

Abstract

Exploring the Nutritional and Functional Properties of Two Understudied Australian Endemic Plants: *Diploglottis bracteata* and *Syzygium aqueum*[†]

Mridusmita Chaliha ^{1,*}, Anh Dao Thi Phan Phan ¹, Hung Trieu Hong ¹, Geraldine McGuire ², Michael E. Netzel ¹ and Yasmina Sultanbawa ¹

¹ Queensland Alliance for Agriculture and Food Innovation (QAAFI), The University of Queensland, Health and Food Sciences Precinct, 39 Kessels Rd, Coopers Plains, Brisbane, QLD 4108, Australia; anh.phan1@uq.net.au (A.D.T.P.P.); h.trieu@uq.edu.au (H.T.H.); m.netzel@uq.edu.au (M.E.N.); y.sultanbawa@uq.edu.au (Y.S.)

² Rainforest Bounty, 66 Lindsay Rd, Malanda, QLD 4885, Australia; geraldine@rainforestbounty.com.au

* Correspondence: m.chaliha@uq.edu.au

[†] Presented at the third International Tropical Agriculture Conference (TROPAG 2019), Brisbane, Australia, 11–13 November 2019.

Published: 1 February 2020

Abstract: Despite the growing national and international interest for Australian traditional plant foods, information on nutritional and functional properties of many endemic species is limited. This restricts their incorporation in food, beverage and nutraceutical applications. This pilot study explored the phytochemical profiles and antimicrobial activity of two Australian endemic fruits: *Diploglottis bracteata* and *Syzygium aqueum*, to explore their marketability. Profiling of major bioactive phytochemicals showed the presence of 3 anthocyanins in *S. aqueum* (delphinidin-3-glucoside, cyanidin-3-glucoside and peonidin-3-glucoside) and four carotenoids in *D. bracteata* (lutein, zeaxanthin, β -cryptoxanthin and β -carotene). The total carotenoid content was comparable to that of orange coloured carrots, an important dietary source of carotenoids. Elemental analysis revealed that, compared to blueberry (a popular dietary source), *D. bracteata* had 4.5 times higher potassium, and 3.7 times higher magnesium content. Calcium levels of *S. aqueum* was 4.9 times higher than blueberry. Methanol, acetone and water extracts of both fruits were analysed for total phenolic content (TPC) and antimicrobial activity. TPC of *D. bracteata* and *S. aqueum* methanolic extracts were 2.9 and 1.4 mg gallic acid equivalents/g FW which is in the same range as blueberry, a popular dietary source of bioactive phenolic compounds. Antimicrobial analysis showed methanol, acetone and water extracts of both fruits have strong inhibitory effects against both Gram positive (*Staphylococcus aureus*) and Gram negative (*Escherichia coli*) bacteria, but no effects against fungi (*Candida albicans*). These promising initial results, diverse phytochemical profiles and strong antibacterial activity, warrant further investigation.

Keywords: Australian native foods; *Diploglottis*; *Syzygium*

Author Contributions: M.C.: designed the experiments, carried out analysis and interpretation, and prepared the draft; A.D.T.P.P. and H.T.H.: carried out instrumental analysis; G.M.: provided plant materials and contributed to study design; M.E.N. and Y.S.: secured the funding for the study and contributed to study design. All authors have read and agreed to the published version of the manuscript.

Funding: This research was funded by Innovation Connections, grant number ICG000612.

Acknowledgments: We acknowledge the Traditional Owners of the lands on which the botanicals we study are harvested, and respect the knowledge and experience the Traditional Owners hold regarding the care, harvest and use of these plants.

Conflicts of Interest: The authors declare no conflict of interest.



© 2020 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (<http://creativecommons.org/licenses/by/4.0/>).