

Original Article

PSYCHOPHARMACOLOGICAL SCREENING OF ETHANOLIC EXTRACT OF *LANATA CAMARA* LINN SEEDS

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ABSTRACT

Objective: To study the skeletal muscle relaxant, antipsychotic and anti anxiety activity of ethanolic extract of *Lantana camaralinn* seeds in male wistar albino mice.

Methods: The extract of the seeds of *Lantana camaralinn* was prepared by using Soxhlet extraction and the obtained extract is used for the evaluation of antianxiety activity, antipsychotic activity and muscle relaxant activity using male albino wistar mice.

Results: The results showed that the high dose (400 mg/kg) of the extract has shown significant anti anxiety, anti psychotic and skeletal muscle relaxant activities than the low dose (200 mg/kg).

Conclusion: we concluded that the plant *Lantana camaralinn seeds* has significant skeletal muscle relaxant, anti anxiety and anti psychotic activities as evidenced by the Rota rod, elevated plus maze, Y maze and acto photometer.

Keywords: *Lantana camara*, Actophotometer, Elevated plus maze, Y maze, Rota rod, Soxhlet apparatus, Antianxiety activity, Anti psychotic activity, Muscle relaxant activity

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INTRODUCTION

Herbal medicine [1]

The World Health Organization (WHO) has recently defined traditional medicine (including herbal drugs) as comparing therapeutic practices that have been in existence, often for hundreds of year, before the development and spread of modern medicine and are still in use today. Or say, traditional medicine is the synthesis of therapeutic experience of the generation of practicing physician medicinal plants, minerals, organic matter, etc. Herbal drugs constitute only those traditional medicines which primarily use medicinal plant preparation for therapy. The earliest recorded evidence of their use in Indian, Chinese, Egyptian, Greek, Roman and Syrian text dates back to about 5000 y.

With the advances in the field of science and technology, came the mostly used drugs of the day, the synthetic drugs. Though effective they possess side effects and sometimes life-threatening adverse effects. Hence, during the past several decades there has been a global trend for the revival of interest in the traditional system of medicine. Simultaneously, the need for basic scientific investigations of medicinal plants using indigenous medical systems has become more interesting and relevant. Medicinal plants have been used for curing diseases for many centuries in different indigenous systems of medicine as well as folk medicines. Moreover, medicinal plants are also used in the preparation of herbal medicines as they are considered to be safe as compared to modern allopathic medicines. Many researchers are focusing on medicinal plants since only a few plant species have been thoroughly investigated for their medicinal properties, potential, mechanism of action, safety evaluation and toxicological studies

Among various medicinal plants, *Lantana camaralinn* seeds (*Lantana camaralinn seed*) family Ranunculaceae is emerging as a miracle herb with a rich historical and religious background since many researches revealed its wide spectrum of pharmacological potential. *Lantana camara linn seeds* are commonly known as black seed. *Lantana camara linn seeds* are native to Southern Europe, North Africa and Southwest Asia and it is cultivated in many

countries in the world like Middle Easter Mediterranean region, South Europe, India, Pakistan, Syria, Turkey, and Saudi Arabia.

It has been extensively studied for its biological activities and therapeutic potential and shown to possess wide spectrum of activities such as diuretic, antihypertensive, antidiabetic, anticancer and immunomodulatory, analgesic, antimicrobial, spasmolytic, bronchodilator, gastro protective, hepatoprotective, renal protective and antioxidant properties. The seeds of *Lantana camaralinn seeds* are widely used in the treatment of various diseases like bronchitis, asthma, diarrhea, rheumatism and skin disorders. It is also used as liver tonic, digestive, antidiarrheal, appetite stimulant, emmenagogue, to increase milk production in nursing mothers to fight parasitic infections, and to support immune system.

