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Comparative study of carica papaya and *Trichosanthes cucumerina* on increasing platelet count by using rat models

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Abstract
Study the effect of *Trichosanthes cucumerina* and carica papaya on increasing platelet count by using rats models. Prepared the aqueous extract juice of fruit *Trichosanthes cucumerina* and carica papaya and studied the preliminary phytochemical analysis of extract**.** Studied the preliminary phytochemical analysis of extract fruit of *Trichosanthes cucumerina* and carica papaya and studied the Anti-platelet activity on aqueous extract juice. The cyclophosphamide studies was determined the low platelet count was shown by monocyte was decreased condition when compare to normal groups. In these platelet activation in trichosanthe cucumerina was increasing the platelet count, R.B.C, leukocytes, hemoglobin are totally increased when compare to normal and cyclophosphamide groups. Carica papaya shows it's activity similler to *Trichosanthes cucumerina* activity. when compare to normal and cyclophosphamide groups cyclophosphamide and Carica papaya at low dose also shows increased activity in some parameters like R.B.C, platelet count leukocytes, hemoglobin, lymphocytes but its activity is less than cyclophosphamide and Carica papaya, *Trichosanthes cucumerina* high dose.

Keywords: *Trichosanthes cucumerina*, *Carica papaya*, R.B.C, leukocytes, haemoglobin, anti-platelet activity

1. Introduction

1.1 Platelets

Also called thrombocytes (thromb- + -cyte, "blood clot cell"), are a component of blood whose function (along with the coagulation factors) is to stop bleeding by clumping and clotting blood vessel injuries. Platelets have no cell nucleus: they are fragments of cytoplasm that are derived from the megakaryocytes of the bone marrow, and then enter the circulation. These unactivated platelets are biconvex discoid (lens-shaped) structures, 2– 3 µm in greatest diameter. Platelets are found only in mammals, whereas in other animals (e.g. birds, amphibians) thrombocytes circulate as intact mononuclear cells. Blood platelets also known as thrombocytes play an important role in your body. These cell fragments are natural source of growth and play basic role in process of haemostasis (preventing bleeding from damaged blood vessel) as well. Normal platelet count in a micro litre of human blood is 150000 to 450000. Slight decrease in the platelet count does not contribute to the disease but when it is below 50,000 per micro litre, thrombocytopenia occurs. Low platelet count in dengue fever can be very dangerous [1-3].

1.2 The reasons for low platelet count in dengue fever are as follows [4-6]

- Dengue virus, the main cause of dengue fever induces bone marrow suppression. Since bone marrow is the manufacturing centre of blood cells its suppression causes deficiency of blood cells leading to low platelet count. Anaemia and spontaneous severe bleeding are the other resultant factors of bone marrow suppression.
- Studies suggest that dengue virus can even bind to platelets of human blood in the presence of virus-specific antibody.

When vascular endothelial cell that are infected with dengue virus gets combined with platelets they tend to destroy platelets. This is one of the major causes of low platelet count in dengue fever.

2. Plant Profile

Trichosanthes cucumerina (Potlakaya)

Common name	:	Potlakaya
Scientific name	:	Trichosanthes cucumerina
English name	:	Snake Gourd
Kingdom	:	Plantae
Division	:	Magnoliophyta
Class	:	Magnoliopsida
Sub-class	:	Dilleniidae
Order	:	Violales
Family	:	Cucurbitaceae
Genus	:	Cucumis
Species	:	Cucumis sativus

2.1 Chemical Constituents and Its Uses

Chemical modifications carried out with imidazole side chains of histidine residues with ethoxyformic anhydride on the galactose-specific lectin (SGSL) purified from snake gourd. Trichosanthes seeds indicated that the loss of activity upon modification was not due to changes in the overall conformation of the lecithin18, 19. A novel isoflavone glucoside, 5,6,6'trimethoxy-3',4'- ethylenedioxyisoflavone7-O-beta-D(2coumaroylglucopyranoside) has been characterized from the seeds of Trichosanthes20. The positive effects of the plant are due to the carotenoids, flavonoids, lycopene, phenolics and ß-carotene present in it *Tricosanthes cucumerina* is used in the treatment of head ache, alopecia, fever, abdominal tumors, bilious, boils, acute colic, diarrohea, haematuria and skin allergy. *T. curcumineria* is used as an abortifacient, vermifuge, stomachic, refrigerant, purgative, malaria, laxative, hydragogue, hemagglutinant, emetic, cathartic, bronchitis and anthelmintic [7-9].

