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Antioxidant, antimicrobial and antiproliferative activities-based comparative study of peel and flesh polyphenols from Kiwifruit (*Actinidia chinensis*)

Aamina Alim

Shaanxi Normal University, China

Kiwifruit, abundant in vitamin C, phenolics and other nutritional elements, is called 'the king of fruits'. This study evaluated the polyphenolic composition and biological activities of peel and flesh of kiwifruit (*Actinidia chinensis*). As a result, the pericarp, the waste of kiwifruit, was found to be more abundant in polyphenols and flavonoids than flesh, with the contents of 12.8 mg/g and 2.7 mg/g, respectively. LC/MS analysis revealed that the contents of catechin, quercetin and epigallocatechin (the main polyphenols in kiwifruit) in peel were significantly higher than that in flesh. Additionally, kiwifruit peel polyphenols showed much more potent antioxidant activity than flesh polyphenols, as evidenced by the higher DPPH, ABTS radical scavenging, hydroxyl ion reducing and ion chelating ability. In the same way, the antibacterial activity of peel polyphenols against gram-negative *Escherichia coli* and gram-positive *Listeria monocytogenes* and *Staphylococcus aureus* was evidently higher as compared to flesh polyphenols. Moreover, the proliferation of HepG2 cells was time- and dose-dependently inhibited by kiwifruit polyphenols, with 170 µg/mL and 291 µg/mL of IC₅₀ values for peel and flesh polyphenols at 72 h of treatment time, respectively. Taken together, kiwifruit peel with higher contents of phenolics and flavonoids exerts more potent antioxidant, antibacterial and anticancer activity than flesh. Our study provides scientific evidences for the development of kiwifruit (especially peel)-based novel natural products with excellent bioactivities.

aamina.alim@yahoo.com