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AGE, LEARNING, AND MEMORY IN HONEY BEES (*APIS MELLIFERA*)

Deveau, Daniel, Dr. Dave Shutler

Department of Biology, Acadia University, Wolfville, NS

The European honey bee (*Apis mellifera*, hereafter honey bee) lives in hives containing of thousands of individuals that operate in an age-determined caste system. A worker honey bee adult starts as a nurse bee completing solely within-hive tasks, becomes a guard bee after three weeks, and becomes a forager bee for the last segment of its life. The different tasks honey bees take on as they age become steadily more dangerous. Honey bees incur wing damage as they work, with some tasks leading to more damage than others. Honey bees experience wing wear at a predictable rate making it a good indicator of relative age. The objective of this study was to test for a



link between age and learning and between age and memory in honey bees.

Associative learning and memory are very important for young honey bees, because they use scents learned in the hive to guide them when foraging later in life. Honey bees were put through the classical conditioning process based on honey bees' proboscis extension reflex (PER). PER is a common learning paradigm and is simply a honey bee extending its proboscis in response to stimulation of its antennae with a sugar solution coupled with scented air. After 24 hr, I tested whether honey bees still responded in the absence of a sugar reward which was interpreted as evidence of memory. There was a significant negative correlation between age and learning, but not between age and memory. Most honey bees did not learn or remember scent regardless of age and those that did remember were of all ages. There was also no correlation between learning and memory.

Daniel Deveau graduated from Mount Blue High School in Farmington ME in



2007. Daniel is currently completing his Honours thesis in his fourth year at Acadia. During his time at Acadia, Daniel has enjoyed being involved in a variety of programs such as BioBuds, a mentoring program for young bio majors, S.M.I.L.E., a program for aiding children with different levels of motor development, and coached youth soccer of various ages. Overall, his favorite experiences will be those that he had with his friends that he has made here. Daniel's future plans include gaining life experience while exploring new things and having fun.

