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Evaluation of antioxidant, anticoagulant and fibrinolytic activity of medicinal plant extract of *ricinus communis*

Dr. Dhinek A[1] | Dr. Sowmia C[2]

[1]Associate Professor, Department of Biochemistry, Sri Ramakrishna College of Arts and Science for Women, Coimbatore, Tamil Nadu, India.
[2]Associate Professor, Department of Biochemistry, Kongunadu College of Arts and Science, Coimbatore, Tamil Nadu, India.

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ABSTRACT

The study is aimed to evaluate Phytochemical and antioxidant, anticoagulant and fibrinolytic activity of ricinus communis. The herb plays a major role in the management of various liver disorders through the traditional medical practices, followed throughout the world. It is better to use a poly herbal formulation than a single herb. Alkaloids and Glycosides were present in higher amounts in all extract. Flavonoids and Steroids were present in higher amounts in ethanol, methanol, aqueous and acetone extract. Carbohydrates, Tannis and saponins were present in higher amounts in ethanol, methanol and aqueous extract. Phenols and proteins were present in methanolic extract of ricinus communis. Ascorbic acid- non enzymatic antioxidant was present in higher amounts in T1 which contained 1ml of extract and lesser amount was present in T2 which contained 0.5ml of the extract. The present study revealed that aqueous, methanol and acetone extract of ricinus communis shows no hemolysis and have more anticoagulant activity. The ethanol extract have only mild anticoagulant activity.

KEYWORDS: *Ascorbic acid, ricinus communis, anticoagulant*

I. INTRODUCTION

Medicinal plants form the backbone of traditional medicine. They are regarded as potential sources of new compounds of therapeutic value and as sources of lead compounds in drug development. The utilization of plant cells for the production of natural or recombinant compounds of commercial interest has gained increasing attention over past decades (Hasan *et al.*, 2007).

Ricinus Communis is an Indian medicine. All the parts of the plants are used for the herbal formulation. It is known as Errand in Ayurvedic classics essential oils come from medicinal plants (Singh, *et al.*, 2010). The root and seed oil of this plant have used for the treatment of inflammation, hypoglycemic, laxative, diuretic, antibacterial, insecticidal, contraceptive, antifertility activity (Upadhayay *et al.*, 2013). Indian traditional The oil of the Castrol seed is colorless or fainty yellow odorless viscid liquid. It is fixed and dried very slowly. It is an oleic acid of about 1.5 percent. (Rahal, *et al.*, 2009).

However, in present scenario the scientific validation is needed to establish their use in present medicinal system and to competewith allopathic medicines (Hussain, *et al.*, 2001;

Mahima *et al.*, 2012; Upadhayay *et al.*, 2013 The important mechanism of the medicinal plants used for the traditional medicinal practitioners for the liver diseases are antioxidant activity. Flavonoids and other polyphenolic compounds have received great attention for this activity. Ricinus communis have phytochemical constituents like Flavonoids and other phenolic compounds present in the extraction of the materials to help the hepatoprotective activity. Research suggests that phytochemicals, working together with nutrients found in fruits, Vegetables and nuts, may help slow the aging process and reduce the risk of many diseases, including cancer, heart disease, stroke, high blood pressure, cataracts, phytochemical fight to your health. (Kala *et al.*, 2002)

The cell may function poorly or die if this occurs. To prevent free radical damage, the body has a defence system of antioxidant. A link between free radical and disease has lead to consider rate research with the aim to discover nontoxic drugs that can scavenge free radical. (Desideri *et al.,* 2003).

Several plants and products posses free radical scavenging activity. Many plants synthesize substances that are useful to the maintenance of health in humans and other animals. These include aromatic substances, most of which are phenols or their oxygen-substituted derivatives such as tannins, plant pigments and other natural oxidants including vitamins. (Patil *et al.,* 2003).

II METHODOLOGY

Collection of plant material:

The experiment work conducted in *ricinus communis* were collected dried. Then it was powdered for the preparation of the extract.

Preparation of the extract:

5g of powder was weighed and taken in 6 standard flask and dissolved in 25 ml of ethanol, methanol, acetone, distilled water, chloroform and petroleum ether separately. The mixture were kept in room temperature for two days. Then it was taken in 6different centrifuge tubes.

The tubes were centrifuged and the supernatant of 6 different tubes were collected. Each tube was named as sample1, sample2, sample3, sample 4, sample5 and sample6.All the 6samples were taken for the experiment.

