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Phytochemical Analysis and Antibacterial Property of Flowers of Abrus Precatorius L.

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INTRODUCTION

The value of medicinal plants, herbs as herbal remedies being lost due to lack of awareness and deforestation. Abrus precatorius L. is a plant is having medicinal potential to cure various disease. It is also known as Rosary pea or jequirity pea. Belonging to family Fabaceae and subfamily papilonaceae. Found all throughout the plains of India. At altitude up to1200 m on the outer Himalayas but now found in all tropical countries. A.Precatorius is a beautiful, much branched, slender, perennial, deciduous, woody, prickly twinning or climbing herb. The stem is wrinkled, cylindrical, bark smooth - textured, brown in colour. The leaves are look like tamarind leaves. Having 20-40 leaflets, they are glabrous and arranged in pairs. They are oblong, measuring 2.5 cm long and 1.5 cm wide. The leaves are pinnately compound, stipulate, 7-24pair of leaflets with appressed hairy. Flowers in auxillary raceme, they are numerous and appear in leaf axiles along the stems, shorter than leaves, seen in red to purple colour or occasionally white. The plant produces shout and short brownish pods, which curl back on opening to reveal toxic and attractive red seeds with black at the hilum. There are 4-6 peas in a pod. The black colour on seed is similar to the eyes of a chicken, so it named chicken eye pearl. The seeds are crushed and taken orally for suicidal purpose. There is no antidote for this poisoning.

Plants are potent biochemists and have been components of phytomedicine since time immemorial; man is able to obtain from them a wondrous assortment of industrial chemicals. Many plant species have been utilized as traditional medicines but it is necessary to establish the scientific basis for the therapeutic actions of traditional plant medicines as these may severe as the source for the development of more effective drugs.

MATERIALS AND METHODS

The fresh leaves of Abrus precatorius were collected from near Markaz Arts and science college, Athavanad. The plant was identified from Botany Department of Markaz College.The plant name checked with www.theplanlist.org.

Preparation of Extracts

Leaves of the plant were shad dried for several days. The dried plant material was ground to course powder and soaked in Distilled water solvent for 48 hours. The solvent was then removed by rotary evaporation. Each residue was weighed and dried extract was stored in refrigerator for further studies.

PRELIMINARY PHYTOCHEMICAL ANALYSIS

Test for Carbohydrates
Molisch's Test:
2 ml of the sample solution was placed in a test tube. Two drops of Molisch's reagent was added. Then two ml of Conc. H_2SO_4 was poured in to the tube. The solution was observed for the formation of purple ring at the junction of two liquids.

Test for Sugar
Benedict's test:
2 ml of Benedict's reagent was taken in a test tube and added 5 drops of thetest solution. Boiled for 5 minutes in water bath and cooled. Noted the color of precipitate.Appearance of red Colouration indicates the presence of sugars.

Test for Ketose
Seliwanoff's Test:
2 ml of seliwanoff's reagent was treated with 2 drops of test solution and heated the solution of just boiling. Red color occurs in the presence of ketose.

Test for Starch
Iodine Test:
2 ml of the test solution was taken in the test tube and added few drops of KI (potassium iodide) solution and shaken well. Blue coloration indicates the presence of starch.

Test for Aminoacid
Ninhydrin Test:
To 2 ml of test solution added 1 ml of Ninhydrin and heated in a boiling waterbath for 20 minutes. Violet color indicates the presence of protein.

Test for Fats
Filter paper Test :
Small quantity of powder was pressed in between the filter paper and watchedfor oily appearance on the paper.

Screening of secondary metabolites
Test for Quinone H_2SO_4Test :
To 2 ml of test solution added Conc. H_2SO_4drop by drop and shakenvigorously. Formation of red color indicates the presence of quinone.

Test for Cardiac Glycosides
Keller-killani Test:
To 2 ml of the filtrate added 1 ml of glacial acetic acid, $FeCl_3$ followed by Conc.H_2SO_4
Appearance of brown ring at the interface indicates the presence of deoxy sugarcharacteristics of Cardiac Glycosides.

Test for Steroids Salkowski Test:
2 ml of each extract was mixed in a 1 ml of chloroform & 2 ml of Conc. H_2SO_4 was carefully added. A reddish browncolor at the interface is an indicative of the presence of steroid ring.

Test for Flavanoids
Alkaline reagent Test:
The extract (1 ml) was taken in a test tube and added a few drops of dilute NaOH solution. In intense yellow colour was appeared in the test tube. It became colourless when on addition of a few drops of dilute acid that indicated the presence of flavonoids.

Test for Alkaloid
Dragendorff's Test:
Extract was diluted in ethanol 96%,HCl 2n was added solution was filtered and the filtrate taken in to two test tube. Each of test tube identified by reagent of dragendorff. The positive result is yellow precipitate.

Test for Phenol
Ferric chloride Test:
To 1 ml of alcoholic solution, 2 ml of distilled water followed by few drops of 10% aqueous ferric solution were added. Formation of blue or green color indicates the presence of Phenol. **Test for Saponins**

Foam Test:
To 2 ml of the test solition added 1 drop of Na_2HCO_3 and shaken vigorously. Formation of honeycomb like froth indicates the presence of saponins.

