

Sulfated Polyhydroxysteroids from the Antarctic Ophiuroid *Gorgonocephalus Chilensis*

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Abstract: Five disulfated steroids and a mixture of monosulfated steroids were isolated from the ethanolic extract of the antarctic ophiuroid *Gorgonocephalus chilensis*. The structures were determined by $^1\text{H-NMR}$, $^{13}\text{C-NMR}$ and FABMS.

Introduction

Sulfated polyhydroxysteroids have been described from a wide variety of marine organisms, in particular sponges and echinoderms. These compounds have exhibited interesting biological activities, in particular, cytotoxic action, inhibition of protein tyrosine kinases and anti-HIV properties [1]. Recently, we have demonstrated the antiviral activity of sulfated steroids isolated from the patagonic ophiuroid *Ophioplocus januarii* against four different pathogenic viruses in humans [2]. We have also isolated three novel sulfated polyhydroxylated steroids from the antarctic ophiuroid *Astrotoma agassizii* [3]. These compounds showed antiviral activity against herpes simplex virus, polio virus and Junin virus, which causes a severe disease in humans known as Argentine hemorrhagic fever [4].

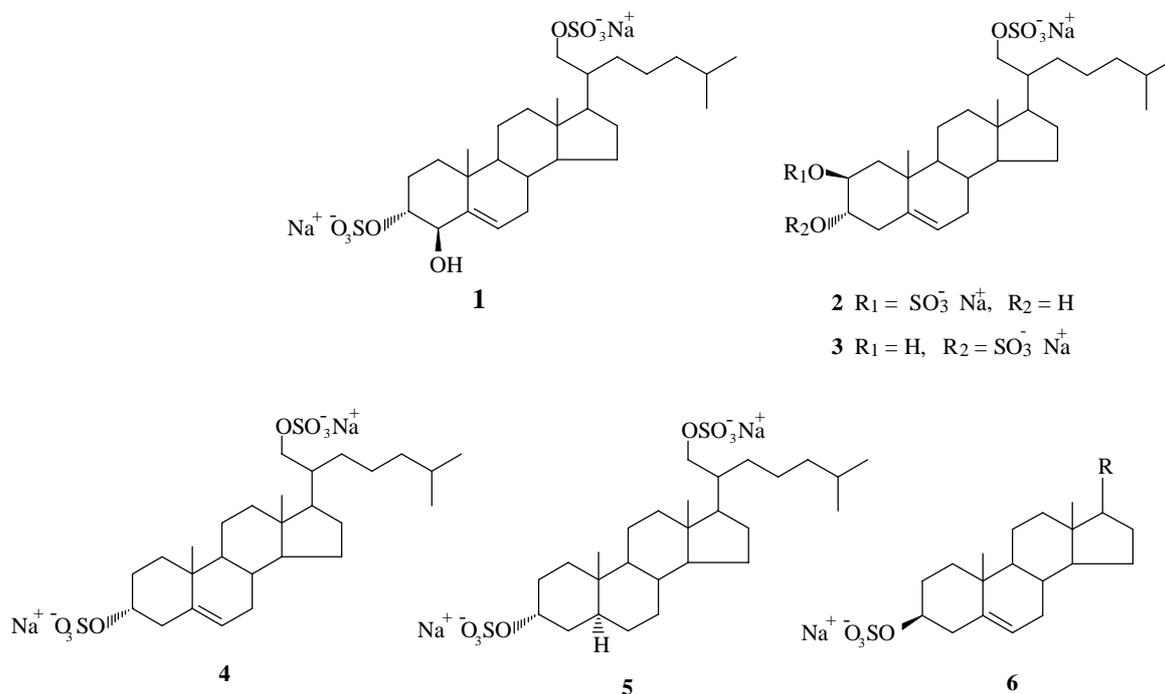
Experimental

The animals were homogenized in ethanol and the aqueous extract obtained after evaporation of the solvent was partitioned between water and cyclohexane. The aqueous phase was extracted with *n*-butanol and the butanolic extract was purified by Sephadex LH20 (MeOH). Fractions containing the polar steroids were purified by vacuum-dry column chromatography on sílica gel C-18 (MeOH/H₂O, MeOH) and HPLC. Structural determination of the purified compounds was performed by H-NMR, $^{13}\text{C-NMR}$, FABMS and by solvolysis reactions.

Results and Discussion

We were able to isolate and characterize five disulfated polyhydroxysteroids (**1-5**). The compounds possess a sulfate group at C-21 and with exception of **2**, all have a sulfate group at C-3(α). Compounds

2 and **3** are isomers that differ only in the location of the sulfate group in ring A. Compound **2** presents a sulfate group at C-2(β). Recently, we have isolated steroid **2** from another antarctic ophiuroid *Astrotoma agassizii* (**3**) and demonstrated its antiviral activity against herpes simplex 2 virus (**4**).



Compounds **4** and **5** differ in the insaturation in ring B and were separated by reversed phase HPLC. We have also isolated a mixture of monosulfated steroids at C-3(β). The composition of the mixture was determined by solvolysis of the sulfate group and analysis of the steroid mixture by glc.

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References and Notes

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