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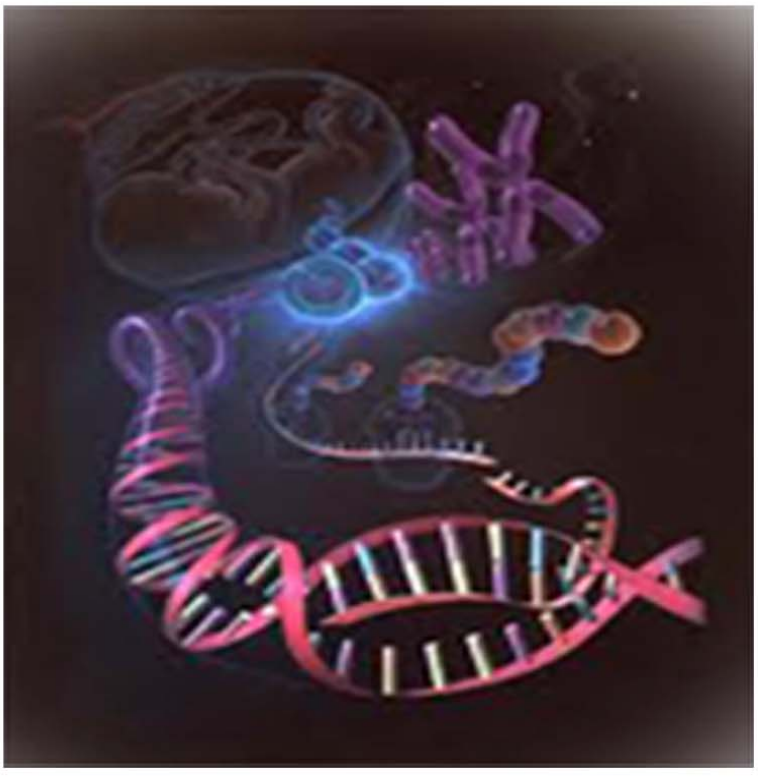

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Research Paper

PHYTOCHEMICAL ANALYSIS OF PAW-PAW (*CARICA PAPAYA*) LEAVES

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Phytochemicals are chemical compounds that occur naturally in plants. They are characterized by multilateral pharmacological activity and broad spectrum of therapeutic actions. The qualitative phytochemical analysis of *Carica papaya* leaves showed the presence of alkaloid, flavonoid, Saponin, Tannin and Glycosides. The qualitative test was justified by their color changes with their various reagents

Keywords: *Carica papaya,* Phytochemicals, Therapeutic actions and color changes

INTRODUCTION

According to Eno *et al*. (2000) Paw paw is the fruits of the plant *Carica papaya* belonging to the genus *Carica*. It is native to the tropics of American and was first cultivated in Mexico (Everette, 2003).

Scientific classification of papaya

Kingdom	-	*Plantae*
Order	-	*Brassicales*
Family	-	*Caricaceae*
Genus	-	*Carica*
Species	-	*C. Papaya*

Binomial name (Gledhil, 2009).

Carica papaya contains the enzyme papain, which is present in the fruits, stem and leaves (Akah *et al*., 2007). Meat can be tenderized by wrapping it in a papaya leaf before cooking. It contains biologically active compounds such as chymopain and papain which aids in digestion (Barger *et al*., 2009). Papain is a proteolytic enzyme that helps in protein digestion. Because it improves digestion in general, papain has also been used orally to treat less serious digestive disorders like bloating and chronic indigestion (Baur *et al*., 2008).

Papain is also used in the treatment of arthritis and intestinal worms. Phytochemicals in papain may increase immune system and may also promote the release of natural chemicals that attack tumor cell (Cordell, 2008).

Hasheen (2007) points out that *Carica papaya* is a large, tree-like plant with a single stem

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growing from 5 to 10 m [16 to 33 ft] tall, with spirally arranged leaves confined to the top of the trunk. The lower truck is conspicuously scarred where leaves and fruit were borne. The leaves are large, 50-70 [20-28 inches] in diameter, deeply and palmately lobed with seven lobes.

