

이삭물수세미 (*Myriophyllum spicatum* L.)로부터 flavonoid의 분리 및 동정  
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### Isolation and Identification of Flavonoids from *Myriophyllum spicatum* L.

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### Objectives

*Myriophyllum spicatum* L. is a submerged aquatic plant, growing in still or slow-moving water, and native to Europe, Asia and north Africa. *M. spicatum* is known to cause allelopathic growth inhibition on the cyanobacterium *Microcystis aeruginosa*. It was reported that four polyphenols, gallic acid, ellagic acid, pyrogallol acid, and (+)-catechin, but also some fatty acids released from *M. spicatum*, are anti-algal allelochemicals. Except them, there is rare report about biological and phytochemical research on this plant.

### Materials and Methods

#### ○ Materials

IR spectra were obtained with a Perkin Elmer Spectrum One FT-IR spectrometer. EI-MS data was recorded on a JEOL JMSAX-505-WA. <sup>1</sup>H-NMR and <sup>13</sup>C-NMR spectra were recorded on a Varian Unity Inova AS-400 FT-NMR spectrometer.

#### ○ Methods

*M. spicatum* was extracted with 80% aqueous MeOH. And the concentrated extract was partitioned with EtOAc, *n*-BuOH and H<sub>2</sub>O, successively. The repeated silica gel and octadecyl silica gel (ODS) column chromatographic separations for the EtOAc fraction, which showed the highest inhibition effect on the growth of cyanobacterium, led to isolation of three flavonoids.

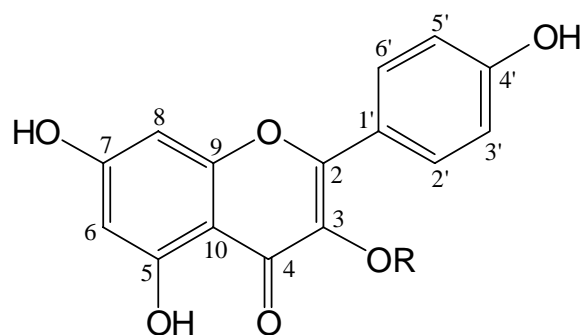
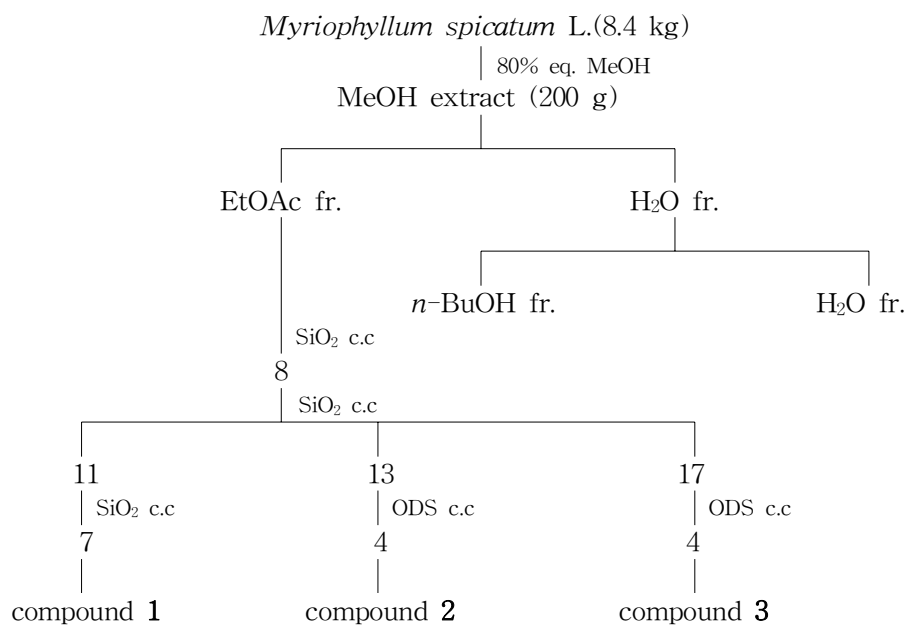
### Results

The chemical structures of the compounds were determined as afzelin (**1**), astragalol (**2**) and quercitrin (**3**) from the interpretation of spectroscopic data including NMR, MS and IR. This study reports the first isolation of compounds **1-3** from *M. spicatum*. These compounds were expected to show anti-algal effects like previously reported allelochemical polyphenols because of their structural similarity.

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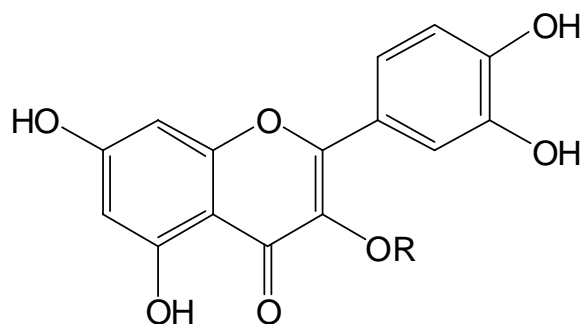
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Table 1. Isolation procedure of *Myriophyllum spicatum* L.



R=Rhm afzelin (1)

R=Glc astragalin (2)



R=Rhm quercitrin (3)

Fig. 1. Flavonoids from *Myriophyllum spicatum* L.