

Contribution of non-peptide substances to inhibition of angiotensin I-converting enzyme (ACE) by aqueous extract of brown seaweed *Undaria pinnatifida*

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Received: 2 March 2012, **Revised:** 2 April 2013, **Accepted:** 9 April 2013

Abstract

Brown seaweeds are thought to be beneficial to the human health, but little is known about their functional abilities to manage the blood pressure. Then, the effects of the extracts prepared from sporophyll, stem and leaf of brown seaweed *Undaria pinnatifida* on angiotensin I-converting enzyme (ACE) were examined to assess their antihypertensive activities. The extracts inhibited the enzyme activity in a concentration-dependent manner, and the 50% inhibition was obtained by approximately 15 μ l of the extract. Further studies showed that sporophyll extract inhibited the enzyme in a competitive manner, and the inhibitory activity was recovered in the non-peptide fraction from the separation processes using both spin column and HPLC systems. Therefore, brown seaweed, particularly its sporophyll, was considered to contain non-peptide substances to inhibit ACE activity, thereby improving the hypertensive conditions by reducing the production of active hypertensive peptide.

Keywords: Brown seaweed, Sporophyll extract, Non-peptide substance, Functional food, Antihypertensive effect, High blood pressure

Introduction

Hypertension is one of the risk factors for cardiovascular diseases, and the implication of the renin-angiotensin-aldosterone system in the regulation of blood pressure has been established. In particular, angiotensin-II is generally recognized as an active peptide playing