



# Review on Phytochemical Screening on Leaves Extract of *Achyranthes aspera*

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**Abstract:** *Achyranthes aspera* is that the important medicinal herb found as weed throughout the india, It belongs to the family Amaranthaceae. Though most of it's parts are utilized in traditional system of medication, leaves, root and seeds are most vital part which are used medicinally. The present article gives an account of updated information on it's phytochemical screening. *Achyranthes aspera* was evaluated in leaves using solvents like Methanol, the preliminary phytochemical screening of leaf extracts of *Achyranthes aspera* showed the presence of phytochemicals like Alkaloids, Carbohydrates, proteins, tannins, phenols, steroids, glycosides. *Achyranthes asepra* is widely studied for its medicinal properties wound healing activity, antiinflammatory, antibacterial, antifungal activity Also shows anti-plasmodic ant-icoagulant, antihelminthic. It is also useful to treat cough, skin rashes, snake bites, inches and skin eruption.

**Keywords:** *Achyranthes aspera*, Phytochemical, Solvent

## I. INTRODUCTION

The leaves of *Achyranthes aspera* (Amaranthaceae) were screened for the presence of its Phytochemical composition, antimicrobial and haemolytic activities. The medicinal plant *Achyranthes aspera* territory has been the best and most vital source of medicinal Preparations. Herbal medicine accustomed treat disease and promote health. *Achyranthes aspera* is employed from a few years for curing the Disease[1]. Plant contains differing kinds of gear like Carbohydrates, lipids, proteins, glycosides, alkaloids, Tannins, etc. chargeable for theirs pharmacological activity. Phytochemical analysis is that the useful for Discovery of recent medicines form the herbal source [2]. Different parts of plant which contain biologically Active ingredients like root, bark, stem and leaf are used for Treatment of acute and chronic ailments like Asthma, Fever, Hypertension, Malaria, Fungal, Bacterial Infection and Heart Disorder[3].

**Plant Profile:**[4]



Fig. *Achyranthes aspera*

**Medicinal Species:** *Achyranthes aspera***Botanical Family:** Amaranthaceae**Common Names (Synonyms):****Sanskrit Name:** Apamargah, Mayooraah, Markatapippalee, Durgrahah.**Marathi Name:** Aaghada.**Hindi Name:** Chirchira, Latjira.**English Name:** Prickly chaff flower.**Geographical Source:**

It is found on road sides, field boundaries and waste places as a weed throughout India up to an Altitude of 2100 m and in South Andaman Islands. The plant is also widespread in Baluchistan, Ceylon, Tropical Asia, Africa, Australia and America.

**Chemical Constituents**

*Achyranthes aspera* plant is very rich in phytochemicals. The main constitute of *Achyranthes aspera*, Carbohydrate, Steroids, Glycosides, Tanins, Alkoloid, Phenolic compound, Saponin A- D-Glucuronic Acid and Saponin B-  $\beta$ -D-Galactopyranosyl ester, Oleanolic acid[5].

Methanol extract of leaves	Carbohydrate, Steroids, Glycosides, Tanins, Alkoloid, Phenolic compound.
Seeds	Saponin A- D-Glucuronic Acid Saponin B- $\beta$ -D-Galactopyranosyl ester
Root	Oleanolic acid

**Taxonomic Classification**

Kingdom	Plantae
Subkingdom	Tracheobinota
Super Division	Spermatophyta
Division	Mangoliophyta
Class	Mangoliophsida
Subclass	Caryophyllidae
Order	Caryophyllales
Family	Amaranthaceae
Genus	<i>Achyranthes</i>
Species	<i>Aspera</i>

**II. MATERIALS AND METHODS**

All the experiments of these investigations were carried out at the laboratories of the Department of Pharmacognosy, Samarth Institute of Pharmacy, Pune, Maharashtra, India. All The chemicals used in this study were of analytical grade [6].



2.1 Collection of Plant Material

The plant material i.e. leaves of Achyranthes aspera (Amaranthaceae) were collected from the Pune District, Maharashtra, during the month of September in the year 2022. The fresh crude drug obtained was shade dried, coarsely powdered, passed through 60 mesh sieve and stored in an Air – tight containers [7].

2.2 Chemicals and Reagents

All chemicals and reagents used in the present study were purchased from reliable firms like Merck, USA and were of analytical grade.

2.3 Preparation of Different Fractions of Achyranthes aspera

The plant parts (leaves) were cleaned, dried and powdered with the help of Mixer grinder separately. Then extraction process done by soxhlet apparatus by using 20gm of the leaf powder was extracted with 100 ml of methanol. After these extracts were concentrated using rotary evaporator and stored at 4 °C in air tight containers For further experimental studies [8].

2.4.Preliminary Phytochemical Screening

Qualitative phytochemical analysis of A. aspera extract (Methanol) were carried out as follows using standard procedures [9].

A. Test for Alkaloids

Alkaloids are basic nitrogenous plant products that are most optically active and Possess nitrogen. They have heterocyclic structural units with pronounced Physiological action.

Table with 3 columns: Test, Observation, Inference. Rows describe Mayer's, Dragendroff's, and Wagner's tests for alkaloids.

B. Test for Phenolics

Phenols are aromatic compounds with hydroxyl groups that are widely spread in plant Kingdom. They occur in all parts of the plant. These offers resistance to diseases in Plants .Grains contain high amount of polyphenols which are resistance to bird attack.

Table with 3 columns: Test, Observation, Inference. Row describes Phenol Test using Ferric chloride solution.

C. Test for Tannins

Table with 3 columns: Test, Observation, Inference. Rows describe Ferric Chloride Test and Gelatin test for tannins.

