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RESEARCH ARTICLE: EVALUATION OF ANTIDEPRESSANT ACTIVITY OF LEAF PARTS OF *NYCTANTHES ARBOR TRISTIS LINN.*

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ABSTRACT

Nyctanthes arbor-tristis Linn. commonly known as Harsingar (English:Night Jasmine), is a well documented plant. The decoction of the leaves of Nyctanthes arbor-tristis Linn. is widely used in Ayurvedic System of medicine for treatment of arthritis, fevers, various painful conditions and as a laxative. It is considered as an important plant that yields not only unique medicinal products but also has industrial importance. It has several medicinal properties such as anti-helminthic and antipyretic, anti-inflammatory and anti-oxidant activities, hepatoprotective, anti-leishmaniasis, anti-viral, antifungal, anti-pyretic, anti-histaminic, anti-malarial, anti-bacterial besides it is used as a laxative, in rheumatism, skin ailments and as a sedative. Moreover, none of the medications assessed in randomized controlled studies are effective in sciatica pain. NSAIDS are less than ideal as most of the NSAIDs are known to causes the gastric irritation, gastrointestinal ulceration reduces renal blood flow, platelet dysfunction, exacerbates asthma, allergic reactions and skin rashes. Sciatica pain requires chronic drug treatment and NSAIDs are not recommended for longterm administration. Nyctanthes arbor tristis is also called the "tree of sorrow", because the flowers lose their brightness during daytime; the scientific name arbor-tristis also means "sad tree". The flowers can be used as a source of yellow day for clothing. Similarly the animals treated with standard drug (Imipramine HCl, 15mg/kg) exhibited significant decrease in immobility time as expected. The p values for ethanol at 100mg/kg and 150mg/kg are 0.0008 and 0.0009 after 30 minutes, ethanol extract at 150mg/kg and 200mg/kg are 0.0003 and 0.0004 after 60 minutes.

KEYWORDS: Nyctanthes arbor-tristis, antidepressant activity, tail, suspension, glycoside, etc.

INTRODUCTION

Medicinal plants represent a rich source of antimicrobial agents. Wide range of different parts of medicinal plants was used for extract as raw drugs and they posses varied medicinal properties. Some of these raw drugs are collected in larger quantities and traded in market as raw material for many herbal industries.[1] The increasing failure of chemotherapeutics and antibiotic resistance exhibited by pathogenic microbial infectious agents has led to the screening of several medicinal plants for their potential antimicrobial activity.[2] Nyctanthes arbortristisis commonly known as Harshinghar or Night Jasmine. It belongs to the family Oleaceae.[3] It has also been reported to possess hepatoprotective, anti-leishmanial, anti-viral and anti-fungal activities and analgesic, antipyretic and ulcerogenic activities. The plant also possess anti-allergic anti-malarial[4] anti-helminthic[5], activities and recently reported heapatoprotective[6], anti-spermatogenic and antioxidant activities.[7] Vernacular Names: Family: Oleaceae; Nyctanthaceae. Unani: Harasingaar. Sanskrit: Parijatha. Siddha: Pavazhamattigai. Hindi: Harsingar. Ayurvedic: Paarijaata, Shephaali, Shephaalikaa, Mandaara. English: Tree of Sorrow, Night Jasmine, Coral Jasmine.

Figure 1: Nyctanthes arbor-tristis Linn.

Chemical Constituents:[9-11] Leaves contain D-mannitol, β-sitosterole, Flavanol glycosides, Astragaline, Nicotiflorin, Oleanolic acid, Nyctanthic acid, Tannic acid, Ascorbic acid, Methyl salicylate, Amorphous glycoside, Amorphous resin, Trace of volatile oil,

Carotene, Friedeline, Lupeol, Mannitol, Glucose, Fructose, Iridoid glycosides, Benzoic acid.

MATERIALS AND METHODS

Selection of Plants: Selection of plants has been based on their ethnomedical & traditional uses. The plant Nyctanthes arbor-tristis Leaves were chosen for the present investigation. Nyctanthes arbor-tristis is reported to have been used for a number of diseases. Traditionally it was used in diarrhea, dysentery, leprosy, piles, cancer, inflammatory swellings and epilepsy but nothing is on record or the record is inadequate regarding its cytomorphology and pharmacological activity. Literature review revealed that a limited number of studies have been done on the leaf of this plant. As discussed with tribal people these plants were widely used by them for treatment of diarrhoea, dysentery, inflammation, tooth ache, and to cure other disorders, therefore the plants were selected.

