

中文題目：糞便中氣味與成份之分析--以融合微滴電噴灑游離質譜法及固相微萃取氣相層析質譜法

英文題目：Comparative Analysis of odor in stool using Solid-Phase Microextraction-Gas Chromatography Mass Spectrometry and Fused-Droplet Electrospray Ionization Mass Spectrometry

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Background: It little known as potential health factors as volatile organic compounds (VOCs) emitted from stool, which contributed to food ingested and bacteria in gastrointestinaltract. The change relative content and species of VOCs such as short-chain fatty acids (SCFAs) and branched-chain fatty acids (BCFAs) might be closely related to particular diseases in previous literature. In this study, Fused-droplet electrospray ionization (FD-ESI/MS) and Solid-phase microextraction-gas chromatography mass spectrometry (SPME-GC/MS) were demonstrated to characterize the VOCs emitted from stools of a cat, dog, gerbil, rabbit and human.

Materials and Methods: Stool samples are all stored at -20°C until being detected. Once beginning to analyze one, 0.1g stool sample was deposited in a glass vial and defrosted within 10 min, then characterized through FD-ESI/MS. Before extraction, all sample vials were placed in on heating plate at 60°C for 5min. Polydimethylsiloxane SPME fiber was used to extract the VOCs emitted from stools for 30min. One GC/MS system (Varian) was used: The injector temperature was 250°C. The column temperature was increased from 25°C to 150°C (at 8°C/min), and then from 150°C to 250°C (at 15/min), where it was held for 5min.The scan range was from m/z 41–500. The components of electrospray solution were MeOH/H₂O/Acetic acid: 50/50/0.1 (v/v/v).

Results: In this study, SCFAs, BCFAs and other VOCs were all detected using FD-ESI/MS. These results were also in accordance with ones obtained through SPME-GC/MS. More complex VOCs emitted from stool of a cat, dog, and human, which might be contributed to raptatorial subjects. Therefore, tedious time was be needed through SPME-GC/MS than FD-ESI-MS favoring to analyze polar volatile compounds and it's suggested that high polar volatile compounds emitted from stool could be analyzed through FD-ESI/MS technique, as well as be a potential and rapid analysis in metabolomics.

Conclusion: Our study showed that various VOCs emitted from stool could be rapidly detected and the identified through FD-ESI/MS and SPME-GC/MS, respectively. For the future, it may be a key to analyze little known polar VOCs using FD-ESI/MS.