**D. Test for Saponins**

These are plant steroid compounds or triterpenoids which are identified by their bitter Taste ability. They form foam in aqueous solution and lyse erythrocytes.

Test	Observation	Inference
Foam Test: 1 ml extract + Shaken well with water.	Formation of honey comb like Foam.	Presence of Saponins.

**E. Test for Flavonoids**

These are also known as Anthoxanthins that are yellow pigments which occur in plant Kingdom.

Test	Observation	Inference
1) Flavonoides Test: 1 ml extract + few magnesium turnings + conc. H <sub>2</sub> SO <sub>4</sub> dropped Through the sides of tube.	Formation of magenta colour, scarlet colour, deep cherry Colour.	The presence of Flavonols, Flavones and Flavonoids.
2) Ferric chloride Test: 1 ml extract + Neutral Ferric chloride solution.	Formation of Blackish vgreen colour.	Presence of Flavonoids.
3) Lead Acetate Test: 1 ml extract + Lead acetate solution.	Formation of yellow Precipitate.	Presence of Flavonoids.
4) Shinoda Test: 1 ml extract + Conc. HCl + Few magnesium turnings.	Formation Magenta Colour.	Presence of Flavonone/ Flavone.
5) Zinc-Hcl Reduction Test/ Pew's Test: 1ml extract + pinch of zinc powder + few Drops of 5N HCl.	Formation of purple, cherry red and pink or brownish colour.	Presence of Flavonoids.

**F. Test for Sterols**

These are of large class of organic compounds occurring widely in plants and animals And are characterized by the presence of 1,2-cyclopentanophenanthrene ring system Which may be partially deduced or other wise modified. Examples: Steroids, Bile Salts, Adenocorticoids etc.

Test	Observation	Inference
1) Salwoski Test: 1 ml extract + Conc. H <sub>2</sub> SO <sub>4</sub> .	Formation of wine red colour.	Presence of Sterols.
2) Libermann-Buchard's Test: 1 ml extract + acetic Anhydride + Conc. H <sub>2</sub> SO <sub>4</sub> Along the sides of tube.	Formation of red ring at the junction of two layers.	Presence of Sterols.

**G. Glycosides**

Heamacetyl form of a sugar reacts with a molecule of an alcohol to form the acetyl Derivatives which are generally known as glycosides. Those of sugars known as Glucosides or fructosides.

Test	Observation	Inference
1) Keller- kilani Test: 1 ml extract + mixed with few drops of glacial acetic acid and Boiled for a min and cooled. To this solution add 2 drops of ferric chloride Solution. The contents were transferred to another tube containing Conc. Sulphuric Acid.	Formation of reddish brown ring at the junction of 2 layers.	Presence Of Glycosides.

**H. Carbohydrate Test**

These are the substances with general formula of  $C_x(H_2O)_y$  are called as carbohydrates Which contains hydrogen and oxygen in the same proportion as in water.

Test	Observation	Inference
1)Molisch's Test: 1ml Extract + Molisch Reagent. Add 2 ml of conc. $H_2SO_4$ along The sides of the test tube of the walls and allow it stand for 2 mins.	Formation of Reddish violet colour at the junction of two layers.	Presence of Carbohydrate.

**I. Amino acid and Protein Test**

Proteins are complex nitrogenous compounds which occur in plant and animal cells. Proteins on hydrolysis with strong inorganic acids or by enzymes yield a mixture of Amino acids.

Test	Observation	Inference
1)Ninhydrin Test: 1 ml extract + Ninhydrin reagent heat for 2-3 mins.	Formation of Purple colour.	Presence of Amino acids.

**III. CONCLUSION**

The present study suggests that the extracted phytochemicals are very very valuable. Seclusion, Distillation and Characterization of the phytochemicals will make interesting studies. Investigations are planned to conduct the phytochemical screening to know the potency of these extracts. The parts of *achyranthes aspera* are used in traditional systems of medicines, seeds, roots and shoots are the most important parts which are used medicinally. The major chemical constituents are carbohydrate, protein, glycosides, alkaloids.

**IV. RESULTS****Phytochemical Screening of *Achyranthes aspera*.**

1. Carbohydrates: The leaf extracts of methanol responds positively to Molish test.
2. Protein and Amino acids: The leaf extracts of methanol responded negatively to Ninhydrin acid Indicating absence of protein in the extracts.
3. Steroids: leaf extract of methanol displayed positive.
4. Phenolic compound: Phenol test to be present in only the leaf extract of methanol and absent in the rest.
5. Glycosides: Tests for glycosides by KellarKiliani and Sulphuric acid test revealed presence in leaf.
6. Saponin: leaf extract of methanol extracts responded negatively to the foam test.
7. Tannins: leaf extracts of methanol responded positively to  $FeCl_3$  test.
8. Alkaloids: Drangendroff test and Mayer's test revealed the presence of alkaloids in leaf extract of methanol.
9. Flavonoids: lead acetate test revealed absence of flavonoids in methanol extract.

SL. NO	TEST	LEAVESEXTRACT OF METHANOL
1	Carbohydrate : Molish Test	+
2	Protein and Amino acids : Ninhydrin Test	-
3	Steroids: Salkowski Test Leibermannburchard's Reaction	+ +
4	Phenolic compound : Phenol Test	+
5	Glycosides: Killer killani Test	+
6	Saponin : Foam Test	-



7	Tanins : Ferric Chloride Test	+
8	Alkaloid : Dragendroff Test Mayer's Test	+ +
9	Flavonoids : Lead Acetate Test	-

**Table 1:** Phytochemical screening of *Achyranthes aspera***ACKNOWLEDGEMENT**

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