

# Extraction and Evaluation of Allium Cepa, Aloe Vera, and Butea Monosperma for Analgesic and Anti-Depressant Properties

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## Abstract

*Depression is one of the significant states of mind problems that prompts advancement of type 2 diabetes in pre-diabetic patients. Any medication reduce the side effects of depression in these patients can fundamentally help forestalling type 2 diabetes. The primary goal of this study was to explore the antidepressant and analgesic exercises of the concentrate of Allium Cepa, Aloe Vera, Butea Monosperma. As Allium cepa is one of the main fixing plants developed and consumed from one side of the planet to the other, different remedial and pharmacological impacts of A. cepa were investigated. Anti-depressant and anxiolytic properties of B. Monosperma extricate was assessed at 300 and 500 mg/kg dosages in various neuropharmacological tests and Diazepam (2mg/kg) was utilized as a kind of perspective medication. The benchmark group was treated with 0.5 ml saline orally. The outcomes showed moderate anti-depressant action in open field test, head plunge test, raising test, foothold test, adding prompted depression test, Y-maize and marble covering test. Present examinations uncovered that Allium Cepa, Aloe Vera, Butea Monosperma extricate has an analgesic, anti-depressant and anxiolytic properties.*

**Keywords:** Allium Cepa, Aloe Vera, Butea Monosperma, Analgesic, Anti-Depressant properties.

## 1. INTRODUCTION

The world is encountering a natural renaissance. Spices are nature's gift to humankind. Spices utilized as medication frequently contain synthetic compounds that have been utilized in conventional medication for millennia. They have been vital to mankind for innumerable years, both socially and monetarily. The onion, Allium cepa, which is an individual from the liliaceae family and just shows a solitary vertical shoot over the dirt, is utilized as an animal categories and a wellspring of energy stockpiling. It can arrive in various shapes and sizes (Asokkumar K, 2020). It is found all around the world in calm environments like Europe, Asia, North America, and Africa. As well as filling in as food, the plump bulb that develops underground is used restoratively. The super natural advantages of onions are assurance from hypercholesterolemia, hypoglycemia, antimicrobial, antibacterial, antifungal, antiplatelet, antispasmodic, and antidermatopytic impacts. They additionally work on cardiovascular wellbeing and have antioxidant and anticancer characteristics. ACP has been utilized for

various clinical purposes, yet little examination has been finished on what it means for the focal sensory system. Thus, an assessment of the *Allium cepa*'s antipsychotic movement has been made (B. K. Tan and J. Vanitha, 2021).

Antioxidants are synthetic compounds that guide in safeguarding the body against cell harm welcomed on by various sorts of free extremists. Shaky oxygen particles with unpaired electrons are known as free extremists. Antioxidants might safeguard against receptive oxygen species harmfulness in different ways, including (i) forestalling the development of responsive oxygen species (ii) blocking responsive oxygen species assaults by rummaging responsive metabolites and switching them over completely to less responsive particles or potentially by expanding the opposition of delicate natural focuses to responsive oxygen species assault (iii), and (iv) working with the maintenance of harm prompted by responsive oxygen species. In all aerobes, the capacity to detoxify responsive oxygen species is pivotal (C. L. Haase, 2021). To diminish the pressure welcomed on by receptive oxygen species, different enzymatic and nonenzymatic systems cooperate in the human body. These antioxidants can be arranged as exogenous antioxidants, which can be provided as enhancements yet can't be made by the human body, and endogenous antioxidants, which are those of physiological beginning. As per reports, the *Butea monosperma* plant has pharmacological properties that incorporate antifungal, anti-fiery, antibacterial, anticonvulsive, antifertility, and antidiarrheal movement. The antioxidant action of *Butea monosperma* leaf separates is accounted for in this work (Candar A, 2022).

Depression can likewise cause mental organic changes, for example, a deficiency of autonomic sensory system guideline, raised cortisol levels, and raised fiery markers, all of which can adversely influence glycemic file the executives (Raatikainen I, 2019).

