THE EFFECTS OF SEASON AND GENDER ON THE PROXIMATE AND FATTY ACID PROFILE OF MALE AND FEMALE WARTY CRAB (*ERIPHIA VERRUCOSA*) FROM BLACK SEA

Y. Ozogul [1]*, M. Aydin [2], M. Durmus [1], U. Karadurmus [2], M. Öz [1], I. Yuvka [1], Y. Uçar [1], D. Ayas [3], E. Kuley [1] and A. Kösger [1]

[1] Cukurova University Faculty of Fisheries - yozogul@cu.edu.tr
[2] Fatsa Faculty of Marine Science, Ordu
[3] Mersin University, Faculty of Fisheries

Abstract

The effects of the seasonal on the proximate and fatty acid compositions of male and female warty crab from Black Sea were investigated. Important differences were found in proximate and fatty acid compositions for all seasons and gender. There were variations in protein and water content of meat of female and male crabs ($p<0.05$). The results of fatty acid analyses showed that the dominant SFAs were palmitic acid (C16:0) and stearic acid (C18:0). MUFAs in all samples consisted of C16:1, C18:1*n*9, C18:1*n*7, C20:1, C22:1n9. EPA (C20:5*n*3) and DHA (C22:6*n*3) were the main PUFAs in crab meat. The results obtained from the study showed that male and female crab meat is an important fatty acid and protein source.

Keywords: Crustacea, Black Sea

Introduction

Seafood, including crustacean shellfish, is recommended for human diet due to their health-promoting characteristics [1]. In terms of the amount of fat and the proportions of saturated, monounsaturated, and polyunsaturated fat, shellfish provide a healthful diet for humans [2]. Especially, seafood lipids have rich EPA and DHA. These fatty acids have a variety of health benefits, including prevention of sudden cardiac death [3] and chemo preventive effects of cancer [4]. *Eriphia verrucosa*, also called the warty crab, is found in the Black Sea, Mediterranean Sea and eastern Atlantic Ocean from Brittany to Mauritania and the Azores. *E. verrucosa* lives among stones and seaweeds in shallow water along rocky coastlines up to a depth of 15 metres. It is reported to feed on bivalves, gastropods and hermit crabs, or on molluscs and polychaetes. In the Black Sea, *E. verrucosa* is the only native species, capable of breaking into the shells of the invasive snail *Rapana venosa*. The objective of this study was to determine the effects of season and gender on the fatty acid and proximate compositions of warty crab from the Black Sea.

Materials and methods

The crabs were collected as discard products from artisanal fishery (gillnets and trammel nets) and by scuba divers, located in the coast of the Central Black sea of Turkey every season during January and Decembers in 2011 and transported immediately to the laboratory. Claw and body meat were separated manually and analysed in triplicate in terms of fatty acid and proximate composition. Lipid content was measured by the method of Bligh & Dyer [5]. Ash and moisture contents were determined as described by AOAC [6] and protein was determined by the Kjeldahl procedure using a Buchi Digestion System, Model K-424 (BÜCHI Labortechnic AG, Flawil, Switzerland) and a Kjeltec Distillation Unit B-324 (BÜCHI Labortechnic AG). Percent protein was calculated as % Nx6.25. Methyl esters were prepared by transmethylation using 2 M KOH in methanol and *n*-hexane according to the method described by Ichihara et al [7] with minor modification; 10 mg of extracted oil were dissolved in 2 ml hexane, followed by 4 ml of 2 M methanolic KOH. The tube was then vortexed for 2 min at room temperature. After centrifugation at 4000 rpm for 10 min, the hexane layer was taken for GC analyses.

Gas chromatographic conditions

The fatty acid composition was analysed by a GC Clarus 500 with autosampler (Perkin–Elmer, USA) equipped with a flame ionization detector and a fused silica capillary SGE column (30m×0.32mm ID×0.25µm BP20 0.25 UM, USA). The oven temperature was 140ºC, held 5 min, rose to 200ºC at the rate 4ºC/min and held at 220ºC at 1ºC/min, while the injector and the detector temperatures were set at 220 and 280ºC, respectively. The sample size was 1µl and the carrier gas was controlled at 16ps. The split used was 1:50. Fatty acids were identified by comparing the retention times of FAME with the standard 37 component FAME mixture. Two replicate GC analyses were performed and the results were expressed in GC area % as mean values±standard deviation.

Results and discussion

The fat and fatty acid compositions of seafood can vary depending on species, diet, gender, location and season of capture [8,9]. Tsai et al. [10] reported that the total lipid concentrations of blue crab were significantly correlated in gender. Akbar et al. [11] found that the protein content of body meat and claw meat in swim crabs vary, and protein is slightly higher in the edible portion of male crabs than female crabs. In this research, the dominant SFAs were palmitic acid (C16:0) and stearic acid (C18:0). MUFAs in all samples consisted of C16:1, C18:1*n*9, C18:1*n*7, C20:1, C22:1*n*9. EPA (C20:5*n*3) and DHA (C22:6*n*3) were the main PUFAs in crab meat. The results obtained from the study showed that male and female crab meat is an important fatty acid and protein source.

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