

DETERMINATION OF FISH COMPOSITIONS AT ARTIFICIAL REEFS DEPLOYED THREE DIFFERENT DEPTHS (20, 30 AND 40M) IN AEGEAN SEA COAST OF TURKEY: PRELIMINARY RESULTS

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Abstract

Studies aimed at determination of fish assemblages around artificial reefs were conducted mainly 10-25m depths in Mediterranean and Aegean Sea. The goals of this study are determine and compare of fish compositions around artificial reefs which deployed 20, 30 and 40m depths. Underwater visual census technique was used to determine fish species and to record number of individuals. The result shows that fish species number and abundance around artificial reef sets are decrease by increase of depth.

Keywords : Artificial Reefs, Biodiversity, Aegean Sea.

Introduction

Artificial reef researches in Turkey were started at 1991 and mainly took place in the Aegean Sea Coast [1]. Coastal municipalities and fisheries cooperatives showed intensive interest to artificial reef projects after 1995. Ten artificial reef projects were carried out by coastal municipalities between 1995 and 2002. But artificial reef studies improved very slowly during this period.

Monitoring and assessment of artificial reefs to evaluate their effectiveness had gained great importance in recent years [2]. Researches on artificial reefs also increased in Turkey after 2002. The most of the studies related to biological aspects. Limited studies were made on engineering aspects such as stability of reefs [3], effects of waves and currents.

Aim of the present study is to determine and to compare the fish composition around artificial reefs which deployed three different depths (20m, 30m and 40m).

Materials and Methods

Gümlüdü is a coastal village located in Gulf of Kuşadası, 60km south of Izmir. Sea bottom between 0-5m is sandy; 5-15m is covered by *P. oceanica* meadows and than muddy zone extending to deeper areas. Concrete culverts which have 30cm diameter and 105cm long were used to artificial reef unit. Six units, for construct a reef set, were formed like a pyramid (3-2-1). Nine pyramid shape reef sets were constructed and three sets were deployed at each depth (20, 30 and 40m) in April 2006 (Figure 1). The distance between sets was approximately 25m. Underwater visual census technique was used to determine fish species richness and abundance. Three artificial reef sets in each depth were visited during to all observations. Fish species were determined and number of individuals counted. Statistical analyzes consists of 20 and 30 meters, because of few number of species and low abundance records of 40 meters were excluded. Species number and abundance data were compared with One Way ANOVA using SPSS 11.0. Jaccard similarity index was used to measure of the similarity of the structure of fish communities at artificial reef sets in three different depths.

Tab. 1. Frequency of occurrence (%) of species in relation to depths.

Species	20m	30m	40m
<i>Conger conger</i>			33.3
<i>Serranus cabrilla</i>	100	100	100
<i>Ephinephelus costae</i>	16.7		
<i>Mullus barbatus</i>		16.7	
<i>Diplodus annularis</i>	16.7	16.7	
<i>Chromis chromis</i>	83.3	16.7	
<i>Gobius niger</i>	16.7	16.7	
<i>Parablennius rouxi</i>	100	66.7	
<i>Scorpaena porcus</i>	16.7		
<i>Scorpaena scrofa</i>	33.3	16.7	
<i>Balistes carolinensis</i>	16.7		
Total no. of species	9	7	2

Results

A total of 11 species (126 fishes) belonging to 9 families were recorded in 6 census during September-October 2006 period (Table 1).

The three reef sets in 20m were recorded 9 species (87 fishes), 7 species (28 fishes) at 30m and 2 species (11 fishes) at 40m. *S. cabrilla* was only species which recorded all depths and it was recorded all observations (Table 1). *C. chromis* at 20m and *S. cabrilla* at 30m and 40m were dominant species.

There were no statistically significant differences in fish abundance ($p > 0.05$), however, species richness differ significantly between 20 and 30 meters ($p < 0.05$). The values of Jaccard index between depths were found 50% between 20m and 30m, 10% between 20m and 40m, 14.3% between 30m and 40m.

Discussion

These preliminary results show that there is a major change in fish composition around 40m depth. But, long-term observations should necessary to make this kind of suggestion. The reason for the absence of many species in this depth may be lack of critical resources such as food. Depth also affects temperature. Thermoclines can be barrier to some organisms [4]. To consider of this kind of result will be important to success of artificial reef projects.

References

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