

A Triterpene and a Flavonoid C-Glycoside from *Aleurites moluccana* L. Willd. (Euphorbiaceae)

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SUMMARY. This paper describes the isolation of two phytoconstituents from the leaves and barks of *Aleurites moluccana*, a medicinal plant widely employed in folk medicine for the treatment of several ailments. On the basis of spectroscopic evidence, these compounds were identified as swertisin (leaves), a flavonoid C-glycoside yet not described for the family Euphorbiaceae and acetyl aleuritolic acid (bark), a triterpene which was recently reported as an antimicrobial agent.

RESUMEN. "Un triterpeno y un flavonoide glicosídico de *Aleurites moluccana* L. Willd. (Euphorbiaceae)". El presente trabajo describe el aislamiento de dos componentes de hojas y corteza de *Aleurites moluccana*, una planta medicinal ampliamente empleada en medicina popular para el tratamiento de varias dolencias. Sobre la bases de la evidencia espectroscópica existente, estos compuestos fueron identificados como swertisina (hojas), un flavonoide glicosídico aún no descrito para la familia Euphorbiaceae y el ácido acetil-aleuritico (corteza), un triterpeno que ha sido recientemente citado como agente antimicrobiano.

INTRODUCTION

Aleurites moluccana L. Willd. (Euphorbiaceae), known as "Nogueira-da-India" or "Nogueira-de-Iguape" is a medicinal plant frequently employed in folk medicine for the treatment of tumours, ulcers, headache, fevers, diarrhea and gonorrhoea¹, and also have been used as antiinflammatory².

Previous phytochemical studies with this plant have revealed the presence of triterpenes³ and a new coumarinolignoid, denominated moluccanin⁴, whereas biological investigations have shown antimicrobial⁵ and antiviral⁶ activities.

Preliminary pharmacological studies conducted by our laboratories have demonstrated that hydroalcoholic extract obtained from *A. moluccana* leaves exhibited potent analgesic effect in mice, which could be related with the presence of hydrocarbons, sterols and triterpenes⁷.

In the present report, we have extended our previous chemical findings and analysed other constituents present in the leaves and barks of *A. moluccana*.

KEY WORDS: Acetyl aleuritolic acid, *Aleurites moluccana*, Chromatography, Swertisin

PALABRAS CLAVE: Acido acetil-aleuritólico, *Aleurites moluccana*, Cromatografía, swertisina

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MATERIAL & METHODS

Plant material

The plant was collected in Itajaí (State of Santa Catarina, Brazil), in January 1996 (leaves) and July 1996 (barks) and classified by Dr. Ademir Reis (HBR). A voucher specimen was deposited in Herbarium Barbosa Rodrigues (HBR), Itajaí (V.C. Filho, 001).

Isolation of constituents

The air-dried leaves (600 g) and barks (570 g) were powdered and separately extracted with ethanol and methanol, respectively, at room temperature for approximately two weeks. After solvent removal, the extracts were concentrated (reduced pressure) and successively partitioned with hexane, CH_2Cl_2 , AcOEt and butanol, respectively. However, we have initially examined the extracts obtained from leaves. Thus, hexane fraction furnished n-hentriacontane, α and β -amyrin, β -sitos-terol and stigmasterol, according previously described ⁷. The AcOEt and butanol fractions exhibited a similar chromatographic profile (TLC) and were then combined. This material (3.38 g) was chromatographed on a silica gel column eluted with a CHCl_3 :MeOH gradient. Elution with CHCl_3 :MeOH 5:5 yielded a yellow solid (80 mg), identified as a glycoside flavonoid, 6- β -D-Glucopyranosyl-5-hydroxy-2-(4-hydroxyphenyl)-7-methoxy-4H-1-benzopyran-4-one (swertisin) (**1**). The spectroscopic data, especially ¹H- and ¹³C-NMR, are identical to those reported in the literature ^{8,9}.

The CH_2Cl_2 fraction (3.9 g) obtained from *A. moluccana* barks was chromatographed as in previous case, eluted with hexane:AcOEt gradient. After monitoring by TLC, the similar fractions were combined and rechromatographed using the same procedure to afford a white crystalline solid, identified as acetyl aleuritic acid (19 mg) (**2**), directly compared with authentic sample and spectral data (IR, ¹H- and ¹³C-NMR), which were found to be identical to those previously described ¹⁰.

RESULTS AND DISCUSSION

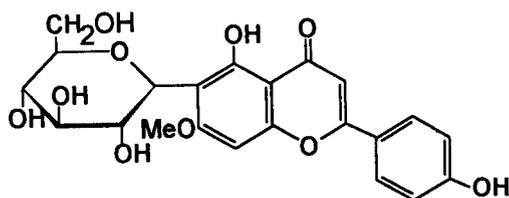
In order to isolate and identify other constituents responsible for the analgesic effects previously shown by some extracts and non polar compounds present in *A. moluccana*, we have now reinvestigated both ethyl acetate and dichloromethane fractions obtained from leaves and barks of this plant, respectively. Chromatographic procedures carried out with ethyl acetate fraction gave a yellow solid which gave positive reaction with FeCl_3 -reagent. The spectral data, especially NMR-¹H and ¹³C were compatible with those of swertisin (**1**), a flavonoid glycoside, isolated by the first time from *Swertia japonica* ⁸. Although such compound have been earlier isolated from other plants, it is an uncommon natural product, being here the first report of them from the family Euphorbiaceae.

On the other hand, swertisin was not detected in the barks of this plant. However, the preliminar analysis by using TLC in the conventional manner revealed the presence of some terpenes in this part of *A. moluccana*. One of them was isolated from the dichloromethane extract and identified as acetyl aleuritic

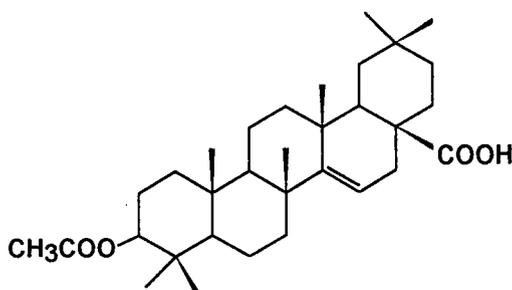
acid (2). The spectroscopic characteristics were in accordance with literature data ¹⁰ and Co-TLC with authentic sample confirmed such structure.

This compound have been earlier isolated by two of us (RAY and FDM) from *Croton urucurana*, which have shown antimicrobial effects against different pathogenic bacteria ¹¹.

Presently, the phytochemical and pharmacological studies are in progress in order to examine which compounds contributes for explain, in addition to compounds previously described, the potent analgesic effects demonstrated for the hydroalcoholic extract of *A. moluccana*.



(1)



(2)

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