Fig 1: *Trichosanthes cucumerina* (Potlakaya)

2.2. Carica Papaya

Common name	:	papaya
Scientific name	:	*Tracheobionta*
Kingdom	:	Plantae
Division	:	Magnolio phyta
Class	:	Sub mangnolio phyta
Sub class	:	Dillenindae
Order	:	Brassicales
Family	:	Cariceae
Genus	:	Caricaa
Species	:	*Capapaya*

2.3 Chemical Constitutents

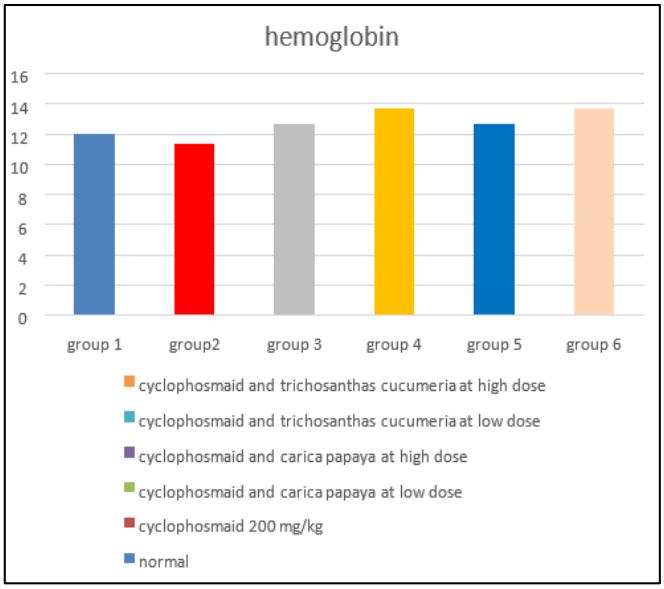
Chemical constituents Fruits: Protein, fat, fibre, carbohydrates, minerals: calcium, phosphorous, iron, vitamin C, thiamine, riboflavin, niacin, and carotene, amino acids, citric and malic acids (green fruits), volatile compounds: linalool, benzyl isothiocyanate, cis and trans 2, 6-dimethyl-3,6 epoxy-7 octen-2-ol, Alkaloid, α; carpaine, benzyl-β-D glucoside, 2-phenylethyl -β-D- glucoside, 4-hydroxy-phenyl-2 ethyl-β-D-glucoside and four isomeric malonated benzyl-β-D-glucoside [9-11].

