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Full Length Research Article

Preliminary Phytochemical Screening of *Vachellia nilotica* and *Carica papaya*

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Abstract

Medicinal plants had played a very pivotal role in the traditional medicine since primordial times. These plants synthesized various chemical compounds either for its protection or for its growth and are also responsible for the medicinal properties. *Vachellia nilotica* (Babul) and *Carica papaya* (Papaya) are a well-known for its medicinal properties. In traditional medicine *Vachellia nilotica* has been seen to show antimicrobial, antiplasmodial and antioxidant activity. *Carica papaya* is a succulent plant which has been traditionally used as a home remedy for the treatment of dengue, cholesterol and menstrual pain ingestion. The article deals with phytochemical activity of *Vachellia nilotica* and *Carica papaya*. Under which the screening for flavonoid, alkaloid, tannin, phenol, sapponin, terpenoid (Triterpenes), sterol and phlobatannin was performed. The solvent used for the extraction purpose were Acetone, chloroform and water. Out of all the phytochemicals, the leaves were found rich with phenol, flavonoids, triterpenoids and tannin content.

***Key words*:** *Vachellia nilotica, Carica papaya,* Phytochemical, Screening, Antibacterial

Plant parts and plant products such as plant derived metabolites [1] or mediated biosynthesized nano particles [2-3] are widely used for the treatment of various diseases [4]. Medicinal plants support the treatment to the most of diseases caused by microorganisms; they possess antifungal, antibacterial, anticancer and antioxidant activity etc. [5-7]. Pharmaceutical chemicals used for many treatments; remain medicinal plants play an important role in treatment of some diseases [8]. *Vachellia nilotica* belongs to Fabaceae family. Generally found in the tropical and subtropical countries. It is to be rich in a number of phytochemical properties such as alkaloids, terpenes, volatile essential oils, tannins, phenols and phenolic glycosides, steroids, resins and oleosins. Plant parts such as root, stem, leaves, bark, flowers, fruits and gum act as antibacterial, anti-cancer, anti-hypertensive, anti-platelet aggregatory, cytotoxic, anti-diabetic, anti-asthmatic, anti-pyretic etc. [9]. *Vachellia nilotica* is widely used plant as it has many antimicrobial anti-plasmodial and antioxidant values as various hazardous diseases like HIV, Hepatitis C, cancers are treated with it. The leaf extracts are best for curing chest pain, fever, Malaria, stomach ulcers its branches are also used as tooth cleaners in this time also in the villages, areas as it works as good mouth fresheners and cure various mouth related problems. It is a blessing to humans as it cures many health-related issues like helps in the treatment for vaginalitis, and in male it solves is ejaculation problems. It is an herbal drug with efficiency of tannin that is extracted from *Vachellia nilotica* plant. *Carica papaya* is a member of Caricaceae family, originated from Central America, Southern Mexico and Northern part of South America [10]. Papaya leaves has been used as folk medicine in centuries. In recent years we have shown their beneficial effects as antitumor, anti-inflammatory agent, wound healing properties, antioxidants and immune-modulatory effects [11]. The pods and bark of the tree also show antioxidant Activity. The potential source of antibacterial and antimicrobial components shows that it can be used in food, agriculture or pharmaceutical products. In the present study aimed to analysis the phytochemical activity of the *Vachellia nilotica* and *Carica papaya*.

MATERIALS AND METHODS

Sample collection

Leaves of *Vachellia nilotica* and *Carica papaya* plants were collected from college campus of Shri Shankaracharya Mahavidyalaya Junwani, Bhilai, Chhattisgarh.

Extraction process

The plant samples were thoroughly washed firstly with tap water and then with distilled water. After that it was left for drying. The leaves were shade dried and it took at least 5 to 6 days for complete drying. After that, the leaves were properly dried and was powdered by the help of Mortar and pestle. With this powdered sample, two types of Extracts were prepared.

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a. *Aqueous extract*: For the aqueous extract, 10g of both the plant sample were soaked in autoclaved distilled water for 5 days. After 5 days a phytochemical screening was done. After that, the extract was dried using a water bath at 60°C. A sticky extract was obtained.

b. *Organic solvent extract*: For the organic solvent extract, 10g of both the plant samples were soaked in 2 different solvents, a polar solvent i.e., acetone and a non-polar solvent i.e., chloroform for 5 days. After 5 days, a phytochemical screening was done. After that, the extract was dried using a water bath at 60°C. A sticky extract was obtained.

