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Review article best on alcoholic root extract of *Achyranthes aspera*

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Abstract
Medicinal plants represent a vital component of global healthcare systems and serve as a rich source of bioactive compounds with significant therapeutic potential. Among these, *Achyranthes aspera* Linn., a member of the family Amaranthaceae, has been extensively utilized in traditional systems of medicine such as Ayurveda, Unani, Siddha, and others. This review aims to comprehensively summarize the phytochemical constituents, pharmacological activities, traditional uses, and therapeutic potential of *A. aspera*. The plant is widely distributed in tropical and subtropical regions and is commonly found in India as a roadside weed. Various parts of the plant, including roots, leaves, seeds, and stems, are employed in the treatment of diverse ailments such as asthma, diabetes, skin diseases, rheumatism, and gastrointestinal disorders. Phytochemical investigations have revealed the presence of important bioactive compounds, including alkaloids, flavonoids, saponins, tannins, terpenoids, and phenolic compounds, which contribute to its medicinal properties. Pharmacological studies have demonstrated a broad spectrum of biological activities such as antioxidant, anti-inflammatory, antimicrobial, antidiabetic, hepatoprotective, anticancer, and immunomodulatory effects. Despite its extensive traditional use and promising pharmacological profile, there remains a lack of well-designed clinical studies and standardized safety evaluations. Therefore, further scientific validation and clinical research are essential to establish its efficacy, safety, and potential for drug development. This review highlights the importance of *A. aspera* as a valuable medicinal plant and underscores the need for future research to fully explore its therapeutic applications.

Keywords: Achyranthes aspera, medicinal plant, phytochemistry, pharmacological activity, traditional medicine, bioactive compounds, antioxidant, anti-inflammatory, antimicrobial, therapeutic potential

Introduction

Plant resources constitute a significant component of natural wealth and have long been utilized as a primary source of therapeutic agents. Plants possess an exceptional ability to synthesize a wide range of bioactive compounds, particularly phenols and their oxygen-substituted derivatives, which contribute to their medicinal properties. Various plant parts such as roots, seeds, leaves, bark, flowers, and fruits are used in the preparation of herbal medicines. In recent decades, there has been a growing global interest in medicinal plants, not only for traditional uses but also for scientific validation of their biological effects. The increasing demand for plant-based medicines, nutraceuticals, and related products is largely attributed to their affordability, safety, and minimal side effects compared to synthetic drugs. Secondary metabolites such as alkaloids, glycosides, tannins, terpenoids, flavonoids, phenolics, and volatile oils play a crucial role in their therapeutic efficacy [1].

According to a report by the World Health Organization (WHO) on Traditional and Complementary Medicine (2019), a wide range of traditional medical systems are practiced across the globe [2]. It is estimated that nearly 80% of the global population relies on herbal medicines for their primary healthcare needs [3]. The growing popularity of traditional medicine is largely due to its therapeutic value, accessibility, and relatively fewer adverse effects compared to conventional synthetic drugs [4].

Among the various medicinal plants, *Achyranthes aspera* Linn. is a well-recognized herb widely used in multiple traditional systems of medicine, including Ayurvedic, Unani, Siddha, Allopathic, Homeopathic, and Naturopathic practices [5]. It belongs to the family Amaranthaceae and is commonly found in tropical, subtropical, and warmer regions worldwide. The plant is typically an erect or procumbent herb growing along roadsides and wastelands, and its name is derived from Greek words referring to its characteristic chaff-like flowers [6]. *Achyranthes aspera*, commonly known as "Prickly Chaff Flower," is widely distributed across India, Africa, and parts of Nigeria, and is represented by numerous genera and species within its family [7].

The plant is known by various vernacular names across different regions and cultures, reflecting its widespread ethnomedicinal importance. In English, it is referred to as "Chaff Flower," "Prickly Chaff Flower," and "Devil's Horsewhip," while it is known by different names in Sanskrit, Hindi, Persian, Punjabi, Indonesian, and African languages. Additionally, the species exhibits several cultivars, including *Achyranthes aspera* aspera, borbonica, pubescens, rubrofusca, velutina, and others [8].

