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From Oct. 21-27, Dr. Mustard can be reached at the Holiday Inn Select San Diego at (619) 291 5720 or by email.

From Oct. 23 – 28, please contact Holly at (614) 596-5053 or at the Omni San Diego Hotel at (619) 231-6664.

[Embargoed until 5 p.m. ET Saturday, Oct. 23, 2004, to coincide with a presentation at the Society for Neuroscience conference in San Diego.]

LATEST BUZZ IN RESEARCH: INTOXICATED HONEY BEES MAY CLUE SCIENTISTS INTO DRUNKEN HUMAN BEHAVIOR

COLUMBUS, Ohio – Inebriated bees could give researchers better insight into alcohol's effects on human behavior, a new study suggests.

"Alcohol affects bees and humans in similar ways – it impairs motor functioning along with learning and memory processing," said Julie Mustard, a study co-author and a postdoctoral researcher in entomology at Ohio State University.

Researchers gave honey bees various levels of ethanol, the intoxicating agent in liquor, and monitored the ensuing behavioral effects of the drink – specifically how much time the bees spent flying, walking, standing still, grooming and flat on their backs, so drunk they couldn't stand up. The researchers also measured the level of ethanol in the

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bees' hemolymph – the circulatory fluid of insects that's akin to blood.

in humans, as well as the molecular basis of addiction."

Not surprisingly, increasing ethanol consumption meant bees spent less time flying, walking and grooming, and more time upside down. The appearance of inebriation occured sooner for bees that were given a larger dose of ethanol. Also, blood ethanol levels increased with time and the amount of ethanol consumed.

This study is preliminary – the researchers simply wanted to see what effects ethanol had on honey bee behavior. In the future, however, they hope to use honey bees as a model for learning more about how chronic alcohol use affects humans, particularly at the molecular level.

"The honey bee nervous system is similar to that of vertebrates," said Geraldine Wright, a study co-author and a postdoctoral researcher in entomology at Ohio State.

Mustard concurred. "On the molecular level, the brains of honey bees and humans work the same. Knowing how chronic alcohol use affects genes and proteins in the honey bee brain may help us eventually understand how alcoholism affects memory and behavior in humans, as well as the molecular basis of addiction."

The researchers presented their work on October 23 in San Diego at the annual Society for Neuroscience conference.

Honey bees were secured into a small harness made from a piece of drinking straw. The researchers then fed bees solutions of sucrose and ethanol, with several ethanol concentrations ranging from 10 to 100 percent. The 10 percent solution was equivalent to drinking wine, Wright said, while the 100 percent solution, which contained no sucrose, was equivalent to drinking 200-proof grain alcohol. A group of control bees was given sucrose only.

The scientists fed the bees and then observed them for 40 minutes, tracking the insects' behaviors – how much time each bee spent walking, standing still, grooming, flying and upside down on its back.

Blood ethanol concentrations increased with time and with the amount of ethanol each bee had consumed. Behavioral differences between the bees depended on the amount of ethanol ingested.

The bees that had consumed the highest concentrations of ethanol – 50, 75 and 100 percent – spent a majority of the observation period on their backs, unable to stand. This effect happened early on, within the first 10 minutes of the observation period. They also spent almost no time grooming or flying.

"These bees had lost postural control," Mustard said. "They couldn't coordinate their legs well enough to flip themselves back over again."

Except for the control bees, bees that had consumed the least amount of ethanol – 10 percent – spent the least amount of time upside down. Even then, it took about 20 minutes for ethanol's effect to set in and cause this behavior.

The researchers hope to learn how alcohol consumption affects social behavior as well as gain a better understanding of the basic mechanisms that drive alcohol addiction and tolerance.

"Honey bees are very social animals, which makes them a great model for studying the effects of alcohol in a social context," Wright said.

"Many people get aggressive when they drink too much," she continued. "We want to learn if ethanol consumption makes the normally calm, friendly honey bee more aggressive. We may be able to examine how ethanol affects the neural basis of aggression in this insect, and in turn learn how it affects humans."

Mustard and Wright conducted this research with Ohio State colleagues Brian Smith, a professor of entomology, and Ian Maze, an undergraduate student studying microbiology.

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