

# 17<sup>th</sup> Workshop of the International Association of Phytoplankton

Kastoria 14-21 September, 2014



EIDIKOS LOGARIASMOΣ  
KONDILION EREVNAS  
ARISTOTLE UNIVERSITY OF  
THESSALONIKI



 **cost**  
EUROPEAN COOPERATION  
IN SCIENCE AND TECHNOLOGY

**17<sup>th</sup> Workshop of the International Association of  
Phytoplankton Taxonomy and Ecology (IAP)  
Kastoria, Greece, 14-21 September 2014**

**SCHEDULE**

**AND**

**BOOK OF ABSTRACT**

**Phytoplankton functional structure in a cold and oligotrophic lake through space and time**

Maria Cellamare<sup>1,2</sup>, Anne Marie Lançon<sup>2</sup>, Maria Leitão<sup>2</sup>, Leonardo Cerasino<sup>3</sup>, Ulrike Obertegger<sup>3</sup>, Giovanna Flaim<sup>3</sup>

<sup>1</sup> Muséum National d'Histoire Naturelle - UMR CNRS 7245 MCAM Equipe "Cyanobactéries, Cyanotoxines et Environnement", 12 rue Buffon - RDC Bâtiment de Cryptogamie - CP39 75231 Paris Cedex 05, France. E-mail: maria\_cellamare@yahoo.com

<sup>2</sup> Bi-Eau, 15 rue Lainé-Laroche, 49000, Angers, France.

<sup>3</sup> Department of Sustainable Agro-ecosystems and Bioresources, Research and Innovation Centre, Fondazione Edmund Mach (FEM), Via E. Mach 1, 38010 San Michele all'Adige Italy.

Cold and oligotrophic environments require specific organism adaptations for survival and growth. Therefore, phytoplankton in cold, clear and nutrient-poor lakes must have particular functional attributes to cope with the harsh conditions that these environments impart. We focused on different functional classifications of species to explore how phytoplankton communities from a cold and oligotrophic lake vary across space and time. Lake Tovel (LTER site IT09-005-A and NETLAKE site, Eastern Alps, Italy) is a deep oligotrophic lake characterized by cold (2013 annual mean lake temperature  $6.1 \pm 2.3$  °C), clear water (long-term  $K_d$  values indicate 1% light penetration up to a depth of 20 m and 0.1% up to 35 m) and low phosphorus concentration ( $<10 \mu\text{g L}^{-1}$ ). We collected integrated samples during the ice-free period (April-December 2013) in the lake's deep central basin (upper 0-20 m and lower 30-35 m) and in the shallow NE basin (0-4 m) and analysed the spatial and temporal patterns of functional groups and traits in relation to selected environmental variables. Despite the absence of dispersal barriers, the phytoplankton functional structure differed among the three sites. Overall, the community was mainly composed of unicellular, mixotrophic, flagellates, and silica-walled organisms. Several psychrophilic taxa were also present, making this lake a good model for tracking climate change effects in cold ecosystems. This study shows how diverse communities can develop in close proximity and is an example of "everything is everywhere, but the environment selects".