Investigation of Anti-Anxiety and Anticonvulsant Activities of *Tectona grandis* Linn.: Evidence from Elevated Plus Maze and Electro Convulsion-Induced Seizure Models

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ABSTRACT

Medicinal plants are crucial to the creation of novel medications because they contain a wide range of bioactive substances with a wide range of pharmacological effects.

One of the most prevalent mental illnesses affecting people is epilepsy and anxiety, and its occurrence is rising. Among the medications that people use the most are anti-convulsant and anxiolytics. The undesirable side effects of synthetic drugs, such as sodium valproate as an anti-convulsant and benzodiazepines as anxiolytics, restrict their clinical use. Therefore, it is imperative to look for novel anti-epileptic and anti-anxiety medications. In traditional medicine, Tectona grandis has been used as a nervine tonic and to relieve nervous tension and insomnia.

There are no reports of scientific investigation of T.G.'s anxiolytic and anti-convulsant properties, despite ethnopharmacological claims of its use in treating CNS-related issues. Thus, this study's objective was to conduct systematic pharmacogenetic, anti-anxiety, and anti-convulsant investigations on T. grandis roots.

Methanolic preparations of T. grandis roots (50, 100, 200 mg/kg, p o) were tested for their anxiolytic and anti-convulsant properties in albino mice using the Elevated Plus Maze and chemically induced epileptic drugs such as PTZ.

Methanol extracts of the plant's roots demonstrated strong anti-convulsant and anti-anxiety properties. In accordance with WHO criteria, thorough pharmacogenetic analyses of the bioactive root portions of plants were conducted. To create exact criteria for plant material authentication, experiments involving microscopic, physicochemical, TLC fingerprinting, and phytochemical screening of the bioactive plant portion were conducted.

After the extract was exposed to anti-anxiety and anti-convulsant guided fractionation, a pure component known as quercetin, a flavonoid, was isolated.

The current investigation supports Tectona Grandis's conventional claim. The plant's anxiolytic and anti-convulsant component, quercetin, appears to have a lot of promise for use in the development of a novel medication to treat anxiety and epileptic conditions.

Keywords; Anxiety, Anti-Convulsant, Tectona Grandis, Quercetin, PTZ, Elevated Plus Maze

Introduction

The term "herbal remedies" refers to the use of any plant material to treat or cure diseases. Herbal treatments have been used extensively throughout human history. Additionally, it has been determined that over 35,000 plant species are used for medical purposes by various human societies worldwide. similar to A number of them possess antibacterial, antifungal, antiviral, anticancer, anti-epileptic, and diabetic properties.

From 1994 to 2004, a comprehensive investigation was carried out to ascertain whether any of the numerous plant species possessed anxiolytic qualities. It was shown that over 20 distinct plants possessed anxiolytic qualities.

Approximately 50% of them rely on GABA receptors to function. Barakol, an active ingredient from the Southeast Asian plant Cassia siamea, may have CNS inhibitory effects via reducing dopamine release and turnover in the striatum. Honokiol and magnolol are the primary constituents of Tectona grandis, a plant used in traditional Chinese medicine that has anxiolytic qualities. It has been demonstrated that both of these medications have a medium to broad affinity for a number of GABA-A and GABA-C receptor subtypes. This implies that the mechanisms generating the anxiolytic effect include central GABAergic circuits. Tectona grandis, Piper methysticum, Melissa officinalis, and Zizapus jujube can all have anxiolytic effects on animals.

The main cause of epilepsy is increased oxidative stress, which is often referred to as an increase in the production of free radicals. The majority of cases of the sickness are caused by this component. Free radicals are known for having unpaired electrons in their valance shells, which makes them frequently extremely reactive. New free radicals were created when these radicals reacted with O2 and transferred their unpaired electrons to the molecular oxygen. Species of extremely reactive oxygen, sometimes known as R.O.S., evolve when a negative charge appears on oxygen.

These species, which include superoxide, hydroxyl, and per hydroxyl, are a family of free radicals that start with the oxygen molecule. These free radicals frequently damage both the surrounding tissue and the tissue's byproducts.

Oxidative damage is the term used to describe this damaging property, and antioxidants are all chemicals that provide protection against radicals. Exposure to oxygen might result in oxidative damage.

Free radicals may be produced in the body as a result of a number of circumstances, including tobacco smoke, excessive use of antibiotics and drugs, pollution, and inflammation. These free radicals contribute to dysregulations of oxidative phosphorylation, which in turn alter the activities of complex-IV in the electron transport chain of the cellular respiration into the mitochondria. Additionally, they cause dysregulations in the cells or the "mitochondrial" oxidative phosphorylation process, which alters the activities in complex-IV of the electron transport chains.

