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Phytochemical investigation of seeds of *Achyranthes aspera* Linn.

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Abstract

The seeds of *Achyranthes aspera* Linn is a common plant and is having wide variety of applications like antiperiodic, hemorrhoids, asthma, edema, bronchitis, dysentery, renal complication, leucoderma and etc., By using maceration process whole or coarsely powdered plant material (seeds) is subjected to different solvents (Benzene, Acetone, and Methanol) extraction in a stoppered container for a definite period with frequent agitation until soluble matter is dissolved. Benzene, Acetone and Methanol solvent extracts of seeds of *Achyranthes aspera* were subjected to various chemical tests. Benzene and Acetone solvent extracts shown similar positive results but not Methanol.

Keywords: *Achyranthes aspera*, Maceration process, Dragendorff's test, phytochemical investigation, Seeds.

1. Introduction

Nature is a resource of therapeutic (Medicinal) agents for hundreds of years and a remarkable number of recent or novel drugs have been isolated from natural sources [1]. In the recent past there has been an incredible increase in the use of plants based health products in developing as well as developed countries ensuring in an exponential development of herbal products worldwide. World health organization has made an attempt to identify all medicinal plants used worldwide and listed more than 22,000 species. Medicinal plants are the richest bioresource of drugs of customary systems of medicine, nutraceuticals, modern medicines, food supplements, pharmaceutical intermediates and chemical entities for synthetic drugs [2]. Plant products are still remaining the principal source of pharmaceutical agents used in traditional medicine.

The therapeutic properties of medicinal plants are mainly due to the existence of an assortment of complex chemical substances of diverse compositions which occur as secondary metabolites. The most significant of these bioactive constituents of plants are alkaloids, glycosides, tannins, proteins, phenolic compounds and flavanoids [1,2].

***Achyranthes aspera* Linn:** (Belongs to family Amaranthaceae) is abundantly found in wastelands. It is distributed throughout India up to an altitude of 3000 ft. [3,4]. It is known as "Prickly chaff flower" shown in (Figure-1). The plant is used as anti-phlegmatic, diuretic, antiperiodic, purgative and laxative and useful in treatment of bleeding, asthma, oedema, in facilitating delivery, boils, bronchitis, cough, cold, colic, debility, dropsy, dysentery, dog bite, ear complications, snake bite, renal complications, headache, leucoderma, scorpion bite, skin diseases and pneumonia [5,7].

It is also useful in haemorrhoids, 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 [6,8]. The seeds were authenticated by botanist and were hand collected and subjected to solvent extraction using different solvents the extracts obtained were subjected to chemical tests and then results of chemical tests indicates the presence of carbohydrates, alkaloids, saponins, steroids, flavonoids, proteins, amino acids and terpenoids.

2. Material and Methods

A. Plant: The seeds of *Achyranthes aspera* were hand collected. The seeds were cleaned with distilled water and air dried at room temperature and subjected to size reduction.

B. Extraction Process

Maceration: In maceration (for fluid extract), whole or coarsely powdered plant material is subjected to solvent extraction in a stoppered container for a definite period with frequent

agitation until soluble matter is dissolved. This method is best suitable for use in case of the thermo labile drugs.

The powder of seeds was extracted with benzene at room temperature in a conical flask for 2 days. The contents of the flask were shaken from time to time to ensure proper extraction. After 2 days, the contents of the flask were filtered and the filtrate was concentrated to give the extract. The producer was repeated for a second time.

The marc was then extracted with acetone and Methanol separate flasks for 2 days. The contents of the flasks were shaken from time to time to ensure proper extraction. After 2

days, the contents of the flasks were filtered and the filtrate was concentrated to give the extract. The producer was repeated for a second time.

The obtained extracts were concentrated by evaporation under room temperature. The extracts after concentrated and were subjected to chemical tests in order to determine the nature of chemical constituents present in the extracts.

All the three solvents in the experiments were able to extract in a relatively low concentration.

The yields of different extracts of seeds of *Achyranthes aspera* were shown in (Table-1).

Table 1: The yields of different extracts of seeds of *Achyranthes aspera*:

Type of extract	Weight (gms)	Weight obtained (gms)	Yield (% w/w)
Benzene	70	3.5	5%
Acetone	70	2.9	4%
methanol	70	2.6	3.43%

3. Results and Discussion

The Benzene, Methanol and Acetone solvents extracts of *Achyranthes aspera* Linn (Family-Amaranthaceae) the seeds were studied for its phytochemical investigation. To get preliminary idea about the active constituents present in the seed extracts different chemical test were performed and showed the presence of flavanoids, tannins, sponins, and alkaloids.

