



Isolation of α -spinasterol from *Amaranthus spinosus* stems

[Aislación de α -spinasterol de ramas de *Amaranthus spinosus*]

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Abstract

α -spinasterol was identified in stems of *Amaranthus spinosus*. The structure was obtained by spectroscopic methods and comparison with literature data.

Keywords: *Amaranthus spinosus*, Amaranthaceae, α - Spinasterol

Resumen

α -spinasterol fue identificado en ramas de *Amaranthus spinosus*. La estructura fue obtenida por métodos espectroscópicos y por comparación con datos de literatura.

Palabras Clave: *Amaranthus spinosus*, Amaranthaceae, α -Spinasterol .

Recibido | Received: May 3, 2011.

Aceptado en versión corregida | Accepted in revised form: May 26, 2012

Publicado en línea | Published online: January 30, 2013

Este artículo puede ser citado como / This article must be cited as: AHM Masum Billah, Mohammad M. Hussain, Mohammad G. Dastagir, Md. Ismail, Abdul Quader. 2013. Isolation of α -spinasterol from *Amaranthus spinosus* stems. *Bol Latinoam Caribe Plant Med Aromat* 12(1): 15 – 17.

INTRODUCTION

Amaranthus spinosus L. (Amaranthaceae) is an annual plant widely distributed in the humid zone of the tropics.

Diferent parts of the plan and extracts are used in traditional medicine. The seed are used as a poultice for broken bones (Duke *et al.*, 1985). The plant is astringent, diaphoretic, diuretic, emollient, febrifuge and galactogogue (Bown, 1995; Chopra *et al.*, 1986; Duke *et al.*, 1993). Methanolic extract of *Amaranthus spinosus* showed anti-inflammatory properties (Olajide *et al.*, 2004) and antimalarial activity (Hilou *et al.*, 2006)

Amaranthus grains and leaves are a good source of palmitic, oleic, and linoleic acids (Ghani, 2003; Kirtikar and Basu, 1980)

As part of a research project on bioactive compounds for the treatment of tropical diseases, isolated from medicinal plants, the preliminary phytochemical study of this plant growing on Bangladesh is reported.

MATERIALS AND METHODS

Plant Material

Representative samples of aerial parts of *Amaranthus spinosus* L. were collected from Chittagong District, Bangladesh. Voucher specimens (DACB accession number N35445) were deposited in the Bangladesh National Herbarium Dhaka, Bangladesh.

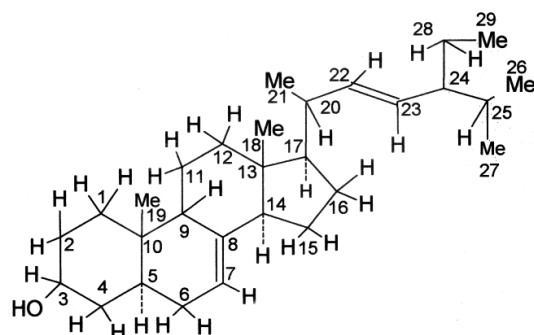
Extraction and Isolation

Air-dried and powdered stems of *A. spinosus* (125 g) were extracted in a soxhlet apparatus successively with petroleum ether (40 - 70°) and ethyl acetate. The extracts were filtered and concentrated, to yield the concentrated petroleum ether extract (13g) and ethyl acetate extract (10g).

Part of the petroleum ether extract (500 mg), was saponified with methanolic sodium hydroxide (0.5 M, 10 ml). Work up of the non-saponified material yield a white crystalline solid m.p. 151-154° C.

α -spinasterol (1). Solid, mp 151-154°; IR ν_{\max} (KBr): 3420(OH), 3050 (H-C=C), 2930, 3850, 1640, 1450, 1370, 1040, 970, 830. $^1\text{H-NMR}$ (CDCl_3) δ : 0.540 (s, 3H in C-18), 0.795 (broad s, 3H in C-27), 0.795 (3H in C-29), 0.814 (s, 3H in C-19), 0.847 (d, $J=5.9$ Hz in C-26), 1.024 (d, $J=6.67$ Hz in C-21), δ 1.40 – 2.0 (m, for methine and methylene protons), δ 2.009 (s, oxygenated methine proton at C-3), 3.584 (m, 1H at C-3), 5.024 (m, 1H, H-7), 5.045 – 5.119 (m, 2H, H-22 and H-23).

The compound was identified by direct comparison of the spectroscopic properties with previous published for α -spinasterol (1) (Agarwal, 1994-1995; Ismail *et al.*, 2010).



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CONCLUSIONS

The chemical study of the stem of *Amaranthus spinosus* L. afforded one pure compound whose structure was established as α -spinasterol (1) by extensive spectroscopic studies as well as comparison with published data.

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