ABSTRACT

Two types of plant protein, soy protein isolate (SPI) and pea protein isolate (PPI) were produced by enzymatic hydrolysis with trypsin, pepsin and alcalase for 8 hours. These hydrolysates were tested based on their degree of hydrolysis (DH%), yield and antimicrobial activity. Hydrolysates with the highest results was further fractionated by ultra- and nano-filtration membranes with 30kDa and 10kDa molecular weight cut-off (MWCO) membranes in order to obtain different fractions of antimicrobial peptides (AMPs). The aim of this study is to screen soy protein hydrolysates and pea protein hydrolysates with the highest antimicrobial activity. In screening for hydrolysates with antimicrobial activity, diameter of zone of inhibition obtained from disc-diffusion test was employed as the indication of the antimicrobial activity. The larger the diameter of zone of inhibition the higher the antimicrobial activity. Based on the result obtained in this research, there were no antibacterial activity found in soy protein hydrolysates (SPH) obtained when enzymatically hydrolyzed for 8 hours with trypsin, pepsin, and alcalase. While there were antibacterial activity found in pea protein hydrolysates (PPH) when enzymatically hydrolyzed under pH 8.5 at 50°C by alcalase and under pH 2.0 and 37°C by pepsin for 8 hours. Moreover, PPI enzymatically hydrolyzed for 6 hours by alcalase (APPIH6h) is selected to be further fractionated into 30kDa and 10kDa MWCO membranes by ultra- and nano-filtration. Selection of particular hydrolysates is based on the high DH% and antimicrobial activity. According to the disc-diffusion test, there are no antimicrobial activity found in all fractions when fractionated into 30kDa and 10kDa MWCO membranes.

Keywords: Antimicrobial peptides (AMPs), plant protein hydrolysates, protein hydrolysates, antimicrobial activity.