Damage to DNA, disruption of the myelin sheath in neurones, damage to the lipid bilayer of unsaturated fatty acids and plasma lipoprotein, which results in the evolution of high levels of peroxides and dialdehydes, and disruption of the tertiary and qua-ternary structures of proteins and other molecules are some of the harmful properties of free radicals. It has also been

connected to the onset of atherosclerosis, autoimmune diseases, and cancer. Another element that leads to the demise of neuronal cells is the overproduction of free radicals.

Coordination in the design of experiments is essential to understand epileptic networks and to provide new concepts for rational drug design. Although the assessment of human surgical specimens has greatly improved, these studies were sometimes restricted to the later phases of the illness and must take into consideration the patients' varied medical histories as well as the lack of suitable controls. In this sense, animal models offer essential supplementary resources for investigating the basic mechanisms of targeted epileptogenic and automated external defibrillator therapy. The vast array of animal models available is both a challenge and an opportunity. Research on animal epilepsy models has greatly advanced our understanding of the aetiology and etiopathogenesis of the condition.

One advantage of using animal models in epilepsy research is that it allows for a better understanding of the aetiology, pathophysiology, and consequences of the disorder. Additionally, it facilitates the development and evaluation of newer medications for the diagnosis of epilepsy. The ideal seizure drug would totally prevent all seizures and have no negative side effects. Most of the drugs used to treat epilepsy were found by accident.

Long-term use of these drugs causes a number of adverse side effects. Herbal remedies are becoming more and more popular these days all throughout the world.

Although a number of native herbs have been used for therapeutic purposes since antiquity, little is understood about how they work. India's hot, humid climate, along with its varied topography and climate, make it a treasure trove of medicinal plants. In order to cure a wide range of ailments, more recent generations have been taught the ancient medicinal knowledge of Ayurveda. Indeed, during the earliest periods of human history, people relied entirely on the extracts of green plants to treat a wide range of illnesses and physical conditions. Many of the many plant species found in India have been used for hundreds of years for medicinal purposes.

AIM AND OBJECTIVE

The purpose of this study is to use the elevated plus maze and the Chemo-Convulsion method to assess the anti-anxiety and anti-convulsant behaviour of *Tectona grandis* Linn methanolic extract on mice in light of observations and a review of the literature.

OBJECTIVES INCLUDE

- To collect the *Tectona Grandis Linn* roots and verify the chosen plant's identity.
- Tectona grandis linn roots are extracted using a Soxhlet equipment.
- To investigate the phytochemical characteristics of *Tectona grandis Linn's* dried roots.
- Pharmacological assessment of Tectona grandis linn root utilising anti-convulsant (Chemo-convulsion technique), anti-anxiety-elevated plus maze, and other animal models.
- To analyse the provided data statistically.

Review of Literature

Traditional and Ethnomedicinal Uses of *Tectona grandis* Linn.

Teak, or Tectona grandis, is a huge deciduous tree that is indigenous to South and Southeast Asia, specifically India, Myanmar, Laos, and Thailand. Ayurveda, Unani, and folk medicine

are just a few of the traditional and ethnomedicinal systems in which T. grandis is prized for its economic worth as a timber-producing tree.

1. **Traditional Uses in Ayurveda and Folk Medicine**
2. The leaves, bark, wood, flowers, and seeds of Tectona grandis are all used medicinally in Indian traditional medicine, or Ayurveda. Teak is said to have anti-inflammatory, analgesic, antipyretic, antibacterial, and wound-healing pharmacological effects.

a. Bark

- Used in decoctions for treating **bronchitis**, **anaemia**, **urinary infections**, and **diabetes**.
- Exhibits **astringent**, **cooling**, and **detoxifying** properties.
- Employed as a **blood purifier** and **anthelmintic**.

b. Leaves

- Traditionally used for **skin ailments**, **headaches**, and **burns**.
- Leaf juice is applied externally to treat **swelling** and **inflammation**.
- Decoction is used as a **diuretic** and for **liver disorders**.

c. Wood

- Wood extract has been used as a **sedative**, **tonic**, and in the treatment of **gastric problems**.
- Powdered wood is believed to alleviate **digestive issues** and **fever**.

d. Flowers

- Considered **diuretic**, **anthelmintic**, and **cardiotonic** in traditional practices.

e. Seeds

- Employed for **urinary tract issues**, **constipation**, and as a **mild laxative**.
- Oil extracted from seeds is sometimes used for **joint pain** and **skin diseases**.