It is regularly referred to that plants are often utilized as helpful materials all through the world because of the synthetic mixtures in them that have clinical importance. For ages, individuals have depended on the recuperating and restorative powers of *Aloe Vera L.* to get everything from disease dermatitis (D. Torres-Villarreal, 2019). Despite the fact that the helpful impacts of *A. Vera*'s different parts have not been enough associated, it is by the by utilized. Nutrients, minerals, catalysts, polysaccharides, phenolic mixtures, and natural acids are a couple of the different substances found in the strong material of *A. Vera* leaves. The fluctuated pharmacological and remedial action that have been noted for *Aloe L.* gel items might be credited to the heterogeneous structure of *A. Vera* mash. The polysaccharides in *A. vera* gel are said to have restorative properties including insusceptible feeling, anti-incendiary impacts, wound recuperating, advancement of radiation harm fix, anti-bacterial, antiviral, anti-contagious, anti-diabetic, and anti-neoplastic exercises, excitement of haematopoiesis, and antioxidant impacts (E. Fenig, 2019). Several examination have shown that *A. Vera* gel has anti-growth activity as far as diminished cancer trouble, growth shrinkage, growth corruption, and longer endurance rates. *A. Vera* gel was likewise shown to have chemoprecaution and anti-genotoxic properties on benzo pyrene-DNA adducts notwithstanding these activities. One possible component of activity for these anti-disease advantages of *Aloe* polysaccharides is invulnerable reaction excitement (Panda, 2019).

## **2. LITERATURE REVIEW**

Utilizing a mouse model of the acidic corrosive prompted squirming test, Singh et al. surveyed the analgesic adequacy of *Allium cepa*. The aftereffects of the examination showed

that *Allium cepa*'s ethanolic extract had high analgesic activity, highlighting the presence of bioactive substances with likely restorative purposes (Singh SK, 2020).

A near report was embraced by Aboelmaaty et al. to survey the analgesic and anti-inflammatory properties of different *Allium cepa* extracts. As indicated by the review, *Allium cepa*'s methanol extract showed the most grounded analgesic and anti-inflammatory impacts, proposing that it might contain bioactive substances with expected remedial purposes (Aboelmaaty WM, 2022).

Kanchan and Menezes inspected aloe vera's antidepressant impacts on rodents. The exploration uncovered that Aloe vera had extensive, portion subordinate antidepressant impact. Aloe vera might be a practical regular solution for the treatment of depression, as indicated by the researchers (Kanchan T, 2019).

Aloe vera's conceivable clinical importance was looked into by Gupta et al. The utilization of aloe vera for remedial purposes, including as an analgesic and an antidepressant, was covered by the essayists. The bioactive synthetic compounds found in aloe vera, as per the creators, could be utilized to make pristine medicines for anxiety and depression (Gupta GL, 2021).

The acidic corrosive actuated squirming test in mice was utilized by Halder et al. to survey the analgesic adequacy of *Butea monosperma* leaves. The examination showed that *Butea monosperma* leaf ethanolic extract had high analgesic activity, demonstrating the presence of bioactive substances with likely restorative purposes (Halder PK, 2019).

### **3. THERAPEUTIC POTENTIAL OF ALLIUM CEPA**

#### **3.1. Antidepressant Effects**

Research has shown that onions have an antidepressant influence also. Samad et al. noticed that different investigations assessed the viable effect on the single immobilization of biochemical and social enhancements welcomed on by pressure, given the anxiolytic, antidepressant, and memory-further developing characteristics of *A. cepa* (AC; onion) bulbs. At the point when the benchmark group approached drinking water for 14 days, AC powder (200 mg/kg/day) was regulated to mice in the examination bunch. Yet again AC treated mice were isolated into unpleasant classes following 14 days of perception. The restless local area's creatures had to stay fixed for two hours. Conduct was seen during 24 hours following immobilization strain (Gunakkunru A, 2020). Constant pressure prompted nervousness conduct pressure in the mouse exposed to the raised in addition to labyrinth test (EPM) and the light dim development test (LDA). Two hours of constrained swimming to quantify the fixed status of burdensome creature conduct because of stress (FST). Clinical weaknesses welcomed on the awkward immobilization were reduced by the organization of AC. The Morris maze uncovered the most noteworthy review creation in pushed mice pretreated with AC (MWM). Assessed systems incorporate acetylcholinesterase, cerebrum butchery, and antioxidant proteins (Turf, Feline, and GPx) (Hurt). As indicated by this review, antioxidant catalysts are significant for working on AC's mental execution and lessening the uneasiness and depression welcomed on by pressure for two hours. The discoveries consequently propose that additional air conditioner might be useful in the administration of tension, depression, and memory hindrance (H. A. El-Shemy, 2020).

