Pharmacological Screening of Analgesic Activity of *Nelumbo nucifera Gaertner*

C. Pradeep Kumar*, Manaswini Deshpande, Vijaya Kuchana, Chennamaneni Naveen Kumar

Teegala Krishna Reddy College Of Pharmacy, Hyderabad, Telangana, India

**A B S T R A C T**

*Nelumbo nucifera Gaertner* belongs to Nelumbonaceae family, though many of its plant parts have various medicinal values. In our study we have chosen its red lotus seeds for its anti-inflammatory activity. We have performed various phytochemical analysis for knowing its phytochemical constituents which are responsible for its anti-inflammatory activity. Our study observed that Total Flavonoid content in the seeds may be responsible for its anti-inflammatory activity. We have performed selected analgesic evaluation methods such as eddy’s hot plate method, writhing test, tail immersion test and tail flick response by which the analgesic activity of *Nelumbo nucifera Gaertner* was estimated. We have chosen Diclofenac sodium and Tramandol HCl as standard and tween is taken as control. Our study noticed that *Nelumbo nucifera Gaertner* has Analgesic activity.

**Keywords:** *Nelumbo Nucifera Gaertner*, Analgesic Activity, Diclofenac Sodium, Tramadol HCl.

**A R T I C L E    I N F O**

**CONTENTS**

1. Introduction ..................................................01
2. Materials and Methods .........................................02
3. Results and Discussion .........................................02
4. Conclusion ..................................................03
5. References ..................................................03

**Article History:** Received 19 September 2015, Accepted 28 October 2015, Available Online 29 December 2015

*Corresponding Author*
C. Pradeep Kumar
Teegala Krishna Reddy College of Pharmacy,
Hyderabad, Telangana, India
Manuscript ID: WJPBT2340


Copyright© 2015 C. Pradeep Kumar, *et al.* This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

1. **Introduction**

Pain is an unpleasant sensation that all will experience in daily life. It is an alert mechanism to prevent further tissue injury. Acute pain rarely needs medical attention, when it does, non-steroidal anti-inflammatory drugs (NASSAID’S) acetaminophen, more powerful opioid analgesics can adequately control the pain almost all currently used analgesics were initially developed for acute pain. The experience of pain in humans can be classified temporarily as acute or chronic. Acute are physiological pain s an early warning against potential injury, a vital defense
mechanism where as chronic pain does not play any useful role as such chronic pain can be very determined to the quality of life of an individual, disrupting sleep and normal living, and degrading health and functional capabilities.

The conceptualization of the neurobiology of pain has undergone continuous refinement with increasing knowledge of multiple conciceptive and targets pathways. Thus, the psycho physiological parameters used to describe behavior in response to dangerous stimuli in the environment, from increased sensitivity to mildly painful stimuli.

Nociceptive pain is caused by ongoing activation of A-gamma and C-nocicepters in response to noxious stimulus. It can be further associated with superficial somatic pain, superficial somatic pain and deep somatic pain. Under normal physiological conditions, there is a close correspondence between pain perception and stimulus intensity, and the sensation of pain is indicative of real or potential tissue damage. As the nervous system becomes sensitized, in addition to spontaneous pain, nociceptive pain is associated with evoked hyperalgesia and alldynia reactions. Analgesia can be classified as partial or total below the level of lesion and as unilateral or bilateral, depending on the cause and level of the lesion. Its onset may be slow and progressive with a tumor or abrupt with traumas.

Analgesics: A drug that selectively relieves pain by acting in the CNS or on peripheral pain mechanisms, without significantly altering consciousness. They relieve pain as a symptom without affecting its cause. They are used when the noxious stimulus cannot be removed or as adjuvants to more etiological approach to pain.

2. Materials and methods

Experimental animals: Sprague-Dawley rats weighing 150-200 g, kept at 12/12 h dark-light cycle with free access to standard rat chow and water, will be used for the experiments. Animals will be brought to the behavioral testing room the day before, to acclimate them to the institutional animal ethics committee (IAEC) Regd.No:1374/ac/10 CPCSEA.

Grouping of animals: animals are divided into 6 groups, each group containing 6 animals, first group of animals are taken as control group. Second group of animals is administered with standard Diclofenac sodium. Third group of animals is administered with Tramadol HCL. Fourth group of animals are administered with crude seed extract of Nelumbo nucifera (600 mg/kg).

Preliminary phytochemical analysis: Ethanol extracts Nelumbo nucifera gaertner seeds were subjected to preliminary phytochemical analysis to test for presence or absence of various phytoconstituents by the following methods.

Test for alkaloids: The extract was treated with dilute HCL and filtered. The filtrate was treated with various alkaloidal agents.