2. Ethnomedicinal Applications Among Indigenous Communities

Many tribal communities in India, such as those in Madhya Pradesh, Odisha, and Jharkhand, utilize *T. grandis* in folk remedies:

- **Leaf paste** is used by tribal healers for **wound healing**, **boils**, and **eczema**.
- **Bark infusion** is consumed to relieve **malaria**, **fever**, and **intestinal parasites**.
- **Crushed leaves** are used to manage **insect bites**, **cuts**, and **skin rashes**.
- Some tribes use **bark ash mixed with honey** to treat **diarrhoea** and **dysentery**.

3. Unani and Siddha Perspectives

In Unani medicine:

- *Tectona grandis* is considered **mufarreh** (heart tonic) and **muqawwi-e-Jigar** (liver tonic).
- Used in compound formulations for **hepatitis**, **jaundice**, and **respiratory disorders**.

In Siddha medicine:

- Known for its **cooling**, **astringent**, and **anti-inflammatory** properties.
- Used in polyherbal formulations to treat **scabies**, **skin diseases**, and **intestinal issues**.

4. Significance in Herbal Drug Discovery

The pharmacological assessment of Tectona grandis in contemporary medicine is based on its extensive variety of traditional applications. It is a good candidate for herbal medicine development since ethnomedical knowledge has led researchers to examine its anxiolytic, anticonvulsant, antibacterial, antioxidant, and hepatoprotective qualities.

EXTRACT PREPARATION

The root crop (TG) was first dried, then grounded in to powder with the blender, about 200 g powdered petroleum ether, then filtered through a musclein cloth and finally dried indoors at 50 degrees for 40 minutes. Preheat the oven for a few minue s to remove moisture and dry the filter cake.

Take the decolorized powder and extract with a Soxhlet extractor with a mixture of 50% meth anol, 10% ethanol and 40% water. Then the solution is placed in a water bath (45 oC).

Figure: An assembly is put up to extract plant extract using the aid of a Soxhlet equipment.

Treatment for Anti-Anxiety Activity

The test creatures were partitioned at arbitrary into five bunches, and a add up to of thirty test creatures were utilized, with each gather accepting six creatures.;

Group 1. Control group: The animals in this group were given an n-saline solution as their vehicle, which is synonymous with the normal diet utilised in research institutes.

Group 2: First extract dose (50 mg/kg): The experimental animal in this group was given a plant extract at a dose of roughly 50 mg/kg.

Group 3 received the first dose of the extract (200 mg/kg); experimental animals in this group were given an extract from Plant exceeding 200 mg/kg.

Group 4. Experimental animals in this group received an extract of the plant at a dose of 100 mg/kg+ 3 mg/kg of nicotine

Group 5: Diazepam (1 mg/kg) plus an inducing substance (nicotine) (3 mg/kg) is the standard medication.

Treatment for Anti-convulsant Activity

Experimental ani1mals were classified a1s randomly into five groups and total 30 experimental animals were taken in which, each gather gets six mice;

Group 1. Control group: animals were given research facilities, such as vehicles that administered n-saline solution in this group.
Group 2: Induced Group: Animals The animals were administered an induced agent, specifically PTZ 40 mg/kg b.wt.
Group 3. Experimental animals in this group were given an extract of Pla1nt at a dose of 200 mg/kg, b.wt., plus an inducing drug, such as PTZ, at a dose of 40 mg/kg.
Group 4. Experimental animals in this group received an extract of Pl1ant at about 1010 mg/kg, b.wt. + inducing agent, i.e., PTZ 40 mg/kg. The second extract dose was 100 mg/kg., b.wt.
Group 5: Sodium valproate (50 mg/kg, b.wt.) The experimental animals in this group were given 50 mg/kg, b.wt. with an inducing drug, such as PTZ, at a dose of 40 mg/kg b.wt.

Test design

Evaluation of locomotor activity

Mice were placed separately in the middle of an 80x80x40 cm open box, with the floor divided into 16 squares to allow for locomotor mobility. The actions were recorded on video, and within a 5-minute timeframe, the number of squares of all four paws (ambulation) that were moved in the centre or close to the divider was tallied and examined.

Induction of seizure

Mice of typical body weight (25–40 g) that were fatigued were used to induce seizures. PTZ was arranged at dosages of 40 mg/kg, b.wt., to demonstrate the chemically induced sickness.

Fig. (I) Facial, vibrissali, and forelimb (ii) Forelimb clonus scattered with clonic and/or tonic seizures (iii) Shaking kangaroo position with pose maintenance behaviour in clonus or moist canines

Figure: Images showing Swiss albino mice accepting seizures in a characteristic attitude while adhering to a Racine seizure scale during PTZ-induced arousing epilepsy Note the mice's writhing behaviour for 30 minutes just after the actuating operator injection. The graphic makes it clear that a rodent's unique behavioural reaction, which can be easily assessed using the Racine seizure scale, was observed from the first measures of nicotine to the tenth readings.

