

Deforestation and human impact around Lake Aktaş (Ardahan-Turkey) during the last 1000 years

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Abstract: The study area is Aktaş Lake, formerly known as Hozapın, is located between 41°14' 8.98" - 41°11' 11.59" north latitudes and 43°10' 0.14" - 43°15' 21.20" east latitudes within the boundaries of the Çıldır county of Ardahan province in the Erzurum-Kars section of the Eastern Anatolia Region. The studied lake has a surface area of 24 km square and a shallow water depth varying between 1.5 and 2 meters except for local deeper parts around the islands rising at the central part. Continental climatic conditions of the northeast Anatolian highland of Turkey prevail in the lake areas. Lake Basin is located in Iran-Turan phytogeographic region and anthropogenic steppe has a broad distribution. Using a Kajak Sediment Core Sampler with 6 cm-diameter sampling tubes, a 61 cm-long short core was recovered for fossil pollen analysis and AMS radiocarbon dating at 4 m water depth in the central part of the lake. After completing all the sampling process for all drilling cores they are brought to Istanbul University Faculty of Forestry Department of Forest Botany Palynology Laboratory for fossil pollen analyses and fossil pollen sampling was prepared on every each 1 cm of drilling core according to the classical method. Also, *Lycopodium* spore tablets were added to the each sediment. The identification and counting of pollen and *Lycopodium* spores are performed via Leica DM750 computer assisted light microscope with x40, x100 immersion objective and 10x ocular. Moreover, in each preparation at least 50 *Lycopodium* spore and 250 pollen grains are identified. Pollen concentration as 1 cm³ is counted for each taxon and the pollen diagrams are drawn with the TILIA program. This study aims to determine the deforestation and human impact on the vegetation around Lake Aktaş from 930-795 cal yr BP to modern times by pollen analysis. The variation of pollen spectra composition reflects vegetation change of *Pinus sylvestris*, *Picea orientalis*, *Abies* sp., *Betula* sp., *Fagus* sp., and *Quercus* sp. existed dominantly in this region 930 years ago. According to fossil pollen influx, arboreal plant species had broad distribution around Lake Aktaş about 930 years ago, which conflicts with herbaceous species dominating around the lake at present. Anthropogenic impacts along with climatic changes towards more continental conditions could have profound effects upon shift in the deforestation in this area.

Keywords: Deforestation, Human impact, Ardahan, Lake Aktaş, *Lycopodium*

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