B28 Identification of Active Odor Signature Chemical in Methamphetamine and 3,4-Methylenedioxy-N-Methylamphetamine (Ecstasy) Using *Canis Familiaris* as Biological Detectors

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The goals of this presentation are to determine the active signature odor that canines are alerting to when trained on MDMA and to establish whether this chemical is exclusive to MDMA or present in other commonly encountered non-illicit tablets.

It was found that canines alert to 10-100 mg of piperonal (a starting material in the synthesis of MDMA) and that compounds found in the headspace of tested over the counter tablets (OTCs) did not share common chemicals with MDMA.

The use of the illicit designer drug 3,4-Methylenedioxy-NMethylamphetamine (Ecstasy or MDMA) has risen in recent years. MDMA is now the fifth most identified controlled substance in crime labs and the newest controlled substance law enforcement detector dogs are being trained to alert to.

Many seizures of illicit drugs such as marijuana, cocaine, and heroin have been made possible by the assistance of detector dogs. The aim of this project was to identify the signature odors in MDMA street samples that detector dogs are alerting to and also to determine if those signature odors are exclusive to MDMA or also found in other commonly encountered non-illicit tablets.

The volatile chemicals that comprise the odor of the illicit drug 3,4-methylenedioxy-N-methylamphetamine (MDMA) were analyzed by Solid-Phase Microextraction (SPME) and identified with the use of GC/MS. Open system SPME studies revealed that the odor composition within the headspace of the sample does not change with respect to where the fiber is placed or the opening size of the system during the extraction period. These studies also indicate that as sample size increases the dominant headspace chemical becomes piperonal. A series of field studies with the assistance of certified narcotics detector dogs were conducted in order to determine the dominant odor compound to which dogs alert. Data suggests that the dominant active odor signature chemical emanating from MDMA tablets is piperonal rather than the parent drug itself. It was found that canines alert to 10-100 mg of piperonal. Studies dealing with the analyses of the headspace composition of different over the counter drugs (OTC) suggest that there is no common headspace compounds found in OTCs that could potentially lead to false positive alerts from the canines in association with these commonly encountered tablets.

MDMA, Detector Dogs, SPME

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