Ultrasound-assisted extraction of antioxidants from manuka leaves

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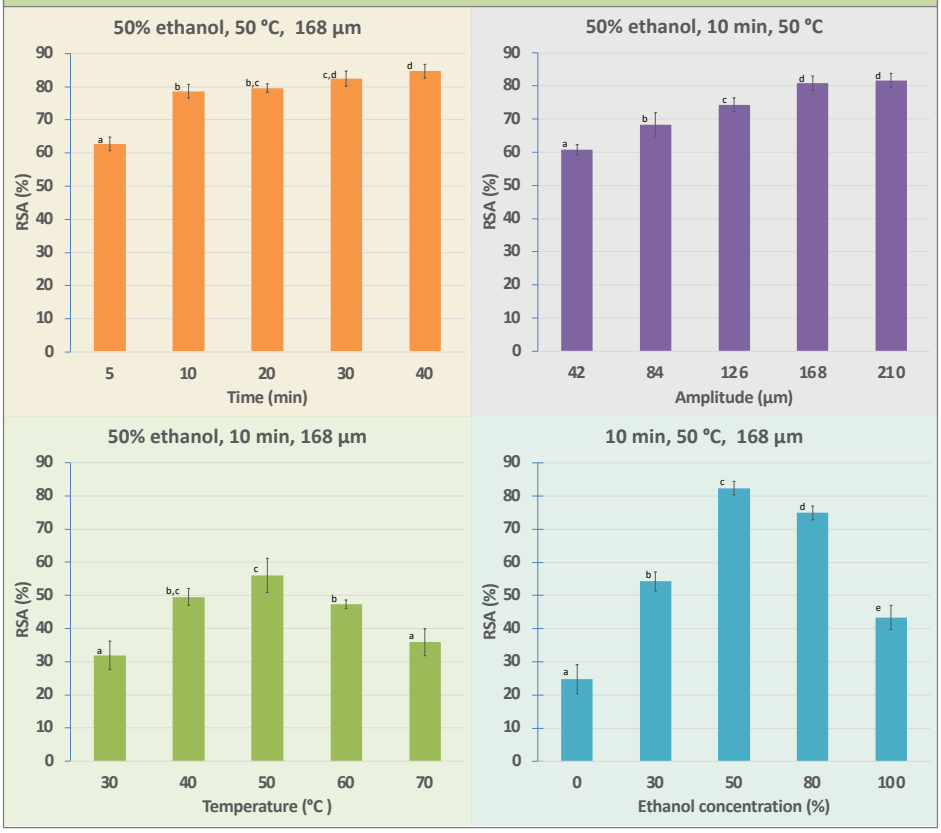
Introduction

Leptospermum scoparium, also known as manuka or the ''tea tree", is the most common and widely distributed native shrub in New Zealand. Early reports show that Maori used the bark, leaves, seeds, and sap of manuka for food, medicine and timber[1]. In medicinal use, different preparations of the leaves have been taken orally, directly chewed, applied as salve, or inhaled to treat cold, dysentery, as vapor baths, and to ease internal and external pains[2,3]. In New Zealand, there is a growing commercial interest of manuka products, especially compounds extracted from leaves. Manuka extract has high antioxidant content[1,4]. Antioxidant compounds are known to play important roles to protect the body from highly reactive radicals that subsequently may cause many diseases. Ultrasound is a technique used in the extraction of natural antioxidants and has been proven to increase the extraction efficiency of bioactives from a wide range of plants[5,6]. Ultrasound-assisted extraction (UAE) is inexpensive, simple, takes less time and less solvent[7].

Results



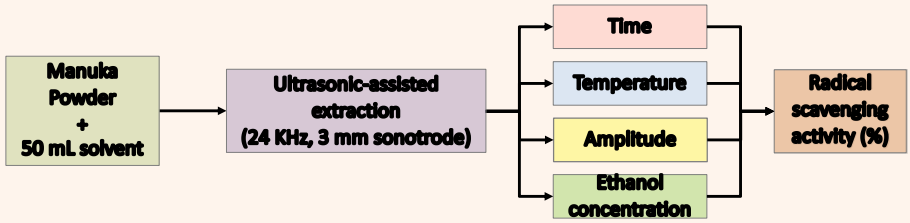
Objectives

The current study involves the ultrasound-assisted solvent extraction of *Leptospermum scoparium* (manuka) leaves to maximize the antioxidant activity. The effects of four extraction parameters (ethanol concentration 0-100%, time 5-40 min, temperature 30-70 °C, and amplitude 42-210 µm) on antioxidant content were studied based on a single factor design.

Conclusions

- Ultrasound-assisted extraction is an efficient method to extract antioxidant related compounds from plant materials.
- The four extraction parameters investigated (time, temperature, amplitude, ethanol concentration) significantly influenced the antioxidant content of *Leptospermum scoparium* extracts.
- For the investigated extraction parameters, the optimized antioxidant content was achieved at these conditions: Extraction for 10 minutes (78.68%±2.07); Temperature at 50 °C (56.05%±5.14); Amplitudes above 168 µm, 0.52 W/ml (>81.69%±2.14); and 50% ethanol:water solvent (82.28%±2.03)

Material & Methods



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References

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