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Chemical Composition of *Serjania tristis* (Sapindaceae)

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ABSTRACT

Species belonging to the genus Serjania are found mainly in regions of tropical climate. Studies described in the literature report the presence of alkaloids, saponins, flavonoids, coumarins, diterpenes and catechins. However, few studies describing the chemical composition for species of this genus are found in the literature. Herein we report the isolation of the flavonoids quecetin 3-O-β-D-glycoside and rutin as well as the saponin Pusatilla D.

Keywords: *Serjania tristis*, Sapindaceae, Flavonoids, Saponin Pusatilla D.

SHORT COMMUNICATION

The genus Serjania comprises about 231 species and occurs mainly in the tropical regions. Some species are found in Brazil such as *Serjania tristis* commonly called "Cipó-timbó" [1]. Phytochemical studies have demonstrated that alkaloids, saponins, flavonoids, tannins, triterpenoids, catechins, coumarins, anthranoids, quinins and diterpenes [2-6] are mainly chemical constituents of species belong to Serjania genus. Several species of Serjania are largely appreciated in tradicional medicine. *S. erecta*, *S. lethalis* and S. triquetra are used in folk medicine against inflammation, stomach ache, ulceratives diseases and diuretic [2,6-7]. In vitro investigations on S. salzmanniana have demonstrated antifungal and mollucicidal activities [4]. *S. yucatanensis* have revealed effect against epimastigotes and trypomastigotes forms of *Trypanosoma cruzi* [8]. The diversity of secondary metabolites as well as the important pharmacological properties described to genus Serjania and the absence in literature of phytochemical studies to *S. tristis* motivated us to study this specie, found in a High Paraná River stretch in the region of Porto Rico.

The aerial parts (leaves) of *S. tristis* were collected in Porto Rico (Paraná state, Brazil) and identified by Prof. Maria Conceição de Souza and Kazue Kawakita and confirmed by María Silvia Ferrucci. A specimen was deposited in the Herbarium of State University of Maringá under the code HUEM 13480. The dried leaves (450 g) of *S. tristis* were pulverized and exhaustively extracted with methanol at room temperature. Extracts were filtered and concentrated by evaporation under reduced pressure at a temperature of about 40°C, yielding crude extracts of leaves (20 g). Half of the crude extract (10 g) was dissolved in MeOH: H_2O (1:1) and partitioned with organic solvents of different polarities: hexane and ethyl acetate. After rotary evaporation of the solvents the hexane fraction STHx (0.069 g), ethyl acetate fraction STA (1.91 g) and the remainder hydromethanol fraction ST- Hydro (7.05 g) were obtained. The STHx fraction was not studied due to its low mass value. Part of the STA fraction (1.00 g) was subjected to cromatographic column on Sephadex LH 20 with H_2O , H_2O:MeOH 25%, H_2O:MeOH 50%, H_2O:MeOH 75% and MeOH 100 % resulting in 32 fractions, that were grouped in 6 new subfractions according to chromatographic similarity in TLC. From subfraction 4, eluted with H_2O: MeOH 50%, was isolated compound 1 (18.5 mg) as a

yellow precipitate. Part of fraction ST- Hydro (1.00 g) was submitted to chromatographic column on Sephadex LH-20 with H_2O, H_2O: MeOH 25%, H_2O: MeOH 50%, H_2O: MeOH 75% and MeOH 100 %, resulting in 83 fractions. The collected fractions were again pooled according to chromatographic similarity in TLC in 8 new subfractions. The subfraction 3, eluted with H_2O: MeOH 75%, resulted in the isolation of the substance 2 (16.0 mg) as a yellow solid and the subfraction 5, eluted with H_2O: MeOH 50% resulted in the isolation of the substance 3 (17.0 mg) as a brown solid. The isolated compounds have been identified by NMR spectral data of ^1H and ^{13}C/DEPT as well as data comparison with the literature.

***Quercetin-3-O-β-D-glycoside (1)*:** ($C_{21}H_{20}O_{12}$), yellow solid. ^1H NMR (300 MHz, CD_3OD, δ, ppm, J/Hz): 6.29(1H, d, J = 2.1, H-6), 6.48 (1H, d, J = 1.5, H-8), 8.02 (1H, d, J = 2.1, H-2'), 6.90 (1H, d, J=7.8, H-5'), 7.59 (1H, dd, J=1.8 and 8.4, H-6'), 5.24 (1H, d, J=7.5, H-1''), 3.47(1H , m, H-2''), 3.36 (1H, m, H-3''), 3.36 (1H, m, H-4''), 3.47 (1H, m, H-5''), 3.71(1H, m, H-6''). ^{13}C NMR (75MHz, CD_3OD, δ, ppm): 178.0 (C-4), 164.8 (C-7), 161.7 (C-5), 156.8 (C-2), 156.7 (C-9), 149.0 (C-4'), 145.3 (C-3'), 134.0 (C-3), 122.5 (C-6'), 121.6 , 116.5 (C-5'), 115.6, 104.3 (C-1''), 102.3 (C-10), 99.2 (C-6), 94.0 (C-8), 76.2 (C-3''), 73.7 (C-2''), 71.7 (C-4''), 78.1 (C-5''), 62,7 (C-6'') [9].

