



CENTRAL LUZON STATE UNIVERSITY



**IDENTIFICATION AND EVALUATION OF PLANT GROWTH PROMOTING
BACTERIA AS POTENTIAL ENHANCER FOR DROUGHT
TOLERANCE IN UPLAND RICE**

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An Undergraduate Thesis Submitted to the Faculty of the Department of
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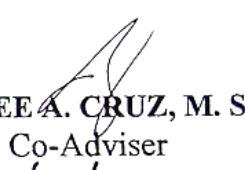
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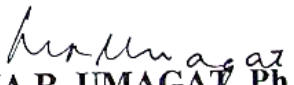
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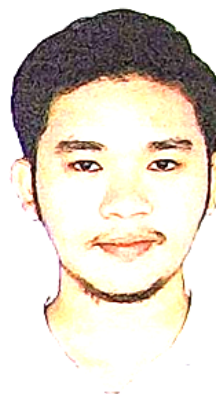
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ABSTRACT

ANDRES, SAM RAVEN D. 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. **IDENTIFICATION AND EVALUATION OF PLANT GROWTH PROMOTING BACERIA AS POTENTIAL ENHANCER FOR DROUGHT TOLERANCE N UPLAND RICE.**

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Drought is a major constraint in agricultural crop production that causes low average yield of upland rice. Here, 75 potential isolates were screened for their growth promoting activities to evaluate the effectiveness of rhizospheric bacteria on the growth and ability to enhance drought tolerance of upland rice. Top five performing isolates in indole-3-acetic acid production and ACC deaminase activity were selected in which isolate 53, 54, 59, 87 and 124 were chosen to be screened in drought screening using various levels of PEG. Bacterial isolates produced both indole-3-acetic acid (IAA) and 1-aminocyclopropane-1-carboxylate (ACC) deaminase and were able to increase shoot length, root length and percentage of dry matter of upland rice under growth room condition. In this study, inoculation with bacterial isolate 53, 54, 59, 87 and 124 significantly increased shoot length of seedlings treated with bacterial isolates at 15% and 35% PEG at 7 DAS, in shoot length at 15% PEG at 14 DAS, fresh weight of rice seedlings in 25% PEG, and dry matter percentage at 35% PEG, however in fresh weight



at 15% and 35% PEG no significant difference was recorded but was able to observed a percentage increase of up to 16.38% and 39.58% increase respectively, improvement of up to 25% in observation in drought intolerance also contributes to the conclusion that plant growth promoting bacteria can be a promising approach to control drought stress. However, re-evaluation of the selected isolates for drought tolerance and growth promoting activities at seedling stage is recommended to validate previous results and field assessment to determine the effect of biotic and abiotic stresses. Hence, it is recommended to identify the bacterial isolates using 16S rDNA analysis.



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