

## A NEW TRITERPENOID FROM *BRIDELIA TOMENTOSA*

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ABSTRACT.—The new triterpenoid 24-methylhanosta-9(11),25-dien-3-one **1** and the known triterpenoid 24,24-dimethylhanosta-9(11),25-dien-3-one **2** were obtained from the roots of *Bridelia tomentosa*.

*Bridelia tomentosa* Bl. (syn. *Bridelia monoica* Merr.), a traditional medicinal plant in Thailand, locally known as "Khon non," is a small tree in the Euphorbiaceae family. A decoction of the bark or leaves is used for colic. A decoction of leaves with parts of other plants is used for high fever. The root serves as a medicine taken the first 3 days after childbirth (1).

Hui and Fung (2) investigated the leaves and stems of *B. monoica* Merr. and reported the isolation of friedelin, friedelan-3 $\beta$ -ol, glutin-5-en-3 $\beta$ -ol (D,B-friedo-olean-5-en-3 $\beta$ -ol), stigmasterol,  $\beta$ -sitosterol, and a long chain aliphatic compound, C<sub>20</sub>H<sub>38</sub>O<sub>2</sub>. There is no other report on *B. monoica* or *B. tomentosa*. We now report the isolation of one new and one additional known triterpenoid from the roots of *B. tomentosa*.

Extraction of the ground roots of *B. tomentosa* with MeOH followed by chromatography yielded a white solid, mp 150–151°. <sup>1</sup>H-nmr spectroscopy showed this to be a mixture of two closely related compounds which we

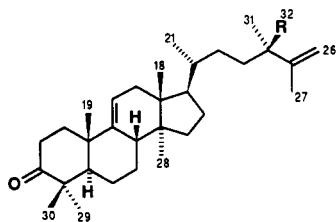
were unable to separate except by gc-ms, but which we were able to show, largely from the <sup>1</sup>H- and <sup>13</sup>C-nmr spectra (Table 1) of the mixture, to contain a new 31-carbon triterpenoid **1** (60%) and the known 32-carbon triterpenoid **2** (40%) (3).

The <sup>13</sup>C spectral peaks of **2** were assigned by comparison with hispidone (4) and 24-*epi*-dihydrocyclonervilasterol (5). The major compound **1** differed from **2** only in the side chain, and its side-chain <sup>1</sup>H-nmr absorption matched that of carnaubadiol (6). The 24(*S*) configuration was determined by hydrogenation to the 25,26-dihydro compound and <sup>1</sup>H-nmr spectral comparison with 24-*epi*-dihydrocyclonervilasterol (5). The optical rotation of **1** was calculated to be +65.5° from the rotation of +61.0° for **2** and the rotation of +63.7° observed for the 60:40 mixture of **1** and **2**.

### EXPERIMENTAL

GENERAL EXPERIMENTAL PROCEDURES.—Ir spectra were recorded with a Perkin-Elmer 781 spectrophotometer. Ms was obtained on a JEOL JMS-DX 300 spectrometer. Elemental analyses were carried out on a Perkin-Elmer 240C elemental analyzer. Uv spectral data were measured with a Shimadzu 240 spectrophotometer. Optical rotations were obtained on an Autopol III Automatic Polarimeter. <sup>1</sup>H-nmr spectra at 250 MHz and <sup>13</sup>C-nmr spectra at 62.9 MHz in CDCl<sub>3</sub> were recorded on a Bruker WM-250 spectrometer.

PLANT MATERIAL.—The dried roots of *B. tomentosa* were obtained from Rayong Province, Thailand in February 1986. The voucher specimen, BK 37631, was deposited at the Herbarium of Botany Section, Botany and Weed Science Division, Department of Agriculture, Ministry of



- 1** R = H  
**2** R = Me

TABLE 1.  $^{13}\text{C}$ - and  $^1\text{H}$ -nmr Chemical Shifts ( $\delta$ ) and Coupling Constants (in Hz, in parentheses) for **1** and **2**.

