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ISOLATION OF PLUMIERIDE FROM *Plumeria inodora*

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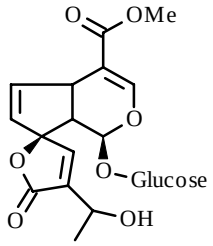
Plumeria, commonly known as frangipani, is a genus of shrubs and trees of the family Apocynaceae [1]. It originates from the New World Tropics, from southern Mexico to northern South America, but has been introduced into all tropical areas of the world and is now common in South-East Asia. This genus has medicinal value in folk medicine. *Plumeria rubra* has been used as a febrifuge, a purgative, and in the treatment of leprosy. In South America, decoctions of leaves, bark, and heartwood are used as an anthelmintic, purgative, emmenagogue, and in the treatment of various infections of the skin [2 and references cited]. Extracts of various *Plumeria* species have been shown to exhibit significant antibacterial, antifungal, and antiviral activity [2].

The genus *Plumeria* is know as a source of iridoids. The biological and pharmacological activities of plant iridoids and iridoid crude plant drugs have been reviewed, including antimicrobial (antibacterial, antifungal, antiviral), antiinflammatory, analgesic, antirheumatic, cholagogue and choleretic, hepatoprotective, laxative, hypotensive, sedative, antitumor, and other activities [3]. Among the iridoids discussed is plumieride, which exhibited a broad diversity of biological activity. A significant anti-fertility effect was reported for the plumeiride content of *Plumeria rubra* [4]. The in vitro tumor inhibition activity of crude extract containing plumierides has been reported [5]. It showed strong fungitoxicity against some dermatophytes causing dermatomycosis in animals and human beings. It also exhibited a noncytotoxic nature against a P388 mouse leukemia cell line [6], and antibiotic activity [7].

As part of our interest in the phytochemical study of the Apocynaceae growing in the Andeen, we decided to investigate the aerial part of *Plumeria inodora*, which is endemic to Colombia and Venezuela and known by the vernacular name Amapola [1, 8]. In the Andes region, *P. inodora* is found in Merida State, where the material object of this study was collected [8]. No chemical investigation of *Plumeria inodora* has been reported up to now, and we focus on the presence or absence of the plumieride **1**, which has been reported in other members of the *Plumeria* genus [5–16].

From the aqueous extract of *Plumeria inodora*, we isolated an amorphous substance, for which MS and ^{1}H- and ^{13}C-NMR spectra were recorded. From these results, the structure of the plumieride was assigned by comparison with literature data [10, 17].

Although plumieride was isolated earlier from other members of the *Plumeria* genus, this is the first report of its presence in *Plumeria inodora*.



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General Experimental Procedures. TLC was carried out on precoated Si gel 60 F254 plates (Merck). Spots were detected under UV (254 nm) before and after spraying with 1% vanillin – 5% H_2SO_4 (MeOH solutions) followed by heating the plate at 110°C for 5 min. Preparative TLC was performed on precoated Si gel 60 F254 plates, layer thickness 2 mm (Merck). Column chromatography was carried out on Si gel 60 (230–400 mesh, Merck). NMR spectra were recorded with a Bruker DPX 300 spectrometer using CD_3OD as solvent and internal standard. Mass spectra were recorded on an Autospec-Q apparatus at 70 eV and at a source temperature of 200°C.

Plant Material. Stems of *Plumeria inodora* were collected on March 2001 in San Rafael de Lagunillas, Merida State, Venezuela, at an elevation of 1000 m above sea level. The plant material was identified by Dr. Gilberto Morillo, from the Faculty of Forestry, University of Los Andes, where a voucher specimen is kept.

Extraction and Isolation. The pulverized air-dried stem material (3.6 kg) was extracted by maceration in water at room temperature. The aqueous extract was freeze dried, yielding 68 g of dry residue which was partitioned between *n*-butanol and water. The butanolic fraction was evaporated to dryness, yielding 0.9 g, then submitted to preparative TLC. An amorphous colorless powder was isolated. Its NMR and MS data identified the compound as plumieride **1**.

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