Body Amino Acid Composition of Axillary seabream (*Pagellus acarne* R., 1827) Catched from Dardanelles (Canakkale, Turkey)

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Abstract. Amino acid composition of the whole body tissue of Axillary seabream (*Pagellus acarne*) was determined. Fish was catched from Dardanelles (April 2013) via fishing line. The most abundant amino acid was Glutamic Acid (11.0 g/100 g crude protein) and Valine was the most abundant essential amino acid (6.2 g/100 g crude protein). The total essential amino acid content was 32.3 g/100 g crude protein and the total nonessential amino acid content was 42.5 g/100 g crude protein.

Keywords: *Pagellus acarne*, Axillary seabream, Dardanelles, Amino acid composition

1 Introduction

Axillary seabream is a sparid distributed in Eastern Atlantic and Mediterranean Sea, occurring from Bay of Biscay to Senegal, Cap Vert, the Azores, Madeira and the Canary Islands (AO CECAF Scientific Committee (AO CECAF Scientific Committee, 2007). This species is found on hard and sandy bottoms at depths ranging from 0 to 500 m, mainly between 40 - 100 m (Muus and Nielsen 1999; Bauchot and Hureau 1990). It is an hermaphrodite, omnivorous species, but prefer worms, mollusks and small crustaceans (Bauchot and Hureau 1990).

Fish is a important source of essential amino acids with growing evidence of potential benefits and fish consumption relate to the use of proteins of high biological value, as well as certain minerals and vitamins (Shaviklo et al 2015). On the other hand, the fish growth optimization is closely linked to the supply of dietary protein

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and it can be maximized by manipulating the composition of the dietary amino acid (Limin et al. 2006).

Although several fish species are cultured worldwide, data on the quantitative requirements for all the essential amino acids have been reported for only a limited number of fish (NRC, 1993). Axillary seabream is considered promising new fish species for marine aquaculture in Turkey (Guner et al 2013). However, its amino acid composition unknown.

The aim of the present study was to determine amino acid composition in territorially consumed Axillary seabream in Dardanelles.

2 Material and Method

Axillary seabream was caught from sampling station (Güzelyalı) in April 2013 in Dardanelles using a fishing line. All samples were collected in the daytime and stored in ice baths until they arrived in laboratory. The samples (n=10) were dried at 105 °C in an oven until they were of constant weight before use.

In order to determine amino acid profiles, the dried samples were hydrolyzed at 110^{o}C for 24 hours with 6.0 M hydrochloric acid. After evaporation, hydrolyzed samples were all dissolved in citrate–sodium citrate buffer (0.1 M, pH 2.2) (Chi al. 2008).

High performance liquid chromatography (HPLC) is generally used for the analysis of amino acid contents. O-Phthalaldehyde (OPA) is the important pre-column derivatization reagent by HPLC-Floresans Dedection or UV. The column and flow rate is a C18 reversed phase and 1.2 mL/min. Fluorimetrical detection of OPA derivatives is carried out at an Ex. 350 nm, Em. 450 nm for OPA derivatization. Mobile Phase consistent of phosphate buffer solution (pH 7.3, 0,02 M) (**A**) and ACN: MeOH: water (45:45:10, v/v/v) (**B**). The gradient elution system (**A/B**) is used as 90/10-3 min, 90/10-10 min,78/22-2 min, 72/28-9 min, 70/30-4 min, 35/65-7 min, 25/75-1 min, 0/100-1 min, 0/100-2min, 90/10-2 min. The derivatization reagents are 10 µL 3-Mercaptopropionic Acid in 10 mL Borate Buffer and 10 mg O-Phthalaldehyde in 5 mL Borate Buffer. Firstly, it is added 45 μL MPA + 25 μL + 10 μL sample at the derivatization procedure, and then mixed and waited for 1 min. Then, it is added 10 μL FMOC in the solution, and mixed and waited for 2 min. Finally, 10 μL of derivatizated amino acids is injected to HPLC.

3 Results

The amino acid data are expressed as g/100 g amino acids in Table 1. The most abundant amino acid was Glutamic Acid (11.0 g/100 g crude protein) and Valine was the most abundant essential amino acid (6.2 g/100 g crude protein). The total essential amino acid content was 32.3 g/100 g crude protein and the total nonessential amino acid content was 42.5 g/100 g crude protein.

4 Discussion

It is widely recognized that the specific requirement for amino acids should be determined in terms of optimum amount of dietary protein necessary for most efficient animal production (Kim and Lall 2000).

Table 1. Whole body amino acids (g/100 g crude protein) of Axillary seabream on dry weight

Essential Amino Acids (EAA)	
Histidine (HIS)	2.1±0.1
Isoleucine (ILE)	6.1±0.3
Leucine (LEU)	2.5±0.2
Lysine (LYS)4	1.1±0.4
Methionine (MET)	4.5±0.1
Phenylalanine (PHE)	5.1±0.2
Threonine (THR)	4.7±0.1
Valine (VAL)	6.2±0.1
Total	32.3
Nonessential Amino Acids (NEAA)	
Alanine (ALA)	6.4±0.1
Aspartic Acid (ASP)	8.4±0.1
Glutamic Acid (GLU)	11.0±0.4
Glycine (GLY)	4.9±0.2
Serine (SER)	4.4±0.1
Tyrosine (TYR)	2.1±0.1
Hydroxylysine (HLY)	1.1±0.1
Cystine (C-C)	4.2±0.2
Total	42.5

The results of present study show that Axillary seabream has a high content of Valine and Isoleucine which are essential amino acids. Valine is involved in many metabolic pathways and is considered indispensable for protein synthesis and optimal fish growth (Abidi and Khan 2004). In addition, isoleucine is a branched-

chain, amino acid needed in the body to produce certain biochemical compounds that help in energy production and together with the other two branched-chain amino acids promotes tissue building (Khan and Abidi 2007). In the present study, glutamic acid which is essential for cell proliferation was the most predominant among all the amino acids in Axillary seabream.

This study demonstrate that Axillary seabream is good source of amino acids.

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