#### **3.2. Anti-Inflammatory Effect**

It is accepted that irritation is a powerful organic cycle that is basically directed by the disturbance of tissue homeostasis. It is a complex organic response framework. It is

commonly brought about by a mix of components, including pathogenic microbes, natural aggravations, and cell and tissue harm. Quercetin and kaempferol have been demonstrated to assume a critical part in keeping away from irritation in various creature models that have been utilized to evaluate the viability of flavonoids against irritation. Several immunoglobulin isotypes, including IgM, IgG, and IgA, which are completely enacted by mitogenes, have been found to be hindered by quercetin (Kusum Devi V, 2022). While allium species' alfrutamide and typheramide modify the movement of COXs and lipoxygenases, quercetin brings down irritation and sensitivities. The steam distillate of freeze-dried onion sprouts has anti-provocative and antioxidant impacts (*A. cepa*). Human polymorphonuclear leukocyte chemotaxis is restrained by cepaenes and thiosulfinates tracked down in onions. Ajoene, a normally happening substance removed from *Allium*, has been found to have anti-fiery properties. In a rodent model of asthma, the lymphocyte and eosinophil includes in the blood and bronchoalveolar lavage liquid (BALF) were diminished by a fluid concentrate of the red onion bulb (EAC: 150 and 300 mg/kg). In BV-2 microglial cells uncovered with lipopolysaccharide (LPS), an alternate report demonstrated that *A. cepa* methanol remove (50, 250, and 500 mg/mL) decreased the proinflammatory cytokines IL-1-, TNF-, and IL-6, safeguarding against neuro irritation (Laurent N.B., 2020).

