

Antinematodal Activities of Ingenane Diterpenes from *Euphorbia kansui* and their Derivatives against the Pine Wood Nematode (*Bursaphelenchus xylophilus*)

Jianxiao Shi^{a,b}, Zhixuan Li^b, Teruhiko Nitoda^a, Minoru Izumi^a, Hiroshi Kanzaki^a, Naomichi Baba^a, Kazuyoshi Kawazu^a, and Shuhei Nakajima^{a,*}

^a Graduate School of Natural Science and Technology, Department of Applied Bioscience and Biotechnology, Laboratory of Natural Products Chemistry, Faculty of Agriculture, Okayama University, Tsushima naka 3-1-1, Okayama 700–8530, Japan.

Fax: +81-86-251-83 02. E-mail: snaka24@cc.okayama-u.ac.jp

^b College of Life Science, Northwest University, Xi'an 710069, People's Republic of China

* Author for correspondence and reprint requests

Z. Naturforsch. **63c**, 59–65 (2008); received June 15/July 25, 2007

Under the bioassay-guided method, two diterpenes, 3-*O*-(2'',3''-dimethylbutanoyl)-13-*O*-dodecanoylingenol (**1**) and 3-*O*-(2'',3''-dimethylbutanoyl)-13-*O*-decanoylingenol (**2**) isolated from *Euphorbia kansui*, showed a pronounced antinematodal activity against the nematode *Bursaphelenchus xylophilus* at the same minimum effective dose (MED) of 5 μ g per cotton ball and still displayed antinematodal activity at a dose of 2.5 μ g per cotton ball. Compounds **3–6** were obtained, and the structure of the new compound **6** was elucidated based on 1D- and 2D-NMR analyses and physicochemical data. Preliminary structure-biological activity relationships of ingenane-type compounds were deduced.

Key words: *Euphorbia kansui*, Antinematodal, Ingenane Diterpenes, *Bursaphelenchus xylophilus*