

## Synthesis and Purification of 7-Prenyloxycoumarins and Herniarin as Bioactive Natural Coumarins

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### Abstract

#### Objective(s)

7-prenyloxycoumarins including 7-isopentenylloxycoumarin, auraptene and umbelliprenin, and herniarin have been widely recognized as bioactive coumarins. This paper presents the ways to synthesis these compounds.

#### Materials and Methods

7-prenyloxycoumarins were synthesized by reaction between 7-hydroxycoumarin (1 M) and relevant prenyl bromides (1.5 M) in acetone at room temperature. The reaction was carried out in the presence of DBU (1, 8-diazabicyclo [5.4.0] undec-7-ene) (2 M). After 24 hr, the mixture was concentrated under reduced pressure. The compounds were purified by column chromatography.

#### Results

Three bioactive 7-prenyloxycoumarins, namely, umbelliprenin, auraptene and 7-isopentenylloxycoumarin, together with herniarin were synthesized from 7-hydroxycoumarin under alkaline conditions (DBU) and then purified by column chromatography. The structures of the products were characterized by NMR spectroscopic method including <sup>1</sup>H- and <sup>13</sup>C-NMR experiments.

#### Conclusion

The method of synthesis for 7-prenyloxycoumarins and herniarin which is presented here has not been reported yet. Moreover, for the first time, umbelliprenin was chemically prepared in this work.

**Keywords:** Auraptene, Herniarin, 7- Isopentenylloxycoumarin, 7-Prenyloxycoumarins, Synthesis, Umbelliprenin

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