

## Some Abstracts Presented at the 18th Conference of the Neuroscience Society of Nigeria

### **Ameliorative Effects of *Stachytarpheta jamaicensis* Aqueous Leaf Extract on the Hippocampus and Prefrontal Cortex of N,N'-dimethyl-4,4'-bipyridinium dichloride-Induced Parkinson's Disease in Adult Wistar Rats**

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#### **Abstract**

Parkinson's disease (PD) is the world's second neurodegenerative disorder after Alzheimer's disease, and degeneration of dopaminergic neurons is the hallmark. This novel management approach for Parkinson's disease with *Stachytarpheta jamaicensis* was to assess the role of leaf extract on the histological and morphological properties of the hippocampus and prefrontal cortex in Paraquat-induced Parkinson's disease. Twenty-eight adult Wistar rats of both sexes (180 - 240g) were assigned to four groups: N,N'-dimethyl-4,4'-bipyridinium dichloride (Paraquat, P), Paraquat and *Stachytarpheta jamaicensis* (PSJ), only *S. jamaicensis* (SJ) and control (CTR). Animals were allowed water and food *ad libitum* throughout, and the weights were taken periodically. Parkinson's-like disease was induced by intraperitoneal injection of 8.4 mg/kg body weight of Paraquat twice weekly for three weeks in the P and PSJ groups; The PSJ further received SJ aqueous leaf extract for another two weeks. Neurobehavioural assessment using Barnes maze for spatial learning and memory was carried out. Animals were sacrificed at the end of the experiment, and brain specimens were excised and processed for histological and biochemical analyses of the hippocampus and prefrontal cortex. The results showed that paraquat caused the degeneration of pyramidal and granular neurons, as well as dysfunctional output of the hippocampus and prefrontal cortex. There was a significant loss of dopaminergic neurons mainly in the P group. On the other hand, SJ leaf extract preserved most of the

neurons. In conclusion, SJ leaf extract produced observable positive effects on the hippocampus and prefrontal cortex of the paraquat-induced Parkinson's disease model.

**Keywords:** Paraquat, Parkinson's disease, *Stachytarpheta jamaicensis*, Hippocampus, Prefrontal cortex, Wistar rat

### **The Effects of *Stachytarpheta Jamaicensis* on the Prefrontal Cortex of Alloxan-Induced Diabetic Wistar Rats**

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#### **Abstract**

This study investigated the effect of post-treatment of *Stachytarpheta jamaicensis* (SJ) aqueous leaf extract on the prefrontal cortex of Alloxan-induced diabetic Wistar rats. Twenty-eight adult Wistar rats (both sexes) with body weight 140-200g were randomized into four groups (n = 7): Control, Alloxan, Alloxan and SJ, and SJ only. After two weeks of acclimatization, the Alloxan, and Alloxan and SJ groups were administered a single dose of 160mg/kg Alloxan dissolved in normal saline, and allowed for three weeks, while the control and SJ only groups were only allowed water and feed. At the end of the third week, the Alloxan and SJ, and SJ only groups were administered 0.06g/ml of SJ daily for another three weeks. After a total of six weeks, physical observations revealed that the Alloxan group appeared weak, with loss of weight, locomotion and balance, hair, appetite and with closed eyelids. The Alloxan and SJ group regained stability, slight movement and weight, while the Control and SJ only groups appeared active with no health impairment. Histological analysis of brain tissues revealed neuronal cells distortion and degeneration in the Alloxan group.

The Alloxan and SJ group showed less degeneration, while the SJ only group had more aggregates of pyramidal cells compared to the control. Hence, SJ aqueous leaf extract may slow the rate of degeneration in brain cells in diabetes.

**Keywords:** *Stachytarpheta jamaicensis*, Prefrontal cortex, Diabetes disease