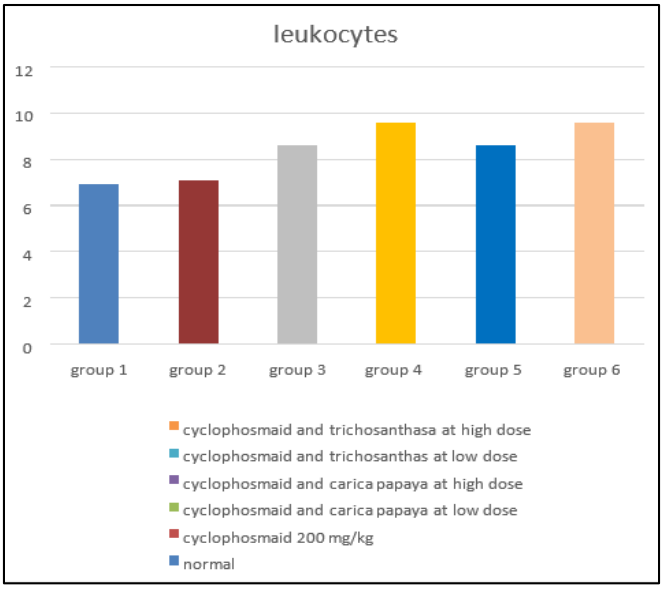
Fig 2: Carica Papaya

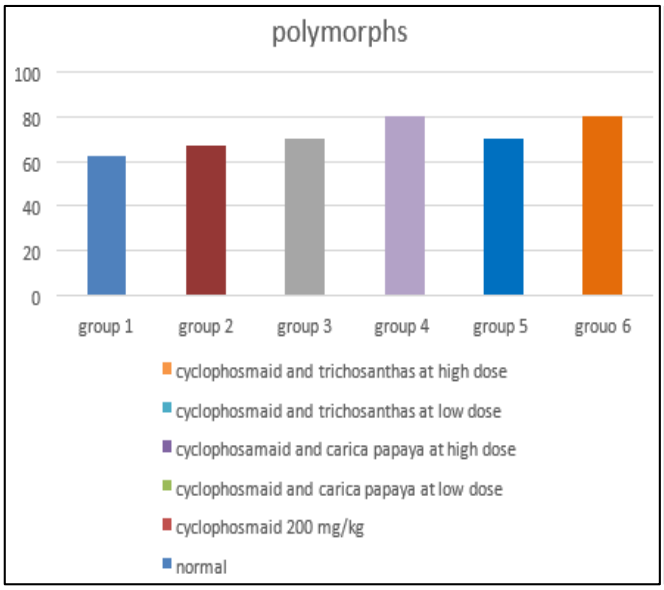
3. Results

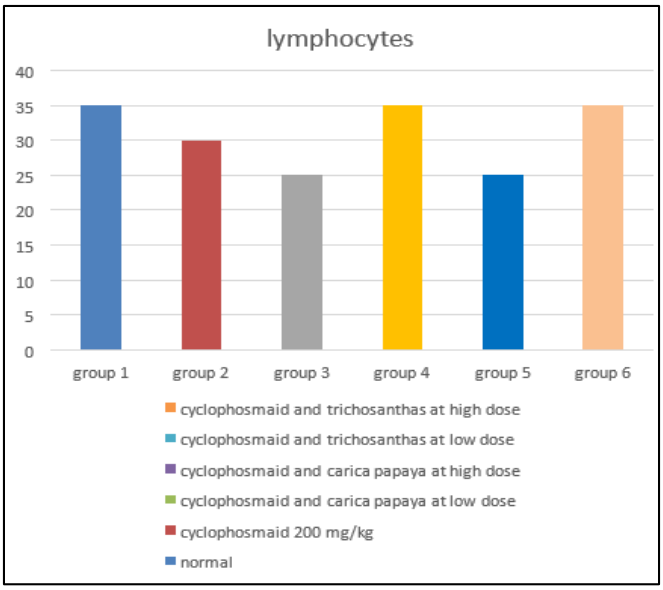
Table 1: Effect of *Trichosanthes cucumerina* and carica papaya by increasing platelet count was shown by these parameters

Groups	Animals	Haemoglobin	leukocytes	polymorphs	lymphocytes	Eosinophil	Monocyte	Platelet count	RBC
Normal group and control group	H	12.0	6.900	62	35	2	1	224000	4.22
	B	12.85	7.100	66	42	1	1	250000	3.98
	T	13.21	7.600	78	35	5	2	290000	4.29
	HB	14.5	8.000	80	39	6	2	215000	5.26
	HT	11.65	6.500	65	36	4	1	216000	5.92
	BT	11.98	7.200	72	43	03	01	240000	6.0
	Mean ±se	12.6± 0.43	7.216 ±0.81	70.5± 1.94	40±0.1	35±6.5	1.5±0.1	239000 ±100	4.94± 0.46









