Int J Pharm Bio Sci 2012 Oct; 3(4): (P) 150 - 154

Research Article **Pharmacognosy**

International Journal of Pharma and Bio Sciences

ISSN 0975-6299

EVALUATION OF ANTI-INFLAMMATORY ACTIVITY OF WHOLE AERIAL PART-*ARGYREIA NERVOSA*

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ABSTRACT

Argyreia nervosa is a common medicinal plant used in various ethno-medical preparations. Traditionally it is used as an antibacterial, antifungal, antipyretic, analgesic, anti-inflammatory etc. In the present study the ethyl acetate extract and methanol extract of the whole aerial part from *Argyreia nervosa* was studied for its anti-inflammatory activity. Study was carried out on healthy wistar strain albino rats weighing about 140-250 g, using carrageenan induced paw edema. It was observed that the ethyl acetate extract and methanol extract produced significant anti-inflammatory activity.

KEYWORDS : Argyreia nervosa, Argyreia speciosa, Convolvulaceae, carrageenan induced paw edema, anti-inflammatory activity

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INTRODUCTION

The use of plants as medicine is as old as human civilization. People of all ages in both developing and developed countries use plants in an attempt to cure various diseases and to get relief from physical sufferings. Natural products are a source for bioactive compounds and have potential for developing some novel therapeutic agents.

Argyreia nervosa is a Vine Forb/herb[1] belongs to family *Convolvulacea.* The botanical synonym[1] of *Argyreia nervosa is Argyreia speciosa* and its common name is samundar-ka-pat. It is distributed throughout India, up to an altitude of 300 m, often cultivated native in India from Assam and Bengal to Karnataka[3,4,5]. Leaves are 7.5-3.0 by 6.3-2.5 cm (sometimes even larger), ovate, acute glabrous above, persistently white-tomentose beneath, base cordate; petioles are 5-15 cm long, white-tomentose, characteristic odour and slightly bitter taste[3,6]; Stem is stout, white tomentose, characteristic odour and slightly bitter taste[6]. Traditionally it was used in gleet, gonorrhoea, strangury and chronic ulcers. A preparation 'Fortege' made from this plant along with several other ingredients is used for curing sexual disorders in males. Another preparation 'Speman' consisting of several ingredients of plant material including this plant, is reported to exhibit anabolic-cum-androgen like activity in mice[3], in stomach complaints, sores on foot, small pox, syphilis, dysentery and diarrhoea[4] in human beings.

MATERIALS AND METHODS

Collection, Authentication and Preparation of Plant Material

The fresh aerial part collected from local area of Barpali, (Dist-Bargarh, Orissa). The plant was authenticated by Botanical Survey of India (BSI), Central National Herbarium Howrah, Kolkata, India (Ref.no.CNN/I-I/49/2010/Tech.II/285). The whole aerial part was dried in shade and then powdered by the help of mechanical process. Powder of whole aerial part was stored in a suitable place.

Extraction

The dried powder plant material was extracted with ethyl acetate and methanol, by successive cold maceration method with increasing order of their polarity. The powdered drug was extracted for 7 days with each solvent. The extract was then filtered using filter paper and the filtrate so obtained was evaporated in a distillation unit[7].

Phytochemical Screening

Qualitative tests for the presence of plant secondary metabolites such as carbohydrates, alkaloids, tannins, flavonoids, proteins, saponins and glycosides were carried out on extracts using standard procedure[8, 9].

Animals

Healthy wistar strain albino rats weighing about 140-250 g of both sexes were selected and housed under standard laboratory conditions, given standard rat pellet and tap water and maintained under standard environmental conditions throughout the period of experimentation. They had free access to standard diet and water. They were divided into 4 groups having 6 in each, numbered and placed into individual restraining cages and fasted for 12 h before the experiment. The experiment protocols were approved by the Institutional Animal Ethics Committee prior to the conduct of the animal experiments.

Experimental Groups and Drug Treatment

Rats were randomly allotted into different experimental groups each containing six animals (n=6). List of experimental groups and respective drug treatment along with the dose used are tabulated in the Table 1.