Exploratory plan for anti-anxiety

EPM, or Elevated Plus Maze

By providing incentives from the external world rather than the internal one, the EPM (Elevated Plus Maze) behavioural paradigm is essentially used to study the effects of cognition in rats and mice. One of EPM's two arms is open, and the other is closed. In essence, there are two closed arms and two open arms. The closed and open arms measure 48 cm by 10 cm, which is almost the same. Some further changes, including an open beat and 40 cm tall dividers, are incorporated into closed arms. To gauge the animal's level of anxiety, the EPM was elevated to a height of 50 cm.

The two core parameters used in EPM are Transfer Inactivity and Memory Maintenance. In Exchange Inactivity, the mouse is placed far from the centre of the platform, while the animal is placed on the edge of the open arm. "Exchange inactivity" is the total amount of time it takes the rodent to use all four legs to enter one of its closed reference sections. Mice were carefully pushed into one of the booted arms within 180 seconds if they did not enter the closed arm after three minutes; in this scenario, the time limit was established at 180 seconds. For the next fifteen seconds, the mouse was allowed to explore the maze before being put back in its original cage.

Memory support is examined on the taking after day, which is 24 hours following the crucial day's preparation. Recently, the maze was meticulously cleaned with 30% ethanol at each assembly to get rid of any odours.

Tests for screening anticonvulsant activity

Check for epilepsy caused by pentylenetetrazol (PTZ) The onset of the primary jerky development, the appearance of Staub's tail, the onset of clonic shaking, the onset of tonic flexion, the onset of rear appendage tonic expansion (HLTE), the decrease in mortality, and the onset of clonic writhing’s, or an increase in writhing idleness, show an anticonvulsant effect. These measurements were made following verbal organisation of the test drugs and saline for the control group.

Animal: Albino mice from Switzerland Total number of animals: 30 mice (6 per gather x 6 bunches) Sexual orientation: Male A vehicle-treated control bunch, an up-and-down handle starting at 100 mg/kg with an increment of 100 mg/kg until 100% security is obtained, or, at the very least, three batches that were each given a different dosage of the test chemical are all examples of dose levels. Strategy for verbal organisation: 92 Vehicle: 0.2% dimethyl sulfoxide in purified water One hour following therapy**.**

Procedure

1. Before being employed, mice were brought into the lab and allowed to acclimatise to the environment for at least half an hour.

2. Mice were selected, their weights recorded, and a unique identification mark was applied to each animal. The mice were returned to their holding cages in order to get ready for dosing.

Mice kept in different home cages were carefully separated to avoid undesirable behavioural reactions (such as hostility).

3. Each mouse in the control group received 0.5 ml of Vehicle (0.2% dimethyl sulfoxide). The chemical was administered one to three minutes apart so order to give each animal an equal amount of time between the chemical delivery and the testing.4. After treatment with the test substance or vehicle, mice were put back in their holding cages.

5. After the one-hour post-treatment period, the mouse was securely restrained by the scruff of its neck, and 40 mg/kg/body weight of pentylenetetrazol was injected intraperitoneally (i.p.).

6. To monitor the progression of the seizure, the mouse was placed in a separate perceptual cage shortly after receiving a PTZ infusion.

7. It was well known that clonic writhing's were inhibited or that shakings became more inactive, indicating anticonvulsant action.

8. For every mouse in the group, repeat steps 8 through 12 using the recommended dosage order.

9. The entire process must be repeated for every treatment group.

RESULTS

All of the unprocessed medications underwent physical and chemical analysis for various characteristics. The first stage used in the identity and standardisation of crude pharmaceuticals is physical examination. It supports the authenticity of crude agent and aids in the detection of adulterating. It serves as the first stage in both standardizing crude drugs and identifying their chemical components.

INVESTIGATION OF FLUORESCENCE

The result of Fluorescence of unrefinedipowder ofi*Tectona grandis* as. specified itibelow.

Table 3. Fluorescence assessment of rough coarse powderi*Tectona grandis* comprise of:

S.NO	Reagents	UV Light (254nm)	UV Light (366nm)	Visible light
1	Coarse Powder	Light Yellowish Brown	Yellowish Brown	Yellowish brown
2	Treated with water	Light Yellowish Brown	Light Brown	Dark Yellowish brown
3	50% Sulphuric acid	Light Brownish	Black Brown	Brown
4	Conc. HCl	Brown	Ruddy Brown	Darkish Brown
5	Chloroform	Yellow	Yellowish Red	Orange
6	Conc. Nitric acid	Greenish Yellow	Reddish brown	Brownish orange

PHYTOCHEMICALANALYSIS The result of phytochemical analysis of crude powder of defatted of *Tectona grandis* species extract.

