ENRICHMENT OF PHENOLIC ANTIOXIDANT OF SABA BANANA *(Musa acuminata x balbisiana)* PEEL BY SOLID-STATE BIOCONVERSION USING *Rhizopus oryzae*

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APPROVAL AND ACCEPTANCE

The undergraduate thesis entitled **ENRICHMENT OF PHENOLIC ANTIOXIDANT OF SABA BANANA** *(Musa acuminata x balbisiana)* **BY SOLID-STATE BIOCONVERSION USING** *Rhizopus oryzae* prepared and submitted by **EULYNNE C. EUGENIO** in partial fulfillment of the requirements for the degree of **BACHELOR OF SCIENCE IN CHEMISTRY** is hereby

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ENRICHMENT OF PHENOLIC ANTIOXIDANT OF SABA BANANA *(Musa acuminata x balbisiana)* BY SOLID-STATE BIOCONVERSION USING *Rhizopus oryzae*[1]

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ABSTRACT

Background: Saba *(Musa acuminata x balbisiana)* banana is one of the common varieties of banana in the Philippines. Banana peels are wastes that contribute pollution to the environment, but also a good source of antioxidants. Solid-state bioconversion (SSB) was used to enrich the phenolic capacity of fruit wastes. *Rhizopus oryzae,* the fungi responsible for fermentation during SSB, can produce β-glucosidase enzyme that can free the bound phenolics during enzyme hydrolysis, and improve antioxidant activity. **Methods:** Two treatments were prepared: one (T1) containing Saba banana peel only, and the other (T2) containing Saba banana peel with 8mm *Rhizopus oryzae*. Treatments were fermented for 16 days. Both treatments were analyzed every after two days. The treatments were extracted after 48 hours of soaking using 80% ethanol. The filtrates were measured spectrophotometrically. The total phenolic content was measured using Folin-Ciocalteau method, and the antioxidant activity using DPPH and H_2O_2 radical scavenging activities. **Results:** The total phenolic content of Saba banana peel without *Rhizopus oryzae* is 0.45 mg/GAE g higher than Saba banana peel with *Rhizopus oryzae*. While in its antioxidant activity, Saba banana peel with *Rhizopus oryzae* is 1.61% higher in inhibiting DPPH radicals compared to Saba banana peel without *Rhizopus oryzae*. In the inhibition of H_2O_2 radicals, the obtained values were negative due to the extraction solvent used, ethanol. The radicals oxidized the ethanol, instead of being scavenged by the Saba banana peel extracts. **Conclusions:** SSB using *Rhizopus oryzae* cannot enrich the total phenolic content of Saba banana peel, and its antioxidant activity.

Keywords: solid-state bioconversion (SSB), *Rhizopus oryzae,* Saba banana (*Musa acuminata x balbisiana),* β-glucosidase

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