WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.084
Volume 11, Issue 12, 1-11. Research Article ISSN 2277– 7105

EVALUATION OF ANTICONVULSIVE AND SEDATIVE EFFECT OF *BRILLANTAISIA PATULA* LEAVES T. ANDERSON IN MICE

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Article Received on
24 June 2022,

Revised on 14 July 2022,
Accepted on 04 August 2022

DOI: 10.20959/wjpr202212-25109

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ABSTRACT

In Congo, *Brilllantaisia patula*, is a plant used in traditional medicine due to its many virtues including anticonvulsant and sedative effects. Therefore, this study aims to assess the anticonvulsant activity of the extracts of *Brilllantaisia patula* leaves in doses of 250 and 500 mg/Kg. The results obtained showed a significant effect of the aqueous extract of the *B. patula* leaves on the time of onset of convulsions. Concerning the sedative activity, the aqueous extract of the *Brillantaisia patula* leaves has a significant effect at dependent dose on the motricity of animals. On the other hand, the effect is not significant on the duration and the time to onset of the sleep.

KEYWORDS: *Brillantaisia patula*, Anticonvulsant effect, Sedative effect, Therapy, Brazzaville.

INTRODUCTION

Epilepsy is a focal neurological disorder where is developed in 5% of people all over the world in their lifetime. The recent epilepsy therapy with new antiepileptic drugs is related to lateral effects, dose associated and chronic toxicity, along with effects of teratogenicity, and about 30% of the patients endure seizures with recent therapy of antiepileptic drugs.[1,2,3,4] Epilepsy is possible that the incidence is greater in developing countries due to greater prevalence of antecedent factors for example infections in brain and parasitic infections. While the diagnosis for seizures control in the majority of patients for seizure control,

reduction and medication extraction. Epilepsy is categorised by recurring incidences of seizures. A seizure is because of abnormal discharge of particular cerebral neurons. Antiepileptic drugs can stabilise the effect on neuronal membrane; stop discharge of usual brain cells by the focal release.[5]

Most of the current and accessible antiepileptic medications are manmade. Medicinal plants used for the epilepsy treatment in traditional medicine showed to have hopeful anticonvulsant activities and will be a precious source of innovative antiepileptic drugs. [6, 7] Various people in less developed countries might not receive plain treatment because of high cost, inaccessibility and unfortunate effects related to the existing antiepileptic medications. Then, various people in the emerging countries quiet lead to traditional medicine to satisfy their health care necessities. WHO considers the use of medicinal plant to ascertain care and efficiency in the healthcare agendas of emerging countries.[8,9]

The usage of medicinal plants in Africa is perhaps as old as the period of human settlement in the continent.[10] These can be resulted from several part of the plant alike leaves, seeds, bark, roots, flowers, fruits, etc.[11] African medicinal plants have vast pharmacological properties such as therapies found by using plants play a vital role in the people health exclusively in the country regions. Medicinal plants are recognised to contain remedial potentials to some biological active materials found in different parts of the plants. The referred substances have many virtues included such as flavonoid, benzophonones, bioflavonoid, etc.[12]

Epilepsy is a disease with impulsive recurrent seizures that may increase from a focal part of the brain or long-windedly causing in several seizures ending in sporadic neuronal discharge.[13,14] When provoked in a usual brain, by treatments for example electric shock deprived of some stimulation, a seizure is defined as “nonepileptic”.[15] New-onset seizures have supposed to happen more often among youngsters than a year and adult’s persons above 55 years.[16] It is unhappy to observe that in developing countries, between 80 and 90% of epileptic patients do not obtain satisfactory treatment. More disturbing is the fact that a greater part of this population does not go to the doctor as main intent.[17,18] It was noticed that pharmacological agents presently in medical use prevent seizures, then it is ambiguous whether or not they can prevent the development of epilepsy.[19]

In Africa, traditional medicine plays a major role in the treatment of many convulsive diseases.[20] Generally in Congo, the population resorts to traditional medicine for primary

health care.[21] *Brillantaisia patula* is a medicinal plant widely used to treat high blood pressure, peptic ulcer disease as well as epilepsy.[22] The present study aims to evaluate the effect of *Brillantaisia patula* on seizures induced by picrotoxin and strychnine in mice.

