

# Study on synthesis of 5-*O*-acylquinic acid analogs involved in blue color development of hydrangea.

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## [ Introduction ]

In spite of various color of Hydrangeamacrophylla the pigment consists of the same components (Fig. 1). The blue color might be due to formation of a supramolecular metal complex from delphinidin 3-*O*-glucoside (1), 5-*O*-acylquinic acid (2, 3) and Al<sup>3+</sup>.

However, it has been only reported that a mixture of the 1, 2, 3 and Al<sup>3+</sup> afforded a blue aq.

Solution, but the chemical structure and the color – developing mechanism have been remained unclear. The blue color showed only in aq. solution, in which NMR signals were too broad to access the structural

analysis. Therefore, in

order to obtain the

structural information of

the structural information

of the blue complex

pigment by reproduction of

the blue color, we

synthesized the 5-*O*-acylquinic acid derivatives.

## [Results and Discussion ]

The important intermediate (8), of which 5-OH was free, was obtained efficiently from quinic acid by three steps. The 5-OH was acylated by using the corresponding carboxylic acids according to modified Tanabe's method to give the compounds, **9 – 12**. Removal of the protecting groups with TFA afforded the 5-*O*-acylquinic acid in 40 – 70% yield. We achieved highly efficient synthesis of the compounds, **13 - 16** (54-29% total yield).

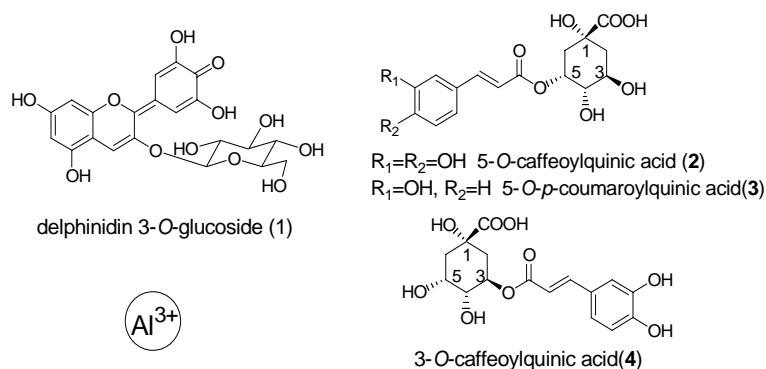
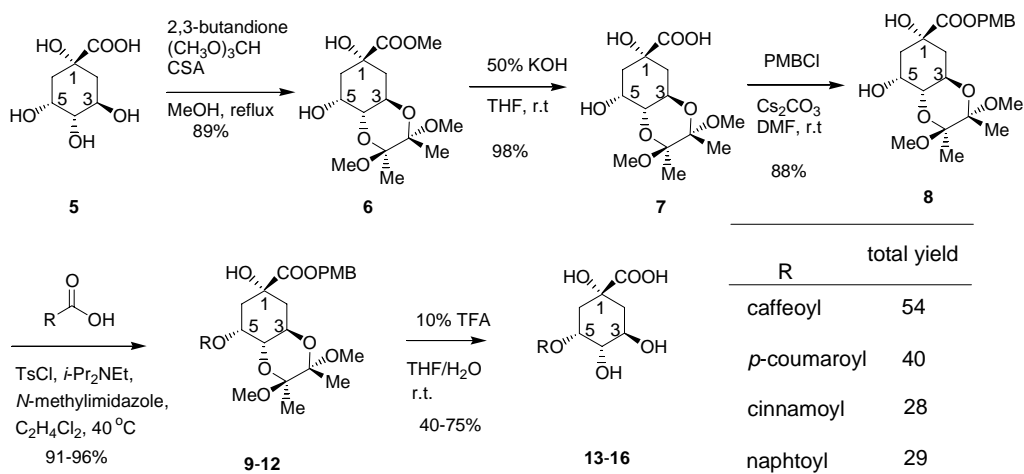


Fig-1. Components of blue pigment of hydrangea sepals