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Abstract

Antimicrobial Activity and Ellagitannins from *Terminalia Ferdinandiana* †

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Abstract: Extracts were prepared from *Terminalia ferdinandiana* (Kakadu plum) fruits, leaves, seedcoats, and barks using accelerated solvent extraction with methanol, ethanol, water, acetone, and hexane. Antioxidant activity was assessed using the 2, 2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging assay and by determining the total phenolic content (TPC). Methanol fruit extracts had the strongest free radical scavenging activity and the highest TPC (12 g/100 g DW). The antimicrobial activity of all extracts (except hexane) was analysed by agar disc diffusion. Fruits and leaves showed larger inhibition zones against foodborne bacteria *Listeria monocytogenes*, *Bacillus cereus*, methicillin resistant *Staphylococcus aureus*, and clinical isolates of *Pseudomonas aeruginosa* compared to seedcoats and barks. The minimum inhibitory and minimum bactericidal concentration of the extracts ranged from 1.0 to 3.0 mg/mL against the tested microorganisms. Scanning electron microscopy images of bacteria treated with the extracts showed morphological changes consistent with cell death. A new UHPLC-MS/MS method for the determination of punicalagin and castalagin, bioactive ellagitannins, was developed and validated. Punicalagin contents in the fruits and leaves were 74 and 49 mg/100 g DW whilst castalagin contents were 1.1 and 0.8 mg/100 g DW. To the best of our knowledge, this is the first report about punicalagin and castalagin concentrations in Kakadu plum fruits and leaves. These initial findings are very promising in regards to the potential use of Kakadu plum fruit and leaf extracts as natural preservatives in the food industry.

Keywords: ellagitannins; Kakadu plum; antimicrobial activity

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