Phytochemical analysis

Test for alkaloid: 1mg of plant extract was treated with 1% HCl over water bath for 5mins. The filtrate was further treated with 3 different reagents.

a. *Dragendorff's test*: The filtrate when treated with Dragendorff's reagent (Potassium bismuth iodide solution) an orange red precipitate shows the presence of alkaloids.

b. *Mayer's test*: The filtrate, when tested with 1ml Mayer's reagent (Potassium mercuric iodide solution) formation of cream-colored precipitate gives an indication of the presence of alkaloids.

c. *Wagner's test*: In Wagner's reagent i.e., 2gm of potassium iodide and 1.27 g of iodine in 5ml distilled water and then make up the final concentration to 100ml using distilled water, add 1ml of filtrate, brown colored precipitate indicates the presence of alkaloid [12].

Test for flavanoid: For the test of flavanoids alkaline reagent test was used. The extract when treated with 2-3 drops of sodium hydroxide, yellow color forms, which changes to colorless when treated with sulphuric acid.

Test of tannin: The extract is first diluted with distilled water and then gets treated with 10% ferric chloride. A blue/green color indicated the presence of tannin [13].

Test for phenol: The addition of 3-4 drops of 0.1% v/v Ferric chloride to the filtrate changed the color to brownish green or blue, indicated the presence of phenols [13].

Test for sapponin: For the test of sapponin forth test was used. 10ml of distilled water was added to 5ml of plant extract and was shaken vigorously for 2mins. It results in the formation of foam and if the foam stays for 10-15 min, it shows the presence of saponin in it [13].

Test for triterpenoids: In 1ml of extract a few drops of concentrated H_2SO_4 was added, which after shaking was left to stand. Formation of golden yellow layer at the bottom part shows the presence of triterpenoids [13].

Test for sterol: 1ml of plant extract is treated with 1ml of chloroform and is then reacted with sulphuric acid by gradual addition along the wall. Formation of reddish-brown layer at the bottom indicated the presence of sterol [14].

Test for phlobatannin: 2ml of plant extract is treated with 2mL boiled 1% HCl. Presence of red precipitate indicated the presence of phlobatannin [13].

RESULTS AND DISCUSSION

The phytochemical screening of *Vachellia nilotica* and *Carica papaya* was done using the leaves of the plants. For the test the aqueous (water) and organic solvent (Acetone and chloroform) were used as the solvent. After completion of all the extraction, the extracts are dried in hot air oven and the dry weight of the sample is taken shown in (Table 1, Fig 1). According to the experiments was performed acetone and water gave more positive result. The phytochemical activities of both the plants were tested against flavanoids, alkaloids, tannins, phenol, sapponin, terpenoids, sterol and phlobatannin shown in (Table 2). The above studies gave more positive results with flavanoids tannins, triterpenoid and phenol as compared to other phytochemicals.

Table 1 Total volume of dry weight of the *Vachellia nilotica* and *Carica papaya*

Solvent	Dry weight of extract (in gram)	
	Vachellia nilotica	*Carica papaya*
Acetone	0.76	0.35
Chloroform	0.06	0.17
Water	0.86	0.69

