



Phytochemical screening of *Xanthium strumarium* and *Argemone mexicana*

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Abstract

Xanthium strumarium and *Argemone mexicana* are rapidly growing weed in Maharashtra. In present work, qualitative phytochemical screening were carried out in leaf and stem of *Xanthium strumarium* and *Argemone mexicana*. Aqueous, Acetone and Methanol Solvents were used for phytochemicals analysis and revealed the presence of alkaloid, tannin, saponin, flavonoid, phenol, terpenoid and glycoside.

Keywords: *Xanthium strumarium*, *Argemone mexicana*, Phytochemicals screening, Qualitative.

Introduction

The importance of plant is very well known to us. According to world Health organization (WHO), medicinal plants would be the best source to obtain variety of drugs. About 80% of individuals from developed countries use traditional medicines, which has compounds derived from medicinal plants and should be investigated to better understand their properties and efficiency (1).

Plant products can be derived from roots, stem and leaves. Drugs derived from the plants are less expensive, easily available and have minimal or no side effects. *Xanthium strumarium* (Asteraceae) is an annual herb with a short, Stout hair stem and

odour of plant is specific. According to Ayurved, *Xanthium strumarium* is cooling, laxative, fattening, anthelmintic, alexiteric tonic, digestive, antipyretic, and improves appetite, voice, complexion, and memory, it cures leucoderma, biliousness, and poisonous bites of insects, epilepsy, salivation and fever. The plant of *Xanthium* yields xanthinin which acts as a plant growth regulator. Antibacterial activity of xanthinin has also been reported. Seed yields semi-drying edible oil (30-35%) which resembles sunflower oil and used in bladder infection, herpes, and erysipelas. Cake can be used as manure whereas shell can be used as activated carbon [2,3]. The plant has been reported as fatal to cattle and pigs.

Argemone mexicana L. (Papaveraceae), commonly known as Prickly Poppy in English. It occurs as wasteland weed in almost every part of India [4, 5]. In Mexico, the seeds have been used as an antidote to snake poisoning [6]. In India, the smoke of the seeds is used to relieve toothache. The fresh yellow, milky seed extract contains protein-dissolving substances effective in the treatment of diuretic, anti-inflammatory, malarial fever, leprosy, scorpion sting, warts, cold sores, wound healing, skin diseases, itches, jaundice and an antidote to various poisons [7-10]. The seeds are purgative and sedative (Ayurveda) [11], useful in skin diseases and leucoderma (Yunani) [12] and in Homeopathy, the tincture of the entire plant is reported to be used orally for bronchitis and whooping cough [13, 14]. The fresh juice of the leaves and the latex both are reported to be used externally as a disinfectant for open wounds and cuts [15, 16]. Various isoquinoline alkaloids viz. berberine, cryptopine, coptisine, muramine, scoulerine, stylopine, cheilkanthifoline, sanguinarine, sarguinarine, chelerytherine, sanguinarine, thalifoline and protopine have been reported from the plant [17].

The present study was undertaken to evaluate the phytochemical analysis of *Xanthium strumarium* and *Argemone mexicana*, stem and leaves.

Materials and Methods

Collection of plant material

Fresh plant material of *Xanthium strumarium* L. and *Argemone mexicana* L. were collected from different regions of Washim district, Maharashtra, India. It commonly occurs in cultivated land, along with roadside, Shady & moist places. Plant material washed under running tap water 2-3 times to remove soil particles and dust. The plant material was shaded for 12 days. After drying plant materials grinded into fine powder using mechanical blender and then transfer into airtight container with proper labeling for further use.

Preparations of solvent Extracts

Stem and leaves of the plant samples were thoroughly washed with running tap water 2-3 times and then finally washed with distilled water followed by shade-dried for seven days and then dried in an oven below 50°C. The dried plant materials were then powdered using mixer and grinder. 30g of plant powder were extracted with 100ml of aqueous, acetone and methanol. After 24 hours, it was filtered through a filter paper, filtrate was collected. Test can be conducted then and there itself after collection or can be stored in refrigerator for conducting test later.

