

THE PROXIMATE, AMINO ACID AND FATTY ACID COMPOSITIONS OF *EQUULITES KLUNZINGERI* FROM ISKENDERUN BAY, NORTHEAST MEDITERRANEAN SEA

Gülsün Özyurt¹, Ali S. Özkütük^{2*} and Caner E. Özyurt¹

¹ University of Cukurova, Faculty of Fisheries

² University of Cukurova Yumurtalik Vocational School - aliserhat@cu.edu.tr

Abstract

Equulites klunzingeri which is a lessepsian fish species Mediterranean Sea recognised as discard fish because of its small size. For evaluating nutritional value of *E. klunzingeri*, proximate composition, fatty acid and amino acid composition were investigated in this study.

Keywords: *Invasive species, Iskenderun Bay, Lessepsian migration, Nutrients, Mediterranean Sea*

Introduction

Equulites klunzingeri (Klunzinger's ponyfish) which was migrated from the Red Sea to the Mediterranean Sea by the Suez Channel is a lessepsian fish species. These fish are called as pony fishes due to their highly protractible mouth, which protract either dorsally, rostrally, or ventrorostrally. The general morphological characters of *E. klunzingeri* are silver coloration, small sized and laterally compressed. *E. klunzingeri*, which is found in large quantities in the Mediterranean Sea, is rejected by Mediterranean countries because of its small size. Because discard fish has a potential as a high quality feed source and a valuable food source for humans as functional ingredients and nutritional supplements, it is important to establish of their components.

Materials and Methods

E. klunzingeri were captured by academic staff of Fisheries Faculty in Iskenderun Bay. The mean weights and lengths of fish were measured as 5.89±2.56 g and 7.55±1.75cm, respectively. Moisture content and crude ash of the samples were determined in an oven at 103 °C and 550 °C respectively until the weight became constant. Lipid content was analyzed according to procedure of Bligh and Dyer [1] and crude protein was determined by Kjeldahl's method [2]. Amino acid composition was determined by the TUBITAK MAM (Scientific and Technological Research Council of Turkey, Food Institute of Marmara Research Centre). Lipid samples were converted to their constituent fatty acid methyl esters by the method of Ichihara [3]. The fatty acids methyl esters were separated and quantified with a gas chromatograph.

Results and Discussions

The moisture, ash, crude protein and lipid content of *E. klunzingeri* were 74.84±0.45 %, 4.06±0.04 %, 16.45±0.54 % and 3.78±0.06 %, respectively. This proximate composition's data reveals that *E. klunzingeri* caught from the Iskenderun Bay had reasonably high protein and low fat contents. Marine oils are rich sources of polyunsaturated fatty acids (PUFA), especially EPA and DHA. Palmitic and stearic acids are the major constituents of saturated fatty acids (SFAs) in marine lipids. For the monounsaturated fatty acids (MUFA), palmitoleic and oleic acids are the major ones. In the presented study, the obtained data of the main fatty acids from *E. klunzingeri* were also had the same results. The total SFAs, MUFAs and PUFAs of *E. klunzingeri* were determined as 35.31±0.63%, 31.39±1.23% and 18.92±1.07%, respectively. Palmitic acid, stearic acid and myristic acid were found as 23.96±0.42%, 5.81±0.13% and 5.09±0.31%, respectively. Palmitoleic acid and oleic acid were the major MUFA and determined as 13.12±0.77% and 10.32±0.29%, respectively. Among the PUFA, EPA and DHA were also the main fatty acids and they were found as 4.97±0.52% and 10.37±0.54%, respectively. Most researchers have reported that the main amino acids in fish are glutamic acid, aspartic acid, lysine and leucine. In this study, the main amino acids in *E. klunzingeri* were lysine, glutamic acid, leucine, alanine and aspartic acid which constituted in the range of 1131 and 2051 mg/100 g sample. It was determined that the remaining amino acids were in range of 322 and 854 mg/100g sample. The ratio of essential amino acids (E) / nonessential amino acids (NE) was determined as 0.88 for *E. klunzingeri*. For many fish species, the reported range of E/NE ratio was 0.69 to 1.00 [4-5]. The results shown that *E. klunzingeri* have well-balanced and high quality protein source in respect to

E/NE ratio. It can be concluded that *E. klunzingeri* has valuable nutritional compounds as a result of this study. Therefore, utilisation of this discard fish may have some advantages in terms of environmental pollution and gaining value-added products.

References

- 1 - Bligh, E.G. and Dyer, W.J., 1959. A rapid method of total lipid extraction and proficiation, *Can. J.Biochem. Physiol.*37: 911-917.
- 2 - AOAC, 1998. Official methods of analysis of AOAC International. In: *Official methods of analysis*, 16th Eds., Chapter 39 (edited by D.L. Soderberg and P. Cunniff), Gaithersburg, MD.
- 3 - Ichihara, K., Shibahara, A., Yamamoto, K., and Nakayama, T., 1996. An Improved Method for Rapid Analysis of the Fatty Acids of Glycerolipids. *Lipids*, 31: 535-539.
- 4 - Özyurt, G. and Polat, A., 2006. Amino acid and fatty acid composition of wild sea bass (*Dicentrarchus labrax*): a seasonal differentiation. *European Food Research and Technology*, 222(3-4): 316-320.
- 5 - Tokur, B., Çakli, S. and Polat, A., 2006. The Quality Changes of Trout (*Oncorhynchus mykiss* W., 1792) with a Vegetable Topping During Frozen Storage (-18° C)." *Su Ürünleri Dergisi* 23.3.