

# A STUDY ON THE STOCKS OF THE DEEP-WATER PINK SHRIMP (*PARAPENAEUS LONGIROSTRIS* LUCAS, 1846) IN THE MARMARA SEA

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## Abstract

In this study, the biomass of the deep-water pink shrimp (*Parapenaeus longirostris*), which was commercially caught with bottom trawl and beam trawl nets in the Marmara Sea, in 2001-2002, was estimated by depth and season. The average biomass per unit area was higher for the beam trawl than the bottom trawl. Comparisons with previous studies showed that its biomass has increased in the last decade in the Marmara Sea.

**Keywords :** Crustacea, Biomass, Sea Of Marmara.

## Introduction

Shrimp is the most abundant species in the benthic fauna of the Marmara Sea. Currently in Turkey, 72% of the shrimp production is providing from the shrimp stocks in this sea. In Turkey, shrimp fishing increased since the beginning of the 1980's and catches increased to a maximum of 8380 t in 1989 [1]. However, catches decreased below to 1000 t in the beginning of the 1990's because of the increase in the fishing effort and illegal trawl fisheries. The decreasing catch was consistent with the results of the study on the biomass, which was carried out by JICA (1993) in 1991-1992 [2].

## Materials and Methods

This study was carried out in five stations at depths of 20 to 200 m. Sampling was carried out seasonally (autumn, winter, spring and summer) in 2001-2002. Samples were collected by commercial fishing vessels. Bottom trawl and beam trawl were used for sampling. The head-rope lengths of the bottom trawl and the beam trawl nets were 37 and 6 m, respectively. Each trawl was equipped with 20 mm mesh size (knot to knot) at the cod-end. Trawling duration (per haul) was limited to one hour. Trawling speed was 2.4-2.7 knots for the bottom trawl and 1.5-1.8 knots for the beam trawl. Biomass estimation were calculated with the swept area method "per stratum" [3]. The catchability coefficient was considered as q=1 for the trawl net. The head rope mouth opening ratio was considered 0.5 for the bottom trawl and 1 for the beam trawl [4].

## Results and Discussion

In total, 43 samplings for the bottom trawl and 50 samplings for the beam trawl were carried out during the survey period. The average biomass per unit area of deep-water pink shrimp obtained from the bottom trawl and the beam trawl nets were estimated as 229.8±57.3 kg/km<sup>2</sup> and 409.3±152.1 kg/km<sup>2</sup>, respectively. The maximum average biomass was estimated for the winter and at the 50-100 m depth zone for both fishing gears (Fig. 1). The differences between winter and the remaining seasons may be the result of migration and thermocline layer changes [5].

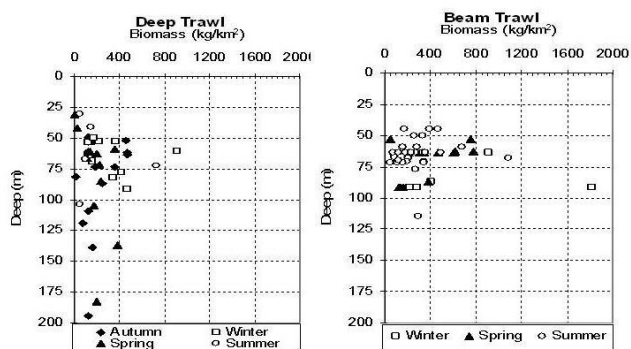


Fig. 1. Biomass distribution of *P. longirostris* estimated by bottom trawl and beam trawl nets according to depth and season.

By comparing the two gears according to the average biomass per unit area, it became apparent that the beam trawl was more advantageous. The biomass of *P. longirostris* has increased slightly since the mid-1990's in the Marmara Sea (Fig. 2). In the early 1990's, the average biomass of trawling at depths 20-100 m was 88.9 kg/km<sup>2</sup> [2], however, in the mid-

1990's it was 127.3 kg/km<sup>2</sup> [6]. These two previous studies were carried out in the same ground and depth and used the swept area method for the calculation of the average biomass. In this study the average biomass was 172.1±44.3 kg/km<sup>2</sup>. There are many factors that can be related with such a linear increase in the *P. longirostris* biomass: (a) the short population doubling time, (b) the fact that spawning takes place twice a year, and (c) the recruitment age of +1 yr [7]. Better oceanographic conditions which occurred in the Marmara and Black Seas in recent years might have also played an important role in the increase of the deep-water pink shrimp stocks during the last decade [1, 6].

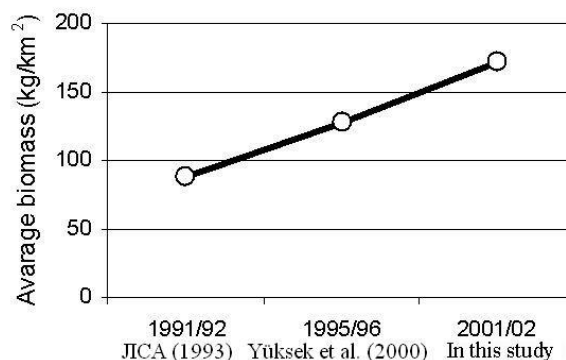


Fig. 2. Temporal changes in biomass estimates of *P. longirostris* in the Marmara Sea.

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