EVIDENCE ON ECOLOGY OF SMALL HERMIT CRAB (*DIOGENES PUGILATOR* (ROUX,1829)) IN A SOFT-BOTTOM NEARSHORE ECOSYSTEM (SOUTHERN BLACK SEA)

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Abstract
The distribution and abundance of small hermit crab inhabiting Samsun Shelf Area was investigated in terms of sediment type, depth and season. Samples were collected in an experimental survey investigating the impact of trawling on benthic habitat. All three factors are determined to be effective on distribution pattern and abundance values. Small hermit crab prefers the sandy bottoms and reaches high abundance values in summer months especially in 0-20m depth range.

Keywords: Coastal waters, Crustacea, Black Sea

Introduction
The small hermit crab (*Diogenes pugilator (*Roux,1829)) was studied in many different marine areas in terms of different aspects[1-4]. In this study, it is aimed to reveal the abundance and distribution of the hermit crab depending on variation of season, sediment type and depth in a nearshore ecosystem in middle-south Black Sea.

Material and Method
The samples were collected along the inshore ecosystem discharged by two big rivers; Kizilirmak and Yesilirmak. This shelf area is also a major fishing ground along the southern Black Sea coasts. Particle size was analyzed from the sediment samples from six stations and the type of the substrate was defined according to Blot and Pye [5]. Biological samples were collected by both a beam trawl and a grab between depths of 0-40 m and seasonally for a whole year. The abundance values of the hermit crab firstly normalized with log(x+1) transformation. Four depth intervals with a range of 10 m, 4 seasons and 5 types of sediment (sand, sandy mud, muddy sand, mud and gravel) are assumed to be the factors controlling the distribution of the hermit crab along this shelf area. The ordination of the abundance values and the factors responsible from the variance was determined by the method of Principal Component Analysis (PCA, PAST 3.10).

Results and Discussion
The small hermit crab existed both in infauna and epifauna (Fig 1).

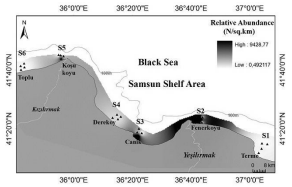

Fig. 1. Distribution and abundance of small hermit crab along stations (S1-S6) in Samsun Shelf Area.

The mean weight of individuals was 0.44 g (±0.03). It is observed that hermit crab mostly occupied the empty shells of small gastropods; *Nassarius reticulatus, Cyclope neritea* and small *Rapana venosa*. It is reported that hermit crab lives around the salinity level of 33.80-39.05 PSU [6]. However, it achieves high abundancies in this nearshore ecosystem of 17-18 PSU and even lower at time of high river discharges. PCA results revealed that depth has a determinative effect on distribution of hermit crab (PC1, 77.7% and PC2, 14.8% of total variance) (Fig 2a). It was more abundant in depths of 0-10m and 10-20m, but quite rare in depths over 30m.

Winter did the greatest contribution to the variation in PC1 (46.5%) and the fall to PC2 (40.7%) making season a significant factor controlling the distribution of hermit crab (Fig 2b). Spring and summer were the seasons that hermit crab reaches the highest abundancies especially along the stations between two estuaries and inside the bay . Sandy substratum was responsible of variance in PC1 (63.7%) and muddy sand and sandy mud in PC2 (19.7%) showing that the hermit crab is inhabiting mostly in sandy bottoms (Fig 2c). The small hermit crab being a short lived and a scavenger organism may be accepted as a typical representative of epifaunal communities exposed to high trawling disturbance as well as in this nearshore ecosystem.

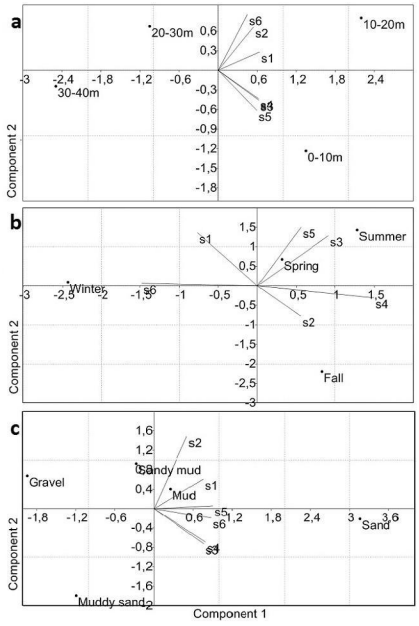

Fig. 2. PCA ordination of abundance data for a) depth, b) season, c) sediment type.

Acknowledgement: This study is funded by the EU- FP7 project BENTHIS (312088).

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