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Phytochemical Screening and Evaluation of Carica Papaya Leaves for Treatment of Dengue

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ABSTRACT

Dengue diseases become a major medical problem. Dengue diseases is a difficult to manage because they tend to be chronic, hard to diagnosis. Dengue is caused by the mosquito papyacarica contain phytoconstituent which is treat dengue diseases. It is abundantly available in tropical area and it is widely distributed Andhra Pradesh, West Bengal &karnatka.

The carica papaya which belong to family caricaceae. Devriya active constituent present in it includes. Alkaloids ,glycosides, Tannins,saponins,flavonoids, and it's fewer side loose contain various bioactive compound. With potential therapeutic benefits phytochemical screening of papaya leaves reveals the presence of Alkaloids (Carpaine) ,Glycosides (flavonoid Glycosides).flavonoids (quercetin), saponins (carpasaponin) Tannins(gallic acid)

Key-words: Carica Papaya, Saponins, Maceration, Phytochemical, Screening, Genome.

I. INTRODUCTION

Medicinal plants are widely distributed throughout the world but most abundantly in tropical countries. 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. To achieve the desired benefit from herbal preparations, an individual must take the required dose over a certain length of time.

Although it is generally believed that most herbal preparations are safe for consumption, some herbs like most biologically active substances could be toxic with undesirable side effects.[1]

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 self defense 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 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,. 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 Cpapaya extract and showed that it was found to be safe for human consumption.

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 compound. [7]

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II. THERAPUTIC APPLICATION

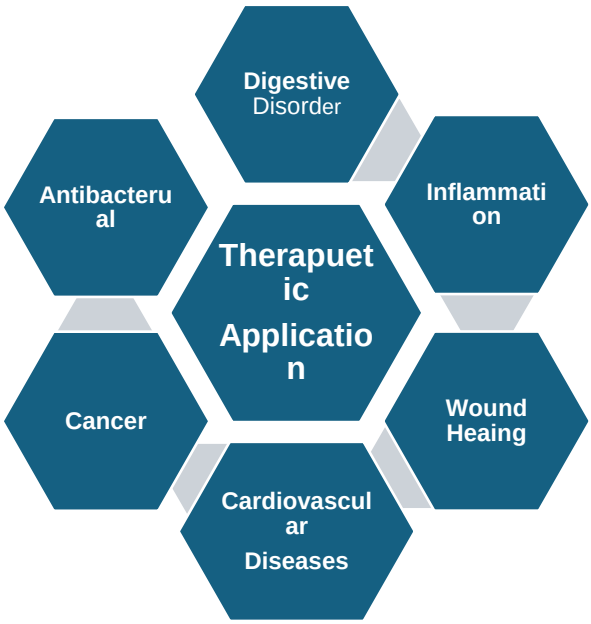

FIG 1: Therapuetic Application

III. DRUG PROFILE

a) Papaya

- **Scientific Name** -Carica papaya.
- **Synonyms** - papaya papaia, pawpaw, melon tree, papaya tree, edible fruit.
- **Biological source-** Papin is the dried and purified latex of the green fruits and leaves of carica papaya L.
- **Family**-Caricaceae

- **Chemical Constituent–**
- Alkaloids
- Glycosides
- Tannins
- Saponins
- Flavonoids

FIG 2: PAPAYA LEAVES

DENGUE

Dengue is a mosquito-borne viral disease that has become a major public health concern globally,.particularly.in.tropical.and.subtropical.regions.

It is estimated that over 3.9 billion people are at risk of contracting dengue, with approximately 390 million cases reported annually. Dengue virus (DENV) is transmitted through the bite of an infected Aedes mosquito, primarily Aedes aegypti and Aedes albopictus. The virus has four distinct serotypes (DENV-1, DENV-2, DENV-3, and DENV-4), which can cause a range of symptoms, from mild flu-like symptoms to severe and potentially life-threatening complications, such as dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS).

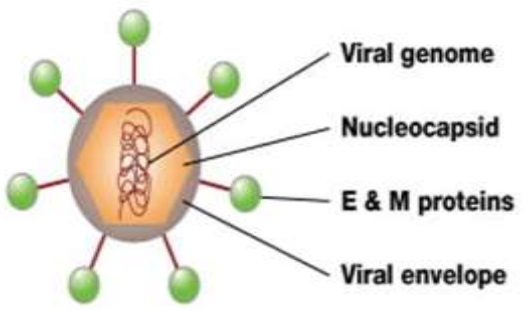

FIG 3: Structure Of Dengue Virus

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Requirement
1. Test tubes
2. Beakers
3. Flasks (e.g., Erlenmeyer, round-bottom)
4. Pipettes (e.g., micropipettes, volumetric pipettes)
5. Burette
6. Separating funnels
7. Chromatography chambers (e.g., TLC, HPLC)
8. Spectrophotometers (e.g., UV-Vis, IR)
9. pH meter
10. Hot plate or water bath
11. Mortar and pestle
12. Filter paper and filter funnel
13. Centrifuge
14. Vortex mixer
15. Autoclave (for sterilization)

PHYTOCHEMICAL SCREENING OF PAPAYA CARCIA LEAVES

Phytochemical screening is the process of identifying and characterizing the bioactive ……compounds present in a plant extract or material. Here's a brief note on phytochemical ……screening:

- **Objective:**

To detect and identify the presence of various phytochemical groups
1. Alkaloids
2.. Glycosides
3. Flavonoids
4. Terpenoids
5. Saponins
6. Tannins

- **Methods:**

1. Preliminary phytochemical screening using chemical tests (e.g, Dragendorff's test for alkaloids) 2. Chromatographic techniques (e.g., TLC, HPLC, GC-MS)
3. Spectroscopic methods (e.g., UV-Vis, IR, NMR)

- **Importance:**

1. Identifies potential bioactive compounds.
2. Guides further purification and characterization.
3. Helps in understanding the plant's medicinal properties.
4. Informs the development of new drugs or herbal products

- **Limitations:**

1. May not detect all phytochemicals present
2. Requires expertise in phytochemistry and analytical techniques
3. Can be time-consuming and costly

- **Materials and Method**

Collection and identification of plant material: Fresh healthy/disease free, mature, plant leaves of Carica papaya were handpicked leaves were washed and surface sterilized in 0.1% mercuric chloride for 5 minutes. It was washed thrice with sterile distilled water for 9 minutes. The sterilized leaves were air dried at room temperature for 24 hrs.

