



D73 Canine Detection and Discrimination of Cadaveric Human Blood

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After attending this presentation, attendees will have a better understanding of how a well-trained detection dog team can maximize the collection of evidence from crime scene and improve investigative efforts

This presentation will impact the forensic science community by providing a variety of benefits to law enforcement regarding the need to improve the performance, reliability, and courtroom defensibility of detection dog teams and their optimized combination with both medical and forensic operators.

This study has determined that trained detection dogs do not alert to generic scent, rather they alert to blood traces, maximizing the location of blood trace evidence in an efficient, cost- and time-effective manner while minimizing the collection of samples not relevant to an investigation.

The scientific and medical evaluation of the crime scene requires a relatively short response time to avoid contamination of the same and, therefore, a well-trained dog allows faster coverage of very large areas of research, preserving any and all possible evidence.

The technique of shaping with positive reinforcements was used to obtain the result of blood scent detection and discrimination.

The goal of this research has been to identify and quantify the minimum mass of cadaveric blood (low concentration) required in order to potentially generate an alert by a detection canine by a *positive predictive value* (PPV).

Field trial experiments to determine canine interest in the observed blood samples were conducted. The canine detection of blood scent in low concentration is called "*sensitivity*."

In addition, this study reports the analysis of several potential interference odorant compounds at these blood scent traces in minimum concentration, and the associated percentages of false positive alerts (false PPV). The canine discrimination of blood scent traces in minimum concentration is called "*specificity*."

After training the detector canines to the cadaveric blood, a series of field trials are performed to test the canine's "*Limit Of Detection*" (LOD) for the blood, which is the lowest quantity of a substance that the dog can distinguish from the absence of that substance (blank value).

The limit of detection (LOD) has been determined by performing scent line-ups in which various amounts of blood have been exposed and the lowest concentration of blood for which the canine can still alert have been recorded.

The study demonstrates that canines are generally not using the relatively low volatility parent substances, but instead use characteristic volatile headspace components to accurately locate specimen of blood, with the ability to distinguish between living and deceased human blood, as well as between human and animal blood.

Detection canines are the most common and widely accepted biological detectors due to the ability of canines to quickly and reliably locate the source of an odor to which they are trained.

The results of this study indicate that the well-trained cadaver dog is an outstanding tool for crime scene investigation displaying excellent sensitivity (88%), specificity (97%), and having a positive predictive value (94%), negative predictive value (98%) as well as accuracy (96%).

These recovery rates, ranged between 88% and 98%, indicate that properly trained cadaver dogs can make significant contributions in the location and recovery human cadaveric blood traces.

Canine Detection and Discrimination, Crime Scene, Cadaveric Human Blood