



## EXTRACTION AND FORMULATION OF SOME CLASSICAL HERBS FOR ENHANCING THE PLATELET COUNT

Akriti Sharma, Shivani Yadav and Mojahid Ul Islam\*

Orlean College of Pharmacy, Knowledge Park-III, Gr. Noida (201308).



\*Corresponding Author: Dr. Mojahid Ul Islam

Orlean College of Pharmacy, Knowledge Park-III, Gr. Noida (201308).

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### ABSTRACT

Fresh Carica papaya leaves were picked daily for 7 days, Leaves were washed and the stems were removed before use. After weighing, leaves were blended without adding water or other liquids. Then the mixture was filtered to obtain a pure extract of C. papaya leaves. Finally, the volume of the extract was measured, and the extracts were stored at 4 °C until use. Papaya leaf extract could be given at any stage of the disease but for best results it should be given from the first day of fever. Classical herbs extracts could be taken as syrup; 30ml three times a day before meals for an adult and 5-10ml three times a day for a child until you have fully recovered from the illness. Decided to work on this plant to find out and compare its nutritional contents of Chlorophyll and Vitamin C in wheatgrass juice and powder with their usefulness to human being. The present works include screening of pharmacogenetics evaluation along with its preliminary phytochemical evaluation. Extraction using different organic solvents is avoided considering solubility of chlorophyll. Considering the medicinal properties of these botanical sources and selection of suitable excipients to optimize the therapeutic efficacy and mask the organoleptic properties to enhance the patient compliance. Three weeks treatment with fresh wheatgrass juice (10 ml/kg, p. o.), papaya juice (5ml/kg, p. o.) produced a significant increase in all blood cell counts. Treatment with fresh juice, methanol and acetone extracts showed significant increase in haemoglobin, RBC and WBC. The mean elevation in platelet count was observed to be 30,000/ $\mu$ l. The mean elevation in WBC count was observed to be 2512.5/ $\mu$ l. The mean increase in Platelet count is 54.45%. The mean increase in WBC count is 127.18%.

**KEYWORDS:** Coagulation, Thrombocytopenia, Blood platelets count, Antibacterial, Extraction.

### INTRODUCTION

Platelets, or thrombocytes are the cells circulating in the blood that are involved in the cellular mechanisms of primary haemostasis leading to the formation of blood clots. Dysfunction or low levels of platelets predisposes to bleeding, while high levels, although usually asymptomatic, may increase the risk of thrombosis. An abnormality or disease of the platelets is called a thrombocytopathy. Both thrombocytopenia and thrombocytosis may present with coagulation problems. Generally, Low Blood Platelet counts increase bleeding risks (although there are exceptions, e.g. immune heparin-induced thrombocytopenia) and thrombocytosis (high counts) may lead to thrombosis (although this is mainly when the elevated count is due to myeloproliferative disorder). Herbal remedies compounds made from the leaves, stems, bark, flowers, seeds, and roots of plants often form the basis of treatments used in these traditional medical systems, as well as in other healing systems. During monsoons ailments like dengue, chikungunya and malaria are the mosquito borne diseases which are highly prevalent and

alarming wherein the platelet count is drastically affected. Even when the ailments have subsided and the platelets have reached their required number, it is recommended to continue with the consumption of these herbs, to build immunity against future infections. Herbs such as papaya leaves and giloy are highly beneficial in increasing the platelet count and enhancing immunity. While the herb plays an important role in strengthening our natural immune system by increasing the white blood corpuscles, it also improves the body response to infections and toxins, which helps in reducing the frequency of infections and enhances excretion of toxins. There are other supportive herbs like Tulsi or Holy Basil lowers it the stress level and boosts the immunity. Carica papaya leaves have been successfully employed in folk medicine for the treatment of dengue infections with haemorrhagic manifestations, using suspensions of powdered leaves in palm oil. Extract obtained from Juice of Carica papa for increasing Platelet counts in Disorders leading to a reduced platelet count. Natural enzymes and nutrients present in Papaya leaves have proven to help reduce the adverse effects of viral infections such as

dengue, malaria, chikungunya etc. Carica papaya is an amazing source of the vitamins C and A which are required for healthy body. Essentially the Papaya leaves are rich in the enzyme called as Papain that increases platelet count in the body. Drinking papaya leaf juice helps to upturn the platelet count significantly in the body and brings it back to normal. papaya leaves contain various Phyto-constituents like saponins, tannins, cardiac glycosides and alkaloids. These components are believed to act on the bone marrow, prevent its destruction and increase its ability to produce platelets. Moreover, this can also prevent platelet destruction in the blood and thereby increase the life of the platelet in circulation. Papaya leaf extract especially works by stimulating the genes responsible for production of platelets.

