ANCHOR DAMAGE ON *POSIDONIA OCEANICA* (L.) DELILE BEDS IN THE GOKOVA BAY

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Abstract

Posidonia oceanica (L.) Delile is the most widespread seagrass in the Mediterranean Sea. It plays an important role in ecosystems of shallow coastal waters in several ways. Experimental evaluations about the impact of anchors of sea vessels have previously shown that each anchoring can on average damage up to six shoots of *Posidonia oceanica*, removing small amount of biomass and, at the same time, interrupting continuity among shoots [1]. When the density of *P.oceanica* meadows is decreased and their state of being well is damaged, the stability of the environment is ruined and loss of habitat occurs. The aim of the study was to determine the effects of boat anchoring on *P. oceanica* seagrass beds on Gokova SPA between 2005-2006.

Keywords: Posidonia, Eastern Mediterranean

Introduction

The endemic seagrass species of Mediterranean basin *Posidonia oceanica* (L.) Delile covers about 2% of the seafloor of Mediterranean Sea [2]. It plays an important role in ecosystems of shallow coastal waters in several ways by providing habitat for a highly diverse fauna and flora; significantly reducing coastal erosion and offering a nursery area for many fish and invertebrate species [3]. Current main threats to the *P. oceanica* habitat are related to: water and sediment enrichment (eutrophication), the disruption of the sedimentation/erosion balance along the coast and direct destruction by human modifications of the coastline, degradation by boat trawling and anchoring [4]. Major damage to seagrasses seems to be caused by dragging anchors and scraping anchor chains along the bottom, as boats swing back and forth [5]. *Posidonia oceanica*, removing small amount of biomass and, at the same time, interrupting continuity among shoots [1]. The aim of the study was to determine the damage caused to *P. oceanica* habitat coverage by anchoring.

Materials and Methods

This study is based on the project "Coastal and Marine Biological Diversity Assessment of Gokova Specially Protected Area". The study was carried in 3 sampling periods between 2005 and 2006 (June-July 2005, April-May 2006 and June-July 2006). 309 scuba dives and 128 skin dives were performed on 220 km coastline of bay during total 75 days. Estimation of *P. oceanica* coverage and anchor damage was done by visual census method. For indicating the dimention of damage, Geographic Information system ArcGIS, was used for mapping and demonstration of sampling and remark data.

Results

It was determined that *P. oceanica* meadows has especially turned the severe marine environment into a more stable environment and ensured it to be used as a habitat for almost all species in the Gokova SPA. When the distribution of *P. oceanica* is decreased and their state of being well is damaged due to the various reasons, the stability of the environment is ruined and the loss of habitat occurs; because of those significant changes occurred in a very short period, biotopes and habitats begin to collapse rapidly. All those events result in the grave changes in the biota. In the study carried out in the Gökova SPA it was observed that most of the bottom was covered by *P. oceanica*. The average percent coverage was calculated as %61 approximately 6.9 km^2 in the studied area. It was significant that *P. oceanica* coverage decrease when area damaged with boat anchor. The areas most frequently used for the anchorages were determined as the west part of Akyaka (Gokova Bay), Çam Harbor, Sedir Island, Ingiliz Harbor, Tuzla Inlet, Hirsiz Inlet, Yediadalar and Çatalca Inlet. At the same time in those locations *P. oceanica* was widely distributed especially in Sedir Island, Çatalca and Hirsiz inlets and Yediadalar. That the sea grasses widely distributed in the vicinity of Sedir Island were extensively exposed to the impact of the daily tour boats should be observed carefully [Fig.1]. The percent coverage was usually higher in the south part of Gökova Bay where there is no or few anchor damage. In addition no distribution of *P. oceanica* was observed in Ingiliz Harbour, Akyaka (Gökova) Bay and Çamli Bay. This situation was created by both natural and human impacts. *P. oceanica* was under a lot of stress due to the touristic activities in the densely populated locations such as Akyaka, Akbük and the damage caused by the private yachts, the daily tour boats and the Blue Cruise boats during the summer as well. Especially Akyaka Bay has the muddy bottom and a lot of freshwater inputs. The value of transparency is lower. The settlement is extensive; in addition there are a harbor and a shipyard. Especially Ingiliz Harbor, Çam Harbor and Karacasögüt were preferred as the anchorages because of their being sheltered places; apart from the extensive sedimentation due to their semi-closed nature, the anchoring and the other activities also caused damages to *P. oceanica* in those areas.

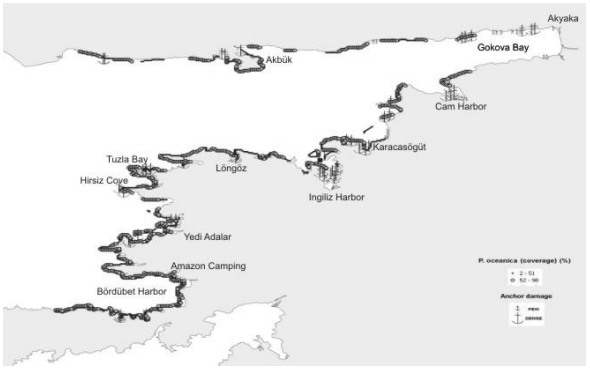

Fig. 1. *Posidonia oceanica* coverage and determined anchor damage along the coasts of Gokova SPA

Discussion

The anchoring should be controlled in the locations with the sea grass meadows given in Figure1. With the aim of the control, the buoys should be fastened to the bottoms in the west part of Akbük Inlet, Ayin Inlet, Löngöz Inlet, Yediadalar Inlet, Amazon Camping and Çati Inlet.

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