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Research Article

ANALGESIC ACTIVITY OF THE METHANOLIC EXTRACT OF *ALSTONIA SCHOLARIS*

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ABSTRACT
The aim of the present study was to investigate the analgesic activity of the methanol extract of the roots of *Alstonia scholaris* on mice using acetic acid induced writhing and tail immersion test. The analgesic activity was evaluated using the methanol root extract at a concentration of 100mg/kg and aspirin was used as a standard drug. The result showed that the administration of the extract lowered the number of writhing and increased the reactive time to pain. Thus the present finding shows, though the extract had analgesic activity, a detailed study is required to establish it as a potent analgesic to be used in drug formulation.
Keywords: *Alstonia scholaris,* root extracts, analgesic.

INTRODUCTION

Plants have always played a major role as a potential source of therapeutic agents since time immemorial and traditional herbal systems of medicine, like ayurveda, resulted in the revival of ancient traditions of medicine[1]. Therefore scientific authentication of these medicinal values of plants is indispensable and will pave the way for future herbal drugs [2-3] with fewer side effects when compared to chemical based drug.

Alstonia scholaris also called Sapthaparna is an evergreen tree found commonly in Southern Asia and Africa. Various pharmacological properties of plants have been evaluated from different parts of the plant like leaves and stem bark. They have been found to be useful remedy for treatment of diseases like diarrhea, beriberi, malaria, and diabetes. The bark is anthelminthic, astringent, and ant periodic. It is used against dysentery and bowel movements [4]. Methanol extract of leaves, stem bark, roots and flowers have been reported to have potent antimicrobial activity [5-6].

Leaves have been reported to have a potent analgesic activity[7] but other parts of plants are still under investigation to evaluate their efficacy in reducing pain. The available clinical efficiencies and data available on *Alstonia scholaris* stimulated us to carry out experiments on analgesic response. Therefore present work was focused on evaluating the analgesic activity of methanol extract of roots of *Alstonia scholaris* using pain models in mouse, as the root has been the least studied with respect to its various pharmacological potential.

MATERIALS AND METHODS

Collection and processing of plant materials

The fresh plant of *Alstonia scholaris* was collected from VIT University and was authenticated by Plant Biotechnology Division. The plant was washed with quality water to remove dirt and was separated in to different parts viz. Leaves, Stem bark, and Roots. The plant parts were pulverized into fine powder using electric blender and were subjected to solvent extraction using Soxhlet Apparatus. The Methanol root extract was dried and dissolved in DMSO to use it for further in vivo study.

ANIMAL STUDY

Analgesic activity of methanol extract of root of *Alstonia scholaris* on mice

Adult Swiss albino mice weighing between 25 – 30gms were used for the present investigation. The animals were maintained under normal laboratory condition, at a room temperature of 30° C and 60 to 65% relative humidity along with standard diet and water.

The *in vivo* analgesic activity of methanol extract of root was conducted at Animal house, VIT University and the protocols for the experiment were approved by Institutional Animal Ethical Committee.

Acetic acid-induced writhing response in mice

To study the writhing response, the protocol was carried out according to Nakamura *et al*., 1986 in which each mouse was orally administered with test drug (extract) followed by the administration of 0.6% acetic acid to induce pain. The response in mice was studied by

counting the number of writhing between 5 min and 20 min after acetic acid injection and was compared with the control (distilled water) [7].

Tail immersion test

The mice were administered with test drug (extract) and were screened for their pain sensitivity by immersing the tail of mice gently in tumbler of hot water at 55° C. The time was recorded for tail withdrawal from hot water after 30 min as reaction time and was compared to control (Distilled water)[9].

