

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

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Introduction

Kava is a perennial shrub native to the Pacific islands and traditionally used for medicinal and cultural purposes [1,2]. In other countries, it has been used as a medication for anxiety and mild depression [3].

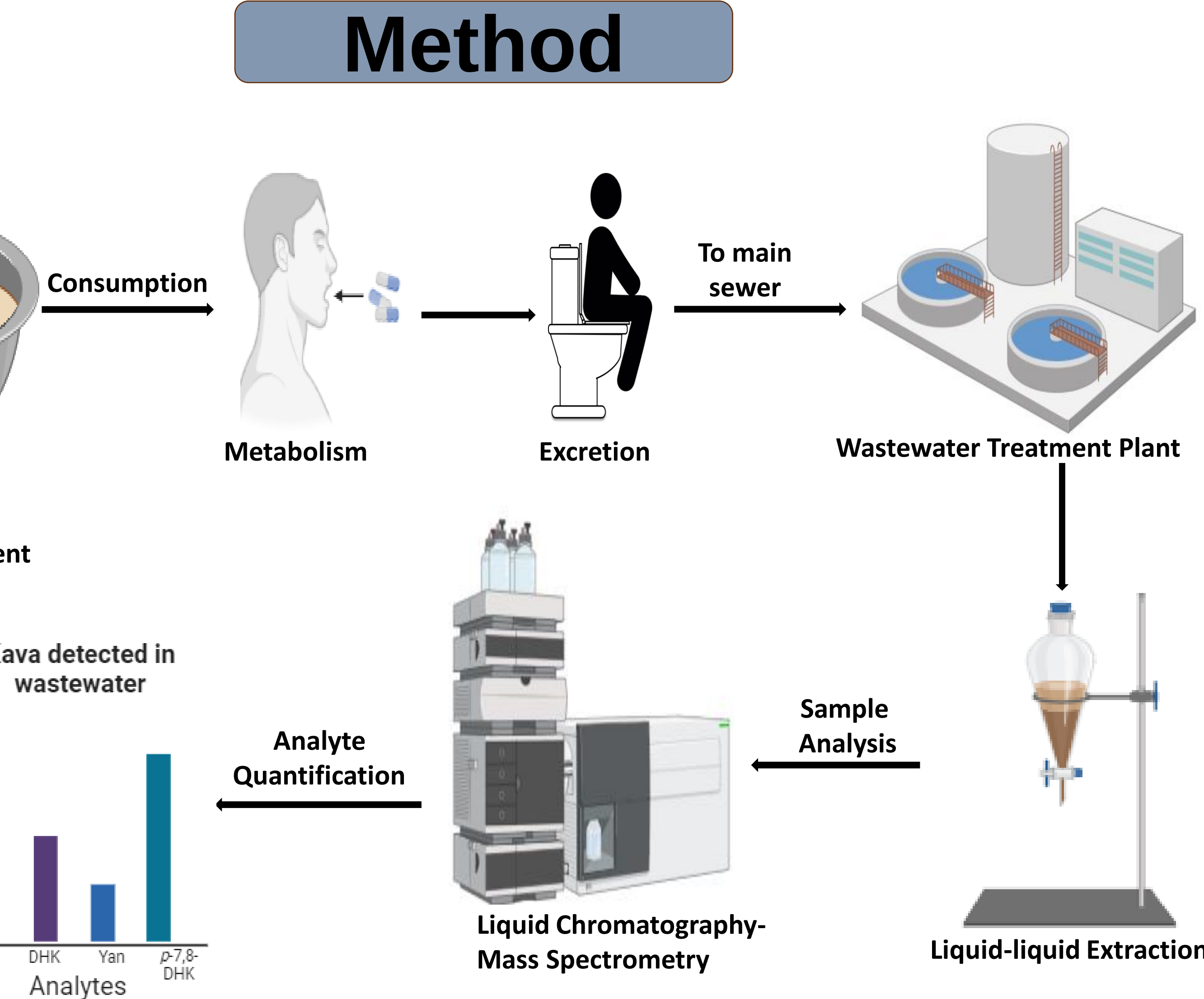
Kava plants consists of many different compounds. However, the main active ingredient are the kavalactones which are responsible for its psychoactive activity.

