Theonellamide G, a Potent Antifungal and Cytotoxic Bicyclic Glycopeptide from the Red Sea Marine Sponge Theonella swinhoei

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Abstract:

In our search for bioactive metabolites from marine organisms, we have investigated the polar fraction of the organic extract of the Red Sea sponge Theonella swinhoei. Successive chromatographic separations and final HPLC purification of the potent antifungal fraction afforded a new bicyclic glycopeptide, theonellamide G (1). The structure of the peptide was determined using extensive 1D and 2D NMR and high-resolution mass spectral determinations. The absolute configuration of theonellamide G was determined by chemical degradation and 2D NMR spectroscopy. Theonellamide G showed potent antifungal activity towards wild and amphotericin B-resistant strains of Candida albicans with IC50 of 4.49 and 2.0 μM, respectively. Additionally, it displayed cytotoxic activity against the human colon adenocarcinoma cell line (HCT-16) with IC50 of 6.0 μM. These findings provide further insight into the chemical diversity and biological activities of this class of compounds.

Published In:

Marine Drugs, doi: 10.3390/md12041911 , Vol. 12 , pp. 1911-1923