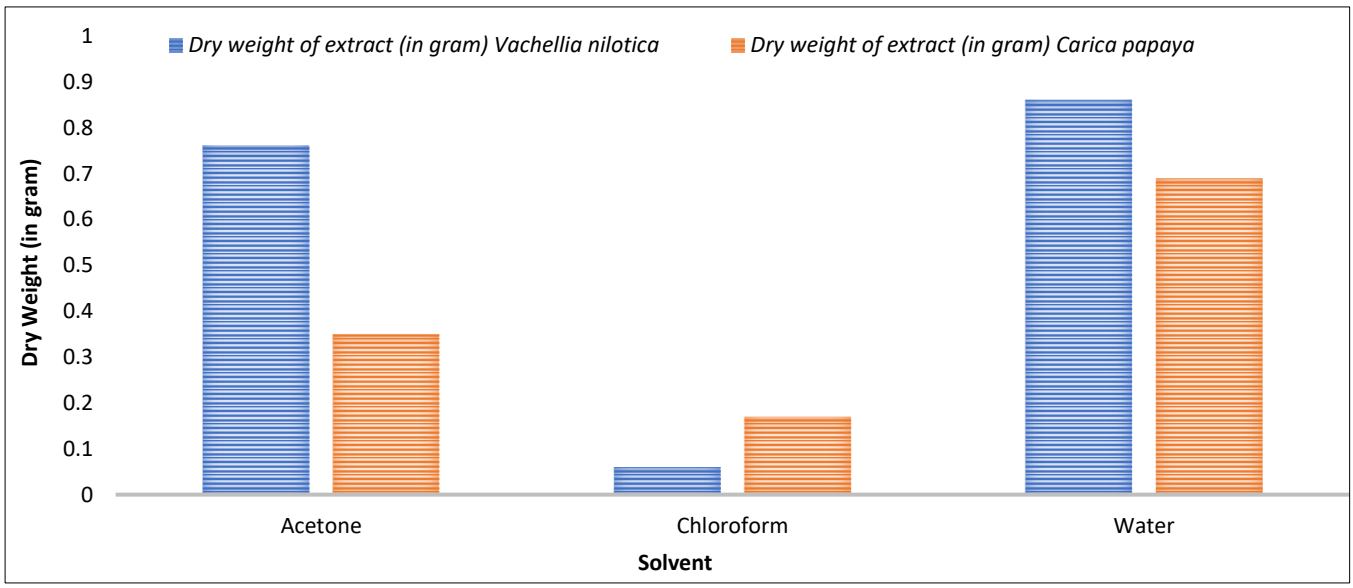

Fig 1 Total volume of dry weight of the *Vachellia nilotica* and *Carica papaya*

Table 2 Phytochemical activity of *Vachellia nilotica* and *Carica papaya*

Plant leave	Extract	Phytochemical screening							
		Flavonoid	Alkaloid	Tannin	Phenol	Saponin	Triterpenoid	Sterol	Phlobatannin
Vachellia nilotica	Acetone	+	-	+	-	-	+	-	-
	Chloroform	-	-	+	+	-	-	+	-
	Water	+	-	+	+	+	+	-	+
Carica papaya	Acetone	+	+	+	-	-	+	-	-
	Chloroform	-	-	+	+	-	+	-	-
	Water	+	+	+	+	+	-	+	+

The phytochemical screening of *Vachellia nilotica* and *Carica papaya* were done from aqueous and organic solvent (Chloroform and Acetone) extracts. The phytochemical analysis revealed the presence of flavonoids, alkaloids tannins, phenol, saponin, triterpenoids, steroid and phlobatannins in certain ratio in both the plants, that brings the consideration that both of them have their own pharmaceutical and nutritional values. The major amount of phytochemicals was extracted in aqueous extract i.e., saponin, tannin, phenol, triterpenes, flavanoid and phlobatannin [15-16] also obtain the same result of phytochemical analysis of *Vachellia nilotica* and *Carica papaya*. As World Health Organization revealed that the photochemical that are naturally present in the plants become a good source for future drug discoveries [17]. The photochemical are non-nutritive chemicals that somehow contained disease preventive qualities. By the preliminary qualitative phytochemical analysis we also came to identify about the secondary metabolites that are present in various alcoholic and aqueous extract in the leaves of *Vachellia nilotica* and *Carica papaya* and the presence of bioactive agents helps in the synthesis of drugs. The above study shows that both the plants, not only have nutritional values but also can be used as antioxidants, antimicrobial and anti-inflammatory actions like leaves of *Vachellia nilotica* shows antimicrobial, antiplasmodial antioxidant activity [15] as it is used in the treatment of immunodeficiency viral diseases, Hepatitis C virus, cancer treatment ,hence prove to be great blessing to the medical field, whereas *Carica papaya* is used to make medicines which are used to treat parasitic infections, also used as a sedatives, pain reliever, it also boosts immunity, anti-aging increases digestion and maintains the proper kidney health.

CONCLUSION

The above studies shows that both the plants are rich source of tannins, flavonoids and terpenoids comparatively other phytochemicals where the presence of tannins shows astringent qualities that precipitates the proteins and various organic compounds whereas terpenoids plays major role in the growth and development and helps the plants to interact with their environment and provide resistance to the environmental stress and give defense against the pathogens whereas the flavonoids helps regulating the cellular activity and fight from free radicals that causes stress in our bodies it also protects us from toxins, stress and act as a powerful antioxidant agents. All the previous studies show that the plant is rich in bio-chemicals and their important medical properties as it protects against the hazardous diseases.

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