Msc Thesis

Assessing edge-effects in *Posidonia oceanica* seagrass meadows: A multidisciplinary approach

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POSIDONIA OCEANICA MEADOWS

Endemic *Posidonia oceanica* (Magnoliophyta, kingdom Archaeplastida) dominant seagrass in the Mediterranean.

Most prominent aspect, its ecological role:

- Autogenic ecosystem engineer species
- Nursery areas
- Source of food for many organisms
- Stabilization of seabed → sediment trapping
WHAT ABOUT EDGES?

Structural boundaries play an important ecological role:

- "edge" is the boundary or interface between two biological communities or different landscape elements.
- "effect" refer to the changes in population or community structure that occurs at these boundaries.

![Diagram of woodland and open corridor with edge effects](image)
From LAND... SAND CORRIDOR...to SEA
INTRODUCTION

Specific Objectives

1. Determine whether there are differences/patterns between the EDGE and the CONTINUOUS meadow in measurements carried out.
2. Investigate if anthropogenic pressures (anchoring) could cause disturbances in the measured parameters.

HYPOTHESIS

Do the edges in *P. oceanica* differ ecologically from continuous meadow?
STUDY AREA

ANCHORING OVER THE MEADOW

Site 1 (STARESO)

Site 2 (L’ALGA)

POINTE DE LA RÉVELLATA
HABITAT
FRAGMENTATION!
Michell (2011)
FIELD-WORK

MATERIALS & METHODS
RESULTS: VAGIL-FAUNA COMMUNITY COMPOSITION

OUT OF 2653 ORGANISMS

55 % AMPHIPODS 1546

APHERUSA 35%

CAPRELLIDAE 15%

OTHERS 50%...
30% MYSIDS
830

<8% DECAPODS
192

MYSIDACEANS

DECAPDODS
<4 % OTHERS
85

ECHINODERMS

PYCNOGIDS

GASTROPODS

POLYCHAETA

FISH LARVAE
How is community distributed?

Community Site 1

Community Site 2

No significant differences
SEAGRASS STRUCTURE

Results

Shoot Density  **Site 1**  

Shoot Density  **Site 2**

**SIGNIFICANT DIFFERENCES**
EPIPHYTES ABUNDANCE

Epiphyte/leaf RATIO

Site 1

Site 2

RESULTS

EPIPHYTES ABUNDANCE

Epiphyte/leaf RATIO

Site 1

Site 2

SIGNIFICANT DIFFERENCES
Changes in seagrass structure and epiphyte biomass. However, no changes in vagile-invertebrates community structure.
ECOLOGICAL RESPONSE TO HABITAT EDGES

Epiphytes biomass  Vagile-fauna  Shoot density

Ries et al. (2004)
CONCLUSIONS

✓ Edges differ from continuous meadow

✓ Epiphytes increase?
  ✓ Exposed areas, light penetration due to low shoot density

✓ Deeper vagile-fauna taxonomic studies needed.

✓ No differences between sites were detected.
  ✓ The ecological distinctions of natural and anthropogenic fragmented meadow is far from being well understood.
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ALL MEASURED PARAMETERS

Multidisciplinary Approach

Canopy communities
- Vagile-fauna
  - Abundance
  - Diversity

Epiphytes abundance

Plant physiology
- Photosynthetic rate

Seagrass Structure
- Shoot density
- Shoot type
  - Proportion %
- Leaf surface area