MATERIAL AND METHODS

Plant material

The leaves of *Brillantaisia patula* was collected from the Talangaï district of Brazzaville City, Congo Republic. They were dried at room temperature for two (2) weeks at the Laboratory of Pharmacodynamics and Experimental Physiopathology (L2PE) of the Faculty of Science and Techniques of Marien Ngouabi University (Congo Republic).

Animal material

Male and female mice of Swiss albino strain (20 and 30g), supplied by the Pet store of the Institute for Research in Health Sciences of Brazzaville (IRSSA), were maintained under standard conditions with free access to food and drinking water.

Preparation of aqueous extract of *brillantaisia patula*

The preparation procedure of aqueous extract of *Brillantaisia patula is shown in* ‶Fig.1″.

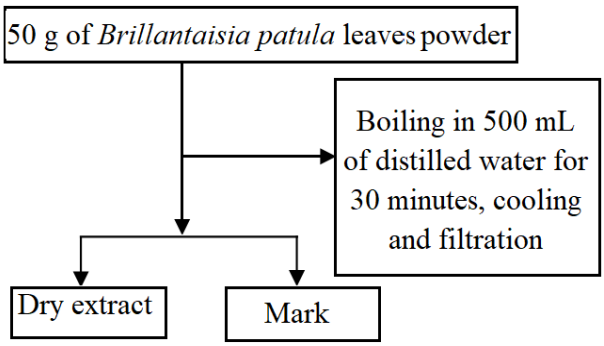

Figure 1: Extract preparation.

Anticonvulsant activity of *brillantaisia patula* leaves: Evaluation of the effect of *brillantaisia patula* leaves on picrotoxin-induced seizures (PIC)

The method consists in inducing clonic convulsions for 15 minutes in mice by intraperitoneal administration of picrotoxin 7.5 mg/kg one hour after all treatments. The animals were observed during this period. Those not showing convulsions or showing convulsions without dying are declared protected. The time to onset as well as the duration of seizures in each group are determined (Bassoueka et al., 2016). Four (4) groups of 5 mice each were formed and fasted for 18 hours before the experiment.

The negative control group received distilled water 0.5 mL/100 g per os, and the positive control group was treated with the reference molecule of Clonazepam 3 mg/kg per os. Then the test groups were treated with the aqueous extract of *B. patula* leaves at respective doses of 250 and 500 mg/Kg of body weight per os.

Evaluation of the effect of the aqueous extract of the *B. patula* leaves on strychnine-induced seizures (STR)

The method consists in inducing tonic convulsions for 10 minutes in mice by intraperitoneal administration of strychnine 2.5 mg/kg one hour after all treatments. The animals are observed during this period. Those not showing convulsions or showing convulsions without dying are declared protected. The time to onset as well as the duration of seizures in each group are determined (Bassoueka et al., 2016).

Groups of 5 mice each were formed and fasted for 18 hours before the experiment. The negative control group received distilled water 0.5 mL/100 g, per os. Then the positive control group was treated with the reference molecule of diazepam 10 mg/kg, per-os. So, the tested groups were treated with the aqueous extract of *B. patula* leaves at respective doses of 250 and 500 mg/Kg of body weight.

Evaluation of the sedative activity of the aqueous extract of *B. patula* leaves in mice: Effects of aqueous extract of *B. patula* leaves on motor activity

The test consists of assessing by using a square board cage comprising 16 squares measuring 40×40 cm being the number of squares scoured by mice in five (5) minutes. Groups of 4 mice each were formed and treated orally. Then the negative control group received distilled water 0.5 mL/100 g. The positive control group was treated with diazepam 10 mg/kg and the test groups were treated with the aqueous extract of *B. patula* leaves at the respective doses of 250 and 500mg/Kg of body weight. One hour after all the treatments, the animals were placed in turn in a squared cage. Next, the number of squares crossed by the animals after five (5) minutes is noted.