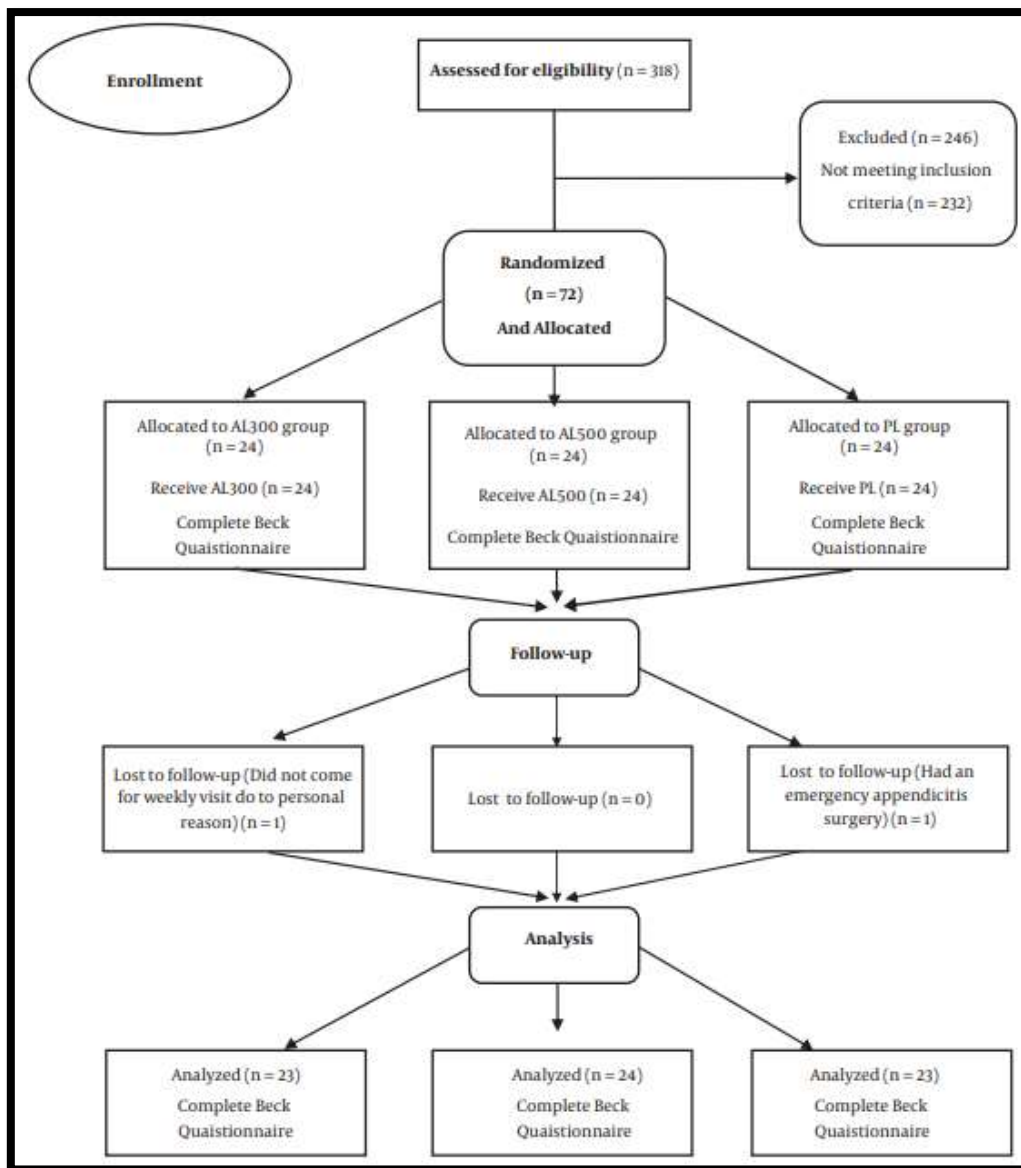
#### **4. MATERIALS AND METHODS**

##### **4.1. Collection and identification**

The plant material was bought from a Hyderabad neighborhood market. Taxonomists recognized the plant, and the voucher example 2-BFH-08 was kept at the herbarium of the College of Hyderabad's Branch of Pharmacognosy.

All through the long stretches of August 2012, the of *Allium cepa* were purchased from a nearby market in Hyderabad. With an electric processor, a fine glue was made from the *Allium cepa*. Several gatherings of rodents and mice were taken care of diets arranged particularly for them that contained various centralizations of ACP (10, 15, and 20% w/w). *Allium cepa* glue, wheat flour blended in with water, a little piece of refined vegetable oil, and a hint of salt (sodium chloride) were the principal fixings in this unique eating regimen. This explicitly pre-arranged dinner was ingested by each rodent at around 12 grams each day and by mice at around 3 milligrams each day. The standard feast for control creatures included wheat flour, manipulated with water, a little measure of refined vegetable oil, a hint of salt, yet no ACP glue (M. Bl' uher, 2019). In view of a pilot examination, the acknowledgment by the creatures, and distributed reports, the ACP glue fixations in the feast were picked.

Aloe juice helps with the productive activity of the body's frameworks. It diminishes physiological and biochemical changes in the body and decreases cell harm brought about by pressure. Synthetic responses that change a compound's oxidative state are alluded to as oxidative pressure. A few antioxidants are created by the body as a component of its generally expected administrative framework, while others are gotten through diet. Aloe Vera is a perfect representation of a practical food that is fundamental for oxidative pressure guard. Before the preliminary, the patients finished the Beck depression stock, which was utilized to work out the depression mean scores. The members were then given the cases' crate alongside a time period for how to use it.



**Figure 1:** Flowchart of the project process and group attrition

**4.2. Plant extraction**

1 kg of *B. Monosperma* seeds were put away in methanol at 25°C for 15 days. From that point onward, a Whatmann channel paper No. 42 was utilized to channel the methanol extricate (125mm). A buildup was delivered when the concentrate was focused on a revolving evaporator with the water shower set at 40 C and diminished pressure.