Collection and Authentication of Plants

Nyctanthes arbor-tristis leaves obtained locally from Gorakhpur and azamgarh region of Uttar Pradesh. Identification of plant samples were done by Professor Dr. N. K. Dubey Taxonomist, centre of advanced study in botany, institute of science, Banaras Hindu University, Varanasi (India). Pharmacological Evaluation: Detremination of Moisture Content: The percentage of active constituents in crude drug is mentioned on air dried bases. Hence, the moisture content of the crude drugs should be determined and should also be controlled. The moisture content should be minimized in order to prevent decomposition of crude drugs either due to chemical changes or microbial contamination.

Extraction of Plant Material

The dried powdered crude drugs 50 gm were kept for maceration in 200 ml ethanol for 7 days. These drugs were re-macerated and obtained extracts were further used for chemical evaluation. Same process has been repeated with water as a solvent.

Acute Toxicity Study of Extract (LD50)

Acute oral toxicity studies have been conducted on an individual basis followed by using OECD guideline 423. The method used defined doses of 5, 50, 300, 2000 mg/kg p.o. body weight. Results were allowed substance rank and classify according to the Globally Harmonized System (GHS) for classification of chemicals which causes acute toxicity. From LD50 determination, 1/10th of the dose was focused as the medical for pharmacological screening. Since all the animals were alive; no mortality, no toxicity and no significant changes in the body weight between the control and treated group were observed at a dose of 2000 mg for duration of 72 hours. This finding probably suggests that the ethanol and aqueous extract are relatively safe or non-toxic in rats at the doses used for this study. The present study has been carried out to evaluate the LD50 and all Pharmacological activities of ethanolic extract & aqueous extract of Nyctanthes arbor-tristis. Stem & leaves. All drugs have been obtained from Pallav Chemicals Pvt. Ltd., Bombay. All extracts were suspended with the help of gum acacia in distilled water at the time of oral administration. Experimental Protocols: All experimental protocols were reviewed and accepted by the Institutional Animal Ethical Committee (IAEC) prior to the initiation of allied experiments. Protocol.

Pharmacological Screening of Extract

Anti-depressant activity

Tail Suspension Malemice weighing 20–25garm used preferentially. They are housed in plastic cages for atleast 10days prior to testing in a 12 hlightcycle with food and water freely available. Animals are transported from the housing roomto the testing are in their own cages and allowed to adapt to the new environment for 1hr before testing. Groups of 10 animals are treated with the test compounds or the vehicle by intraperitoneal injection 30 min prior to testing. For the test the mice are suspended on the edge of a shelf 58cm above table to by adhesive tape placed approximately 1cm from the tip of the tail. The duration of immobility is recorded for periods of 5min. Mice are considered immobile when the hang passively and completely motionless for atleast 1min. Experimental Animals and treatment regimens Before one day of the experiment, the animals were divided and only into control, standard and Experimental Groups (n=6). The first group (Group I) served as control group and receive vehicle, distilled water. The second group (Group II) has served as reference standard. The third group (Group III) was used to served standard drug mix with methanol for better analysis. Five groups (Group III, IV, V, VI and VII) and other five groups (Group IV, V, VI, VII and VIII) served test groups and received chloroform and methanolic extract of Nyctanthes arbor-tristis leaves respectively at five different doses such as 50,100,150,200 and 250mg/kg per orally. On the basis of our preliminary screening these five doses were selected. Experimental protocol Tail suspension test was first given by Steru. et.al. is commonly used animal behavioural model for screening of antidepressant-like activity in the rat or mice. So the present study was based on this model with some modification. For adaptation of laboratory condition, animals were transported from their housing colony to laboratory in their own cages before 1-2hr. Animals were individually hung on the edge of the shelf 50cm by above the floor by the using of adhesive tape placed approximately 1cm from the tip of the tail. The duration of immobility was recorded for 5min by using stop-watch. Animal was considered to be immobile when the hung passively and completely motionless. The changes in immobility were studies after 30min of administration of extracts, standard imipramine and vehicle. The test was conducted dim light and noise free room.

RESULTS AND DISCUSSION

The overall objective of the study was to compare the CNS activity of MENT explore on the rat. We have our attention focussed on CNS since the plant was used for the treatment of some psychic disorders. It is also widely used for the treatment of other disease, the neuro behavioural parameters were observed to see whether the plant is having any inherent toxicity which if present would make it unsuitable for any therapeutic promotion. The present study was set about to evaluation of different pharmacological activities of ethanol, methanol, chloroform, n-hexane and petroleum ether extracts of the Nyctanthes arbor-tristis leaves. The suggested worker presented compared antidepressant activity of Nyctanthes arbortristis. The selected medicinal plant was selected, authenticated and powdered. The powdered obtained was subjected for standardization with different parameters. Evaluation of Antidepressant activity.

