



Pedology around a 6700 year old Neolithic ring ditch system in Germany

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The cultural landscape in Europe is the product of many different human and natural activities and processes. Settlement, clearing and farming over thousands of years are constantly transforming the landscape and the according bio- and geo-components like flora and fauna, relief, hydrology, soils and others. As Geoarchaeology tries to reconstruct certain stages of this cultural landscape development, the existence of geoarchives of the respective time period are a crucial precondition. Soil science often works with colluvium as geoarchives but that presupposes the original soil to be destroyed by erosion. Therefore there is a lack of in situ soils of certain time periods throughout Europe.

During archaeological excavations conducted by the Kreisarchäologie Deggendorf in eastern Bavaria late 2008 a new Neolithic ring ditch system was discovered which dates back to 4700 BC. Beside its enormous archaeological relevance the study site offers unique possibilities for pedological studies. Situated in the loess belt of eastern Bavaria calcic luvisols form the native soils of the region. However, black soils from older floodplains, the so-called Tschernitza, are described some hundred meters beside the excavation area. In addition black sediments which fill the pits of a Neolithic settlement close to the ring ditch system have been detected. The black backfill sediments are correlated with anthropogenic settlement activities. Interestingly, the backfills of the contemporaneous ring ditch system differ. The 2 m wide and 2.5 m deep ditch functioned as an ideal trap for naturally eroded sediments. The backfills of the ditch indicate different phases of sedimentation and artificial reformation of the ditch. Furthermore, the analysis of thin sections and laboratory data (such as RFA, RDA, pedogenic oxides, magn. suscept., etc.) together with geophysical measurements point to the existence of a fully developed calcic luvisol around 6700 years ago. At the same time within some hundred meters of distance and under the same meso-scale climatic conditions black soils formed and black sediments were produced by the Neolithic settlers. We compare this situation with other sites known in Bavaria and present the meaning of our results for Archaeology.