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Preliminary Phytochemical analysis of *Amaranthus polygonoides.*

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ABSTRACT

Phytochemicals are certain non-nutritive plant chemicals which have some disease preventive properties. The given five extract aqueous, chloroform , chloroform and ethyl acetate, Acetone and aqueous and n-butyl alcohol extracts of leaves of the fresh *Amarathus polygonoides* were screened for the presence of different phytochemical by standard procedure . The present study indicates that the fresh plant contains different classes of secondary metabolites such as alkaloids , steroids , flavonoids , tri terpenoids , anthraquinones , saponins , cardiac glycosides, tannins and reducing sugar . The presence of these secondary metabolites signifies the potential of *Amarathus polygonoides* as a source of therapeutic agent. Therefore,it is of interest to investigate the phytochemical constituents of the Indian medicinal plant *Amaranthus polygonoides.*

Key words : *Amarathus polygonoides* , phytochemicals, flavonoids, saponins , alkaloides

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INTRODUCTION

Amaranthus derived from the Greek word "amarantos" which means "unfading", a r eference to the persisting color of certain Amaranth flowersEthnomedicinally the plant is us ed as a source to treat several disorders such as the leaves are used as a laxative and applie d as an emollient poultice to abscesses, boils and burns .The juice of the root is used to trea t fevers, urinary troubles, diarrhoea 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 .[Kirtikar and Basu , (1995)] Plants consist of a number of biologically active ingredients therefore they are used for the treatment of a large number of infectious diseases [Anpin et al 2010, Rao et al, 2011, Jeeva et al., 2006, Premkumar et al 2011 , Anpin et al, 2011]These biologically active ingredients are alkaloids, flavonoids steroids, glycosides, Terpenes, tannins and phenolic compound [Balakumar, et al 2011, Mohamed , et al 2011, Pour and Sasidharan, 2011., Paulraj, et al , 2011., Rajan,et al, 2011.]

The medicinal value of plants lies in some chemical substances that produce a definite physiologic action on the human body. The most important of these bioactive compounds of plants are alkaloids, flavonoids, tannins and phenolic compounds. Knowledge of the chemical constituents of plants is desirable, not only for the discovery of therapeutic agents, but also because such information may be of value in disclosing new sources of such economic materials as tannins, oils, gums, precursors for the synthesis of complex chemical substances. In addition, the knowledge of the chemical constituents of plants would further be valuable in discovering the actual value of folkloric remedies [Mojab, et al., 2003]. Chemically constituents may be therapeutically active or inactive. The ones which are active are called active constituents and the inactive ones are called inert chemical constituents [Iyengar, 1995.].

Plants provide a variety of resources that contribute to the fundamental needs of food, clothing and shelter. Among plants of economic importance medicinal and aromatic plants have played a vital role in alleviating human sufferings [Baquar , 2001].

Plants are utilized as therapeutic agents since time immemorial in both organized (Ayurveda, Unani) and unorganized (folk, tribal, native) form. The healing properties of many herbal medicines have been recognized in many ancient cultures [Girach ,et al, 2003] The natural resources how so ever large are bound to diminish hence need effective strategy is needed for sustainable utilization [Singh et al , 2003,]. 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 [Shabbir et al, 2003,]

MATERIAL AND METHODS

Collection of samples

The medicinal plant used for the experiment were leaves of *Amarathus*

polygonoids. The plant parts were identified by Dr. Shashikala, Central drug Research Institute, Arumbakkam , Chennai and the respective herbarium were submitted there.

Preparation of extracts

25 grams of crushed extract of *Amarathus viridis* leaves was packed in five separate round bottom flask for sample extraction using five solvents namely aqueous, , chloroform, chloroform and ethyl acetate , acetone and ,aqueous and butanol(1:1). The extraction was conducted with 150 ml 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 represence of different phytochemicals alkaloids, saponin, tannins, steroids, flavonoids, anthraquinone, cardiac glycosides and reducing sugars, tri-terpenoids ,proteins amino acids based on the protocols available in the literature [Iyengar 1995, Siddique and Ali 1997]

Test for alkaloids

To 0.5 g of each extract 5 mL of 1% aqueous hydrochloric acid is added and kept in water bath. 1 mL of the filtrates is to be treated with Mayer's reagent (Potassium Mercuric Iodide) . Formation of a yellow colored precipitate indicates the presence of alkaloids.[Siddique and Ali 1997]

Test for saponins

To 1 ml extract 2 mL of distilled water is added and shaken well. Persistent foam formation indicates presence of Saponins..

