B24 Narcotic Age and Working Dog Performance: Instrumental Perspectives on Training Aid Lifespan

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After attending this presentation, attendees will better understand the chemicals emitted from both pseudo and real narcotic K-9 training aids evaluated over periods of time and how these aids perform in routine canine training.

This presentation will impact the forensic science community by providing strong, scientific perspectives, implementing both chemical and behavioral studies, concerning the odor concentration levels of K-9 narcotic training aids over time. Canines are the front line of defense in detecting narcotics by police and military working units worldwide. Therefore, this study will further enhance optimum canine detection procedures for national security purposes. The optimal implementation of canine narcotic detection impacts the forensic field by providing a valuable, highly deployable tool in the war against drugs.

There has been little scientific research into the use of narcotic training aids in relation to K-9 performance, even though they are a pivotal part of the training regimen. Many different associations that certify canines as narcotic detector dogs have very few standards as to the optimal lifespan of their training aids. Emerging research is beginning to look into canine detection, but none is specifically looking at the age or lifespan of narcotic canine training aids and their subsequent impact on canine performance.

The goals of this study were to monitor and provide a calibration standard of the target odor vapors emanating from real and pseudo K-9 training aids based on age and to document their training aid alert performance during K-9 field testing. The odor evaluation process consisted of collaboration with the Lubbock Police Department (LPD) Canine Unit and the use of their narcotic training aids that range up to 10 years of age compared to fresh training aids. The study used nine certified narcotic detection K-9 teams for field testing purposes. Instrumental evaluation utilized Divinylbenzene/Carbon/Polydimethylsiloxane (DVB/CAR/PDMS) -coated Solid-Phase Microextraction (SPME) fibers that were injected into a Gas Chromatography/Mass Spectrometry (GC/MS) system for the identification of extracted narcotic headspace odor profiles of heroin, methamphetamine, and cocaine. The LPD narcotic training aids were sampled in individual mason jars for time increments of 15 minutes, 30 minutes, and 1 hour to allow for headspace extraction time optimization. The pseudo narcotic formulations were evaluated in a controlled laboratory setting of storage time ranges of 2 weeks, 4 weeks, 6 weeks, and up to 12 weeks. Evaluation of both abundance and type of target volatiles was performed at each extraction time to measure training aid condition for both real and pseudo narcotics. This was performed in order to document the emission of odor vapors at different time ranges. Field testing of both the real and the pseudo narcotic training aids were then run through routine K-9 detection narcotic training by a double-blind line-up test. The findings include an assortment of chemical compounds emitted from each narcotic exhibiting distinctive odor profiles as a factor of age.

Conclusion and Significance: The benefit this study provides is enhanced knowledge in the realm of optimal canine detection procedures for national security purposes and K-9 detection performance. This research will ultimately bridge a gap in knowledge regarding the odor concentration levels for canine narcotic training aids at various ages and how this age or lifespan impacts practical canine field work, an aspect which has not previously been evaluated.

Canine Detection, Narcotic Odor, SPME-GC/MS

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