“*Tinospora cordifolia*” one of the most promising plant species of *Tinospora* known as “Giloy” or Guduchi that is used in several traditional medicines in treating diseases e.g., metabolic and immune disorders, diabetes, heart diseases, cancer, and infectious diseases, has been widely investigated contain a wide range of essential chemical constituents, including alkaloids, glycosides, steroids, flavonoids, phenols, tannins, terpenoids, polysaccharides. The Giloy stem is effective because of its nutritional content and the alkaloids found in it. It is a climber with heart-shaped leaves, boosting the immune system to fight off infections. Varieties of bioactive phytochemical constituents isolated from the stem, root and whole plant of *T. cordifolia* have been identified. It is used to enhance the body's natural defence mechanisms and is often recommended to boost the immune system. It has been traditionally used to manage various types of fever, including viral and bacterial infections. The plant is known for its antioxidant and anti-inflammatory effects. It is used to alleviate inflammation-related conditions such as arthritis and to counter oxidative stress in the body. While wheatgrass contains nutrients such as vitamin K, which plays a role in blood clotting and even chlorophyll that may turn to have some minor health benefits. Wheatgrass contains chlorophyll, which is like haemoglobin in blood. Chlorophyll's structural homology to haemoglobin suggests it may play a role as a blood builder. Wheatgrass is said to increase levels of haemoglobin (Hb), total white blood cells, and red blood cells; this has an overarching effect on increasing the platelet count.

*Aloe vera* (*Aloe barbadensis* Miller, family Xanthorrhoeaceae) is a perennial green herb with bright yellow tubular flowers that is extensively distributed in hot and dry areas of North Africa, the Middle East of Asia, the Southern Mediterranean, and the Canary Islands. *Aloe vera* derives from “Allaeh” (Arabic word that means “shining bitter substances”) and “Vera” (Latin word that means “true”). The colourless mucilaginous gel from *Aloe vera* leaves has been extensively used with pharmacological applications. Aloe Vera helps in blood purification process. It is also

effective in preventing blood infections. All this leads to increase in blood platelet count and treats the problem of low platelets effectively, also Aloe vera has compounds that can stimulate white blood cell production, which in turn helps increase platelet count. To use aloe vera to increase platelet count, you can mix two tablespoons of aloe vera gel with a glass of water or fruit juice. Aloe vera has compounds that can stimulate white blood cell production, which in turn helps increase platelet count.

#### **AIM AND OBJECTIVE**

This aim to provide a foundational understanding of how classical herbs can be utilised to enhance platelets count, potentially offering alternative therapeutic option for condition characterised by thrombocytopenia. To investigate the efficacy of selected classical herbs in enhancing platelets count and to identify their active compounds and mechanism of action. Analyse the result statically to determine the significance of any observed effects on platelet count. The main objective of this medication is to enhance the platelet counts during the condition of thrombocytopenia during Dengue and malarial fever. It is the combination of various herbs which is not only for enhancing platelets counts but it also helps in the management of symptoms associated with dengue (*Aedes Aegyptus*) and malarial fever (*Plasmodium falciparum*) and typhoid. Ayurvedic herbs believed to enhance immune function and platelet production.

#### **MATERIAL AND METHODS**

##### **Method of preparation**

Get fresh healthy mature papaya leaves from a fruit-bearing tree, Wash the leaves thoroughly with running tap water and chop the leaves in to small pieces excluding the main stem (not necessary to remove the small stems in the leaves) after that Weigh 50g of papaya leaves and put it into a mortar and pestle then Add 50ml of boiled cool water and 25g of sugar, Pound the above mixture well for 15 minutes till a uniform pulp is made. Mix this pulp well and keep for about 30 minutes then Squeeze this pulp by hand and get the papaya leaf extract (do not use a cotton sieve to extract the juice), now you can store this preparation for 24 hours in the lower compartment of the refrigerator.

The 20 g powder of dried stems of *Tinospora cordifolia* is placed in thimble holder and about 300 mL of ethanol is filled in the flask. The thimble was clogged with cotton in order to avoid transfer of sample particles to the distillation flask, the drug was extracted with ethanol in Soxhlet apparatus for 3 h. Ethanolic extract is filtered and concentrated on Rota evaporator to give the ethanolic extract.