- **Preparation of papaya extract:**

Maceration is a process of extracting the active ingredients from plants, herbs, and other organic materials using a solvent, such as water, ethanol, or glycerin.

❖ Steps Involved in Maceration

1. Preparation of the material: The plant material is cleaned, dried, and chopped or crushed to increase the surface area.
2. Selection of the solvent: A suitable solvent is chosen based on the type of plant material and the desired extract.
3. Combining the material and solvent: The plant material is added to the solvent in a container, and the mixture is stirred or shaken.
4. Steeping: The mixture is left to steep for a period of time, which can range from a few hours to several weeks.
5. Strain and filter: The liquid is strained and filtered to separate the solvent from the plant material.
6. Concentration: The resulting liquid can be concentrated through evaporation, distillation, or other methods.

FIG 5: MACERATION

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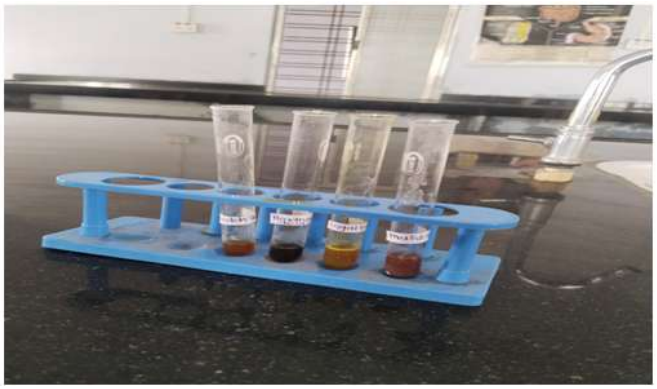
- **ALKALOIDS IN PAPAYA LEAF**

SR. NO	TEST	REAGENT	COLOR
1	Mayers Test	Pottasium mercuric iodide	White, yellow
2	Dragendroffs Test	Pottasium bismuth iodide	orange,red
3	Wangers test	Iodine potassium iodide	Brown, black
4	Hangers Test	Picric acid	yellow ,orange

Glycosides in Papaya leaf:

SR NO	CHEMICAL TEST	REAGENT	COLOR
1	Legals test	Picric acid	Yellow Orange
2	Bortnagars tset	2,3,5triphenyltetrazolium chloride	Pink Red
3	Molisch test	Napthol	Purple Red



Tannis in papaya leaves

SR NO	CHEMICAL TEST	REAGENT	COLOR
1	Gelatin test	Gelatin solution	Precipitate
2	Ferric chloride test	2 drops of ferric chloride	Blue Green

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Flavonoids in papaya leaves

SR NO	CHEMICAL TEST	REAGENT	COLOR
1	Alkaline reagent test	1-2 drops of 10% NaOH	Yellow Orange Red
2	Shinoda test	1-2 drops magnesium powder and 1-2 drops of conc HCL	Pink Red

Saponins in papaya leaves

SR NO	CHEMICAL TEST	REAGENT	COLOR
1	Foam test	water	Perisatent foam

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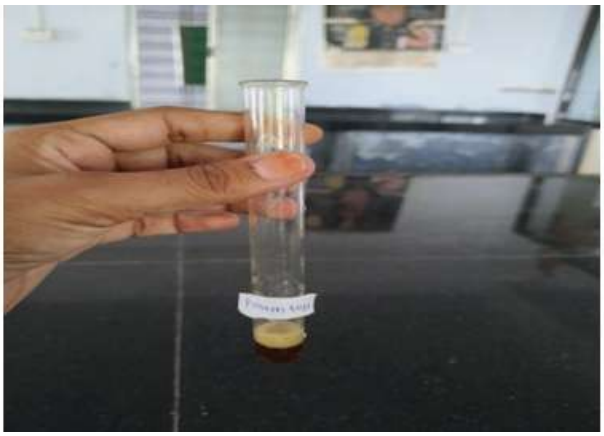

IV. CONCLUSION

Papaya leaves contain various bioactive compounds with potential therapeutic benefits. Phytochemical screening of Papaya leaves reveals the presence of:

1. Alkaloids (e.g., carpaine)
2. Glycosides (e.g., flavonoid glycosides)
3. Flavonoids (e.g., kaempferol, quercetin)
4. Phenolic acids (e.g., gallic acid, caffeic acid)
5. Terpenoids (e.g., lupeol, β-sitosterol)
6. Saponins (e.g., carpasaponin)
7. Tannins (e.g., gallic acid, ellagic acid)

These compounds may contribute to the reported medicinal properties of Papaya leaves, including:

1. Antioxidant and anti-inflammatory activities
2. Antimicrobial and antiviral properties
3. Anticancer and immunomodulatory effects
4. Cardiovascular and neuroprotective benefits

Further research is necessary to:

1. Isolate and characterize specific bioactive compounds
2. Investigate their mechanisms of action
3. Evaluate their therapeutic potential
4. Develop standardized extracts for medicinal use

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