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Preliminary Phytochemical Analysis of *Trichosanthes Anguina* Linn. Fruit

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Abstract: ***Trichosanthes anguina Linn.(snake gourd) is a cultivated species from the family Cucurbitaceae. The nutritional point of view fruit is important sources of nutrients necessary for human and animal health, the nutritional values make the plant pharmacologically and therapeutically important. It increases appetite and acts as a tonic and stomachic, lessens thirst, cures biliousness and good source of minerals, fibers and vitamin A, B and C and the roots and seeds are anthelmintic, antidiarrhoel and used in the treatment of syphilis. Phytochemical study were carried out on the fruits of Trichosanthes anguina Linn. by using eight different solvents such as aqueous, benzene, chloroform, petroleum ether, acetone, methanol, ethanol and rectified spirit. The presence of secondary metabolites from various extracts reported presence of alkaloids, steroids, tannins, saponins, flavonoids, glycosides, phenols, polyoses, polyuronoids, leucoanthocyanin, carbohydrates, proteins, amino acids and lipids.***

Keywords: Cucurbitaceae, *Trichosanthes anguina* Linn., Phytochemical, Nutritional

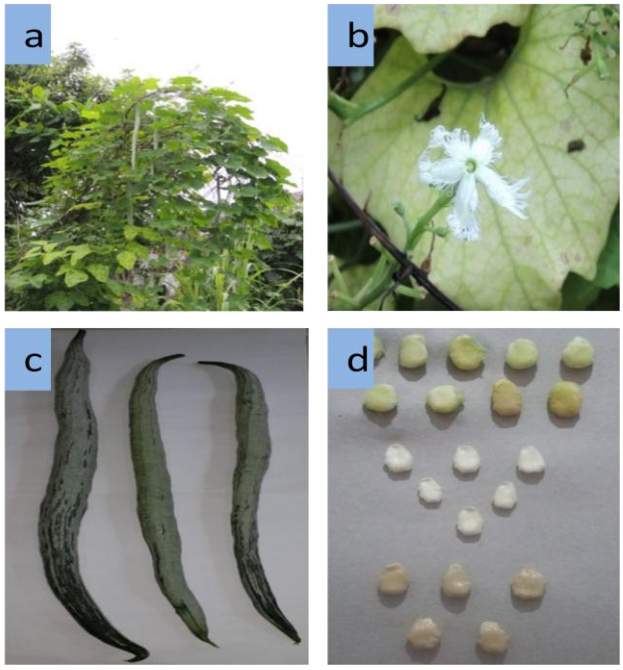
1. Introduction

The family Cucurbitaceae is among the largest, high economic, medicinal values and the most diverse plant families; it containing 110 genera and 640 species; it is cultivated worldwide in a variety of environmental conditions. They have a large range of fruit characteristics; fruits are eaten when immature or mature, it can be baked, pickled, candied, or consumed fresh in salads or dessert and very useful in terms of human health, i.e., purification of blood, removal of constipation and good for digestion and give energy. *Trichosanthes anguina* Linn. is monoecious, climber belonging to Cucurbitaceae family, it commonly known as Padaval in Maharashtra. The fruits are generally very long, narrow, cylindrical, smooth and coiled seen like long snakes and having great medicinal values; when young it is green and striped with white, changing to a bright yellow to orange-red when ripe. The latter has been cultivated for a long time in India for vegetable (27). It is largely used as a vegetable, either boiled or in curry. The plant is used as a purgative and vermifuge. The root and stem both are considered to be cathartic. The leaf juice is rubbed over the liver to relieve liver congestion. The seed are used for stomach disorders (26).