Botanically, *Achyranthes aspera* (also known as *Achyranthes aspera* Linnaeus) belongs to the genus *Achyranthes* and includes related species such as *Achyranthes bidentata* and *Achyranthes longifolia*. The plant has been used for centuries in traditional medicine and is documented in classical texts such as the *Compendium of Materia Medica*. It is traditionally known for promoting blood circulation, detoxification, and diuresis, and is used in the treatment of fever, tonsillitis, nephritis, and other

ailments. Modern pharmacological studies have demonstrated that the plant exhibits antioxidant, antiinflammatory, anti-aging, and immunomodulatory properties, primarily due to the presence of bioactive compounds such as saponins and flavonoids [9].

Furthermore, *Achyranthes aspera* has been widely reported to possess diverse pharmacological activities, including anti-leprotic, contraceptive, antibacterial, anti-inflammatory, anti-arthritic, hepatoprotective, and cancer chemoprotective effects. The root extracts are particularly used in the treatment of diseases such as diabetes, asthma, hypertension, and malarial fever [10].

In addition to its traditional uses, *Achyranthes aspera* L. has gained significant attention in recent years due to its broad spectrum of biological activities. The plant is rich in phytochemicals such as flavonoids, saponins, steroidal compounds, triterpenoids, phenolics, and alkaloids, which contribute to its therapeutic potential. Scientific studies have validated its anti-inflammatory, antimicrobial, wound healing, antidiabetic, hepatoprotective, and anticancer properties. Despite its extensive ethnomedicinal use, there remains a lack of standardized clinical studies and comprehensive safety evaluations [3].

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

Therefore, the present review aims to systematically compile and critically analyze the available information on the phytochemistry, pharmacology, and therapeutic potential of *Achyranthes aspera*, while also highlighting the need for further research to support its safe and effective use in drug development.

Fig 1: Achyranthes aspera plant

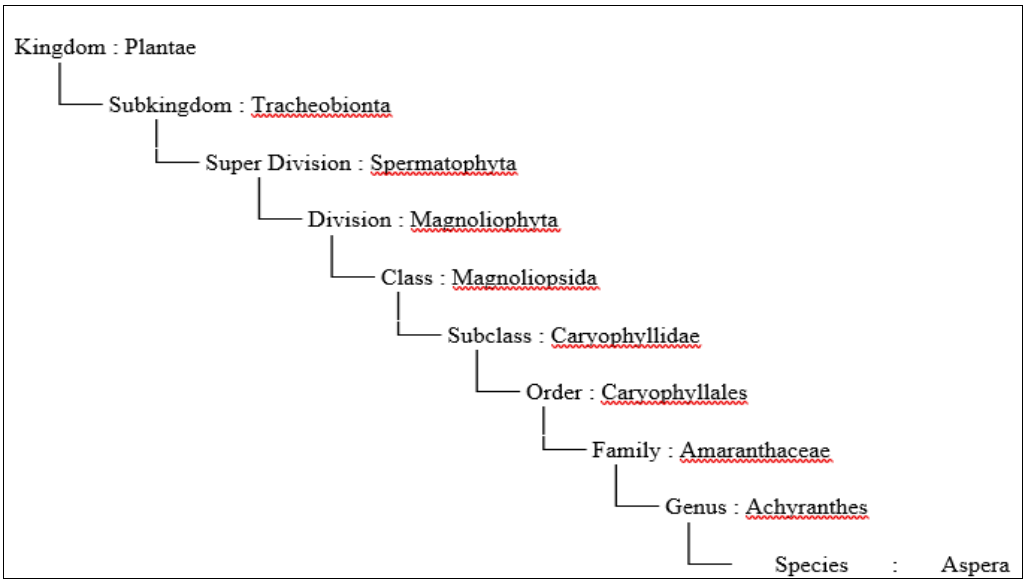
Name of Achyranthes aspera in various languages: (11,12)

