Cadaveric VOC profiling from human internal cavity

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The processes tacking place during body decomposition is not yet totally understood. Soon after death, the different parts of a body start to decompose. This phenomenon conduct to the production of gases inside or around the different organs. These gases reservoirs can be located using imaging tools as post-mortem computed tomography (PMCT) and subsequently sample (1).

The analysis of very volatile compounds inside these internal cavities already provides useful information for legal medicine investigations (2). It gives valuable information about the potential cause of death avoiding the invasiveness of the autopsy procedure. This project wanted to perform an untargeted screening of this internal cavity in order to monitor the decomposition process taking place inside a cadaver. The analytical method was base on previously used techniques for complete decomposition analysis (3-4).

This study wanted to investigate the volatile organic compounds (VOC) mixture present in these cavities. To achieve this task, we applied solid phase micro-extraction (SPME) combined with two-dimensional gas chromatography coupled to high-resolution time of flight mass spectrometer (GC×GC-HRTOFMS). The first point was to demonstrate the ability of GC×GC-HRTOFMS to detect these VOC. The combination of different statistical approaches conducted to establishment of potential biomarkers list. Base on these biomarkers identification, different decomposition stages were observed for different organs in the same body. The cardiac area seems to decompose faster than the other tissues studied in this project.

References

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