Chromanone Acid Derivatives from the Stem Bark of *Calophyllum incrassatum*

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Abstract. Two chromanone acid derivatives, calofolic acid B (**1**) and apetalic acid (**2**) were isolated from the stem bark of *Calophyllum incrassatum*. The structures of both compounds were elucidated by UV, IR, HRESIMS, 1D and 2D NMR spectroscopies and comparison of their data with literatures. Compounds **1-2** were evaluated for their cytotoxic activity against P-388 cells, compound (**1**) showing value IC_{50} 1.14 µg/mL.

Keywords: *Calophyllum incrassatum,* Calofolic acid B, Apetalic acid, P-388 cells.

1. Introduction

The genus *Calophyllum* (Calophyllaceae) comprises approximately 150 species that grow in the restrictive area of South East Asia. In Indonesia, the plants has many advantages, used as traditional treatment for rheumatism, inflammation, eye disease, and skin disease [1]. This genus is well known to produce a variety secondary metabolites such as xanthones [2], 4-phenylcoumarins [3], benzofuran-3-ones [4], biflavonoids [5] and chromanone acid [6-8], which have some biological activities such as anticancer, antibactery, and antitumor. Xanthone and 4-phenylcoumarin derivatives containing a isoprenyl side chain in aromatic region revealed as a key element to enhance their biological activities. In continuation of our work on phytochemical examination of chromanone acid on *Calophyllum* from West Kalimantan, we report the isolation of calofolic acid B (**1**), and apetalic acid (**2**) from the methanol extract of the stem bark of *Calophyllum incrassatum*. Compounds **1** and **2** were established by UV, IR, HRESIMS, 1D and 2D NMR, as well as by comparison with those related compounds previously reported. The cytotoxic activity against murine leukemia P-388 cells of isolated compounds from this species is also briefly described.

2. Experimental Methode

2.1 General experimental

UV spectra was measured by Shimadzu series 1800 UV-VIS spectrophotometer with methanol (Kyoto, Japan). IR spectra was recorded in KBr on a One Perkin Elmer instrument (Waltham, MA, USA). Mass spectra was recorded on Synapt G2 mass spectrometer (Manchester, UK). NMR spectra (^{1}H-NMR, ^{13}C-NMR, HMQC, and HMBC) was obtained with a JEOL JNM-ECA 400 MHz FTNMR spectrophotometer (Tokyo, Japan) with $CDCl_3$ as the solvent and internal standard. Column chromatography and planar radial chromatography was carried out using Si gel 60 Cat. No. 1.07734.1000 and Si gel 60 PF_{254} No. 1.07749.1000 (Merck, Darmstadt, Germany).

2.2 Plant Material

The stem bark of *C. incrassatum* was collected from Mandor sub-district, Landak regency, West Kalimantan, Indonesia. The sampel was identified by Mr. Ismail Rachman from the Herbarium Bogoriense, Bogor, Center of Biological Research and Development.