Botanical → Achyranthes aspera
Ayurvedic → Apamarga
Unani → Chirchitaa
Siddha → Nayuruvi
English → Prickly chaff flower , Rough chaff
Chinese → Nieou si
Sanskrit → Aghata, Apamarga
Hindi → Chirchita, Latjira
Gujarati → Safad Aghedo
Tamil → Shiru-kadaladi
Kannada → Uttatane
Malayalam → Kadaladi
Telugu → Uttaraene
Punjabi → Puthkanda , kutri
Bengali → Apang
Arabian → Atkumah
French → Achyranth a feuilles rudes, collant, gendarme
Persian → Khare-vazhun
Spanish → Khare-vazhun - Mosotillo, rabo de gato, rabo de chango, rabo de raton

Synonyms: (13)

1. Achyranthes argentea Lam.
2. Aspera var. indica L.
3. Aspera var. obtusifolia (Lam.) Suess.
4. Achyranthes indica (L.) Mill.
5. Achyranthes obtusifolia Lam.

Taxonomic Classification [12, 14, 15]



Geographical sources

Achyranthes aspera is widely distributed across tropical, subtropical, and warmer regions of the world, extending up to an altitude of about 2100 m [11]. Globally, it is found in regions such as Tropical Asia, Africa, Australia, and America, and is also reported in countries/regions like Pakistan (Baluchistan) and Sri Lanka (Ceylon) [11, 13, 15, 16, 17].

In the Indian subcontinent, the plant is extensively distributed throughout India, particularly across the plains of almost all states [11]. It commonly grows as a weed along roadsides, field boundaries, waste places, and grasslands [13, 15, 16, 17]. It is easily found throughout the country up to an altitude of 2100 m and is also present in the South Andaman Islands [13, 15].

Morphology

Achyranthes aspera is an annual or sometimes perennial herb widely recognized for its medicinal properties across the world. It typically grows as an erect or procumbent plant reaching 1–2 m in height, often with a woody base. The stem is angular, ribbed, striate, and pubescent, sometimes exhibiting a purplish tinge, with branches that may be terete or quadrangular. Leaves are simple, opposite, ovate to elliptic or obovate, measuring approximately 3.8–6.3 × 2.5–4.5 cm, with a soft velvety pubescence on both surfaces and short petioles (6–20 mm). The root system is cylindrical, about 1 cm in diameter, and differentiated into secondary and tertiary roots. Anatomically, the plant shows well-developed vascular and medullary bundles along with cambium, while embryological features and anisocytic stomata are also observed. The flowers are small, greenish-white or sometimes reddish, bracteolate, and arranged in long axillary or terminal spike inflorescences that may reach up to 75 cm in length. Each flower typically contains five stamens with bilobed (dithecous) anthers and a superior ovary composed of two syncarpous carpels. The fruit is a dry utricle, enclosing smooth, curved, albuminous seeds that are subcylindrical, truncate at the apex, and rounded at the base [18, 19].

Traditional uses

Achyranthes aspera is a well-known medicinal plant widely utilized in traditional systems of medicine for the management of various ailments. The whole plant has been traditionally employed in the treatment of skin disorders, asthma, rheumatism, and gastric disturbances. Different parts of the plant are used in specific formulations to address a wide range of health conditions. The aqueous paste of flowering spikes is commonly applied in the treatment of snake bites, whereas the paste of fresh leaves is used for relieving back strain and toxic bites. Root infusion is traditionally administered for the management of wasp stings, as well as ophthalmic and bowel complaints [20].

