Metal content in dried leaves and infusions of medicinal plant *Davilla elliptica*

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Abstract

In this work were evaluated concentrations of metals in medicinal plant *Davilla elliptica,* popularly known as "lixinha" or "lixeirinha". Results show that metal contents are within the values recommended for consumption. This analysis is important since at high concentrations, these elements can cause damage to the body, due to its toxicity.

Introduction

Several species of *Davilla elliptica* are known in Brazilian folk medicine with several therapeutic indications as stomachaches, diarrhea, inflammation, ulcers, astringent, tonic, sedative, diuretic, in the treatment of hemorrhoids, hernia and topical applications as an antiseptic in wounds cleaning.[1,2]

Its pharmacological potential has been extensively reported in recent years, since infusions from leaves *of Davilla elliptica* are employed in folk medicine as tea form to treat gastric pain, diarrhea, inflammation and ulcer.[1] Thus, it is interesting to evaluate the content of metals naturally occurring in *Davilla elliptica* an infusions. In this study, metals present in *Davilla elliptica* species were identified by using Inductively Coupled Plasma Atomic Emission Spectrometry (ICP-OES).

Results and Discussion

In order to investigate the metal content in natural *D. elliptica,* 0,5 g of dried leaves were digested with nitric acid (HNO_3) in a digestion block. After filtering, samples were filled up to 25 mL with mili-Q water. Infusions were prepared by placing 5 g of *Davilla* leaves in 50 mL of hot water for 10 min, filtered, digested with nitric acid and remain solution was filled up to 50 mL with milli-Q water. All measurements were made in triplicate (n=3). Some samples were spiked with the same solutions used to perform calibration, and recoveries were within the acceptable range of ± 20%.

Principal metals found in the samples were Fe, Mn, Al, Cd, K, Mg, Ba, Cu, Sr and Ca. Table 1 shows the observed concentrations of metals in leave samples and infusions.

The World Health Organization defines limits only to the consumption of arsenic, cadmium and lead in raw material, which were not quantified in these samples. However, as shown in Table 1, daily need of these elements are reported for consumption by a person weighting 70 kg.[3] The results show that the infusion of *Davilla elliptica* can be a good source of micro and macro nutrients to the body.

Table 1. Concentrations of elements found in *Davilla elliptica* leaves and their infusion (mean ± standard deviation, n=3).

Element	Dried Leaves ($mg.kg^{-1}$)	Infusion ($mg.L^{-1}$)	Daily need (mg/day)
Fe	7,77 ± 3,58	0,05 ± 0,03	15
Mn	10,77 ± 0,63	2,30 ± 0,09	2,8
Al	18,28 ± 2,51	1,06 ± 0,22	5
K	320,48 ± 1,26	24,93 ± 4,80	-
Mg	89,63 ± 7,60	32,50 ± 1,44	300
Ba	3,53 ± 1,25	0,24 ± 0,02	1,1
Cu	5,95 ± 1,56	ND	2,5
Sr	4,55 ± 0,82	0,80 ± 0,05	1,6
Ca	204,70 ± 85,59	28,86 ± 2,96	500

ND: not detected

Conclusion

In this work, some elements were identified and quantified in *Davilla elliptica* species to ensure that its use is not toxic. As soon as *D. elliptica* is a plant consumed by population and with potential application as medicament, these findings are important due to the necessity to know the metals present to ensure that its use is not toxic. Furthermore, elements found may be related to the pharmacological potential of the plant, and further studies will be performed.

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