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Research Article

**COMPARATIVE QUALITATIVE AND QUANTITATIVE STUDY
OF MEDICINAL PLANTS BY USING METHANOL AND
AQUEOUS EXTRACT (CARICA PAPAYA)**Siddharth Shankar, Dr. Vivekanand Katare*¹, Ms. Nisha Kalme¹, Dr. Prabhat Kumar Jain²¹Vivekanand College of Pharmacy, Bhopal (M.P.), ²Scan Research Laboratories, Bhopal (M.P.)**Article Received:** December 2022 **Accepted:** December 2022 **Published:** January 2023**Abstract:**

Indian traditional codified medicinal systems and folk medicine are a vast lexicon of herbal formulations and medicinal plants. In last few decades, the popularity of herbal medicine/products has increased worldwide, not only as part of conventional treatment strategies but also for health care management. A large number of modern medicines are derived from the plants used in Ayurveda and other traditional medicinal systems. Ayurveda and other traditional herbal medicines are capable of addressing some modern unmet medical needs, and can provide the basis for developing potential medicines. *Carica papaya* (papaya) is a herbaceous plant belonging to the family *Caricaceae*. This plant is a dicotyledonous, polygamous and diploid species. It originated from Southern Mexico, Central America and the Northern part of South America. The whole plant parts, fruit, roots, bark, peel, seeds and pulp are also known for its medicinal properties. The papaya has high content of Vitamins A, B and C. The proteolytic enzymes like papain and chymopapain have antiviral, antifungal and antibacterial properties. This study deals with the Comparative qualitative and quantitative study of *Carica papaya*. The plant material was collected and subjected to maceration by Methanol & water separately. The phytochemical screening & quantitative estimation of flavonoid was also performed. The results showed that the methanol & aqueous extract have percentage yield of 5.31% w/w & 6.71% w/w. Methanolic extract showed presence of Carbohydrates, Flavonoids, Proteins & Amino acids, Diterpenes & Aqueous extract was found to contain Flavonoid, diterpenes & saponins. The total flavonoid content for methanol & aqueous extract was observed to be 0.299 mg/100mg & 0.484 mg/100mg respectively. These results indicate that aqueous extract contain greater amount of phytoconstituents than methanolic extract.

Keywords: *Carica papaya*, Medicinal plant, Phytochemicals, Flavonoids,**Corresponding author:****Vivekanand Katare,**

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INTRODUCTION:

Medicinal plants have been used in virtually all cultures as a source of medicine. Assurance of the safety, quality, and efficacy of medicinal plants and herbal products has now become a key issue in industrialized and in developing countries. The widespread use of herbal remedies and healthcare preparations is described in the Vedas and the Bible. Medicinal Plants have been used for thousands of years to flavor and conserve food, to treat health disorders and to prevent diseases including epidemics. The knowledge of their healing properties has been transmitted over the centuries within and among human communities (Singh,2015).

Active compounds produced during secondary metabolism are usually responsible for the biological properties of plant species used throughout the globe for various purposes, including treatment of infectious diseases. Currently, data on the antimicrobial activity of numerous plants, so far considered empirical, have been scientifically confirmed, with the increasing number of reports on pathogenic microorganisms resistant to antimicrobials. Products derived from plants may potentially control microbial growth in diverse situations and in the specific case of disease treatment(Davidson,2000).

Carica papaya (papaya) is a herbaceous plant belonging to the family Caricaceae. This plant is a dicotyledonous, polygamous and diploid species. It originated from Southern Mexico, Central America and the Northern part of South America. It is a rich source of three powerful antioxidants which are vitamin C, vitamin A and vitamin E. This fruit also contains a digestive enzyme which is known as papain which effectively treats sport injuries, trauma and allergies (Subenthiran *et al.*, 2013; Aravind *et al.*, 2013).

The whole plant parts, fruit, roots, bark, peel, seeds and pulp are also known for its medicinal properties. The papaya has high content of Vitamins A, B and C. The proteolytic enzymes like papain and chymopapain have antiviral, antifungal and antibacterial properties. The juice from the leaves of *Carica papaya* helps to increase the count of white blood cells and platelets count, it also helps to normalize clotting and repairs the liver. The extract of papaya juice was given to patient with dengue fever within 24 hours the platelet count and white blood cell count raised to normal level. Papaya has been used as an abortifacient, Amebicide. It can be used to treat Asthma, Corns and boils, Diarrhea and dysentery, Digestive Dyspepsia, Fever Hypertension, arthritis. This research work deals with comparative

qualitative and quantitative study of methanol and aqueous extract of *Carica papaya* (Baskaran *et al.*, 2012; Silva *et al.*, 2007).