Mayer’s Test: was treated with mayer’s reagent, appearance of cream color indicates presence of alkaloids. World Journal of Pharmacy and Biotechnology

Dragendorff’s Test: Sample was treated with Dragendorff’s reagent, appearance of reddish brown precipitate indicates presence of alkaloids.

Hager’s Test: sample was treated with hanger’s reagent, appearance of yellow color indicates presence of alkaloids.

Wagner’s Test: sample was treated with wagner’s reagent, appearance of brown precipitate indicates presence of alkaloids.

Test for carbohydrates: The extract was treated with 3 ml of alpha naphthol in alcohol and concentrated sulphuric acid was carefully added to side of the test tubes. Formation of a violate ring at the junction of two liquids indicates presence of carbohydrates.

Fehling’s Test: To the sample Fehlings solution A and B was added and heated for minutes. Appearance of Reddish brown color indicates presence of reducing sugars.

Benedict’s test: To the sample benedicts solution was added and heated, appearance of reddish orange precipitate indicates presence of reducing sugars.

Barfoed’s Test: sample were treated with Barfoed’s reagent and heated, appearance of reddish orange precipitate indicates presence of reducing sugars.

Test for proteins: Biuret’s Test: To the extracts copper sulphate solution followed by sodium hydroxide solution, a violet color precipitates indicates presence of proteins.

Millon’s test: To the extracts million’s reagent was added, appearance of pink color indicates presence of proteins.

Test for Flavonoids: 5 ml of extract solution was hydrolyzed with 10% sulphuric acid and cooled. It was then extracted with Diethyl ether and divided in to 3 portions in three separates test tubes. 1 ml of diluted ammonia solutions were added to the first second and third test tube respectively. Development of yellow color in each test tube indicates presence of flavonoids.

Shindoa’s test: The extract was dissolved in alcohol, to which a piece of magnesium followed by drop wise addition of con. HCL and heated. Appearance of magenta color indicates presence of flavonoids. And other test which we have performed include test for steroids, Liebermann burchard test , Test for Sterols, Test for tannins and Test for phenols, Test for Gums and Mucilage, Test for Glycosides, Test for Saponins and Test for Terpenes.

Pharmacological screening: General behavioural tests: This experiment was performed by Dixit and Varma Murgesan et al. different parameters like sound responses, touch response and pain response, were recorded hourly followed by evaluation of in-vivo methods viz, as eddy’s hot plate, writhing test, tail immersion test tail flick response .

Statistical analysis: Statistical analysis was carried out instant 3 soft ware. All results were expressed as mean ± SE. data analysis was done using ANOVA followed by student-Newman-Keul’s test for multiple comparisons. A p ≤0.05 level of probability was used as criterion for significance.

3. Result and Discussion

Discussion: The phytochemical analysis of Lotus seeds
revealed the presence of Alkaloids, Flavonoids, Glycosides, steroids, Phenolic compounds, Diterpenes, and Triterpenes in them. In the present study, the Diclofenac and red lotus seed extract treated groups showed a significant analgesic effect compared to that of control group, but the activity shown by the lotus seed extracts were less than to that of diclofenac treated group. The ethanol extract of red lotus seed at both dose levels exerts a similar reaction time suggesting an increase in the dose from 400 mg/kg to 600 mg/kg body weight will not have significant influence in the analgesic activity. A significant increase in the reaction time for the tail flick method indicated the analgesic effect by red lotus seed and also elucidates the involvement of central mechanism in analgesic action. Analgesic effect mediated through central mechanisms indicates the involvement of endogenous opioid peptides and biogenic amines like 5HT. The flavonoids were reported to have analgesic activity by reducing availability of prostaglandins. Hence, the presence of flavonoids in the ethanolic extract of red lotus seed may also contribute for the analgesic activity. From the results of the study, it can be inferred that ethanolic extract of red lotus seed may also contribute for the analgesic activity.

4. Conclusion
The phytochemical study revealed that the presence of alkaloids, carbohydrates, proteins and flavonoids. The ethanolic extracts of nelumbo nucifera gaertner possesses good analgesic activity.

5. Reference
medicinal chemistry and pharmacological chemistry, eleventh edition. (731-763)


[22] Indian medicinal plants. “Nelumbo (tourn) adans. P.116-120


[26] N.S Parmar ,Shiv Prakash; Screening methods in pharmacology, (225-235)

[27] Vinod.D. Rangari; Pharmacognosy and phytochemistry ;volume-2 (71-79)

[28] Ashutosh kar; Pharmacognosy and pharma-biotechnology, second edition (744-750)
