

New Bioactive Pregnadiene-Derived Glycosides from the Gulf of California Gorgonian *Muricea cf. austera*

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Abstract

Two new steroidal glycosides, pregna-5,20-diene-3-*O*- β -glucopyranoside (**2**), and pregna-5,20-diene-3-*O*- β -(6'-*O*-acetyl)glucopyranoside (**3**), and the known trihydroxy sterol, pregna-5-ene-3 β ,20 α ,21-triol (**1**) have been isolated from the Gulf of California gorgonian *Muricea cf. austera*. The structures of the new compounds were established on the basis of chemical and spectral studies. Compound **3**, and its peracetylated derivative, **4**, displayed moderate *in vitro* cytotoxicity (IC₅₀: 17.3 and 14.3 μ g/mL respectively) toward HCT-116 human colon carcinoma. Compound **1** showed growth inhibition of *Staphylococcus aureus* and *Bacillus subtilis* at 250 μ g/disk, in the agar disk–diffusion assay.

Keywords: antibacterial activity, cytotoxicity, *Muricea austera*, steroidal glycosides, Pregnadiene-derived, Gulf of California.

Latin binomials of organisms (Family)

Muricea cf. austera Verrill (Plexauridae)
Damiriana hawaiiiana de Laubenfels (Mycalidae)
Gersemia rubiformis Pallas (Nephtheidae)
Muricea fruticosa Verrill (Plexauridae)
Pseudoplexaura wagneri Stiasny (Plexauridae)
Pieterfaurea unilobata Thomson (Nidaliidae)
Eunicea sp.
Muricea sp.
Bacillus subtilis
Staphylococcus aureus

Introduction

Marine octocorals of the order Gorgonacea are known to produce a extensive range of biologically active secondary metabolites (Faulkner, 1999). Recently, our research group assayed a number of octocorals from the Gulf of California, belonging to the genus *Muricea*, resulting interesting antibacterial activity (Encarnación-Dimayuga et al., 2000). On that basis, the gorgonian *Muricea cf. austera* Verrill (Plexauridae) was selected for study with the goal the isolation of antibacterial compounds. Species of the genus *Muricea* have been shown to be rich sources of novel steroids (Block, 1974; Benito-Pruna et al., 1983; Popov et al., 1983; Bandurraga & Fenical, 1985), and sesquiterpenoids (Izac et al., 1982; Jeffs & Lytle, 1974). Very recently the isolation of degraded pregnanes from *Muricea* sp. was reported (Ortega et al., 2002). In this paper, we describe the isolation, identification, and biological activity of the previously reported trihydroxy sterol **1** and two new sterol glycosides, **2** and **3**.

Materials and methods

General experimental procedures

Optical rotations were measured with an AUTOPOL III polarimeter (Rudolph Research Analytical, Flanders, NJ). Melting points were measured with a MELTEMP II (Laboratory Devices, USA) and are uncorrected. IR spectra were recorded in KBr pellets with a Perkin Elmer Paragon 500 spectrometer. MS data were obtained on an Agilent 1100 LC-MS using electrospray ionization. Proton and carbon NMR

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