Table : Pharmacognostical Analysis

S. N0.	Test Performed	Ethanolic extract	Aqueous extract
1).	Alkaloids		
	Mayer's Reag.	+	++
	dragEndarff's Reag.	+	+
	Wagner's Reag.	+	
	Hager's Reag.	+	++
2).	Saponins		
	Foam investigation	+	+
3).	Steroids		
	Salkowski Test	++	++
	Leiberman's Reagent	+	++
4).	Carbohydrates		
	Molisch's Test	+	+
	Fehling's assessment	++	++
5).	Anthraquinone Glycosides		
	Borntrager's Test	++	+
6).	Cardiac Glycosides		
	legal Test	+	+
	Keller killiani Test	-	+
7).	Tannins		
	$Pb(C_2H_3O_2)^2$ Solution	-	+
	$FeCl_3$ Solution	+	++
8).	Proteins		
	Xanthoprotein assay	−	+
	Biuret assay	−	-
9).	Flavonoids Test		
	Shinoda assay	++	+++
10).	Cyanogenetic Glycosides	--	--

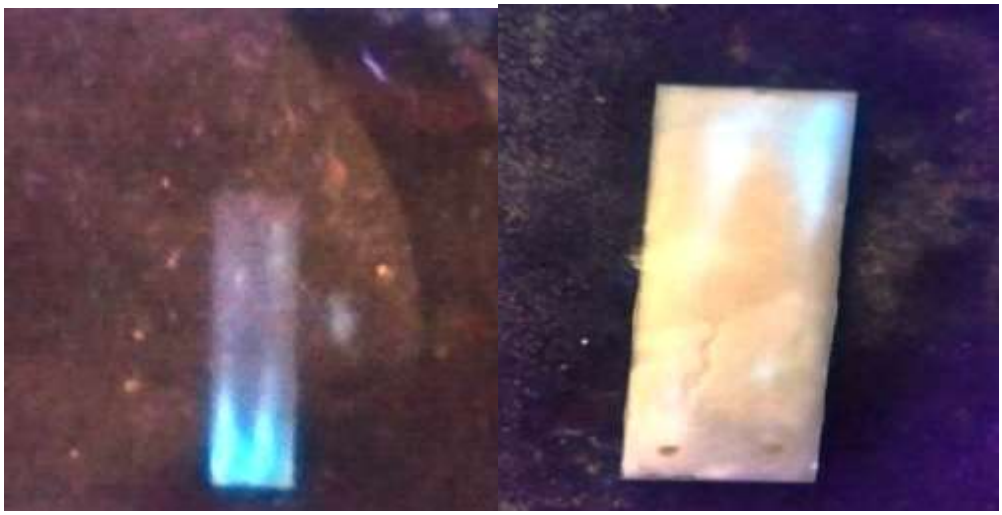
THIN LAYER CHROMATOGRAPHY

Different mobile phases of variant composition, such as solvent systems like CHCl3+CH3OH+H2O (5:10:15), C4H8O+C3H6O+H2O (15:5:3), C4H9OH+C2H5OH+H2O (10:10:14), and C4H9OH+CH3COOH+H2O (12:3:5), were utilised to efficiently separate the various elements contained in the sample. and dots were found in daylight, followed by UV light with shorter and longer wavelengths. and different locations were identified with the aid of in-butanol, acetic acid, formic acid, and water (12:3:5). The mobile phase

.

Table 5 Showing different *Rf value* for Extract are given below

S.NO	SolventsIsystem	R*fI*
1	$CHCl_3+CH_3OH+H_2O$	0.25
2	$C_4H_8O+C_3H_6O+H_2O$	0.55
3	$C_4H_9OH+C_2H_5OH+H_2OI$	0.43
4	$C_4H_9OH+CH_3COOH+H_2OI$	0.65



a) R*f* =0.55I **b) R*f* =0.65I**

Figure: Showing various spot of chemicals present in TLC- plate of plants extract. i.e *TectonaIgrandis*

Pharmacological Evaluation

Determination of Oral Acute Toxicity Study:

Effective Dose

To assess the harmful and dangerous effects of *Tectona grandis* methanolic root extract administered orally to albino mice. Two phases were used to test the methanolic extract's acute oral toxicity. One dose in the initial phase. The animal showed effectiveness without death at 1000 mg/kg; thus, the required dosage was administered. Ten percent, or 100 mg/kg, was chosen as the effective dose, and another dose of 200 mg/kg was administered.

