A COMPARISON OF THE SIZE STRUCTURE OF PARAPENAEUS LONGIROSTRIS (LUCAS, 1846) (DECAPODA, PENAEIDAE) BETWEEN POPULATIONS IN THE SEA OF MARMARA AND IN THE AEGEAN SEA∗)

BY

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ABSTRACT

The size structure of the commercially important rose shrimp, Parapenaeus longirostris, was compared between populations in the Sea of Marmara and the Aegean Sea. The analysis was based on data collected during trawl selectivity surveys carried out in November and December 2006. Growth showed no similar pattern, and in additions differences were found in length frequency distribution, sex ratio, and recruitment pattern of the P. longirostris populations in these two areas.

RÉSUMÉ

La structure de taille de la crevette rose d’importance commerciale, Parapenaeus longirostris, a été comparée chez les populations de la mer de Marmara et de la mer Égée. L’analyse a porté sur des données obtenues au cours de campagnes de contrôle de sélectivité des chaluts, menées en novembre et décembre 2006. La croissance suivait des modèles différents et de plus, des différences ont été observées dans la distribution des fréquences de longueur, dans le sex-ratio et dans le modèle de recrutement des populations de P. longirostris dans ces deux zones.

INTRODUCTION

The deep water rose shrimp, Parapenaeus longirostris (Lucas, 1846) shows a wide geographic distribution in the eastern Atlantic Ocean from Angola to Portugal and in the western Atlantic from Guyana to Massachusetts; it also inhabits the

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entire Mediterranean (Fischer et al., 1987). In the Mediterranean Sea, the species can be found at depths ranging from 20 to 750 m (Tom et al., 1988), but it is more common and abundant on sandy-muddy bottoms between 100 and 400 m (Holthuis, 1980). Although a number of investigations based on trawl surveys has been performed for this species in the Mediterranean Sea (Sobrino et al., 2005), little is known about its biological and ecological characteristics in Turkish seas (JICA, 1993; Kara & Gurbet, 1999; Zengin et al., 2004; Bayhan et al., 2005; Deval et al., 2006a, b; Zengin & Tosunoglu, 2006).

Turkey is surrounded by four distinct water bodies, the Black Sea, the Sea of Marmara, the Aegean Sea, and the Mediterranean (Levantine) Sea. Connected through straits, these together constitute an exclusive ecosystem due to different environmental factors and ecological histories (Cihangir et al., 1999). The Bosporus, Sea of Marmara, and Dardanelles together constitute the Turkish straits system: due to its geological, hydrological, and biological characteristics, the Sea of Marmara represents a peculiar marine ecosystem between the Mediterranean Sea and the Black Sea. Hence, the fauna and the flora of the Sea of Marmara are mixtures of the elements of the two adjoining seas (Zaitsev & Öztürk, 2001). As the passage between the Black Sea and the Aegean Sea, the Sea of Marmara shows less saline water (22 ppt) at the surface and more saline water (39 ppt) at the bottom, between which are rather sharp halo- and isothermoclines at 20-30 m depth (Cihangir et al., 1999).

The Aegean Sea, as a transition area between the Mediterranean Sea sensu stricto and the Black Sea, may be divided from an oceanographical point of view into a northern, a middle, and a southern part. The southern and middle parts (the area trawled in this study) are affected by Mediterranean waters, and have warmer and more saline water than the northern part. The surface salinity is usually over 39‰ and the surface water temperature in the southern Aegean Sea is about 17°C in February, but in water deeper than 200 m temperature becomes constant at about 14-15°C. Although the Aegean water has a relatively low concentration of nutrients, that is still greater than in many other areas of the Mediterranean (Zaitsev & Öztürk, 2001). As a part of the Mediterranean ecosystem, the Aegean Sea has a special economic importance for Turkey due to its environmental conditions (Benli et al., 2000), and because its total catch accounts for nearly 12% (38 774 t) of the total marine fish capture of Turkey (Anonymous, 2007).

The deep-water rose shrimp fisheries in the Aegean Sea and the Sea of Marmara are generally characterized by demersal otter trawls and by beam-trawls, respectively, which drastically exploit a diversity of demersal species, constituting a typical multi-species fishery. The annual registered shrimp catch in Turkey was 6339 tonnes in 2005, of which the largest portion came from the Sea of Marmara (3542 t), followed by the Aegean Sea (1837 t), and the Levantine Sea (960 t).