Antibacterial and cytotoxic properties of isoprenoids from the red sea soft coral, Lobophytum sp

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Abstract

Purpose: To evaluate the antibacterial and cytotoxic activities of the secondary metabolites of Lobophytum sp.

Methods: Maceration with methanol: chloroform (1: 1) was applied to extract the coral material. Chromatographic and spectroscopic techniques were employed for fractionation, isolation and elucidation of pure compounds. Antibacterial activities were performed by well diffusion method against three Gram-positive and four Gram-negative bacteria. Brine shrimp lethality test was employed to predict toxicity, while antitumor activity were tested by 3-(4, 5-dimethylthiazol-2-yl)-2, 5-diphenyltetrazolium bromide (MTT) method against Ehrlich carcinoma cells.

Results: Four sesquiterpenes, one cembranoid type diterpenes and two steroids were isolated. 1 exhibited significant antibacterial activity against four tested bacteria (P. aeruginosa, S. aureus, S. epidermis, and S. pneumonia) with MIC value of 15 mu g/mL. Moreover, 1 showed high diameter zone of inhibition ranging from 16 - 18 mm against test bacteria. Compounds 4 and 5 displayed moderate antibacterial activity against all test bacteria with inhibition zone diameter (IZD) ranging from 11 - 15 mm and MIC values of 30 mu g/mL. 2, 3, 6 and 7 exhibited weak antibacterial activity (IZD, 7 - 11 mm; MIC = 30 mu g/mL). In addition, only diterpene compound (4) showed high toxicity against A. Salina and antitumor activity against Erhlich carcinoma cells with the LD50 of 25 and 50 mu g/mL, respectively.

Conclusion: This study reveals the strong antibacterial activity of sesquiterpene alismol (1) and the potential antibacterial and antitumor activity of cembranoid type diterpene, cembrene A (4).

Keywords

Author Keywords: Soft coral; Lobophytum sp.; Red Sea; Antibacterial; Cytotoxicity; Sesquiterpene Alismol; Cembranoid; Diterpene; Cembrene

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