Effects of aqueous extract of *B. patula* leaves on phenobarbital-induced sleep

Four (4) groups of 4 mice each were constituted and treated as of habit. The negative control group received distilled water 0.5 mL/100 g, per-os. Then the positive control group was treated with Diazepam 10 mg/kg, per os. The tested groups were treated with the aqueous extract of *B. patula* leaves at respective doses of 250 and 500 mg/Kg of body weight. One

hour after administration of the various products, the sleep was induced by intraperitoneal injection of phenobarbital 70mg/kg. The time to onset and the duration of sleep were determined for each mice. Sleep duration is considered as the lapse of the time between when the mice loses the righting reflex and when the righting reflex reappears (Bassoueka et al., 2015).

Statistical analysis

Statistical analysis was done using Excel software (Office 2010) in order to compute statistical parameters. The results were expressed as mean ± SEM and subjected to a one-way analysis of variance and the Student-Fischer t-test ($p < 0.05$, $p < 0.01$, $p < 0.001$).

RESULTS

Anticonvulsant effect of aqueous extract of *brillantaisia patula leaves*

Effect of aqueous extract of *B. patula* leaves against picrotoxin-induced seizures (PIC)

"Fig.2 and 3"show the effect of the aqueous extract of *B. patular* respectively on the time to onset and duration of seizures in mice. It is noticed that, at a dose of 500 mg/kg, the extract of *B. patula* led to a significant increase in the time to onset of convulsions (*** p>0.001). However, at doses of 250 and 500 mg/kg the extract caused a non-significant reduction in the duration of convulsions.

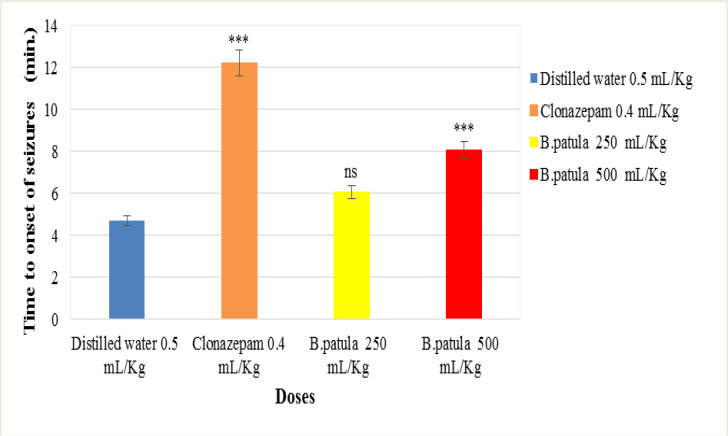

Figure 2: Effect of the aqueous extract of *B. patula* leaves on the time to onset of seizures. The results are expressed as mean ± standard error, n=4, *** p>0.001 significant difference, B.patula NS = non-significant difference.

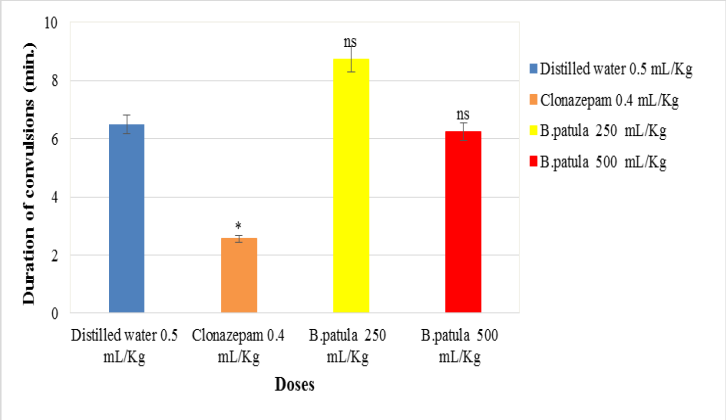

Figure 3: Effect of the aqueous extract of *B. patula* leaves on the duration of convulsions. The results are expressed as mean ± standard error, n = 4, NS = non-significant difference compared to the control group, p<0.05 significant difference. Duration of convulsions (min.)

Effect of aqueous extract of *B. patula* leaves against strychnine-induced seizures (STR)

"Fig.4 and 5" show the effect of the aqueous extract of *B. patula* on the time to onset and the duration of seizures in mice, respectively. The results obtained suggest that the aqueous extract at doses of 250 and 500 mg/kg led to a significant increase in the time to onset of seizures (*** p>0.001) and a non-significant decrease in the duration of seizures.

