



“Gheorghe Asachi” Technical University of Iasi, Romania



P13

EVALUATION OF MYCROCISTIN BIODEGRADATION BY WILD YEASTS FOR APPLICATION IN WATER TREATMENT

Gisele Maria de Andrade de Nobrega*¹, T.A. Miguel², D.D. Lopes³, C.L. Yokoyama⁴,
F.C. Pagnocca⁵, E.K. Kuroda⁶, K. Tsuji⁷, A.R. Coelho⁸, E.H. Hashimoto⁸, S.Garcia⁹,
L.D. Paccola-Meirelles¹, O. Kawamura¹⁰, K-I. Harada¹¹, E.Y. Hirooka⁹

¹Department of General Biology, Center for Biological Sciences, State University of Londrina, Londrina-State of Paraná, Brazil; ²Department of Food Science and Technology, Center of Agricultural Sciences, State University of Londrina; ³Department of Genetics, Federal University of Rio Grande do Sul; ⁴Department of Food Science and Technology, Center of Agricultural Sciences, State University of Londrina; ⁵State University of São Paulo, Institute of Biosciences of Rio Claro; ⁶Department of Construction, Center of Technology and Urbanism, State University of Londrina; ⁷Kanagawa Prefectural Institute of Public Health, Chigasaki, Kagawa, Japan; ⁸Federal Technological University of Paraná, Campus Francisco Beltrão; ⁹Department of Food Science and Technology, Center of Agricultural Sciences, State University of Londrina, University Campus. P.O.Box 6001. 86051-990, Londrina-State of Paraná, Brazil; ¹⁰Department of Biochemistry and Food Science, Faculty of Agriculture, Kanagawa University, Japan; ¹¹Faculty of Pharmacy, Meijo University, Nagoya, Aichi, Japan; e-mail:giselenobrega@uel.br

Abstract

Yeasts are one of the most important safe microorganisms in fermentative processes nowadays, and play an important role, with emphasis on non-pathogenic. Many studies show the potential of these microorganisms in biologic control. Microcystins (MC) are produced by toxic cyanobacteria such *Microcystis aeruginosa*, which occur in eutrophic water environments and cause undesirable economic loss, as well as human and animal health hazards. Conventional water treatment has been ineffective in MC removal and the application of chemical agents has caused negative environmental impact. Therefore using yeasts for biocontrol would be a promising strategy to avoid MC hazard in water supply. In this work, 31 yeast strains isolated from anthill and sugar and bioethanol plants, were tested for MC degradation. The yeasts were analyzed for MC degradation potential with a commercial enzyme-linked immunosorbent assay (ELISA) kit. Yeast cell suspension was added to 8 ml of solution containing 1 mg/l of MC (lyophilized crude extract prepared with cell mass of *Microcystis* spp. Strain TAC 95). After 96 h of incubation at 30°C by shaking at 100 rpm MC levels were evaluated by ELISA. Negative control was crude cell extract of strain TAC 95 without yeast cells. Positive control was carried out by adding *S. microcystinivorans* strain B9 to the crude cell extract suspension prepared with TAC 95. B9 strain is characterized as having a potent MC degrading activity, showing 97% to 99% of MC degradation. Yeast MC degradation rates varied from 0% to 70%, and the highest degradation was observed when using strain VI08R, which is a *Saccharomyces cerevisiae*, hence, a GRAS degree microorganism. *S. boulardii* commercial strain, another GRAS degree yeast, and also presented high MC degradation rate (53%). The data indicated that tested yeast isolates can be a promising strategy for MC degrading and their application can be more explored with promising results to water treatment.

Acknowledgements

Financial Support: NANOBIO/CAPES Foundation, Ministry of Education/BRAZIL. Araucária Foundation and Paraná Fund (Paraná State Grant).
