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Exploring the Medicinal Marvels of Achyranthes Aspera: Traditional Uses to Modern Applications

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Abstract: *Achyranthes aspera (family Amaranthaceae) is a commonly found medicinal herb in India, valued for its extensive use in traditional medicine. Medicinally important parts include seeds, roots, and shoots, which are rich in bioactive compounds such as saponins, alkaloids, oleanolic acid, and long-chain ketones. The plant demonstrates a broad spectrum of pharmacological properties including antiperiodic, diuretic, purgative, laxative, antiasthmatic, hepatoprotective, and anti-allergic effects. Traditionally, it has been used for conditions like pneumonia, diarrhoea, dysentery, and bowel complaints. Recent scientific studies have validated many of its traditional uses and highlighted its potential as a multipurpose medicinal agent.*

Keywords: Achyranthes aspera, Latjeera, phytochemical constituents, chemical constituents, medicinal properties, pharmacological actions, pharmacological activities, toxicity

I. INTRODUCTION

Two varieties of A. aspera, red and white are mentioned in Ayurvedic and Chinese medicines. Achyranthes asperaas a rough flowered stalk is described as in Sanskrit synonyms. It is described in 'Nighantas' as pungent, purgative, digestive, and a remedy for inflammation of the internal organs, Tooth ache plaque itch, piles, abdominal enlargements and enlarged cervical glands. The diuretic property of the plant was well known to the natives of India and European physicians. Various plant parts form ingredients in many native prescriptions were used in combination with more active remedies.

The plant is globally available as a medicinal weed in Baluchistan, Ceylon, Tropical Asia, Africa, Australia and America. It is reported as an invasive alien species in northern Bangladesh. It is also found to be the most prevalent weed in Himachal Pradesh and an exotic medicinal herb of district, Lalitpur (Uttar Pradesh), India. Throughout India A. asperais found in field boundaries, road sides and waste places as a medicinal herb

There are seven species of Achyranthes:

1. Achyranthes aspera
2. Achyranthes atollensis
3. Achyranthes bidentata
4. Achyranthes canescens
5. Achyrathes japonica
6. Achyranthes splendens
7. Achyranthes mutica

A. aspera has been used in folk medicine, such as in Australia in the 19th century. The 1889 book The Useful Native Plants of Australia records that this plant was found in all the tropical and sub-tropical regions of the old world. The herb is administered in India in cases of dropsy. The seeds are given in hydrophobia, and in casesof snake-bites, as well as in ophthalmia and cutaneous diseases. The flowering spikes, rubbed with a little sugar, are made into pills, and given internally to people bitten bymad dogs. The leaves, taken fresh and reduced to a pulp, are considered a good remedy when applied externally to the bites of scorpions. The ashes of the plant yield a considerable quantity of potash, which is used in washingclothes. The flowering spike has the reputation in India (Oude) of being a safeguard against scorpions, which it is believed to paralyse

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Traditionally, the plant is used in asthma and cough. It is pungent, antiphlegmatic, antiperiodic,diuretic, purgative and laxative, useful in oedema, dropsy and piles, boils and eruptions of skin etc. Crushed plant is boiled in water and is used in pneumonia. Infusion of the root is a mild astringent in bowel complaints. The flowering spikes or seeds, ground and made into a paste with water, are used as external application for bites of poisonous snakes and reptiles, used in night blindness and cutaneous diseases

Drug Profile

Taxonomic classification :

Kingdom	–	Plantae
Subkingdom	-	Tracheobinota
Super Division	-	Spermatophyta
Division	-	Mangoliophyta
Class	-	Mangoliophsida
Subclass	-	Caryophyllidae
Order	-	Caryophyllales
Family	-	Amaranthaceae
Genus	-	Achyranthes
Species	-	Aspera

Botanical description:

Latin	-	Achyranthes aspera
Sanskrit	-	Aghata
Hindi	-	Latjira, Chirchira
Gujarati	-	Safad Aghedo
Tamil	-	Shiru-kadaladi
Punjabi	-	Kutri
Ayurvedic	-	Apaamaarga, Chirchitaa, Shikhari, Shaikharika
Telugu	-	Uttaraene
Malayalam	-	Kadaladi
Unani	-	Chirchitaa
Persian	-	Khare-vazhun
Arabian	-	Atkumah
French	-	Achyranth a feuilles rudes, collant, gendarme

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History and origin :

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Photochemistry of plant :

Plant part	compound family	Active ingredient
Whole Plant	Saponins	a) Ecdysterons b) 20-hydroxy-ecdysone Betaine (CsHn0]
Arial part	Alkaloids	a) Three bisdesmosidic saponins (I-III) b)20-hydroxyecdysone part
	Triterpenoid Saponins	a) B-D-glucopyranosyl-13-B-[0-a-L-rhamnopyranoky)
Shoots	Ketones	a) 36,37-dihydroxyhenpentacontan-4-one b)Triacontanol c) 36,47-dihydroxyhenpentacontan-4-one d) 27-cyclohexyl-heptacosan-7-Ol
Roots	Saponins	Ecdysterone Ecdysone
Steams Leaves	Compounds of volatile	a) P-benzoquinone;Hydroquinone b) Nerol c) α-ionone

