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Research Article

FIBRINOLYTIC ACTIVITY OF *HIBISCUS ROSA SINENSIS*

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ABSTRACT

The main function of the fibrinolytic system is to dissolve fibrin clots in circulation. This system is composed of inactive precursor plasminogen which can be converted into plasmin by the proteolytic enzyme tissue type plasminogen activator (tPA). Fibrinolytic properties have been determined in a variety of plant material. The following study involves the isolation of fractions and fibrinolytic effect of the aqueous extract of *Hibiscus rosa sinensis*. The RBC cell count was examined under microscope by haemocytometer. The result showed that the aqueous extract of *Hibiscus rosa sinenis* displayed significant fibrinolytic activity.

Keywords: Fibrinolytic activity, *Hibiscus rosa sinensis*, Aqueous extract.

INTRODUCTION

Cardiovascular diseases are most serious health problems of contemporary society. Fibrinolysis means capable of digesting fibrin, fibrinogen and proaccelerin[1]. Allopathy at present uses streptokinase and urokinase as the drug of choice because it activates the conversion of plasminogen to plasmin. The plasmin which is a serine protease hydrolyses fibrin to a variety of peptides. Survey of many ancient literature reveal about the use of several indigenous plant medicines in the management of cardiac disease. Fibrin is an insoluble protein that can be dissolved by two proteolytic enzymes; thrombin and plasmin. They could be activated by circulating plasma precursor plasminogen or prothrombin, which could be further activated by tissue - type plasminogen activator (tPA) or urokinase plasminogen activator (uPA), few days after wound repair[2]. Unwanted accumulation of fibrin in the arterial can decrease fluidity of blood circulation and cause cardiovascular diseases (CVD) such as myocardial infarction and stroke[3] .Urokinase which was derived from human urine has been broadly employed for thromboembolis therapy, but it has low specificity to fibrin and high cost[4]. Hibiscus tea lowers blood pressure in a group of prehypertensive and mildly hypertensive adults. Three cups of tea daily resulted in an average drop of 7.3 point in their systolic blood pressure, compared to a 1.3 point drop in the volunteers who drank the placebo beverage[5]. Hibiscus is considered to have medicinal properties in the Indian traditional system of medicine, ayurveda[6]. The bark of hibiscus contains strong fibers. The natives of Southern India used *Hibiscus rosa sinensis* (Red Hibiscus) for hair care purposes. The Red Hibiscus petals are used to cure fever while its roots are used to cure cough. The flowers are used as refrigerant, emollient, demulcent and aphrodiasiac[7]. Hence the present study investigates the fibrinolytic effect of *Hibiscus rosa sinensis.*

MATERIALS AND METHODS

Preparation of plant extract

The flowers of *Hibiscus rosa sinensis* belonging to the family *Malvacea* was collected from Madurai. It was shade dried and powdered and extracted with water.

Isolation

Hibiscus rosa sinensis which is having fibrinolytic activity was subjected to column chromatography by using sephadex G100. The gel such as sephadex is dry powders. A known weight of the powder should be swelled in the required volume of buffer and refrigerated overnight. The column is fixed vertically on a

stand with glass wool at the bottom to prevent the gel beads flowing out. The column is fixed ¼ with extraction buffer and the outlet is opened[8]. About 50ml of extract was passed through sephadex G100 column. The sephadex G100 column was saturated with extract to form a gel and passed through the column tube. Eleven fractions were collected in an eppendrof tubes and about 3ml of a fractionated solutions were kept at -4ºC. All these fractions were subjected to clot solubilisation assay.

Clot Solubilisation assay

0.5ml of blood samples was taken in test tube from healthy human volunteers and allowed to clot at room temperature. To this 0.1ml of the extracts was added respectively and incubated at room temperature for 15-20 minutes. Gently mixed the aliquot and spread uniformly over the haemocytometer. Finally observe the RBC cells under microscope and check for haemolysis (Table I).

RESULTS AND DISCUSSIONS

The results showed the extract of *Hibiscus rosa sinensis* possesses greater fibrinolytic activity without haemolysis.

Table I reflects no haemolysis of blood cells from the clot and the same clot was solubilised by fraction number 5 of *Hibiscus rosa sinensis*.

Table I: Effect of Isolated Fractions of *Hibiscus rosa sinensis*

S. No	RBC cell count (millions/cu.mm)	Morphology of RBC
1	1.28	Unlysed
2	1.92	Unlysed
3	1.92	Unlysed
4	2.88	Unlysed
5	3.04	Unlysed
6	2.08	Unlysed
7	1.76	Unlysed
8	1.76	Unlysed
9	*1.60*	Unlysed
10	1.44	Unlysed
11	1.44	Unlysed

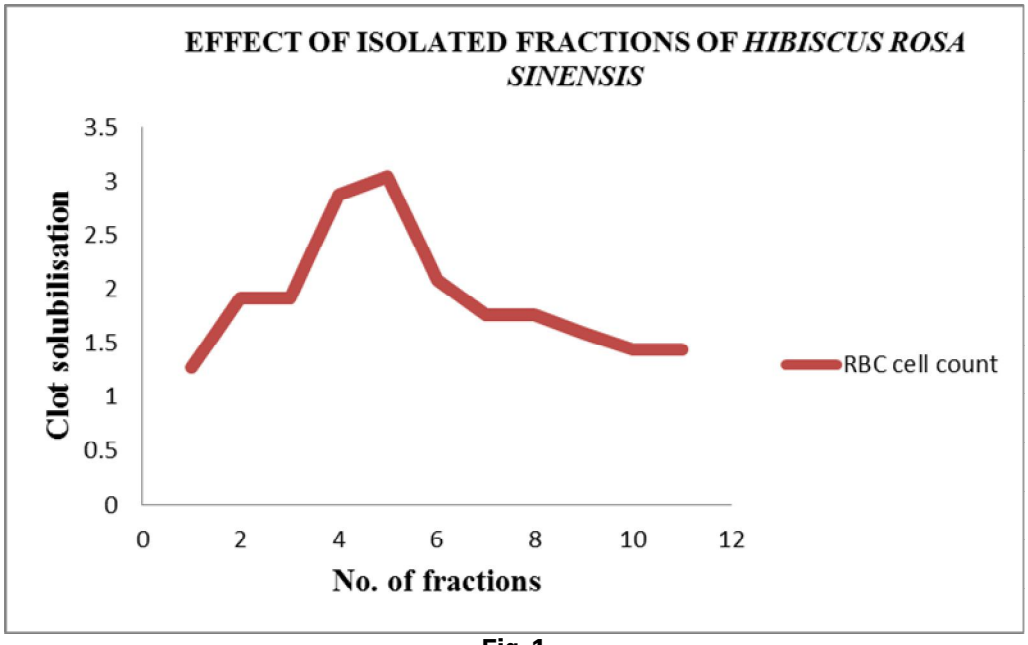

Fig. 1

The fibrinolytic enzyme prevents the formation of fibrin clot in the circulatory system[9]. Some medicine like urokinase and streptokinase are widely used to inhibit haemostatic disorders, particularly thromboemboli[10]. Previous studies have been conducted to find the effects of herbal medicine in haemostatic disorders[11]. *Hibiscus Rosa sinensis* is rich in anthocyanin, which may be responsible for fibrinolytic activity[12-15].

CONCLUSION

The extract exhibited good fibrinolytic activity, while the fraction 5 showed significant activity among the eleven isolated fractions. The current study examined fibrinolytic effect of *Hibiscus Rosa sinensis* invitro, a novel and simple method introduced for future and further studies. Characterizations and identification of the various fractions will be carried out as future studies.

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