INTERNATIONAL RESEARCH JOURNAL OF PHARMACY **ISSN 2230 – 8407**
Available online http://www.irjponline.com
Review Article

PHYTO-PHARMACOLOGICAL REVIEW OF *ARGYREIA NERVOSA*

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Article Received on: 29/12/10 Revised on: 23/01/11 Approved for publication: 12/02/11

ABSTRACT
Herbal medicines are the significant and reliable sources for treating various diseases. *Argyreia nervosa* is traditionally used in wound healing, syphilius,diuretics,rheumatic affections, leucohorrhoea.,cerebral disorders, ulcers, as anti-tumour and to prevent contraception.Phytoconstituents such as flavanoids, steroids, ergoline alkaloids and triterpenoids were identified. Pharmacological studies proved its anticonvulsant, immunomodulatory, hypotensive, anti- inflammatory and nootropic effect.The present form of article highlights the phytochemical and pharmacological studies including traditional practice of *Argyreia nervosa* have been carried out so far.

KEY WORDS: *Argyreia nervosa* , ergoline alkaloids, Convolvulaceae

INTRODUCTION

Complementary system of medicine includes namely Ayurveda,Siddha,Unani,Kaempo and Chinese medicine have gained its popularity in recent years[1]. Herb is said to be biosynthetic lab for the active principles like alkaloids, glycosides, resins, oleo-resins, tannins, phenylpropanoids etc, which exhibits definite pharmacological and therapeutic effect based on the dose [2].

Argyreia nervosa belongs to Convolvulaceae commonly known as Elephant creeper. It is a climbing shrub with hard woody stalk bearing heart shaped leaves of 9-12 cm long and 8-10 cm breadth often cultivated throughout India. It is grown at an elevation of 900m.Leaves are larger, acute apex, cordate base, glabrous above and tomentose beneath. Flowers are large, purple silky pubescent with peduncled infundibula. Petals are purple, silky pubesecent outside and wooly glabrous inside. Calyxes are white, tomentose outside with glabrous ovary. Fruits are globose and indehiscent berry[3]. The present article review the traditional uses, phytochemical studies and modern pharmacological studies evaluated so far.

TRADITIONAL USES

Argyreia nervosa has been used widely by the tribals of Rajasthan to prevent conception while in Assam and Bihar leaves are used as vegetable. In Uttar Pradesh folklore practice the young leaves are used for healing the wounds[4.] Young leaves are used to treat wounds and skin infections. According to Yuani medicine, roots are used in rheumatic affections, alternative tonic to cerebral disorders and as diuretic[5]. Roots preparations are used to treat syphilius, synovitis, rheumatism, obesity, wound, ulcers, skin infections.Roots are used as an appetitizer, aphrodisiac, brain tonic, cardiotonic, expectorant, and in anti inflammatory. In Hindu medicine, root is used externally for to reduce obesity[6,7].

PHYTOCHEMISTRY

Among the phytoconstituents ergoline alkaloids are the major constituents in *Argyreia nervosa*. It is one of the essential phytoprinciple of *Argyreia nervosa* from the historical and quantitative point of view. A group of nineteen indole alkaloids were identified and isolated by thin layer chromagraphy and paper chromatography. Among those constituents ergoline alkaloids, lysergic acid and isolysergic acid were analysed by thin layer chromagraphy, m.p, ultraviolet and infrared spectral analysis. Seeds are found to

possess hypotensive and spasmolytic activity which were due to the mixture of ergot alkaloids, isolated and analysed by ultraviolet. Due to instability only one constituent was identified as ergometrine. Other constituents such as caffeic acid and ethyl caffeate were identified[8,9]. Apart from ergoline alkaloids, N-formylloline alkaloids, flavonoidal sulphates steroids and triterpenoids were isolated from other parts of *Argyreia nervosa*[10,11]. Para-hydroxy-cinnmate, scopeltin and argyroside[12,13].

PHARMACOLOGICAL ACTIVITIES

Antimicrobial activity

According to Mishra et al., isolated oil from the seed of *Argyreia nervosa* and evaluated the anitbacterial effect[14].

Antifunal and phytotoxic activity

A study was undertaken by Shukla et al.,isolated the constituents p-hydroxy cinnmate and scopeltin from *Argyreia nervosa*, gallic acid from Oenthrea biennis. The isolated phytochemicals were evaluated for anti fungal activity and phytotoxicity. Para-hydroxy-cinnmate and scopeltin showed potent activity against the fungi Alternaaria alternate and showed significant moderate inhibition of root growth of germinated seeds of wheat at 250ppm levels whereas 1000 ppm completely inhibited the root growth[12].

Immunomodulatory effect

A study was undertaken by Gokhlae et al., proved that ethanloic extract of *Argyreia nervosa* root produced the immunomodulator effect on cellular and humoral immunity when administered at the dose of 50,100 and 200 mg/kg orally to rats potenitated the delayed type of hypersensitivity reaction induced by sheep red blood cells (SRBC) and oxazolone It enhanced the production of circulating antibody titre in mice in response to SRBC. The above dose failed to show any effect on macrophage phagocytosis. Chronic administration of *Argyreia nervosa* significantly ameliorated the total WBC and restored the myleosuppressive effects induced by cyclophospahamide[15].

