

# ABSTRACT BOOK



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## THE TROPHIC RELIANCE OF METHANE IN THE BENTHIC FOOD WEB: NATURAL VERSUS ANTHROPOGENIC DRIVERS.

S. Belle<sup>1</sup>, L. Millet<sup>1</sup>, V. Verneaux<sup>1</sup>, D. Etienne, L. Murgia<sup>1</sup>, A. Lami, S. Musazzi, C. Parent<sup>1</sup>, M. Magny<sup>1</sup>

<sup>1</sup>UMR CNRS 6249, Laboratoire de Chrono-Environnement, Université de Franche-Comté

<sup>2</sup>UMR INRA 42, Centre Alpin de Recherche sur les Réseaux Trophiques des Ecosystèmes

<sup>3</sup>CNR, Istituto per lo Studio degli Ecosistemi,

It is now widely recognized that biogenic methane can contribute up to 80% of the chironomid biomass in case of hypoxic tropholytic zone. However, several studies have revealed that hypoxic deep conditions can appear more or less abruptly through time, suggesting that the biogenic methane contribution is not the 'reference' functioning in most lakes. This study aims at identifying the causes of the trophic reliance of methane ('TRM') activation, and to understand the environmental conditions that enable the activation of the TRM. Three different lakes (productivity, altitude, water depth, etc.) were investigated using paleolimnological approach. The methodological strategy is built in three steps: (i) the reconstruction of the temporal evolution of methanotroph availability (ancient DNA of methanotroph) and the chironomid paleo-diet (carbon stable isotopes), (ii) the comparison of these dynamics with the histories of climate variability and anthropogenic pressures (pollen analysis) (iii) and the assessment of the environmental conditions (trophic state, oxygen conditions and organic matter accumulation) that allowed this activation. Results reveal very contrasting evolutions suggesting (i) that this pathway is highly driven by human and climate pressures and (ii) that lakes seem to have a various 'sensitivity' facing the activation and the modulation of the TRM.