***Rutin (2)*:** ($C_{27}H_{30}O_{16}$), yellow solid. ^1H NMR (300MHz CD_3OD, δ, ppm, J/Hz): 6.40 (1H, d, J = 2.1, H-6), 6.39 (1H, d, J = 2.1, H-8), 7.66(1H, d, J = 2.1, H-2'), 6.88(1H, d, J = 8.4, H-5'), 7.21(1H, dd, J = 2.4 and 8.4, H-6'), 5.12(1H, d, J = 7.5, H-1''), 3.27(1H, s, H-2''), 3.44(1H, s, H-3''), 3.43(1H, s, H-4''), 3.62(1H, s, H-5''), 3.36 (1H, m, H-6''), 3.79 (1H, m, H-6'') 4.51(1H, d, J = 1.2, H-1'''), 3.27(1H, s, H-2'''), 3.43(1H, s, H-3'''), 3.51 (1H, d,J = 9.3, H-4'''), 3.43 (1H, s, H-5'''), 1.09(3H, d, J = 6.0, H-6'''). ^{13}C NMR (75MHz, CD_3OD, δ, ppm): 179.4 (C-4), 166.0 (C-7), 163.0 (C-5), 158.5 (C-2), 158.5 (C-9), 149.8 (C-4'), 145.8 (C-3'), 135.6 (C-3), 123.5 (C-1'), 123.1 (C-6'), 117.6 (C-2'), 116.0 (C-5'), 109.0 (C-10), 105.4 (C-1''), 102.4 (C-1'''), 99.9 (C-6), 94.8 (C-8), 73.9 (C-2''), 72.2 (C-4'''), 72.1 (C-4''), 71.3 (2'''), 69.7 (C-5'''), 68.5 (C-5''), 68.5 (C-6''), 17.8 (C-6''') [10,11].

Pulsatilla D (3): ($C_{47}H_{76}O_{17}$), Brown solid. ^{13}C NMR (75MHz, CD_3OD, δ, ppm): 181.1 (C-28), 145.2 (C-13), 123.0 (C-12), 106.1 (C-1'''), 104.5 (C-1'), 101.8 (C-1''), 82.2 (C-4'), 79.7 (C-5'''), 78.0 (C-3'''), 77.8 (C-3), 76.9 (C-2'), 75.3 (C-2'''), 74.0 (C-3'), 73.9 (C-4''), 72.1 (C-3''), 71.3 (C-4'''), 70.1 (C-5''), 65.1 (C-23), 64.5 (C-5'), 62.6 (C-6'''), 49.8 (C-5), 48.1 (C-9), 47.9 (C-17), 47.2 (C-19), 42.9 (C-14), 42.7 (C-18), 40.5 (C-8), 37.6 (C-4), 37.6 (C-10), 34.9 (C-21), 33.8 (C-1), 33.5 (C-29), 33.4 (C-22), 33.4 (C-7), 31.6 (C-20), 28.8 (C-2), 28.8 (C-15), 26.4 (C-27), 24.0 (C-11), 24.0 (C-16), 23.9 (C-30), 18.8 (C-6), 17.9 (C-24), 17.7 (C-26), 16.4 (C-25), 13.3 (C-6'') [12].

This work is the first relate to chemical studies of *Serjania tristis* (Figure 1).

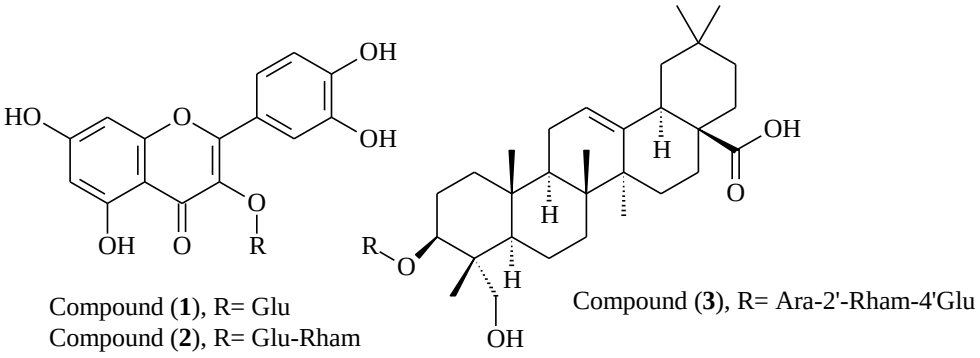

Figure 1: Isolated compounds

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