PHYTOCHEMICAL SCREENING

Detection of alkaloids:

Mayer's Test: 1.36g of mercuric chloride was dissolved in 60ml of distilled water and 5gm of potassium iodide in 10ml of distilled water. The two solutions were mixed and diluted to 100ml with distilled water. To 1.0ml of extract and few drops of reagent was added. Formation of white or pale precipitate showed the presence of alkaloids.

Detection of carbohydrates:

Molisch's Test: To 3ml of extract with 2 drops of freshly prepared 20% alcoholic solution of alcohol napthol was added mixed.To this solution 2ml of concentrated sulphuric acid was added, so as to form a layer below the mixture. Formation of red violet ring at the junction of the solution and is disappearance on addition of an excess solution indicates the presence of carbohydrates.

Fehling's test: To 2ml of extract, 1ml of equal parts of Fehling solution A and B was added. The contents were boiled for a few minutes. Formation of red or brick red precipitate indicates the presence of carbohydrates.

Detection of glycosides:

To 2ml of the extract added 4 drops of chloroform, 2 drops of concentrated sulphuric acid at the side of the test tubes. Then developed of a brownish ring at the interface of the two liquids and appearance of violet color in the supernatant layer indicate the presence of glycosides.

Detectionof saponins:

Foam Test : 0.5g of extract was shaken with 2ml of water. If foam produced persists for ten minutes it indicates the presence of saponins.

Detection of phytosterols:

Salkowski's Test: Extracts were treated with chloroform and filtered. The filtrates were treated with few drops of concentrated sulphuricacid ,shaken and allowed to stand. Appearance of golden yellow color indicates the presence of triterpenes/ phytosterols.

Detection of phenols:

Ferric Chloride Test: Extracts were treated with 3-4 drops of ferric chloride solution. Formation of bluish black color indicates the presence of phenols.

Detection of tannins:

About 1-2 ml of the extract was taken. A few drops of 5% ferric chloride was added and observed for brownish green or blue black coloration.

Detection of flavonids:

Lead acetate Test: Extracts were treated with few drops of lead acetate solution .Formation of yellow colorprecipitate indicates the presence of flavonoids.

Detection of amino acids:

TEST	ETHANOL	CHLOROFORM	WATER	ACETONE	METHAOL	PETROLEUM ETHER
Alkaloids	+	-	+	-	+	+
Flavonoids	+	+	+	+	+	+
Phenols	+	-	+	+	+	+
Tannins	+	+	+	+	+	+
Steroids	+	+	+	+	+	+
Glycosides	+	-	+	+	+	+
Saponins	+	+	-	+	+	+
Carbohydrates	+	+	+	+	+	+
Proteins/Amino acids	+	+	-	+	+	+
Diterpenes	+	+	-	+	+	-

Ninhydrin Test: To the extract, 0.25% w/v ninhydrin reagent was added and boiled for few minutes. Formation of blue color indicates the presence of aminoacids.

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 color indicates the presence of diterpenes.

Non enzymatic antioxidant

(Ascorbic acid-vitamin C)

Ascorbic acid is first dehydrogenated by bromination. The dehydro ascorbic acid is then reacted with 2,4 dinitro phenyl hydrazine to form osazone and dissolved in sulphuric acid to give an orange red coloured solution which is measured at 540nm.

Pipetted out 0.2ml of working standard ascorbic acid solution corresponding to µg values 20-100. Similarly pipetted out 0.5ml sample extract. Made up the volume in each tube to 3.0ml distilled water. Added 1ml of DNPH reagent followed by 1-2 drop of thiourea to each tube. A blank was set as above but with water in place with ascorbic acid solution. Mix the contents of the tubes thoroughly and kept in boiling water bath for 1hr at 37°C. After incubated the tubes were kept at ice bath. Dissolve the orange red crystals formed by adding 7ml of 80% sulphuric acid drop wise while the tubes were till in water bath. Allow the tubes to stand at room temperature for 30minutes and measured the absorbance at 540nm.

ANTICOAGULANT ACTIVITY

Anticoagulant activity of the plant extract studied by using the method of Naraspur (1997), a clear venipuncture was done 3ml of blood was drawn in a syringe and transferred into 4 test tubes containing 0.5ml of blood.

FIBRINOLYTIC ACTIVITY

Fibrinolytic activity of the plant extract was studied by using the method of Naraspur (1997), a clear venipuncture was done 3ml of the blood was drawn in the syringe and transferred into 4 test tubes containing 0.5ml of blood.

