

PALEOLIMNOLOGICAL EVIDENCES FOR THE RISE AND FALL OF A STAR-LIKE PLANKTONIC DIATOM (*ASTERIONELLA FORMOSA*) DURING THE ANTHROPOCENE

Paleolimnológiai adatok egy csillagszerű, planktonikus kovaalga, az *Asterionella formosa* „tündökléséről és bukásáról” az Antropocénban

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Asterionella formosa is known as a common and often dominant planktonic diatom in mesotrophic and eutrophic lakes worldwide. The bone-shaped *Asterionella* cells often form colonies consisting usually of eight cells, but the number of cells can reach up to 20 cells. The colonies are star shaped, and this shape slowing down settling velocity can makes them dominant in low viscosity warm water. Recently the abundance of this species increases in oligotrophic lakes as well. It is a rather well established fact, that the proliferation of *A. formosa* correlates with nutrient enrichment, especially when atmospheric nitrogen deposition intensifies in the lakes. However, there are increasing numbers of paleolimnological evidence, that other factor may be responsible for the spreading of this diatom.

High-resolution, multi-proxy study was carried out on a sedimentary record obtained from Lake Ighiel (46°10'50"N, 23°22'00"E). Lake Ighiel is located in Alba County, Romania, in the south-eastern part of the Trascaului Mountains in the Romanian Carpathians. This small lake is located in a mid-altitude mountain belt at 924 m above sea level, with a maximum depth of 9 m and a catchment area of 487 hectare. The here presented results are focussing on the increase and decrease of *A. formosa* abundance. Lake Ighiel was formed ca. 6000 years ago, however the siliceous algae were able to preserve in the sediment from ca. 4800 cal yr BP. After the dominance of small fragilaroids, the Middle Holocene (ca 4800–4200 cal yr BP) is marked clearly by a relative increase in benthic *Navicula* and *Gyrosigma* taxa, indicating habitat diversification. There is an episodic return to small fragilaroids from 2600 to 2500 cal yr BP with some periphitic taxa becoming abundant. In the last 1000 years *A. formosa* increases in relative abundance, reaching dominance in the last 200 years, while before it had been only sporadic in the sedimentary record. We can assume a strong positive correlation between the abundance of *A. formosa* and global warming. Probably development of soil also influences contribution of this species to the diatom assemblage. The period of the II. World War is imprinted as a decline of *A. formosa* in the assemblage. Global warming related changes, like longer open water periods, changing mixing regimes and thermal properties of water might have contributed to the increased abundance of *A. formosa*. In the last couple of years the „star” of *Asterionella* dramatically and abruptly fell, while the small celled Centrales taxa practically replaced it in the lake sediment. To disentangle if nutrient supply and/or climate are main driving force on diatom distribution is an unsolved problem. The authors acknowledge financial support from OTKA 119208, CRYPTIC project.