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.

Aim

To develop an analytical method to quantify kava markers and metabolites in wastewater to monitor its uptake at the population level.

Method



- Sampling- 24 h composite influent wastewater collected for seven consecutive days bimonthly/every 4 months.
- Sampling location- 56 wastewater treatment plants across Australia.

Results

Six kava markers; dihydrokavain, dihydromethysticin, desmethoxyyangonin, kavain, yangonin, methysticin and two urinary metabolites; *p*-OH-kavain and *p*-OH-7,8-dihydrokavain (*p*-OH-7,8-DHK) were detected in all wastewater samples collected in Australia.

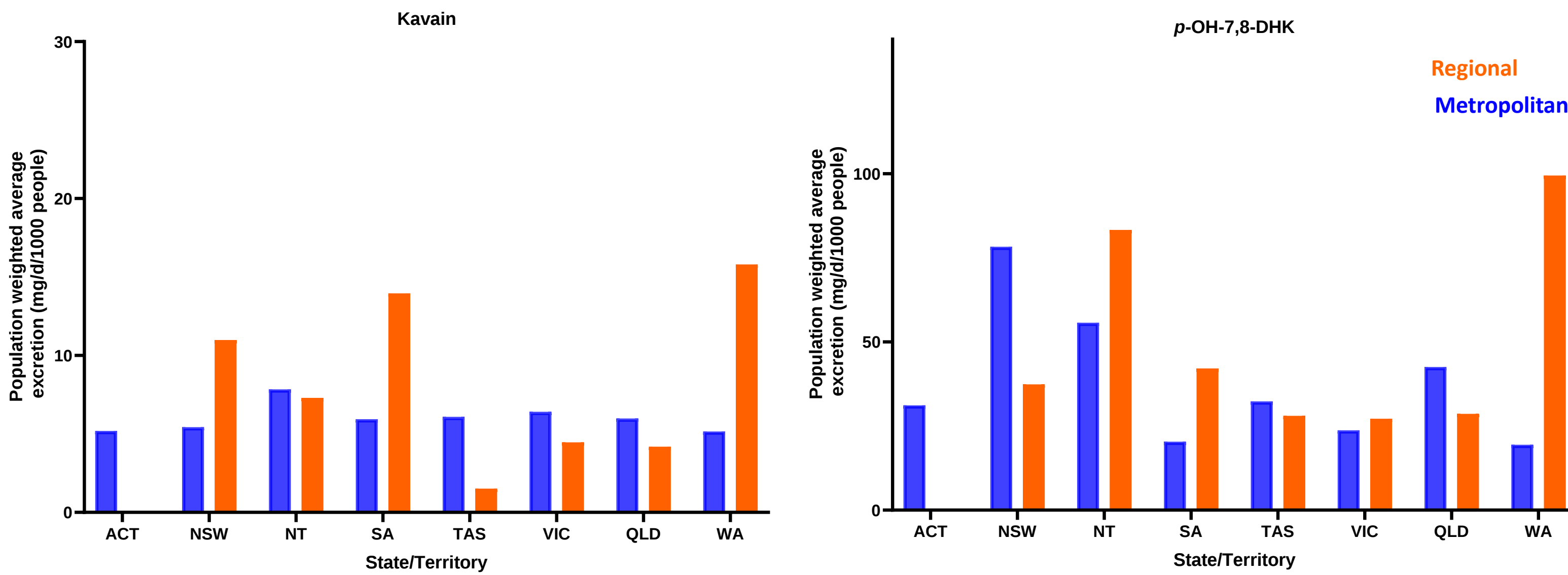


Figure 1: Kava consumption in metropolitan and regional areas - December 2023

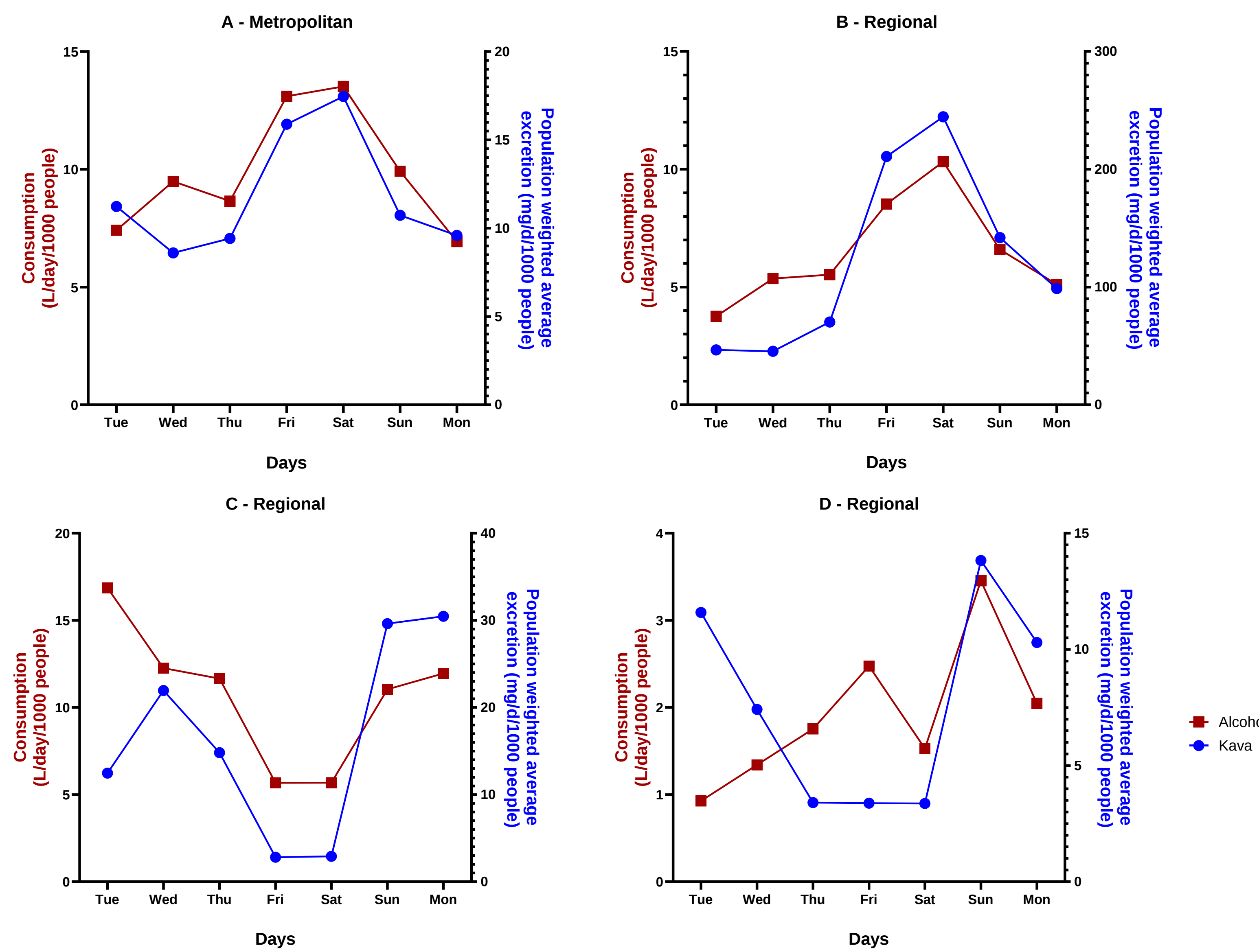


Figure 2: Comparison between kava and alcohol consumption patterns in metropolitan and regional Australia - December 2023

Discussion and Conclusion

- A new analytical method was developed to separate and quantify kava markers and metabolites in wastewater for the first time.
- Quantifying both parent compounds and metabolites allows the distinguishing consumption and disposal of kava.
- The method was applied to wastewater samples from across Australia covering areas with different socio-economic status and more than half the population (Figure 1).
- Similar pattern between kava and alcohol consumption in some areas (Figure 2).
- The variation in kava consumption across Australia requires further work to understand the underlying reasons.

Acknowledgements

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References

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