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Preliminary Phytochemical Screening of *Trianthema portulacastrum*.

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ABSTRACT

Trianthema portulacastrum Linn. is a herb used in Ayurvedic medicine. *trianthema portulacastrum* Linn, belonging to the family Aizoaceae, is one of the common weed, which has enormous traditional uses against diseases and some bioactive compounds have been isolated from this weed. It is an exotic weed and a native of tropical America. It is growing throughout most tropical countries, such as Baluchistan, Ceylon, and India . It is .now naturalized throughout India in cultivated fields, river beds, waste ground, etc . Its infestation is very common in various agricultural and vegetable crops, such as mustard, maize, pigeon pea, mung bean, potato, onion, cotton, soybean, pearl millet, and sugarcane, especially during the rainy seasons. This is not cultivated commercially, but it is found throughout India as a tropical problematic terrestrial weed by virtue of its infestation in plains, river beds, and in wastelands. It also grows automatically in cultivated fields with agriculture and vegetable crops, especially in the rainy seasons . Therefore it is of interest to investigate the preliminary phytochemical screening of *Trianthema portulacastrum*.

Keywords: *Trianthema portulacastrum*, Secondary metabolites, Alternative medicine, Phytochemicals, Crude drugs.

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INTRODUCTION

Recently there has been considerable interest in the use of plant material as an alternative method to control pathogenic microorganism [1] and many components of plants products have been shown to be specially targeted against resistant pathogenic bacteria [2]. The emergence of multidrug resistant strain of many pathogens is a serious threat and makes chemotherapy more difficult. Moreover, the current cost of most of the chemotherapeutic agents is unbearable to the public especially in developing countries like India [3]. Therefore attempts must be directed towards the development of effective natural, non-toxic drug for treatment. Medicinal plants are believed to be important source of new chemical substances with potential therapeutic effects. The secondary metabolites of plants were found to be source of various phytochemicals that could be directly used as intermediates for the production of new drugs. Traditional medicine should be able to play an even greater role in the modern primary healthcare system of the developing countries. The natural medicines are believed to be more acceptable to the human body, when compared to modern synthetic drugs. Thus the most important factor needed is to derive the maximum benefit from the traditional system of medicine for providing adequate healthcare service to rural people. Nature has long been an important source of medicinal agents. An impressive number of modern drugs have been isolated or derived from natural source, based on their use in traditional medicine. The plants have been used traditionally for centuries and modern scientific studies have shown the existence of good correlation between the traditional or folkloric application of some of the plants further strengthens the search for pharmacological active components from plants [4]. Therefore it is of interest to investigate the phytochemical analysis of *Trianthema portulacastrum*.

MATERIALS AND METHODS

Collection of samples

The medicinal plant used for the experiment were leaves of *Trianthema portulacastrum*. were collected from Chennai, Tamil Nadu, India.

Preparation of extracts

500 grams of dried leaves of *Trianthema portulacastrum*. was packed in five separate round bottom flask for sample extraction using solvents namely, Chloroform(70%)-Water(30%) mixture, Acetone, Ethyl Alcohol(70%)-Water(30%) mixture, Ethyl Acetate, and Water. The extraction was conducted by 150 ml of the each solvent mixture for a period of 24 hours. At the end of the extraction the respective solvents were concentrated under reduced pressure and keep it in water bath (at 50°C). Now the extracted experimental solutions were stored in refrigerator.

Phytochemicals analysis

The extracts were prepared and analyzed for the presence of alkaloids, saponins, tannins, steroids, flavonoids, anthraquinones, cardiac glycosides and reducing sugars based on the protocols available in the literature [5-12].

Test for alkaloids

The extract of the crude dry leaf powder of each solvent was evaporated to dryness in boiling water bath. The residues were dissolved in 2 N Hydrochloric acids. The mixture was filtered and the filtrate was divided into three equal portions. One portion was treated with a few drops of Mayer's reagent, one portion was treated with equal amount of Dragendorff's reagent and the third portion was treated with equal amount of Wagner's reagent respectively. The appearance of creamish precipitate, the orange precipitate and brown precipitate indicated the presence of respective alkaloids.

