CENTRAL LUZON STATE UNIVERSITY

SEQUENCING AND CHARACTERIZATION OF *LACI* GENE OF *Ganoderma lucidum*

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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 Fulfillment of the Requirements for the Degree

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ABSTRACT

CASABAR, JENNIFER T. Bachelor of Science in Biology, Department of Biological Sciences, College of Arts and Sciences, Central Luzon State University, Science City of Munoz, Nueva Ecija. Philippines, June 2017, **SEQUENCING AND CHARACTERIZATION OF LAC1 GENE OF *Ganoderma lucidum.***

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Laccases are multicopper enzymes belonging to the group of blue oxidases that has been known due to its potential functions in detoxification, wine stabilization, paper processing, textile dye bleaching, pulp bleaching, detergents and enzymatic conversion of chemical intermediates. These laccases can completely mineralized by white-rot fungi like *G. lucidum.* In this study, new sets of primers were designed from the conserved regions of the nucleotide sequences of *laccase* gene from different *Ganoderma* species using Primer3. The *LAC1* gene obtained from the mycelia of *G. lucidum* collected from CTMRD was successfully isolated with a 550 bp long of nucleotide sequence. The amplified partial *LAC1* gene had 79% similarity to *G. lucidum* laccase with an accession number of DQ914869.1 and found to had 85% similarity to *G. weberianum* laccase with an accession number of KF384100.1. The percentage homology of the obtained sequence to other fungal laccases ranged from 69% to 85%. In the nucleotide percentage identity matrix done with Clustal 2.1, there was 57.73% homology of laccases between GL_LAC1 and *G. lucidum* (DQ914869.1) and particularly it has approximately 255

polymorphisms within the amplified region. On the other hand, there was 56.35% homology between the laccases of GL_LAC1 and *G. weberianum* (KF384100.1) and GL_LAC1 had~295 polymorphisms as compared to *G. weberianum*. *LAC1* gene obtained from *G. lucidum* is distant relative to other laccases isolated and supported the idea that *G. lucidum* has a complex structure that made it unique among other *Ganoderma* species.

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