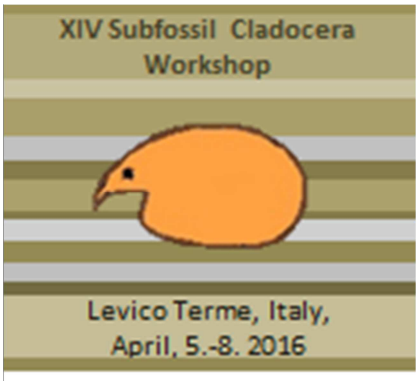
XIV SUBFOSSIL CLADOCERA WORKSHOP



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ABSTRACT BOOK

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A.I.O.L.

Effects of long term nutrient and climate variability of subfossil Cladocera in Lake Garda (northern Italy).

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Although Cladocera remains are considered to be a reliable proxy for tracking historical lake development they have scarcely been studied, in large and deep lakes. In order to reconstruct Cladocera species distribution and abundances in the two basins of the largest and deep italian lake (Lake Garda) during the last few centuries, a first sediment core was collected from the largest sub-basin (Brenzone, 350 m deep), while other two cores were retrieved from the profundal and the littoral zones of the smaller sub-basin (Bardolino, 80 and 40 m deep, respectively). The long-term differences in Cladocera assemblage were analyzed and related to historical limnological and climatic variability, and were compared with chnges in other biological proxies, such as diatoms, pigments and *Pediastrum* remains, in order to discriminate the lake's response to nutrient enrichment and climate change.
Although the three cores studied showed some minor differences related to the different morphological and hydrological features of the two basins , they outlined highly coherent temporal changes in the Cladocera assemblages. The profundal layers of the three cores were characterized by species sensitive to water temperature, suggesting a response of the lake at the major climatic events, such as the Medieval Climatic Anomaly and the Little Ice Age. On the other hand a common and evident change in Cladocera assemblage occurred during the 1960s, when planktonic taxa, such as *Daphnia* spp. and *Bosmina* spp., dominated at the expense of littoral taxa. A non-metric multidimensional scaling (NMDS) revealed a clear response of Cladocera to climate variability before the 1960s, i.e. during periods of low lake nutrient levels, which is in contrast with. the scarce response of diatoms to climate variability during the same period. On the other hand, Cladocera and diatoms exhibited concomitant changes in assemblage composition after the 1960s, which have been related to increased nutrient concentrations . During this period of lake's nutrient enrichment, the response of Cladocera to climate variations seemed to be overridden by changing nutrient levels. This study highlights the value of a multi-proxy approach for disentangling the biological responses to multiple environmental stressors in large and deep lakes.