



Temporal framework of Lake Van sediments provided by single crystal 40Ar/39Ar dating of tephra layers

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The timing and evolution of Lake Van is closely connected to that of the two major active stratovolcanoes Nemrut and Süphan bordering the lake in the west and north. Here we focus on dating the tephrostratigraphy of the sediments of Lake Van drilled at 2 sites in the ICDP Paleovan project (Site 1: Northern Basin, 142 m; Site 2: Ahlat Ridge, 214 m) to provide a high resolution temporal framework of climate evolution. More than 90 vol.% of the volcanic particles in the cores have probably been supplied by Nemrut volcano; lesser amounts of tephra of subduction-related composition derived from Süphan volcano are interspersed between Nemrut tephra layers. Compositionally fingerprinted and texturally prominent tephra layers in the cores were correlated to some of the ca. 40 fallout tephra layers recognized by us on land during the pre-site survey, many of them also dated. Macroscopically recognizable layers in the cored sediments are mostly in the mm-to cm scale but some are up to 20 m thick as documented basically by intervals of nonrecovery. The tephrostratigraphy and dating of the sediments cored depends fundamentally on the stratigraphic and temporal framework of the land tephrostratigraphy documented during the pre-site survey.

Ages determined by single crystal 40Ar/39Ar dating of anorthoclase phenocrysts from onland tephra show major explosive activity of Nemrut Volcano throughout at least the past 400 000 years. Dating of alkali feldspars in cc samples from the lowermost 60 m of Site 2 cores has yielded preliminary ages ranging up to ca. 570 ka, some of the ages showing high standard deviations.

Here we present new dates determined on both onland tephra and tephra throughout the cores which will be available by April. The new data will help to determine the oldest Nemrut tephra found sofar on land and provide a more detailed temporal framework throughout both the land tephrostratigraphy and that of the cores allowing to interpret the sediments and their various parameters (TOC etc) to the MIS scale. The rounded polymict clasts of the basal epiclastic fresh water sediments drilled at Site 2 petrographically resemble the continental red beds forming the basement of the town of Ahlat. Feldspar crystals from these basal sands yield ages from ca 2 to 16 Ma, slightly extending the age of Miocene volcanics erupted over wide areas in eastern Anatolia north of Lake Van.