



## Phytochemicals from *Calophyllum depressinervosum*

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A phytochemical investigation on the stem bark of *Calophyllum depressinervosum* resulted in the isolation of four xanthones, one coumarin and one kavalactone which were elucidated to be caloxanthone B (1), caloxanthone I (2), caloxanthone J (3), xanthochymone B (4), calopolynolide B (5) and desmethoxyyangonin (6). The structures of the compounds were elucidated using spectroscopic analysis such as 1D and 2D NMR together with MS technique. The dichloromethane extract of *Calophyllum depressinervosum* gave good cell viability on RAW246.7 cells for potential antiinflammatory test with an IC<sub>50</sub> value of 17.19 ± 0.007 µg/mL.

**Keywords:** *Calophyllum depressinervosum*, Xanthone, Coumarin, Kavalactones, Antiinflammatory.

### INTRODUCTION

The use of plants since ancient times by human civilization to treat and cure diseases has helped in the expansion and development of the pharmaceutical industries [1]. Malaysia, a tropical rain forest country is rich in a wide variety of plants. *Calophyllum depressinervosum* is one *Calophyllum* genus that grows abundantly in Malaysia. These plants are also known as bintagor lekok by local Malaysians [2]. This genus has gained medicinal uses such as antiseptics, astringents, diuretics and purgatives [3]. Besides, it also shows biological activities such as anti-HIV, anticancer, antifungal, antimicrobial, and antimalarial [4-6]. Our ongoing research on the chemical constituents and biological activities of *Calophyllum depressinervosum* has resulted in the isolation of four xanthones, one coumarin and one kavalactone (Fig. 1). They are caloxanthone B (1), caloxanthone I (2), caloxanthone J (3), xanthochymone B (4), calopolynolide A (5) and desmethoxyyangonin (6), respectively. Astonishingly, desmethoxyyangonin (6) from the class of kavalactone normally found in the Piperaceae family was found in this species. This paper discussed the NO inhibition of the extracts of *Calophyllum depressinervosum*.

### EXPERIMENTAL

The stem bark of *Calophyllum depressinervosum* was collected from Sri Aman district in Sarawak, Malaysia and identified by Prof. Dr. Rusea Go, Department of Biology,

Faculty of Science, Universiti Putra Malaysia. A voucher specimen (RG5028) was deposited in the Herbarium of Biology Department, Faculty of Science, Universiti Putra Malaysia.

**General procedure:** 1D and 2D NMR spectra were obtained using a JOEL FT-NMR 500MHz spectrometer and using tetramethylsilane (TMS) as an internal standard. GC-MS were obtained using a shimadzu GCMS-QP5050. The ultraviolet spectra were recorded in ethanol on a Shimadzu UV-160A UV-Visible recording spectrometer. Meanwhile, the infrared spectra were measured using the universal attenuated total reflection (UATR) on a Perkin-Elmer 100 series FTIR spectrometer. The melting point was measured using a Leica Galen III microscope, equipped with a Testo 720 Temperature recorder.

**Extraction and isolation:** Air-dried stem bark of *Calophyllum depressinervosum* (~ 1.8 kg) was grounded into a fine powder. The powdered stem bark was then extracted three times by soaking in hexane at room temperature for 72 h. This same procedure was repeated for three other extraction solvents which are dichloromethane, ethyl acetate and methanol. All the extracts were evaporated to dryness under reduced pressure to obtain 27 g of hexane, 26 g of dichloromethane, 33 g of ethyl acetate and 87 g of methanol extracts. The extracts were chromatographed in a silica gel glass column under vacuum using a stepwise gradient system (hexane:dichloromethane, dichloromethane:ethyl acetate, ethyl acetate:methanol). Further purification of the hexane extract using silica gel column gravity column chromatography afforded caloxanthone B (1). Mean-