



## EVALUATION OF ANTIDEPRESSANT ACTIVITY OF GINKGOBILOBA IN RESERPINE INDUCED DEPRESSED ANIMAL MODEL

Dr. J. Raghu Ram\*<sup>1</sup>, Dr. Anupama Koneru<sup>2</sup> and Sana Tabassum<sup>3</sup>

<sup>1,2,3</sup>Department of Pharmacology, Sultan Ul-Uloom College of Pharmacy, Mount Pleasant, 8-2-249, Road No.3, Banjara Hills, Hyderabad, Telangana – 50034, India.



\*Corresponding Author: Dr. J. Raghu Ram

Department of Pharmacology, Sultan Ul-Uloom College of Pharmacy, Mount Pleasant, 8-2-249, Road No.3, Banjara Hills, Hyderabad, Telangana – 50034, India.

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### ABSTRACT

Depression may disrupt a variety of serotonergic and noradrenergic pathways, leading to a wide range of physiological and psychological distress. Subtypes of the serotonin receptors have been identified, with a focus on 5-HT1 and 5-HT2 in the field of psychiatry. Tolerant skepticism about melancholy places special emphasis on serotonin as a neuro-modulator and a key site of antidepressant efficacy. The kynurenine hypothesis is based on the premise that altered serotonin (5-Hydroxy Trypt.) levels in the brain contribute to the development of depression. Many studies have shown that drugs that inhibit N-Methyl-D-aspartate receptor activity have effects similar to those of active antidepressants.

**KEYWORDS:** Depression, serotonin and psychological distress.

### INTRODUCTION

#### Depression

Classic Antidepressants and the Sadness Issue More than 300 million individuals all over the world are influenced by major depressive disorder, moreover known as MDD. This mental sickness is greatly weakening and carries a tall individual and societal fetched, especially given the critical confinements of the treatment alternatives that are right now accessible. Conventional antidepressants, such as SSRIs, SNRIs, TCAs, and MAOIs, are predicated on the theory that monoamine neurotransmitter frameworks, such as serotonin, norepinephrine, and dopamine, are hypoactive, especially in districts of the brain that are emphatically connected to major depressive disorder.<sup>[1]</sup>

#### ETIOLOGY OF DEPRESSIVE DISORDERS

Those who go on to create misery have been appeared in more than one consider to appear signs of cognitive decrease starting as youthful as four a long time ancient. It is challenging to supply a persuading basis for the beginning of disposition disarranges like sadness and other comparable conditions. Numerous diverse things might contribute to somebody getting to be misery. Major depressive disorder is characterized by a alter within the rate at which neurotransmitters within the brain are reused, counting dopamine, serotonin, nor-epinephrine, and epinephrine, among others. Fortuitously, life is pressed with a variety of startling difficulties. The

tremendous larger part of individuals is able to manage with the dissatisfactions that life tosses at them and have as it were brief lows in disposition; in any case, mental patients who are subjected to indistinguishable circumstances frequently persevere serious misery scenes.

As a result of the truth that a number of distinctive pathophysiological conditions may each play a portion in making pitiful sentiments, the causes of misery are in some cases convoluted. Individuals who have a hereditary inclination to misery, especially those who come from discouraged families, may be at the next chance of encountering a extreme depressive scene in case particular conditions are met (such as upsetting occasions, physical maladies, monoamine-depleting solutions).<sup>[11]</sup>

#### PATHOPHYSIOLOGY

Putting Forward the Speculation of Biogenic Amines It's conceivable that the physiologic breakdown that underlies discouragement is caused by a essential awkwardness of various neurotransmitters within the brain. The biogenic amine theory may be a school of thought that dates back to the early 1950s and points to clarify the beginning of different classes of amines. Analysts found that reserpine diminished the amounts of the neurotransmitters NE, 5-HT, and DA that were show in synaptic granules. The capacity of the body's fringe to

metabolize serotonin was appeared to be impeded by the hallucinogen lysergic corrosive diethylamide, which was found by researchers.<sup>[12]</sup>

