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STRESSED OUT: THE EFFECTS OF EPINASTINE AND OCTOPAMINE ON LEARNING, MEMORY, AND HEART RATE IN HELIOTHINE MOTHS

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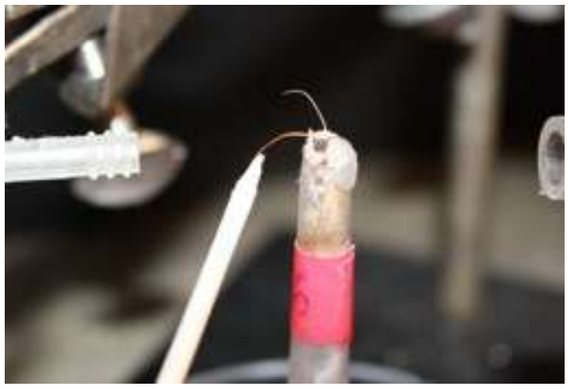

Octopamine (OA), a biogenic amine, is known to modulate many physiological processes in invertebrates. One such effect is an increase in cardiac output. Previous studies have also shown that OA assists in learning and memory in Heliothine moths. Epinastine (EPI) is a compound which acts as an OA antagonist. The purpose of this study is to investigate the effect of EPI on learning and memory, as well as the effects of OA and EPI on heart rate. To study the former, the proboscis extension reflex (PER), based on the Pavlovian conditioning model, was used. PER is the extension of the proboscis as a reflex to feed, elicited by sucrose stimulation applied to the antennae. *Heliothis virescens* were injected with saline (control) or EPI and conditioned to extend their proboscis during the presentation of an odour. In the second experiment, the effect of OA and EPI on heart rate was examined in *Helicoverpa zea*. Moths were dissected to expose the heart, which was bathed in saline (control), OA, and finally EPI in four consecutive trials. Following exposure, the beats per minute of the heart were counted. It was observed that PER response was greater in moths that were treated with EPI, compared to control moths. OA lowered the initial heart rate, and EPI further lowered the bpm. The average bpm at the final control trial was similar to that of the EPI trials. These data suggest that EPI could be hindering initial learning, and is metabolized before the 45 minute recall begins, as no hindrance is seen at recall trials. Addition of OA or EPI has little to no effect on the moth heart rate. Continued study of the OA/EPI effect on memory and heart rate has the potential to provide useful insights into stress.

Stephanie Powell graduated from Roncalli Central High School in Port Saunders, NL in 2007. Stephanie is currently completing her Honours thesis in her fourth year at Acadia University. She was awarded an Acadia entrance scholarship and the Fred C. Manning Scholarship, an award she has maintained for the past four years. Stephanie also received an undergraduate Natural Sciences and Engineering Research Council (NSERC) award to conduct her Honours research. She has been actively involved in campus life, serving as both an executive member of her residence house council and a New Student Orientation Leader, as well as working as a Resident Assistant in Whitman House for the past two years. In September, Stephanie was elected as the secretary of the 2011 Grad Class Executive, a position she will serve for life. Next year, she will be attending the University of Waterloo to complete the four year Doctor of Optometry program.