



Isolation of cytotoxic sesquiterpenes from *Curcuma comosa* and characterization of their structures

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Three guaiane-type sesquiterpenes named curcumenol (**1**), zedoarondiol (**2**), and (1*S*,4*S*,5*S*,10*R*)-isozedoarondiol (**3**) were isolated from the rhizomes of *Curcuma comosa*. Their structures were elucidated on the basis of extensive spectroscopic analysis. The cytotoxic activities of all isolated compounds were tested by MTT assay. Compounds **2** and **3** showed the most potent activities against T47D cell line with IC₅₀ values 12.13 and 10.93 µg/mL, respectively.

Keywords: *Curcuma comosa*, Zingiberaceae, guaiane-type sesquiterpenes, MTT assay.

Introduction

Curcuma comosa (Zingiberaceae), widely grown in tropical and subtropical area of Asia, including Thailand, Indonesia, Malaysia and Taunggyi¹⁻³ (Shan State of Myanmar). Taunggyi is the fifth largest city of Myanmar. Taunggyi has a humid subtropical climate. The climate usually comprises three seasons: hot summer, rainy monsoon, and cold winter.

In Taunggyi, the rhizome of *Curcuma comosa* is called **Sa-nwin-ga** and local people have used it as a traditional medicine for stomach ache, diabetes mellitus and hypertension. In Thailand, the rhizome of *C. comosa* is called **Waam chak mod luuk** and it has been used for the treatment of reproductive disorders in women, and for relief of unpleasant menopausal symptoms among postmenopausal women, and it is also widely used as an aromatic stomachic and anti-inflammatory agent. Several compounds have been isolated from the rhizomes of *C. comosa*. Three major groups of structures reported include sesquiterpenes, diarylheptanoids, and flavonoids glycosides. The structure of sesquiterpenes can be classified into five sub-groups: (i) Germacrane type sesquiterpene, (ii) Guaiane type sesquiterpene, (iii) Bisaborane

type sesquiterpene, (iv) Carabrane type sesquiterpene, and (v) Eudesmane type sesquiterpene. Pharmacological investigations on diarylheptanoids have displayed significant biological activities, including estrogenic, anti-bacteria, anti-inflammatory, and anti-osteoclastogenic properties³⁻¹⁰.

This research focused on chemical investigation of a methanolic extract of *C. comosa* resulting in isolation and structure elucidation of three guaiane-type sesquiterpenes. Moreover, cytotoxic activity of all the isolated compounds also evaluated.

Experimental

General:

All chemical solvents used were of analytical grade and were purchased in Surabaya, Indonesia. The solvents used for extraction and chromatography were distilled at their boiling points. Column chromatography (CC) was carried out on silica gel 60. TLC was carried out on silica gel 60GF₂₅₄ pre-coated plates (Merck). Melting points were determined using appropriate apparatus. The ¹H NMR and ¹³C NMR spectra were recorded at 600 and 151 MHz, in CDCl₃, methanol-