Enzymatic hydrolysis of silk fibroin by using various commercial proteases

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Abstract

This study was conducted to characterize the final products by the hydrolysis of silk fibroin by various commercial proteases. The commercial proteases used were papain, collupulin, bromelain, alcalase 2.4L, protamex™. The reaction mixture was prepared by 5 % (w/v) silk fibroin in 5 mM cysteine and 2 mM EDTA solution and the proteolysis reaction was started by adding 5 % (w/w fibroin) of the commercial proteases. Hydrolysis reactions were carried out at 60 ℃ for 1 hour. The hydrolysates were characterized with respect to soluble dry matter (DM), absorbance and peptide molecular weight distribution. Papain gave the highest yields of solubilized dry matter, approached 99%. Also, the compositions of hydrolyzed peptide by the enzymes were identified by using Electrospray Ionization Mass Spectrometry (ESI/MS). As a result of identification, we confirmed that peptides are composed of 542.28 [SGAGAGAG], 419.21 [GAGAGS], 367.17 [YGAG], 495.24 [YGAGAG] by turns.

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