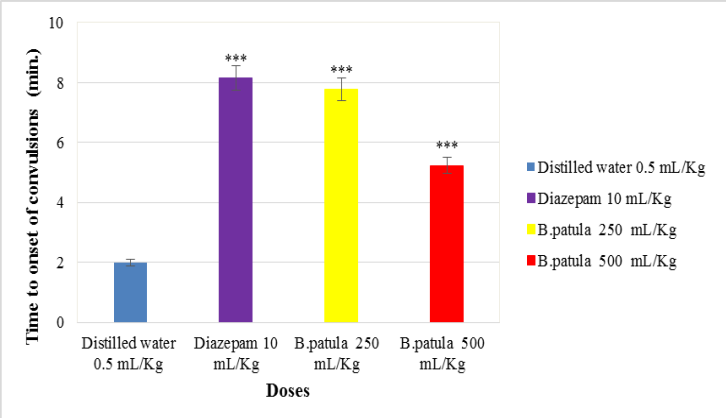

Figure 4: Effect of the aqueous extract of *B. patula* leaves on the time to onset of convulsions. The results are expressed as mean ± standard error, n = 3, * (p>0.001) difference compared to the control.**

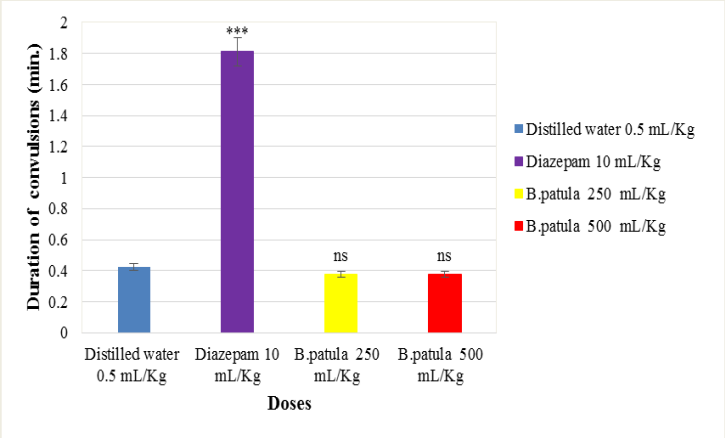

Figure 5: Effect of the aqueous extract of *B. patula* leaves on the duration of convulsions. The results are expressed as mean ± standard error, n = 3, ns = non-significant difference, p<0.05 significant difference compared to the control.

Sedative effect of the aqueous extract of the *B. patula* leaves: Effect on motor activity

Table 1 shows the effect of the aqueous extract of *B. patula* leaves on motor activity in mice. It is observed that the aqueous extract at doses of 250 and 500 mg/Kg caused a decrease in motility in mice.

Table 1: Effect of aqueous extract of *B. patula* on motor activity in mice.

Products	Doses (mg/Kg)	Number of Square crossed (5 min.)
Distilled water	0,5 (a)	108,25±2,84
Diazepam	10	25,25±2,75***
Extract from leaves	250	74±2,12***
Extract from leaves	500	55,5±2,22***

(a): mL/100g; Values are expressed as mean ± SEM; n=4; ***p < 0.001 significant difference from the control group.

Effect on the sleep induced by the gardenal

"Fig. 6 and 7". show the effect of the aqueous extract of the leaves of *B. patula* respectively on the time of onset and duration of sleep in mice. These results suggest that the aqueous extract of *B. patula* leaves at a dose of 500 mg/kg led to reduce the time of onset of sleep in mice. However, *B. patula* had no significant effect on sleep duration compared with the control group.

