

A Review on Pharmacological Activity of *Achyranthes Aspera* Linn.

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ABSTRACT:

Herbal remedies are globally used since time ancient indicating that herbs are a growing part of current, high-tech medicament. India has an ancient heritage of traditional herbal drug. The medicinal Plant are used for treatment of Various disease because of their safety and effectiveness. *Achyranthes aspera* has been long history of medicinal Plant. The medicinal plant set up as a weed throughout India. Though nearly all of its parts are used in traditional systems of drugs, seeds, roots and shoots are the most important parts which are used medicinally. The review reveals that wide figures of phytochemical ingredients have been insulated from the factory which possesses activity like Antiviral and Anticarcinogenic, Spermicidal, Hepatoprotective, Nephroprotective, Antidiabetic, Anti-inflammatory, Immuno-stimulates, Antimicrobial, Antiparasitic, Anti-allergic, Wound Healing, Antioxidant and Hypolipidemic parcels of *Achyranthes aspera* which are necessary in making it potent against infections.

Keywords: *Achyranthes aspera* Linn., Biological & Pharmacological activities, Phytochemistry, Medicinal plants, Herbal drugs.

I. INTRODUCTION:

The Plants have been used in traditional drug for several times. The use of traditional drug in utmost developing countries is a normative base for the conservation of good health. The factory area has been the stylish source of remedies for curing a verity of complaint and pain. This is why medicinal plant has played a crucial part in the world wide for health. Current advancements in drug discovery and hunt for new chemical diversity have boosted the sweats for exploring leads from Ayurveda the traditional system of drug in India.

World Health Organization has made an attempt to identify all medicinal shops used encyclopedically and listed further than species[1]. According to the WHO about 80% of the world's population relies on traditional herbal drug for their primary health care [2]. Medicinal plants have been

used as an exemplary source for centuries as an indispensable remedy for treating mortal conditions because they contain multitudinous active ingredients of immense remedial value. In the present period of medicine development and discovery of newer medicine notes numerous factory products are estimated on the base of their traditional uses. The secondary metabolites of the plants are the major sources of medicinal, food complements and spices. In the present period of medicine development and discovery of new drugs, numerous herb products are estimated on the base of their traditional uses. The restorative properties of medicinal shops are substantially due to the presence of many complex chemical substances of different compositions which do as secondary metabolites[3]. Important bioactive constituents of plants are alkaloids, tannins, phenolic and flavonoids etc. that are responsible for protecting the plant from insects, pests and other microorganisms.

In the present time of drug discovery and development of new drug molecules many plant products are estimated on the base of their traditional uses. One of the numerous plants which are being estimated for their remedial effectualness of *Achyranthes aspera* Linn. Belongs to the family Amaranthaceae. It's an periodic, stiff erect herb and set up generally as a weed throughout India and is one of the important medicinal plants having numerous remedial uses. It has been used all the corridor in traditional systems of drugs. Seeds, roots and shoots are the most important parts which are used as medicinally. The present composition gives an account of streamlined information on its phytochemical and pharmacological properties. The review reveals that wide figures of phytochemical ingredients have been insulated from the plant which possesses property like antiperiodic, diuretic, purgative, laxative, anti-asthmatic, hepato-defensive, anti-allergic and colorful other important medicinal activities. The crushed plant is used in pneumonia and infusion of the root is used as mild tanga in bowel complaints. Decoction of powdered leaves with honey or sugar delicacy is useful in

early stages of diarrhoea and dysentery. For the last many decades or so, expansive research work has been done to prove its natural conditioning and pharmacology of its extracts. Saponins, oleonic acid, dihydroxy ketones, alkaloids, long chain composites and numerous other chemical ingredients have been insulated.

Geographical Source:

A. asperaplant is widespread in the world tropics and subtropics of Europe, Africa, Europe, Asia, Australia and America. It's easily found anywhere on roadsides or on the edges of field and waste places as weed. Throughout India up to altitude of 2100m and in South Andaman Islands [Anonymous 2005, Gupta 2010]. India northern parts it is known as medicinal plant in different systems of folk medicine.

Traditional Uses:

Achyranthes asperalinn. (Family Amaranthaceae) is a common plant of study area found in wastelands. It is known as "Prickly chaff flower" in English and "Chirchita", "Latjeera", "Onga" or "Apamarga" in local language and dialects. This plant is highly traditional healer and used as treatment of asthma, bleeding, bronchitis, cold, cough, colic, dropsy, debility, dysentery, dog bite, headache, ear complication, pneumonia, leucoderma, scorpion bite, renal complication, snake bite and skin disease [Jain 1991].