Test for saponins

About 0.5 g of the plant tuber extract was vigorously shaken with water in a test tube and then heated to boil. Frothing was observed which was taken as a preliminary evidence for the presence of the 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.

Test for steroids

2 ml of acetic anhydride was added to 2 ml of plant tuber extract of each sample along with 2 ml sulphuric acid. The colour changed from violet to blue or green in some samples indicating the presence of steroids.

Test for flavonoids

2 ml of extract solution was treated with 1.5 ml of 50% methanol solution. The solution was warmed and metal magnesium was added. To this solution few drops of conc. Hydrochloric acid was added and the red colour was observed for flavonoids and orange colour for flavones.

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.

Test for cardiac glycosides

0.2 g of extract was dissolved in 1 ml of glacial acetic acid containing 1 drop of ferric chloride solution. This was then under layered with 1ml of concentrated sulphuric acid. A brown ring obtained at the interface indicated the presence of a deoxysugar characteristic of cardioids.

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 colour indicated the presence of peptide linkage of the molecule.

Test for Amino Acids

To 2 ml of sample was added to 2 ml of Ninhydrin reagent and kept in water bath for 20 minutes. Appearance of purple colour indicated the presence of amino acids in the sample.

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.

Test for Reducing Sugar

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.

Trianthema portulacastrum



RESULTS AND DISCUSSION

Preliminary Phytochemical analysis of Aqueous methanol, Aqueous Chloroformic and Aqueous ethyl acetate extracts of *Trianthema portulacastrum*.

S.No	Phytochemical Constituents	Aqueous Methanol extract	Aqueous Chloroformic extract	Aqueous Ethylacetate extract
1	Flavanoids	++	++	++
2	Alkaloids	++	++	++
3	Tri-Terpenoids	++	--	--
4	Saponins	--	--	--
5	Tannins	--	++	++
6	Reducing Sugars	++	++	++
7	Amino Acids	--	--	--
8	Proteins	--	--	--
9	Anthroquinones	--	--	--
10	Steroids	++	++	++
11	Cardiac Glycosides	++	++	++

Numerous plant products in the form of decoction, tincture, tablets and capsules have been clinically used for the treatment of different ailments and diseases including cancer. Synthetic analogues in some cases have also been prepared to improve the efficacy and decrease the side effects of parent compounds. Traditional medicine using plant extracts continues to provide health coverage for over 80% of the world's population, especially in the developing world. Indeed, traditional medicine is a potential source of new drugs and a source of cheap starting products for the synthesis of known drugs. Plant chemicals from carbohydrates, fats, protein, vitamins and minerals, are parts of our body composition and chemistry. Plant medicine remains indispensable to modern pharmacology and clinical practice. Many of the current drug discovery and development process are plant-based and new medicines derived from plants are inevitable. Table 1. showed

that Preliminary Phytochemical analysis of Aqueous methanol ,Aqueous chloroformic and Aqueous ethyl acetate extracts of *Trianthema portulacastrum* were analysed. The phytochemical screening of the crude extracts of aqueous methanolic extract revealed that the presence of Flavonoids, Tri-terpenoids, Alkaloids, Triple sugars, Cardiac glycosides and Steroids remaining all are absent. In aqueous ethyl acetate extract of plant contains Flavonoids, Alkaloids, Tannins, Steroids, Triple sugars and Gardiac glycosides remaining phytoconstituents was absent. Flavonoids, Alkaloids, Triple sugars ,Tannins, Steroids, Tri-terpenoids and Cardiac glycosides were presnt in the the aqueous chloroformic extract of *T.portulacastrum* and remaining phytochemicals were absent.

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