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Formulation of Herbal Tablet from the Plant of Papaya Carica for Treatment of Dengue

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Abstract: *Herbal Factory Papaya Carica Uses Antimicrobial, antiinflamatory Tablets are used as expression and are prepared by using factory excerpts i.e., Carica papaya and Embelica officinalis. These tablets were prepared by using wet granulation system. In this composition the excerpt of leaves of Carica papaya and fruits of Papaya were used for making herbal tablets. Excerpts of leaves of Carica papaya was attained by cold birth and through maceration system and the excerpt of fruits of Embelica officinalis was attained by maceration process. Both excerpts were dried and mixed. These excerpts were also saturated with the excipients like diluents, binding agents, super disintegrating agent, lubricants, etc. to make grain.*

Keywords: Carica Papaya, Maceration, Embelica officinalis, Wet Granulation.

I. INTRODUCTION

Medicinal plants are widely distributed throughout the world but most abundantly in tropical countries. It is a mosquito-borne disease affected by infection of any anti-genically distinct dengue virus serotypes, belonging from Flavivirus genus as well as Flaviviridae family, contain with single positive stranded RNA viruses. It is estimated that about 25% of all modern medicines are directly or indirectly derived from higher plants. Thus, herbal medicine has led to the discovery of a number of new drugs, and non-drug substances.

1.1 OBJECTIVES:

The objectives of this review article are as follows:

- The Primary objective Of This Study is to formulate and evaluate a herbal tablet using traditional herbs CARICA PAPAYA
- The Development of the herbal dosage form such tablets associated with an extended period of local remedy with beneficial therapeutic effect was the objective of this study
- The Developed tablets include many herbs having effect on respiratory tract and completely natural.
- Carica Papaya leaves juice significantly accelerates the rate of increase in platelet count
- Among patients with dengue fever ana dengue Haemorrhagic fever

II. DRUG FORMULATION

Papaya: Carica papaya belongs to the fruits and vegetables class of family Caricaceae. The fruit are popularly used as desert or processed into Jam, puree or wine, while the green fruits are cooked as vegetable.2 Carica papaya leave (CPL) is used as food or as medication in folk medicine. Traditionally, the leaf extract was used as a tonic for the heart, analgesia and treatment for stomach ache. The extract is also known to have antioxidant properties but there are no scientific data reported on the protective effect of this extract on alcohol induced acute gastric damage.3 Figure 1: Showing leaf of Carica papaya Papaya is also known as the source of papain enzyme, a kind of enzyme that is utilized as meat tenderizer. Papaya leaf extracts have phenolic compounds, such as protocatechuic acid, p-coumaric acid, 5,7-dimethoxycoumarin, caffeic acid, kaempferol, quercetin, chlorogenic acid. These compounds have antimicrobial activity and have been proven to be able to inhibit the growth of microbes.4 The high level of natural selfdefense compounds in the tree makes it highly resistant to insect and disease infestation.5 Carica papaya has crown shaped large palmate leaves emerging from the apex of the trunk of the tree. The soft, hollow, cylindrical trunk ranges from 30 cm in

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diameter at the base to about 5 cm in diameter at the crown. The leaves (especially fallen ones) are used variously for the treatment of fevers, pyrexia, diabetes, gonorrhea, syphilis, inflammation and as a dressing for septic wound.6 Recent studies have shown its beneficial effect as an anti-inflammatory agent, for its wound healing properties anti-tumor as well as immunomodulatory effects and as an antioxidant. A toxicity study (acute, sub-acute and chronic toxicity) conducted on Sprague Dawley rats administered with C. papaya leaves juice revealed that it was safe for oral consumption. Safety studies based on OECD (Organization of Economic Cooperation and Development) guidelines for acute, sub-acute and chronic toxicity conducted on C. papaya extract and showed that it was found to be safe for human consumption. The leaves of papaya have been showed to contain many active components that can increase total antioxidant activity in blood and reduce lipid peroxidation level, such as paper chymopapain, cystatin, tocopherol, ascorbic acid, flavonoids, cyanogenicglycosides glucosinolates. The alkaloids, flavonoids, saponins, tannin, and glycosides are related with antiinflammatory activity. C. papaya leaves extract also found to have anti-bacterial effect, anti-tumor, and immunomodulation activities. The leaf of C. papaya is categorized as nontoxic because it's LD50 >15 g/kg body weight. The leaves also contain cardiac glycosides, anthraquinones, carpaine, pseudocarpaine, phenolic

III. DESCRIPTION

Macroscopic:

Drug consists of curled pieces of pericarp of dried fruit occuring either as separated single segment, 1-2 cm long or united as 3 or 4 segments, bulk colour grey to black, pieces showing a broad, highly shrivelled and wrinkled external convex surface to somewhat concave, transversely wrinkled lateral surface, external surface shows a few whitish specks, occasionally some pieces show a portion of stony testa (which should be removed before processing); texture rough, cartilaginous and tough.