**4.3. Assessment of anti-inflammatory and analgesic activity**

Following specific acclimations to the procedures depicted by Turner and Koster et al., analgesic activities of the removed material were analyzed. Mice were set into four gatherings (n = 5), with Gathering A filling in as the control, Gatherings B and C getting oral portions of 300 mg/kg and 500 mg/kg of unrefined concentrate, separately, and Gathering D getting the ordinary prescription Ibuprofen (300 mg/kg). The quantity of squirms (brought about by 0.6% acidic corrosive) and the quantity of formalin-incited licking and gnawing were built up to decide the analgesic action.

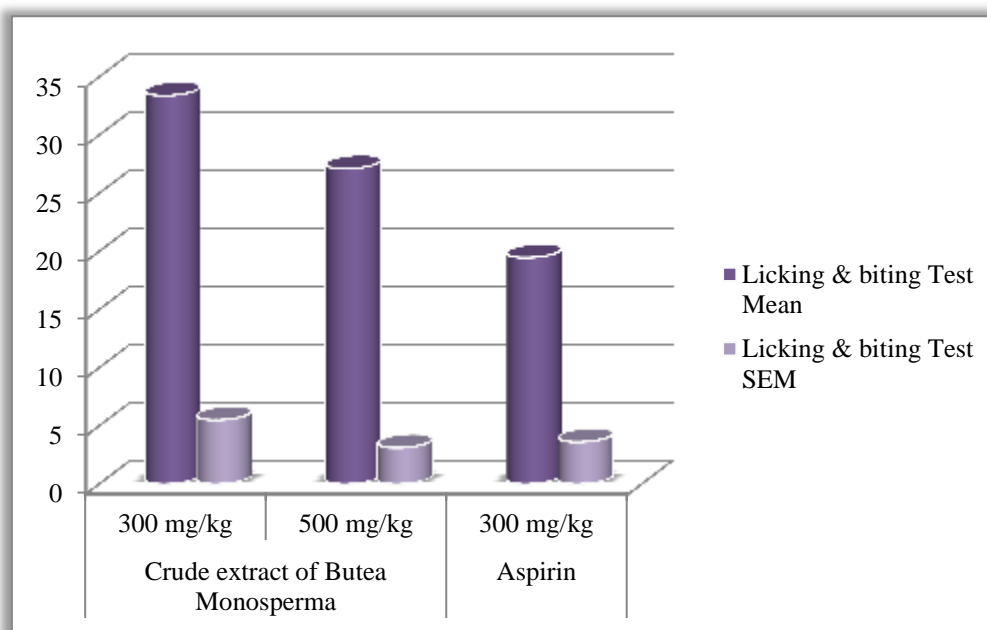
**5. RESULTS**

**5.1. Analgesic activity**

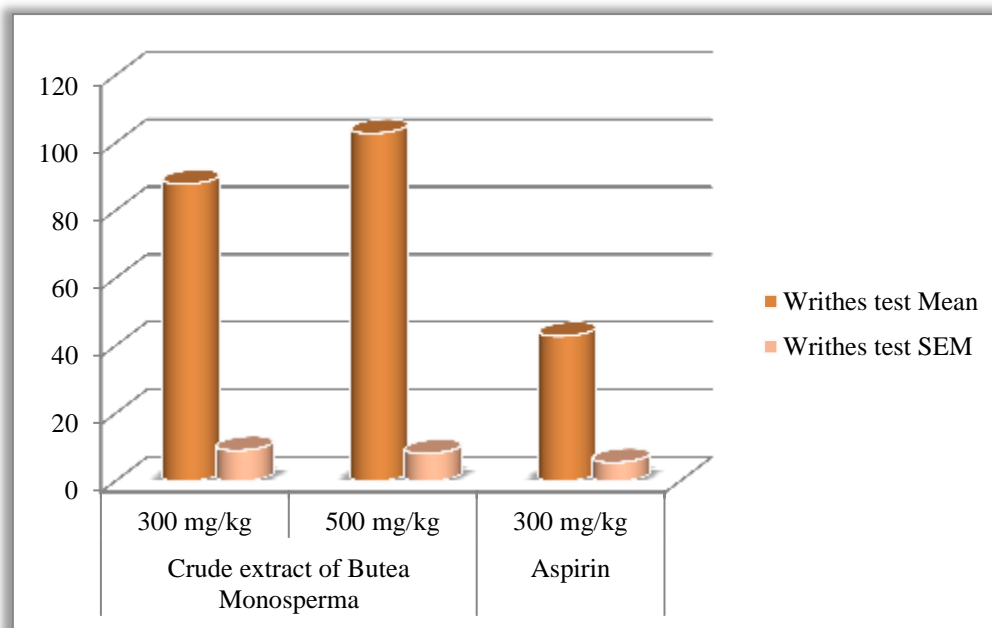
The rough concentrate of *B. monosperma* was tried for analgesic viability utilizing a formalin-incited licking, gnawing, and squirming test. Table 1 presents the discoveries. How much squirms fundamentally diminished with expanding portion in the *B. Monosperma* rough concentrate. Acidic corrosive intraperitoneally infused into the control rodents caused 148.8.76 squirms, which were diminished to 88.9.21 and 103.8.28 with oral doses of the test material of 300 mg/kg and 500 mg/kg, separately. The squirming test results are substantial when contrasted with the control, however not as huge