

Harnessing natural resources as a source for obtaining new drugs and expanding therapeutic strategies for the treatment of pathologies.

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INTRODUCTION

Sugarcane cultivation has advanced worldwide: in Brazil, data on the 2013-2014 crop yields show that the area devoted to the cultivation of the plant was approximately 8 million hectares, with a production of about 600 million tons, intended mainly for obtaining sugar and ethanol. Due to advancements in biotechnology, the use of ethanol as a biofuel has already been well established. Several efforts have been made in order to use the agricultural waste from sugar cane, i.e., bagasse and straw. Currently, the sugarcane bagasse supply amounts to 20 million tons/month – this is the raw material used in the factories of this sector to generate heat, steam, and energy in the production process. Straw has great potential for generating heat, electricity, and producing cellulosic ethanol. In order to take full advantage of this plant, we are looking for new potentials it may have as a source for new drugs or as raw material for the production of biomolecules with therapeutic purposes.

OBJECTIVE

Investigation of the pharmacological actions of the aqueous extract obtained from the green leaves of *Saccharum officinarum* L. in rats. In this study, behavioral responses of animals were analyzed after acute administration of the plant extract.

MATERIAL AND METHODS

BOTANICAL MATERIAL AND EXTRACTION

Saccharum officinarum green leaves collection

↓ Drying at room temperature

Aqueous Extract preparation (10%)

↓ Infusion, 70°C, 30 min
Freeze drying

Aqueous Extract (AE 7%)

EXPERIMENTAL PROTOCOL

Wistar rats (180-250 g)
Fasting (3 h) and water *ad libitum*

Control
Water (p.o.)

Group AE
(0.5 – 2 g. kg⁻¹, p.o.)



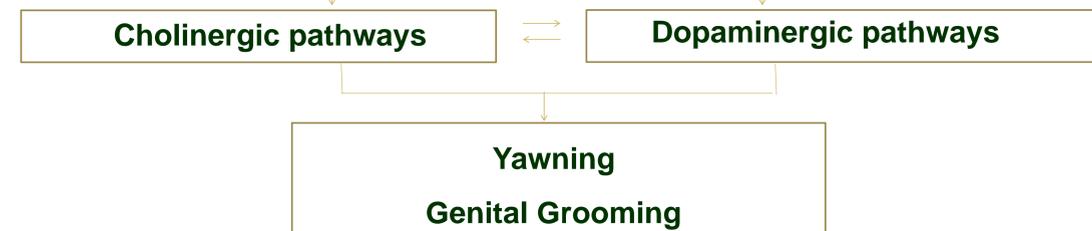
Sugarcane

Observation and quantification of behavioral responses of rats to individual cages after water or AE administration over a period of 60 min. The AE was tested in absence and presence of atropine (cholinergic antagonist) and haloperidol (dopaminergic antagonist), drugs that were related with cholinergic and dopaminergic neural pathways.

RESULTS

Saccharum officinarum. L.

(Aqueous extract)



- Induction of yawning and genital grooming by the aqueous extract of *S. officinarum* L.
- Involvement of cholinergic and dopaminergic pathways in central action of *S. officinarum* L.
- Dopaminergic and Cholinergic control on *S. officinarum* L. induced-yawning and genital grooming.

CONCLUSION

- Pharmacological tests revealed that aqueous extracts of the green leaves of *Saccharum officinarum* L. (sugarcane) had an effect on the central nervous system in rats.
- Dopaminergic and cholinergic neural pathways are involved in mechanism of action of aqueous extract of the plant.

Dopaminergic and cholinergic transmissions are involved in motor and cognitive physiological processes. In rats, the interrelationship between dopaminergic and cholinergic transmission can be explored through behavioral tools such as yawning and genital grooming.

Unbalances between these transmissions are found in some disorders, such as Parkinson's disease, Huntington's disease and schizophrenia. Considering the existence of these various neurological and psychiatric disorders, the search for new psychoactive agents is essential. Therefore, the pharmacological validation of plant species such as sugarcane, which has been used for decades by the population, offers new perspectives on the development of therapeutic agents for the treatment of serious diseases.