**ARISTOLOCHIA BRACTEATA (ARISTOLOCHIACEAE)**
**PHARMA COLOGICAL REVIEW**

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**ABSTRACT**

*Aristolochia bracteolata* is a shrub distributed throughout India, belongs to the family Aristolochiaceae. It is used in traditional medicines as a gastric stimulant and in the treatment of cancer, lung inflammation, dysentery and snakebites. In the indigenous system of medicine, the plant was used as purgative, antipyretic & anti-inflammatory agents. Its leaves are bitter and antihelmintic, antiulcer, antiplasmodial and are medicinally important. Almost every part of the plant has medicinal usage. The Phytochemical screening revealed the presence of alkaloids, triterpenoids, steroids and sterols, flavonoids, tannins and phenolic compounds and cardio glycosides.

**Key words:** *Aristolochia bracteolata* Antihelmintic, antiulcer, antiplasmodial, flavonoids.

**INTRODUCTION**

*Aristolochia bracteata* Retz. (Aristolochiaceae) commonly called as Worm killer in English and aaduthenandaapalai in Tamil. The whole plant was used as purgative, anthelmentic, antipyretic & anti-inflammatory agents. The root parts was used to treat syphilis, gonorrhea and also used during labors to increase uterine contraction. The plant contain Aristolochic acid has many medicinal properties in various disease condition. *Aristolochia bracteolata* is a shrub distributed throughout India. It is used in traditional medicines as a gastric stimulant and in the treatment of cancer, lung inflammation, dysentery and snakebites. In the indigenous system of medicine, the plant was used as purgative, antipyretic & anti-inflammatory agents. Its leaves are bitter and antihelmintic, antiulcer, antiplasmodial and are medicinally important. Almost every part of the plant has medicinal usage. *A. bracteolata* is proved to have antioxidant property and insecticidal properties. The plant contain Aristolochic acid, has many medicinal properties in various disease condition. The Phytochemical screening revealed the presence of alkaloids, triterpenoids, steroids and sterols, flavonoids, tannins and phenolic compounds and cardio glycosides. The present review is an attempt to provide an up-to-date and detailed survey of literature of Pharmacognostical, ethno botanical and traditional uses as well as Phytochemical and Pharmacological reports on *A. bracteolata*.

**Phyto pharmacological screening of Aristolochia bracteata:**

**Cardiovascular effect**

The aqueous extract of leaves of *Aristolochia bracteata* on isolated perfused frog heart preparation produced positive results for alkaloids, glycosides terpenoids saponins,
flavanoids, phenols, volatile oils. The aqueous extract of Aristolochia bracteata produced negative results for carbohydrates, proteins, gums and mucilage. Ringer solution without calcium was used as a vehicle for administration of aqueous extract as test and Digoxin as standard. The incremental dose of aqueous extract of Aristolochia bracteata produced positive ionotrophic and negative chronotropic effect on isolated frog heart and is dose dependent. The test extract had not produced cardiac arrest even at a dose of 10mg/ml, a higher concentration as compared to standard, digoxin that showed cardiac arrest at dose of 0.2 mg. Hence, as compared to standard, test drug showed wide therapeutic index. The mechanism involved in the positive ionotrophic action of extract has been studied. In the present study Theophylline increase the dose response curve of Aristolochia bracteata aqueous extract. Aristolochia bracteata aqueous extract induced positive ionotrophic effect were completely blocked by Propranolol. The data suggests that Aristolochia bracteata aqueous leaf extract induce positive ionotrophism involved any adrenergic receptor mediated action.

Anti pyretic activity
Petroleum ether and acetone extracts of A.bracteolata was investigated for their anti pyretic activity. Petroleum ether and acetone extracts of the plant A. bracteolata were prepared using Soxhlet extraction. Pyrexia produced in rats by injecting 20ml/kg (s.c) of 20% aqueous suspension of brewer’s yeast suspension. Extracts at 250 mg/kg exhibited significant anti pyretic activity. Aspirin (300mg/kg) was used as standard for which Pet. Ether extracts was found to be more effective than acetone extract.