It was already accepted that the impacts of serotonin's movement on the central apprehensive framework were mindful for the mind-altering impacts that produces. In any case, this early thought was missing in its capacity to satisfactorily depict the genuine cause of pity. In spite of the fast reuptake blockage of monoamine oxidase restraint on the verbal course, be that as it may, the upper impact of drugs does not gotten to be discernible in patients for up to four weeks after treatment has started. To have distant much improved a stronger understanding of the exact pathway physiology of sadness, encourage investigate is required, perhaps concentrating on the versatile changes brought almost by antidepressants.<sup>[13]</sup>

## MATERIALS AND METHODS

### Animals

Swiss albino mice strain (25-30g) were used for the study. The experimental mice were procured from Sainath Animal Agency, Musheerabad, Hyderabad, India. The mice were kept under standard well controlled conditions before and throughout the experimental duration. The temperature was maintained at 22°C ( $\pm 3^\circ\text{C}$ ) and relative humidity was between 50-60%. The animals were given pellet diet and drinking water ad libitum, kept in 12h/h light/darkcycle and maintained for atleast 5 days prior to dosing to allow for acclimatization to laboratory conditions. The experimental protocol was given approval by Institutional Animal Ethical Committee and was carried under the compliance of IAEC guidelines. (IAEC/SUCP/2022/08).

### Plant material collection and extraction

The Plants parts of Ginkobiloba were collected from, identified and authenified by Dr. Ghousia tabassum: Hyderabad Unani Research Foundation, Hyderabad, Telangana State. The plants were cleaned, shade dried, coarsely powdered and sieved through sieve no.100. The methanolic extract of Ginkobiloba was prepared. This powder was used for solvent extraction. The MESAG was formulated in 2:2:1ratio (Ginkobiloba About 250gms of powder poly herbal powder extract was subjected to soxhlet extraction using 500ml solvent ethanol. This cycle was repeated many times until the colour of the solvent in the siphon of the soxhlet faded away. The extract was concentrated on water bath. The MESAG was suspended in normal saline and administered orally.

### Experimental Design

Group I (Normal Control): Animals will receive normal diet and vehicle 0.9 NACL at a dose of 1ml/100gm body weight.

Group II (Negative Control): Animals will receive Reserpine 0.75mg/kg body weight in by i.p.

Group III (Standard): Animals will receive Reserpine 0.75mg/kg body weight + clomipramine 25mg/kg body

weight i.p.

Group IV (Treatment group- I): Animals will receive Reserpine 0.75mg/kg body weight + methanolic extract of ginko biloba 250mg/kg body weight by orally.

Group V (Treatment group- II): Animals will receive Reserpine 0.75mg/kg body weight + methanolic extract of Reserpine 500mg/kg body weight by p.o.

The behavioural activity of mice is evaluated before and during treatment using Force Swim Test, and Tail Suspension Test.

After assessing the anti-depression activity of Ginko biloba In Reserpine Induced Depressed Animal Model, mice from each group sacrificed by cervical dislocation, the brain will be removed and washed with ice cold isotonic saline solution and will be subjected to estimation of biochemical parameters and histopathological study.

The biochemical parameters such as Dopamine, Serotonin and Nor-epinephrine will be determined.

### FST Methodology

The technique proposed by Porsolt was taken after by our. Each creature was set in its possess glass measuring utencil containing five liters of water for a period of perception enduring six minutes. The measuring utencils were filled with water to inside fifteen centimetres of their particular tops. It wasn't until the exceptionally conclusion of the perception period—the exceptionally last four minutes—that the sum of time went through stable was counted. It was thought that the mouse was stationary when it coasted in put without making any developments or when it made fair the most minor developments fundamental to keep its head over the water. After each of the tests, the accessible water was refilled. It is a sign that the pharmaceutical is having an upper impact in case the period of inertia endures for a shorter time.

