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Preliminary chemical profile and in vitro pharmacological evaluation of the hallucinogenic plant *Diplopterys cabrerana*

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Abstract

Background: For the last few years, Ayahuasca ceremonies have been gaining popularity in recreational settings in Europe and North America [1]. Similar to *Psychotria viridis*, *Diplopterys cabrerana* is also suggested to contain the psychoactive compound *N*,*N*-dimethyltryptamine, and is therefore used in Ayahuasca rituals for its ability to induce hallucinations, euphoria and entheogenic effects [1-3]. However, while information on the toxic profile of *D. cabrerana* remains very limited, its acquisition is easily accomplished by consumers. **Objective:** We aimed to characterize the aqueous extracts of *D. cabrerana* leaves, mimicking those typically consumed, to identify bioactives that underlie the psychoactive or toxic effects, and evaluate their impact on neuronal function, neurotransmission and radical stress. **Methods:** Chemical characterization was attained by HPLC-DAD. Impact upon neuronal viability was assessed by the MTT assay (up to 1000 µg/mL) in SH-SY5Y neuroblastoma cells. Impact on neuromodulation and neuroinflammation was evaluated through acetylcholinesterase and 5-lipoxygenase inhibition, while antiradical properties were assessed by evaluating nitric oxide (•NO) and xanthine oxidase (XO) activity. Inhibition of the α-glucosidase enzyme was also evaluated. Statistical comparisons among groups performed by one-way ANOVA followed by Dunnett post hoc test. **Results:** Preliminary characterization results revealed the presence of several catechin derivates, alongside two apigenin derivates and one tryptamine derivate. Cytotoxicity was not verified up to the highest concentration tested. Acetylcholinesterase inhibition was recorded starting at 250 µg/mL, and a concentration-dependent inhibition of 5-lipoxygenase was found (IC_{50}=79.77 µg/mL). Concentration-dependent scavenging effects upon •NO and XO inhibition were verified at concentrations higher than 1.953 µg/mL and 31.25 µg/mL, respectively. At last, inhibition of α-glucosidase occurred with concentration-dependency and an IC_{50} of 4.78 µg/mL. **Conclusions:** Although antiradical, anti-inflammatory and antidiabetic properties were verified, with no *in vitro* cytotoxicity being detected, further research is needed to elucidate the underlying mechanisms that might be involved in our preliminary results.

Keywords: new psychoactive substances; ayahuasca; hallucinogenic plants; recreational setting; neurotoxicity

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