

Angiotensin-Converting Enzyme-Inhibitory Activity of Allergen Reduced Peanut Protein Hydrolysate

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This study evaluated the *in vitro* allergenicity and angiotensin-converting enzyme (ACE)-inhibitory activity of peanut protein hydrolysates (PPH) produced by proteolytic hydrolysis of peanut flours. Partially defatted light- and dark-roasted peanut flours (12% fat) were hydrolyzed with Alcalase at the optimal pH and temperature of the enzyme. Samples were taken hourly to inactivate the enzyme. The peanut flour suspension incubated without Alcalase was used as control. After centrifugation, the soluble portions (PPH) were collected and total protein concentrations were determined. The degradation of major allergens Ara h 1, Ara h 2, Ara h 3 and Ara h 6 were monitored by SDS-PAGE. The IgE-binding of PPH was used as an indicator of *in vitro* allergenicity and was determined by Western Blot method using pooled plasma from 6 peanut allergic patients. The ACE-inhibitory activity of PPH was determined using ACE from rabbit lung. SDS-PAGE show that the major allergenic proteins Ara h 1, Ara h 2, Ara h 3 and Ara h 6 in peanut flour were greatly reduced by Alcalase treatment compared to the untreated, meanwhile, the smaller peptides (<10 kDa) were produced. Western blot shows that enzymatic hydrolysis eliminated or significantly reduced allergenicity of Ara h 1, Ara h 2 and Ara h 3 in the PPH, although some residual allergenicity of Ara h 6 and proteins/peptides 5-15 kDa remained. Alcalase hydrolysis resulted in PPH with 18-37% ACE-inhibitory activity at 1mg/ml depending on hydrolysis time, and the fraction with molecular weight smaller than 5kDa showed higher ACE-inhibitory activity than crude PPH. However, the ACE-inhibitory activity of light-roasted PPH was not significantly different from that of dark-roasted PPH at same concentration. Higher ACE-inhibitory activity indicates greater antihypertensive potential.

This study indicates that protease treatment of peanut flour could produce low allergenic PPH which can be a potential antihypertensive agent. However, more studies in food and animal models are needed.