

Ostracoda, and other fauna and flora assemblages of the Lake Çubuk (Göynük/Bolu, NW Anatolia): palaeolimnologic and palaeoclimatologic analysis of the 1400 years-old record

Cemal TUNOGLU, Faruk OCAKOGLU, Sanem ACIKALIN, I. Ömer YILMAZ, Emel Oybak DÖNMEZ, Aydin AKBULUT, Celal ERAYIK, Osman KIR & Alaettin TUNCER

Lake Çubuk is located about 15 km north of Göynük town of Bolu province (NW of Turkey) and 30 km south of the North Anatolian Fault Zone. The elevation of Lake Çubuk is 1025 meters above sea level. It has 0.16 km² surface and 7 km² drainage areas. The average lake water depth is 6 meters.

Sixteen bottom grab samples from littoral parts of the lake and samples from a core have been investigated, focusing on ostracods. The aim of this study is to determine the palaeoclimatic and palaeolimnologic changes in the lake during the past 1400 years. A total of 300 cm core material was obtained from the deepest point of the lake (ÇK-1 drilling). Samples were taken from the core every 4 cm, yielding a total of 76 samples. The highest ostracod density and diversity in the core was found in the interval between 244 and 256 cm.

According to radio carbon analysis, the corrected age of 500 AD is obtained at the 143 cm level, while the year 1400 AD is located between 280–282 cm. Ostracod species are *Candona neglecta*, *Candona* sp. 1, *Limnocythere* sp. 1, *Ilyocypris bradyi*, *I. getica*, *Physocypris kraepelini* and *Potamocypris arcuata*. Both, the highest species diversity, and the highest number of individuals were recognized in the 248 cm level. Through the investigated period of the lake history, a second diverse and abundant ostracod association was found between 750–900 AD, where the precipitation rate was assumed to be high. *Limnocythere*, *Ilyocypris*, *Potamocypris* and *Physocypris* species have been observed in this level. This level yields also abundant Characean oospores and Gyrogonite fragments. Microgastropod shells and fish teeth have been found in some different levels of this core.

The climatic records of Lake Çubuk display similarities with the climate of Central Anatolia and the Northern Hemisphere. Warm and rainy periods were recognized in the stable isotope record of the lake between AD 900–1100, hot and dry periods (the Medieval Warm Period Maximum) between AD 800–900 and cold and dry periods around AD 1600 (Little Ice Age Maximum).

Authors addresses:

Cemal Tunoglu & Alaettin Tuncer

Hacettepe University, Geological Engineering Dept. Beytepe, Ankara, Turkey

tunay@hacettepe.edu.tr

Faruk Ocakoglu, Sanem Acikalın, Celal Erayik & Osman Kir

Eskişehir Osmangazi University, Geological Engineering Dept., Eskişehir, Turkey

I. Ömer Yılmaz

Middle East Technical University, Geological Engineering Dept., Ankara, Turkey

Emel Oybak Dönmez

Hacettepe University, Biology Dept., Beytepe, Ankara, Turkey

Aydin Akbulut

Gazi University, Biology Dept., Ankara, Turkey