ANTHOCYANIN QUANTIFICATION AND MOLECULAR PROFILING OF GENE CONTROLLING PIGMENT IN CENTRAL LUZON STATE UNIVERSITY PIGMENTED RICE GERMPLASM

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ACCEPTANCE SHEET

This undergraduate thesis entitled **"ANTHOCYANIN QUANTIFICATION AND MOLECULAR PROFILING OF GENE CONTROLLING PIGMENT IN CENTRAL LUZON STATE UNIVERSITY PIGMENTED RICE GERMPLASM"**, prepared and submitted by **REYNIEL R. AQUINO**, in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN AGRICULTURE (CROP SCIENCE – AGRONOMY)**, is hereby accepted:

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BIOGRAPHICAL SKETCH

Reyniel Ramirez Aquino was born on November 12, 1998 in Unzad, Villasis, Pangasinan. He is the third of the four children of Mr. Reynaldo B. Aquino and Mrs. Regina R. Aquino.

He finished his elementary education at the STARS Educational Center Inc. in 2011 as fourth honors. He also finished his secondary education at the Unzad National High School in 2015 as class Valedictorian. The author is not only academically inclined but also experienced in music and arts. He also became a student leader elected as president of the Supreme Student Government during his last year in high school. In 2015, he was admitted at Central Luzon State University, Science City of Muñoz, Nueva Ecija under the Bachelor of Science in Agriculture program Major in Crop Science specializing in Agronomy. Aside from his academics, he also engaged in extra-curricular activities and participating national quiz contest. He was also a former president of a college-based organization, Society of Crop Science Majors. In 2017, he graduated with Certificate in Agricultural Science during his second year in college.

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ABSTRACT

AQUINO, REYNIEL R., Department of Crop Science, College of Agriculture, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **JUNE 2019, ANTHOCYANIN QUANTIFICATION AND MOLECULAR PROFILING OF GENE CONTROLLING PIGMENT IN CENTRAL LUZON STATE UNIVERSITY PIGMENTED RICE GERMPLASM**

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Pigmentation in rice pericarps is governed by *Rd*, *Rc*, and *Ra* genes, and the presence or absence of these genes determines the variation of anthocyanin deposition in rice pericarps. The twenty pigmented rice germplasm of Central Luzon State University were genetically profiled and total anthocyanin content was obtained as well as agro-morphological characterization was observed. This study aimed to (1) determine the anthocyanin content of the different pigmented rice accessions, (2) profile selected gene (*Rc, Rd,* and *Ra*) controlling pigmentation in rice, (3) morphologically characterize the twenty CLSU pigmented rice germplasm and (4) determine the grain yield component.

The accessions that obtained the highest total anthocyanin content were from Ominio and Bongkitan PG. It was also observed that high amounts of anthocyanin were obtained from purple pericarps, significant amounts on red and brown pericarps and negligible amounts on white rice pericarps. Moreover, *Rd* gene was amplified on all accessions except for Escalante. Whereas, *Rc* gene was amplified at different expected products on all the accessions. While, *Ra* gene was amplified on all accessions except for Escalante and the non-pigmented accessions. Further, seven groups were observed in the dendrogram generated from morphological characterization. Consequently, the selection

of two accessions belonging to separate groups in the dendrogram can be used by breeders for crossing more diverse parents for better variability among their progenies.

The phenotypic and genotypic data gathered from this study provides a valuable information that can be used as basis for selection of accessions with high yielding ability and high anthocyanin that could be reproduced as a source of special rice with healthier benefits or more nutritious than ordinary rice.

Keywords: pigmented rice germplasm; anthocyanins; purple rice; red rice

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