Lethal Dose

To assess, via oral administration, the harmful and dangerous effects of *Tectona grandis* methanolic root extract in albino mice. Two stages of testing for methanolic extract's acute oral toxicity were conducted. A single dose of 10, 50, 100, 500, and 1000 mg/kg (dissolved in water) body weight was given to the test group during the first phase, while mice in the control group received regular saline. For 14 days, the mortality, wellness metrics, and body weight of each animal were examined separately. The experiment was carried out in accordance with OECD standards 423. There were no deaths or notable physiological alterations in the animals up to 1000 mg/kg bodyweight. For the second phase of the trial, single dosages of 1000, 1250, 1500, and 2000 mg/kg were used. A mortality rate of 1250 mg/kg was observed. As a result, the

extract's LD50 was calculated to be greater than 1000 mg/kg body weight. Lastly, there were no discernible changes in food and water intake or other behavioural patterns following a single dose of 10, 50, 100, 500, or 1000 mg/kg of the extract. It is at a dose of 1250 mg/kg body weight that the extract begins to exhibit toxicity. Since the animal showed effectiveness at 1000 mg/kg without dying, the

Table: Estimating the onset and duration of myoclonic jerk and tonic generalised extensor contractions to determine the impact of plant extract on epileptic condition. Every group's value is compared to the control.

Anticonvulsant Activity

S. No	**Group**	**Tonic generalized extensor onset (Sec)**	**Tonic generalized extensor duration (sec)**
1	Control Group	40.2±10.2	100±12.2
2	PTZ induced group	112±14.72	85±3.6
3	Test group 1 (200mg/kg + 40mg/kg PTZ)	270.2±14.72	40.23±3.6
4	Test group 2 (100mg/kg + 40mg/kg)	240.2±13.24	50.23±1.24
5	Standard group (50mg/kg Sodium Valproate + 40mg/kg PTZ)	300±16.6	32.08±2.3

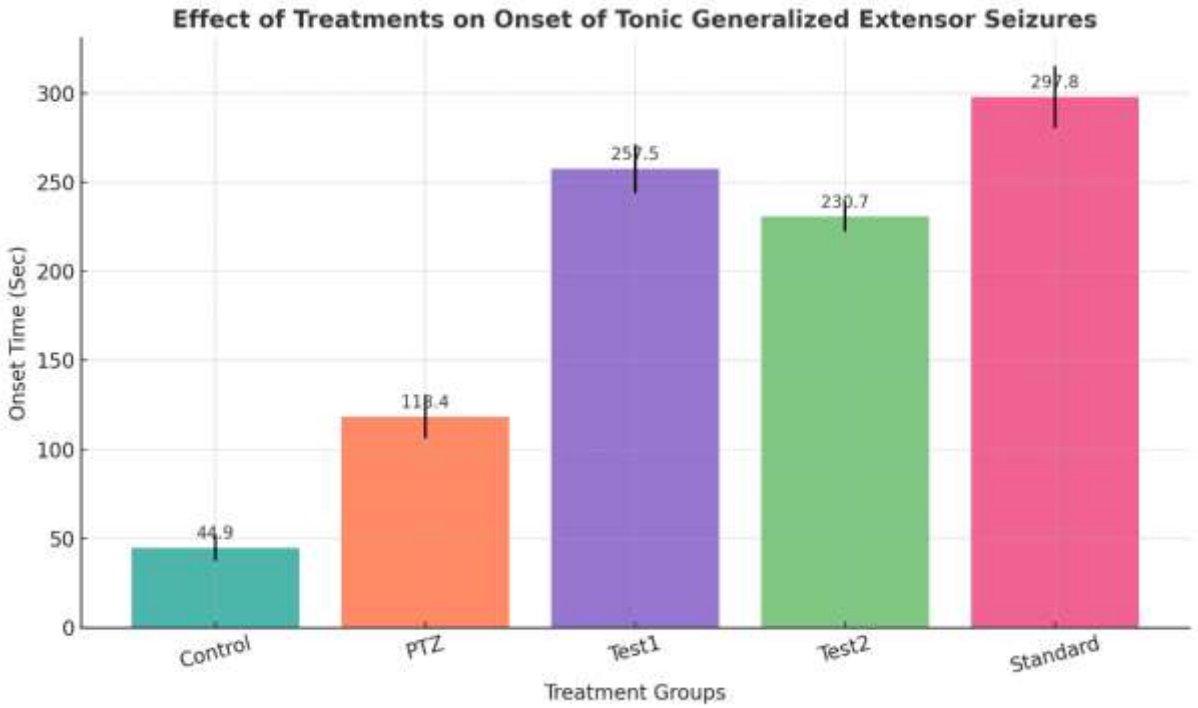


Figure: *Effect of various treatments on the onset time of tonic generalized extensor seizures in experimental animals.*

The bar graph represents the mean onset time (in seconds) ± standard deviation (SD) for different treatment groups (n=5 per group). The PTZ-induced group showed a significant delay in onset compared to the control group, indicating seizure induction. Test groups (Test1: 200 mg/kg + PTZ and Test2: 100 mg/kg + PTZ) and the standard group (Sodium Valproate + PTZ) exhibited a marked increase in seizure onset time, suggesting anticonvulsant activity. The standard group showed the highest onset latency, indicating maximum protection against PTZ-induced seizures.

