

CHEMICAL CONSTITUENTS AND ANTIOXIDANT ACTIVITY OF *GARCINIA PARVIFOLIA* MIQ. STEM BARK

Muhammad Aizam Hassan, NorazahBasar, Farediah Ahmad

Department of Chemistry, Faculty of Science, Universiti Teknologi Malaysia, 81310 Johor Bahru.

Abstract

The chemical constituents of *Garciniaparvifolia*Miq.stem bark have been studied. The dried samples have been extracted using Soxhlet apparatus to give the crude products. The constituents were separated and purified by using vacuum column chromatography, gravity column chromatography and recrystallisation. The chemical compounds obtained were elucidated by infrared (IR) and nuclear magnetic resonance (NMR) spectroscopy. Two compounds namely as 1,6,7-trihydroxy-3-methoxyxanthone and 3,8"-binaringenin were isolated from the ethyl acetate crude extracts of *G. parvifolia*Miq. The free-radical scavenging activity of the crude extracts were determined by the 2,2-diphenyl-1-picrylhydrazyl (DPPH) assay. The ethyl acetate extract was found to be the most active free radical scavenger with IC₅₀ value of 4.2 ppm, followed by methanol extract (IC₅₀ 96 ppm) and petroleum ether extract (IC₅₀ 200 ppm).

Keywords: *Garciniaparvifolia*Miq.,stem bark, 1,6,7-trihydroxy-3-methoxyxanthone, 3,8"-binaringenin.

INTRODUCTION

*Garciniaparvifolia*Miq.is one of the species from Clusiaceae (Guttiferae) family distributed widely in the tropical region of the world and has high potential as spice and value medicinal plants. Clusiaceae family have 36 genera and 1,600 species with a pan tropical distribution. Four genera and 16 species are native to Australia and three genera and five species are found in the Northern Territory, Australia. Three genera were reported as *Calophyllum*L., *Garcinia*L., and *Hypericum*L. The Clusiaceae (Guttiferae) family is part of Malpighiales and Clusioideae as the subfamily [1]. In peninsular Malaysia there are 49 *Garcinia* species out of 350 species estimated, which include *Garciniaatroviridis*, *G. cowa*, *G. morella*, *G. lanceaeifolia*, *G. hombroniana*, *G. prainiana*and *G. mangostana* [2,3].

*Garciniaparvifolia*Miq is known as "asamkandis" and it has white colour with taste like mangosteen which is the most famous fruit in Malaysia [4]. Previous study on *G. parvifolia*Miq.reportedthe presence of xanthenes as the major chemical constituents together with triterpenes, bioflavonoids and benzophenones. Moreover, *G. parvifolia*Miqshowed several biological activities included antioxidant, antibacterial, cytotoxicand antiplasmodial activities [5]. In this paper, we report the isolation of two chemical constituents from the stem bark of *Garciniaparvifolia*Miq. and the antioxidant assay on the crude extracts.

EXPERIMENTAL

General Experimental Procedures

Thin layer chromatography (TLC) analysis was done using Merck 60 F₂₅₄ pre-coated silica gel aluminium sheet with thickness of 0.20 mm with different polarity of solvent system. The spots on the TLC plate was visualized by UV lamp (254 nm) and sprayed with vanillin-sulphuric acid spraying reagent. Fractionation and purification process was carried out by using vacuum liquid chromatography (VLC) and gravity column chromatography (CC) with different size of silica gel as stationary phase. Silica gel 230-400 mesh was used for VLC, while silica gel 70-230 mesh was used for gravity column chromatography (CC) with different polarity of solvent as the mobile phase. Elucidation of pure compounds was obtained by infrared (IR) and Nuclear Magnetic Resonance (NMR) spectroscopies. The IR spectra were measured using Perkin-Elmer Spectrum Two (ATR), while ¹H NMR spectra were recorded by BrukerAvance Spectrometer 400 MHz with deuterated chloroform (CDCl₃) and acetone (acetone-d₆) as solvents.

Plant Material

The stem barks of *G. parvifolia*Miq. with voucher specimen number SK 1961/11 was obtained from Sekayu Forest Reserved in Kuala Berang, Terengganu, Malaysia in June 2011.