EFFECTS OF THE LOSS OF *PARAMURICEA CLAVATA* (RISSO, 1826) FORESTS ON CORALLIGENOUS ASSEMBLAGES

A. Scinto [1], M. Bertolino [2], C. Huete-stauffer [1], M. Previati [1]*, T. Romagnoli [2], L. Valisano [2] and C. Cerrano [1]
[1] DIPTERIS, Genoa University, Genoa, Italy - m.previati@email.it
[2] DISMAR, Polytechnic University of Marche, Ancona, Italy

Abstract
Arborescent benthic species, both algal and animal, define the architecture and functional ecology of certain "forest" structures. Such ecosystem engineers (foundation) species are declining throughout the world due to anthropic activities and/or global warming, leading to introductions and outbreaks of pests and pathogens. The case study of *Paramuricea clavata* here reported shows how the loss of the biggest foundation species of coralligenous assemblages may compromise the accretion processes of coralligenous reducing the presence of some calcifying species such as coralline algae and bryozoans.
Keywords: Biodiversity, Global Change, Mortality

Introduction
During recent years climate warming and thermal anomalies are negatively affecting the survivor of marine benthic species, resulting in diseases and pathogens spreading, whose effects, always sudden and dramatic, lead to reductions in biomass of several filter feeders, sponges and gorgonians ([1], [2]). Considering gorgonians as engineering species able to shape the architecture and increase the complexity or influence the biogeochemistry of habitats, it is evident that a decrease in the population negatively affects habitat heterogeneity and biodiversity [3]. Here we investigate the effects of the loss of *P. clavata* colonies on coralligenous accretions focusing mainly on coralline algae and bryozoans.

Method
Six plastic panels 15x10 cm^2 size were positioned inside and outside a gorgonian forest on the Portofino Promontory cliff (Ligurian Sea, Italy) to evidence possible effects of sea fans on the dynamics of colonization of a substratum. After the collection of the panels, four months after positioning (from May to September 2009), they were dry preserved and analysed at the stereomicroscope by a grid with a mesh of $1cm^2$. Data were arc-sin transformed and analysed with Cochran's Test, ANOVA and SNK Test.

Results
Regarding coralline algae, four different morphotypes of newly settled Corallina *species* and three of *Peyssonelia* have been separated (Fig.1). Algae showed different frequencies in panels inside and outside gorgonians populations (20.3±2.8 and 18.2±2.4 inside and outside respectively) (ANOVA, P=0.0041) and the unique morphotype that presented differences in frequencies between inside and outside is the one we call *Corallina* sp. 2 (SNK, P<0.01), more abundant inside (15.1±5.3 and 1.6±0.9 respectivaly) , while the other species showed similar frequencies. Regarding Bryozoa, inside gorgonian forest seven species of Bryozoa have been found, three of them exclusively inside (Fig.2). The Shannon diversity index underlines a major diversity in species inside the gorgonian forests (2.9±0.1 and 2.7± 0.04 inside and outside respectively) (One-way ANOVA, P=0.02).

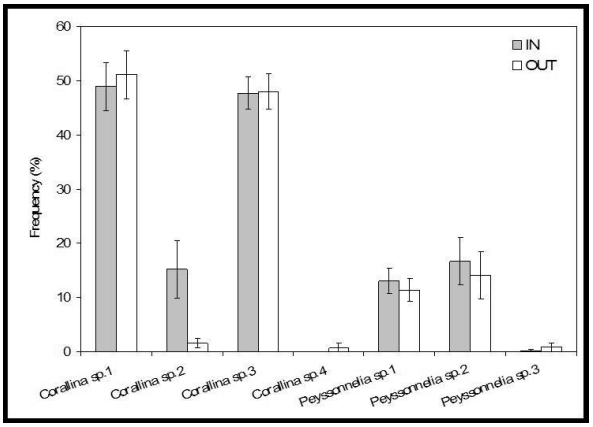

Fig. 1. Different *Corallina* and *Peyssonelia* unidentified species inside and outside the gorgonian forest

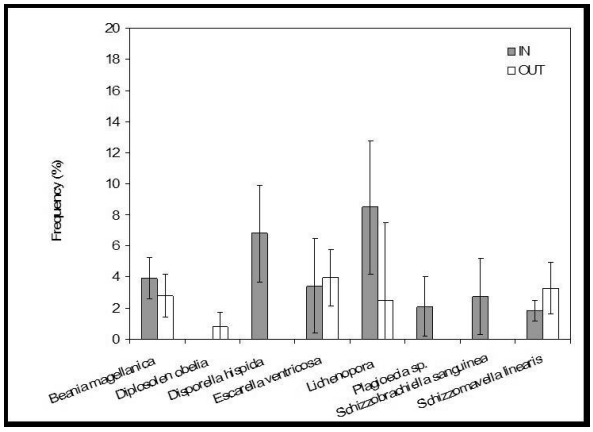

Fig. 2. Different species of bryozoans observed inside and outside of the Gorgonian forest

Discussion
The loss of foundation species changes the local abiotic and biotic environment on which a variety of other species depend [3]. One of the most dramatic example in the Mediterranean Sea is the rapid loss of sponge gardens and gorgonian forests [1]. The decrease of *P. clavata* colonies from coralligenous accretions will lead to a shift from a dim-light environment (optimal for some Corallinales) to a light exposed one. The negative effect we noticed towards some bryozoans may be also due to the reduction of a sort of physical protection played by sea-fans on rigid colonies. The studied area host high touristic fluxes of scuba divers, whose activities can have an impact on some sessile species.
These dynamics are rapidly changing shallow (0-40 m) coastal habitats seascapes, with unpredictable effects on marine trophic webs.

References
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