Nutritional composition and angiotensin converting enzyme inhibitory activity of blue lupin (Lupinus angustifolius)

ABSTRACT

The nutritional, protein and amino acid compositions of blue lupin (Lupinus angustifolius) flour were studied. The angiotensin converting enzyme (ACE) inhibitory activity of lupin protein isolate (LPI) hydrolysates prepared using Alcalase and Flavourzyme, and the Osborne protein fractions hydrolysates prepared using Alcalase were determined. Lupin flour was high in protein (43 g/100 g) and dietary fiber (34 g/100 g) but low in carbohydrate (4.8 g/100 g) and ash (3.4 g/100 g). Results from a sequential Osborne extraction procedure showed that lupin protein was comprised of 56% globulin, 26% albumin and 19% glutelin, while prolamin was only found in trace amounts. Lupin protein was high in Lys but limiting in Met. SDS-PAGE analysis suggested that protein hydrolysis catalyzed using Alcalase was more effective than Flavourzyme as shown by the presence of lower molecular weight peptides in the former. LPI hydrolysates prepared using Alcalase showed high ACE inhibitory activities with IC50 values ranging from 0.10 to 0.21 mg/ml. The results suggested that the globulin fraction was the main contributor towards the ACE inhibitory activity observed in lupin protein.

Keyword: ACE inhibitory activity; Alcalase; Blue lupin; Flavourzyme; Lupinus; Osborne protein fractions