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Title:

Impact of the Food Matrix on Anthocyanin Stability, Bioaccessibility, and Gut Barrier Integrity in Açaí Berry

Authors & affiliations:

Name and surname Institution/ Department, University, Country
*Kumkum CR[1], Kathryn Aston-Mourney[1], Bryony A. McNeill[1], and Leni R. Rivera[1]**
[1]Institute for Innovation in Physical and Mental Health and Clinical Translation (IMPACT), Deakin University, Geelong 3220, Australia

Abstract: (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text into it.)

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1. The title should be as brief as possible but long enough to indicate clearly the nature of the study. Capitalise the first letter of the first word ONLY (place names excluded). No full stop at the end.
2. Abstracts should state briefly and clearly the purpose, methods, results and conclusions of the work.
Introduction: Clearly state the purpose of the abstract
Methods: Describe your selection of observations or experimental subjects clearly
Results: Present your results in a logical sequence
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Introduction:
Polyphenols, particularly anthocyanins, are associated with metabolic health benefits. However, whether anthocyanin extracts provide greater bioavailability than whole foods remain unclear. This study investigated the role of the food matrix in acai berry - one of the richest anthocyanin sources on polyphenol bioaccessibility and intestinal barrier outcomes across three different forms.

Methods:
Three forms of acai berry, whole-fruit, crude and pure extracts underwent standardized INFOGEST digestion. Total polyphenol content (TPC) and anthocyanins (ACN) and antioxidant activity were measure using Folin-Ciocalteu, pH-differential and DPPH assay methods respectively. Caco-2 monolayers were exposed to intestinal digests to evaluate transepithelial electrical resistance (TEER) and fluorescein isothiocyanate–dextran (FITC-dextran) permeability.

Results:
Bioaccessible TPC was similar in whole fruit (30.91 ± 1.08 mgGAE/g; 58%) and crude extract (30.99 ± 1.33 mgGAE/g; 58%), but significantly lower in pure extract (22.77 ± 1.62 mgGAE/g; 43%). ACN bioaccessibility was highest in whole fruit (6.30 ± 0.12 mgC3G/g, 44%), intermediate in crude extract (4.59 ± 1.02 mgC3G/g, 32%), and significantly lower in pure extract (1.74 ± 0.26 mgC3G/g, 12%). Antioxidant capacity in intestinal digests was highest in whole fruit (63.4 ± 4.0% inhibition), comparable to crude extract (62.0 ± 0.04%), but significantly higher than pure extract (58.5 ± 1.2%). Furthermore, whole fruit digests enhanced TEER and reduced FITC-dextran permeability compared to both crude and pure extracts, suggesting improved barrier protection.

Conclusions:
Food matrix components significantly preserve anthocyanin stability, enhance antioxidant activity, and intestinal barrier integrity. Incorporating natural matrices may be key to enhancing the bioavailability and functional properties of anthocyanin-rich nutraceuticals such as acai berry.