



Central Luzon State University



**ISOLATION AND ANALYSIS OF LIGNIN-DEGRADING BACTERIA
FROM RUMINANT DUNG**

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An Undergraduate Thesis Submitted to the Faculty of the Department of
Biological Sciences, College of Arts and Sciences, Central Luzon
State University, Science City of Muñoz, Nueva Ecija,
Philippines, In Partial Fulfilment of the
Requirements for the Degree

BACHELOR OF SCIENCE IN BIOLOGY

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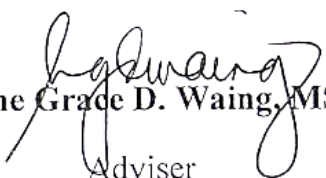


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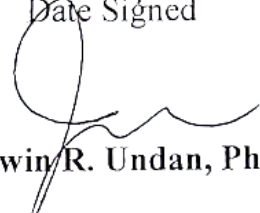
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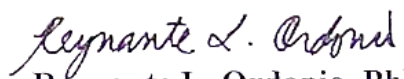
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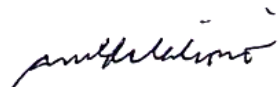

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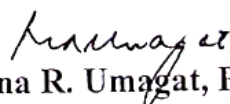
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ABSTRACT

AGPAOA, ALEXANDRA ROBLES, Bachelor of Science in Biology, Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, June 2017. **ISOLATION AND ANALYSIS OF LIGNIN DEGRADING BACTERIA FROM RUMINANT DUNG**

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Lignin is considered as the most abundant aromatic polymer in nature. It is synthesized by plants such as rice straw which is considered as a plant biomass. Chemical treatments have been used in degradation of lignin but this can cause threat to the environment. An isolation and analysis of environment friendly bacteria for lignin degradation becomes an essential. Twenty-six bacterial strains have been isolated from cow dung in San Jose City and Science City of Munoz, Nueva Ecija but only thermoresistant and thermophilic bacteria were selected for further characterization and identification. These isolates were identified as *Bacillus licheniformis* and *Proteus* sp. and were found to both possess ligninolytic enzyme and can utilize glucose. *B. licheniformis* was shown its capability in starch hydrolysis, kraft lignin and rice straw degradation but cannot produce bioethanol from rice straw. Also, these potential bacterial strains exhibit plant growth promoting ability which includes phosphorus solubilization and siderophore production but only *Proteus* sp. can produce indole acetic acid. Furthermore, lignin



content of different high yielding varieties of rice was measured through tissue staining and wet chemistry analysis. Total lignin content in both methods were somehow correlated since two of the varieties varied in both methods.



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