Most of the therapeutic properties of this plant are due to the presence of thymoquinone (TQ), which is a major active chemical component of the essential oil. Black seeds are also used in food like flavoring additive in the breads and pickles because it has very low level of toxicity

Herbal medicine and its usage [2]

Herbs and herbal medicine are used for human health care from time immemorial due to their easy availability, least toxicity and wide acceptability among human population. Herbal medicine is the branch of science dealing with the plant-based formulation usage in alleviating diseases. Bio-diversities in natural resources like plants, animals, microbes, marine source have served the need of human beings, and they are also useful in healthcare from immemorial times. In every era of ages there are different systems of medicine but the common thing is botanical remedies used universally. The green pharmacy from the people of preliterate societies has surprised the civilized societies with compendiums of healing herbs and this herbal healing lore was passed from generation to generation by word of mouth.

India is a varietal emporium of medicinal plants and is the richest resource of medicinal plants. The traditional system of medicine like Ayurveda, Unani and Siddha are used over hundreds of plant species

for combating human ailments. Ayurveda is a system of ethno-medicine that takes in to consideration of the physical, psychological, philosophical and ethical well being of the human and shows great importance on living in harmony with the universe. The old definitive text "CharakSamhitha" specifies on the complete treatment of diseases using herbs. The importance of medicinal plants and traditional systems of medicine in solving the health care problems of the world is increased now a day. Most of the developing countries have adopted traditional medical practice due to its advantage over the available systems.

Health regulatory bodies in the world like the World Health Organization (WHO) estimates that about three quarters of the world's population. Currently use herbs and others forms of traditional medicines to treat their diseases. Even as we commence the new century with its exciting prospect of gene therapy, herbal medicines remains one of the common forms of therapy available for most of the world's population. The herbal products possess diverse pharmacological activities and are relatively free of side effects.

MATERIALS AND METHODS

Chemicals required

Ethanol (600 ml), Diazepam (10 ml), Water for injection (20 ml).

Equipments required

Elevated plus Maze, Y Maze, Rota rod Apparatus, Actophotometer, Soxhlet Apparatus.

Plan of work

Procuring drying and powdering seeds of *Lantana camaralinn* seeds. Extracting the powder with ethanol. Procuring male albino wistar mice of weight between 25-40 g. phytochemical screenings of the obtained extract. Screening of, Skeletal Muscle Relaxant Activity using Rotarod apparatus, Antianxiety Activity using Elevated plus maze and y maze, Antipsychotic Activity using Actophotometer on mice.

Preparation of extract

Collection of seeds

The seeds of plant *Lantana camaralinn* were procured from local seeds, Telangana State, India in the rainy season.

Extraction of seeds

Seeds were dried at room temperature. 500 g of *Lantana camaralinn* seeds were powdered and weighed then kept for extraction in soxhlet apparatus using 600 ml ethanol as solvent for 10 h. The obtained extract was transferred to a china dish for evaporation on a heating mantle. The finally obtained product was in oil form.



Fig. 1: Soxhlet apparatus

Phytochemical screening

Phytochemical examinations were carried out for all the extracts as per the standard methods.

RESULTS

Percentage yield

The percentage yield of the obtained extract was found to be 19.6%.

Table 1: Qualitative screening of phytoconstituents

| Constituents | Name of the test | Ethanolic extract |
|---------------|--------------------------|-------------------|
| ALKALOIDS | Mayer's Test | |
| | Wagner's Test | + |
| | Dragendorff's Test | |
| | Hager's Tests | |
| CARBOHYDRATES | Molisch Test | |
| | Benedict's Test | - |
| | Fehling's Test | |
| GLYCOSIDES | Modified Borntagers Test | |
| | Legal's Test | - |
| SAPONINS | Froth Test | |
| | Foam Test | + |
| | Salkowaski Test | |
| PHYTO STEROLS | LibermannBuchards Test | + |
| | Ferric Chloride Test | - |
| PHENOLS | Gelatin Test | - |
| TANNINS | Alkaline Reagent Test | |
| FLAVONIDS | Lead Acetate Test | - |
| | Xanthoprotic Test | - |
| PROTEINS | Ninhydrin Test | |
| | Copper Acetate Test | - |

