



INTERNATIONAL CONFERENCE ON BIOLOGICAL SCIENCE



**ADVANCES IN BIOLOGICAL SCIENCE:
Respect to Biodiversity from Molecular to Ecosystem
for Better Human Prosperity**

PROCEEDINGS

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**Faculty of Biology Universitas Gadjah Mada
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PREFACE

This publication reports papers presented **at the International Conference on Biological Science Faculty of Biology Universitas Gadjah Mada 2009 (ICBS BIO-UGM 2009), Advances in Biological Science: Respect to Biodiversity from Molecular to Ecosystem for Better Human Prosperity**, organized by and held at the Faculty of Biology, Universitas Gadjah Mada, Yogyakarta, Indonesia on October 16-17, 2009. The conference addressed a range of important research from various fields in biological science likely to play role in the improvement of human prosperity. Three kinds of session were held at the conference: plenary session featuring keynote and invited papers, oral presentation session, and poster presentation session. This proceeding features a number of papers presented in these sessions, which represent 5 themes covered in the conference, i.e. genetics and molecular biology, ecology and conservation, systematics and evolution, physiology and developmental biology, and biomedics.

I wish to thank my fellow Organizing Committee for their efforts towards the success of the conference. On behalf of the Organizing Committee, I wish also to thank keynote speaker, all invited speakers, paper presenters, academic reviewers, participants, and sponsors who have made the conference a success. Last but not least, I hope that the conference leaves us and all participants with memorable and fruitful experience.

Maryani

Chair of the Organizing Committee

P-EC15**STUDY OF PURINE DEGRADATION IN AQUEOUS SOLUTION BY *LACTOBACILLUS FERMENTUM***Tri Agus Siswoyo^{1,2}, Dian Puji A.P³ and Tri Ardyati⁴

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Abstract

In this study the degradation of extracellular purines by the bacterium *Lactobacillus fermentum* was examined with aqueous purine solutions. *Lactobacillus fermentum* was able to decompose free purine bases. The nitrogen-containing products of the degradation were ammonia. Purine uptake was the main control of purine decomposition. In the cases of adenine, guanine, xanthine and hypoxanthine further control was exerted by induction. Furthermore, the uptake of the purines caused differences in the duration and temporal development of the substrate degradation. It was also responsible for the inhibitory effects of the purines on the decomposition of one another when the substrates were used in mixtures. Also, fermentation parameters like biomass and purine concentration, pH, and temperature influenced the purine usage of *Lactobacillus fermentum*.

Keywords : Degradation, Purine, *Lactobacillus fermentum*, Xanthine

INTRODUCTION

Today many foodstuffs contain substances that might be harmful to the human organism. Purines belong to this group because their degradation product, uric acid, causes hyperuricemia and gout. Hyperuricemia is a disease, which results from the overproduction and/or underexcretion of uric acid and is greatly influenced by a high dietary intake of purine. It is usually an asymptomatic condition, which is hypothesized to play a role in cardiovascular disease and hypertension. Some hyperuricemic individuals develop gout, a common disease with a worldwide distribution and are mainly caused by deposition of monosodium urate crystal in joints and other tissues as a result of extracellular urate supersaturation. Although most uric acid is derived from the metabolism of endogenous purine, eating foods rich in purines contributes to the total pool of uric acid. Usually this disease is treated with a diet low in purines and/or the use of medicaments. The patients often reject this treatment because it is contrary to their nutritional habits. A solution to this problem might be the availability of dietetic food low in purines.