced by glacial-interglacial variations in a generally uplifting area. Today, these sediments form the upper part of the sediment sequence of the VB and also form terraces in the more uplifted blocks of the VB. In addition, the VB is shaped by the tectonic regime of a large subsiding pull-apart structure related to the Vienna Basin Transform Fault System (VBTFs; Decker, et al. 2005, Salcher et al., 2012) between the Eastern Alps and the Western Carpathians. Thus, fault activity dissects the terrace staircases after primary fluvial deposition. Age determination of terrace sediments may enable (1) to find a possible link between terrace formation and climate change, and (2) constraining the vertical displacement of different tectonic units during the timespan of terrace formation.

The VB terrace record north of the Danube is considerably different from the south. In the north one large terrace, the Gänserndorf Terrace was abandoned between 190 000 and 220 000 years ago (Weissl et al, 2017; Braumann et al, in press). This terrace is bordered by two smaller terrace bodies to the east and west where the eastern terrace was dated to 340 +/- 170 kyr (Braumann et al, in press). In contrast, south of the Danube different fault blocks with up to six terrace levels are present in isolated blocks where they form staircases with terrace base elevations ranging between 25 and 130 m above today's base of the Danube. These terraces have been strongly dissected by faults related to the sinistral movement of the VBTFs and have been the focus of this study.

The cosmogenic nuclide pair of ^{26}Al and ^{10}Be was used for isochron burial dating of terrace sediments to the south of the Danube River. This method uses the differential decay of both in-situ produced isotopes to calculate the time of terrace abandonment. The Danube derived sediments in the VB are quartz-dominated coarse, uncemented fluvial deposits that are well-suited for burial age dating due to the presence of large individual cobbles that share the same post-depositional history, but have different pre-exposure and transport histories (Balco and Rovey, 2008).

Numerical age dates of selected terraces south of the Danube (city of Vienna, Rauchenwarth/Fischamend area, Arbenthal Hills, and Hainburg Hills) will be presented and the relative incision rate of the Danube (i.e. uplift rate of selected blocks) for this time interval will be calculated.

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