



Antimicrobial Terpenoids from *Elephantopus mollis*

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ABSTRACT

The leaves of *Elephantopus mollis* HBK, commonly known as malatabako is reported to exhibit antimicrobial properties. The study was conducted to isolate the dichloromethane soluble constituents of the plant which may contribute to this activity. The air-dried leaves of *E. mollis* afforded molephantin (1), molephantinin (2), 2-deethoxy-2-hydroxyphantomolin (3), stigmaterol (4), α -amyrin fatty acid ester (5a), and lupeol fatty acid ester (5b). The structures of the sesquiterpenes (1-3) were elucidated by extensive 1D and 2D NMR spectroscopy and confirmed by comparison of their ¹³C NMR data with those found in the literature, while the structures of 4, 5a, and 5b were deduced by comparison of their ¹H and ¹³C NMR spectral data with those reported in the literature. Antimicrobial tests on 1-3 indicated that they are moderately active against the fungus, *C. albicans* and slightly against the bacteria: *E. coli* and *P. aeruginosa* and the fungus, *T. mentagrophytes*. Compounds 1 and a mixture of 1 and 2 exhibited slight activity against *S. aureus*, while 3 and a mixture of 1 and 2 were slightly active against *B. subtilis*. All compounds were found inactive against *A. niger*.

Keywords: *Elephantopus mollis*, Asteraceae, molephantin, molephantinin, 2-deethoxy-2-hydroxyphantomolin, α -amyrin fatty acid ester, lupeol fatty acid ester, antimicrobial

INTRODUCTION

Elephantopus mollis is a weed found throughout the Philippines. The leaves are applied to wounds as a vulnerary, while a decoction of the plant is given as diuretic and febrifuge (Quisumbing, 1978). An earlier study reported that the 70% ethanol extract of the air-dried leaves of *E. mollis* exhibited antibacterial activity against *E. coli* (Hansel & Lagare, 2005). A previous study on the plant reported the isolation of three new sesquiterpenoid lactones: 2,5-epoxy-2 β -hydroxy-8 α -(2-methylpropenyloxy)-4(15),10(14),11(13)-germacra trien-12,6 α -olide, (4 β H)-8 α -(2-methylpropenyloxy)-2-oxo-1(5),10(14),11(13)-guaiaatrien-12,6 α -olide and (4H)-5-hydroxy-8-(2-methylpropenyloxy)-1(10),11(13)-guaiaadiene-1,2,6-olide together with molephantin, elephantopin, isoelephantopin and 2-deethoxy-2 β -methoxyphantomolin which exhibited potent leishmanicidal activities (Fuchino *et al.*, 2001). Other studies on *E. mollis* reported the isolation of elephanmollen and 2,5-epoxy-2 β -hydroxy-8 α -(2methylbut-2-enoyloxy)-4(15),10(14),11(13)-germacratrien-12, 6 α -olide (Tabopda *et al.*, 2007); lupeol, lupeol acetate, epifriedelinol, molephantin, 2-deethoxy-2-methoxyphantomolin and deethoxy-2-hydroxy phantomolin