# VIRULENCE CHARACTERIZATION OF ISOLATED FUNGAL ANTAGONIST AGAINST RICE BLAST (*Magnaporthe oryzae*) Couch.

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An Undergraduate Thesis Submitted to the Faculty of the Department of Crop Protection, College of Agriculture, Central Luzon State University Science City of Muñoz, Nueva Ecija, Philippines in Partial Fulfillment of the Requirements for the Degree of

**BACHELOR OF SCIENCE IN AGRICULTURE**
**(Crop Protection Plant-Pathology)**

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## ACCEPTANCE SHEET

This undergraduate thesis manuscript entitled **"VIRULENCE CHARACTERIZATION OF ISOLATED FUNGAL ANTAGONIST AGAINST RICE BLAST (*Magnaporthe oryzae*) Couch.,"** prepared and submitted by **JEFFREY MONTOYA OREJANA,** in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN AGRICULTURE (CROP PROTECTION-Plant Pathology),** is hereby accepted:

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## BIOGRAPHICAL SKETCH

The author, Jeffrey Montoya Orejana was born in Tondo General Hospital in Tondo, Manila on March 24, 1998. He is the second child of the three children of Mr. Reynaldo M. Orejana and Mrs. Teresita M. Orejana. He is currently living in T. delos santos street, Poblacion South, Science City of Muñoz, Nueva Ecija, Philippines.

His eldest brother Johnrey is working in Otautau, New Zealand as Dairy assistant farm technician, while his younger brother is 2nd year college in Philippine Nippon Technical College in Calamba, Laguna. His proud parents are Mr. Reynaldo Orejana who is an auto mechanic and Mrs. Teresita Orejana is a unit manager of a life plan in an insurance company. He started his primary education in 2004 at Muñoz Central School in Science City of Muñoz, Nueva Ecija, and finished it in 2010. After elementary, his parents enrolled him at Muñoz National High School to take his secondary education. He belongs to the pilot section in basic education curriculum, and graduated high school in 2014.

In his tertiary, he decided to take the entrance exam and he passed the College Admission Test (CAT) in Central Luzon State University. During enrolment, he took up the Bachelor of Science in Agriculture, and in 3$^{rd}$ year, and Plant Pathology as his field of specialization in the department of Crop Protection. In his college life, he became the member of organization in Pest Management Society (PMS).

He is one of the scholars of the CHED Tulong Dunong from 2014-2018, and in year 2019, he became the scholar of ANCLA partylist. He is also an active member of Sangguniang Kabataan (SK) Councilor official in his barangay Poblacion South in Science City of Muñoz,

He continues to strive for his dreams, and he promised to finish his study for his family. And finally, he obtained his certification in Agricultural Science and degree in Bachelor of Science in Agriculture in year 2019.

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## ABSTRACT

**OREJANA, JEFFREY M.,** Department of Crop Protection, College of Agriculture, Central Luzon State University, Science City of Muñoz, Nueva Ecija, Philippines, **June 2019, VIRULENCE CHARACTERIZATION OF ISOLATED FUNGAL ANTAGONIST AGAINST RICE BLAST (*Magnaporthe oryzae)* Couch.**

Adviser: MARILYN G. PATRICIO, Ph.D.
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Rice blast caused by *Magnaporthe oryzae* is one of the most important fungal disease in rice. Bio-control agent provides sustainable control for the disease. Generally, the study aimed to characterize the virulence of isolated fungal antagonist against rice blast. Moreover, in this study the rice blast fungal pathogen (*Magnaporthe oryzae*) was isolated through single spore isolation technique, identified the fungal antagonist using morphological and molecular approach, and conducted dual culture assay.

Results showed that, P1, P2, P6 and P8 isolates were identified as *Penicillium verruculosum* and isolates FA and FB were identified as *Fusarium oxysporum* with 98-100% identity. Phylogenetic tree displayed that the P8J (P8) isolates was closely related to *P. verruculosum* species among the four *Penicillium* species, and FAJ was closely related to *Fusarium oxysporum*. Dual culture assay showed that among five isolates; P1, P2, P6, FA and FB, the P1 isolates exhibited the highest percent growth of inhibition of 46.9 % against *Magnaporthe oryzae* compare to the other isolates.



Keywords: fungal antagonist; *Magnaporthe oryzae; Penicillium verruculosum*; mono-conidial isolation; dual culture assay

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