

**EXTRACTION OF CRUDE COLLAGEN FROM
YELLOWFIN TUNA SKIN (*Thunnus albacares*) AND
DETERMINATION FUNCTIONAL PROPERTIES
OF ITS HYDROLYSATES**

A dissertation submitted to the
Faculty of Animal Science and Export Agriculture

Uva Wellassa University

in partial fulfillment of the requirement of

the degree of

Bachelor of Animal Science

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2018

ABSTRACT

Collagen is dominant protein in connective tissues and highly valuable in food industry. Fish processing by products are good alternative source for collagen. The objective of this study was to develop a simple non-toxic method to extract collagen from Yellowfin tuna skin and to check functional properties of its hydrolysates. Extraction procedure were conducted using acetic acid and citric acid with 0.5M concentrations. Based on 8% SDS-PAGE gel, type I collagen were identified. Enzymatic hydrolysis were done with protease, trypsin, pepsin enzymes with different time combinations (0h, 3h, 6h, 9h, 12h, 24h) at 37°C after adjusting to its optimum pH level. Best hydrolysate were selected and subjected to antioxidant activity by using Diphenyl-1-picrylhydrazyl (DPPH) radical scavenging activity and thiobarbituric acid reactive substances (TBARS) assay. Metal (Fe^{2+}) chelating activity were evaluated by using ferrozine method and Antimicrobial activity were evaluated by using agar well diffusion method. Proximate analysis were conducted for raw skin to determine moisture, ash, protein, fat content and 59.44±0.013%, 1.91±0.37%, 28.55±1.19%, 6.83±0.30% values were obtained respectively. Hydrolysates produced after incubating for 0 h at 37°C followed with heat inactivation was selected as the best. Hydrolyzed produced using citric acid showed lower scavenging activity (63.62%) compared to acetic acid (85.07%) ($p < 0.05$). In TBARS assay citric acid shows high antioxidant activity than acetic acid ($p < 0.05$). In both acetic and citric extractions Fe^{2+} chelating activity did not showed significant difference among the treatments ($p > 0.05$). In agar well diffusion method it shows good antimicrobial activity with acetic acid than citric acid ($p < 0.05$). According to the collagen hydrolysates incubated at 0 h at 37°C showed good antioxidant activity with acetic acid extraction with pepsin enzyme. This conclude that collagen hydrolysates produced using acetic acid and pepsin showed good antioxidant activity comparing with the ascorbic acid as positive control and it could be deserved to use as good alternative source as natural anti-oxidant in food industry.

Key words: Fish collagen, Yellow fin tuna, Antioxidant activity, Hydrolysates