EDITORIAL

Extraction, Encapsulation and Potential Health Benefits of Plant Phenolic Compounds

Polyphenols derived from plants have diverse structures and properties and have received increasing interest. Polyphenols are secondary metabolites, which can exhibit defensive mechanisms against diseases and pathogens. In food, they may contribute to bitterness, astringency, colour, flavour, odour and may inhibit lipid oxidation and microbial growth [1]. They also possess antioxidant activities and therapeutic properties; thus, they can also be potentially used in cosmetic and pharmaceutical products [2]. Polyphenols are rich in plant materials, such as Tuckeroo (*Cupaniopsis anacardioides*), Australian Maroon Bush (*Scaevola spinescens R*. Br.), lemon myrtle (*Backhousia citriodora*), and *Salacia chinensis* L. Tuckeroo, Australian Maroon Bush, and lemon myrtle, which are native to Australia. In contrast, *Salacia chinensis* L. grows widely in the forests of Asian countries, such as Vietnam, China, India, and Sri Lanka. These plant materials have been traditionally used as herbal medicine for various diseases, revealing that polyphenols derived from these materials are potential therapeutic agents. Therefore, it is important to effectively extract, encapsulate and further test the properties of the extracts prepared from these materials.

Extraction is an important process for the preparation of the extract enriched in polyphenols from plant materials. As polyphenols in plants have different structures, stability and properties, their extraction efficiency largely depends on extraction conditions and techniques [3]. There are two extraction techniques, including conventional techniques such as organic or aqueous extraction, and advanced techniques such as ultrasound-assisted extraction and microwave-assisted extraction. The conditions and effectiveness of each technique depend on the type of plant materials [3]. Following extraction, effective encapsulation is required to produce a functional product that maximizes bioactive compound yield, minimizes degradation over time, and enhances the sensory appeal of the product [4]. Therefore, finding the optimal encapsulation methods is key for producing a functional powder from plant extracts enriched in polyphenols. Among the various encapsulating techniques, spray drying is the most widely accepted as it is a relatively low cost, continuous process that produces powder with high solubility and low water activity [4]; however, the operation conditions need to be optimised.

This special issue is a collection of four papers focusing on the theme of extraction, encapsulation, and potential health benefits of plant phenolic compounds. The first paper entitled, "Optimization of aqueous extraction of the Australian maroon bush (*Scaevola spinescens* R. Br.) to maximize bioactive compound and antioxidant yield," reports the impact of four different extraction conditions and optimal conditions for extraction of polyphenols using a conventional technique. The second paper entitled, "Development of ultrasound-assisted extraction conditions for the optimal yield of phenolic compounds and antioxidant properties from lemon myrtle (*Backhousia citriodora*) leaves," applied ultrasound as the advanced technique for optimal extraction of polyphenols from plant material. The third paper entitled, "Optimising conditions for encapsulation of Salacia chinensis root extract enriched with phenolic compounds," reports the optimal spray drying conditions for encapsulation of the extract enriched with polyphenols. Finally, the last paper entitled, "Preliminary study on major phenolic groups, antioxidant and cytotoxic capacity of Tuckeroo (*Cupaniopsis anacardioides*) fruit extracts," further describes the link between polyphenols and their cytotoxicity.

Although there are limited papers in this special issue, I hope that this collection will provide the readers with further information related to plant polyphenols, their extraction, encapsulation, and potential health benefits.

REFERENCES

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