ELEVATED PLUS MAZE TEST

Swiss albino mice's level of anxiety has been measured using the Elevated plus maze test, which records how long the mice spend in both open and closed arms following medication administration. Seconds are used to measure time spent. For the treatment, we have taken into consideration five levels. We are particularly interested in examining the notable variations in the reduction of mice's anxiety levels across treatment doses.

TABLE: DESCRIPTIVE STATISTICS OF ELEVATED PLUS MAZE

Group	**Dose**	**Open arm**	**Close arm**
		Time spent in open arm (sec)	Time spent in close arm (sec)
Control Group	10 ml/kg	26.50±0.764	273.50±0.764

Standard Group (Diazepam)	1 mg/kg	203.16±0.703**	96.83±0.703**
Test Group 1(TG)	50 mg/kg	120.00±0.577*	180.00±0.577*
Test Group 2(TG)	100 mg/kg	150.66±0.145*	149.33±1.145*
Test Group 3(TG)	200 mg/kg	170.16±1.167*	130.00±1.155*

Table No :12 Evaluation of anxiety activity of *Tectona grandis* using estimation of acquisition and retention trials. Values are expressed as Mean ± SD (One way ANOVA followed by Dunnett multiple comparison test). * Significant difference at P< 0.05 vs. Control group; ** More Significant difference at P< 0.01 vs. Control group.