TAXONOMIC CLASSIFICATION:

- **Kingdom** - Plantae
- **Subkingdom** - Tracheobionta
- **Superdivision** - Spermatophyta
- **Division** - Magnoliophyta
- **Class** - Magnoliopsida
- **Subclass** - Caryophyllidae
- **Order** - Caryophyllales
- **Family** - Amaranthaceae
- **Genus** - *Achyranthes*
- **Species** - *aspera*

Botanical Description: A stiff erect condiment, 30- 90 cm high, branches spreading, leaves are contrary, satiny, tomentose, 3.8-12.7 cm x 5.1-7.6 cm. Flowers are bisexual, greenish white, arranged in long harpoons, reversed. Plant herbaceous, erect; root angular and longitudinally furrowed, colour greenish or sanguine; leaves contrary and obovate, margins wavy; face covered with whitish hairs, harpoons terminal, long and generally twisted about the middle; flowers small and of a sanguine color; bracts green, old bracts tough, rigid, prickly and clinging to the clothes; fruits conical, covered

with sharp pointed bracts and containing multitudinous seeds; seeds oblong and of a shining pale brown color, taste like that of bajari grams. The medicines vended in the request under the name of Aghadabija is the whole fruit.

PHYTOCHEMICAL STUDIES:

Chemical ingredients Betaine, achyranthine, hentriacontane, ecdysterone, achyranthesaponins A, B, C, D are the major chemical ingredients set up in *A. aspera*. The seeds of *Apamarg* contains a Lrhamnopyranosyl-(1-4)-(B-Dglucopyranosyluronic acid)-(1-3)-Oleanolic acid, Lrhamnopyranosyl-(1-4)-(B-Dglucopyranosyluronic acid)-(1-3)-Oleanolic-28-O-B-D glucopyranoside and a Lrhamnopyranosyl-(1-4)-(B-Dglucopyranosyluronic acid)-(1-3)-oleanolic acid-28-O-B-Dglucopyranosyl-(1-4)-B-Dglucopyranoside [4].

Ethanollic excerpts of the roots of *Achyranthes aspera* Linn. insulated a new aliphatic acid and it has been linked as n- hexacos-14-enoic acid [5]. This composites reported for the first time from any natural and synthetic source, certain other emulsion were also insulated and linked as strigmasta- 5, 2- dien 3-8-ol, trans-13-docasenoic acid, n- hexacosanyl ,n-decaniate, n-hexacos-17-enoic acid. Rameswar isolated chemical composites of the unpredictable oil painting from *Achyranthes aspera* leaves [6].

Biological Activity of Achyranthes aspera: Methanolic extract of aerial parts of *Achyranthes aspera* shows many activities against microorganism (bacterial and fungal) [7]. *Achyranthes aspera* shown antiviral activity against Papaya viruses. In addition to these *Achyranthes aspera* shows many biological activities [8].

Spermicidal activity: Extracts from roots of *Achyranthes aspera* have been reported to retain spermicidal activity in mortal and rat sperm, as studied by Paul et al. (2010) [9]. Study was made on hydroethanolic, n- hexane and chloroform extracts, which were set up to be most effective for sperm immobilization, sperm viability, acrosome status, 5'- nucleotidase activity and nuclear chromatin decondensation. Ethanolic extract of the root of *Achyranthes aspera* shows post coital anti-fertility activity in womanish albino rats. According to their study, the extract exhibited 83.3% anti-implantation activity when given orally at 200 mg/kg body weight [10].

Antiparasitic Activity: Ethyl acetate extracts of *A. aspera* have been proved to contain anti parasitic activity by Zahiretal. (2009). It has been studied

that dried lamina, flower and seed extract of *A. Aspera* are active against the larvae of cattle tick *Rhipicephalus (Boophilus) microplus* (Acarilxodidae), lamb internal parasite *Paramphistomum cervi* [11].

Hypoglycemic and Cancer Chemo preventative Activity: hydrated methanolic extract of the whole plant have been shown to hold hypoglycaemic activity [12]. Methanolic extracts from leaves of *Achyranthes aspera* have been proved to have cancer preventative action on Epstein- Barr contagion early antigen activation persuaded by exrescence protagonist 12- O-tetradecanoylphorbol-13-acetate in Raji cells [13].

Hepatoprotective Activity: the methanolic extract of the upstanding parts of *Achyranthes aspera* shows hepatoprotective activity on rifampicin induced hepatotoxicity in albino rats [14]. Methanolic excerpt showed drug dependent loss in the situations of SGPT, SGOT, ALKP and total bilirubin.

Anti-inflammatory, anti-arthritis and Anti-oxidant activity: Alcoholic extract of the roots of *Achyranthes aspera*, was innovate to expose anti-inflammatory activity in Wistar rats using carrageenan- convinced paw edema system and cotton bullet granuloma test [15]. Gayathri et al. (2009) also reported antioxidant activity on arial and roots [16].

