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Phytochemical Study of White Variety Seed of Abrus Precatorius. Linn (Leguminosae) an Unexplored Medicinal Plant of India

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ABSTRACT

Plant medicines are great importance in the primary healthcare in many developing countries. According to World Health Organization (WHO) still about 80% of the world population rely mainly on plant-based drugs. In Ayurveda, Siddha, and Unani, utilizing a large number of medicinal plants were used for the treatment of human diseases [1].The medicinal plants occupied a unique place in human life. It provides more information about the use of plants or plant parts as medicine[2]. Medicinal plants are one of the most sensitive commodity areas of research in the world today. The medicinal plants have been used by humans from the pre-historical times.Medicinal plants play a vital role in drug discovery . About 50 drugs have been discovered from ethnobotanical leads by translating folk knowledge into new pharmaceuticals [3]. Plant-based drugs used in the traditional medicine have paid great attention because it is easily available, less expensive and also have no side effects [4].Plants have the ability to synthesize a wide verity of phytochemical compounds as secondary metabolites. Many of the phytochemicals have been used to effectively treat the various ailments for mankind. The evaluation of these drugs is primarily based on phytochemical, pharmacological and allied approaches including various instrumental techniques such chromatography, microscopy and others. With the emerging worldwide interest in adopting and studying traditional systems and exploiting their potential based on different health care systems, the evaluation of the rich heritage of traditional medicine is essential[5]. World Health Organization has made an attempt to identify all medicinal plants used globally and listed more than 20,000 species. Most of the medicinal plant parts are used as raw drugs and they possess varied medicinal properties [6].Plants have a great potential for producing new drugs and used in traditional medicine to treat chronic and even infectious diseases [7]. India has a unique position in the world, where a number of recognized indigenous systems of medicine are available for the health care of people. No doubts that the herbal drugs are popular among rural and urban community of India. The demands for plant based medicines are increasing very fast in India. Among the traditional system of medicine Abrus precatorius L is one of the important herb commonly known as Indian licorice Fabaceae.

Keywords : Medicinal Plants, World Health Organization, Abrus Seeds, Ulcerogenic

I. INTRODUCTION

The seeds of Abrus precatorius have been used through history in a variety of roles. The Abrus seeds have also been used for medicinal purposes, including the treatment of chronic eye disease. Arabic culture has purportedly used the seed as an aphrodisiac known as coq's eye. The toxicity of theAbrus seed was associated with its use as a fish poison as well as a homicidal agent.The poisoning by the seeds of Abrus precatorius has been reviewed and reported often in literature. Death has been reported with twenty seeds bended with water. The symptoms included vomiting of blood, severe pain in the eyesand burning of ears. Death ensued in two days [8].

The word "Phyto" is the Greed word for plant. Phytochemicals, which not only that they are nonnutritive. Phyto chemicals that have protective or disease preventive properties but also protect human from a host of diseases [9]. From thousands of years, plants have been utilized as medicines. Major constituents of more than 50% of all the drugs in clinical use are natural products and their derivatives [10]. Medicinal herbs constitute effective sources of antimicrobial and antioxidant natural products[11]. Medicinal herbs are an important source for the therapeutic remedies of various ailments [12]. Plant was

used asanthelmintic, astringent and also used for dysentery, snake bite, fever, inflammation and rheumatism. Biological activities such as analgesic, anti-inflammatory and ulcerogenic were reported for more research scholars and scientist. There has been an growing interest in the study of medicinal plants as natural products in diverse parts of the world[13]. Medicinal plants containing active chemical constituents with high antioxidant property play an important role in the prevention of various degenerative diseases [14]

This article aims to provide a comprehensive review on the phytochemical study of white variety seed of aspects of *Abrus Precatorius L*

Taxonomical classification

Kingdom: Plantae
Division: Magnoliophyta
Order: Fabales
Family: Facaceae
Subfamily: Facoideae
Tribe: Abreae
Genus: Abrus
Species: Abrus precatorius

Common names in India

Sanskrit	Gunja
Hindi	Rati,Gaungchi,Gunchi, Gunja
Bengali	Kunch,Koonch,Chunhali
Gujarati	Gumchi,Chanothi
Kannada	Gurugunji
Kashmiri	Shangir
Malayalam	Kunni,Gundumani
Persian	Gunchi,Chashami-Khurosa
Punjabi	Mulati
Tamil	Gundumani, Kunthamani
Telugu	Guruginia

Common name according to different countries

Egypt	Rosary pea
Nepal	Crab's eye
Philippines	Jequerity
USA	Precatory bean
Indonesia	Saga
Pakistan	Gunchi

Figure.

II. MATERIALS AND METHODS

Collection of seed sample

The white seeds were collected from the garden cleaned and chopped into small pieces, shade dried and coarsely powdered and stored in a sealed vessel wrapped with a polyethylene bag at 4^0c.

Preparation of extracts

After cleaning and removal of the sand and foreign materials, the dried and powdered material were ground to a fine powder using a grind. The seed powder sample was extracted with methanol and n-hexane (1:4 w/v) by continuous extraction in a soxlet apparatus for 48 h at 40-60^0c. The extracted was separated from solvent by rotavapour at 40^0c. After extraction and purification the sample were filtered and stored.

Preliminary Phytochemical screening

Test for alkaloids:

Extract was dissolved individually in dilute Hydrochloric acid and Solution was clarified by filtration.

a. Mayer's Test:

Filtrate was treated with Mayer's reagent (Potassium Mercuric Iodide). Formation of a yellow colored precipitate indicates the presence of alkaloids.

b. Wagner's Test:

Filtrate was treated with Wagner's reagent (Iodine in Potassium Iodide)Formation of brown/reddish precipitate indicates the presence of alkaloids.

c. Dragondroffs Test:

Filtrate was treated with Dragondroffs reagent (solution of Potassium Bismuth Iodide). Formation of red precipitate indicates the presence of alkaloids.

