PRODUCTION OF ALTERNAN BY FERMENTATION USING LOCAL BACTERIAL ISOLATES

BY

ENAS ESMAIL MAHMOUD RAAFAT

B.Sc. Agric. Sc. (Agric. Microbiology), Ain Shams University, 2000

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This thesis for M.Sc. degree has been approved by:

Prof. Dr. Fawkia M. El-beih …….....…

Prof. of Microbiology, Faculty of Science, Ain Shams Univ.

Prof. Fatma R. Nassar ..……...

Prof. of Agriculture Microbiology, Faculty of Agric., Ain Shams Univ.

Prof. Dr. Hemmat M. Abdelhady ……..

Prof. of Agriculture Microbiology, Faculty of Agric., Ain Shams Univ.

Prof. Dr. Rawia F. Gamal …….

Prof. of Agriculture Microbiology, Faculty of Agric., Ain Shams Univ.

Date of Examination 28 / 06 / 2006

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Under the supervision of:

Prof. Dr. Rawia F. Gamal

Prof. of Agric. Microbiology, Dept. of Agric. Microbiology, Fac. of Agric., Ain Shams Univ. (Principal Supervisor)

Prof. Dr. Hemmat M. Abdelhady

Prof. of Agric. Microbiology, Dept. of Agric. Microbiology, Fac. of Agric., Ain Shams Univ.

Prof. Dr. Sohir A. I. Nasr

Prof. of Agric. Microbiology, Dept. of Agric. Microbiology, Fac. of Agric., Ain Shams Univ.

ABSTRACT

ENAS ESMAIL MAHMOUD RAAFAT "Production of Alternan by Fermentation Using Local Bacterial Isolates". Unpublished Master of Science Thesis, Ain Shams University, Faculty of Agriculture, Department of Agricultural Microbiology, 2006.

Alternan is a unique branched glucan produced by fermentation with *Leuconostoc mesenteroides*. Alternan might be used as a low or non-caloric food additive, filler and bulking agent for food products as well as in inks, adhesives, cosmetic creams or ointments. Therefore, this investigation was designed to study the production of alternan by fermentation.

In the present study, a number of 75 grayish white pigmented gram positive spherical in pairs and chain isolates were collected and tested for alternan production. Only seven isolates were selected as high efficient alternan producing bacteria and completely identified as *L. mesenteroides*. In a series of experiments on alternan production, modified **Raemaekers and Vandamme** medium containing 120 gL^{-1} sucrose was recommended, with incubation for 22 hrs at 30^{o}C in shaking flasks at 200 rpm as a batch culture.

Different gamma radiation doses were applied to produce some mutants from each local parent strain capable to increase alternan and dextran production about 1.93& 1.82 fold by local *L. mesenteroides* M_{m6} mutant and *L. mesenteroides* C_{m6}, respectively.

Biological activity of alternan producing *Leuconostoc* strains was studied in shake flask as a batch culture. In batch bioreactor culture, the effect of agitation speeds on alternan production by *L. mesenteroides* M_{m6} during 28 hrs fermentation period was studied and comparing with that obtained by

reference standard *L. mesenteroides* NRRL B-1355 strain. This technique increased the produced alternan, by 2.66 fold as compared to that produced by batch culture technique.

Key words: Alternan, *Leuconostoc mesenteroides*, Shake flasks, Bioreactor, Batch culture, Dextran, Alternan parameters, Dextran parameters.

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Under the supervision of:

Prof. Dr. Rawia F. Gamal

Prof. of Agric. Microbiology, Department of Agric. Microbiology, Fac. of Agric., Ain Shams Univ.

Prof. Dr. Hemmat M. Abd El-Hady

Prof. of Agric. Microbiology, Department of Agric. Microbiology, Fac. of Agric., Ain Shams Univ.

Prof. Dr. Sohir A. I. Nasr

Prof. of Agric. Microbiology, Department of Agric. Microbiology, Fac. of Agric., Ain Shams Univ.

Dr. Abd El-Monem S. Bashandy

Assist. Prof. of Microbiology, National Center for Radiation Research and Technology, Atomic Energy Authority.

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