

ALIEN AND INVASIVE SEaweEDS DISTRIBUTION ALONG THE TURKISH COAST OF THE AEGEAN SEA

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Abstract

The distribution of alien invasive species, *Caulerpa racemosa* var. *cylindracea*, *Styopodium schimperi* and *Halophila stipulacea*, was observed along the Aegean coastline. The distribution areas of these species were also mapped.

Keywords : Aegean Sea, Algae, Migration.

Introduction

Mediterranean and Aegean coastline has a very rich biodiversity however it is threatened and affected from intensive coastal settlement, transportation, tourism, industrial fisheries, aquaculture activities and alien invasive species which enters the Mediterranean from channels (Suez and Gibraltar). At the beginning of this century the number of lessepsien migrated species was at level of tens but nowadays this number comes to hundreds and it is thought to reach to thousands at 2020 [1-2].

Caulerpa racemosa var. *cylindracea* was observed to be distributed intensely among the other alien and invasive species along the southern half of the Aegean Sea. In this study, special emphasis was given to *Caulerpa racemosa* var. *cylindracea* because of the problems this species creates with regard to biodiversity. The distribution of these species at the base stations were mapped with the aid of GPS. The spreading characteristics of these three species were compared.

Materials and Methods

In this study, the alien invasive seaweeds distribution areas were observed, mapped, sampled and water quality parameters were measured. *Caulerpa racemosa* var. *cylindracea* is the species which affects the biodiversity and distributes more than other observed species, so three base stations where this species shows an intense distribution in the northern, central and southern Aegean Sea were determined. Sampling were taken place seasonally to indicate these species life cycles and effects to the ecosystem by scuba diving. The diving equipments, underwater cameras, fishermen observations and trawl materials were used for the investigation. The deep sea observations were made by ROV, so the deepest points of distribution were determined. GPS was used to map the distribution of the species at the sampling sites.

Results and Discussion

It is observed that, alien invasive species have negative effect on biodiversity and ecosystem[1-3]. Besides that, the new distribution areas of *Caulerpa racemosa* var. *cylindracea*, *Styopodium schimperi* and *Halophila stipulacea* are determined as an addition to previous studies[4-6].

As a result, among alien invasive species *Caulerpa racemosa* var. *cylindracea* observed intensely along Aegean Sea coasts especially at the southern half of the coastline. While because of its tropical origin *Styopodium schimperi*'s northernmost distribution range was Çeşme coasts, subtropical *Halophila stipulacea* showed more northernly range until Dikili coasts. When the spreading characteristics of these three species were compared, *Caulerpa racemosa* var. *cylindracea* was determined to be the fastest spreading weed, *Styopodium schimperi* was markedly faster, and *Halophila stipulacea* was reasonably faster. While first two species affects the biota and biodiversity of the site that they occur greatly, *Halophila stipulacea* was found to be spreading without affecting the surrounding biota. When the spreading kinetics were taken into account, *Caulerpa racemosa* var. *cylindracea* has the capacity to influence the whole Turkish Mediterranean coasts. Furthermore, with such kind of distribution and spreading mechanism, the eradication of the species has not been foreseen. Under the light of the present information, the distribution of this algae should be monitored with a big scale programme.



Fig. 1. *Caulerpa racemosa* var. *cylindracea*.

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