# SUNFLOWER FLORAL NECTAR CHARACTERIZATION AND GENE EXPRESSION ANALYSIS OF SUCROSE HYDROLYSING GENE *HaCWINV2*

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

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## ACCEPTANCE SHEET

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## BIOGRAPHICAL SKETCH

The author of the study is Ms. Xyrelle P. Juan. She is the third among the four siblings of Mr. and Mrs. Teresita Juan. The names of her older brothers are Christian and Jacob, and her younger sister is Bhethel Divine. She was born in December 17, 1999 at Sto. Domingo, Nueva Ecija continues to live in there.

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# ABSTRACT

**JUAN, XYRELLE P.,** Department of Crop Science, College of Agriculture, Central Luzon State University, Science City of Munoz, Nueva Ecija, Philippines, **June 2019, SUNFLOWER FLORAL NECTAR CHARACTERIZATION AND GENE EXPRESSION ANALYSIS OF SUCROSE HYDROLYSING GENE *HaCWINV2***

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Pollination enhances the seed setting of the cross-pollinated crops and maintains the floral diversity in the ecosystem. Honeybees benefited as they perform the function of pollination by obtaining nectar as their main source of food. However, populations of honey bees are declining due to excessive use of pesticide, change in climate, lack of nectar source plants and eventually may lead to declining of beekeeping industry and honey production. Sunflower honey is one of the most in-demand due to its nutraceuticals and flavor. Thus, this study was conducted to evaluate the floral parts and floral nectar of selected CLSU Sunflower Germplasm in terms of volume, sugar concentration, sugar composition and gene expression of *HaCWINV2* gene responsible in hydrolysing sucrose to glucose and fructose as pollinators have different sugar preferences. Among the 23 accessions, six are single heads and 17 have more than one flower which may contributed to the amount of nectar. CL-SF18 accession provides the highest average sugar volume and the third based on head diameter. In terms of sugar concentration, three accessions fall above the optimum sugar requirement of bees. These are CL-SF1 with 71.83 brix, CL-SF27= 63.33 brix, and CL-SF14= 61.67 brix. The gene expression analysis shows that CL-SF27 has the highest gene expression over the ten selected accessions that correlate to the sugar composition analysis. High expression of the gene results to low

content sucrose having a negative weak linear association, glucose and fructose have a strong linear association with the gene expression of *HaCWINV2*. The same accession has the highest glucose content of 2.01g/l and fructose of 1.14g/l. result of higher glucose. Thus, it is a good candidate as source of nectar for beekeeping industry.

Keywords: sunflower, nectar, *HaCWINV2*

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