### TST Methodology

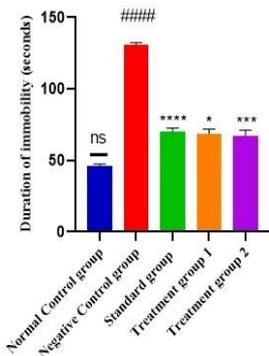
The strategy that Steru depicted was the same one that we utilized for our examination. The animals' tails were tied to a plastic rope that was hung 75 centimetres over the ground, and they were taped to the rope. We planned how long we stood still, and it was eight minutes add up to. The time that was went through sitting or standing still was followed all through the final six minutes of the perception. Mice were as it were considered stationary when they remained still and hung in one put. A diminish within the sum of time went through doing nothing would be demonstrative of an antidepressant's adequacy.

RESULTS AND DISCUSSION

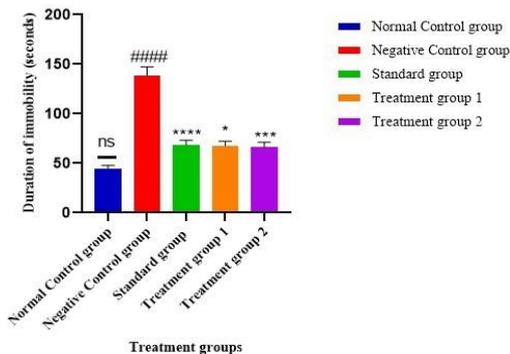
Tabel I: Immobility Time In The Forced Swim Test (Fst) Using Mice.

S.No	Treatment	Duration of immobility (seconds)			
		Day 1	Day 7	Day 14	Day 21
1.	Group I	44.73	42.89	40.27	39.84
2.	Group II	129.86	144.65	146.72	147.72
3.	Group III	68.39	65.26	63.18	62.26
4.	Group IV	66.26	64.35	62.45	60.16
5.	Group V	64.28	62.88	59.48	55.27

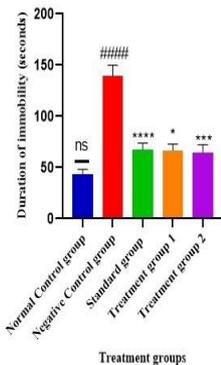
FORCED SWIM TEST (FST) DAY 1



FORCED SWIM TEST (FST) DAY 7



FORCED SWIM TEST (FST) DAY 14



FORCED SWIM TEST (FST) DAY 21

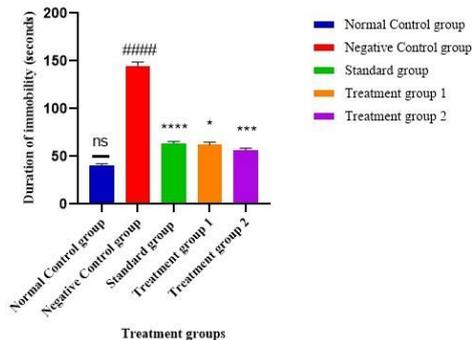


Figure-1.

Tabel: (Open Field Test).

Treatments	Movement central Area (mins)	Movement in corner Area(mins)
Group I	8.37	1.43
Group II	6.78	3.59
Group III	5.27	4.73
Group IV	4.56	5.82
Group V	4.18	5.27

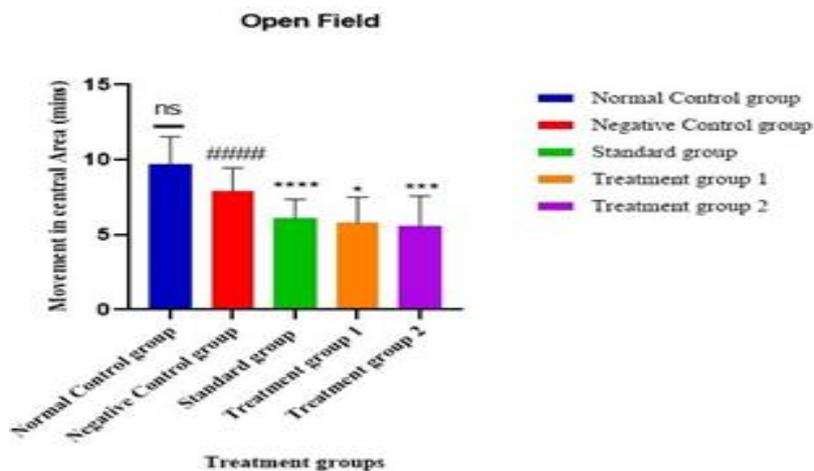


Figure-2  
Open Field Test

Tabel-3  
Tabel-3 Lipid Peroxidase.