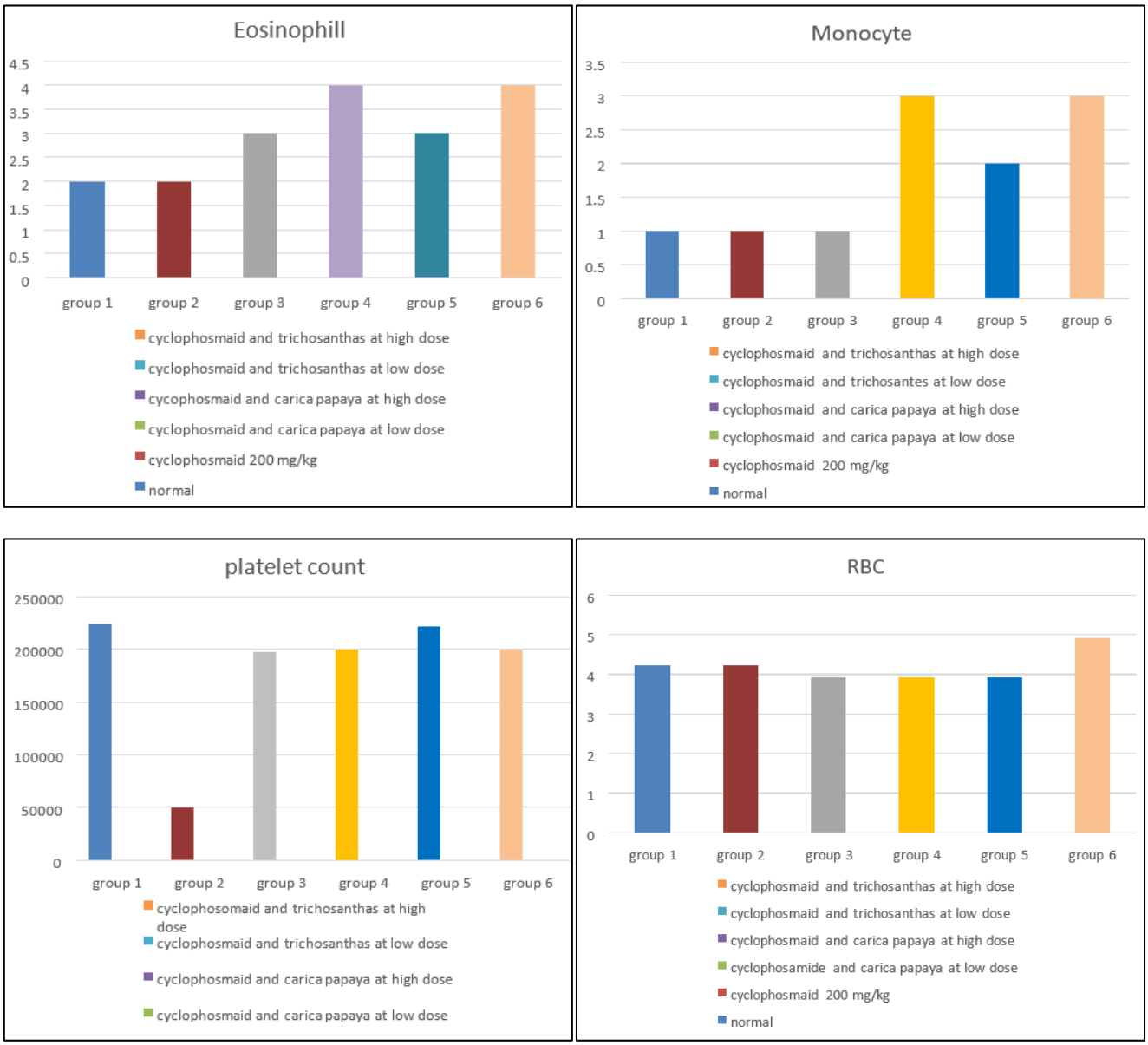


Fig 3: Showing Effect of *Trichosanthes cucumerina* and carica papaya

4. Discussion

Platelets, also called thrombocytes (thromb- + -cyte, "blood clot cell"), are a component of blood whose function (along with the coagulation factors) is to stop bleeding by clumping and clotting blood vessel injuries. Platelets have no cell nucleus: they are fragments of cytoplasm that are derived from the megakaryocytes of the bone marrow, and then enter the circulation. These unactivated platelets are biconvex discoid (lensshaped) structures, 2–3 µm in greatest diameter. Platelets are found only in mammals, whereas in other animals (e.g. birds, amphibians) thrombocytes circulate as intact mononuclear cells. Normal platelets can respond to an abnormality on the vessel wall rather than to hemorrhage, resulting in inappropriate platelet adhesion/activation and thrombosis: the formation of a clot within an intact vessel. This type of thrombosis arises by mechanisms different than those of a normal clot: namely, extending the fibrin clot of venous thrombosis; extending an unstable or ruptured arterial plaque, causing arterial thrombosis; and microcirculatory thrombosis. An arterial thrombus may partially obstruct blood flow, causing downstream ischemia, or may completely obstruct it, causing downstream tissue death. The cyclophosphamide studies was determined the low platelet count was shown by monocyte was decreased condition when compare to normal groups.

In these platelet activation in trichosanthe cucumerina was increasing the platelet count, R.B.C, leukocytes, hemoglobin are totally increased when compare to normal and cyclophosphamide groups .cyclophosphamide and *Trichosanthes cucumerina* at high dose shows increased activity in Some parameters like R.B.C, platelet count, leukocytes, hemoglobin, lymphocytes likewise cyclophosphamide and Carica papaya shows it's activity similler to trichosanthes cuvumerina activity. when compare to normal and cyclophosphamide groups cyclophosphamide and Carica papaya at low dose also shows increased activity in some parameters like R.B.C, platelet count leukocytes, hemoglobin, lymphocytes but its activity is less than cyclophosphamide and Carica papaya, *Trichosanthes cucumerina* high dose. Cyclophosphamide and *Trichosanthes cucumerina* at low dose also shows activity smaller to cyclophosphamide and Carica papaya at low dose

