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Angiotensin I Converting Enzyme Inhibitor Derived from Fermented Mussel, *Mytilus edulus*

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Introduction

Angiotensin I converting enzyme [EC 3.4.15.1] (ACE) is important in the maintenance of blood pressure. The enzyme removes histidyl-leucine from angiotensin I to form the blood-vessel-constricting octapeptide, angiotensin II, and degrades vasodilative bradykinin in blood vessels and stimulates the release of aldosterone in the adrenal cortex. Synthetic inhibitors such as captopril and enalapril have been used as antihypertensive drugs but this inhibitors has some side effects. So in recently, a many researchers studied in the foods and reported ACE inhibitors from enzymatic hydrolysates of various materials including casein, zein, gelatin, dried bonito, fish sauce, tuna muscle (Suetsuna K. et al, 2000).

In the present study, we isolated ACE inhibitor from a fermented mussel, *Mytilus edulus*.

Materials and Method

Assay for ACE inhibitory activity The ACE inhibitory activity assay was performed using a modified version of the method of Cushman and Cheung (1971). A sample solution (50 ㎕) with 50 ㎕ of ACE solution (25 milliunits/㎖) was preincubated at 37℃ for 10 min and then incubated with 150 ㎕ of substrate at 37℃ for 30min. The reaction was stopped by the addition of 250 ㎕ of 1M HCl. The resulting hippuric acid was extracted with 500 ㎕ of ethyl acetate. After centrifugation, 200 ㎕ upper layer was transferred into a test tube and evaporated at room

temperature for 2h in a vacuum. The hippuric acid was dissloved in 1 ㎖ of distilled water, and the absorbance was measured at 228 nm using spectrophotometer. The IC_{50} value was defined as the concentration of inhibitor required to inhibit 50% of the ACE inhibitory activity.

Results and Discussion

Angiotensin I converting enzyme (ACE) inhibitor from a fermented mussel, *Mytilus edulus* was purified by gel filtration on Sephadex G-75, ion-exchange chromatography on Sp-Sephadex C-25 and high performance liquid chromatography (HPLC) on C18 column. The molecular weight of the purified inhibitor was estimated to be approximately 5.2kDa as determined by HPLC on GPC column. IC_{50} value of the purified inhibitor was 19.34 ㎍/㎖.

References

Cushman, D. W. and H. S. Cheung (1971) Spectrophotometric assay and properties of the angiotensin-converting enzyme of rabbit lung, Biochem. Pharmacol., 20, 1637~1648.

Suetsuna K. and T. Nakano (2000) Identification of an antihypertensive peptide from peptic digest of wakame (*Undaria pinnatifida*), J. Nutr. Biochem., 11, 450-454.