

METABOLITES FROM THE STEMS OF *Meliosma rigida*

Ming-Jen Cheng,<sup>1</sup> Ming-Der Wu,<sup>2\*</sup> Nanthaphong Khamthong,<sup>3</sup>  
Jyh-Yih Leu,<sup>1</sup> Chih-Chuan Lin,<sup>4</sup> and Jih-Jung Chen<sup>5,6\*</sup>

*Meliosma rigida* Siebold & Zucc. is a small evergreen tree belonging to the family Sabiaceae [1], which is native to tropical or warm temperate regions of South Asia and the Americas. There are about 160 species in three genera throughout the world, all of which are woody plants, whereas there are only two genera and six species in Taiwan. In addition to the *Meliosma rhoifolia* Maxim. studied in this study, *Meliosma* also includes *Meliosma rigida* Siebold & Zucc. and *M. squamulata* Hance, whose components have never been studied. The metabolites isolated in this study have not been found in the Sabiaceae. Its buds, young branches, midribs, and inflorescences are all embroidered with fluff. It is distributed in the Himalayas, China, Japan, and scattered in forests at medium altitudes in Taiwan. After reviewing the past literature, it was found that there is no reference to chemical and biological activity of the title plant.

This paper deals with the isolation work on the plant. In the course of screening for biologically and chemically novel agents from Formosan plants in the family Sabiaceae, *M. rigida* was chosen for further phytochemical investigation. In this study, the EtOH extract of its stems was subjected to solvent partitioning and chromatographic separation to afford eight pure constituents. The chemical constituents of the stems of *M. rigida* were separated by column chromatography, revealing eight compounds—including five butanolides: isolinderanolide B (**1**) [2], linderanolide B (**2**) [2], isolinderanolide C (**3**) [2], secolincomolide A (**4**) [3], secokotomolide A (**5**) [4], one chroman:  $\alpha$ -tocopherol (**6**) [5]; one quinone-terpenoid:  $\alpha$ -tocospirone (**7**) [6]; as well as one tetralone: ( $\pm$ )-4-hydroxy-4,7-dimethyl-1-tetralone (**8**) [7]. All of these compounds were found for the first time in this plant. The specimen of *M. rigida* was collected from Huisun experimental forest station, Renai, Nantou County, Taiwan in July 2019. A voucher specimen was identified by one of the authors Chih-Chuan Lin and was deposited in the Bioresource Collection and Research Center (BCRC), Food Industry Research and Development Institute (FIRDI). Dried stems (10 kg) were sliced and extracted with cold EtOH five times. After concentration under reduced pressure, the EtOH extract was partitioned between EtOAc–H<sub>2</sub>O (1:1) to obtain an EtOAc soluble-fraction (67 g), H<sub>2</sub>O-soluble fraction (70 g) and an insoluble fraction (29 g). The EtOAc fraction (67 g) was subjected to silica gel column (230–400 mesh, about 3 kg), eluting with a gradient of *n*-hexane–acetone to give 10 fractions (1–10). Fraction 1 (2.8 g) was applied to a silica gel (230–400 mesh, 100 g), eluting with CH<sub>2</sub>Cl<sub>2</sub>–EtOAc (10:1) to give five subfractions (1-1–1-5). Subfraction 1-3 (1.2 g) was chromatographed on a silica gel column (230–400 mesh, 30 g), eluting with *n*-hexane–acetone (10:1) to obtain **1** (1.4 mg) and **2** (3.1 mg). Subfraction 1-4 (907 mg) was chromatographed on a silica gel column (230–400 mesh, 30 g), eluting with CH<sub>2</sub>Cl<sub>2</sub>–acetone (8:1) to give 6 subfractions (1-4-1–1-4-6). Subfraction 1-4-3 (89 mg) was further purified by preparative TLC (*n*-hexane–acetone, 10:1) to afford **3** (1.4 mg), **4** (3.8 mg), and **7** (0.7 mg). Fraction 3 (1.96 g) was applied to a silica gel (230–400 mesh, 70 g), eluting with a gradient of *n*-hexane–EtOAc to obtain eight subfractions (3-1–3-8). Subfraction 3-7 (401 mg) was applied to a RP-C18 column (1 g), eluting with acetone–H<sub>2</sub>O (20:1) to afford **5** (9.1 mg), **6** (4.2 mg), and **8** (0.9 mg).

**Isolinderanolide B (1)**, liquid,  $[\alpha]_D^{22} +87.2^\circ$  (*c* 0.01, CHCl<sub>3</sub>). UV ( $\lambda_{\max}$ , nm): 226. IR ( $\nu_{\max}$ , cm<sup>-1</sup>): 3421 (OH), 1771, 1672 ( $\alpha,\beta'$ -unsaturated- $\gamma$ -lactone). <sup>1</sup>H NMR (600 MHz, CDCl<sub>3</sub>,  $\delta$ , ppm, J/Hz): 0.78 (3H, t, J = 7.1, H-19), 1.22–1.30

1) Department of Life Science, Fu Jen Catholic University, New Taipei City, 24205, Taiwan, e-mail: chengfirdi@gmail.com; 2) Bioresource Collection and Research Center, Food Industry Research and Development Institute, 300193, Hsinchu, Taiwan; 3) College of Oriental Medicine, Rangsit University, 12000, Pathum Thani, Thailand; 4) Experimental Forest Management Office, College of Agriculture and Natural Resources, National Chung Hsing University, 402, Taichung, Taiwan; 5) Department of Pharmacy, School of Pharmaceutical Sciences, National Yang Ming Chiao Tung University, 112304, Taipei, Taiwan; 6) Department of Medical Research, China Medical University Hospital, China Medical University, 404333, Taichung, Taiwan. Published in *Khimiya Prirodnykh Soedinenii*, No. 4, July–August, 2023, pp. 681–682. Original article submitted July 8, 2022.