Table 2: Effects of treatment on entries in the arms of elevated plus maze

| Drug | No. of arm entries | | Time spent (Sec) | |
|----------|--------------------|------------|------------------|-------------|
| | Open arm | Closed arm | Open arm | Closed arm |
| Blank | 5.5+1.82 | 14.33+1.89 | 50.63+8.55 | 153.33+5.95 |
| Standard | 11.5+1.43 | 6.67+2.44 | 123.83+6.67 | 74.17+6.49 |
| Test-I | 7.33+1.63 | 11.8+1.74 | 94.54+7.13 | 106.57+3.13 |
| Test-II | 18+1.54 | 5.83+1.28 | 115.5+9.19 | 93.54+6.98 |

All values are represented as mean+SEM value of n=6 in each group. The results were analyzed using One way ANOVA followed by Dunnett's method; value of Elevated plus Maze $p > 0.05$ used to indicate the statistical significance when compared to control group.

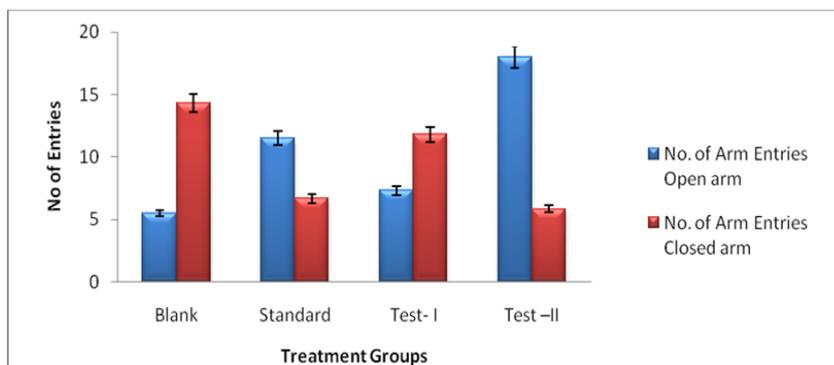


Fig. 2: Effects of treatment on entries in the arms of elevated plus maze

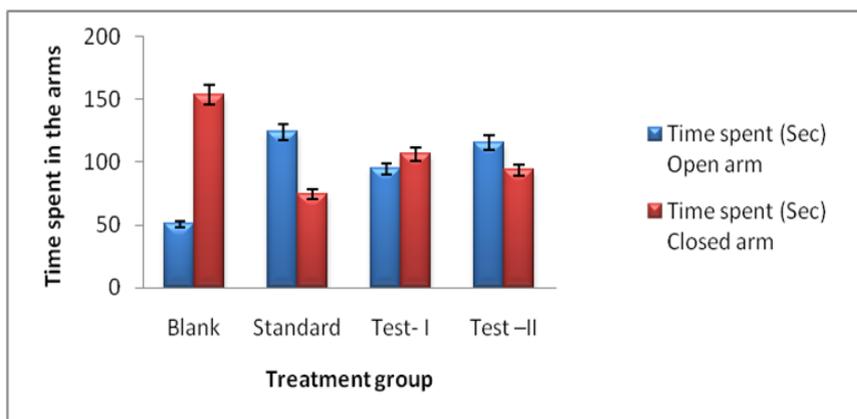


Fig. 3: Effect of treatment on time spent in the arms of elevated plus maze

Anxiolytic effect of ethanolic extract of *lantana camaralinn seeds*

Elevated plus maze

The anxiolytic activity of *Lantana camara* was studied and the results showed that the number of open arm entries increased and number of closed arm entries were decreased significantly in the extract tested group when compared with the blank and standard with a *p* value of *p*>0. 05.

Y-Maze

The antipsychotic activity of *Lantana camaralinn seeds* by Elevated Plus Maze was observed and the results showed that the number of

entries when the light is on increased and number of entries when the light is off decreased significantly in the extract treated groups when compared with standard and blank with a value of *p*>0.05.