Phytochemical screening

Extracts of stem and leaves of *Xanthium strumarium* and *Argemone mexicana* using aqueous, acetone and methanol were subjected to various chemical tests in order to determine the secondary plant constituents: (18-22).

Test for Alkaloids

Mayer's test

A few drops of Mayer's reagents were added. The turbidity of the resulting precipitate indicates a positive test for alkaloids.

Test for Tannins

A few drops of 0.1% ferric chloride were added and observed blackish-blue or brownish green coloration indicates the presence of tannins.

Test for saponins

Extract was mixed with 5 ml of distilled water in a test tube and then it was shaken vigorously. Formation of stable foam indicates presence of saponins.

Test for Flavonoids

Extract were treated with few drops of lead acetate solution. Yellow coloration indicates the presence of flavonoids.

Test for phenol

Crude Extract were treated with 3-4 drops of ferric chloride solution. bluish black or blue green colour indicate positive test for phenol.

Test for Terpenoids

(Salkowski test)

Extract was mixed in 2 ml of chloroform and concentrated H₂SO₄ (3ml) was carefully added to form a layer. A radish brown coloration of thin interface was formed it indicates positive test for terpenoids.

Test for amino acids

Ninhydrin test

Crude extract when boiled With 2 ml of 0.2% Solution of Ninhydrin Violet color indicates the presence of amino acids.

Test for Carbohydrates

Benedict's test

2 ml of Benedict's reagent added and heated on boiling Water bath for 2 min. reddish brown precipitate indicates the presence of Carbohydrates.

Test for Glycosides

To known volume of extract 1 ml of distilled Water added and aqueous solution of NaOH was added formation of yellow color indicates positive test for Glycosides.

Results and Discussion

Phytochemical analysis of aqueous Acetone and methanol extract of *Xanthium strumarium* and *Argemone mexicana* shows positive test for tannin, phenol and glycosides were present in both plants. protein and Carbohydrates were absent in the extracts of both plants. Terpenoids were present In *X. strumarium* Leaf extracts. Aqueous Acetone and Methanol extract of *Argemone mexicana* stem Shows positive tests for flavonoids. The Water extract of *X. strumarium* Contain Tannin, saponin, flavonoid, phenol, Terpenoid and glycosides. Water extract of the Leaf of *Argemone mexicana* Tannin, saponin, flavonoids, phenol and glycoside is present. Alkaloid were Absent In Aqueous and Acetone Extracts and present in Methanol extract of stem of *Argemone mexicana*. Aqueous Acetone and Methanol extracts of stem of *Argemone mexicana* Shows for Saponin, Tannin, flavonoid, phenol and Glycoside. The results of phytochemical contents stem and leaf in Aqueous, Acetone and Methanol of *Xanthium strumarium* and *Argemone mexicana* are reported in Table 1 (Fig. 1 to 3), Table-2(Fig. 4 to 6) and Table-3 (Fig. 7 to 9), Table 4 (Fig. 10 to 12), respectively.

Table 1: Phytochemical analysis of Aqueous, Acetone and Methanol extract of stem of *Xanthium strumarium*

Test	Aqueous	Acetone	Methanol
Alkaloid	+	-	+
Tannin	+	+	+
Saponin	+	-	-
Flavonoid	-	+	+
Phenol	+	+	+
Terpenoids	-	-	+
Amino acid	-	-	-
Carbohydrate	-	-	-
Glycoside	+	+	+