2. Material and Methods

The plant for the present study was collected from Amaravati District, Maharashtra, India in the month of October. It was identified and confirmed with the help of flora of the Maharashtra & other floras. The collected materials were washed thoroughly with water and were shade dried. Dried plant parts were powdered with the help of mixer grinder and stored separately in the air tight polythene zip lock bags for future analysis. Ten grams of dried fine fruit powder was weighed and Powders were extracted in aqueous, chloroform, petroleum ether, acetone, methanol, ethanol, benzene and rectified spirit by Soxhlet extraction method. Detection of bioactive compounds was done by standard prescribed methods. (Harborn J.B. 1973; Kokate C.K. 2009; Thimmaiah S.K., 2009; Trease G.E. and Evans W.C.,1989). Responses to various tests were denoted by +, ++, +++, indicated weak, moderate and strong reaction respectively. Various phytochemical tests performed are mentioned in the observation tables.

3. Observations



(a) Habit, (b) Flower, (c) Fruits and (d) Seeds of *Trichosanthes anguina* Linn.

3.1 Medicinal uses of *Trichosanthes anguina* Linn.

- *Trichosanthes anguina* Linn. fruits are used as a tonic; to cure vata, thirst, biliousness.
- *Trichosanthes anguina* Linn. the fruit have good source of minerals, fibers and vitamins such as vitamin A, vitamin B, vitamin C (14).

- The roots and seeds are anthelmintic, antidiarrhoel and used in the treatment of syphilis.
- Leaf juice rubbed over the liver in remittent fever, skin diseases, antispasmodic, emetic, aphrodisiac, blood purifier and also in cardiac failure.
- The roots and seeds are anthelmintic, antidiarrhoel and used in the treatment of syphilis (19).
- Various parts of the *Trichosanthes anguina* Linn. have been reported to have anti-inflammatory, antioxidant, antibacterial, antifungal, hepatoprotective, anti-diabetic, anti-HIV, anti-arthritic, anti-cardiac failure, anti-fertility, anti-diarrheal, analgesic, cytoprotective, antiovulatory, and antihelmintic (2).

4. Result and Discussion

Phytochemical analysis of fruit extracts provides information about the phytochemical constituents present in *Trichosanthes anguina* Linn. fruit and phytochemical tests were carried out in the laboratory and screened out various metabolites. Plant constituents a source of various chemical compounds which are of potentially used in the medicine and other applications.

In the preliminary phytochemical analysis of fruit extracts of *Trichosanthes anguina* Linn. found the presence of various phytoconstituents such as alkaloids, cardenoloids, steroids, tannins, flavonoids, phenols, leucoanthocyanin, polyoses, polyuronoids, carbohydrates, proteins and amino acids, and lipids. In the observation table mentioned the response to various tests in eight different extracts.

The negative responses in all the eight solvent extracts were recorded for iridoids, anthraquiones and emodins. Anthracene glycosides showed positive response in chloroform, petroleum ether, acetone, rectified spirit extracts and absent in aqueous, benzene, methanol, ethanol extracts. Saponins reported only in aqueous, methanol, ethanol extracts and absent in all remaining solvents.

4.1. Observation Table

Phytochemical constituents of *Trichosanthes anguina* in different solvent extracts:-