Certified sample of species of wheat *Triticum aestivum*, was acquired from wheat Research Center. These wheat varieties were grown in plastic trays as per standard procedure described by Wigmore, 1985. Fresh juice of wheatgrass was prepared by standard procedure

described by Wigmore, 1985. Dried powder of wheatgrass was subjected for extraction with methanol and water using Soxhlet apparatus.

Method for extracting aloe vera to increase platelet count: Clean 250 grams of fresh aloe vera leaves with 70% ethanol Remove the rind and cut the gel into 5 cm sections Wash the gel sections with deionized water to remove latex Grind the gel into a liquid Centrifuge the liquid at 2500 rpm for 5 minutes to remove fibres. Add the clear supernatant to sterile culture plates and lyophilize at  $-72^{\circ}\text{C}$  for 48 hours Refrigerate the concentrated, freeze-dried extract at  $4^{\circ}\text{C}$ .

### Formulation of syrup

The syrup is prepared in order to mask the bitter taste of the papaya juice. The syrup is consisting of papaya leaf extract, *Tinospora cardifolia*, *Triticum aestivum*; honey which is use as a flavouring agent and to also increase the viscosity of the syrup it also masks the unpleasant taste which can be easily taken by the patient. Water is added as a vehicle, and sodium Benzoate as a preservative, all the ingredients are added in an ambered glass bottle and agitate thoroughly in order to mix them well. This syrup can be taken by dengue patient who are elder or children who cannot take tablet.

### Biological constituents

Papaya Leaves constitute different components in varying proportions such as 8.3% of carbohydrates, 38.6% of vitamin C, 5.6% of pro- and 0.23% of phosphoric acid. A good amount of tannin ( $0.85 \pm 10^{-3} \pm 1.76 \pm 10^{-4}$  M, 0.824%) in papaya leaf extract has been reported by a few researchers. Giloy's many constituents are the source of active phytochemical compounds, such as  $\beta$ -sitosterol, tinosporin, tinosporide, and cordifolia. These compounds have been shown to have antimicrobial, anti-inflammatory, antioxidant, and antidiabetic properties. Major constituent of *Tinospora cordifolia* are terpenoid, alkaloid, lignans and steroids. *T. cordifolia* belong to different classes such as alkaloids, glycosides, steroids, phenolics, aliphatic compounds, polysaccharides, leaves are rich in protein (11.2%), calcium and phosphorus. Wheatgrass is a source of potassium, dietary fiber, Vitamin A, vitamin C, Vitamin E (alpha tocopherol), Vitamin K, thiamine, riboflavin, niacin, Vitamin B6, pantothenic acid, iron, zinc, copper, manganese and selenium.

### RESULTS AND DISCUSSION

In the literature, the phytochemical compounds in papaya leaf have been summarized and are reported to include: 2S-sambuningrin, 5,7-dimethoxycoumarin, anthraquinone, apigenin, caffeic acid, caffeoyl alcohol, catechin, dimethoxyphenol, ferulic acid, kaempferol, p-coumaric alcohol, protocatechuic acid, R-prunasin, carpaine, dehydrocarpaine I, dehydrocarpaine II, carposide, emetine, myricetin 3-rhamnoside, chlorogenic acid, E-3-(4-hydroxy-3-(3,4,5-

trimethoxybenzyl)phenyl)acrylic acid, gallic acid, and o-coumaric acid.

In our study, for evaluation of beneficial effects of wheatgrass in thrombocytopenia, busulfan was used to induce experimental thrombocytopenia. Three weeks treatment with fresh wheatgrass juice (10 ml/kg, p. o.), papaya juice (5ml/kg, p. o.) produced a significant increase in all blood cell counts. Treatment with fresh juice, methanol and acetone extracts showed significant increase in haemoglobin, RBC and WBC. The mean elevation in platelet count was observed to be 30,000/ $\mu\text{l}$ . The mean elevation in WBC count was observed to be 2512.5/ $\mu\text{l}$ . The mean increase in Platelet count is 54.45%. The mean increase in WBC count is 127.18%. different extracts and are more likely responsible for their biological activities.

### CONCLUSION

Lower toxicity of this plant can be an advantage to qualify it to be used as new therapeutic agent. Papaya leaf extracts not only prevent fall in platelet count induced by carboplatin but also increases platelet count in a dose dependent manner without any toxic effects.

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