Atom	Compound			
	1		2 <sup>a</sup>	
	$^1\text{H}$	$^{13}\text{C}$	$^1\text{H}$	$^{13}\text{C}$
1	$\beta$ 2.10 ddd (13.2, 6.3, 3.1)	36.7		
2	$\alpha$ 2.40 ddd (15.4, 5.4, 3.1) $\beta$ 2.72 ddd (15.4, 13.3, 6.3)	34.9		
3		217.2		
4		46.9		
5		53.4		
6		27.7 <sup>b</sup>		
7		22.5 <sup>b</sup>		
8	2.23 br d (12.3)	41.8		
9		147.0		
10		39.0		
11	5.28 br d (5.9)	116.3		
12	1.92 m, 2.08 m	37.1		
13		44.2		
14		47.7		
15		33.9		
16		27.9		
17		50.8		50.7
18	0.66 s	14.4		
19	1.23 s	21.8		
20		36.0		36.6
21	0.87 d (6.3)	18.6		18.5
22		33.9 <sup>c</sup>		30.7
23		31.4 <sup>c</sup>		37.3
24	2.1 m	41.6		38.7
25		150.1		152.3
26	4.67 br s	109.4	4.67 br s, 4.72 br s	109.3
27	1.64 br s	20.2	1.69 br s	19.4
28	0.74 s	18.4		
29	1.07 s	25.6		
30	1.07 s	22.0		
31	1.00 d (6.9)	18.4	1.01 s	27.2
32			1.02 s	27.5

<sup>a</sup>Only the parameters which differed from those of **1** are shown for **2**.

<sup>b,c</sup>Values in the same column with the same superscript may be interchanged.

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ISOLATION OF TRITERPENOIDs.—Dried and ground roots (4.9 kg) were exhaustively extracted with MeOH by maceration. The MeOH extract was evaporated and partitioned with  $\text{CHCl}_3$ . The  $\text{CHCl}_3$  extract was concentrated to give a brown semisolid (50.7 g) and column chromatographed using Si gel as adsorbent. On elution with  $\text{CHCl}_3$ -hexane (1:3), a white solid was obtained and recrystallized from MeOH as white needles (680 mg): mp 150–151°;  $[\alpha]^{25}\text{D} + 63.7^\circ$  ( $c = 1.0$ ,  $\text{CHCl}_3$ );  $R_f$  0.7 (Si gel,  $\text{CHCl}_3$ ); uv  $\lambda$  max ( $\text{CHCl}_3$ ) 291 nm ( $\epsilon$  33); ir  $\nu$  max (KBr) 3060, 3040, 1710, 1640, 880  $\text{cm}^{-1}$ ; gc-ms (2%

OV-1, 1 m, 270°) **1** Rt 6 min,  $m/z$  (rel. int.)  $[\text{M}]^+$  438 (28), 423 (79), 311 (100), 257 (44), 245 (41); gc-ms **2** Rt 7.4 min,  $m/z$  (rel. int.)  $[\text{M}]^+$  452 (20), 437 (50), 395 (9), 311 (92), 257 (38), 245 (32), 55 (100);  $^1\text{H}$  and  $^{13}\text{C}$  nmr see Table 1. Found C 85.09, H 11.60, calcd for  $\text{C}_{31}\text{H}_{50}\text{O}$ , C 84.87, H 11.49%, calcd for  $\text{C}_{32}\text{H}_{52}\text{O}$ , C 84.89, H 11.58%.

HYDROGENATION OF THE MIXTURE OF COMPOUNDS **1** AND **2**.—The mixture of compounds **1** and **2** (10 mg), 2 mg of 5% Pd/charcoal, and 5 ml of EtOH was stirred under  $\text{H}_2$  for 30 min. After filtration and concentration, the  $^1\text{H}$ -nmr spectrum showed doublets ( $J = 6$  Hz) at  $\delta$  0.782, 0.856, and 0.885 characteristic of the S

configuration at C-24 in 25,26-dihydro-1 and lacked peaks expected for an *R* configuration.

#### ACKNOWLEDGMENTS

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