

Isolation and Characterization of Styryllactone of *Goniothalamus ridleyi* (Pemencilan dan Pencirian Stirillakton *Goniothalamus ridleyi*)

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ABSTRACT

Phytochemical studies were conducted on the stem bark, stem, root and fruit of Goniothalamus ridleyi (Annonaceae) collected at Post Brooke, Gua Musang, Kelantan, Malaysia. Extraction using organic solvent followed by extensive purification using standard procedure afforded an epoxystyryllactone, 5-acetoxyisogoniothalamine oxide (1) from the stem bark and fruit; a styryllactone, 5-acetoxygoniothalamine (2) and a styrylpyrone, dehydrogoniothalamine (3) from the stem and root; a styryllactone, 5-hydroxygoniothalamine (4) from the root and styrylpyrone as well as goniothalamine (5) from the fruit. These compounds were characterized using spectroscopic techniques.

Keywords: Annonaceae; goniothalamine derivatives; Goniothalamus; NMR

ABSTRAK

Kajian fitokimia telah dijalankan ke atas kulit batang, batang, akar dan buah Goniothalamus ridleyi (Annonaceae) yang diperolehi dari Post Brooke, Gua Musang, Kelantan, Malaysia. Pengekstrakan menggunakan pelarut organik diikuti dengan pemisahan ekstensif menggunakan prosedur piawai menghasilkan epoksisstirillakton, 5-asetoksiisogoniothalamina oksida (1) daripada kulit batang dan buah; stiriillakton, 5-asetoksigoniothalamina (2) dan stiriilpiron, dehidrogoniothalamina (3) daripada batang dan akar; stiriillakton, 5-hidroksigoniothalamina (4) daripada akar dan stiriilpiron manakala goniothalamina (5) daripada buah. Sebatian-sebatian ini dikenal pasti menggunakan teknik spektroskopi.

Kata kunci: Annonaceae; Goniothalamus; NMR; terbitan goniothalamina

INTRODUCTION

The genus *Goniothalamus* (Annonaceae) is an archaic shrub or treelets which grow in shady primary rainforest of tropical Asia (Wiert 2007). *Goniothalamus ridleyi* is a sub-canopy tree which can grow up to 7-15 m tall and 8-20 cm diameter. Stipules are absent and the leaves are alternate, simple and penni-veined. The size of the flower petals are approximately 5-10 cm long, reddish-brown and are placed in apocarps containing several seeds. This plant could be found in undisturbed forests up to 500 m in altitude, usually on hillsides and ridges. In the secondary forests, it is usually present as a pre-disturbance remnant. The bark decoction is used to treat stomach-ache (Mat-Salleh & Latiff 2002). Phytochemical studies on *Goniothalamus* spp. showed that the presence of interesting secondary metabolites particularly styryllactones and annonaceous acetogenins and alkaloids. All the secondary metabolites isolated from this genera especially styryllactone and acetogenin showed significant cytotoxicity against several human cell lines. In the previous study on *G. ridleyi*, goniothalamine, goniothalamine oxide and isoaltholactone have been isolated (Ee et al. 1999). The objectives of this research was to isolate and characterize secondary metabolites from different parts of *G. ridleyi* and to investigate the correlation of these compounds in the plant.

MATERIALS AND METHODS

PLANT

G. ridleyi was collected from Post Brooke, Gua Musang, Kelantan, Malaysia and separated into stem bark, stem, root and fruit. The samples were oven dried at 50°C and ground to powder form prior to extraction. This species has been identified by a botanist, Dr. Shamsul Khamis (UPM). The voucher specimen of *G. ridleyi* (SK1739/10) was deposited at Herbarium Universiti Putra Malaysia (UPM), Serdang.

EXTRACTION AND ISOLATION

The extraction of samples were carried out using three different solvent i.e. hexane, chloroform and methanol, which afforded three crude extracts. Each crude extract was separated using vacuum liquid chromatography (VLC, if the extract was more than 3 g), column chromatography (CC) and preparative thin layer chromatography (PTLC). The purification of the crude extracts afforded 5-acetoxyisogoniothalamine oxide (1), 5-acetoxygoniothalamine (2), dehydrogoniothalamine (3), 5-hydroxygoniothalamine (4) and goniothalamine (5).

The chloroform crude extract of the stem bark of *G. ridleyi* (5 g) was separated using VLC using mixture of chloroform, ethyl acetate and as mobile phase.