

EPIPHYTIC DIATOM COMMUNITY RESPONSE TO OCEAN ACIDIFICATION

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Increasing pCO₂ in the atmosphere due to human activity is causing the acidification of the oceans during this century. Perspectives based on mathematical models announced a surface pH lowering of about 0.4 units. For this reason it's fundamental to improve our understanding on marine organism's response to such global change as well as on the long-term effects on marine ecosystems, now still unpredictable. The "Castello" vent site (Ischia Island, Italy) can be considered a natural laboratory to simulate future scenarios of ocean acidification.

In coastal benthic communities, more sensitive to anthropic pressure, *Posidonia oceanica* (L.) Delile assemblages play a great structural and functional role. Diatom community gives a great contribution to the epiphytic biodiversity on *P. oceanica* leaves and changes in their abundance may cause important modifications to the entire food web. Recent researches evidenced different effects of acidification on vegetated communities, suggesting that increasing pCO₂ do not favours all the photosynthetic organisms. Furthermore, acidification combined with other factors such as eutrophication and temperature rising, may cause a significant decrease in abundance and algal diversity. Up to now no studies have been carried out on diatom community response to ocean acidification, inducing an important gap in the knowledge on coastal ecosystem response to this environmental emergency.

We present preliminary results of a two-year study on abundance and diversity changes of diatom community on *P. oceanica* leaves along seasonal and pH gradients at Castello vent site. Adult and intermediate leaves of *P. oceanica* have been bimonthly collected starting from August 2011 and three portions of each leaf blade (i.e. apex, mid and base) have been considered to assess epiphytic diatom community. More than 22 diatom genera have been identified using Scanning Electron Microscopy (SEM) and *Cocconeis* was the dominant genus. Cell density followed the leaves age gradient with higher abundance on the apical portion of the blade especially on the intermediate leaves. Qualitative and quantitative changes in diatom composition have been detected in samples collected along the pH gradient. The encrusting *Cocconeis* genus remained the dominant one but with a lower specie number and a marked reduction of cell density at lower pH environments. Erected (*Lichmophora*, *Gomphonemopsis*) and adnate genera (i.e. *Amphora*, *Mastogloia*) strongly decreased their abundances in correlation to disappearance of calcareous macroalgal turfs. Conversely motile forms seemed to slightly increase their occurrence in the acidified diatom community, especially in terms of species diversity.