Skeletal muscle relaxant effect of ethanolic extract of *lantana camaralinn seeds*

Rotarod

The skeletal muscle relaxant activity of *Lantana camaralinn seeds* by Rota rod method was absorbed to be significant when standard is compared with normal with a P-value of P>0.05 Whereas the test sample (high and low dose) has not shown any significant changes.

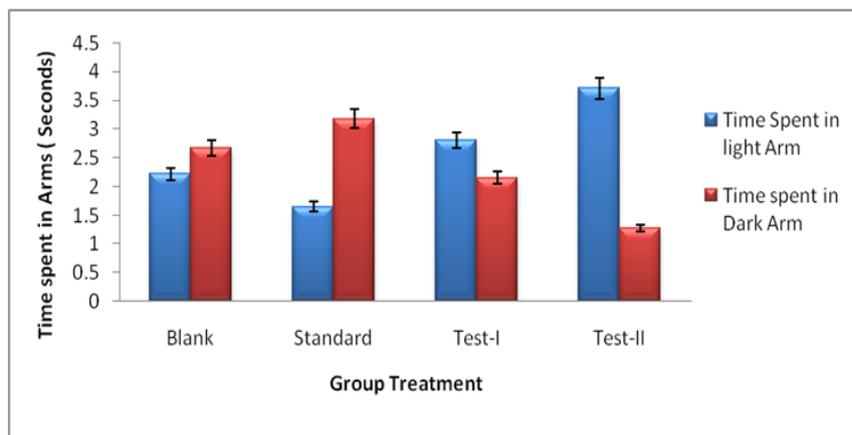


Fig. 4: Effect of treatment on the time spent in Y maze arms

Table 3: Effect of treatment on the time spent in Y maze arms

| Drug | Light on entries | Light off entries |
|----------|------------------|-------------------|
| Blank | 2.22±1.02* | 2.67±1.00* |
| Standard | 1.65±2.21* | 3.18±1.20** |
| Test-I | 2.81±2.32** | 2.15±2.55* |
| Test-II | 3.71±3.42** | 1.28±3.35* |

All values are represented as mean±SEM value of n=6 in each group. The results were analyzed using One way ANOVA followed by Dunnett's method; value of p>0.05 used to indicate the statistical significance when compared to control group

Table 4: Effect of treatment on fall of time

| Drug | Fall off time before administration | Fall off time after administration |
|----------|-------------------------------------|------------------------------------|
| Blank | 173.52±9.6** | 178.52±11.56** |
| Standard | 182.27±10.08** | 91.45±12.45** |
| Test-I | 179.77±11.63** | 164.59±9.74** |
| Test-II | 183.7±12.54** | 154.9±8.84** |

All values are represented as mean±SEM value of n=6 in each group. The results were analyzed using One way ANOVA followed by Dunnett's method; value of p>0.05 used to indicate the statistical significance when compared to control group.

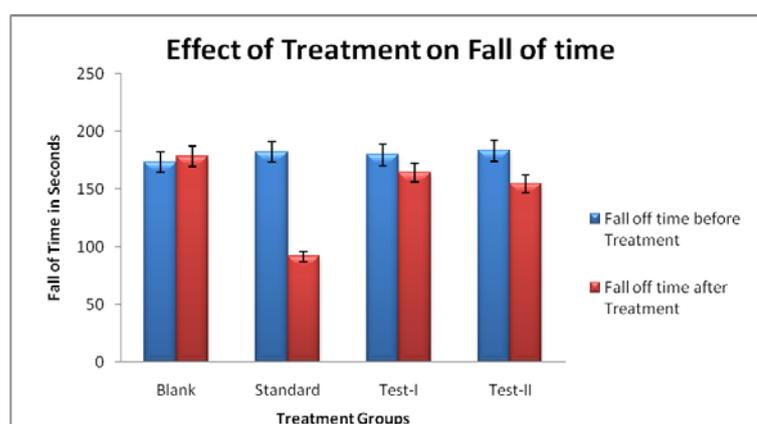


Fig. 5: Effect of treatment on fall of time

Table 5: Effect of treatment on locomotor activity

| Drug | Activity before | Activity after |
|----------|-----------------|----------------|
| Blank | 187.33±16.51 | 187.2±12.24 |
| Standard | 189.16±14.74 | 101.67±13.28** |
| Test-I | 190.12±15.04 | 186.5±15.54 |
| Test-II | 195.65±17.56 | 168.33±16.33 |

