

툃(*Hizikia fusiformis*)으로부터 스테로이드의 분리동정과 MG63

조골세포에 대한 분화활성

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Fucostron Derivatives from *Hizikia fusiformis* and Their Proliferation Activities on
Osteoblast MG63 Cell Line

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Objectives

Hiziki (*Hizikia fusiformis*) is an edible brown algae widely consumed in northeast Asia and belongs to class Phaeophyceae, order Fucales, family Sargassaceae. It is possessed of therapeutic materials which exhibit several biological activities such as reactive oxygen species (ROS) scavenging, lipid peroxidation inhibitory, and anti-hemocoagulative effects. However, investigation of principal components exhibiting anti-osteoarthritic activity was scarcely reported. This study is focused on isolation and identification of the single compounds from this algae to manifest anti-osteoarthritic activity using MTT assay on MG63 osteoblast.

Materials and Methods

○ Materials

The powder of *Hizikia fusiformis* was offered and identified by Prof. Tae-Hoo Yi, Department of Oriental Medicinal Materials and Processing, Kyung Hee University (Yongin). ¹H-NMR (400 MHz) and ¹³C-NMR (100 MHz) spectra were

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recorded on a Varian Unity Inova AS-400 FT-NMR spectrometer (CA, USA).

○ Methods

The dried powder of *H. fusiformis* was extracted and concentrated repeatedly with 80% aqueous methanol at room temperature, and the methanolic extract was successively concentrated and partitioned with EtOAc, *n*-BuOH, and H₂O. From the EtOAc fraction, three fucosterol derivatives were isolated through the repeated silica gel (SiO₂) and octadecyl silica gel (ODS) column chromatography.

Results

According to the results of spectroscopic methods including nuclear magnetic resonance spectroscopy (NMR), mass spectroscopy (MS) and infrared spectroscopy (IR), the chemical structures of the sterols were elucidated as fucosterol (**1**), the mixture of 24*R*,28*S*- and 24*S*,28*R*-epoxy-24-ethylcholesterol and 24*R*,28*R*- and 24*S*,28*S*-epoxy-24-ethylcholesterol (**2**), and 24*R*-saringosterol (**3**). These compounds were previously isolated from this algae and were carried out MTT assay to verify the proliferation of osteoblasts. Compounds **1–3** exhibited significant proliferation activity on MG63 cell line and this results can be applicable to nutritional approaches for control of degenerative osteoarthritis.

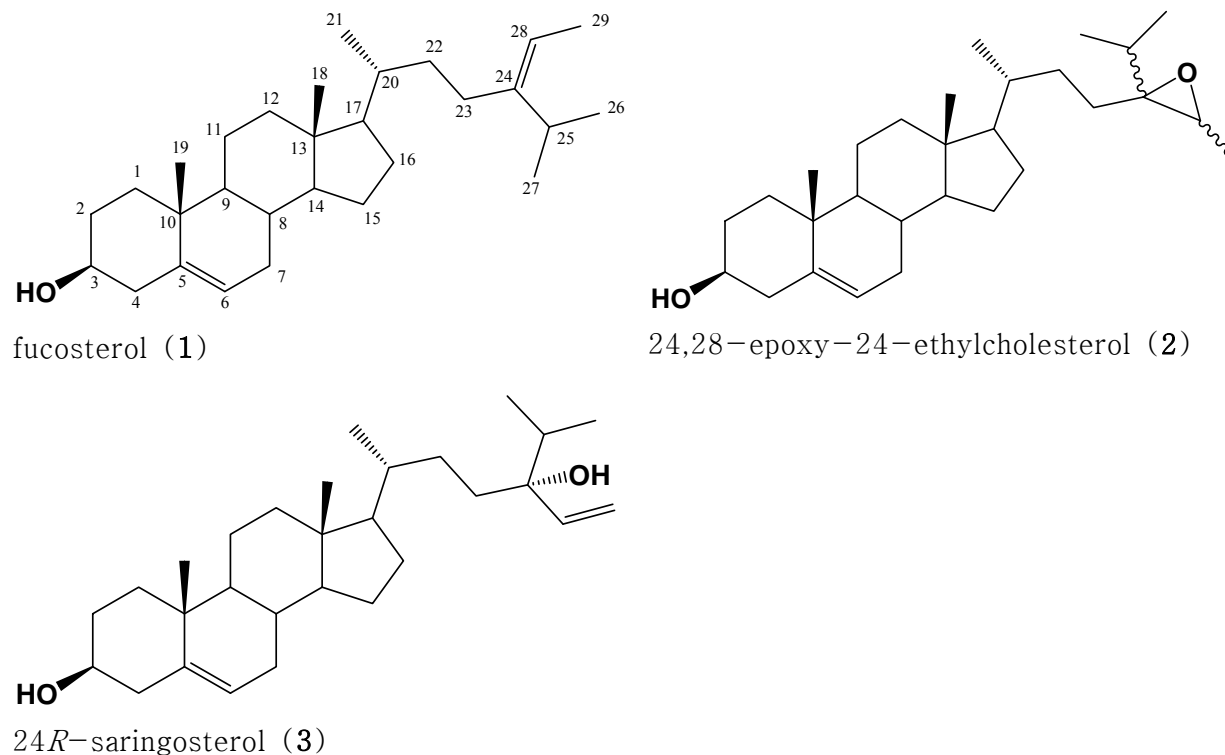


Fig. 1. Fucosterol derivatives from *Hizikia fusiformis*.