

Forever young... Colonization pattern of epibionts on *Posidonia oceanica* artificial leaves in relation to ocean acidification

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Ocean acidification (OA) is today considered one of the most pervasive stressors for marine biota at the level of species, communities and ecosystems. Naturally acidified systems, such as the CO₂ vents, represent suitable laboratories to study the effects of OA on benthic organisms. An analysis of the colonization pattern of epibionts settled on artificial leaves (mimics) of *Posidonia oceanica* in relation to ocean acidification at the shallow CO₂ vents off the island of Ischia, is here presented. Mimics of *Posidonia oceanica* artificial leaves (dark green flexible PVC stripes 1 cm wide x 36 cm long) were placed from September 2009 to September 2010 along a gradient of OA of the Ischia vent's system at six stations (3 on the south and 3 on the north side of the study area), located at extreme low pH (mean pH 7.5), low pH (7.8), and control, normal pH conditions (8.12). Six artificial leaves per station were collected every three months and analysed for taxa identification and estimates of coverage (algae and sessile clonal invertebrates) and number of individuals (not clonal taxa).

Patterns of colonization in control stations showed a progressive increase in time in coverage values of many organisms, mainly calcifying forms as coralline algae, which represent the dominant taxon, spirorbids and bryozoans. Colonization of artificial leaves located in low pH stations followed a similar temporal pattern as control conditions, but with lower coverage and higher patchiness of calcareous forms at 12 months of colonization. Epibionts in extreme low pH conditions were dominated by filamentous green/brown algae, with the occurrence of a few coralline algae, spirorbids and bryozoans, especially in the early months of colonization (3 and 6 months). Colonization at 9 and 12 months showed the disappearance of even these rare calcareous organisms and occurrence only of filamentous turf and fleshy algae, with a very simplified epibiont assemblage, remaining at an early, young colonization stage. These results indicate a strong selection of calcareous forms and the lack of successional stages in extreme low pH conditions, while the few calcifiers settled at short exposure time (3-6 months) do not seem to survive at longer exposure to critical values of OA.