All values are represented as mean±SEM value of n=6 in each group. The results were analyzed using One way ANOVA followed by Dunnett's method; value of p>0.05 used to indicate the statistical significance when compared to control group.

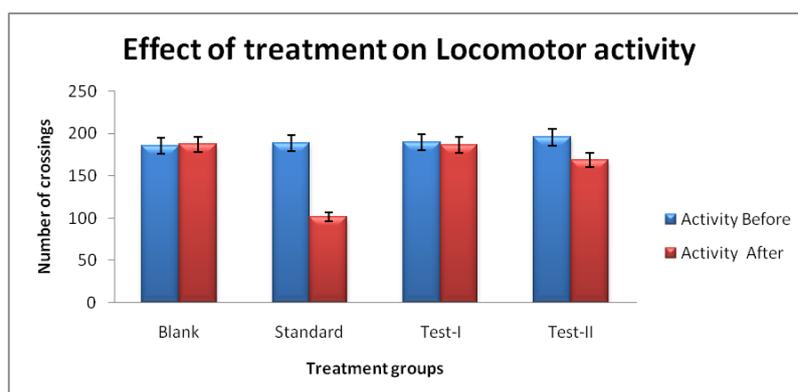


Fig. 6: Effect of treatment on locomotor activity

Antipsychotic effect of ethanolic extract of *Lantana camaralinn seeds*

Actophotometer

The anti psychotic activity of *Lantana camaralinn seeds* by actophotometer method was absorbed to be significant when standard is compared with normal with a P value of $P > 0.005$. Whereas the test sample (high and low dose) has not shown any significant changes when compared with standard.

DISCUSSION

The plant has been used in many other activities. The herbal medicines have wide therapeutic action and safety profile. This makes the herbal therapies successful. Studies conducted in India have found that *Lantana camarahas* antimicrobial, fungicidal, insecticidal properties. *Lantana camarahas* also been used in traditional herbal medicines for treating a varieties of diseases including cancer⁶, skin itching, leprosy, rabies, chicken pox, measles, asthma and ulcers⁴. In this study the evaluation of psychopharmacological activity of *Lantana camaralinn seeds* were carried out to determine various psychological parameters using appropriate models like Elevated plus maze for anxiolytic activity³, Elevated Y maze for anxiolytic activity, actophotometer for anti psychotic activity, rotarod for skeletal muscle relaxant activity. The ethanolic extract of procured *Lantana camaralinn seeds* was obtained in the form of oil, proves its nature. The phytochemical constituents present in the obtained extract were alkaloids, saponins and phytosterols. From the literature review the high dose of the extract was taken as 400 mg/kg and low dose as 200 mg/kg. The locomotor activity is an index of alertness and a decrease indicates sedative effect. Decreased locomotion reveals depressant effect of CNS drugs. Increase in motor activity gives an indication of the level of excitability of the CNS and decrease may be related to sedation resulting from depression of CNS⁸. The result of the present laboratory animal study provides evidences in favour of locomotion activity of the herbs, the obtained extract has shown significant decrease in the no. of entries in closed and dark arms of plus maze and y maze respectively. This shows that the extract is possessing the anti anxiety activity. It is a test based on a rotating rod with forced motor activity being applied. The test measures parameters such as riding time or endurance. Some of the functions of the test include evaluating balance, grip strength and motor coordination.⁵ After administration of the extract there is decrease in the fall off time of the mice in the rotarod apparatus which shows the skeletal muscle relaxant activity of the extract. The locomotor activity of the animal has no significant change after administration of the extract in actophotometer. From the above-obtained results we can conclude that the ethanolic extract of *Lantana camaralinn seeds* shows better results than the standard drug diazepam. The high dose (400 mg/kg) of the extract has shown better anti anxiety, anti psychotic and skeletal muscle relaxant activities than the low dose (200 mg/kg).