III RESULTS AND DISCUSSION

PHYTOCHEMICAL SCREENING:

Table 1.1: The present study on *ricinus communis* showed that:

(+ indicates presence, - indicates absence)

The phytochemical study of the *ricinus communis* extract showed the presence of Alkaloids, Flavonoids, Phenols, Tannins, Steroids, Glycosides, Saponin, Carbohydrates, Aminoacids and Diterpenes. Hence the phytochemical screening revealed that the *ricinus communis* extract shows high secondary metabolite, according to Yahya *et al.,* (2013).

ANTIOXIDANT - NON ENZYMATIC-ASCORBIC ACID ACTIVITY OF *RICINUS COMMUNIS*

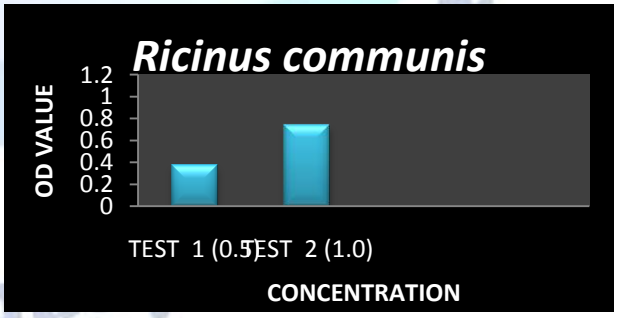

Fig.1: Ascorbic acid activity of *ricinus communis*

The present study show that:

Ascorbic acid- nonenzymatic antioxidant was present in higher amounts in T1 which contained 1ml of the *ricinus communis* extract and lesser amount was present in T2 which contained 0.5ml of the *ricinus communis* extract.

ANTICOAGULANT AND FIBRINOLYTIC ACTIVITY *RICINUS COMMUNIS*

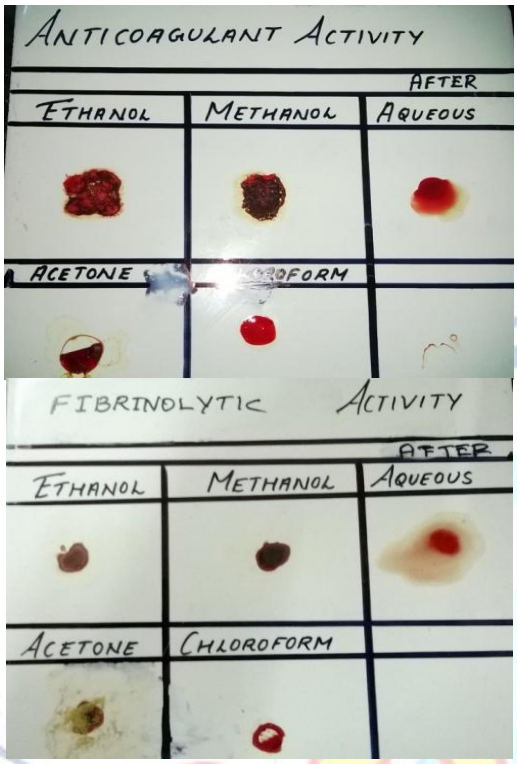

Fig. 2: Anticoagulant and fibrinolytic activity of *ricinus communis*

The present study revealed that here was a no clot formation with the chloroform and aqueous extract of *ricinus communis*. And it indicates that the plant *ricinus communis* have the anticoagulant property. There was a no clot formation with the aqueous extract of *ricinus communis*. And it indicates that the plant *ricinus communis* does not have the fibrinolytic property.

IV SUMMARY AND CONCLUSION

The preliminary phytochemical screening and antioxidant assay of *ricinus communis* revealed the major class of compounds present in the plant. Antioxidants like ascorbic acids play an important role in the protection of diseases like cancer and hepatic diseases.

Anticoagulant activity of *ricinus communis* methanol, aqueous and acetone extract have highest anticoagulant activity.

The ethanol extract of *ricinus communis* have highest significant fibrinolytic activity and aqueous, methanol and acetone extract of *ricinus communis* does not contains fibrinolytic activity.

From the above studies it can be concluded that *ricinus communis* are of great importance as it may lead to identification of a substitute for the genuine drug. Medicinal plants are natural compounds have no side effects. So we are recommended that the medicinal plants extracts have increasing anticoagulant activity. For further confirmation,detailed pharmacological investigations are needed.

So I conclude that the herbal extracts could serve as free radical scavenger, act as a powerful enzymatic antioxidants, so this plant extract can be used to discover bioactive natural products that may serve as leads for the development of new pharmaceuticals.

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