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## 2-Quinolone alkaloids from the rare species of Rutaceae *Andreadoxa flava* Kallunki

Sandra Virgínia Alves Hohlemwenger<sup>a</sup>, Waldir Tavares<sup>b</sup>,  
André Maurício de Carvalho<sup>c</sup>, Paulo César Vieira<sup>b</sup>,  
Eudes da Silva Velozo<sup>a,\*</sup>

<sup>a</sup> *Laboratório de Pesquisa em Matéria Médica (LAPEMM), Faculdade de Farmácia, Universidade Federal da Bahia, Rua Barão de Jeremoabo, s/n-Campus Universitário de Ondina, 170-110 Salvador, BA 40.170-290, Brazil*

<sup>b</sup> *Laboratório de Pesquisa em Produtos Naturais, Departamento de Química, Universidade Federal de São Carlos, São Carlos, Brazil*

<sup>c</sup> *Departamento de Botânica, Instituto de Biologia (in memorian), Universidade Federal da Bahia, Salvador, Brazil*

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### 1. Subject and source

*Andreadoxa flava* Kallunki is a species belonging to a new genus described for the first time in 1998, classified in the tribe Galipeae and subtribe Galipeinae (Kallunki, 1998). Stems, leaves and flowers from *A. flava* were collected near cocoa plantations of the Centro de Pesquisa da Lavoura Cacaueira (CEPLAC), in the state of Bahia, Brazil. The botanical material was identified by Prof. Dr. André Maurício de Carvalho and a voucher specimen (no. 047534) was deposited in the Herbarium Alexandre Leal Costa (ALCB) of the Instituto de Biologia at the Universidade Federal da Bahia, Brazil.

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\* Corresponding author. Tel.: +55-71-3742721; fax: +55-71-2359350.  
E-mail address: [euvelozo@ufba.br](mailto:euvelozo@ufba.br) (E. da Silva Velozo).

## 2. Previous work

No previous chemical studies on *A. flava* have been reported. However, alkaloids derived from anthranilic acid occur in abundance in plants belonging to the subtribe Galipeinae (Rutaceae). Some examples are furoquinoline alkaloids in *Adiscanthus fusciflorus* (Vieira et al., 1980), dihydrofuroquinolines in *Almeidea guyanensis* (Moulis et al., 1983), acridones in *Almeidea lilacina* (Veloze et al. 1997), pyranoquinoline alkaloids in *Euxylophora paraensis* (Waterman and Grundon, 1983) and furoquinoline alkaloids in *Ticorea longiflora* (Toro et al., 1997).

## 3. Present study

The hexane extract (5.4 g) obtained from the stems of *A. flava* was fractionated by chromatography on silica gel with hexane/ethyl acetate. This procedure yielded oligofiline (18.1 mg) (Ali et al., 2001) and 8-methoxy-*N*-methylflindersine and *N*-methylflindersine (3.6 mg), isolated as a mixture (Funayama et al., 1994; Kamperdick et al., 1999). The methanolic extract (30.0 g) of the stems of *A. flava* was submitted to an acid–basic extraction. The acid fraction was neutralized and fractionated by chromatographic methods, yielding 4-methoxy-*N*-methylquinolone (2.7 mg) (Hifnawy et al., 1977), dictamnine (6.8 mg) (Brown et al., 1980) and almeine (4.7 mg) (Moulis et al., 1983). Chromatographic fractionation of the hexane extract of the leaves (14.0 g) allowed the isolation of the alkaloids xanthophylline (1.6 mg) (Stermitz and Sharif, 1977) and 8-methoxyflindersine (1.2 mg) (Hifnawy et al., 1977). The methanolic extract of the flowers (4.2 g) was partitioned with hexane/MeOH (5% H<sub>2</sub>O). The hexane phase (1.7 g) was submitted to chromatography on silica gel with chloroform/methanol to give the alkaloids xanthophylline (6.8 mg) (Stermitz and Sharif, 1977) and 8-methoxyflindersine (15.6 mg) (Hifnawy et al., 1977). These structures were identified by <sup>1</sup>H NMR, <sup>13</sup>C NMR, DEPT 135°, COSY, HETCOR, infrared and mass spectrometry and by comparison with data in the literature.

## 4. Chemotaxonomic significance

This is the first report on the chemical composition of this rare species growing in the Atlantic Forest of Southern Bahia and in the risk of extinction. The presence of 2-quinolone alkaloids is in accordance with the chemical composition of other species of the subtribe Galipeinae (Rutaceae).

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