

Method Development for The Identification of Volatile Organic Compound (VOC) in the Faecal of Malayan Tiger using SPME Extraction and GC-MS Analysis

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Structured Abstract

Background: Captive breeding programs aim to protect species, but they can negatively effect the health of captive tigers due to the unnatural environment and behaviour. To monitor the well-being of caged tigers without causing them more stress, researchers are using faecal metabolome profiling, a non-invasive method. The research goal is to efficiently handle and analyse faeces samples from Malayan tigers. While Solid-Phase Microextraction Gas Chromatography-Mass Spectrometry (SPME-GC-MS) is commonly used for VOC measurement in other animals' faeces, its application for tiger faeces is limited.

Methods: This study evaluated various aspects of sample preparation, such as extraction temperature, exposure time, and mass of the faecal sample to be used, when processing Malayan tiger faeces samples using a pipeline incorporating solid phase micro-extraction (SPME) coupled to gas chromatography-mass spectrometry (GC-MS).

Results: This study determined the extraction parameters, such as temperature of 70°C and exposure duration of 30 minutes, that produce the most accurate and consistent findings, including the sample mass, which is 400 mg. In our final suggestion, we offer a technique that is optimised for the direct SPME-GC-MS analysis of VOCs in samples of Malayan tiger excrement. With this improvement, it will be feasible to identify VOCs in samples of faeces from Malayan tigers, giving that information about a particular species.

Conclusion: As a result, this work has made significant contributions to our understanding of how to best handle and analyse faeces samples for Malayan tigers, particularly when using Solid-Phase Microextraction Gas Chromatography-Mass Spectrometry (SPME-GC-MS). In conclusion, our study helps to the conservation efforts of the Malayan tiger by offering a practical way for assessing the physiological health of captivity-housed tigers without increasing their stress.

Keywords: Volatile organic compound, faecal metabolome profiling, solid-phase microextraction, gas chromatography-mass spectrometry, Malayan tiger

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