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Extraction of Snakehead Fish [*Ophiocephalus striatus* (Bloch, 1793)] Into Fish Protein Concentrate as Albumin Source using Various Solvent

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Abstract

Study aimed to determine the optimum solvent for extraction of soluble protein (albumin) and identify the chemical composition of Snakehead fish [*Channa striata* (Bloch, 1793)] protein concentrate. The method was experimental while the treatments were the variation of solvents: distilled water, HCl 0.1M, and NaCl 0.9 %. Soluble protein (albumin) and yield parameters analyzed by using completely randomized design (RAL) which consist three treatments and four replications, the other parameters were described descriptively. The result showed that the highest soluble protein (albumin) (7.65 %) was produced by HCl 0.1 M solvent with 2.55 % yield, 10.76 % dry basis moisture content, 63.78 % total protein content, and 2.54 % fat content.

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Keywords: Extraction; fish protein concentrate; Snakehead fish [*Ophiocephalus striatus* (Bloch, 1793)]; soluble protein; solvent

1. Introduction

Albumin is a protein which soluble in water and could be coagulated by heat where present in blood serum and the whites of eggs. In human plasma, albumin is the majority protein ($4.5 \text{ g} \cdot \text{dL}^{-1}$) which is about 60 % of total plasma (Murray et al., 1999). Along with the presence of several hospitals that utilized snakehead fish as a source of albumin for hypoalbumin and wound healing, the albumin products have a specific target market. Traditionally

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albumin obtained by steaming the fish until acquired the cloudy white color filtrate. The volume that can be generated by 65 mL per 100 g of material. Levels of albumin filtrate ranged from 0.46 g per 100 mL to 1.50 g per 100 mL (Santoso, 2001). Albumin extraction of snakehead fish is expected to be the alternative of cheaper albumin source for clinical use. The use of a suitable solvent can increase the amount of albumin that can be extracted. Albumin is a globular protein which soluble in water, salt and acid solvents (Masuelli, 2013). This fact indicates that albumin protein of snakehead fish can be extracted to be a concentrate of fish protein using among solvents. Fish protein concentrate is a product that is produced by removing fat and water and gaining higher protein concentration (Ibrahim 2009). Based on the information, this study was conducted to determine the optimal solvent which made the extraction of soluble protein (albumin) become optimal and to identify the chemical composition of snakehead fish protein concentrate.

2. Material and methods

2.1. Material

Materials used in this study were Snakehead fish [*Ophiocephalus striatus* (Bloch, 1793)] obtained from Gedebage traditional market, Bandung, Indonesia, hexane solvent to separate fat, aquades, HCl 0.1 M, NaCl 0.9 % and clean water. Equipment used in this study were blender, knife, waterbath, funnel, oven and grinder.

2.2. Research method

The method was experimental. Data analysis was conducted using Complete Randomized Design consisting of three treatments with four fold replication. The treatments were the variation of solvents. The solvents were distilled water, HCl 0.1 M and NaCl 0.9 % with ratio 1 : 1 (100 mL solvent : 100 g fish). All treatment was given boiling temperature at 50 °C ($\pm 10^\circ\text{C}$) for about 15 min. The research procedure can be seen on Figure 1.

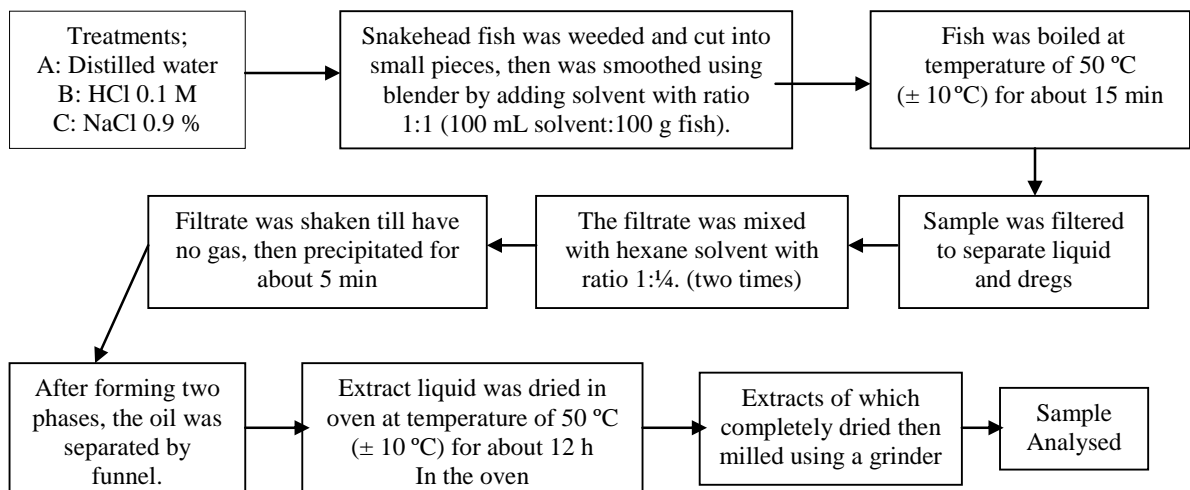


Fig. 1. Extraction of Snakehead Fish into fish protein concentrate (Mustafa et al., 2012)

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