when contrasted with Anti-inflammatory medicine (reference guidelines), which caused 43.56 squirms. Rough concentrate hindered squirms by 43% (300 mg/kg) and 32.10% (500 mg/kg), contrasted with ibuprofen's 73.11%.

**Table 1:** Monitoring analgesic action

Treatment	Dose mg/kg orally	Licking & biting Test		Writhes test	
		Mean±SEM	Inhibition (%)	Mean±SEM	Inhibition (%)
Control	0.5ml saline	64.4±8.49	00	148±8.76	00
Crude extract of <i>Butea Monosperma</i>	300 mg/kg	33.4±5.50	51.85*	88±9.21	43*
	500 mg/kg	27.10±3.11	60.7*	103±8.28	32.10*
Aspirin	300 mg/kg	19.46±3.61	73.98**	43±5.64	73.11**



**Figure 2:** Graphical illustration of the Licking and Biting Test's Mean and SEM



**Figure 3:** Visualization of the Mean and SEM of the Writers test

**5.2. Rearing test**

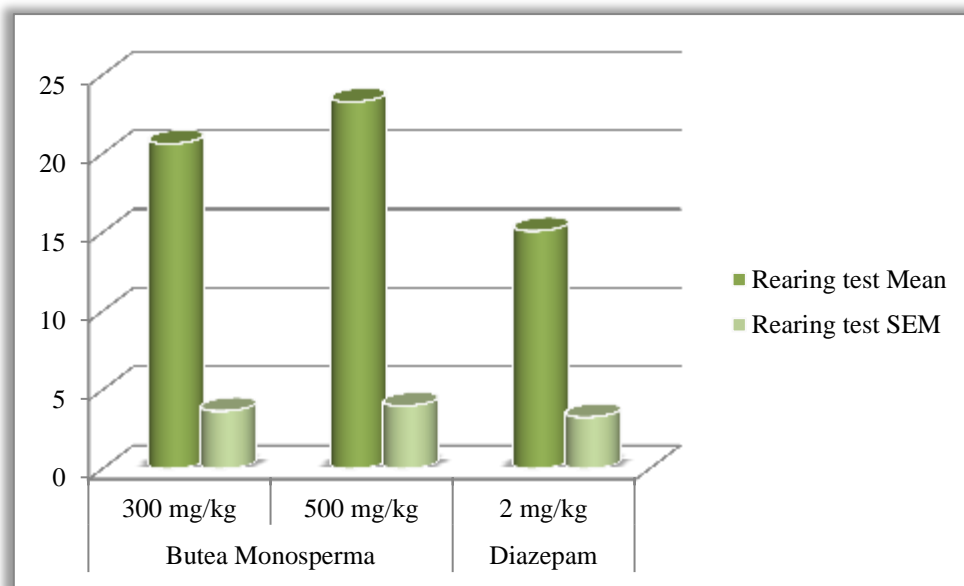
The exploratory action was reduced in the raising test, like the open field and head plunge tests. Table 2 shows that at an oral portion of 300 mg/kg of Butea monosperma, action was more diminished. As far as the impacts of the calming drug diazepam, the gathering treated with 2 mg/kg of diazepam had an average of 15.10 raising exercises, while the mean number of raising exercises with 300 mg/kg and 500 mg/kg oral portions of rough concentrate was 20.64 and 23.3, individually. The benchmark group's average number of raising exercises was 31.8.