Microscopic:

Transverse section of fruit shows epicarp consisting of a single layered epidermis cell appearing tabular and polygonal in surface view; cuticle present; mesocarp cells tangentially elongated parenchymatous and crushed differentiated roughly into peripheral 8 or 9 layers of tangentially elongated smaller cells, rest consisting of mostly isodiametric larger cells with walls showing irregular thickenings; ramified vascular elements occasionally present; stone cells present either isolated or in small groups towards endocarp ; pitted vascular fibers, walls appearing serrated due to the pit canals, leading into lumen

Powder:

Fine powder shows epidermis with uniformly thickened straight walled isodiametric parenchyma cells with irregular thickened walls, occasionally short fibers and tracheids.11

IV. CAUSATIVE ORGANISM FOR DENGUE

Viruses essentially consist of genetic material (nucleic acids, DNA strand) and a capsular envelope made up of proteins, often with a coat of a phospholipids (PL) bilayer with embedded proteins. They lack a metabolic system but depend on the infected cell for their growth and replication. Targeted therapeutic suppression of viral replication requires selective inhibition of those metabolic processes that specifically serve viral replication in infected cells. To date, this can be achieved only to a limited extent.12

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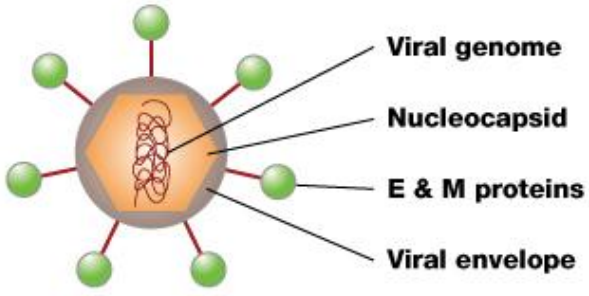

Figure: Showing Structure of Dengue Virus

Figure 4: Showing Structure of Dengue Virus Positive stranded encapsulated RNA virus, 3 structural protein genes: C, M, E & 7 NS protein genes Dengue is an arthropod-borne viral disease carried by Aedes aegypti as the vector, caused by 4 possible viral serotypes, namely, serotype 1, 2, 3, and 4 of the Flaviviridae family. There is no specific antiviral drug available for the treatment of dengue infection. Each episode of infection is known to induce a life-long protective immunity to the homologous serotype but confers only partial and transient protection against subsequent infection by the other serotypes. Secondary infection is a major risk factor for Dengue Haemorrhagic Fever (DHF) possibly due to antibody-dependent enhancement. A patient with dengue fever presents typically with fever, headache, and rash known as the dengue triad. There are many other nonspecific signs and symptoms associated with DF and patient can progress to DHF and typically manifests as abdominal pain, bleeding, and even circulatory collapse. The clinical course of dengue has an abrupt onset followed by three phases, namely, the febrile phase, the critical phase and the recovery phase. It is during the critical phase that thrombocytopenia, characterized by a decrease in platelet count below 1,00,000/mm3 from the baseline and haemoconcentration, characterized by an increase of haematocrit by 20% or more, is detectable before the subsidence of fever and the onset of shock. Safety studies based on OECD guidelines for acute, subacute, and chronic toxicity were conducted on C. papaya extract and showed that it was found to be safe for human consumption. The present study was conducted to determine and investigate the traditional claim that CPLJ increases the platelet count in patients with DF and DHF.13

V. MATERIALS AND METHODS

Material used Plants used are locally cultivated Papaya (Carica papaya) and Amla (Emblica officinalis) and authenticated in own laboratory. Lactose, Starch, Magnesium Stearate, Talc, Methyl Parabens, Mannitol, Sucrose, Sodium Starch Glycolate, Ethanol were procured from sigma Aldrich. Vanillin, Calcium Carbonate, Sodium Carbonate and Sodium Saccharin were procured by CDH, chemicals. All other ingredients are of analytical grade.