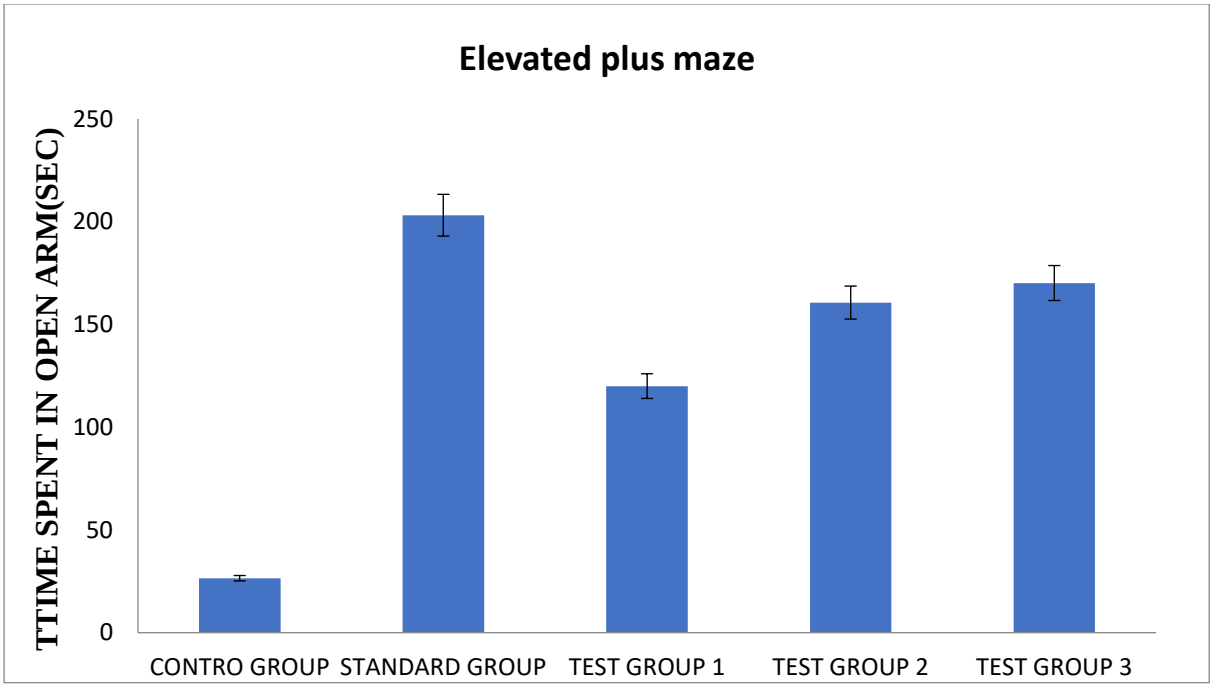


Fig. 1: Total mean time spentiin open arm

EFFECT OF VARIOUS TREATMENTS ON TOTAL TIME SPENTIIN CLOSE ARM

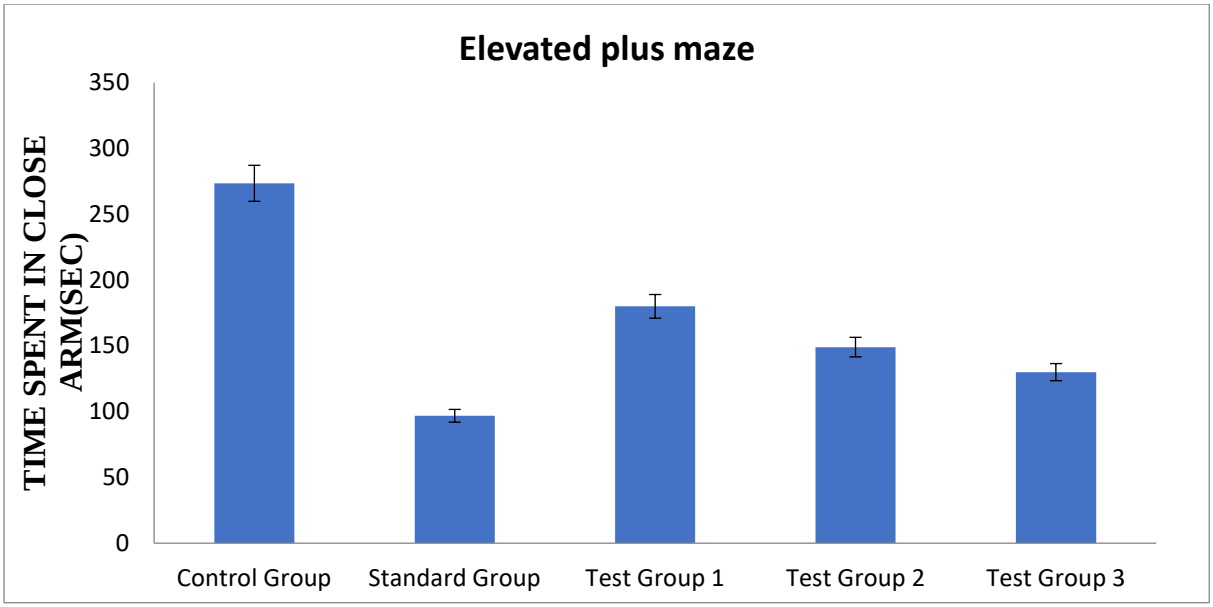


Fig.2: Total mean time spent in close arm

Results

On the basis of above observation, we found that the test group 3 (200 mg/kg) were more effective (170.16±1.167*). in compare to other extract group in to the open arm. Control Group10 ml/kg (26.50±0.764), Standard Group 1mg/kg (203.16±0.703**), Test Group 1, 50mg/kg (120.00±0.577*) Test Group 2, 100mg/kg (150.66±0.145*).

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DISSCUSION

In this study, plant roots were collected from a local market, thoroughly washed, and verified by botanists before being ground into a uniform coarse powder. The quality of the powdered material was assessed through various physical and chemical tests, including extractive values, ash content, fluorescence analysis, and phytochemical screening to detect key active compounds.

The powdered roots were extracted using solvents like ethanol and water through maceration at room temperature for seven days. The extract was then filtered, concentrated, and dried to preserve its bioactive components. These standardized extracts were further used to formulate polyherbal preparations. This approach aligns with sustainable practices by utilizing plant materials efficiently.

The methanolic extract of teak wood roots was found rich in important phytochemicals, supporting its therapeutic potential. Given the lack of effective epilepsy treatments, the study focused on evaluating the plant's anticonvulsant effects. Epilepsy is associated with neuroinflammation, oxidative stress, and decreased GABA levels, which the extract may help alleviate.

Physicochemical tests included moisture content, ash values, and indices like swelling and foaming, ensuring extract quality. Fluorescence analysis confirmed the presence of multiple phytochemicals, such as alkaloids, flavonoids, glycosides, and steroids. These compounds are known for their antioxidant and neuroprotective properties.

Toxicity tests at different doses showed no adverse effects, indicating the extract's safety. Using the PTZ-induced seizure model in mice, the extract demonstrated an increased seizure threshold and reduced mortality, highlighting its anticonvulsant potential. Overall, the study suggests that the plant extract is a promising candidate for developing natural treatments for epilepsy.

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