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Characteristic of Active Compound of *Artocarpus odoratissimus*

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Abstract

Artocarpus odoratissimus, Terep (Sasak), is traditionally used as a malarian drug. As chemotacsomomy analisys, *A. odoratissimus* contains flavonoids. This experiment involves the isolation of flavonoid from *A. odoratissimus*. Isolation of flavonoid in *A. odoratissimus* could be performed using methanol as extracting solvent, and gravitational column chromatography was used to isolate flavonoid in pure form the extract. The characteristic of flavonoid from *A. odoratissimus* could be studied in undergraduate course.

Keywords

Artocarpus odoratissimus, Flavonoids, Isolation

1. Background

The genus *Artocarpus* (Moraceae) consists of approximately 50 species and is widely distributed throughout Indonesia [1] [2]. Some members of this genus have been used medicinally to treat various diseases [3] [4] [5]. Different compounds isolated from some species of *Artocarpus* have been shown to exhibit interesting biological properties [3] [4] [5]. *Artocarpus odoratissimus*, otherwise known as Terep (Sasak), grow in tropical and sub-tropical region. The medicinal values of *A. odoratissimus* have been used as an antimalarial. Based on chemotaxonomy, *Artocarpus* plants contain flavonoid. Isolation of flavonoid from *Artocarpus* plants can be useful for undergraduate students [6]-[11]. Students were exposed to skills as extraction, fractionation, and purification of flavonoid. Major coumpound in *Artocarpus* plants is flavonoid as shown in **Figure 1**.

2. Experimental Overview

This experiment is suited to upper-level undergraduate students who have a

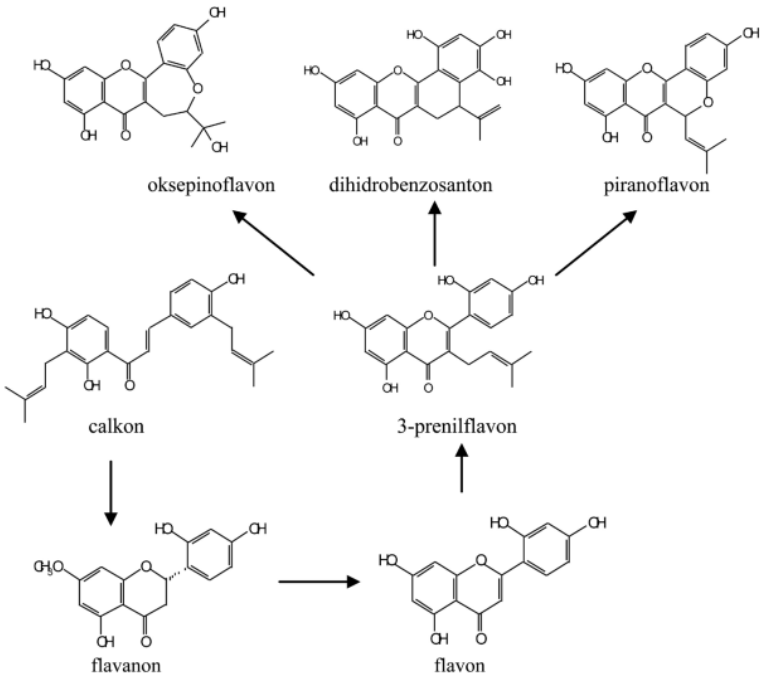

Figure 1. Major compound in *Artocarpus*.

concrete understanding of chromatograhy techniques employed in purification of organic compounds. The isolation step is straightforward and has also been completed with consistent reproducibility by upper-level undergraduate students. The experiment can be completed in two three-week laboratory sessions. This experiment allows the student to design their own activities in order to isolate flavonoid from *A. odoratissimus*. The whole procedure of flavonoid isolation from *A. odoratissimus* is discussed. The *A. odoratissimus* plant material was collected from Narmada (Lombok), Indonesia. During the laboratory sessions, the student practices a variety of techniques such as extraction of natural products, thin-layer chromatography (TLC), and gravitational column chromatography (GCC). The students identify flavonoid through the interpretation of a wide variety of spectroscopic data.

3. Experimental Details

TLC analysis was performed using precoated Si gel plates (Merck Kieselgel 60 F254, 0.25 mm). Gravitational column chromatography (GCC) was carried out using Merck Si gel 60 GF254. Plant materials of *A. odoratissimus* were collected in Narmada (Lombok), Indonesia and identified at the biology department of Mataram University, Indonesia in April 2015 (**Table 1**).

The dried of *A. odoratissimus* (460 g) was extracted with methanol. Methanol extract was evaporated to yield 27.19 g crude extract. GCC of 1 g crude extract over Si gel, using a n-hexane and chloroform (7:3) as eluent, afforded 6

Table 1. Procedures to isolate flavonoid from *Artocarpus odoratissimus*.

Procedures	Flavonoid *Artocarpus odoratissimus*	
	Coumpound 1	Coumpound 2
Extraction	Macerated 460 g dried of *A. odoratissimus* with methanol turn out 27.19 g brown crude extract	Macerated 460 g dried of *A. odoratissimus* with methanol turn out 27.19 g brown crude extract
TLC Cromatogram	n-hexane and chloroform (7:3) as eluent	n-hexane and chloroform (6:4) as eluent
Fractionation	GCC of 1 g crude extract over Si gel, using a n-hexane and chloroform (7:3) as eluent, afforded 6 fractions (F1 = 172 mg, F2 = 28 mg, F3 = 207 mg, F4 = 119 mg, F5 = 37 mg, F6 = 201 mg)	GCC of 1 g crude extract over Si gel, using a n-hexane and chloroform (7:3) as eluent, afforded 6 fractions (F1 = 172 mg, F2 = 28 mg, F3 = 207 mg, F4 = 119 mg, F5 = 37 mg, F6 = 201 mg)
Purification	Recrystallization method was used for purification fraction I to yield 106 mg coumpound 1	Fraction 3 was GCC on Si gel (n-hexane and chloroform (6:4)) to yield 31 mg coumpound 2

fractions. Recrystallization method was used for purification fraction I to yield 106 mg coumpound 1. Fraction 3 was GCC on Si gel (n-hexane and chloroform (6:4)) to yield 31 mg coumpound 2.

4. Hazards

The experiment involves the use of some potentially hazardous reagents. Laboratory coats and eye protection must be worn while performing this experiment. Chloroform is toxic if inhaled, swallowed, or absorbed through the skin. Protective gloves must be worn when handling Gravitational column chromatography. The n-hexane system used as a mobile phase is extremely flammable and is toxic to the eyes, skin, and respiratory system. Avoid inhaling vapor and use in a fume hood. Ultraviolet (UV) radiation can cause severe damage to the eyes. Do not look directly into the light source.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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