Methodology:

Preparation of extracts of Carica papaya

Cold extraction

The collected green Carica papaya leaves were washed with distilled water from which 50 grams of the leaves were crushed and grounded in a blender using 200 ml of distilled water in order to obtain the juice from the fresh leaves.

Maceration

An aqueous extract of Carica Papaya was prepared with 100% distilled water by adding 50g of fresh cut leaves in to 200 ml of distilled water. The mixture was kept in the room temperature for two days. At the end of the first day the water containing the extract was filtered and collected, then it was resuspended with 200ml fresh distilled water and the maceration was continued again for the next day. Finally both extracts were combined.

Concentration of Extract :

The mixture was heated at 50-60˚ C for 48 hours. The procedure involves simple decoction process of the aqueous extract from which the soluble compounds further heated at a higher temperature 70-75˚C for 3 hours until the solvent gets evaporated completely. Temperature was maintained to avoid the charring of the product. The obtained dry product was weighed and the yield was noted.

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Preparation of extracts of Emblica officinalis:-

Procured plant materials Amla pericarp was dried and then coarsely powdered in a blender. The coarse powder 1 kg was subjected to maceration for 72 hours, followed by exhaustive maceration for 48 hours by using solvents 60% ethanol. The solvents was decanted and filtered with filter paper and recovered by distillation with help of rotary vacuum evaporator at 750ºC to 800ºC. The extracts were dried under desiccator and stored in airtight container at room temperature.

Preparation of tablets:

Wet granulation method:

The concentrated extract of Carica papaya and Amla was mixed with the excepients such as Sodium starch glycolate, Methyl paraben, Starch, Sodium saccharin, Vallinin, Calcium carbonate and Mannitol in order to increase its bulkiness and to convert in to a powder mass with passable flow property and compressibility. It was passed through sieve no. 8 & 12 in order to break the lumps to get uniform granules in which Talc and Magnesium stearate were added finally. The total weight of the granules was noted and evaluated

Discussion:

The preparation, evaluation and submission of the tables were done successfully. Three batches were prepared that is, one is trial batch and others are drug containing batch F1 and F2. There were many differences that are seen in the both of the formula of formulation F1 and F2. As in formula of both the batches to increase their bulkiness different diluents are used. In F1, Lactose is used while in F2, Calcium Carbonate is used. In formula also there is difference between the super disintegrating agent i.e., Sodium Starch Glycolate (SSG) in both formulations, the amount of SSG is increased in F2. In F1, the use of Sodium Bicarbonate is done that will decrease the tablet disintegration time. Papaya leaves extract is used to prepare the formulation because due to Dengue the Platelet count in patient is decreased, it will increase the count. Amla fruit extract is used to increase the immunity of the patient. The sweetening agents are also used to mask the bad taste. Also the flavoring agent is used which will mask the bad odour too. The difference between the evaluation parameters of Granules is also seen. Every evaluation parameter of F1 is Greater than the F2. The evaluation parameters of the tablets also have difference in both F1 and F2. As in physical appearance, tablets of F1 is having brownish-black colour and in F2, tablets are having brownish color. Acceptability test of both formulations indicates that they can be easily taken by patients. Weight variation and friability of F1 is lesser than F2. Thicknesses of the tablets of both formulations are same. Hardness and disintegration time of the F2 is lesser than as that of F1.

VI. CONCLUSION

From all the results obtained and discussion observed, the conclusion is obtained that the tablets were prepared for the Dengue was successful and that can be used for the treatment of the disease. In the present study the extract of leaves of Carica papaya was used and fruits of Embelica officinalis were used for making tablets. Extracts of leaves of Carica papaya was obtained by cold extraction and through maceration. Extract of fruits of Embelica officinalis was obtained by maceration process. These extracts were impregnated with the excipients like diluents, binding agents, lubricants to make granules. These granules were used for making tablets of desired size and shape. Recent studies haveFrom all the results obtained and discussion observed, the conclusion is obtained that the tablets were prepared for the Dengue was successful and that can be used for the treatment of the disease. In the present study the extract of leaves of Carica papaya was used and fruits of Embelica officinalis were used for making tablets. Extracts of leaves of Carica papaya was obtained by cold extraction and through maceration. Extract of fruits of Embelica officinalis was obtained by maceration process.

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