Sr. No	Constituents	Chemical Tests	Solvents							
			Aqueous	Chloroform	Benzene	Petroleum ether	Acetone	Methanol	Ethanol	Rectified spirit
1	Alkaloids	(A) Dragendorff's reagent	+++	+++	+++	+++	+++	+++	+++	+++
		Mayer's reagent	_	_	_	+	+	_	_	_
		Wagner's reagent	+++	+++	++	+++	+++	+++	+++	+++
		(B) Mayer's reagent	+	++	++	++	++	++	+	++
		(C) Mayer's reagent	_	_	_	_	_	+	_	_
		Dragendorff's reagent	+	++	+	+	+	++	++	++
2	Iridoids		_	_	_	_	_	_	_	_
3	Anthraquiones	(A)	_	_	_	_	_	_	_	_
		(B)	_	_	_	_	_	_	_	_
4	Simple phenolics		++	++	++	++	+++	+++	++	+++
5	Steroids	(A)Test for steroid nucleus	_	_	_	_	_	_	_	_
		(B) Salkawaski test for unsaturated steroid	++	+	+	++	+++	+++	+++	++
6	Tannins	(A)Gelatin-Salt reagent	+	++	+	_	+	++	+	+
		(B)Aq. Ammonia	_	_	+	+	+	+	_	_
7	Saponins	(A)	++	_	_	_	_	+	++	_
		(B)	+++	_	_	_	_	+	++	_
8	Juglone Test		+	+	+	+	++	++	+	+
9	Emodin		_	_	_	_	_	_	_	_
10	Polyoses		+	++	++	++	++	++	++	++
11	Polyuronoids		+++	++	++	+++	++	+++	++	++
12	Anthracene glycosides		_	+	_	++	+	_	_	+
13	Cardenoloids	(A)Cardiac glycosides	+	+	+	_	+++	_	++	++
		(B) 2-dextrose sugar	++	++	++	++	+++	+++	++	++
14	Flavonoids	(A) Shinoda test	+	++	_	_	_	_	_	+
		(B) Flavanonols	_	_	_	_	_	_	_	_
		(C) Flavonols	+	+	+	+	+	++	++	+
		(D) Flavones & Flavanols	+	++	+	++	++	+++	++	++
		(E) Rao & Sheshandri test	_	_	_	_	_	_	_	_
15	Leuco-anthocyanin	(A)	+	++	+	++	++	+++	++	++
		(B)	_	_	_	_	_	_	_	_
16	Carbohydrates	(A) Molish's test	+	+++	++	+++	++	++	+++	++
		(B) Fehling test	++	+++	+	++	+++	+++	+++	+++
		(C) Benedict test	++	++	+	+	++	+++	+++	+++
		(D) Iodine test	_	+	++	+	+	+	+	++
		(E) Anthrone test	_	_	_	_	_	_	_	_
17	Amino acids	(A) Ninhydrin test	++	++	++	+	+	+++	+++	+++
		(B) Xanthoproteic test	_	_	_	++	++	+++	++	+++

		(C) Million's test	_	_	_	_	+++	+	+	+
		(D) Sakaguchi test	_	_	_	_	+	_	_	_
		(E) Hopkins & Cole	_	_	_	_	_	_	++	+++
		(F) Nitropruside test	_	_	_	_	+++	+	++	++
18	Protein									
	1) Biuret test		+++	+++	+++	++	+++	+++	++	++
	2)Heavy metal	(A) Hgcl2	+++	+++	+++	+++	+++	+++	++	+++
		(B) Cuso4	+++	+++	+++	+++	+++	+++	+++	+++
		(C) Lead acetate	+++	+++	+++	+++	+++	+++	+++	+++
	3)Precipitate by organic solvent	(A) Ethanol	+	++	+++	_	_	_	+	_
		(B) Acetone	+	+	++	+	_	+	+	_
19	Lipid's	(A) Solubility test	++	+	++	++	+++	++	++	++
		(B) Formation of translucent spot on paper	+	++	+++	++	++	++	+	+
		(C) Litmus paper test	++	+	++	++	++	++	++	++
		(D) Emulsification	+	++	+	+	++	++	++	+
		(E) Saponification	+	+	+	+	++	++	++	+++
		(F) Test for unsaturation	+	+	+	+	+	++	++	++

5. Conclusion

The results of the study shown that amongst the above solvents chloroform, methanol, ethanol, acetone and rectified spirit were effective extractants in which most of the common secondary metabolites - alkaloids, flavanoids, phenolics, tannins, steroids were traced out. Iridoids, Anthraquinones and Emodins were absent totally. Anthracene glycosides are present only in chloroform, petroleum ether, acetone and rectified sprit extract and absent in remaining different solvents. Saponins present only in aqueous, methanol, ethanol and absent in remaining solvents. These reports may be useful in the isolation and characterization of active phytoconstituents for bioactivity and have great importance as therapeutic agents.

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