



# THE DISTRIBUTION OF THE INVASIVE *CAULERPA CYLINDRACEA* IN LIPSI ISLAND, GREECE

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## Introduction

In the early 90's *Caulerpa cylindracea* (Sonder, 1845), lessepsian migrant, was identified as being one of the most **invasive species** of the *Caulerpa* genus in the Mediterranean Sea (Piazzi et al. 2005).

Native to south-western Australia and poorly described in both **ecology and morphology**, the effect of this species was not fully recognized. Previous studies demonstrated not only the competition between this species and the seagrass *Posidonia oceanica* (Delile, 1813), but also its tolerance to low light, which increases its ability to out-compete native species (Dumay et al. 2002). The aim of this study was to evaluate the spread of *C. cylindracea* in Lipsi island (Greece) and understand the **factors** influencing its spread. This will help to further evaluate the influence of this species on the biodiversity of **native algae and seagrass communities**.

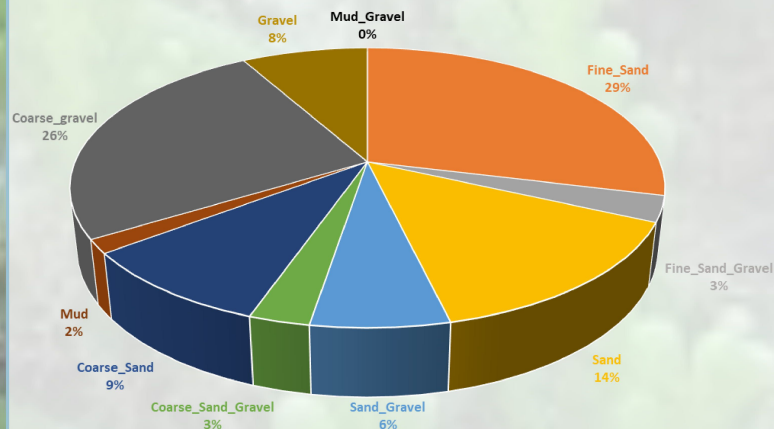


Figure 1— Close up of a colony of *Caulerpa cylindracea*

## Results

Even though the distribution of *C. cylindracea* was **significantly affected** by the **substrate type** (ANOVA,  $p < 0.05$ ) and the **exposure of the coastline** (ANOVA,  $p < 0.05$ ), no significant pairwise comparisons were found. Results showed no significant effect of the depth on the distribution of *C. cylindracea* (ANOVA,  $p > 0.05$ ).

### *Caulerpa cylindracea* distribution vs substrate type



Graphic 1— Distribution of *Caulerpa cylindracea* in relation to substrate type

## Description of the Study Area

This research was conducted in Lipsi island, in the eastern Aegean Sea, Greece. Sampling took place in 4 sites (fig.2), with varying levels of anthropogenic impact, wave exposure and sedimentation rate.

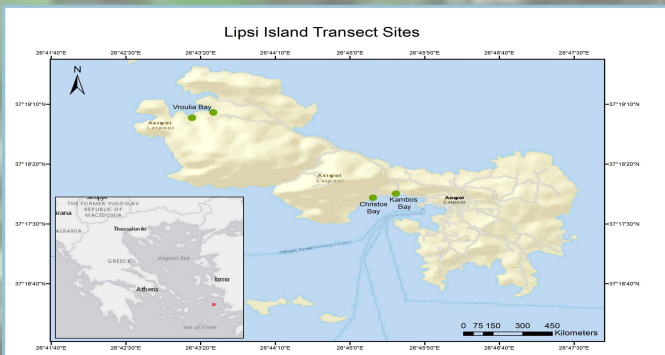
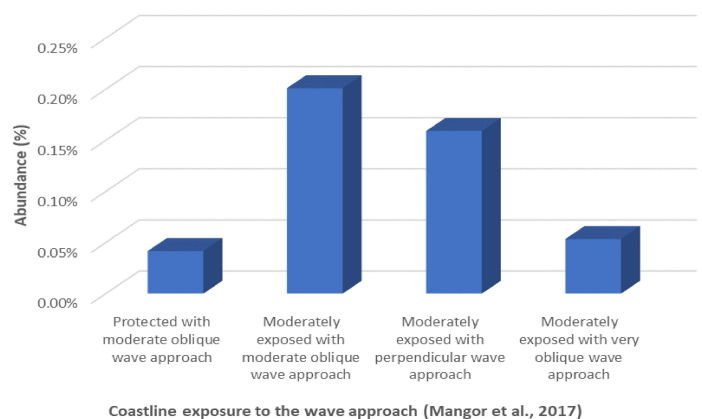


Figure 2— Map of the sites studied in Lipsi island

### *Caulerpa cylindracea* distribution vs coastline exposure



Graphic 2— Distribution of *Caulerpa cylindracea* in relation to the coastline exposure

## Methodology

This study was conducted in 2 sampling periods in the summers of 2016 and 2017, in accordance to the **international seagrass watch protocol** (McKenzie et al. 2007). In each sampling period, 16 linear 50m transects were surveyed and replicated 3 times. In each transect 10 quadrats of 50x50cm were surveyed. In order to lower the sampling error, the transects were placed at pre-determined GPS coordinates. Species biodiversity and abundance were assessed, along with environmental factors including **substrate type, depth and coastline exposure** (the latter based on the index by Mangor et al. 2017).

## Discussion

The coverage of *C. cylindracea* seemed to be affected by the **substrate type** and the **coastline exposure**. However it was not possible to identify one main substrate type or coastline morphology defining its spread, highlighting the **generalist character** of this species. Despite new conceptual models of spreading recently published by Piazzi et al. (2016), further research is necessary to **understand the complex mechanisms** involved in *C. cylindracea* spread.