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Antioxidant Activity of Extracts and Fractions of Leaves from *Banisteriopsis argyrophylla*

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Abstract: Several diseases such as Alzheimer's, arthritis, cataracts, diabetes and Parkinson's are associated with the presence of free radicals in the body. The antioxidants are molecules which combine with these radicals, rendering them harmless [1]. Studies with species of the genus *Banisteriopsis* have shown several biological properties, like antioxidants [2]. The aim of this work was study the antioxidant potential of extracts and fractions from leaves of *Banisteriopsis argyrophylla*, known as "cipó-prata", and belonging to the Malpighiaceae family [3]. The leaves were collected in Uberlândia region, and an ethanolic extract (25,28 g) was prepared by maceration, and then submitted to liquid-liquid extraction with *n*-hexane (5,51 g), dichloromethane (1,67 g), ethyl acetate (3,73 g) and *n*-butanol (4,99 g), remaining at the end of the partitions the water fraction (4,22 g). These extracts and fractions were analyzed for total phenol content by Folin-Ciocalteau method [4], flavonoids using aluminum chloride solution [5], and proanthocyanidins by vanillin-sulfuric acid method [4]. The antioxidant potential was evaluated by 2,2-diphenyl-1-picrylhydrazyl (DPPH) free radical scavenging [4], which represents the concentration of sample needed to sequester 50% of DPPH radicals, and evaluated by the analysis of charge density (Q) and peak oxidation potentials (Ep) by electrochemical method, using differential pulse voltammetry (working electrode: glassy carbon; reference electrode: Ag/AgCl; auxiliary electrode: platinum; acetate buffer). The Ep value reflects the redox properties of antioxidants and Q values are related to the amount of charge transferred. The higher the Ep value, the greater the amount of antioxidant compounds [6]. The results are shown in Table 1.

Table 1. Total phenolics, flavonoids, and proanthocyanidins contents and their antioxidant activities of ethanolic extract and fractions of leaves from *B. argyrophylla*.

Samples	Phenolics (mg gallic acid equivalent/g extract)	Flavonoids (mg quercetin equivalent/g extract)	Proanthocyanidins (mg catechin equivalent/g extract).	IC_{50} ($\mu g_{extract}$/mL)	Ep (V)	Q^* (μC)
Ethanol extract	337,13±1,44^{b}	71,82±0,30^{b}	272,48±0,31^{d}	4,27±0,82^{a}	0,342±0,025^{a}	54,81±1,4^{b}
n-Hexane	174,91±1,93^{d}	71,00±1,92^{c}	99,08±2,49^{e}	12,02±2,0^{b}	0,367±0,002^{a}	52,02±2,00$^{b;c}$
Dichloromethane	73,10±1,12^{e}	59,27±0,98^{a}	51,83±1,14^{c}	17,03±0,41^{c}	0,376±0,003^{a}	9,13±1,23^{d}
Ethyl acetate	405,46±3,20^{a}	211,85±2,89^{d}	208,79±1,14^{b}	4,10±0,13^{a}	0,378±0,000^{a}	72,49±2,06^{a}
n-Butanol	229,46 ±1,07^{c}	21,40±0,64$^{b;c}$	226,59±2,86^{f}	4,80±0,08^{a}	0,289±0,077^{a}	47,99±0,61^{c}
Water	67,48±0,45^{f}	0,00±0,14^{e}	36,01±0,65^{a}	23,08±2,3^{d}	0,302±0,002^{a}	5,47±0,93^{b}

Values in the same column followed by a different letter (a-f) are significantly different ($P < 0,01$). Tukey test was used.

Crud extract and fractions of the leaves from *B. argyrophylla* showed good antioxidant activities. Ethyl acetate fraction obtained from ethanolic extract showed the highest amount of the total phenol content, especially flavonoids. Among the fractions obtained, the *n*-butanol fraction showed the highest amount of total proanthocyanidins. The electrochemical method, in general, presented linear correlations with results of total phenolics contents. These two fractions also presented the better antioxidant activities (IC_{50}), showing similar results to the positive control (BHT 6,5±0,2 μg/mL). These findings are important and make this plant a promising source of new compounds which should help in the control, prevention and treatment of diseases.

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