GROUPS	LPO $\mu\text{m of /H}_2\text{O}_2/\text{mgtissue}$
Group I	17.77
Group II	13.28
Group III	16.32
Group IV	18.56
Group V	19.23

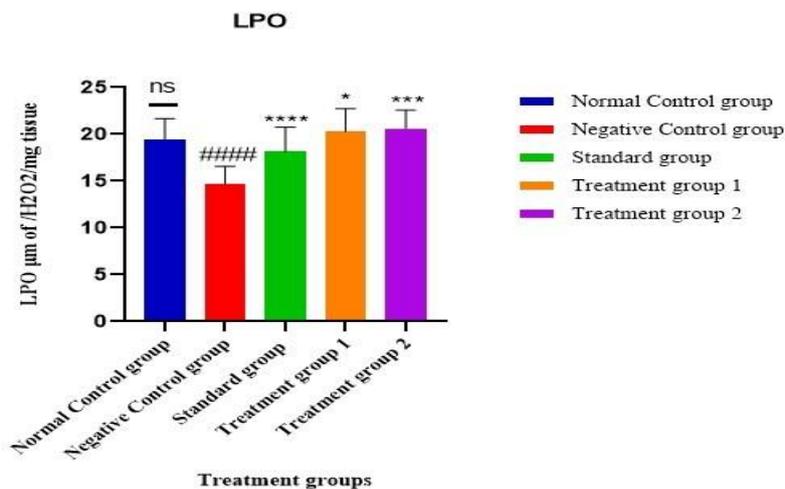
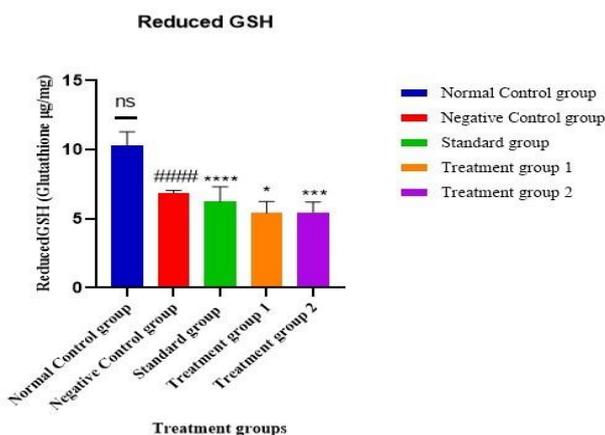


Figure-3 Lipid Peroxidase

GSH  
Tabel 4: Reduced GSH.

Group	Reduced GSH(Glutathione $\mu\text{g}/\text{mg}$ )
Group I	9.56
Group II	6.73
Group III	5.46
Group IV	4.82



**Figure-4: ReducedGSH.**

## DISCUSSION

Different serotonergic and noradrenergic pathways may be broken in sadness creating numerous diverse side effects. The serotonin receptors (5-HT) have been recognized into different sub-types with the 5-HT<sub>1</sub> and 5-HT<sub>2</sub> sub-type being of more prominent intrigued in psychiatry. The tolerant speculation of discouragement emphasizes 5-HT as a neuro-modulator and its significance as a center for antidepressant activity. The kynurenine theory rises from the preface that misery emerges from modified levels of serotonin (5-Hydro Trypt.) within the intellect. Numerous of the inquires about affirm that compounds, which initiate decrease in exercises at the N – Methyl – D – Aspartate receptors create impacts comparable to dynamic antidepressants.

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