Anti allergic activity
Anti allergic activity of A. bracteolata was evaluated by using compound 48/80 induced anaphylaxis, dermatitis rhinitis and pruritis, as a preclinical model for acute phase of hypersensitivity reactions. The late phase hypersensitivity was evidenced by considering toluidine diisocynate induced volume of broncho alveolar fluid secretion and its inhibition. The possible anti allergic mechanism was evaluated by using compound 48/80 induced mast cell activation and estimated serum nitric oxide (NO), rat peritoneal fluid NO, broncho alveolar fluid NO and blood histamine levels. It has been reported that the chloroform extract of A.bracteolata had potent and significant inhibitory effect on compound 48/80 induced pruritis and dermatitis activity in Swiss albino mice. It showed significant effect in toluidine diisocynate induced rhinitis in Swiss albino mice. Mast cell membrane stabilization activity was also observed in compound 48/80 induced mast cell activation. A significant reduction was observed in serum nitrate levels, rat peritoneal fluid nitrate levels and BAL nitrate levels. The extract was also found to posses’ significant inhibitory effect on blood histamine levels. It could be concluded that the chloroform extract posses potent anti allergic activity, possibly through mast cell membranestabilization, inhibiting NO and histamine pathway.

Anti-arthritis activity
Anti-arthritic activity was demonstrated using Freund’s complete adjuvant in rats. The results shows that, regular treatment of adjuvant induced arthritic rats with A.bracteolata extracts improves ESR, Hb value and also restores body weight . Significant (P<0.01) inhibitory effect was observed with A. bracteolata extracton Freund’s complete adjuvant induced paw edema throughout the study (P<0.001). The latency to thermal stimuli and inhibitory effect on xylene induced ear edema was significantly (P<0.05) affected by oral treatment of A.bracteolata, irrespective of solvent used for extraction. Treatment of FCA induced rats with A.bracteolata extracts shown (P<0.05) increase in pain threshold, weight bearing ability, ambulation and also decline in scratching, defecation and urination, were observed as a sign of improvement in behavioural condition.
Antibacterial activity

*A. bracteolata* leaves were subjected to antibacterial activity on disc diffusion method against *bacillus subtilus*, lactobacillus planta rum, *Escherichia coli*, staphylococcus aureus, streptococcus faecalis and pseudo monasaeruginosa. The leaves of *Aristolochia bracteolata* Retz were extracted with petroleum ether, chloroform and alcohol. Alcoholic extract showed significant anti bacterial activity as compared to that of other extracts. Negi PS *et al* investigated the antibacterial activity of *Aristolochia bracteolata* root extracts. Powdered Roots of *A. bracteolata* were extracted with ethyl acetate, acetone, methanol, and water for 8 hours each using a Soxhlet extractor. Antibacterial activity of dried ex- tracts was evaluated by the pour-plate method against a few Gram-positive and Gram-negative bacteria. All the crude extracts showed a broad spectrum of antibacterial activity among which ethyl acetate extract was found to be the most effective. This study shows the potential for replacement of synthetic preservatives by the use of natural extracts. According to another study, the different extracts (Aqueous, methanol and chloroform) of this plant were effective against the bacterial strains *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus*, *Klebsiella pneumonia*, *Pseudomonasfluorescents*, Shigella Flexner, Proteus vulgaris and the fungal strains like Aspergillus Niger, Aspergillus terries, Penicillium notatum and Rhizopus stolonifer. Among the three extracts, methanol extract was found to have the significant activity followed by the chloroform extract against certain bacteria. Water extract did not have any activity against bacteria. Antifungal activity assessment indicated that the tested fungal strains are more susceptible to aqueous extract followed by methanol extract and chloroform extract.5