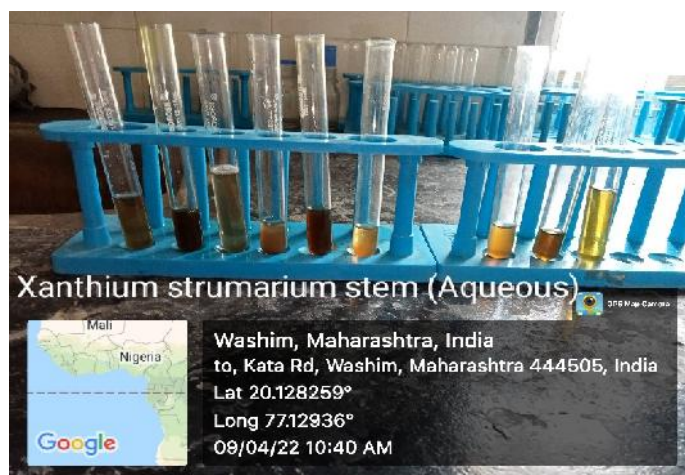


Fig. 1 Phytochemical analysis of Aqueous extract of stem of *Xanthium strumarium*



Fig. 2 Phytochemical analysis of Acetone extract of stem of *Xanthium strumarium*



Fig. 3 Phytochemical analysis of Methanol extract of stem of *Xanthium strumarium*

Table 2: Phytochemical analysis of Aqueous, Acetone and Methanol extract of leaf of *Xanthium strumarium*

Test	Aqueous	Acetone	Methanol
Alkaloid	-	-	-
Tannin	+	+	+
Saponin	+	+	-
Flavonoid	+	-	-
Phenol	+	+	+
Terpenoids	+	+	+
Amino acid	-	-	-
Carbohydrate	-	-	-
Glycoside	+	+	+



Fig. 4 Phytochemical analysis of Aqueous extract of leaf of *Xanthium strumarium*



Fig. 5 Phytochemical analysis of Acetone extract of leaf of *Xanthium strumarium*



Fig. 6 Phytochemical analysis of Methanol extract of leaf of *Xanthium strumarium*

Table 3: Phytochemical analysis of Aqueous, Acetone and Methanol extract of stem of *Argemone mexicana*

Test	Aqueous	Acetone	Methanol
Alkaloid	-	-	+
Tannin	+	+	+
Saponin	+	+	+
Flavonoid	+	+	+
Phenol	+	+	+
Terpenoids	-	+	-
Amino acid	-	-	-
Carbohydrate	-	-	-
Glycoside	+	+	+



Fig. 7 Phytochemical analysis of Aqueous extract of stem of *Argemone mexicana*



Fig. 8 Phytochemical analysis of Acetone extract of stem of *Argemone mexicana*



Fig. 9 Phytochemical analysis of Methanol extract of stem of *Argemone mexicana*

Table 4: Phytochemical analysis of Aqueous, Acetone and Methanol extract of leaf of *Argemone mexicana*

Test	Aqueous	Acetone	Methanol
Alkaloid	+	-	-
Tannin	+	+	+
Saponin	+	+	-
Flavonoid	+	-	-
Phenol	+	+	+
Terpenoids	-	+	+
Amino acid	-	-	-
Carbohydrate	-	-	-
Glycoside	+	+	+



Fig. 10 Phytochemical analysis of Aqueous extract of leaf of *Argemone mexicana*



Fig. 11 Phytochemical analysis of Acetone extract of leaf of *Argemone mexicana*



Fig. 12 Phytochemical analysis of Methanol extract of leaf of *Argemone mexicana*

Conclusion

The *Xanthium strumarium* and *Argemone mexicana* this plants are source of secondary metabolites and the solvent choice is very important for extraction of Phytochemical from plants. Medicinal plants are helpful for discovering and Manufacturing of new drugs. The research on *Xanthium strumarium* and *Argemone mexicana* plants which can be medicinally important.

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	Website: www.ijarbs.com
	Subject: Phytochemistry
Quick Response Code	
DOI: 10.22192/ijarbs.2022.09.05.009	

How to cite this article:

Gajanan D. Wadankar, Janhavi J. Bakal and Sadashiv K. Arsod. (2022). Phytochemical screening of *Xanthium strumarium* and *Argemone mexicana*. *Int. J. Adv. Res. Biol. Sci.* 9(5): 83-92.

DOI: <https://dx.doi.org/10.22192/ijarbs.2022.09.05.009>