NUTRITIONAL COMPOSITION, ANTIOXIDANT PROPERTIES AND PRODUCT FORMULATION UTILIZING ORANGE (CITRUS AURANTIUM) BIO-WASTE (PEEL AND RESIDUE)

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A huge quantity of bio-waste is produced during processing of citrus fruits which can be utilized for various purposes. Hence, in this study, by-products of orange (peel and residue) were analysed for nutritional composition, antioxidant components and activity and a curry mix was formulated using peel. Following results were obtained for peel and residue per 100g dry weight: protein, 7.39 and 8.45g; insoluble fiber, 56.7 and 1.83g; soluble fiber 2.57 and 14.11g; fat, 3.38 and 2.09g; iron, 1.27 and 2.35mg; calcium, 355 and 304mg; tannins, 2512 and 2034mg; carotenoids, 30.8 and 0.7 mg; vitamin C, 572 and 30mg. Polyphenols were high in methanol, ethanol and aqueous extracts for peel than residue. The total antioxidant activity was highest in methanol than ethanol and aqueous extracts for peel (148258 µmoles ascorbic acid/g of sample). But for residue the activity was high in aqueous extracts (118712 µmoles ascorbic acid/g of sample). Free radical scavenging activity was high in peel for solvent and aqueous extracts. A high activity of 92% was seen in the extracts at 4mg concentration. The reducing power of peel was high in both methanol and ethanol extracts compared to aqueous extracts. The orange peel curry mix was acceptable by sensory panel. It can be concluded that orange by-products can be utilized for their nutritional and antioxidant properties.