**5.3. Swimming induced depression test**

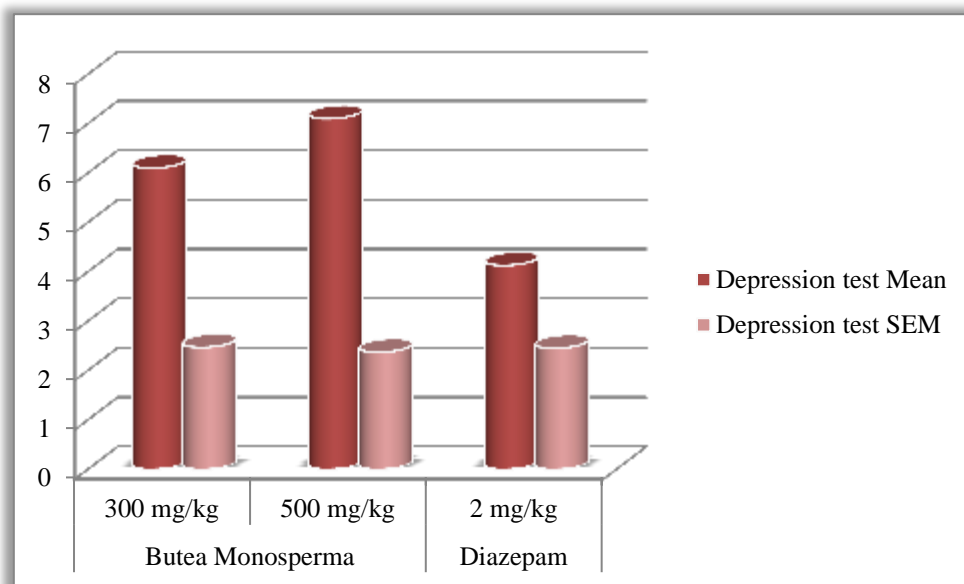
The average action time in the water tub for creatures given Butea monosperma medicines was 5.34 minutes for 300 mg/kg, 6.10 minutes for 500 mg/kg, and 4.13 minutes for diazepam-treated creatures, as per Table 2. In the experimental group, mean action was lower (7.24 minutes) than in the benchmark group, and idleness time was more limited. This outcome recommends that Butea Monosperma might be delegated a less powerful antidepressant.

**Table 2:** Evaluation of Butea monosperma's neuropharmacological effects

Treatment	Dose mg/kg orally	Rearing test	Depression test (min.)
		Mean±SEM	Mean±SEM
Control	0.5ml saline	31.8±4.79	7.24± 2.36
Butea Monosperma	300 mg/kg	20.64±3.67*	6.10±2.47*
	500 mg/kg	23.3±4.00*	7.10±2.37*
Diazepam	2 mg/kg	15.10±3.28**	4.13±2.45**



**Figure 4:** A graphic showing the Rearing test's Mean and SEM



**Figure 5:** An illustration of the Depression Test's Mean and SEM

Just the gathering getting the 500-mg Aloe vera containers showed a fundamentally lower depression mean score (Table 3;  $P = 0.036$ ). Likewise, the 500-mg Aloe vera container bunch (AL 500) exhibited a massive distinction in depression mean score upgrades when contrasted with the AL 300 and fake treatment gatherings ( $P = 0.035$ ).

