



Research Article

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**Isolation structure and elucidation of flavone from Temu Hitam rhizome  
(*Curcuma aeruginosa* Roxb.)**

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**ABSTRACT**

*Isolation structure and elucidation of flavone from Temu Hitam Rhizome extract (*Curcuma aeruginosa* Roxb.) were done. Purificated compound known as white amorf which has melting point 98-100<sup>0</sup>C, gives a single spot to some eluents with various ratio. Structure elucidation was done by UV, IR, and NMR spectroscopy. Based on the data, the isolated compound is flavon.*

**Keywords:** flavonoid, *Curcuma aeruginosa* Roxb, zingiberaceae, Flavone

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**INTRODUCTION**

Rhizomes of Temu Hitam (*Curcuma aeruginosa* Roxb.) is in the family Zingiberaceae. There are 54 genus and more than 1200 species mainly distributed [1-2]. In Thailand, *Curcuma aeruginosa* Roxb. is often used as traditional medicine for anti-inflammatory, anti-HIV, contraception, antioxidant, antimicroba [3-4] and stimulate gastric activity, antitussive, antiasthma, and anthelmintic [5]. Phytochemical screening of *Curcuma aeruginosa* Roxb showed the presence of monoterpenoid, sesquiterpene [7-9] volatile oil, terpenoid, flavonoid, alcohol, and curcumine [5-6] . In this study, we investigated the flavonoid compound in rhizome of *Curcuma aeruginosa* Roxb. from ethyl acetate fraction which has not been reported yet. The structure was identified by UV-Vis spectrum, and NMR Spectrophotometer.

**EXPERIMENTAL SECTION**

**General**

Spectroscopic data were obtained from the following instruments: UV- Secomam 1000 PC, FT-IR (Thermo Scientific Nicolet iS10), NMR 2D (<sup>1</sup>H 500 MHz, <sup>13</sup>C 125 MHz, HMQC, COSY, HMBC), and absolute methanol (Merck). All other chemicals used were of analytical grade obtained from Merck, Germany.

**Plant material**

*Curcuma aeruginosa* Roxb. rhizomes were collected from Lubuk Buaya Padang, West Sumatera Indonesia. Collected rhizomes were air dried at room temperature for a week. The plants was identified in Herbarium of Andalas University (ANDA) with herbarium number 284/K-ID/ANDA/XI/2015.

### Extraction

Finely ground rhizomes (2.89 kg) were extracted with methanol (MeOH). The extract was concentrated to dryness *in vacuo* at 40°C to remove the methanol. The aqueous extract was made and successively partitioned with hexane (Hex.) and ethyl acetate (EtOAc). The combined organic layer of each partition was evaporated to dryness *in vacuo* at 40°C using rotary evaporator to afford MeOH, Hex. and EtOAc fractions, Table 1.

### Isolation of the compounds

The EtOAc fraction (20 g) was fractionated on column chromatography silica gel using an increasing gradient of hexane in EtOAc up to 100%, followed by an increasing gradient of MeOH up to 100%. This process gave 14 fractions A – N. Purification of E by dissolving in ethyl acetate and saturating in n-hexane afforded two layers. The top layer was monitored by thin layer chromatography to give gave four tailing spots. It was recrystallized by hexane and dichloromethane and left at room temperature to afford pure compound (49 mg).

## RESULTS AND DISCUSSION

The isolated compound from ethyl acetate extract of *Curcuma aeruginosa* Roxb was identified as flavone. Melting point 98-100°C, UV  $\lambda_{\text{max}}$  (MeOH) nm : 251, 294 , IR (KBR),  $\nu_{\text{max}}$  (cm<sup>-1</sup>), 3059, 1568, 1465, 1652 . <sup>1</sup>H NMR (500 MHz, CDCl<sub>3</sub>- D):  $\delta_{\text{H}}$  6.87 (1H, s, H-3), 8.25 (1H, dd, J= 1.3 and 7.75, H-5), 7.43 (1H, t, H- 6 ), 7.71 (1H, t, H- 7), 7.58 (1H, d J=1.3, H-8), 7.94 (2H, dd, J=1.95 and 7.8, H-2' and 6'), 7.51, 7.53 (3H, t, H-3' and 5'). <sup>13</sup>C-NMR (125 MHz, CDCl<sub>3</sub>- D).  $\delta_{\text{C}}$  163.7 (C2), 107.8 (C3), 178.7 (C4), 125.9 (C5), 125.4 (C6), 134 (C7), 118.3 (C8), 156.5 (C9), 124.1 (C10), 132 (C1'), 126.5 (C2'), 129.2 (C3'), 131.8 (C4'), 129.2 (C5'), 126.5 (C6').

The spectra data were in agreement with that of flavone reported in the literature [10].



Figure 1. a) plant b) rhizome of *Curcuma aeruginosa* Roxb.

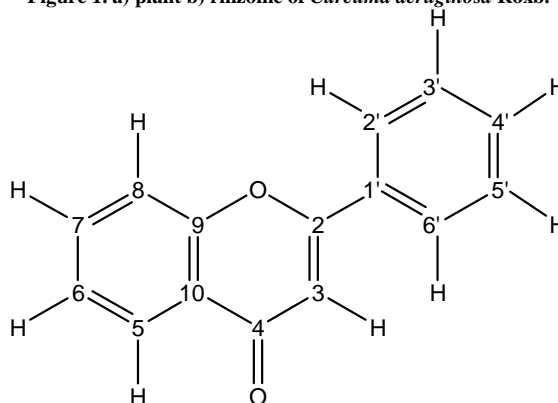


Figure 2. Structure of the isolated compound from *Curcuma aeruginosa* Roxb (flavone)

Table 1: Weights of the *Curcuma aeruginosa* Roxb. rhizomes extracts

Extract	Weight (g)
Methanol extract	129.17
Methanol fraction	72.24
Hexane fraction	15.20
Ethyl acetate fraction	22.13

### CONCLUSION

The sample used in this study was *Curcuma aeruginosa* Roxb. Maceration process was held to isolated the pure compound. The structure was identified by UV-Vis, IR and NMR. Based on spectral analysis of spectroscopy and by comparing with that of flavones reported , the isolated compound is flavones.

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