In normal and control group platelet count increased from 224000 to 239000+ 100 .In cyclohosphamide amide, platelet count reduced from 98000 to 86000. In cyclo phosphatase and Carica papaya extract at low dose platelet count increased

from 197000 to 222000.In cyclophosphamide and carica papaya at high dose platelet count increased from199000 to 237000. In cyclophosphamide and trichosanthes at high dose the platelet count increased from1999000 to 237000+ 100. Haemoglobin content increased from 12.6+ 0.43 to 14.7+0.14., leukocytes increased from 7.216 + 0.81 to 9.916+0.91, polymorph's increased from 67.6+1.94 to 77.3 + 1.99, R.B.C increased from 4.48+0.46 to 5.58 + 0.45.

5. Conclusion

Platelet count was studied by using rat models The platelet count ,white blood cells (W.B.C) and leucocytes was subsequently increased in the blood sample was checked after the administration of fruit juice extract .It was observes that platelet count increased from 55×103/} to 170 ×103 / ,W.B.C from 3.7 ×103 / to 7.9 × 103. / and 46.0% to 80.3% /8. Evaluation of the effect of increasing platelet count in carica papaya by using albino rats .The platelet count, Red blood cells and leucocytes was subsequently increased in the blood sample was rechecked after the administration of fruit juice extract. It was observed that platelet count increased from 55×102/ to 172×103 / ,W.B.C from3.7 × 103 to 7.9×103 / and 46.0 to 81.2%/8. Total 36 mice were used for the trail .Fresh Snake gourd fruit juice extract of high dose was given only to the test group (1) and found that both fresh snake gourd and Carica papaya fruit extract significantly increased the platelet and R.B.C count in the test group (1)as compared to control, likewise fresh carica fruit juice extract of high dose was given to another test group(2) and found that fresh snake gourd fruit extract significantly increased the platelet and R.B.C counts smillar to *Trichosanthes cucumerina* at high dose .

Next fresh snake gourd fruit juice extract of low dose was given only to another test group (3) and found that fresh snake gourd fruit extract significantly increased the platelet count and R.B.C count but decrease in platelet count when compared to high dose then fresh *Trichosanthes cucumerina* fruit juice extract a low dose. A study for evaluation of platelet activity of papaya and snake gourd fruit aqueous extract at high dose in mice with cyclophosphamide induced thrombocytopenia by showed significant increase in platelet count and decreasing clotting time.

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