

Application of a method to measure Kava use across Australia by wastewater analysis.

Lorato Makanye¹, Emma L. Keller¹, Bradley S. Simpson¹, Cobus Gerber¹

¹Clinical and Health Sciences, University of South Australia, Adelaide, Australia

Presenter's email: lorato.makanye@mymail.unisa.edu.au

Introduction: *Kava (Piper methysticum) is native to the Pacific islands and is used traditionally for medicinal and cultural purposes. In Western countries, it has been used as a medication for anxiety and mild depression. Prior to 2019, Kava was considered a banned psychoactive substance in Australia. The phase-wise lifting of the Kava ban to strengthen economic, cultural and bilateral relations with the Pacific Islands will result in increased availability of the substance in the country. This study aimed to develop an analytical method to quantify Kava as a way of continuously monitoring its uptake at the population level over time.*

Method: *Wastewater samples were extracted using the liquid-liquid extraction technique. The detection of kavalactones, flavokavains and human urinary metabolites was performed using a liquid chromatography-tandem mass spectrometry.*

Results: *The six major kavalactones and their two human urinary metabolites were detected in all wastewater samples collected from across Australia. The concentration of target analytes in wastewater ranged between 3-2000 ng/L. Several sites had weekly averages at the higher end of the range.*

Discussion and Conclusion: *A new analytical method was developed to separate and quantify Kava compounds in wastewater. This method was applied to samples from wastewater treatment plants across Australia covering areas with different socio-economic status. The results suggest that Kava consumption is very different across the country and further work is required to understand the underlying reasons.*

Acknowledgements: *The authors thank all the wastewater treatment plant operators across Australia, the University of South Australia Enterprise Research Scholarship Multiple Funding Sources and the Australian Criminal Intelligence Commission for their support.*