Test for Flavonoids

a. Alkaline Reagent Test:

The Extract was treated with few drops of sodium hydroxide solution. Formation of intense yellow colour, which becomes colorless on addition of dilute HCl acid, indicates the presence of flavonoids.

b. Lead acetate Test:

The Extract was treated with few drops of lead acetate solution. Formation of yellow colour precipitate indicates the presence of flavonoids.

Test for Carbohydrate

a.Molisch's Test:

To 1 ml of extract, 2 drops of Molisch's regent was added in a test tube and 2 ml of concentrate H2SO4 was added carefully keeping the test tube slightly curved. Formation of violet ring at the junction indicated the presence of carbohydrate.

b.Benedict's Test :

Test solution was mixed with few drops of Benedict's reagent (alkaline solution containing cupric citrate complex) and boiled in water bath, observed for the formation of reddish brownprecipitate to show a positive result for the presence of carbohydrate.

c. Fehling's Test:

Extracts were hydrolyzed with dil. HCl, neutralized with alkali and heated with Fehling's A
& B solutions. Formation of red precipitate indicates the presence of carbohydrate.

Test for phenols

a. Ferric Chloride Test:

The aqueous solution of extract was treated with three drops of freshly prepared 1% ferric chloride and potassium ferrocyanide. Formation of bluish-green colour was taken as positive. The methanol extract was dissolved in water. Few crystals of ferric sulphate were added to the mixture. Formation of dark violet colour indicated the presence of phenolic compounds.

Test for Saponins

a. Froth Test:

Extract was diluted with distilled water to 20ml and this was shaken in a graduated cylinder for 15 minutes. Formation of 1 cm layer of "honey comb" froth indicates the presence of saponins.

Test for Proteins

a.Biuret Test:

Test solution was treated with 10% sodium hydroxide solution and two drops of 0.1% copper sulphate solution and observed for the formation of violet/pink color.

Test for Phytosterols

a. Salkowski's test:

The extract was dissolved in 2 ml chloroform in a test tube. Conc. Sulphuric acid was carefully added on the wall of the test tube to form a lower layer. A reddish brown colour at the interface
indicated the presence of a steroid ring i.e., glycoside.

b. Liebermann Burchard's test:

The Extract was treated with chloroform and filtered. The filtrate was treated with few drops of acetic anhydride, boiled and cooled. Conc. Sulphuric acid was added. Formation of brown ring at the junction indicates the presence of phytosterols.

Test for Oil & Fats

a.Filter paper test:

Small quantities of various extracts were pressed separately between the filter papers. Appearance of oil stain on the paper indicates the presence of fixed oils.

Test for Glycosides

a.Keller Killiani Test:

Test solution was treated with few drops of glacial acetic acid and Ferric chloride solution and mixed. Concentrated sulphuric acid was added, and observed for the formation of two layers. Lower reddish brown layer and upper acetic acid layer which turns bluish green would indicate a positive test for glycosides.

b.Borntrager's Test:

To the 3ml of aqueous extract, dil. H2SO4 was added. The solution was then boiled and filtered. The filtrate was cooled and to it equal volume of benzene was added. The solution was shaken well and the organic layer was separated. Equal volume of dilute ammonia solution was added to the organic layer. The ammonia layer turned pink showing the presence of glycosides.

Test for Tannins

a. Ferric chloride test

The extract was dissolved in water. The solution was clarified by filtration; 10% ferric chloride solution was added to the clear filtrate. This was observed for a change in colour to bluish black.

b. Lead acetate test.

The extract was dissolved in water and to that 10% Lead acetate solution was added. The appearance of yellow precipitate confirms the tannins.

Gelatin Test: To the extract, 1% gelatin solution containing sodium chloride was added. Formation of white precipitate indicates the presence of tannins.

Test for Coumarins

0.5 g of the moistened various extracts was taken in a test tube. The mouth of the tube was covered with filter paper treated with 1 N NaOH solution. Test tube was placed for few minutes in boiling water and then the filter paper was removed and examined under the UV light for yellow fluorescenceindicated the
presence of coumarins

Test for Anthraquinones

About 0.5 g of each extract was boiled with 10 % HCl for few minutes in water bath, filtered and allowed to cool. Equal volume of $CHCl_3$ was added to the filtrates. Few drops of 10% ammonia was added to the mixtures and heated. Formation of rose-pink color indicated the presence of anthroquinone.

Test for Anthocyanins

The presence of anthocyanins has been demonstrated by adding 2 mL of the plant extract with 2 mL of 2 N HCl. The appearance of apink-red color that turns purplish blue after addition of ammonia indicates the presence anthocyanins

Detection of Diterpenes

Copper acetate Test:

Extracts were dissolved in water and treated with 3-4 drops of copper acetate solution. Formation of emerald green colour indicates the presence of diterpenes

Table 1. Results of phytochemical analyses of the seed (white variety) of Abrus precatorius. L

Sr.No.	Variable	Methanol extract	n-hexane extract
1	Alkaloids	+	+
2	Flavonoids:	++	+
3	Carbohydrate:	-	-
4	Phenols:	+	+
5	Saponins	+	+
6	Proteins	+	+
7	Phytosterols	-	-
8	Oil	-	+
9	Fats	-	-
10	Glycosides:	+	+
11	Tannins	-	-
12	Coumarins	-	-
13	Anthraquinones	-	-
14	Anthocyanins	+	+
15	Diterpenes	-	-

(+) = Presence, (-) = Absence

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