MATERIAL AND METHODS:**Collection of plant materials:**

The roots of *Carica papaya* were collected from Akshat Nursery, Bhopal in the period of March 2022, considering the seasonal conditions for obtaining maximum phytoconstituents.

Extraction:

Collected plant drugs namely *Carica papaya* leaves were cleaned properly and washed with distilled water to remove any kind of dust particles. Cleaned and dried plant drugs were converted into moderately coarse powder in hand grinder. Powdered plant drugs were weighed (50 gm) and packed in (1 liter) air tight glass bottle. The plant drugs were subjected to extraction by Methanol & water separately as solvent for about 24 hrs. The liquid extracts were collected in a tared conical flask. The solvent removed from the extract by evaporation method using hot plate. The extracts obtained with each solvent were weighed to a constant weight and percentage w/w basis was calculated (Mukherjee,2007).

Preliminary Phytochemical Screening:

Preliminary phytochemical screening means to investigate the plant material in terms of its active constituents. In order to detect the various constituents, present in the Hydroalcoholic extract of leaves of *Carica papaya* were subjected to the phytochemical tests as per standard methods (Kokate,1994; The Unani pharmacopeia of India,2007).

Estimation of total flavonoids content:

The aluminum chloride colorimetric method was modified from the procedure reported by Woisky and Salatín. Quercetin was used to make the calibration curve. Ten milligrams of quercetin was dissolved in 80% ethanol and then diluted to 10 to 50 µg/mL. The diluted standard solutions (0.5 mL) were separately mixed with 1.5 mL of 95% ethanol, 0.1 mL of 10% aluminum chloride, 0.1 mL of 1M potassium acetate and 2.8 mL of distilled water. After incubation at room temperature for 30 min, the absorbance of the reaction mixture was measured at 415 nm with a Shimadzu spectrophotometer. The amount of 10% aluminum chloride was substituted by the same amount of distilled water in blank. Similarly, 0.5 mL of Hydroalcoholic extracts and Flavonoid standard solutions (100 ppm) were reacted with aluminum chloride for determination of Flavonoid content as described (Parkhe and Bharti,2019).

RESULTS & DISCUSSION:

The methanol & aqueous extract have percentage yield of 5.31% w/w & 6.71% w/w. Methanolic extract showed presence of Carbohydrates,

Flavonoids, Proteins & Amino acids, Diterpenes & Aqueous extract was found to contain Flavonoid, diterpenes & saponins. The total flavonoid content for methanol & aqueous extract was observed to be 0.299 mg/100mg & 0.484 mg/100mg respectively.

Table: 1 Extractive values obtained from *Carica papaya*

S.N.	Solvent	% Yield
1.	Methanol	5.31%
2.	Aqueous	6.71%

Table: 2 Preliminary phytochemical screening of *Carica papaya*

S.N.	Phytoconstituents	Test Name	Methanolic Extract	Aqueous extract
1	Alkaloids	Wagner's Test	-(ve)	-(ve)
2	Carbohydrates	Fehling's Test	+(ve)	-(ve)
3	Flavonoids	Lead acetate	+(ve)	+(ve)
		Alkaline reagent test	-(ve)	+(ve)
4	Proteins & Amino acids	Precipitation test	+(ve)	-(ve)
5	Phenols	Ferric chloride test	-(ve)	-(ve)
6	Diterpenes	Copper acetate test	+(ve)	+(ve)
7	Saponins	Foam test	-(ve)	+(ve)

Table: 3 Total Flavonoid content of Methanolic & Aqueous extract *Carica papaya*

S. N.	Extracts 100µg/ml	Flavonoid content Quercetin equivalent mg/100mg
1	Methanolic extract (100µg/ml)	0.299
2.	Aqueous extract (100µg/ml)	0.484

CONCLUSION:

The results of the phytochemical test indicated the presence of Diterpenes, Proteins, Flavonoids, and Carbohydrates in Methanolic extract of *Carica papaya*. While the aqueous extract of *Carica papaya* exhibited positive results for flavonoid, Saponin, Diterpenes. The Methanolic extract was discovered to be devoid of Alkaloid, Phenol, Flavonoid & Saponins. The aqueous extract is devoid of Alkaloid, Carbohydrate, Phenol & Proteins. This plant was also subjected to total flavonoid content, which demonstrated the existence of flavonoids. In order to treat many diseases and ailments, this plant portion can be used.

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