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Research Article

PRELIMINARY PHYTOCHEMICAL ANALYSIS OF DIFFERENT SOLVENT EXTRACTS FROM LEAF OF *AMARANTHUS TRICOLOR*

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ABSTRACT

Plants produce wide ranges of secondary metabolites, making them a great source of various types of medicines. A continuous and widespread use of medicinal plants throughout the world has enhanced the concern over their safety, efficacy and quality of natural products. Thus a proper knowledge of the phytochemical constituents of the plants is important, because this information will be desirable for synthesis of new pharmaceutical products. The main objective of current investigation was to study the qualitative preliminary analysis of *Amaranthus tricolor*. Discovery of active compounds and their role in curing diseases from this plant leads its importance. For finding several other compounds the investigation of its qualitative phytochemical analysis of leaves and is very important. Five different solvents viz; water, ethanol, methanol, chloroform and acetone were used to obtain extracts of leaves. These extracts were used for qualitative preliminary phytochemical analysis using standard chemical tests. Data indicate the presence of alkaloids, amino-acid, phenolic compounds, flavonoids, saponins, and cardiac glycosides. Most of the phytochemical components were found in ethanolic extract due to high solubility of active compound of *Amaranthus tricolor* in this solvent as compared to other solvents. The presence of these secondary bioactive phytochemicals signifies the importance of these medicinal plants as an efficient source of therapeutic agent.

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INTRODUCTION

Amaranthus derived from the Greek word “amarantos” which means “unfading” a reference to the persisting color of certain *Amaranth* flowers. Ethno medicinally the plant is used as a source to treat several disorders, boils and burns. The juice of the root is used to treat fevers, urinary troubles, diarrhea and dysentery. The seed is used as a poultice for broken ribs.

Natural's product is a source of synthetic and traditional herbal medicine and is still the primary health care system. Plants consist of a number of biologically active ingredients therefore they are used for the treatment of a large number of infectious disease. The most important of these biologically active ingredients are alkaloids, flavonoids, glycosides, tannins and phenolic compound.

Knowledge of the chemical constitutes of plants is desirable, not only for the discovery new source of such economic materials as tannins, oils, gums, precursors for the synthesis of complex chemical substances.

Plants are utilized as therapeutic agents since time immemorial in both organized and unorganized (folk, tribal, native) form. The healing properties of many herbal medicines have been recognized in many ancient cultures. The natural resources how so ever large are bound to diminish hence need effective strategy is needed for sustainable utilization. Cultivation of medicinal and aromatic plants is constrained due to lack of suitable technology, which has led to low yield and poor quality. Consequently, medicinal herbs are predominantly harvested in sufficient quantities from the wild in an unregulated manner.

MATERIAL AND METHODS

Collection of samples

Fresh plant leaves of *Amaranthus tricolor* were collected from Ahmednagar. The leaves are thoroughly washed through tap water and dried under shade for 3-5 days. The dried leaves are ground to fine powder and stored in polythene bags for further use.

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Preparation of extracts

2 grams of dried powder of *Amaranthus tricolor* leaves was packed in five separate round bottom flask for sample extraction using five solvents namely aqueous, acetone, ethanol, methanol and chloroform. The extraction was conducted with 20ml of each solvent for a period of 24 hours. At the end of the extraction the respective solvents were concentrated under reduced pressure and the crude extracts were stored in refrigerator

Phytochemical analysis

Various chemical tests are conducted to identify presence of different phytochemicals terpenes, alkaloids, flavonoids, glycosides, tannins and phenolic compound based on the protocols available in the literature.

Test of Alkaloids (Wagner's Test)

Take 1ml of plant extract and add 3-5 drops of Wagner's reagent and observe for the formation of reddish brown precipitate or colouration.

Test of carbohydrates (Molisch;s test)

Take 1ml of plant extract and add 3-5 drops of Molisch's reagent, along with this add 1ml of conc. Sulphuric acid (H_2SO_4) down the side of the test tube. Then allow the mixture to stand for 2-3 min. Observe for the formation of red or dull violet colour at the interface of the two layers is positive result.

