

UNIVERSITI TEKNOLOGI MARA

**CHEMICAL CONSTITUENTS
AND CYTOTOXIC PROPERTIES OF
*GONIOTHALAMUS MACROPHYLLUS***

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Thesis submitted in fulfillment of the requirements
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Candidate's Declaration

I declare that the work in this thesis was carried out in accordance with the regulations of Universiti Teknologi MARA. It is original and is the result of my own work, unless otherwise indicated or acknowledged as referenced work. This thesis has not been submitted to any other academic institution or non-academic institution for any other degree or qualification.

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ABSTRACT

The roots of *Goniothalamus macrophyllus* (Annonaceae), commonly known as 'akar gajah beranak' by Malaysian is traditionally consumed by women after child birth. The ground roots were extracted with aqueous methanol and partitioned sequentially to afford the hexane, chloroform, butanol and residual extracts. The chloroform extract exhibited the highest lethality against the brine shrimp nauplii with an LC_{50} value of 58.7 $\mu\text{g/mL}$. Through brine shrimp lethality guided fractionation, two styryl lactones, goniothalamine (7) and goniodiol (12) and one flavonoid, pinocembrin (99) were isolated. Goniothalamine (7) and pinocembrin (99) exhibited lethality against the brine shrimp nauplii with LC_{50} values of 9.33 ± 0.85 and 18.20 ± 0.56 $\mu\text{g/mL}$, respectively. Though goniodiol (12) exhibited no activity against the brine shrimp nauplii, it exhibited moderate cytotoxic activity against P388 cells with an IC_{50} value of 1.00 ± 0.11 $\mu\text{g/mL}$. Both 7 and 99 exhibited IC_{50} values of 0.09 ± 0.02 and 42.00 ± 0.13 $\mu\text{g/mL}$, respectively against the P388 cells. The cytotoxic activities of these three isolated compounds were mediated through the depolymerization of tubulins. The unsaturation at C-7 and C-8 of the styryl pyrone skeleton is a structural requirement for the cytotoxic activity against the P388 cells and induction of tubulin depolymerization activity.

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