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# Reproducible GC-MS Profiling of Urinary Metabolites as Biomarker Candidates for Dengue Infection: Seasonal Analysis Among Outpatients

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**Abstract**

**INTRODUCTION:** Dengue diagnosis remains a clinical challenge as early symptoms might overlap with other febrile illnesses. Urine-based metabolic profiling offers a promising, non-invasive approach for detecting dengue infection biomarkers. In our earlier study among warded patients, gas chromatography mass spectrometry (GC-MS) identified nine urinary metabolites associated with dengue infection. This study assesses the consistency of these metabolites in non-warded outpatients.

**MATERIALS AND METHODS:** A cross-sectional study was conducted at outpatient clinics in Kuantan involving 30 dengue-confirmed patients and 30 healthy volunteers. Midstream urine samples were collected prior to treatment, and dengue infection was confirmed through serological testing. The nine targeted metabolites were analysed using GC-MS method described in our previous study.

**RESULTS:** Two metabolites (hexadecane and pentadecane) were consistently detected in dengue-positive patients but absent in controls. Hexadecane eluted at a retention time (RT) of 20.95 +/- 2.23 min, with a spectral similarity index (SI) of 85.50 +/- 5.00 % and a peak area of 1360566.25 +/- 1066618.37 a.u. Pentadecane eluted at RT of 24.07 +/- 3.35 min, with an SI of 86.00 +/- 4.55 % and peak area of 853458.25 +/- 523318.12 a.u. Hexadecane exhibited a stronger signal, approximately 1.6 times higher than pentadecane with 100% specificity and sensitivity of 8%.

**CONCLUSION:** These findings confirm that the presence of urinary hexadecane and pentadecane remain consistent across different patient subgroups. These results provide preliminary evidence that urinary hexadecane and pentadecane are reproducibly detected in a subset of dengue patients and warrant further large-scale studies to confirm their diagnostic utility.

**Keywords**

**Author Keywords:** [Urinary](#); [Biomarker](#); [Dengue](#); [Screening](#); [Diagnostic](#)

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