Test for Cardiac Glycosides (Keller Kelliani's Test)

Take 1ml extract and treat it with 1ml of glacial acetic acid and 2-3 drops of 5% ferric chloride solution. To this mixture add 0.5ml of conc. H_2SO_4 . Observe for a brown ring at the interface shows the presence of deoxysugar characteristics of cardenolides. A violet ring may appear below the ring while in the acetic acid layer, a greenish ring may form.

Test for Flavonoids (Alkaline reagent Test)

Take 1ml of extract and treat it with 3-5 drops of 20% NaOH solution. Observe for the formation of intense yellow colour, which becomes colourless on addition of 0.5 ml dilute HCl indicates the presence of flavonoids.

Test for Phenols (Ferric Chloride Test)

Take 1ml of extract and add 5-6 drops of aqueous ferric chloride solution and observe for the formation of deep blue or black colour.

Test for Amino acid and Proteins (1% Ninhydrin solution in Acetone)

Take 1ml of extract and add 2-5 drops of aqueous Ninhydrin solution and keep it in a boiling water bath for 1-2 min and observe for the formation of purple colour.

Test for Saponins (Foam test)

Take 1ml of extract and add 5ml distilled water and shake vigorously. Observe for the formation of persistence foam for 10-15 min that confirms the presence of saponins.

Test for Tannins (Braymer's test)

Take 1ml of extract and treat it with 1ml of 10% alcoholic ferric chloride solution and observe for the formation of blue or greenish colour.

Test for Terpenoids (Salkowski Test)

Take 1ml of extract and treat it with 0.5ml of conc. HCl and observe for the formation of yellow precipitate or colouration.

Test for Quinones

Take 1ml of extract and add 5ml distilled water and observe for the turbidity.

Test for Coumarins

Take 1ml of extract and add 1.5ml of 10% NaOH then observe for the formation of yellow colour which indicates the presence of coumarins.

RESULTS AND DISCUSSION

Table 1. shows the preliminary phytochemical constituents of aqueous, acetone, ethanol, methanol and chloroform of *Amaranthus tricolor*. The phytochemical screening of the crude extract revealed the presence of flavonoids aqueous and acetone and methanol, ethanol and chloroform extract remaining are absent whereas the Saponins was absent in all the extract solvents. Alkaloids, carbohydrates, cardiac glycosides and tannins are present in all extracts. Quinones and coumarins were present only in ethanol extract and remaining showed negative result. Amino acid and proteins are present in aqueous, methanol and absent in acetone, ethanol and chloroform. Phenols are present in aqueous, acetone, chloroform and ethanol and methanol solvents showed negative result. Terpenoids present in aqueous, chloroform, ethanol and methanol and absent in acetone. Flavonoids present in aqueous and acetone and remaining solvents showed negative result. Resins present in Aqueous, chloroform and ethanol and absent in Acetone and methanol.

Table 1 Preliminary phytochemical constituents of aqueous, acetone, ethanol, methanol and chloroform extracts of *Amaranthus tricolor*

Sr. No.	Phyto Constituents	Aqueous extract	Acetone extract	Chloroform extract	Methanol extract	Ethanol extract
1	Alkaloids	+++	+++	+++	+++	+++
2	Carbohydrates	+++	+++	+++	+++	+++
3	Cardiac glycosides	+++	+++	+++	+++	+++
4	Flavonoids	+++	+++	---	---	---
5	Phenol	+++	+++	+++	---	+++
6	Aminoacids / Proteins	+++	---	---	+++	+++
7	Saponins	---	---	---	---	---
8	Tannins	+++	+++	+++	+++	+++
9	Terpenoids	+++	---	+++	+++	+++
10	Quinones	---	---	---	---	+++
11	Resins	+++	---	+++	---	+++
12	Coumarins	---	---	---	---	+++

Positive +++, Negative ---

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