

Volatile collection of cadaveric compounds

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Context

Thanatochemistry, also named "chemistry of death", is poorly studied and the available information regarding the volatile organic compounds (cadaveric VOCs) released after death are rather limited. Thanks to the use of analytical chemistry methods, the olfactive signature of a dead body may be studied during the decomposition process. Domestic pigs (*Sus domesticus*) are used as animal model to surrogate human decomposition.

Volatile collection: two techniques may be used to collect the cadaveric VOCs

Dynamic sampling



Pump device



Passive sampling



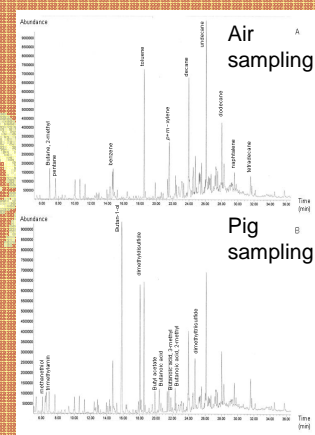
Radiello® diffusive sampler



The smell of death... is constituted by a blend of volatile organic compounds which change during the decay process.

Our study [1] using GC-MS for cadaveric VOC identification in different biotopes reported on around 100 analytes of interest including acids, ketones, aldehydes, esters, alcohols, nitrogen compounds,

sulfur compounds, cyclic and non-cyclic hydrocarbons, as well as halogenated compounds. However, we found no trace of cadaverine or putrescine.



Chemical analyses

cadaveric VOCs may be analyzed by gas chromatography coupled to mass spectrometry (GC-MS) or more recently with comprehensive two dimensional gas chromatography (GCxGC) coupled to time-of-flight mass spectrometry (TOF-MS). Before their chromatographic analyses, analytes may be solvent desorbed or thermally desorbed (TDS).

Conclusions & perspectives

Numerous applications would however benefit from a better understanding of the olfactive signature of a human or animal corpse. The cadaveric VOCs find applications in forensic sciences area such as training of cadaver dogs, or even development of cadaveric material detection devices. In the field of forensic entomology, these chemical compounds may have an attractive role on the necrophagous insect behavior.

[1] J. Dekeirsschieter, F.J. Verheggen, M. Gohy, F. Hubrecht, L. Bourguignon, G. Lognay, E. Haubruge, Forensic Science International 189 (2009) 46-53.