Pharmacological activity

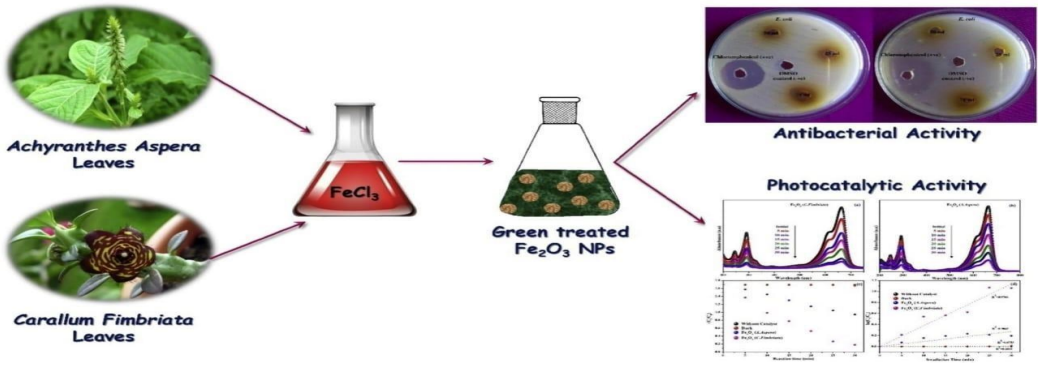

FIG : PHARMACOLOGICAL ACTIVITY OF ACHYRANTHES ASPERA

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1. Antimicrobial Action

Mechanism: Achyranthes aspera contains alkaloids, saponins, and flavonoids that exhibit antimicrobial properties. These compounds inhibit the growth of bacteria commonly associated with dental caries (e.g., Streptococcus mutans) and periodontal diseases.

Effect: Reduces the bacterial load in the oral cavity, preventing plaque formation and cavities.

2. Anti-inflammatory Properties

Mechanism: The plant contains compounds with anti-inflammatory activity, such as betaine and steroidal saponins. These compounds reduce inflammation in the gums by modulating inflammatory pathways.

Effect: Helps alleviate gingivitis and other inflammatory gum conditions.

3. Wound Healing

Mechanism: Achyranthes aspera promotes cell proliferation and tissue repair through its phytoconstituents.

Effect: Aids in the healing of oral ulcers and minor wounds in the oral cavity.

4. Antioxidant Activity

Mechanism: The flavonoids and phenolic compounds in Achyranthes aspera scavenge free radicals, protecting oral tissues from oxidative damage.

Effect: Prevents the progression of oral diseases caused by oxidative stress.

5. Astringent and Cleansing Effects

Mechanism: The tannins present in Achyranthes aspera have an astringent effect, which helps tighten gum tissues and remove debris.

Effect: Enhances oral cleanliness and strengthens gum health.

6. Analgesic Action

Mechanism: Certain phytochemicals in Achyranthes aspera act as mild analgesics by interfering with pain signaling pathways.

Effect: Provides relief from dental sensitivity or mild pain.

Therapeutic Uses:

A. Digestive Disorders

Used to treat indigestion, dysentery, and constipation.The seeds and root extracts are known to improve appetite and aid in gut health.

B. Respiratory Health

Effective in managing asthma, cough, and other respiratory ailments. Decoctions of the plant are used as an expectorant.

C. Skin Conditions

Paste made from the leaves or roots is applied to wounds, ulcers, and skin infections to promote healing.

D. Anti-diabetic Activity :

Achyranthes aspera has hypoglycemic effects, making it beneficial for managing blood sugar levels in diabetes.

E. Pain Relief :

Known for its analgesic properties; used to relieve joint pain, headaches, and body aches.

F. Cardiovascular Health :

It helps lower blood pressure and improve circulation due to its anti-hypertensive properties.

G. Urinary Disorders :

Acts as a diuretic and helps in the treatment of kidney stones, urinary infections, and retention.

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H. Women's Health :

Used to regulate menstrual cycles and alleviate menstrual cramps.

I. Anti-parasitic Action :

Decoctions or powders from the plant are traditionally used to expel intestinal worms.

II. CONCLUSION

Achyranthes aspera is a versatile medicinal plant with a rich history of traditional use and diverse pharmacological activities. Its bioactive compounds contribute to therapeutic effects such as analgesic, antipyretic, and nephroprotective actions. Given its potential, further clinical trials are warranted to validate and expand its medicinal applications.

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