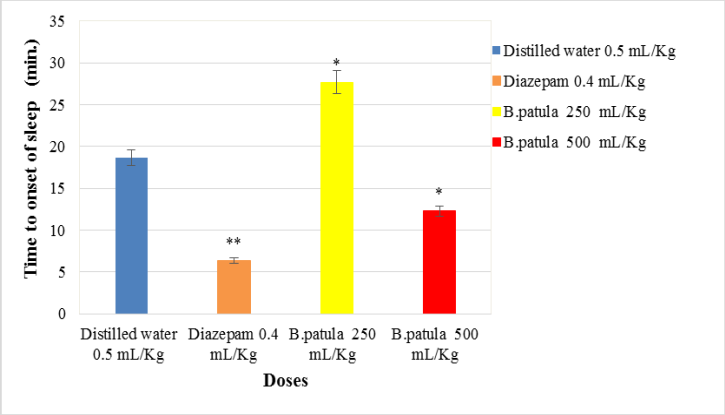

Figure 6: Effect of aqueos extract of *B. patula leaves* on time of onset of sleep in mice. The results are expressed as mean ± ESM; n = 4; *p < 0,05; **p < 0.01; compared with the control group.

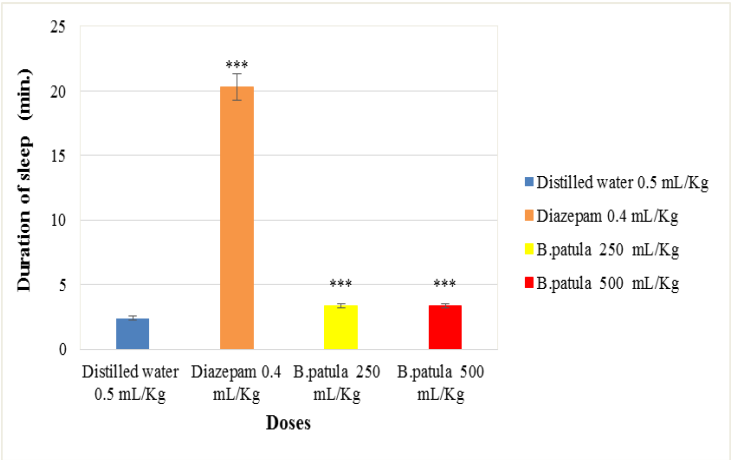

Figure 7: Effect of aqueos extract of *B. patula leaves* on the duration of sleep in mice. The results are expressed as mean ± ESM; n=4; ***p < 0,001 compared with the control group.

DISCUSSION

This work was carried out with the aim of evaluating the anticonvulsant and sedative effects of *Brillantaisia patula* in mice. Then it is noticed that the aqueous extract of *Brillantaisia patula* at a dose of 500 mg/Kg caused an increase in the time to onset of convulsions and a non-significant decrease in the duration of convulsions induced by ICP, at doses of 250 and 500 mg/kg in mice. These results mention that the aqueous extract of *B. patula* could have anticonvulsant properties.[23, 24]

The aqueous extract of *B. patula* at doses of 250 and 500 mg/kg caused a significant increase and a non-significant decrease, respectively, in the time to onset and the duration of

convulsions induced by STR. Since STR acts on the glycine receptor in the spinal cord and brainstem to inhibit the opening of the chloride channel. So, this suggests that the aqueous extract of *B. patula* would have an effect on the glycine-sensitive receptor by counteracting the effect of the STR.[25,26,27]

Concerning the sedative activity, the results obtained show that at doses of 250 and 500 mg/kg the aqueous extract of *B. patula* led to a significant reduction in motor skills in mice (74 and 55.5 squares) compared with the control group (108.25 squares). However, the aqueous extract of *B. patula* did not have too much effect on the time to onset and the duration of sleep in mice.

ACKNOWLEDGMENT

We acknowledge the Marien Ngouabi University, Faculty of Sciences and Techniques, for allowing the use of the Pharmacological and Pharmaceutical Technology. We are also grateful to the laboratory technicians for their assistance.

CONCLUSION

The aim of the current work is to assess the anticonvulsant and sedative effects of *Brillantaisia patula* in mice. Results obtained proved the behaviour of *Brillantaisia patula* extract to increase the time to onset of convulsions induced by ICP.

The aqueous extract of *B. patula* has tendency to experiment anticonvulsant properties causing a significant increase in the time to onset and the duration of convulsions induced by STR. *B. patula* conducts to a significant reduction in motor skills in mice without sufficient effect on the time to onset and the duration of sleep in mice.““

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