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This is to certify that

Faezeh Taghizadeh Tabasi

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Study on the efficiency of fermentation of Nile tilapia fish by-product (Oreochromis niloticus) with Bacillus licheniformis on the molecular weight profile of the produced proteins

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24th IRAN'S INTERNATIONAL CONGRESS OF MICROBIOLOGY

Study on the efficiency of fermentation of Nile tilapia fish by-product (*Oreochromis niloticus*) with *Bacillus licheniformis* on the molecular weight profile of the produced proteins

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ABSTRACT

BACKGROUND AND OBJECTIVES

Nile tilapia is the third most produced fish. Due to the increasing demand for the production of tilapia fish fillet, a large amount of by-products including skin, intestine and viscera, head and tail are produced and causes many environmental problems. The enzymatic hydrolysis, chemical synthesis, and fermentation are the most common methods of hydrolyzing protein to produce bioactive peptides. The purpose of this research is to recover proteins from the by-products of tilapia culture using fermentation and convert them into high-value added products such as bioactive peptides.

MATERIALS AND METHODS

Nile tilapia by-products was dried at 55°C for 2 days. The culture medium containing 1% glucose, 0.5% salt, and 10% fish was prepared. After autoclaving, it was inoculated with 5% *B. licheniformis* (IBRCM10204) (v/v) and incubated for 72 hours. The supernatant solution was separated by centrifugation (5000 rpm, 5 min) and the dissolved protein was measured by Bradford, TLC, and SDS-PAGE methods.

RESULTS AND DISCUSSION

Bradford's assay showed that the amount of soluble protein has a decreasing trend after bacterial culture. Analysis of soluble protein at different times of fermentation with paper chromatography (TLC) showed that the proteins were hydrolyzed and broken into smaller peptides compared to zero time, which was also confirmed by the protein profile obtained from silver nitrate staining of SDS-PAGE gel. Similar results were reported on by-products fermentation of other aquatic species in literature.

CONCLUSION

Fermentation of low-value protein feeds for the production of bioactive peptides using proteolytic microorganisms is an inexpensive alternative to enzymatic and chemical processes.

Keywords: **Nile tilapia fish by-products, Fermentation, Bioactive peptide, *Bacillus licheniformis***