Test for tannins

About 0.5 g of plant tuber extract was added was in 10 ml of water in a test tube and filtered. A few drops of 0.1% ferric chloride was added and observed for brownish green or blue-black coloration. **[**Segelman et al,,1969**]**

Test for steroids

2 ml of acetic anhydride was added to 0.5 g of methanol extract of each sample with 2 ml sulphuric acid. The colour changed from violet to blue or green in some samples indicating the presence of steroids. (Siddique and Ali, 1997)

Test for flavonoids

To 4 mL of extract 1.5 mL of 50% methanol solution is added. The solution was warmed and metal magnesium is added. To this solution, 5-6 drops of concentrated

hydrochloric acid is added, red color will be observed for flavonoids and orange color for flavones (Siddique and Ali, 1997).

Test for anthraquinones

About 0.5 g of extract was taken in a dry test tube and 5 ml of chloroform was added and shaken for 5 min. The extract was filtered and the filtrate shaken with equal volume of 10% of ammonia solution. A pink violet or red colour in the ammonical layer indicates the presence of anthraquinones. (Siddique and Ali, 1997)

Test for cardiac glycosides

To the solution of the extract glacial acetic acid,few drops of 5% ferric chloride and concentrated sulphuric acid are added, and observed for a reddish brown coloration at the junction of two layers and the bluish green color in the upper layer (Siddique and Ali, 1997).

Test for Proteins

To 2ml of protein solution 1ml of 40% NaOH solution and 1 to 2 drops of 1% CuSO4 solution was added. A violet color indicated the presence of peptide linkage of the molecule.[Iyengar 1995]

Test for Amino Acids

To 2ml of sample was added to 2ml of Ninhydrin reagent and kept in water bath for 20 minutes. Appearance of purple color indicated the presence of amino acids in the sample (Siddique and Ali, 1997)

Test for Tri-Terpenoids

5ml of each extract was added to 2ml of chloroform and 3ml of con. H2SO4 to form a monolayer of reddish brown coloration of the interface was showed to form positive result for the tri-terpenoids. (Siddique and Ali, 1997)

Test for Reducing Sugars

To 2 ml of extract 2drops of Molisch's reagent was added and shaken well. 2ml of conc. H2SO4 was added on the sides of the test tube. A reddish violet ring appeared at the junction of two layers immediately indicated the presence of carbohydrates.[Iyengar 1995]

RESULTS AND DISCUSSION

Table 1. shows the preliminary phytochemical constituents of Aqueous extract , chloroform extract ,and chloroform and ethyl acetate extract (1:1) ,acetone extract and aqueous and n-butyl alcohol (1:1) of *Amaranthus polgonoides* .The phytochemical screening of the crude extract revealed the presence of flavonoids in chloroform ,and chloroform and ethyl acetate ,acetone and aqueous and n-butyl alcohol extract remaining are absent

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whereas the Terpenoids were absent in all the extracts . In case of Tannins are present in all the extracts .The saponins are present in Aqueous and chloroform extract and remaining showed negative result . In the case of Proteins were present in acetone and aqueous and n-butyl alcohol extract and remaining were absent all the extract got negative result in amino acids. Anthroquinones are positive in the extract of chloroform and ethyl acetate and acetone extract whereas Aqueous, chloroform and aqueous and n-butyl alcohol extract having negative result. In the steroids analysis aqueous and n-butyl alcohol extract showed positive whereas remaining extract showed negative. In the case of alkaloids present in chloroform and aqueous and n-butyl alcohol extract whereas Aqueous , chloroform and ethyl acetate and acetone extract showed negative result .In case of cardiac glycosides and reducing sugar where absent in all the extract.

Table 1: Preliminary phytochemical constituents of aqueous, chloroform , chloroform and ethyl acetate, Acetone and aqueous and n-butyl alcohol extracts of *Amaranthus polygonoides.*

S.NO	PHYTO CONSTITUENTS	AQUEOUS EXTRACT	CHLORO FORM EXTRACT	CHLORO FORM+ ETHYL ACETATE EXTRACT (1:1)	ACETONE EXTRACT	AQUEOUS+ N-BUTYL ALCOHOL EXTRACT (1:1)
1.	Flavanaoid	--	++	++	++	++
2.	Alkaloids	--	++	--	--	++
3.	Saponins	++	++	--	--	--
4.	Tanins	++	++	++	++	++
5.	Amino acid	--	--	--	--	--
6.	Protein	--	--	--	++	++
7.	Terpenoids	--	--	--	--	--
8.	Reducing sugar	--	--	--	--	- -
9.	Cardiac glycosides	--	--	--	--	- -
10.	Anthroquinones	--	--	++	++	- -
11.	Steroids	--	--	--	--	++

Positive ++ , Negative --

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