Chemical constituents and cytotoxic activity of *Caesalpinia peltophoroides*

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Abstract

Phytochemical study of leaves from *C. peltophoroides* led to the isolation of two flavonoids: Quercetin-3-O-β-glucopiranoside (**1**) and Agatisflavone (**2**) identified by NMR 1D and 2D. Some fractions and EtOH extract from leaves and flowers showed high cytotoxicity against cancer cell lines.

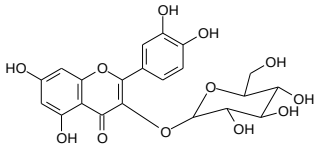
Introdução

The Fabaceae family is found in Brazil and it's constituted by 210 genera and 2694 species.[1] One of it's members, *Caesalpinia peltophoroides*, is popularly known as "Sibipiruna" or "Falso Pau-Brasil". The bark of *C. peltophoroides* is popularly used to treat dysentery and the literature reports studies on antimalarial activity.[2,3] However, the knowledge about the chemical components of its leaves and flowers, and biological activities is absent. The objectives of the present study were investigate the chemical composition of leaves and the cytotoxic activity of ETOH extracts and fractions from *C. peltophoroides*.

Resultados e Discussão

The EtOH extracts from leaves and flowers of *C. peltophoroides* were partitioned with hexane, ether and ethyl acetate. Ether phase (3.0 g) from leaves, was chromatographed on SiO_2 column, using hexane, AcOEt and MeOH as eluents. Fraction S10 (1.2 g) was rechromatographed on SiO_2 column, using AcOEt/MeOH as eluent. The new fraction S10-30 (318.6 mg) was chromatographed on Sephadex LH-20 column, using MeOH as eluent yielding the compound **1** (14.9 mg).The fraction S8 (356.0 mg) was rechromatographed on SiO_2 column, using hexane/AcOEt and AcOEt/MeOH as eluents. The new fraction S8-9 (35.2 mg) was chromatographed on SiO_2 column, using $CHCl_3$/MeOH as eluent yielding the compound **2** (5.1 mg). The compounds were identified by NMR 1D and 2D, and by comparison with literature data (Figure 1).[4]

Extracts and phases were evaluated in a variety of tumor cell lines using the colorimetric MTT assay (Table 1).[5] The EtOH extract and ether phase from leaves revealed high percent inhibition (> 80%) in all tumor cell lines tested. The ethyl acetate phase (flowers) and hexane phase (leaves) presented high percent inhibition (> 80%) in Hep-2 (cervical cancer) and NCI-H292 (lung cancer) (Table 1).



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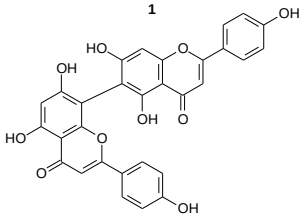

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Figure 1. Flavonoids isolated of leaves from *C. peltophoroides*

Table 1. Percent inhibition (%) in single concentration (50 μg mL^{-1}) of cell growth in three tumor cell lines.

Aerial part	Samples	HEP-2	MCF-7	NCI-H292
flowers	EtOH extract	0	25.9 ± 20.8	41.3 ± 3.0
	Hexane phase	0	26.4 ± 57.4	41.2 ± 41.6
	Ether phase	0	51.3 ± 6.4	60.3 ± 11.3
	Ethyl acetate phase	97.6 ± 15,6	22.9 ± 2.6	87.4 ± 16.8
	MeOH/H_2O phase	36.5 ± 14.9	13.4 ± 7.7	35.5 ± 43.0
leaves	EtOH extract	93.4 ± 5.0	98.1 ± 11.9	88.6 ± 3.6
	Hexane phase	102.7 ± 0.3	73.3 ± 10.7	105.6 ± 5.5
	Ether phase	100.1 ± 3.9	100.3 ± 8.6	96.0 ± 1.6
	Ethyl acetate phase	34.5 ± 0.8	56.8 ± 5.3	16.4 ± 73.1
	MeOH/H_2O phase	48.9 ± 7.2	46.5 ± 4.5	33.8 ± 0.8
	Doxorubicin (2 μg mL^{-1})	100.0 ± 5.7	100.0 ± 5.2	64.1 ± 7.4

Hep-2 (cervical cancer), MCF-7 (breast cancer) and NCI-H292 (lung cancer); Doxorubicin as positive control

Conclusões

The chemical study of the leaves from *C. peltophoroides* resulted in the isolation of two flavonoids. The EtOH extract, hexane phase, and ether phase from leaves and ethyl acetate phase from flowers showed potent cytotoxicity against tumor cell lines. According to phytochemical investigation, suggest that flavonoid(s) may be responsible for high cytotoxicity of the ether phase from leaves.

Agradecimentos

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[1]Lorenzi, H. 1949 – *Árvores brasileiras manual de identificação e cultivo de plantas arbóreas do Brasil*, vol.1 / Harri lorenzi. – 3ª ed.—Nova Odessa, SP: Instituto Plantarum, **2002**.
[2]Deharo, E.; Bourdy, G.; Quenevo, C.; Muñoz, V.; Ruiz, G.; Suvain, M.; *J. Ethnopharmacol*. **2001**, 77, 91.
[3]Baelmans, R.; Deharo, E.; Bourdy, G.; Muñozv, V.; Quenevo, C.; Sauvain, M.; Ginsburg, H. *J. Ethnopharmacol*. **2000**, 73; 271.
[4]Agrawal, P. K.; *Carbon-13 of Flavonoids*, Elsevier, 1989.
[5]Mosmann T. *J. Immunol. Methods*. **1983**, 16, 55.