RESULT AND DISCUSSION

In the present study, frequency of writhing and response to heat stimulus by tail immersion test are shown in Table 1 & 2. It was observed that the extract caused less writhing (100) as compared to control (150). However the writhing number was found to be higher than that in case of aspirin. Similar result was obtained in case of inhibition ratio (%).Though the writhing inhibition of aspirin was higher (86.66%) a considerable amount of writhing inhibition was also found in case of the test material, the root extract (33.33%) which indicated that the extract possessed a considerable amount of analgesic activity (Table 1).

The results of tail immersion test using mouse model showed that a longer time(4 seconds) was required to react to pain stimulus as compared to the control(3 seconds) (Table 2.).The above results indicated that the methanol extract of roots of *Alstonia scholaris* had potent analgesic effect which was mediated via peripheral and central inhibitory mechanism. Thus the use of this plant can be evidenced as an efficient therapeutic intervention in various pain and inflammatory disorders [10].

CONCLUSION

Animal studies were performed on adult Swiss albino mice to test the analgesic activity. The results of the writhing experiment showed that the writhing was less as compared to control. The writhing inhibition was also found to be significant (33.33%). Similar results were observed in case of tail immersion test where the time required to react to pain stimulus was found to be higher that of control situation.

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REFERENCES

1. Kurian A and Sankar M A. Medicinal Plants. Delhi: Jai Bharat Printing press; 1-2.
2. Karthishwaran K, Mirunalini S, Dhamodharanand G, Arulmozhi V. Phytochemical investigation of methanolic Extract of the leaves of Pergularia daemia. J. of biological sciences 2010; 10(3): 242-246.
3. Trivedi PC. Medicinal Plants: Traditional Knowledge. New Delhi: I.K. international Pvt. Limited; 2006. p. 216-217.
4. Nadkarni AK and Nadkarni KM. Indian Materia Medica. Bombay: Popular Prakashan; 1976, Vol. I: p 80-83.
5. Misra CS, Pratyush K, Sagadevan LDM, James J, Veetil AKT and Thankamani V. A comparative study on phytochemical screening and antibacterial activity of roots of Alstonia scholaris with the roots leaves and stem bark. International Journal of Research in Phytochemistry and pharmacology 2011; 1(2): 77-82.
6. Thankamani V, James J, Veetil AKT and Sagadevan LDM. Phytochemical screening and anti microbial activity of Alstonia scholaris flowers (L) R.BR. Fam: Apocynaceae. International Journal of Pharmaceutical Research and Development 2011; 3(3): 172-178.
7. Shang J H, Cai XH, Feng T, Luo X D, Zhao YL, Wang JK, Zhao YL, Yan M. Pharmacological evaluation of Alstonia scholaris: Anti-inflammatory and analgesic effects. Journal of Ethno pharmacology 2010; 129: 174-181.
8. Nakamura H, Shimoda A, Ishii K, Kadokawa T. Central and peripheral analgesic action of non-acidic non-steroidal anti-inflammatory drugs in mice and rats, Archives International Pharmacodynamic Therapy 1986; 282: 16–25.
9. Agrahari Ak, Khaliquzzama M and Panda SK. Evaluation of analgesic activity of methanol extract of Trapa natans l.var. Bispinosa roxb. Roots. Journal of Current Pharmaceutical Research 2010; 01: 8-11.
10. Adeyemi OO, Okpo SO, Okpaka O. The analgesic effect of the methanol extract of Acanthus montanus , Journal of Ethno pharmacology 2004; 90: 45-48.

Table 1: A comparison of writhing frequency between aspirin and methanol extract of root of *Alstonia scholaris* with respect to control.

Extract	Dose (mg/kg)	Treatment	Number of writhing	Inhibition ratio (%)
Control	-	Oral	150	-
Aspirin	100	Oral	20	86.66
Extract	100	Oral	100	33.33

Table 2: A Comparison of tail immersion test between aspirin and methanol extract of root of *Alstonia scholaris*

Extract	Dose (mg/kg)	Treatment	Reaction time (sec)
Control	-	Oral	3
Aspirin	100	Oral	5
Extract	100	Oral	4

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