



## Minerals and trace elements in broad-leaved Geebung (*Persoonia stradbrokeensis*), an underutilised native Australian fruit

J. Zhang<sup>1</sup>, D. Sivakumar<sup>1,2</sup>, M.E. Netzel<sup>1</sup> and Y. Sultanbawa<sup>1</sup>

<sup>1</sup>ARC Industrial Transformation Training Centre for Uniquely Australian Foods, Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of Queensland, Indooroopilly, QLD 4068, Australia

<sup>2</sup>Phytochemical Food Network, Department of Crop Sciences, Tshwane University of Technology, Private Bag X680, Pretoria, 0001, South Africa

Minerals and trace elements are essential for human health and wellness. Fruits can be an important dietary source of these micronutrients. For centuries, native Australian fruits have been a vital source of nutrition and well-being for the Indigenous Communities<sup>(1)</sup>. However, comprehensive information on the mineral and trace element composition of these native fruits, including broad-leaved Geebung (*Persoonia stradbrokeensis*), is lacking. Therefore, the aim of the present study was to determine the mineral and trace element composition of broad-leaved Geebung, an important but still underutilised native Australian fruit, at different maturity stages. Inductively coupled plasma mass spectrometry (ICP-MS) and inductively coupled plasma-optical emission spectroscopy (ICP-OES) were used to analyse the fruit. Statistical analysis was performed using one-way ANOVA and the means (n = 3) were compared by Tukey's multiple comparison post hoc test with  $p < 0.05$  as significant. Calcium and potassium could be identified as the main minerals, and iron, zinc and manganese as the main trace elements. The calcium content in broad-leaved Geebung was lower than Australian desert lime, kakadu plum, and riberry, respectively (35.7-271.5 vs. 384.2 vs. 282.5 vs. 307.7 mg/100g dry weight (DW))<sup>(2)</sup>. Potassium has a vital role in the prevention of bone loss and is essential for the heart, kidney, and blood pressure. The potassium content of broad-leaved Geebung fruit was lower than Australian desert lime, kakadu plum, lemon aspen, quandong and riberry (average 516.4 vs. 1287.8 vs. 1905.5 vs. 1512.9 vs. 3456.2 vs. 1715.7 mg/100g DW)<sup>(2)</sup>, which contributes to approximately 15% recommended dietary allowance (RDA). Iron is the main element in the production of hemoglobin and is important for maintaining healthy blood. Iron content in the fruit ranged from 0.8-2.6 mg/100g DW, which was higher than that of Davidson's plum (1.2 mg/100g DW), but lower than the Green Plum, Australian desert lime, and kakadu plum (3.8 vs. 4.7 vs. 4.0 mg/100g DW)<sup>(2,3)</sup>. Besides, the manganese levels were relatively high in broad-leaved Geebung fruit and considerably higher than in other native Australian fruits such as Kakadu plums, Desert limes and Quandongs (11.2-26.4 vs. 3.5 vs. 0.9 vs. 0.3 mg/100 g DW)<sup>(2)</sup>. Interestingly, the mineral and trace element content decreased ( $p < 0.05$ ) during fruit maturity. In general, broad-leaved Geebung fruit can provide considerable amounts of essential minerals and trace elements and its potential as a healthy "snack" alternative should be investigated further.

**Keywords:** native fruit; Australian; micronutrients; nutrition

### Ethics Declaration

No

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### References

1. Brand-Miller J & Holt S (1998) *Nutr Res Rev* **11**, 5–23.
2. Konczak I, Zabaraz D, Dunstan M *et al.* (2009) Health Benefits of Australian Native Foods, [https://www.researchgate.net/publication/285127462\\_Health\\_benefits\\_of\\_australian\\_native\\_foods\\_-\\_An\\_evaluation\\_of\\_health-enhancing\\_compounds](https://www.researchgate.net/publication/285127462_Health_benefits_of_australian_native_foods_-_An_evaluation_of_health-enhancing_compounds)
3. Fyfe SA, Netzel ME, Tinggi U *et al.* (2018) *Nutr Diet* **75**, 527–532.