Italian Journal of Animal Science

ISSN: (Print) 1828-051X (Online) Journal homepage: https://www.tandfonline.com/loi/tjas20

# Animal fouling as an indicator of water quality in Mediterranean fish farmed areas

M. Lo Martire & G. Sarà

**To cite this article:** M. Lo Martire & G. Sarà (2007) Animal fouling as an indicator of water quality in Mediterranean fish farmed areas, Italian Journal of Animal Science, 6:sup1, 803-803, DOI: 10.4081/ijas.2007.1s.803

**To link to this article:** https://doi.org/10.4081/ijas.2007.1s.803

# Animal fouling as an indicator of water quality in Mediterranean fish farmed areas

M. Lo Martire, G. Sarà

Dipartimento di Biologia Animale. Università di Palermo, Italy

*Corresponding author*: Marco Lo Martire. Dipartimento di Biologia Animale, Via Archirafi 18, 90123 Palermo, Italy - Tel. +39 091 6230141 - Fax: +39 091 6230144 - Email: marcolomartire@yahoo.it

**ABSTRACT**

In the Mediterranean, most of the fish farm plants are located in very deep water columns (>20-30 m) and are characterised by energetic hydrodynamic regime levels. Thus, the effects of farming loading should not be investigated exclusively in the underlying sediments, because the uneaten feed particles, once produced, are transported laterally rather than vertically within the water column. Under such conditions, benthic organisms attached on artificial hard substrata (i.e. fouling) in the surrounding of fish farms are recently proposed as a reliable tool in detecting environmental modifications in the water column. In the present paper, we report on the ecological response of fouling organisms to organic loading from a fish farm located in the Gulf of Castellammare (Sicily) by comparing artificial hard substrata in sites upstream (control, CTRL) and downstream (impact, IMP) from the fish cages. The experiment was carried out in Autumn 2004, when samples of fouling organisms (quadrats of 20×20cm) were scraped by means of a putty knife from plastic buoys spaced throughout the study area. In the lab, samples were frozen (-20°C) or stored in alcohol or formalin as a function of taxa. All specimens from each quadrat were sorted, classified according to species or genera (number of taxa, S), and counted (abundance, n). To test whether fouling ecological features were different among CTRL and IMP, a Permutational Analysis of Variance (PERMANOVA) was carried out on a Bray-Curtis dissimilarity matrix and P-values were calculated using 9999 permutations. In the analysis, treatment (CTRL *vs* IMP, 2 levels) was the fixed factor and quadrats in each treatment represented replicates (n=9). The fouling community was composed of 6 functional groups, and their abundance and frequency were significantly different among controls and impacts (PERMANOVA, $p<0.05$). Suspension feeders, represented by bivalves (55.0-60.0 ± 30.0%) and barnacles (40.0-45.0 ± 27.0%), were the most abundant taxa within the fouling community, while grazers (e.g. limpets) and predators (e.g. crabs) accounted for not more than 1% of the total abundance within the community. Bivalves were significantly more abundant at impacted sites, while barnacles dominated at controls. The water column depth in the study area was higher than 40m and for this reason sediments were less affected by organic waste coming from facilities. Thus, the results of the present paper showed that, in deep waters, fouling organisms could efficiently record trophic modifications of the water column induced by organic waste. They also represent one of the most reliable tools for detecting environmental alterations in the surrounding of fish farms.