Oral presentation

LAMINARIA OCHROLEUCA PARADOXICAL FAILURE TO CONSOLIDATE KELP FOREST INSIDE A MARINE NATIONAL PARK

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Kelp forests, one of the world's most productive ecosystems, have been in decline in many regions in recent years. Climate change, through gradual sea warming or marine heatwaves, is one of the main culprits of the deforestation. Nevertheless, kelp forest decline may also depend on another non-climatic stressor such as grazing. In NW Spain, the conservation status of these habitats is poorly known but a range of stakeholders has reported the decline of *Laminaria ochroleuca* inside the Islas Atlánticas Marine National Park (Cíes archipelago) in the last years. However, the extent of this decline has not yet been investigated. Using a combination of quadrat-scale (biomass, abundance) and transect-scale (cover) surveys over one year, we found striking differences between the populations of *L. ochroleuca* located inside and outside the Marine National Park (MNP). As expected for a perennial seaweed, outside populations were typical kelp forests, stable year round, and mostly composed of adults. In comparison, *L. ochroleuca* seemed unable to attain the mature kelp forest stage inside the MNP. Mid-sized young plants were detected only in autumn but many had disappeared by winter, and the ones that remained were just a stipe with no blade and no growth meristem. As a result, spring and, in particular, summer populations were entirely composed of new recruits. Therefore, grazing seems to be inhibiting the recovery of mature kelp forests within the MNP; the causes that may have led to this new regime are discussed.
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Keywords: Kelp, herbivory, NW Spain

Oral presentation

TOWARDS THE RESTORATION OF CANOPY-FORMING BROWN ALGAE IN THE MEDITERRANEAN SEA: BIG CHALLENGES AND SOME WINS

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In the Mediterranean Sea, marine forests constituted by brown algae of the genus *Cystoseira sensu lato* (s.l.) play a valuable role as foundation species. Due to the evidences of regression/loss of these habitats caused by different factors, active restoration techniques are encouraged by European legislation. In the framework of the EU project ROCPOP-Life, the *ex situ* outplanting restoration technique was applied in the Mediterranean to repopulate two different *Cystoseira s. l.* species: *Cystoseira amentacea* var. stricta and *Treptacantha barbata*. This technique consists in three main steps: i) collection of fertile apices, ii) culturing juveniles under laboratory conditions and, iii) outplanting, i.e., the deployment of the cultured juveniles in the field. Since the two target species thrive in different habitat, midlittoral for *C. amentacea* and subtidal for *T. barbata*, these species are differently subjected to environmental factors. Therefore, the implementation of the *ex situ* restoration action was designed according to the requirements of each species, particularly for the outplanting step. In the case of the midlittoral species the direct attachment of the substrates was used to deploy the juveniles in the field, where heat, desiccation and wave exposure are the main factors to face. For the subtidal species, a complex multiple attachment device and strategy was used against grazing, the most challenging disturb. However, unpredictable challenges as thermal anomaly and huge storms were also tackled during the performance of these restoration actions. Nevertheless, both actions obtained relevant results encouraging further studies of this novel approach to guarantee and preserve marine biodiversity.
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Keywords: Restoration, *ex situ* outplanting, *Cystoseira sensu lato*

Oral presentation

USING GENOMICS TO DESIGN AND EVALUATE RESTORATION AND FUTURE-PROOFING OF UNDERWATER FORESTS

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Restoration is an emerging intervention to reverse the degradation and loss of marine forests and the ecosystem services they underpin. Genetic characteristics of restored populations have the potential to greatly influence both short and long-term success, however this is rarely empirically examined within restoration projects. We used genomics to design a restoration program for lost forests of *Phyllospora comosa*, a dominant macroalga that went locally extinct from reefs off Sydney, Australia. Population genetic diversity and structure