Test for Tannin
Lead acetate Test:
To 2 ml of test solution added a few drops of 10% lead acetate solution. Formation of a yellow or red precipitate indicates the presence of tannin.

Test for Coumarin
To 1 ml of test solution added 10% NaOH solution. Yellow color will be formedin the presence of coumarin.

Test for Terpenoids
5 ml of the extract was added to chloroform along with a few drops of Conc. Sulphuric acid. The mixture was shaken well and kept aside for some time. Appearance of yellow color in the lower layer indicates the presence of terpenoids.

ANTI BACTERIAL PROPERTY
The hole plate diffusion was used or described to access the antimicrobial susceptibility of extracts by measuring the diameter of zone inhibition and determining the minimal inhibitory bacterial concentration. The hole plate diffusion method consisted of performing a uniform spread of bacteria suspension on a Muller- Hinton agar plate followed by creation of wells of 6mm diameter on labelled positions of the bacteria lawn and filling respective. Wells with 120 of test solution. Positive control wells contain gentamicin and nystatin respectively, for bacterial species and 10% DMSO served as the negative control. Plate were incubated at 37°c for 24 hours and and zone of inhibition measured. Read carefully along the sides.

RESULT & DISCUSSION

Phytochemical screening results of Distilled water extract of leaves showed the presence of alkaloids, carbohydrates, Quinone, Cardiac glycoside, steroid, Flavonoid, Saponin, Tannin,
Phenol, Coumarin and Terpenoids.(Table 1.1)

Table 1.1 Phytochemical Screening of leaves of Abrus precatorius

1°&2°metabolites	Name of test	Distilled water Extract
Carbohydrate	Molisch's test	+
Sugar	Benedict's test	-
Ketose	Seliwanoff's test	-
Starch	Iodine test	-
Aminoacid	Ninhdrin test	-
Fat	Filter paper test	-
Quinone	H_2SO_4 test	+
Cardiac Glycosides	Keller-killani test	+
Steroid	Salkowski test	+
Flavanoid	Alkaline reagent test	+
Alkaloid	Dragendorff's test	+
Phenol	Ferric chloride test	+
Saponins	Foam test	+
Tannin	Lead acetate test	+
Coumarin	Sodium Hydroxide test	+
Terpenoids	Salkowski test	+

Antibacterial property analysis

Distilled water Extract of Abrus precatorius L. showed inhibitory effect against E.colisps. The extract shows 16 cm zone of inhibition (sensitive) against bacteria . The inhibitory effect shows the Positive Result.

DISCUSSION

We took Abrus precatorius L.as our material because the plant was common everywhere . But now it has become less common . It has many medicinal property. Abrus precatorius is a folk medicine . It has a long term medicinal history worldwide.It is used to treat various ailments such as bronchitis, hepatitis ,tumor, abortion etc. Only few studies are conducted on this plant. Abrus precatorius first described as a medicinal plant by William Boericke in the Homeopathic Materia Medica entitled Jequirity. Comparing the seed,root,leaves; the leaves is observed to the less toxic.

The phytochemical analysis of leaves shows presence of various secondary metabolites like flavonoids, saponin, tannin and alkaloids.Secondary metabolites are substances manufactured by plants that make them competitive in their own environment. These small molecules exert a wide range of effects on the plant itself and on other living organisms.Presence of such secondary metabolites indicate antibacterial property and we conducted experiment on antibacterial efficiency against E.colisps and It resulted16 cm zone of inhibition (sensitive). These phytochemicals can be antimicrobial, act as attractants / repellents, or as deterrents against herbivores.

CONCLUSION

This study has explored the various phytochemicals including including flavonoids, alkaloids, saponin, tannin present in the leaf of Abrus precatorius . Further studies in necessary to get maximum benefit from this plant. It is used to make drug and medicine. It can play a pivotal role to change the traditional system of medicine in to scientific and standard medication system. The present study evaluate the antibacterial property and determine the zone of growth inhibition of leaf extract of Abrus precatorius on some bacterial strain . The antibacterial property was evaluated against the variants of E.coli. And it's show the zone of inhibition. The result is indicated the leaf extract of Abrus precatorius contains phytochemicals that are potential antibacterial sources and can be used to discover bioactive products that may be useful to combating bacteria . The result is obtained the leaf extract of Abrus precatorius contains antibacterial agents and it shows the plant can be valuable natural source for the treatment and discovery of novel phytochemicals that could be effective against antimicrobial infections and drug resistant microorganisms. The inhibition of bacteria tested by the extract of Abrus precatorius may be exploited in the treatment of various diseases caused by bacteria. It is folkloric use of Abrus precatorius leaf extract for wound treatment. There are many drugs have entered the international market through exploration of traditional medicine. Abrus precatorius is the good source of many unique potential phytochemicals.

We hope that the study emphasize the accuracy and efficiency of traditional remedies and that in inspires people to realize the importance of protecting natural resources for sustainable use for its protect pharmaceuticals.

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