BIOPRESERVATION OF FRESH FISH FILLETS USING BACTERIOCINS AND SOME ORGANIC ACID SALTS

By

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B.Sc. Agric. Sci. (Food Science), Fac. Agric., Cairo Univ., 2013

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APPROVAL SHEET

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ABSTRACT

Lactococcus lactis subsp. *Lactis* (NRRL 1821), *Lactobacillus sakei* (NRRL1917) and *Lactobacillus rhamnosus* (NRRL 1937) were evaluated for bacteriocins production in skim milk (SM). *Lactococcus lactis* subsp. *lactis* showed the highest production and the maximum activity was noticed after 48 h of fermentation. The highest antimicrobial activity of fermented skim milk (FSM) was achieved at pH 2.0 in the presence of EDTA (250 ppm). Fresh Egyptian nile perch fillets were treated by dipping in solutions of: diluted (3:1 distilled water) fermented SM, (T1); diluted FSM+ EDTA, (T2); sodium acetate, (T3); diluted FSM+ sodium acetate, (T4) and diluted FSM+ sodium acetate+ EDTA, (T5) and stored for 5 weeks in ice. Microbiological, chemical and sensory characteristics of the treated fillets were evaluated. All treatments succeeded in reduction initial psychrotrophic count, increasing the lag phase period and extending the microbial shelf life. T4 and T5 reduced the initial microbial load by 2.4 log (each), elongated the lag phase by 1 and 2 weeks and extended shelf life by 2.3 and 3.0 weeks, respectively. At the end of storage period, T4 and T5 maintained the pH to 6.5 and 6.0, respectively compared with 7.7 of control. The TBA values were 1.56 (T4) and 1.22 (T5) compared with 8.69 mg malondialdehyed Kg^{-1} fillets for control. Also, TVB-N values were 32.2 (T4) and 29.74 (T5) compared with 53.51 mg N/100 g fillets for control at the end of storage period. Similarly, T4 and T5 maintained better ($P<0.05$) sensory characteristics than control.

Keywords: Bacteriocins, biopreservation, fish fillets, nile perch, *Lactococcus lactis* subsp. *Lactis*, shelf life.

DEDICATION

I dedicate this work to whom my heartfelt thanks; to my family: my parents Mr. Nady and Mrs. Khamla, my husband Ahmed, my lovely daughter Gana, my sister Heba, my brothers Khaled, Waleed & Omar and my friend Doaa.

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