Antioxidant properties

*A. bracteolata* Retz was investigated and 2, 2-diphenyl picrylhydrazyl (DPPH) radical scavenging activities, reducing powers, and the amount of total phenolic compounds of the extracts were studied. The antioxidant activity was by ammonium thiocyanate assay. 2, 2-Diphenyl picrylhydrazyl (DPPH) free radicals scavenging activity was assessed according to Blois (1958), with a slight weight modification. Absorbance was measured at 700 nm. Ascorbic acid solution was used for comparison. Increased absorbance of the reaction mixture indicated increased reducing power. The antioxidative effect is mainly due to phenolic components, such as phenolic acids, and phenolic diterpenes. The antioxidant activity of phenolic compounds is mainly due to their redox properties, which can play an important role in absorbing and neutralizing free radicals, quenching singlet and triplet oxygen, or decomposing peroxides.6

Trypansocidal effect

*Aristolochia bracteolata* was evaluated for its *in vivo* activity against trypanosome evansi infection in the rats. Six groups of 10 rats each aged 5-7 weeks, average weight 150grams were used. Both the chloroformic and methanolic extract of the plant extract was administered orally at dose rates of 250 and 500mg/kgBW. The activity was compared to cymelarsan which was given at a dose rate of 2.5mg/kg BW subcutaneously. Results showed that plant extract gave a promising trypansocidal effect. The chloroformic extract gave better result than that of the methanolic extract with both doses.7

Insecticidal and repellent effects

This research was dealt with insecticidal potentialities of scorpion root (*Aristolochiabracteolata*) against the third instar larvae of the khapra beetle (*Trogoderma granarium*). Organic and water extracts of three parts (fruits, leaves and roots) were tested at three concentrations (1.25%, 2.5% and 5% w/v) in laboratory experiments, during 2010-2011, at the Environment and Natural Resources Research Institute, Sudan. The main
parameters considered included, mortality and repellent effects of treatments on the pest, and the consequent impact on sorghum grains damage. The results of bioassay experiment revealed very poor mortality effects by all extracts of scorpion root without significant differences from the untreated control, except the highest dose (5%) of leaves ethyl acetate extract which showed the best significant result, though hardly exceeded 50% mortality after three weeks post treatments. But, the latter extract has attained the next inferior chemical yield compared to the other extracts. Considering the larval damage, the highest savings of grains was attained by the fruits hexane extract, followed by the leaves ethyl acetate extract. Although, the latter extract exerted higher repellent action than fruits hexane extract, no significant differences were found between them. However, the superior saving of sorghum grains showed by the fruits hexane extract may need further investigation particularly for the presence of antifeedant compounds in this extract. Moreover, the higher extractive yields obtained by this extract as compared with that of leaves ethyl acetate, may suggest the potentiality of such portion (fruits hexane extract) which should be emphasized in future research.

**Antifungal activity**

The phytochemical analysis of both the aqueous and methanolic extracts of the medicinal plant *Aristolochia bracteata* Retz, and their antibacterial and antifungal activities against six pathogenic bacteria such as *Staphylococcus aureus, Streptococcus pyogenes, Leuconostoc lactis, Escherichia coli, Pseudomonas aeruginosa* and *Salmonella typhi* as well as four fungus namely *Aspergillus niger, Aspergillus flavus, Rhizopus indicus* and *Mucor indicus* were investigated. The phytochemical analysis revealed the presence of carbohydrates, alkaloids, steroids, saponins, tannins, phenols, fixed oils & fats, proteins and flavonoids in varying concentration. Antibacterial potentiality of aqueous and methanol solvent extract of mature leaves of A. bracteata was evaluated against the bacteria, highest antibacterial activity was observed against *Streptococcus pyogenes* (42 mm) and followed by *Pseudomonas aeruginosa* (38 mm) in methanol extract. But in the case of antifungal activity the maximum inhibition zone found against *Rhizopus indicus* (18 mm) in methanol extract. There is no activity antibacterial and antifungal activity found in the aqueous extract.

