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Dating of pollen samples from the sediment core of Lake St Anne in the East Carpathian Mountains, Romania

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Lake St Anne (950 m a.s.l.) is situated in the Ciomadul volcano crater, the youngest volcano in the Carpathians. Aims driving forward the studies there are twofold, one is dating the latest eruption of the Ciomadul volcano and the other is the multi-proxy palaeoenvironmental reconstruction of this region. The sediment of Lake St Anne was sampled several times already, but never reached the bottom of the lake before. During the winter of 2013 at a new core location drilling started at 600 cm water depth and finally reached the bottom of the lake sediment at approximately 2300 cm including water depth.

As for all multi-proxy studies essential requirement was to build a reliable chronology. Sediments were dated by radiocarbon method. Previous radiocarbon dates were measured on plant macrofossils, charcoal, Cladocera eggs, chironomid head capsules and bulk lake sediments. Lake St Anne has volcanic origin and there is intensive upwelling of CO_2it is important to study and take into consideration, whether there is any local reservoir effect at the case of samples where it could be problematic. Furthermore the late part of the sediment section (between 15,000 and 30,000 cal. yr BP) has low organic matter content (less than 2-4%) with scarcity of datable plant macrofossil material.

In this review a different fraction of pollen samples with terrestrial origin was tested and studied as a novel sample type for the radiocarbon dating. Pollen samples were extracted from the lake sediment cores. This type of organic material could be an ideal candidate for radiocarbon based chronological studies as it has terrestrial source and is present in the whole core in contrast with the terrestrial macrofossils.

Although the pollen remains were present in the whole core, in many cases their amount give a challenge even for the AMS technic. Samples were measured with EnvironMICADAS AMS and its gas ion source in the HEKAL laboratory (Debrecen, Hungary).

We examine the reliability the radiocarbon dates given from different pollen fractions and their compatibility to the previously measured radiocarbon dates from macrofossil and other dated materials.

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