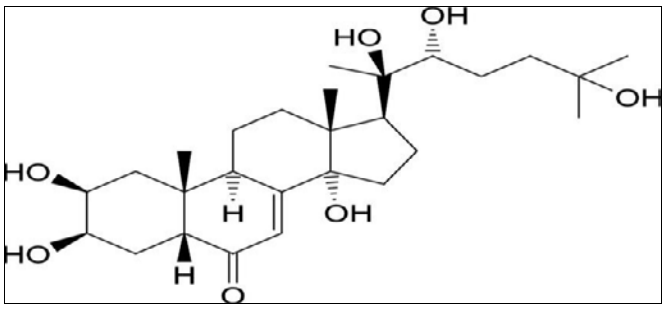
Leaves of *A. aspera* are particularly valued for their therapeutic properties. Dried leaf powder (2–5 g), when taken with honey, is used to treat diarrhoea. Leaf juice is considered an effective remedy for various skin diseases such as pruritus and scabies, while leaf paste is externally applied for toxic bites [21]. The ash obtained from the whole plant is widely used in the treatment of bleeding piles and abdominal disorders. The root serves as a natural toothbrush for maintaining oral hygiene and treating halitosis. Additionally, an infusion of the twig is used as a mouthwash for toothache, and root extract is applied as an eye drop at bedtime for the treatment of night blindness [21, 22].

Phytochemical studies have revealed that *Achyranthes aspera* contains several important bioactive constituents, including alkaloids, flavonoids, saponins, steroids, and terpenoids. Among these, flavonoids have attracted considerable attention due to their potential role in preventing or slowing the development of certain cancers [22].

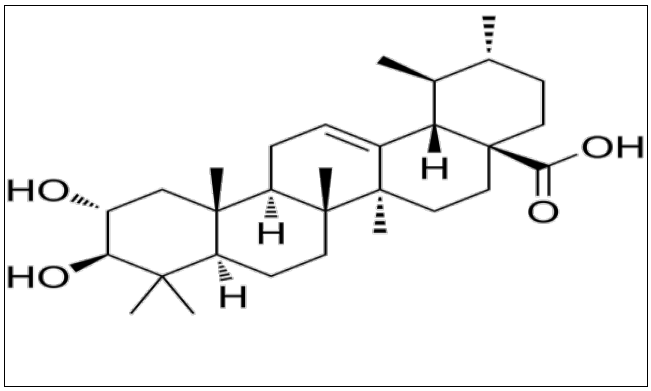
Phytochemical constituents and pharmacological activity of *A. aspera*

S. No.	Phytochemical Constituents	Extract/Part Used	Pharmacological Activity	Reference
1.	Ursolic acid, oleanolic acid, sitosterol, triacontanol, hexatriacontane, palmitic acid	Chloroform and ethanol root extract	Significant antidiabetic activity in streptozotocin induced diabetic rats	[23]
2.	Carbohydrates, proteins, Steroids, glycosides, alkaloids, Tannins, saponins, flavonoids, Lignin	Petroleum ether, alcoholic and aqueous root extracts	Antimicrobial activity acute oral toxicity; pharmacognostic evaluation (ash value, extractive value, loss on drying) E. coli)	[24]
3.	Not specifically identified (present in methanolic extract)	Methanolic extract of whole plant	Antibacterial activity against Escherichia coli, Klebsiella pneumoniae, bacillus cereus (maximum inhibition against E. coli)	[25]
4.	Tannins, alkaloids, glycosides, carbohydrates, proteins & amino acids, gums & mucilage, flavonoids, saponins, steroid, sterols	Chloroform and methanol root and shoot extracts	Antibacterial activity against enterobacteria; activity against Bacillus subtilis; antifungal activity against Fusarium species	[26]
5.	Alkaloids, Carbohydrates, glycosides, saponins, phenolics, proteins, ammino acids	Methanolic and aqueous extracts	Determination of total phenolic (GAE) and flavonoid (QE) content using folin-ciocalteu and aluminium chloride methods; antioxidant potential	[27]
6.	Not specifically isolated (various bioactive compound in extract)	Hydroethanolic, n-hexane, chloroform and ethanolic root extracts	Spermicidal activity; antifertility (83.3% anti-implantation); anti-inflammatory (paw edema and granuloma models); antioxidant activity	[28]
7.	Ursolic acid; corrosolic acid; achyrantheric acid; 20-Hydroxyecdysone	Methanolic and petroleum ether and root extracts	Identification of phytoecdysteroid and terpenoids contributing to pharmacological properties	[29]