**Anti-inflammatory activity**

The ethanolic extract of the shade dried leaves of *A. bracteolata* was evaluated anti inflammatory activities in wistar rats by using the carrageenan induced left hind paw edema method. Significant reduction of edema volume was observed in the drug treated group when compared with the standard and untreated control. Antioxidant investigation of the ethanol extract along with its two successive fractions using nitric oxide and 1,1-diphenyl-2 picryl hydrazyl (DPPH)-induced free radical assay methods showed good free radicals cavenging activity, thereby support in its anti-inflammatory properties.

**Antiulcer activity**

The aqueous extract of leaves of *A. Bracteolate* exhibited antiulcer activity in rats. The antiulcer activity of *A. bracteolata* was evaluated against ethanol induced and pylorus ligation induced models, at two different dose levels of 400 and 800mg/kg/body wt/day. The activity was compared with standard drug Ranitidine. Pre-treatment with the extract resulted in a significant decrease of the ulcerated area. The volume and acidity of the gastric juice decreased in the pre-treated rats. Among the two dose assessed, 800mg/kg was found to have the significant activity than the lower dose.

**Wound healing activity**

The ethanol extract of the leaves of *Aristolochia bracteolata* Lam. was studied for its effect on wound healing in rats, using incision, excision and deadspace wound models, at two
different dose levels of 400 and 800 mg/kg/body wt/day. The plant showed a definite, positive effect on wound healing, with a significant increase of the level of two powerful antioxidant enzymes, super oxide dismutase and catalase, in the granuloma tissue.\textsuperscript{12}

**Anti angiogenic activity**

Petroleum ether extract of *Aristolochia bracteolate* Lam (Aristolochiaceae) roots was screened for the activity against cutaneous melanoma using Chicken Chorioallantoic Membrane (CAM) Assay has been studied. Angiogenesis and melanoma cell survival were visualized and recorded using dissecting microscope and imaging system. Concentrations of the extracts ranging from 10mg to 50mg were screened. Chemical tests of the extract revealed the presence of alkaloids, triterpenes and steroids. It was observed that 30mg dose notably reduced the proliferation of blood vessels and reduced survival rate of melanoma cells in CAM. Cultured melanoma cell lines were obtained from cancer research centre, Hyderabad. It was concluded that the root extract of *Aristolochia bracteolate* possess inhibitory effect on proliferation of melanoma cells and its topical application may be more advantageous to treat cutaneous melanoma, since topical treatments have advantages for rapid, effective and natural healing of cancers targeting the cancer site with much higher doses than could ever be achieved with oral treatments alone.

**Anti implantation and abortifacient activity**

Ethyl acetate soluble fraction of the ethanolic extract of *Aristolochia bracteolata* was tested for precoital and postcoital anti implantation test and abortifacient activities in female albino rats. In the precoital study, the treatment at 20 and 40 mg/kg body weight showed significant and dose related anti implantation and abortifacient properties. In the post coital study of 20, 30 and 40 mg/kg body weight doses similar results were observed. The total anti fertility activity of 40 mg/kg body weight was found to be comparable to the standard ethinyl oestadiol given for the similar period.\textsuperscript{14}

**Conclusion:**

Medicinal plants have been used as an exemplary source for centuries as an alternative remedy for treating human disease because they contain numerous active constituents of therapeutics value. In recent years, ethno botanical and traditional uses of natural compounds Especially of plant origin received much attention as generally believed to be safe for human use. Through screening of literature available on *A.Bracteata* that crude extract and aqueous extracts of root and leaf have been screened for some pharmacological activities like cardiovascular effect, Anti pyretic activity, Anti allergic activity, Anti-arthritis activity, Antibacterial activity, and Antioxidant properties etc., Presently there is an increasing interest worldwide in herbal medicines accompanied by increased laboratory investigation into the pharmacological properties of the bioactive ingredients and their ability to treat various diseases. In future study the isolated principle needs to be evaluated in scientifically animal model and clinical trial to understand the molecular mechanism of action, in search of lead molecules from natural resources. As the global scenario is now changing towards the use of nontoxic plant product having traditional medicine use for the various diseases.

**REFERENCES**


