

**THE CHARACTERIZATION OF A NEW
ALKALOID AND OTHER
MEDICINAL CONSTITUENTS OF
MENISPERMACEAE
WITH SPECIAL REFERENCE TO ALBERTISIA
MEGACARPA
DIELS EX FORMAN**

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ABSTRACT

*Several compounds isolated from the wood of **Albertisia megacarpa** are identified as ∞ - amyriol, uvaol, stigmasterol and β -sitosterol. A novel azafluoranthene alkaloid isolated is given a trivial name aitidaline. The crude extract showed strong CNS activity on mice with LD_{50} 253 mg/kg body weight.*

INTRODUCTION

Menispermaceae is a family comprising of about 63 genera and with more than 350 species (Diels, 1910). This family is known locally as "mengkunyit" or "akar kunyit". they grow either as shrubs or climbers and are widely distributed in the tropical region (Ridely, 1967). Many species of this family have various medicinal uses such as treatments of jaundice, indigestion and intestinal disturbances (Perry, 1980). Several review papers on the chemical constituents of this family have been published (Tomita, 1952; Thorner, 1970). To date more than 420 alkaloids in 12 different classes are known. However all these alkaloids are based on isoquinoline carbon skeleton.

EXPERIMENTAL

Melting points were taken on Fisher John melting point apparatus and uncorrected. UV spectra were determined on a Varian Superscan spectrophotometer. IR spectra were obtained on Beckman Infra Red Spectrometer, using KBr pellets. The $^1\text{H-NMR}$ were recorded in deuterated chloroform on a JEOL JNM-FX 100. The mass spectra were obtained on Kratos MS 30 spectrometer. The plant material was collected at Bukit Bauk, Dungun, Terengganu in July, 1989.

Plant Extraction - The dried and ground wood of the plant was first extracted with light petroleum ether ($40^\circ - 60^\circ \text{C}$), after which they were air-dried, then basified with 20% ammonia and left to soak overnight. The air-dried sample was then reextracted with dichloromethane and methanol.

The petroleum-ether extracts was examined for their alkaloids and terpenoids content using Thin Layer Chromatography (TLC) and sprayed with Dragendorff's and Vanillin reagent, respectively. The extract was found to have alkaloids and terpenoids.

The dichloromethane extracts were concentrated to a volume of 500 ml and then repeatedly extracted with a solution of 5% HCl until Mayer test gave a result negative. The combined extracts were then basified with anhydrous sodium sulphate and evaporated to dryness to give crude alkaloid.

Separation and Purification of the Terpenoids - the crude from light petroleum ether extract was chromatographed on a silica gel column and eluted with 500 ml chloroform : hexane [1:1] followed by 1500 ml chloroform. Four terpenoids isolated were α -amyrin, uvaol, stigmasterol and β -sitosterol.

Separation and purification a New Alkaloid - The crude alkaloid was chromatographed on column silica gel using 500 ml mixture of light petroleum ether : diethyl ether : chloroform [2 : 1 : 1], 500 ml mixture of the same solvent systems in tation [1 : 1 : 8], 1000 ml methanol : chloroform [1 : 19] and followed by 300 ml 10% methanol in chloroform. This afforded aitalidine (1) which was further purified using preparative TLC. This compound has never been characterized before.

Aitalidine is a yellowish compound, m.p. 215°C , UV : λ_{max} (Me OH) ($\log \epsilon$) nm : 420 (4.20), 393 (4.10), 318 (4.72), 304 (4.70); IR : ν_{max} (KBr) cm^{-1} : 2920, 2840, 1650, 1370. $^1\text{H-NMR}$ (CDCl_3 , 100 MHz) : δ 4.08 (3H, s, OCH_3), 4.15 (3H, s, OCH_3), 4.20 (3H, s, OCH_3), 6.21 (1H, s, H-4), 7.84 (1H, dd, $j = 2\text{Hz}$, H-7), 7.59 (2H, dd, $J = 9\text{Hz}$, H-9, H-10), 8.30 (1H, d, $J = 9\text{Hz}$, H-5).

MS m/e (%) : M + 293.2856 (0.2), 279 (4.3), 266 (0.3), 265 (3.2), 247 (6.4), 167 (7.6), 150 (2.6), 149 (38.5).

Biological assay for CNS and LD₅₀ (Baird-Lambert, 1980)

The crude methanol extract of *Albertisia megacarpa* was evaporated to dryness. The dried extract was dissolved in distilled water. The water soluble fraction was separated and evaporated to dryness. Two grams of water soluble extract was dissolved in 10 ml of 0.9% saline solution to give 200 mg/ml of sample.

In the CNS test 10 mice were used for each treatment at different dosage. Every treated mice, dead or alive after 48 hours was sacrificed and an autopsy was carried out.

The LD₅₀ experiment was conducted to study the toxicity of the extract on mice. In each treatment, 20 mice in duplicate were used. The control mice were injected only with sterilized 0.9% saline at appropriate volumes.

RESULTS AND DISCUSSION

From the wood of *Albertisia megacarpa* Diels ex Forman, four terpenoids isolated were α - amyrin, uvaol, stigmasterol and β -sitosrerol. The four compounds previously have been reported from several species of this family (Gupta, 1978 ; Itokawa et al, 1973).

A novel azaflorenthene alkaloid, aitaline (1) was isolated from *Albertisia megacarpa*. Similar compound was also isolated previously from Menispermaceae species, *Abuta imene* and *Abuta rufescens* (Cave et al, 1972). In fact, these two genera are related to each other and the presence of this class of alkaloid may be a useful for taxonomic marker.

The pharmacological screening of the crude methanol extract showed positive effect on central Nervous System (CNS) of treated mice with LD₅₀ 253 mg/kg. Intra peretonal injection at a dose of 100 mg/kg, the mice immediately becomes inactive after 30 minutes. However, at dosage between 100-253 mg/kg convulsion can be seen which led to death.

This species is considered relatively toxic and poisonous. Therefore, precautions must be taken when using this plant orally as a medicine.

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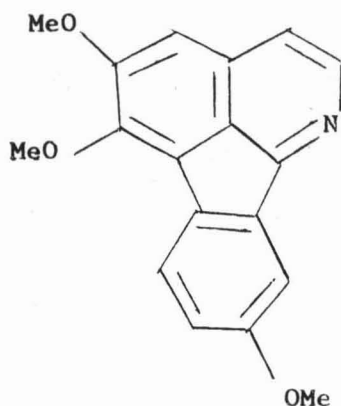
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(1) Aitidaline