EVALUATION OF ANTIDEPRESSANT ACTIVITY

Tail Suspension Test The responses of control and all extract of different dose were compared. The result were found to be significant at 5% level of significance where P value<0.05. The effect of ethanol, chloroform, methanol, n-hexane and petroleum ether extracts were more propounced after 30, 60, 60, 60 and 60minutes respectively at all test doses which are showing the table I, II, III, IV and V respectively. It was observed that ethanol extract at 100mg/kg and 150mg/kg and chloroform extract at 150mg/kg and at 200mg/kg possess highly significant reduction in immobility time when compared to control in dose dependent manner. Similarly the animal is treated with standard drug (Imipramine HCl, 15mg/kg) exhibited significant decrease in immobility time as expected. The Pvalues for ethanol at 100mg/kg and 150mg/kg are 0.0008 and 0.0009 after 30minutes, methanol extract at 150mg/kg and 200mg/kg are 0.0003 and 0.0004 after 60 minutes.

Table I: Anti-depressant effect of EENT by tail suspension method (mean ± SEM).

Group	Dose (mg/kg)	Immobility Period (in second)								
		Pre Treatment	I (.30 hr)	II (1.40hr)	III (2.50 hr)	IV (4.0 hr)	V (5.10 hr)	VI (6.20 hr)	VII (7.30 hr)	VIII (24.0 hr)
I	50	45.90± 3.10**	39.32± 0.68**	38.24± 0.76**	36.26± 0.74**	39.18± 0.92**	39.39± 0.61**	38.31± 0.69**	34.43± 1.57**	49.95± 3.05**
II	100	57.91± 3.09**	56.53± 2.47**	54.45± 1.55**	51.47± 1.53**	59.49± 1.54**	56.50± 2.40**	57.52± 2.48**	55.54± 2.46**	45.96± 3.04**
III	150	59.92± 3.08**	55.54± 2.46**	56.36± 0.64**	55.38± 0.62**	52.40± 1.50**	55.41± 1.59**	49.43± 1.57**	46.55± 2.45**	55.87± 3.13**
IV	200	60.3± 3.17**	57.45± 1.55**	58.37± 0.63**	53.39± 0.61**	55.41± 1.59**	55.42± 1.58**	48.44± 1.56**	41.66± 3.34**	30.68± 3.32**
V	250	59.54± 2.46**	57.26± 0.74**	54.38± 0.62**	50.30± 0.60**	55.32± 0.68**	56.43± 1.57**	41.55± 2.45**	47.57± 2.43**	51.59± 2.41**
Std.	15	70.51± 2.49	50.43± 1.58	55.45± 1.55	49.47± 1.53	51.59± 2.40	53.40± 1.60	47.42± 1.58	54.54± 2.46	50.56± 2.44
Cont.	15	86.85± 3.15	84.47± 1.53	88.39± 0.61	79.41± 1.59	82.53± 2.47	76.44± 1.56	78.46± 1.54	81.58± 1.42	82.50± 1.50

All values are expressed in mean ± standard error mean (n=6).
All data were found to be significant at 5% level of significance where ***p*<0.05.

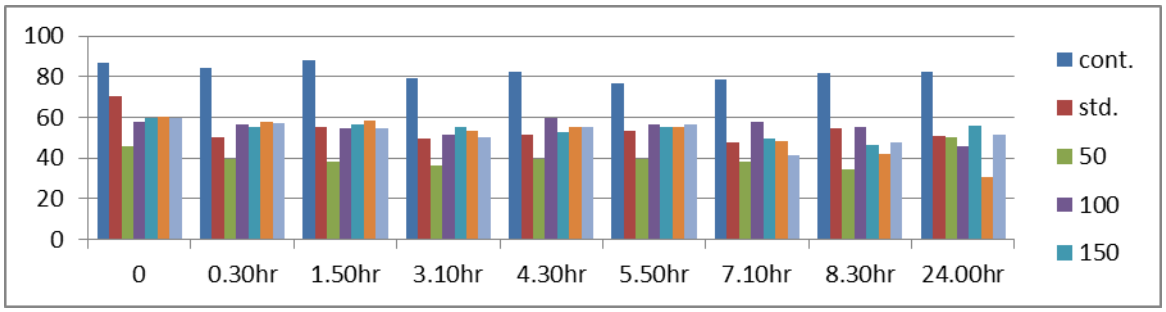

Figure II: Effect of EENT in Immobility time.

CONCLUSION

These findings establish the potential of the selected plant as CNS activity and scientifically proved its traditional claim. Hence the present study concludes that the selected plant directs the importance of future development of some potential antidepressant drugs as well as their mechanism of action.

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