Anti –inflammatory effect

A pharmacological study by Bacchav et al., proved the anti- inflammation effect of *Argyreia nervosa*. Ethanolic extracts of various doses 50,100,200, mg/kg p.o were administered to acute and chronic models of inflammation induced by caraageenan. *Argyreia nervosa* significantly reduced the paw edema and prevented the accumulation of inflammatory cells in carageenan induced peritonitis. The above study supported and adds credibility to the traditional use of this plant in rheumatism[16].

Halluicogenic effect

The plant contains ergoline alkaloids showed hallucinogenic effect and used for recreation purposes[17].

Anti diarrhoeal activity

An investigation was taken by Ran et al., established the antidiarrhoeal effect of *Argyreia nervosa*. Hydroalcoholic extracts of *Argyreia nervosa* was undertaken to evaluate the anti diarrhoeal activity against experimental models of diarrhoea in rats. Administration of 50,100 and 150 mg/kg orally showed dose dependent decrease in the intestinal propulsion from 61.54 %-41.36 % in comparision with control and standard Atropine used. The extract appears to be as inhibitory as atropine and reduced the intestinal propulsion to greater extent. The extract also showed dose dependent decrease in the number of faecal matter passed by rats. In addition the extract also exhibited concentration-dependent reduction in the intestinal fluid accumulation from 9.97-39.52 when compared to control group[18].

Aphrodisiac property

Subramoniam et al., evaluated this property by mounting behavior, mating performance of male mice and its fertility effect on litter size and sex ratio of pups were observed. Aqueous extract of roots, flowers and leaves were used for screening the aphrodisiaic effect .Alcoholic extract and n-hexane extract of leaves were used for the screening.

Mounting behavior

Repeated administration of suspension 1g/kg of fresh parts of the plant (leaf and fruit) exhibited excessive mounting behavior in comparison with control. Therefore leaves treated mice showed only marginal activity when compared to root and flower. Single dose of 200mg/kg of ethanol extract of root was found to be effective, about 400% increases in mounting behavior to control group.

Mating performance

Daily administration of root and flower suspension for six days to male mice resulted in increase in mating behavior of mice. Leaf suspension caused only moderate effect when compared to root and flower.

Effect of herbal drug on litter size (sex ratio of pups)

The pups of dams of control treated group when inseminated found that all females were pregnant. As a outcome of results male/female ratio of pups were significant increase in the herbal drug treated. Thus, the root and flower of *Argyreia nervosa* are safe and effective medicine for stimulating sexual activity with preferential influence on sex ratio. Therefore, the sexual behavior could be elevated testosterone levels and other drugs, such effect can be acheived by *Argyreia nervosa* without any known toxic symptoms which adds credibility to ethnomedical belief that increase the chances of male offspring[19].

Nootropic effect

Joshi et al., performed nootropic activity by using memory models. Aqueous extract of *Argyreia nervosa* prepared by simple maceration. Two different doses of 100mg/kg and 200mg/kg were administered in the form of suspension by using Tween 80. Nootropic effect was evalauted by

1. **Memeory model** such as exteroeceptive behaviour model and passive shock avoidance paradigm. A dose of 200mg/kg was administered to rats orally increased step down latency significantly as compared to control. It also reversed effects of diazepam, scopolamine induced amnesia, natural aging and decreased the transfer latency on elevated the plus maze model.
2. **Estimation of brain acetyl cholinesterase (Ach –E) activity.** The whole brain AchE activity was measured using Ellman method. A dose of 100 and 200mg/kg were administered to rats showed significant reduction in Ach –E activity in comparision with piracetumand control[20].

Effect of central nervous system

A pharmacological study by Galani et al., evaluated the hydroalcoholic extract of *Argyreia nervosa* when fractioned with n-hexane, choloroform, ethyl acetate and water were concentrated under vacuum. The above derived fractions were evaluated for neuropharmacological activity including spontaneous motor activity and pentobarbitone induced hypnosis at different dose such as 100,200 and 500 mg/kg to various groups along with chloropromazine (2mg/kg)and control. All the extracts produced significant and dose dependent reduction in spontaneous motor activity and potentiation of pentobarbital sodium induced sleep duration with hexane, chloroform, ethyl acetate and water fraction. Reduced onset of sleep and prolonged duration of sleep was observed in positive control. The results of above activity confirmed the ability of *Argyreia nervosa* in potentiating the pentobarbitone induced sleep and decrease in spontaneous locomotor activity highly recommends the effect of *Argyreia nervosa* in rheumatism[21].

Anticonvulsant activity

A pharmacological study by Vyawahare et al., evaluated the anticonvulsant effect of *Argyreia nervosa* roots. Different doses of 100,200 and 400 mg/kg p.o were administered to rats. Convulsions were induced by pentylenetetrazole (PTZ) and maximal electric shock (MES) method. Pretreatment of *Argyreia nervosa* caused significant delay in the onset of convulsion as well as lethality. At the dose of 100 mg no effect was observed whereas the other two dose produced significant prolonged onset of lethality after pentylene tetrazole administration and exhibited protection of 16.66 % and 33.33% in maximal electric shock. Pretreatment of *Argyreia nervosa* significantly reduced the hind limb extension[22].

CONCLUSION

The plant *Argyreia nervosa* is exclusively identified. The leaves are used internally and externally to treat wounds, skin infections by the local traditional practitioners for longer time. The research study may further be continued in identifying the phytoconstituents, toxicity and other useful pharmacological studies to explore its utilization.

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