

Triterpenoids from *Garcinia rigida*

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Abstract: The leaves of *Garcinia rigida* afforded six triterpenoid compounds, friedelin (**1**), lanosta-8,25-en-3 β -ol (**2**), stigmasterol (**3**), lupeol (**4**), 3 β -hydroxy-20(29)-en-lupan-30-al (**5**) and 3 β -hydroxy-20(29)-en-lupan-30-ol (**6**). The structures of **1-6** were elucidated by IR, MS, NMR spectroscopies and comparison of their spectroscopic data with those reported in the literatures. Compound **6** showed toxicity to *Artemia salina* in brine shrimp lethality test (BLST) with LC₅₀ 27.72 μ g/mL.

Keywords: *Garcinia rigida*; triterpenoid; brine shrimp lethality test (BLST).

1. Plant Source

Garcinia rigida belongs to Guttiferae family which commonly grows in Indonesia [1]. *Garcinia rigida* is a multy years plant (perennial) that has strong radices. The plant lives in primary forest at lower plateau up until at a highest level of 700 meters above sea levels. This plant is called in Indonesia as a 'forest manggis' or 'manggis hutan', and grows commonly at Sumatera, Jawa and Kalimantan [1,2]. The shape of the leaves is lancet until ellips, and the shape of the fruits is ellips small. The bark of the fruit is red, and thinner than that of *G. mangostana* and the fruit has a good smell, likes a pineapple flavour [1,2].

The leaves of *Garcinia rigida* (Guttiferae) were collected in Bogor, Indonesia, in October 2002, identified by Dr. Irawati. A voucher specimen has been deposited in Pharmacy Department of University of Indonesia (No GR-1002). In previous papers, we reported the isolation of xanthones from the leaves *Garcinia rigida* [3,4] and a cytotoxic xanthone [5-6].

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2. Previous Studies

The family of Guttiferae were reported to be rich in natural chemical substances [5]. In previous paper, we reported the isolation of xanthenes from the leaves *Garcinia rigida* [3,4] and a cytotoxic xanthone [6].

3. Present Study

The air dried leaves *G. rigida* (900 g) were soaked in hexane for a week and then soaked in acetone for a week. The hexane extract was concentrated to give a residue (10.0 g) that was subjected to column chromatography on Si gel with petroleum ether-ethyl acetate systems, affording 9 fractions. Fraction 1 to give **1** (55 mg), fraction 2 to obtain **2** (43 mg), fraction 3 to yield **4** (32 mg), fraction 6 to yield **6** (22 mg). Fraction 4 was subjected to column chromatography on Sephadex LH-20 (CHCl₃-MeOH, 1-1) afforded compounds **3** (32 mg) and **5** (18 mg). These compounds were elucidated by IR, MS, NMR spectroscopies and comparison of their spectroscopic data with those reported in the literatures [7-8].

FTIR spectra were measured on Bio-Rad Merlin Spectrophotometer. MS were performed on an Autospec 3000 spectrometer at 70 eV. The NMR spectra were recorded on Bruker AM-400 and DRX-500 spectrometers.

The six triterpenoids were isolated i.e friedelin (**1**), lanosta-8,25-en-3 β -ol (**2**), stigmasterol (**3**), lupeol (**4**), 3 β -hydroxy-20(29)-en-lupan-30-al (**5**) and 3 β -hydroxy-20(29)-en-lupan-30-ol (**6**)

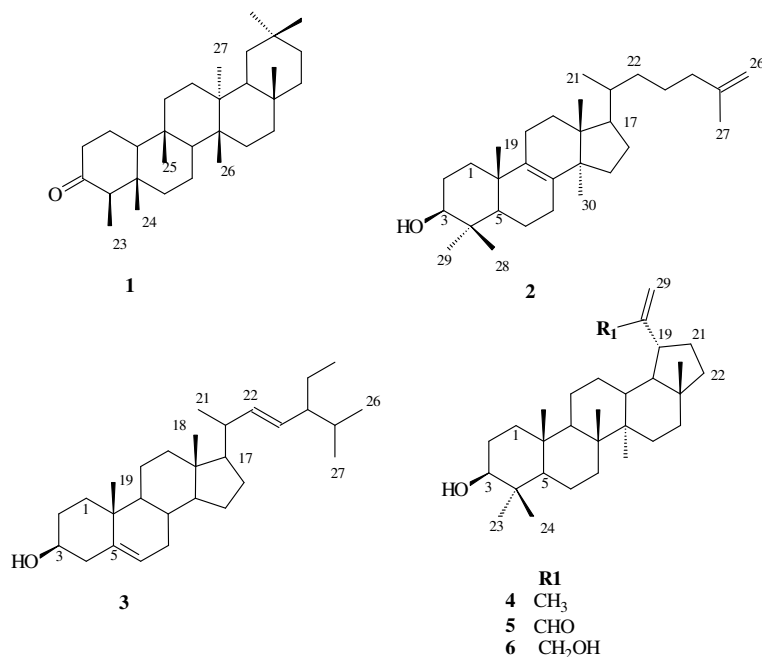


Figure 1. Isolated compounds from *Garcinia rigida*

The isolated compounds then were tested its toxicity towards *Artemia salina* in brine shrimp lethality test (BLST)

Brine Shrimp Lethality Assay [9]: Brine shrimp (*Artemia salina* Leach) eggs were placed in a hatching tank containing sea water for 48 h. Each compound was made solution at concentration 200, 100, 40, 10, 5 $\mu\text{g/mL}$ in vial and allowed to evaporate. After evaporation, 5 ml of brine was added to each vial in triplicate to prepare a test concentration. Ten shrimp were added to each vial (30 shrimps per concentration). The number of survivors out of 30 shrimps per concentration was recorded.

Table 1. The toxicity to *Artemia salina* in brine shrimp lethality test for compound **1-6**

Compound	Concentration ($\mu\text{g/mL}$)	Mortality (%)	LC ₅₀
1	200	60,00	183.839
	100	30,00	
	40	23,33	
	10	13,33	
2	200	60,00	138.471
	100	40,00	
	40	33,33	
	10	23,33	
3	200	66,67	96.066
	100	46,67	
	40	33,33	
	10	16,67	
4	200	63,33	177.372
	100	26,67	
	40	23,33	
	10	13,33	
5	100	56,67	62.082
	40	43,33	
	10	23,33	
	1	3,33	
6	100	66,67	27.721
	40	56,67	
	10	36,67	
	1	10,00	

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Supporting Information

Supporting Information accompanies this paper on <http://www.acgpubs.org/RNP>

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