Table 1
Experimental groups and drug treatment

Sl No.	Groups (n=6)
Group I	Control (2% gum acacia solution)
Group II	Inflammation + Ibuprofen(100 mg/kg)
Group III	Inflammation + Ethyl acetate extract(300 mg/kg)
Group IV	Inflammation + Methanolic extract (300 mg/kg)

Acute Toxicity Studies

The acute oral toxicity test of the extract was carried out by using albino rats of either sex weighing between 150-200 g as per revised OECD (Organisation for Economic Cooperation and Development) guidelines 423. The ethyl acetate and methanolic extract of whole aerial part from *Argyreia nervosa* was administered orally to overnight fasted animals at the dose of 250 mg/kg, 500 mg/kg, 1000 mg/kg and 3000 mg/kg of body weight. After administration of the extracts, the animals were observed continuously for the first two hours, for any toxic manifestation. Thereafter, observations were made at regular intervals for 48 hours. Further the animals were under investigation up to a period of 2 week for mortality and general behaviour[10].

Anti-Inflammatory Activity

The anti-inflammatory activity of ethyl acetate extract and methanol extract of whole aerial part from *Argyreia nervosa* was studied using carrageenan induced paw edema.

Cosolvent (2% gum acacia solution, p.o), ethyl acetate extract and methanol extract of the whole aerial part from *Argyreia nervosa* as suspension in 2% gum acacia solution (p.o) and ibuprofen (100 mg/kg, p.o) was administered 30 min before carrageenan injection (0.1 mL of 1% w/v)[11]. The group received cosolvent was treated as control. The initial right hind paw volume of the rats were measured using a plethysmometer and then 0.1 ml of 1% w/v carrageenan solution in normal saline was subcutaneously injected into the sub plantar region of the right hind paw. The volume of right hind paw was measured at 1, 2, 3, 4, and 5 h after carrageenan injection, and the paw volume was determined. The data were expressed as paw volume (mL), compared with the initial hind paw volume of each rat[12].

Statistical Analysis

All results are expressed as mean ± standard error. The data was analyzed statistically using ANOVA followed by Dunnett's Multiple Comparison Test using SPSS 10.0 statistical software. The level of significance was fixed at 5%.

RESULTS AND DISCUSSION

Extraction

The dried powder plant material was extracted with ethyl acetate, methanol by successive cold maceration method. The ethyl acetate and methanol extracts so obtained having yield 3.57% w/w and 4.93%w/w respectively and a general study reveal yield, consistency and color of extracts given in Table 2.

Table 2
Yield, color and consistency of Extracts

Extracts	%age Yield (w/w)	Consistency	Color	Color under UV
Ethyl acetate	3.57%	Sticky	Greenish black	Brown
Methanol	4.93%	Greasy	Dark black	Dark brown

Preliminary Phytochemical Studies

Ethyl acetate extract of whole aerial part from *Argyreia nervosa* shows the presence of fixed oil, fats, phytosterols, glycosides, flavonoids, alkaloids, tannins and phenolic compounds while methanol extract shows the presence of carbohydrates, protein, amino acids, fixed oil, fats, phytosterols, glycosides, flavonoids, alkaloids, tannins and phenolic compounds.

Acute Toxicity Studies

Acute toxicity studies were carried out to evaluate the drug's toxicity and to determine the minimum effective dose of the drug extracts, using albino rats. No death was observed till the end of the study. The extract was found to be safe up to the dose of 3000 mg/kg, hence 1/10th of the tested dose, 300 mg/kg dose was chosen as the experimental dose.

Table 3
Acute toxicity studies

S. No.	Dose (mg/kg)	Observation
1	250	No Death
2	500	No Death
3	1000	No Death
4	3000	No Death

Anti-Inflammatory Activity

The present study was carried out to evaluate the anti-inflammatory activity of ethyl acetate extract and methanol extract of the whole aerial part from *Argyreia nervosa* by using carrageenan induced paw edema.

The 300 mg/kg dose of the extracts was administered orally to various groups of animals as per the acute toxicity study. The results of anti-inflammatory activity are shown in Table 4. The results revealed that ethyl acetate and methanolic extracts of whole aerial part from *Argyreia nervosa* showed significant activity when compared to the standard drug ibuprofen.

