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 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

JUNE 2017

Republic of the Philippines
CENTRAL LUZON STATE UNIVERSITY
Science City of Muñoz, Nueva Ecija

COLLEGE OF ARTS AND SCIENCES
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ACKNOWLEDGEMENT

First and foremost, praises and thanks to the God, the Almighty, for His showers of blessings throughout the researcher's work to complete the research successfully.

The author would like to express his deepest gratitude to his adviser, Dr. Jerwin R. Undan, for giving him advices to finish the study successfully. Without his utmost support, this study would not have been possible;

The author would also like to express his deep and sincere gratitude to his research adviser in PhilRice, Ms. Jayvee A. Cruz, for giving him the opportunity to do research and providing invaluable guidance throughout this research. Her dynamism, vision, sincerity and motivation have deeply inspired him. She has taught the methodology to carry out the research and to present the research works as clearly as possible. It was a great privilege and honor to work and study under her guidance.

To his committee, Ms. Mary Jhane G. Valentino and Mr. Rich Milton R. Dulay the Department Research Coordinator, for their encouragement, insightful comments, and supervision that helped him to carry out this thesis;

To Dr. Evaristo A. Abella, the Department Chair, Dr. Anna Maria Lourdes S. Latonio, the College Research Coordinator and Dr. Myrna R. Umagat, the College Dean for allowing him to undertake this study;

The author is extending his heartfelt thanks to his research adviser's co-worker's in PhilRice Ma'am Arlen A. Dela Cruz, Ma'am Yeyeth C. Fernando, Sir Rey L. Ordonio, and her staff; kuya Josef R. Bautista, Ate Ann Jhudeil C. Santos, Ate Editha V.

Evangelista, kuya Ronel Aguilar and his co-student researchers, Harry Jay Cavite and Abby Ador Dionisio for their acceptance, patience and family like treatment.

The author is extremely grateful to his parents Benjamin S. Andres and Josiephine D. Andres; his sisters Erika Joy D. Andres and Diane Kate D. Andres for their love, prayers, caring and sacrifices.

The author would like to say thanks to his friends Abegail A. Alcazar, Jaya Lou Pasigue, Noemi C. Ramilo, Eduardo J. Damaso, Jr, Kresta Padilla, Levi Corpuz, Wilson Mendoza and Kristal Dale Corpuz for providing him with unfailing support and continuous encouragement through the process of conducting and writing this thesis.

Finally, his thanks go to all the people who have supported him to complete the research work directly or indirectly.

SAM RAVEN D. ANDRES

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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.**

Manuscript No: BIO-M-2nd 17-023

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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 where 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 was selected in which isolate 53, 54, 59, 87 and 124 were chosen to be screened in drought screening using various level of PEG. Bacterial isolates produced both indole-3-acetic acid (IAA) and 1-aminocyclopropane-1-carboxylate (ACC) deaminase and were able to increased 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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