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# SHORT REPORT

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## CHEMICAL CONSTITUENTS OF *CASSIA TIMORENSIS* AND *CASSIA GRANDIS*

WANDEE GRITSANAPAN,<sup>a</sup> BAMRUNG TANTISEWIE<sup>b</sup> and VICHARA JIRAWONGSE<sup>b</sup>

a. Department of Pharmacognosy, Faculty of Pharmacy, Mahidol University, Sri-Ayudhya Road, Bangkok, Thailand.

b. Department of Pharmacognosy, Faculty of Pharmaceutical Sciences, Chulalongkorn University, Bangkok, Thailand.

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### Abstract

2,5-Dimethyl-3aH-pyrano[2,3,4-de]-1-benzopyran-3a, 8-diol (barakol) has been isolated from the leaves of *Cassia timorensis* DC. and the leaves of *Cassia grandis* L. have yielded 1,8-dihydroxy-3 (hydroxy-methyl)-anthraquinone (aloe-emodin).

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*Cassia timorensis* DC. is widely distributed in Southeast Asia and is commonly found associated with limestone in the Malay Peninsula. The young leaves of this small tree are boiled with water and used as a vegetable in Thailand. The chemical constituents of this species do not appear to have been examined previously.

Extraction of the leaves of *C. timorensis* with boiling 2% aqueous acetic acid has now yielded 2,5-dimethyl-3aH-pyrano [2,3,4-de]-1-benzopyran-3a, 8-diol (barakol) which was identified from its physical properties.

There have been several previous examination of *C. grandis* L. which is a Central American species now cultivated widely in Thailand. In the present work the dried leaves have yielded 1,8-dihydroxy-3(hydroxy-methyl) anthraquinone (aloe-emodin) which does not appear to have been detected in this species before.

Voucher specimens of *C. timorensis* DC. (No. CW 77102) and *C. grandis* L. (No. CW 77031) have been deposited in the herbarium of the Faculty of Pharmacy at Mahidol University.

Fresh young leaves (4 kg) of *C. timorensis* were cut into small pieces and boiled twice with 2% aq. acetic acid for 1 h. The extracts were filtered, combined and basified with conc. aq.  $\text{NH}_3$  (d0.880) then the mixture was extracted with chloroform. The chloroform solution was washed with water, concentrated to ca 500 ml and shaken with 5% aq. acetic acid until the extract was colourless. When the acid extract was neutralized carefully with conc. aq.  $\text{NH}_3$  and cooled, crude barakol was obtained as greenish yellow needles (1.4 g).

This product was purified by chromatography of its solution in chloroform over silicic acid. Crystallization of the product from methanol then gave barakol as greenish yellow needles (0.7 g) mp 164-5° (lit mp 165)<sup>2</sup>. The u.v., i.r. and n.m.r. spectra of this substance also agreed with those of authentic barakol obtained from *Cassia siamea* Lamk<sup>2</sup>.

Powdered air-dried leaves (3 kg) of *C. grandis* were extracted by refluxing with several portions of 70% aq. ethanol for 3 h. The combined extracts were concentrated under reduced pressure to remove the ethanol then the aqueous residue was acidified with glacial acetic acid (150 ml). After boiling the mixture for 4 h. it was filtered through kieselguhr and extracted with chloroform. The chloroform layer was concentrated to ca 500 ml, washed with 5% aq.  $\text{NaHCO}_3$  (3×100 ml) then extracted with 5% aq. NaOH. This alkaline solution was acidified and extracted with benzene. The extract was washed with water then evaporated to give a brown syrup (1.22 g). Chromatography of a benzene solution of this product over silicic acid then gave aloe-emodin which crystallized from benzene as yellow needles (230 mg) mp 223-225° (lit<sup>3</sup> m.p. 223-224). The u.v. and i.r. spectra of this substance agreed with those recorded for aloe-emodin in the literature<sup>3</sup>.

## References

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2. Bycroft, B.W., Hassania, Johnson, A.W. and King, T.J., (1970) *J. Chem. Soc. C*, 1686.
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## บทคัดย่อ

จากใบอ่อนของต้นขี้เหล็กเลือด (*Cassia timoriensis* DC.) สกัดแยกได้สารบาราคอล (Barakol) และจากใบของต้นกัลปพฤกษ์ (*Cassia grandis* Linn.) สกัดแยกได้ อะโลเอโมดิน (Aloe-emodin)