CONCLUSION

CNS disorders remain to be one of the serious health problems. In the absence of reliable protective drugs in allopathic medical practices, herbs play a role in the management of various CNS disorders. Knowledge of CNS Disorders has increased enormously in the past few years and has changed both the diagnosis and the treatment⁸. India is well known for a plethora of medicinal plants. In the last ten years, the consumption of medicinal herbs or herbal preparations is tremendously increasing in order to identify alternative approaches to improve the quality of life and maintain a good health. In the meantime, extensive studies on the adverse effects of these herbal medicines and the establishments of a good correlation between biomarkers and plants are essential for

ensuring the efficiency and quality of herbal medicines. In our study we have made an attempt to study the skeletal muscle relaxant, anti psychotic and anti anxiety activities of a locally available plant which is in use by the local tribal people but lacks its mention in scientific literature. This plant which is normally used as a spices. Hence, I thought it would be of concern if we look into the activity of the plant.⁷ Based on the results of the present study of different extracts on psychopharmacological tests, we conclude that the extracts possess CNS stimulant activity. Ethanolic extracts showed the CNS stimulant activity in dose dependent manner. A significant change in motor coordination and muscle relaxant activity was also noted in animals treated with crude extract. The results all together indicate that the extract shows CNS stimulant activity. This work aims to study the therapeutic effect of the ethanolic extract of *Lantana camaralinn seeds*, by examining the skeletal muscle relaxant, anti anxiety and anti psychotic activities in mice. Our biochemical results demonstrated that the test groups used i.e. Test-I group (containing 0.2 ml) and Test-II group (containing 0.4 ml) decreases the skeletal muscle relaxant, anti anxiety and anti psychotic activities in mice. From all these findings we can conclude that the plant *Lantana camaralinn seeds* has significant skeletal muscle relaxant, anti anxiety and anti psychotic activities as evidenced by the Rota rod, elevated plus maze, Y maze and actophotometer. The present findings provide scientific evidence to the medicinal use of this plant genetic resource in treating CNS disorders.

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AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

CONFLICT OF INTERESTS

Declared none

REFERENCES

1. Everitt BJ, Robbins TW. Neural systems of reinforcement for drug addiction: from actions to habits to compulsion. *Nat Neurosci*. 2005;8(11):1481-9. doi: 10.1038/nn1579, PMID 16251991.
2. Sudhakar P, Gopalakrishna HN, Ashok KS, Sekhar SS, Shishir M, Vinayak M, Vinod N. Antidepressant activity of aqueous extract of fruits of *Emblia Officinalis* in mice. *Int J Appl Biol Pharmace Tech*. 2010;1(2):449-54.
3. KD. Tripathi essentials of medical pharmacology. 7th ed ch: 25. p. 356-9 ch: 32 p. 421-4, 466.
4. Varanasi KV. Neuropsychopharmacological studies on Indian *Hypericum perforatum* Linn. *Phys D*; 2000.
5. Newcomer JW. Second-generation (atypical) antipsychotics and metabolic effects: a comprehensive literature review. *CNS Drugs*. 2005;19Suppl 1:1-93. doi: 10.2165/00023210-200519001-00001, PMID 15998156.
6. Silveira MCL, Sandner G, Graeff FG. Induction of fos immunoreactivity in the brain by exposure to the elevated plus-maze. *Behavioural Brain Research*. 1993;56(1):115-8. doi: 10.1016/0166-4328(93)90028-0.
7. Narahashi T. Neuroreceptors and ion channels as the basis for drug action: past, present, and future. *J Pharmacol Exp Ther*. 2000;294(1):1-26. PMID 10871290.