



### A188 Detection Canine Field Accuracy to Flowers Producing Methyl Benzoate (A Cocaine Odorant)

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The goal of this presentation is to inform attendees of the capabilities of canine detectors, in terms of their field accuracy and selectivity, by discussing their response to common landscaping and decorative plants that contain the active odor signature of an illicit substance.

This presentation will impact the forensic science community by strengthening the weight and validity of evidence discovered by detector canines in a court of law through the exploration of the figures of merit of detector canines, which includes their accuracy, selectivity, and reliability.

Biological detectors, such as canines, are valuable tools for the rapid identification of illicit substances because they can be trained to reliably detect a wide variety of odors and track them to the source. Previous studies have shown that detection canines do not induce an alert response to the parent compound or illicit substance, but to specific components comprised of the substance's signature odor profile. Such signature odors are Volatile Organic Compounds (VOCs) identified in the headspace of the substance in question. For example, methyl benzoate has been identified as the active signature odor of cocaine.<sup>1</sup> While this revelation has assisted in the understanding of canine detectors, helped to improve their training and efficiency, and led to the production of pseudo-drug training aids, it has also raised many questions. Recently, the accuracy and reliability of canine detectors has been challenged within the forensic community and the legal system.

One recent example of the scrutiny faced by detection canines was referenced in the case *State of Florida vs. Joelis Jardines*.<sup>2</sup> This case revolved around the argument of whether a warrantless canine drug-detection sniff performed at the front door of a private residence was a breach of the Fourth Amendment. The Respondent's position, believing that this scenario is, in fact, unconstitutional, used scientific canine literature to back up this argument to aid in discrediting the use of canines in this scenario. It was stated that if a canine is alerting to the active odor signature that the canine associates with the contraband, and not the contraband itself, the canine's accuracy and selectivity is under question, especially since many of these compounds have been found in common household products. Specifically, methyl benzoate, the sweet-smelling VOC associated with cocaine, has recently been found to be the most abundant compound produced by popular landscaping flowers, such as snapdragons (*Antirrhinums*), as a means of attracting pollinators.<sup>3</sup> Therefore, the question arose whether a canine would falsely alert to a snapdragon flower bed, bouquet, or arrangement if a canine alerts to methyl benzoate, as there was no previous scientific evidence to support this claim.

The purpose of this study was to examine the VOCs released from various types of newly grown snapdragon flowers, primarily methyl benzoate, and assess its potential at eliciting a false alert from specially trained detector canines. An optimized method using Headspace Solid-Phase Microextraction coupled with Gas Chromatography-Mass Spectrometry (HS-SPME-GC/MS) was used to assess the different types and abundances of compounds generated from snapdragons at various stages throughout their life cycle, as well as to determine the day at which the highest amount of VOCs was produced. The findings from this study were used to evaluate the accuracy of the response given by detector canines, especially when the flowers were at their highest methyl benzoate production rates. The results suggest that although methyl benzoate is a heavy contributor to the odor profile of snapdragon flowers, other compounds contribute heavily, if not more, than that of methyl benzoate. A canine's ability to distinguish between unfamiliar pools of odor which slightly resemble the illicit substance, like those produced by snapdragon flowers, as well as the potential of a false alert in a similar field scenario, was examined. More than fifty canine trials were performed to evaluate four different types of snapdragon flowers. Results showed that 0% of the canines alerted to the flowers, while 100% alerted to cocaine, the positive control. Though methyl benzoate was found to be released by the snapdragon flowers, the results revealed that canines do not need further training to differentiate between similar odor pools validating their discrimination power and use in the field.

#### References:

- <sup>1</sup>Furton, K. G.; Hong, Y.; Hsu, Y. L.; Luo, T.; Rose, S.; Walton, J. Identification of Odor Signature Chemicals in Cocaine Using Solid-Phase Microextraction-Gas Chromatography and Detector-Dog Response to Isolated Compounds Spiked on US Paper Currency. *Journal of chromatographic science* 2002, 40 (3), 147-155.



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1. Leslie A. Shoebottom. State of Florida v. Joelis Jardines: Brief of Amici Curiae Fourth Amendment in Support of Respondent. 2012. Cuckle Law Brief Printing.
  2. Dudareva, N.; Murfitt, L. M.; Mann, C. J.; Gorenstein, N.; Kolosova, N.; Kish, C. M.; Bonham, C.; Wood, K. Developmental regulation of methyl benzoate biosynthesis and emission in snapdragon flowers. *The Plant Cell Online* 2000, 12 (6), 949-961.
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### **Detection Canines, Methyl Benzoate, Illicit Substances**