

**CYTOTOXIC EFFECT OF *Cyces zambalensis* USING BRINE SHRIMP  
(*Artemia salina*) LETHALITY BIOASSAY**

**THESIS**

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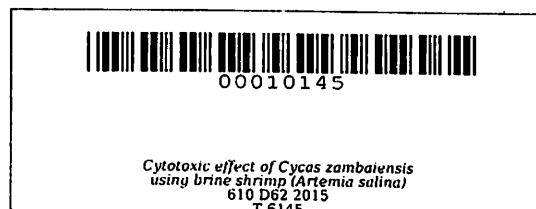
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(*Artemia salina*) LETHALITY BIOASSAY**

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## ABSTRACT

DIONISIO, MA. JANINE D., GALAM, JENNY ROSE G., AND RODRIN, ELLAINE B. Cytotoxic Effect of *Cycas zambalensis* using Brine Shrimp (*Artemia salina*) Lethality Bioassay. Undergraduate Thesis. Bachelor of Science in Medical Technology, Cavite State University, Indang, Cavite. October 2015. Adviser: Prof. Ronalyn Sanchez, RMT.

The study, entitled “Cytotoxic Effect of *Cycas zambalensis* using Brine Shrimp (*Artemia salina*) Lethality Bioassay,” was conducted at College of Nursing, Medical Technology Department, at Cavite State University, Indang, Cavite from April to October, 2014. Generally, the study aimed to assess the cytotoxic potential of *Cycas zambalensis* plant extracts using brine shrimp. Specifically, it aimed to: determine the phytochemical contents of the plant; assess which concentration of each extract has the greatest cytotoxic effect; compare which of the extracts is the most effective; and ascertain the lethal concentration of the extracts.

The phytochemical constituents of the leaves were qualitatively analyzed by submitting the samples to Department of Science and Technology, Taguig City. Each of the ethanolic, methanolic and hexanolic extracts of *Cycas zambalensis* leaves were prepared in 10 000µg/ml, 1 000µg/ml, 100µg/ml, and 10µg/ml concentrations and were screened for cytotoxicity potential using Brine Shrimp Lethality Assay (BSLA). Ten active nauplii in each vial were tested, with three replicates for each treatment. Positive and negative control was also tested. After 24 hours of incubation, the numbers of surviving shrimps were counted. Cytotoxicity was evaluated in terms of lethality concentration (LC<sub>50</sub>).

Based on phytochemical analysis, *Cycas zambalensis* leaves contain flavonoids and tannins, which are known to have cytotoxic ability.

Ethanollic extracts showed a significant activity by the values of  $p < 0.01$  using one-way analysis of variance (ANOVA). Likewise, methanolic and hexanolic extracts showed a markedly significant cytotoxic activity by the values of  $p < 0.05$  using one-way analysis of variance (ANOVA).

Results of the study showed that all of the prepared extracts were found effective, however, hexanolic extract was the most potent against brine shrimps. The 1 000 $\mu$ g/ml concentration of ethanol and hexane extracts and 10 000 $\mu$ g/ml concentration of methanolic extract of *Cycas zambalensis* showed the greatest cytotoxic effect against brine shrimps. Ethanolic, methanolic and hexanolic extract of *Cycas zambalensis* leaves were potent against brine shrimp with  $LC_{50}$  values of 100, 100 and 10  $\mu$ g/mL, respectively. Results were interpreted based on an  $LC_{50}$  value of 1.0-10.0 indicates toxicity, and  $LC_{50} > 30 < 100$   $\mu$ g/mL indicates mildly toxic. Therefore, this may serve as baseline information for future researchers and may also be used as an alternative treatment or a medicinal plant to prevent the growth of cancer cells.

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An undergraduate thesis submitted to the faculty of Department of Medical Technology, College of Nursing, Cavite State University, Indang, Cavite in partial fulfillment of the requirements for the degree of Bachelor of Science in Medical Technology with Contribution No. SP CON MT no. 2015 - 02. Prepared under the supervision of Prof. Ronalyn S. Sanchez, RMT.

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## **INTRODUCTION**

*Cycas*, of the family Cycadaceae are a group of plants of many unique features, with ancient origin and a very long history. *Cycas* are known to have lived over 200 million years ago during the Permian era, even before the dinosaurs roamed the earth. Although once abundant across the globe, the *Cycads* are now greatly reduced in both numbers and distribution. There are now about 250 species in 11 genera and each genus has a restricted geographical range (Hill, 2010).

*Cycas zambalensis* which is a native in the Philippines, usually distributed on the hillsides and grow fully exposed to the sun and strong wind near the sea, were distinguished by having long petioles, densely brown-tomentose, tomentum persistent, with very woolly megasporophylls. Stems are tall, with a dark green, semiglossy leaves; a triangular, needle-like, stiff, pilose Cataphylls; with pollen cones, brownish orange in