

Morgan Medal Presentation

Investigating Antihypertensive, Angiotensin-I Converting Enzyme (ACE)-Inhibitory Activity of Soldier Bean Protein Hydrolysates

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Purpose: Hypertension is a chronic condition that affects 7.2 million Canadians, yet it can be managed and modified through dietary interventions. Although several research studies have shown that red lentils, chickpeas, and lima beans contain bioactive peptides with Angiotensin-I Converting Enzyme (ACE)-inhibitory properties, to date no studies have been conducted to determine the antihypertensive abilities of Nova Scotian soldier bean (SB) proteins. The aim of this study is to determine if trypsin hydrolysis of SB proteins would generate peptides with ACE inhibitory activity.

Methods: SB protein isolates were hydrolyzed with the enzyme trypsin. Two different enzyme: substrate (E:S) ratios were used (1:100 and 1:250) and the degree of hydrolysis was determined by a 2,4,6-Trinitrobenzenesulfonic acid (TNBS) assay. In addition, ACE-inhibitory activity was measured using the hippuryl-His-Leu (HHL) substrate method. For these studies, a commercial pea protein, Propulse™, was used as a control.

Results: It was demonstrated that SB peptides possess ACE-inhibitory properties. When hydrolyzed in a 1:100 E:S solution, SB peptide concentrations of 0.25 µg/mL yielded 53% inhibitory activity. In a 1:250 E:S ratio, SB peptides exhibited inhibitory values of 53% and 60% in 0.5 µg/mL and 5 µg/mL concentrations, respectively. For the control, Propulse™, over 50% ACE-inhibitory activity was only observed at a peptide concentration of 5µg/mL when an E:S ratio of 1:250 was used.

Conclusions: Although preliminary, the findings from this study provide an important first step in establishing evidence to further investigate Nova Scotian SB as potential candidates for antihypertensive activity. Dietetic research that continues to examine the antihypertensive abilities of pulses offers the potential to provide supportive evidence for dietary interventions used to combat the prevalence of hypertension in Canadian adults.