Phytochemical screening results of the seed samples of *Achyranthes aspera* extracted in Benzene and Acetone extract showed the presence of alkaloids, carbohydrates, saponins, steroids, flavonoids, proteins and terpenoids, whereas methanol

extract of seeds of *Achyranthes aspera* showed the presence of carbohydrates, C-glycosides and flavonoids (Table-2).

Benzene and acetone solvent extracts were tested with various reagents and the results showed the presence of alkaloids, flavonoids, terpenoids proteins, and amino acids (Figures-2, 3) but glycosides were absent shown in (Table-2).

Methanol solvent extract was tested with various regents these tests conclude with absence of amino acids, Steroids, alkaloids and presence of glycosides (Table-2) (Figure-4).

Table 2: Qualitative chemical analysis of the seeds extract of *Achyranthes aspera* Linn. By using Benzene, Methanol and Acetone solvent extracts:

S.no	Test for Phytochemicals	Benzene extract	Methanol extract	Acetone extract
I.	Alkaloids:			
	a. Dragendroff's test:	+ ve	-ve	+ve
	b. Mayer's test:	+ve	-ve	+ve
	c. Wagner's test:	+ve	-ve	+ve
II.	Carbohydrates:			
	a. Molisch's test:	+ve	+ve	+ve
	b. Benedict's test:	+ve	+ve	+ve
	c. Fehling's test:	+ve	+ve	+ve
III.	Steroids and Terpenoids:			
	a. Salkowski's test:	+ve	-ve	+ve
	b. Libermann Burchard's test:	+ve	-ve	+ve
IV.	Glycosides:			
	A. Cardiac glycosides:			
	a. Baljet's test:	-ve	+ve	-ve
	b. Legal's test:	-ve	+ve	-ve
	B. Anthraquinone glycosides:			
	a. Borntrager's test:	-ve	+ve	-ve
	C. Saponin glycosides:			
	a. Foam test:	+ve	+ve	+ve
b. Froth test:	+ve	+ve	+ve	
V.	Flavonoids:			
	a. Shinoda test:	+ve	+ve	+ve
	b. Alkaline reagent test:	+ve	+ve	+ve
VI.	Proteins and amino acids:			
	a. Millon's test:	+ve	-ve	+ve
	b. Ninhydrin test:	+ve	-ve	+ve



Fig 1: *Achyranthes aspera* Linn Plant:



Fig 2: Chemical tests of Benzene solvent extract:



Fig 3: Chemical tests of Acetone solvent Extract:

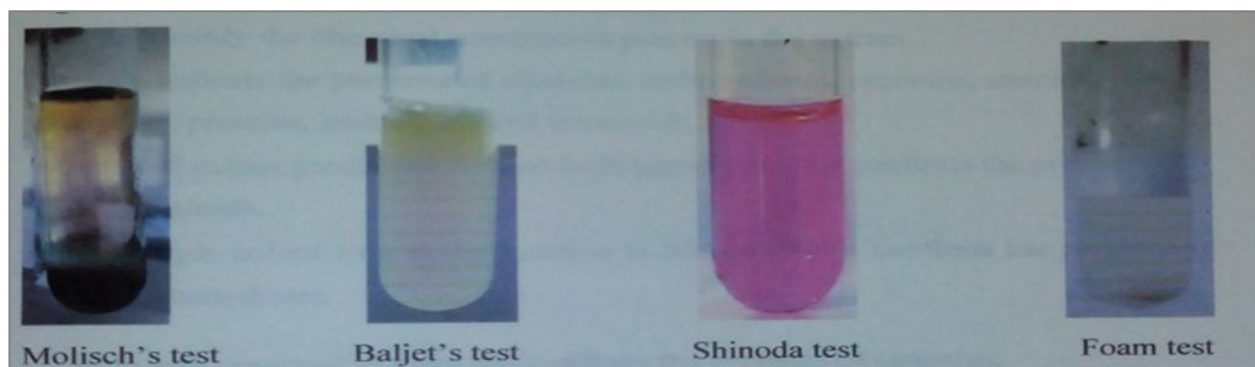


Fig 4: Chemical tests of Methanol solvent Extract:

4. Conclusion

Seeds of *Achyranthes aspera* were hand collected; air dried and it were subjected to size reduction. The obtained powder material was subjected to solvent extraction by using polar and non-polar solvent extracts and subjected to various chemical tests the reports of chemical tests of benzene, acetone and methanol extracts indicates that the presence of alkaloids, saponins, glycosides (especially C-glycosides), flavonoids, proteins, amino acids and terpenoids. Further studies needed to find out the active compounds responsible for these activities and this development effort will help to identify the active constituents. Structures and their mechanism of action liable for the activity and this project will also help a new researcher to precede his research study.

5. Conflict of interest: None.

6. References

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