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Inhibitory Properties of Cashew Nut and Fluted-Pumpkin Protein Hydrolysates and their Membrane Fractions against Renin-Angiotensin System (RAS) and Free Radicals

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This study aimed to discover and prepare novel antioxidant and renin-angiotensin system (RAS) inhibitory peptides from fluted-pumpkin and cashew nut proteins (FPP and CNP). Both FPP and CNP were isolated and hydrolyzed using alcalase and pepsin to obtain hydrolysates (*a*-FPPH, *p*-FPPH, *a*-CNPH and *p*-CNPH, respectively). The resulting hydrolysates were sequentially passed through ultrafiltration membranes with molecular weight cut-off (MWCO) of different pore sizes to obtain<1, 1–3, 3–5, and 5–10 kDa peptide sizes. The *in vitro* bioactive properties of the resultant hydrolysates and their membrane fractions were accessed through OH-scavenging, DPPḢ-scavenging, metal chelation, FRAP, renin and ACE-inhibitory activities as well as their amino acid (AA) composition analysis and degrees of hydrolysis (DH). The results showed that the AA composition of the hydrolysates and their fractions are mainly composed of arginine and several hydrophobic AA. The CNPH has higher DH (>50%) than FPPH (48%). Meanwhile, both hydrolysates and their fractions had about >90% OH-, DPPH-, and FRAP-scavenging activities. Contrarily, the metal chelation activities of FPPH and CNPH are >90 and 20%, respectively. The *in vitro* ACE-inhibitory results of 4%-*a*-FPPH, 2%-*p*-FPPH, 3%-*p*-CNPH, 2%-*a*-CNPH, <1 kDa*a*- FPPH and 1–3 kDa-*p*-CNPH are 92, 78, 88, 82%, 88 and 92%, respectively. Besides, the *p*-CNPH and its 1–3 kDa fractions had higher renin inhibitory activities (>95%) than the *a*-FPPH (78%). These results suggest that both fluted-pumpkin and cashew nut proteins have potential as an antioxidant and antihypertensive agents, thus serving as functional food ingredients in both human nutrition and health applications.