



Inhibitory activity of protein hydrolysates from rice bran on mushroom tyrosinase

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Abstract

Rice bran (*Oryza sativa* L.) protein hydrolysates (RBPHs) obtained by Alcalase® have attracted attention because of their bioactivity properties (antioxidant, anti-acetylcholinesterase and anti-butyrylcholinesterase). However, there has been no report on their improved inhibition of melanogenesis. This study aimed to investigate the inhibitory tyrosinase activity of RBPH. The defatted Khao Hom Mali RD15 rice bran protein was extracted into water (RBP1), 2% NaCl (RBP2) and 0.1 N NaOH (RBP3) fractions. All protein fractions were hydrolyzed with Alcalase® to produce RBPH1, RBPH2 and RBPH3. The protein content, % yield, degree of hydrolysis (DH) and molecular weight patterns of each fraction were investigated. The RBPH2 and RBPH3 showed high potential inhibition on mushroom tyrosinase activity, the IC₅₀ values were determined to be 1.92 mg/ml and 0.46 mg/ml, respectively. The inhibition kinetics showed that RBPH2 was an uncompetitive mechanism, with inhibition constants (K_i and K_{is}) were 6.1 mg/ml and 4.5 mg/ml, respectively. Moreover, the RBPH3 displayed a non-competitive mechanism and K_i and K_{is} were 2.8 mg/ml and 2.5 mg/ml, respectively. Therefore, the RBPHs could be potential candidates for use in the cosmetics and food industries.

Keywords: inhibition, kinetic, mushroom tyrosinase, rice bran hydrolysate, rice bran protein,