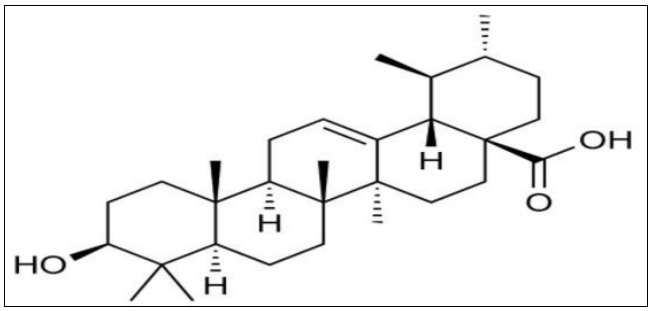
Ecdysteron



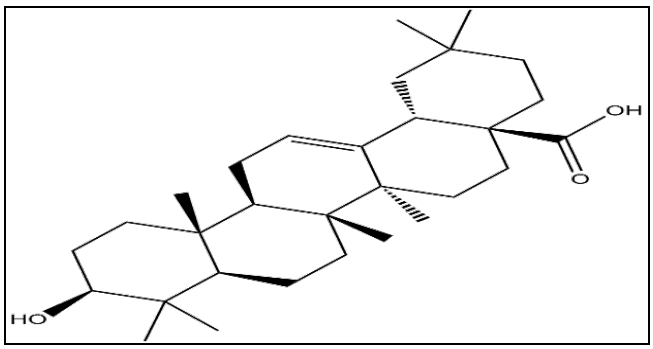
Corrosolic acid



Ursoloic acid



oleanolic acid



Conclusion

Achyranthes aspera is an important medicinal plant with diverse traditional uses and a wide range of pharmacological activities attributed to its rich phytochemical composition. Although experimental studies support its therapeutic potential, the lack of standardized clinical trials and safety evaluations limits its application in modern medicine. Therefore, further research is essential to validate its efficacy and ensure its safe use in drug development.