Nephroprotective Activity: Methanolic extract of the whole plant of *Achyranthes aspera* was shown to produce nephroprotective activity against lead acetate convinced nephrotoxicity in masculine albino rats [17].

Anti-depressant Activity: Methanolic extract of arial parts of *Achyranthes aspera* shows anti-depressant activity in mice and rats using forced swimming test in mice and rats and tail suspense test in rats [18].

Bronchoprotective Activity: Ethanolic extract of *Achyranthes aspera* shows bronchoprotective effect in toluene diisocyanate (TDI) convinced occupational asthma in Wistar [19]. The total and discrimination leucocytes were counted in blood and bronchoalveolar (BAL) fluid. Liver homogenate was employed for assessment of oxidative stress and lung histological examination was performed to investigate the inflammatory status of airway. The results suggest that *Achyranthes aspera* treated rats didn't show any airway abnormality.

Anti-allergic and Wound Healing Activity: Petroleum ether extract (200 mg/kg, i.p.) of the plant shows significant antiallergic exertion in both milk convinced leukocytosis and milk

gained eosinophilia in mice [20]. therefore the antiallergic activity of *Achyranthes aspera* may due to the presence of steroids. therefore these steroids present in the plant may be responsible for the antiallergic activity. Ethanolic and waterless extract of leaves of *Achyranthes aspera* for injury recovery activity [21].

Antidiabetic Activity: The ethanolic extract of *A. aspera* seed showed significant hypoglycemic activity in streptozotocin got diabetic rats [22]. M.S. Akhtar & J. Iqbal studied the hydrated and methanolic extracts of the powdered whole plant, which shows hypoglycaemic activity. Blood glucose levels of normal and Alloxan gained diabetic rabbits were determined after oral administration of various dosages [23].

Immuno-modulatory: The indigenous Indian fish *Labeorohita* was fed with a diet containing 0.01, 0.1 and 0.5 of *A. aspera* seeds. The fish immunized with heat-killed *Aeromonas hydrophila* were experimentally infected with living *Aeromonas hydrophila* also. In the *A. aspera* treated groups the mortality was less against controls up after infection. Super oxide anion product, serum bactericidal activity, lysozyme, serum protein and albumin/ globulin ratios came enhanced in *Achyranthes*- treated groups. *A. aspera* stimulates immunity and protect against the infection in this fish [24].

Antimicrobial Activity: M.T.J. Khan et al. found that ethanol and chloroform extracts of seeds of *Achyranthes aspera* shows mild to moderate antibiotic activity against *B. subtilis*, *E. coli* and *P. aeruginosa* [25]. S.H.K.R. Prasad et al. studied the Many extracts of the leaves and callus of the plant also shows antimicrobial activity [26]. P. Saravanan et al. reported the solvent lamina extracts were tested for antibacterial and antifungal exertion against *E. coli*, *P. aeruginosa*, *P. vulgaris*, *S. aureus*, *Klebsiella* species [27]. T.N. Misra et al. reported 17-pentatriacontanol as a primary constituent separated from essential oil of the shoots of plant, the oil shows antifungal activity against *Aspergillus carneus* [28]. S. Sharma et al. studied the alcoholic extract which shows the presence of the triterpenoidsaponin with drug dependent inhibitory activity against *Staphylococcus aureus*, a bacteria causing skin disorder in human beings. minimal inhibitory concentration was begin to be highest (0.15 mg) for purified fraction. The identification of the compound gave a triterpenoidsaponin purified fraction [29].

Hypolipidemic Activity: A.K. Khanna et al. researched the alcoholic extract of *A. aspera*, at 100 mg/kg drug lowered serum cholesterol (TC),

phospholipid(PL) triglyceride(TG) and total lipids(TL) levels by 60, 51, 33 and 53 independently in triton induced hyperlipidemic rats. The habitual administration of this medicine at the same dosages to normal rats for 30 days, lowered serum TC, PL, TG and TL by 56, 62, 68 and 67 independently followed by significant reduction in the levels of hepatic lipids. The faecal excretion of cholic acid and deoxycholic acid increased by 24 and 40 independently under the action of this medicament. The possible mechanism of action of cholesterol lowering exertion of *A. aspera* may be due to rapid-excretion of acid causing low absorption of cholesterol[30].

II. CONCLUSION:

In view of above data, the medicinal plant, *Achyranthes aspera* L. Traditionally, this plant using since Vedic period to present days using in the treatment of many disorders. Now a day's many experimental studies proves many medicinal values and using in various conditions. It's seen from the literature that *Achyranthes aspera* is a veritably important plant for its large number of medicinal properties. therefore, *Achyranthes aspera* is proved to be a multipurpose medicinal agent, therefore necessary in curing large number of affections. Its study paves the way for further attention and exploration to identify the active composites responsible for the plant natural activity, to characterize the active compounds and to demonstrate the exact mechanism of action by which they show their antibacterial effects.

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