As the carrageenan-induced paw edema model was used for evaluation of anti-inflammatory activity of the compounds involving several chemical mediators such as prostaglandins, serotonin, histamine and bradykinin, it may be possible that the active constituents in the ethyl acetate and methanolic extracts of whole aerial part from *Argyreia nervosa* showing significant activity may be involved in the inhibition of some of these inflammatory mediators[13].

Table 4
Anti-Inflammatory effect of ethyl acetate extract and methanol extract of the whole aerial part from Argyreia nervosa

Drug/ Extract	Paw Volume(ml)					
	0 h	1 h	2 h	3 h	4 h	5 h
Control	4.13 ± 0.13	4.98 ± 0.16	5.93 ± 0.06	6.84 ± 0.13	7.68 ± 0.16	7.94 ± 0.09
Ibuprofen	3.57 ± 0.06	3.94 ± 0.11*	3.96 ± 0.08*	4.13 ± 0.99*	4.32 ± 0.04*	4.58 ± 0.06*
Ethyl acetate extract	3.51 ± 0.03	3.73 ± 0.02*	3.64 ± 0.15*	3.89± 0.79*	3.92 ± 0.64*	4.85 ± 0.16*
Methanolic extract	3.58 ± 0.26	3.78 ± 0.03*	3.73 ± 0.18*	3.96 ± 0.66*	4.19 ± 0.42*	4.96 ± 0.86*

Each value is Mean ± S.E.M (n=6), *Denotes significant difference when compared to control values at p<0.05

CONCLUSION

The ethyl acetate and methanol extract of whole aerial part from *Argyreia nervosa* exhibited anti-inflammatory activity in experimental animal models. The results of this study provide a scientific basis for the utilization of *Argyreia nervosa* in traditional medicine. Further studies and tests are needed to explore the exact active principle responsible for the anti-inflammatory activity.

ACKNOWLEDGEMENT

All authors are grateful to "The Pharmaceutical College, Barpali (Orissa), India" for guidance and financial assistance to carry out the research work.

REFERENCES

1. USDA, Natural resources conservation service website http://plants.usda.gov/java/nameSearch?keywordquery=argyreia+nervosa&mode=sciname&submsu.x=12&submit.y=9.Accessed April 5, 2011.
2. Flora of Orissa, Vol 2, Orissa forest development co. ltd Bhubaneswar, Orissa: 1160, (1995)
3. The Wealth of India: A dictionary of Indian Raw materials and industrial products, Vol A-I, CSIR: 418-419, (1985)
4. Guhabakshi DN, Sensarma P, Pal DC. A lexicon of medicinal plant in India, Vol-1: 180-181, (1999)
5. Nadkarni KM. Indian Materia Medica, vol 1, Popular Prakashan Pvt Ltd: 136-137, (1976)
6. Kirtikar KR, Basu BD. Indian medicinal plants, 2nd Edn, Vol 3, Lalit Mohan Basu publication: 1707-1708, (1981)
7. Harborne J. B. Phytochemical Methods-A Guide to Modern Techniques of Plant Analysis. 3rd ed, Springer: 1-32 & 40-227, (1998)
8. Shah BN, Nayak BS. Experimental Pharmacognosy, 1st Edn, Vikas & Co: 190-200, (2008)
9. Kokate CK, Purohit AP, Gokhale SB. Pharmacognosy, 20th Edn, Nirali Prakashan: 108-109, (2002)
10. Kumar S and Alagawadi KR. Hypoglycemic effect of *Argyreia nervosa* root extract in normal and streptozotocin-diabetic rats. Der Pharmacia Lettre, 2(2): 333-337, (2010)
11. Mathur A. Anti-Inflammatory Activity of Leaves Extracts of *Murraya Koenigii* L. Int J Pharm Bio Sci, 2(1): 541-544, (2011)
12. Winter CA, Risley EA, Nuss GW. Carrageenan-induced edema in hind paws of the rat as an assay for anti-inflammatory drugs. Proc Soc Exp Biol Med, 111: 544-47, (1962)
13. Vinegar R, Truax JF, Selph JL, Johnston PR, Venable AL, McKenzie KK. Pathway to carrageenan-induced inflammation in the hind limb of the rat. Fed. Proc, 46: 118-126, (1987)