MACROFOULING OF MARINE FISH-CAGE NETS

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Abstract

Biofouling of meshes can create a severe problem to mariculture, since netting material is an ideal substrate for many organisms. Some net-panels were immersed at different time on a fish-cage in the Ligurian Sea for one year. Monthly settlement, development of fouling community and its biomass were described.

Key-words: fouling, mariculture, fish cages, meshes, Ligurian Sea

Introduction

The rapid growth of biofouling on floating net cages is a considerable problem for mariculture plants, since non-toxic netting material is an ideal substrate for many organisms (1). The main critical effects are a reduced water flow through the meshes (2, 3) and an increased load on fish cages. The aim of the paper is to describe settlement and development of mesh fouling in a marine farm in the Ligurian Sea.

Material and methods

The research has been carried out on the off-shore mariculture farm of Lavagna (Ligurian Sea). A nylon net (mesh=10 mm side, the same used for the fish cages) was assembled on 20x24 cm pvc frames to form "panels". Panels were suspended vertically on the floating cages at 6 and 12 m depth and removed monthly, every 3 months and after 6, 9, 12 months during a year since August 2001. Composition and abundance (as Covering Index and number) of fouling organisms were determined. Wet weight of fouling was measured (g/dm^2 net). Estimates of the percentage of mesh occlusion have also been done (4). Altogether 47 panels were examined.

Results and Discussion

Fouling settled down on nets consists of 76 species belonging to 15 taxa of algae and invertebrates (table 1). Polychaetes, algae, hydroids and molluscs shows the highest number of species. The amphipods *Caprella equilibra, Jassa marmorata* e *Stenothoe* sp. have the maximun percentage index of presence during a year study (100%). Some species such as hydroid *Tubularia crocea* and amphipods *C. equilibra* and *Stenothoe* sp. settled down on panels every month; bivalv *Mytilus galloprovincialis* since April and algae since June. The estimates of mesh occlusion by dominant fouling organisms (panels after 1,3,6,9 and 12 months immersion) are given in figure 1. Hydroids and bivalves are the most critical in fact, because of their quantity, dimension and growth rate, they occlude meshes most of all. Meshes are heavily fouled already after 6 months of immersion (about 90 g/dm^2 of net) mainly with mussels, hydroids and ascidians (Fig. 2).

Table 1. Number of taxa and most frequent species found on panels.

TAXA	Number of Species	Percentage Index of Presence	
Algae	13	Ceramium flaccidum	F=47%
		filamentose verdi n.c.	F=60%
Porifera	1	Calcarea n.c.	F=7%
Hydrozoa	10	Tubularia crocea	F=67%
		Campanularidae n.c.	F=57%
Anthozoa	1	Corynactis viridis	F=7%
Platyhelminthes	1	n.c.	F=30%
Polychaeta	22	Syllis zonata	F=33%
		Platynereis dumerilii	F=23%
Pantopoda	4	Tanystylum sp.	F=60%
Tanaidacea	1	n.c.	F=63%
Amphipoda	8	Caprella equilibra	F=100%
		Jassa marmorata	F=100%
		Stenothoe sp.	F=100%
		Caprella penantis	F=50%
		Elasmopus sp.	F=50%
Decapoda	1	n.c.	F=23%
Nudibranchia	1	n.c.	F=33%
Bivalvia	7	Mytilus galloprovincialis	F=60%
		Musculus costulatus	F=53%
		Hiatella arctica	F=27%
Bryozoa	4	Scruparia ambigua	F=23%
Echinoidea	1	n.c.	F=3%
Ascidiacea	1	Diplosoma listerianum	F=43%
Total	76		

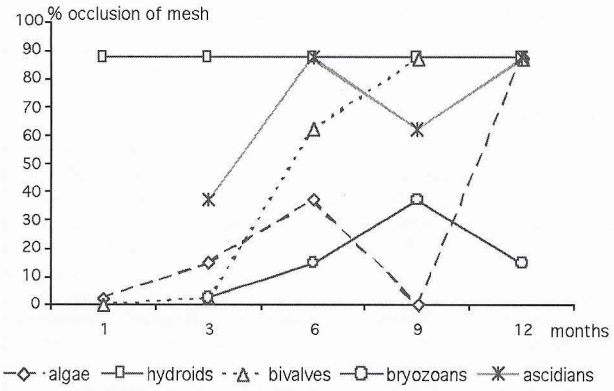

Fig. 1. Percentage of mesh occlusion for the main taxa.

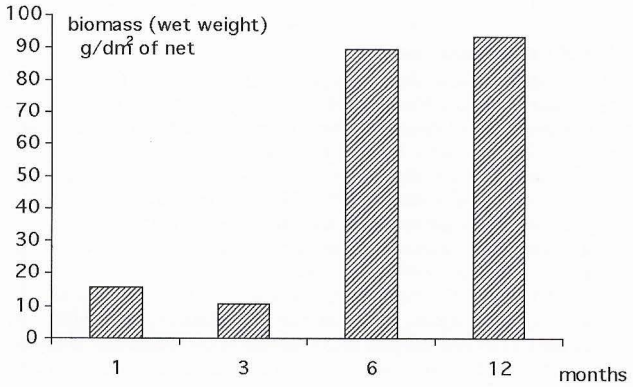

Fig. 2. Fouling biomass on panels after 1, 3, 6 and 12 months immersion.

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