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**Efficiency of Lactic Acid Bacterium, *Lactobacillus acidophilus*, in Enhancing the Quality of Tilapia Fish Mince**

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Roll No.: 0122/09

Registration No.: 1131

Session: 2022-2023

**A thesis submitted in the partial fulfillment of the requirements for the degree of Master of Science in Department of Fishing and Post-Harvest Technology**

**Department of Fishing and Post-Harvest Technology**

**Faculty of Fisheries**

**Chattogram Veterinary and Animal Sciences University**

**Chattogram - 4225, Bangladesh**

**DECEMBER 2023**

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**DECEMBER 2023**

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**This is to certify that we have examined the above Master’s thesis and have found that is complete and satisfactory in all respects, and that all revisions required by the thesis examination committee have been made**

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**Chattogram-4225, Bangladesh**

**DECEMBER 2023**

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February, 2024

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**LIST OF ABBREVIATIONS**

|  |  |
| --- | --- |
| Short Form | Abbreviations |
| ANOVA | One-way Analysis of Variance |
| Cm | Centimeter |
| CVASU | Chattogram Veterinary and Animal Sciences University |
| LAB | Lactic acid bacteria |
| RT-PCR | Real time Polymerase Chain Reaction |
| et al. | And his associates |
| FAO | Food and Agriculture Organization |
| WHO | World Health Organization |
| G | Gram |
| Cfu/g | Colony Forming Units |
| HCl | Hydrochloric Acid |
| H2SO4 | Sulfuric acid |
| KOH | Potassium Hydroxide |
| M | Mass |
| Mg | Milligram |
| MT | Metric Ton |
| N | North |
| NaOH | Sodium Hydroxide |
| Ppm | Parts per million |
| wt. | Weight |
| °C | Degree Celsius |
| % | Per cent |

**Dedicated**

**To**

**My Beloved Parents**

**ABSTRACT**

This research focused on evaluating the impact of *Lactobacillus acidophilus* inoculation on the quality of the Tilapia fish mince. The quality of fish mince was compared with that of regular fish mince. The study assessed changes in organoleptic characteristics, biochemical properties (proximate compositions, TVB-N and NPN were determined using a modified version of the AOCA (2016) method) and changes in bacterial count. In the study, approximately 105 *Lactobacillus acidophilus* inoculated in 10 grams of tilapia fish mince and stored at 4°C. A normal fish mince was also kept at the same temperature. Parameters were measured weekly over a 6 week period. At first *L. acidophilus* growth was confirmed by using RT-PCR technique. Organoleptic test involved a panel (10 trained participants) evaluating color, smell, texture and general appearance. Lactic acid bacteria inoculated fish mince received higher consumer acceptance. The pH level notably decreased in the lactic acid bacteria inoculated fish mince (from 6.1±0.07 to 4.7±0.05) compare to the normal fish mince (from 6.6±0.04 to 5±0.08) throughout the study. TVBN content increased more rapidly in normal fish mince compare to lactic acid bacteria inoculated fish mince, with TVB-N content measuring 33.05±1.05 mg/100g and 30.36±1.35 mg/100g respectively in the last week. NPN content increased steadily in first four weeks for both samples, but in the last two weeks, the normal fish mince exhibited a rapid increase compare to the lactic acid bacteria inoculated fish mince. Proximate composition showed no significant difference (p<0.05) between the two samples. *L. acidophilus* bacteria displayed rapid growth in the inoculated sample during the initial three weeks, followed by a decreasing rate. Total bacterial load in normal fish mince increased throughout the study from 0.9×105 to 3.9×105 cfu/g, while lactic acid bacteria inoculated fish mince showed a decreasing rate 1.8×104 to 0.2×103 cfu/g. Notably, no pathogenic bacteria such as *Salmonella spp*., *Shigella spp*., or *E.coli* were detected in either sample. Overall, the lactic acid bacteria inoculated bacteria consistently exhibited better quality than the normal fish mince throughout the experiment. The study concluded that lactic acid bacteria have significant effect on the quality of tilapia fish mince, serving as biopreservatives.

Keywords: Lactic acid bacteria, fish mince, Tilapia, *L. acidophilus*