References

1. Nargatti P, Patil S, Wadkar K. Phytochemical profile and pharmacological aspects of Achyranthes aspera Linn: An overview. Journal of Pharmaceutical Research International,2021:33(34B):187–206.
2. Gupta S, *et al*. Unveiling the medicinal benefits, contemporary phytopharmacological potentials and in-silico studies of Achyranthes aspera. Research Journal of Pharmacy and Technology,2025:18(8):4007–4013.
3. Ubale TS, *et al*. A systematic review on Achyranthes aspera L. (prickly chaff flower): Phytochemical profile, ethnomedicine and future prospects. World Journal of Pharmaceutical Research, 15(7), 45–65.
4. Luo H, *et al*. Role of Achyranthes aspera in neurodegenerative diseases: Current evidence and future directions. Frontiers in Pharmacology,2025:16:1511011.
5. Kumar RS, *et al*. Clinical and microbial evaluation of mouthwash containing Achyranthes aspera and Trachyspermum ammi: A randomized controlled non-inferiority trial. Journal of Oral Biology and Craniofacial Research,2024:14(5):522–529.
6. Thorat V, *et al*. Pharmacognostic account and medicinal uses of Achyranthes aspera L. Linn. International Journal of Pharmacognosy,2020:8(8):100–108.
7. Rehman R, *et al*. Commercial importance, medicinal value and therapeutic potentials of chaff flower (Achyranthes aspera) – A review. International Journal of Chemical and Biochemical Sciences,2018:14:62–70.
8. Kumar A, *et al*. Achyranthes aspera (Latjeera): Ethnomedicinal usage and chemical components. International Journal of Pharmacology and Pharmaceutical Research,2023:5(1):5–14.
9. Mankilik MM, Longdet IY, Luka CD. Evaluation of Achyranthes aspera shoot extract as an alternative therapy for malaria. The Journal of Basic and Applied Zoology,2021:82(1):14.
10. Mishra A, *et al*. Screening antioxidant activity in different parts of plant Achyranthes aspera L. The Journal of the Indian Botanical Society,2024:104(1):35–40.
11. Sannd R. Pharmacognostic evaluation of Achyranthes aspera Linn whole plant,2022.
12. Thapa R, Arya GC, Arora S. Isolation and characterization of chemical compounds from Achyranthes bidentata for evaluation of anti-Parkinson's activity through in-silico approach. International Journal of Life Science and Pharma Research,2023:13(4):105–P127.
13. Shinde GS, *et al*. A review on pharmacological and phytochemical constituent of Achyranthes aspera L. Linn. International Journal of Pharmacognosy,2021:8(8):58–64.
14. Sohani S. Ethno-medicinal uses and chemical constituents of Indian flora: Achyranthes aspera (Latjeera). International Journal of Science and Research,2020:9(4):1778–1780.
15. Kumar M, Soni N. A review on therapeutic benefits of Achyranthes aspera, 2023.
16. Sonar S, *et al*. Spiritual medicinal plants, 2022.
17. Tiwari SK, *et al*. A brief study on Achyranthes aspera: A review.

18. Verma KK, *et al*. A comprehensive review on traditional uses, chemical compositions and pharmacology properties of Achyranthes aspera (Amaranthaceae). Journal of Drug Delivery and Therapeutics,2021:11(2-S):143–149.
19. Srivastav S, *et al*. Achyranthes aspera – An important medicinal plant: A review. Journal of Natural Products and Plant Resources,2011:1(1):1–14.
20. Husain N, Kumar A. Phytochemical analysis of flower, leaf and root of Achyranthes aspera from Durg District of Chhattisgarh – A comparative study. International Journal of Scientific Research,2016:5(3):162–246.
21. Lakshmi V, *et al*. An overview of Achyranthes aspera Linn. Journal of Scientific and Innovative Research,2018:7(1):27–29.
22. Verma S. A review study on Achyranthes aspera (Amaranthaceae) – A valuable medicinal herb. Journal of Medicinal Plants Studies,2016:4(3):6–7.
23. Lakshmi V, Srivastava AK. Antidiabetic potential of the roots of the Achyranthes aspera Linn, 2019.
24. Shinde GS, *et al*. A review on pharmacological and phytochemical constituent of Achyranthes aspera L. Linn. International Journal of Pharmacognosy,2021:8(8):58–64.
25. Neeta SR, *et al*. Antibacterial potential of Achyranthes aspera Linn procured from Himachal Pradesh, Punjab and Haryana, India. Research Journal of Chemical Sciences, 2231–606X, 2011.
26. Parveen S. Phytochemical screening and antimicrobial activity of herbal plant extracts – Achyranthes aspera. International Journal of Pharmaceutical and Clinical Research,2018:10(7):201–209.
27. Venkadassalapathy SD, *et al*. *In vitro* antibacterial, cytotoxicity and wound healing activities of methanol and aqueous extracts from Achyranthes aspera. Journal of Pharmacy and Bioallied Sciences,2023:15(Suppl 1):S764–S770.
28. Hasan S. Pharmacological and medicinal uses of Achyranthes aspera. International Journal of Science, Environment and Technology,2014:3(1):123–129.
29. Nargatti P, Patil S, Wadkar K. Phytochemical profile and pharmacological aspects of Achyranthes aspera Linn: An overview. Journal of Pharmaceutical Research International,2021:33(34B):187–206