TD-GC×GC-TOFMS study of human cadaveric VOC profiles

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Human remain detection (HRD) canines are commonly used to locate or trace cadavers, but also to assist in recovering victims of natural disasters. Some artificial scent solutions are available for training purposes, but what dogs are generally educated with are oversimplistic solutions[1]. A better understanding of the volatile organic compound (VOC) profile released by death or injured bodies could possibly help better design of training solutions for forensic purposes.

In previous studies, we developed direct-sampling based approaches for cadaveric VOC analysis from grave soils and decaying bodies by mean of thermal desorption (TD) coupled to comprehensive two-dimensional GC coupled to time-of-flight MS (GC×GC-TOFMS)[2,3,4]. They were based on the use of human analogs (Sus domesticus L. carcasses).

For the present study, we investigated the VOC profile of early stage decomposition of human bodies. We analyzed samples collected during different trials organized during different seasons in a body farm located in Texas. Samples included environmental controls, pig carcasses, and human bodies (protected or not from scavenger insects). The data processing was performed in the light of identifying possible seasonal and species variations. Both peak capacity enhancement and spectral deconvolution helped to characterize VOC mixtures and improve comparisons of profiles.

Acknowledgements: Human samples were collected during the project “Development and validation of standard operating procedures for measuring microbial populations for estimating a post-mortem interval” Grant Award No. 2010-DN-BX-K243. The authors of that grant are acknowledged for giving us the opportunity to access cadavers for sampling.

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