**Table 3:** Comparison of the Groups a, b, and c's Mean Depression Scores and Score Changes

Variables (Time)	Groups				
	Mean Depression Score			Mean Depression Score Changes	
	Before the Intervention	After 8 Weeks	Paired t-test Results	Before the Intervention to 8 Weeks After That	ANOVA Test Results



Aloe vera, 500 mg	15.5 ± 4.53	13.9 ± 4	0.036*	-3.8 ± 3.19	P = 0.035* Tukey post-hoc test = 0.048
Aloe vera, 300 mg	15.49 ± 4.17	15.14 ± 4.01	0.20	2.37 ± 2.93-	
Placebo	14.58 ± 3.58	14.75 ± 3.70	0.53	2.19 ± 3.28-	

- a. Values are presented as the mean SD.
- b. The comparison between the start of the trial and the eighth week of the intervention in the same group is used for all P values stated.
- c. P 0.05 in compared to the control group's four times matching results.

**6. DISCUSSION**

As indicated by a survey of the writing, Butea monosperma is a huge restorative spice. It contains various critical parts that are useful in the treatment of specific issues.

At portions of 300 mg/kg and 500 mg/kg, B. monosperma seeds were found to have extensive analgesic properties. Results from the licking and gnawing tests showed an extensive decrease in irritation, coming to 51.85% and 60.7% at doses of 300 mg/kg and 500 mg/kg, separately. By and by, these outcomes were less huge than those acquired with the reference medication, anti-inflammatory medicine 300 mg/kg, which came to 73.98%. Hindrance of irritation was estimated as 23.6% and 25.7% at measurements of 300 mg/kg and 500 mg/kg, individually, while standard medicine showed 37.4% by estimating paw distance across (M. N. Islam, 2021). This recommends that B. Monosperma forestalls the aggravation that formalin causes in mice. Similar testing of the anti-incendiary properties of the roots and leaves of B. Monosperma and Flubiprofen on hare eyes additionally uncovered substantial contrasts in their activities, with B. Monosperma being viewed as more successful than Flubiprofen.

The analgesic movement test results were additionally remarkable on the grounds that the average number of squirms in the benchmark group was 148 and diminished to 88 and 103 in the experimental group at portions of 300 mg/kg and 500 mg/kg, separately.

When contrasted with the benchmark group (Diazepam 2 mg/kg), the open field movement of the unrefined concentrate of B. Monosperma at dosages of 300 mg/kg and 500 mg/kg shows that the action is diminished, however the impact is less critical. This leads us to the end that the B. Monosperma has feeble anxiolytic action. The exploratory action in the raising test dropped by 20.643.67 and 23.34.00, separately. At a portion of 300 mg/kg controlled orally, B. Monosperma gave indications of anxiolytic activity (Mishra, 2019). In the experimental group, swimming-actuated depression prompted less movement comparative with the benchmark group, and the idleness span was decreased. This outcome recommends that B. monosperma has immaterial antidepressant impact.

Only 500 mg of Aloe vera per container, as indicated by the discoveries, could decisively bring down the mean depression score 60 days following the mediation. Be that as it may, the 300-mg Aloe vera case perceptibly affected the mean depression score. This outcome might be made sense of by the way that restorative impacts of therapeutic plants might take more time to show when utilized at lower dosages. Notwithstanding, to see upgrades in

temperament problems like depression, the drug should be taken for longer timeframes or at higher portions.

## 7. CONCLUSION

Delicious leaves contain strong dynamic components can quiet human existence and wellbeing in various ways. The plant requires more review center to be utilized all the more really by people. Aloe vera is irrefutably a gift from nature to humankind that might be utilized for restorative, consume, and helpful purposes. We simply have to acquaint it with ourselves and value nature for the ceaseless gift. Following two months of treatment, the AL500 gathering's unadulterated concentrate powder of aloe vera may essentially bring down depression mean scores. *A. cepa* can play out numerous activities in the area of pharmacology, and scientists can continue to investigate how it functions so clinical experts can profit from it. Research on onions can possibly progress many fields, including the advancement of crossovers and sorts that are impervious to biotic and abiotic impacts, worked on quality norms, and medicines for various illnesses. At the point when we contrasted the outcomes and the negative control, yet to a lesser extent than the standard medication used, we reached the resolution that the *Butea monosperma* rough concentrate serious areas of strength for had activity. At a measurement of 300 mg/kg, *B. Monosperma*'s CNS influence shows a substantial antidepressant activity.

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