

New Glycosplingolipids and Densely Oxygenated Cembranolides from the Soft Corals *Sarcophyton ehrenbergi* and *Lobophytum durum*

Abstract

In our ongoing research for bioactive secondary metabolites from the acetone-solubles of the soft coral *Sarcophyton ehrenbergi*, collected at Dongsha Islands located in northeastern South China Sea, led to the discovery of four new glycosplingolipids (**1–4**), and two known glycosplingolipids (**5** and **6**).^{1–4} In addition, sixteen new densely oxygenated cembranolides (**8, 9, 11, 12**, and **17–28**), together with six known cembranolides (**7, 10**, and **13–16**),^{5–8} were isolated from the organic extracts of the other soft coral *Lobophytum durum*. Spectral analysis, employing NMR, IR, UV, and MS spectrum and chemical methods (acetylation, methanolysis, and Mosher's esterification), were used to assign the structures and absolute configurations of these new metabolites. Compounds **1** and **6** significantly reduce the levels of iNOS to $46.9 \pm 9.7\%$ and $20.3 \pm 6.8\%$, respectively, and COX-2 to $77.2 \pm 9.9\%$ and $64.3 \pm 8.6\%$, respectively, in comparison with those of the control groups. Compounds **1a, 2, 4, 5**, and **6** could significantly reduce the iNOS protein expression ($55.6 \pm 2.9\%$, $47.3 \pm 7.1\%$, $46.5 \pm 5.3\%$, $25.8 \pm 6.2\%$ and $20.4 \pm 6.8\%$, respectively), but did not inhibit the COX-2 protein expression. All compounds at a concentration of 10 μM did not affect the housekeeping β -actin protein expression at 10 μM concentration. The *in vitro* antimicrobial activity of isolated metabolites (**1–6, 15** and **16**) was tested against five bacteria species, including *Enterobacter aerogenes* (ATCC13048), *Serratia marcescens* (ATCC25419), *Salmonella enteritidis* (ATCC13076), *Yersinia enterocolitica* (ATCC23715), and *Shigella sonnei* (ATCC11060), using a agar diffusion method. Among these tested compounds (20 $\mu\text{g/mL}$), compounds **15** and **16** showed potent antibacterial activities against *E. aerogenes*, *S. marcescens*, *S. enteritidis*, and *Y. enterocolitica*. Results for inhibition of HCMV (Human cytomegalovirus) endonuclease activity assay are all negative at a concentration of 1 $\mu\text{g/mL}$.

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