

**NEUTRALIZING EFFECT OF CAFFEINE (1,3,7-TRIMETHYL XANTHINE)  
AGAINST PHILIPPINE COBRA VENOM (*Naja philippinensis*)**

**THESIS**

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## ABSTRACT

**BARROS, QUENNIE ROSE P., AND JABOL, RHIANDEE A. Neutralizing Effect Of Caffeine (1,3,7-trimethylxanthine) Against Philippine Cobra Venom (*Naja philippinensis*).** Undergraduate Thesis. Bachelor of Science in Medical Technology, Cavite State University, Indang, Cavite, October 2015. Adviser: Ms. Ronalyn S. Sanchez.

This study was conducted at the Medical Technology Laboratory, Cavite State University, Indang, Cavite from January to June 2015. It aimed to determine the neutralizing effects of caffeine (1,3,7-trimethylxanthine) against Philippine cobra venom (*Naja philippinensis*).

Phospholipase enzyme activity of the cobra venom was determined using Egg hydrolysis test developed by Yap, Tan, & Fung, (2011). Different concentration of caffeine namely 308 $\mu$ M, 103 $\mu$ M, 64.57 $\mu$ M, & 25.7  $\mu$ M were added to the egg yolk-venom solution. Changes in pH level in the solution were then recorded after one hour of incubation. Therapeutic dose 50 of caffeine, concentrations 308 $\mu$ M, 103 $\mu$ M, 64.57 $\mu$ M, & 25.7  $\mu$ M, were tested on venom injected-earthworm (*Eudrilus euginae*) (Wang, *et al*; 2011). Number of live earthworm were then counted after 24 hours of incubation.

The pH of the egg yolk solution dropped turning the solution acidic. However, the downward shift was abated upon treatments of caffeine concentration. This downward shift was due to the hydrolyzing effect of phospholipase enzyme present on the cobra venom at -acyl ester bonds of 3-sn-phospholipids yielding fatty acids and lysophospholipids (Sam, Gopalakrishnakone, & Chow, 2012). Analysis of variance has showed trial 1 was significant at p-value of 0.004 having 103  $\mu$ M caffeine concentration as the significant treatment using Tukey analysis. Probit analysis of the therapeutic dose

50 on venom-treated earthworm have shown that 103  $\mu$ M of caffeine was significant on neutralizing the venom activity as compared to other treatments.



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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 number **SP CON MT 2015-12**. Prepared under the supervision of Ms. Ronalyn S. Sanchez, RMT.

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## **INTRODUCTION**

The most deadly snakes are those with the most toxic venom that rarely bite people while the most dangerous are those that kill the most people. There are numerous snakes that were either deadly, dangerous or both, but in the Philippines, it is the bite of the Philippine cobra (*Naja philippinensis*) that matters the most (Research Institute for tropical Medicine, 2003). Philippine cobra venom(*Naja philippinensis*) constitute a wide array of enzyme belonging to a class of phospholipases. Cardiotoxicity, neurotoxicity, and myotoxicity are brought by this enzymes that differ only on specific amino acid, however the remainder is constant to all.

Based on the commentary of Mukherjee (2012), the World Health Organization declared that snake bite is a “neglected tropical disease” that may be considered as a global health matter. In addition to the unavailability of sufficient snake antivenom to