Practically, every part of *Carica papaya* is of economic value and its use ranged from nutritional to medicinal. The fruits are popularly used and processed into juice and wine, while the fruits are cooked as vegetable (Gragson, 2001). The seeds are medically important in the treatment of sickle cell diseases, poisoning related disorder. The leaf tea or extract has a reputation as a tumor destroyer agent. The fresh green tea is an antiseptic whilst, the brown dried pawpaw leaves are best served as a tonic and blood purifies ([Ezugwu, 2008).

Due to its antioxidant and fiber contents, it is therefore, used in the treatments of digestion and other ailments such as chronic indigestion, overweight, obesity, high blood pressure and weakening of the heart (Everette, 2003).

The aim of this study was to determine the phytochemicals that are present in *Carica papaya* leaves. This will help in determining of its medicinal value which may be useful in pharmaceutical industry.

MATERIALS AND METHODS

Reagents

Ethanol 100ml, Mayer's reagent 0.5ml, Wagner's reagent 0.5ml, Distilled water, Tetraoxosulphate (vi) acid (H_2SO_4), 20% Potassium hydroxide (KOH), Fehling solution, Ferric chloride ($FeCl_3$), 10% potassium hydroxide solution, Sodium hydroxide solution, Aluminum chloride ($AlCl_3$), Concentrated H_2SO_4, Olive oil, and 20 g powdered *Carica papaya* leaves.

Apparatus

Spatula, Filter Paper, Water bath, Oven, Beaker, Test tubes, Sieve, Funnel, Measuring cylinder, Hand grinder, Sample bottle, Detergent and Aluminium foil.

Sample Collection

The leaves of *Carica papaya* were collected from Pawpaw plant at Mr. Nwodo O. farm in Enugu Ezike, Igbo Eze North Local Government Area of Enugu State, Nigeria. The sample for this work was collected in November, 2012 and was washed immediately with clean water to remove dirts, sand particles and other solid contaminants. Drying of the sample was done under the sun for one week and pulverized to powder. The pulverized sample was stored in a tightly closed glass sample bottle until extraction.

Sterilization of Glass Wares

All glass ware used in this research work were washed with detergent, rinse with distilled water and air dried. They were also sterilized on a hot air oven and each material was wrapped with aluminium foil before sterilization.

Extraction of Sample

The pulverized leaf was collected and 10g of it were measured and introduced into 20ml of ethanol and distilled water. Each of this were placed at an intermediate stirring and allowed to stay for 48 h before filtering. It was filtered with Whattman filter paper. The residue was thrown away while the filtrate was exposed under air and allowed to evaporate in order to obtain the concentrated extract. The concentrated extract was stored in a clean bottle in a refrigerator until usage.

Phytochemical Screening of the *Carica Papaya* Extract

The extract of *Carica papaya* leaves were tested for the presence of photochemicals such as alkaloid, flavonoid, saponin and glycoside using the standard procedure described by Tang.

Qualitative Test for Alkaloid

a. 1ml of 1% HCl was added to 3ml of each extract in different test-tube. Each mixture was heated for 2 min in a water bath while stirring continuously. It was cooled and filtered.
b. 1ml of filtrate from (i) above was added to 0.5ml of Mayer's reagent.
c. 1ml of each filtrate from (i) above was added to 0.5ml of Wagner's reagent in different test tube.

Qualitative Test for Tannin

Ferric Chloride ($Fecl_3$) Test: 5g of ferric chloride was dissolved and made up to 100ml with distilled water. 0.5ml of $FeCl_3$ was then added to 2 ml of the extract.

KOH Test: 1ml of freshly prepared 10% KOH was added to 1ml of each extract in difference test-tube.

Qualitative Test For Flavonoid

a. Two drops of NaOH solution was added to 1ml of each extract in difference test –tubes.
b. Two drops of $AlCl_3$ solution was added to (a) above, followed by addition of concentrated H_2SO_4.

Qualitative Test for Saponin

a. Emulsion test: Three drops of olive oil was added to 3 ml of each extract and stirred.
b. 3 ml of distilled water was added to 2 ml of the extract and the mixture was stirred vigorously.
c. Fehling Test: 2 ml of each of the fehling solution A and B was added to 3 ml of the extract. The mixture was boiled for 5 min.

Qualitative Test for Glycoside

5 ml of distilled water was added to 2 ml of the papaya leaf extract. 2 ml of the H_2SO_4 was also added the mixture and was boiled in water bath for 15 min and allowed to cool.

The mixture was neutralized with 20% KOH solution. 1 ml of equal parts of fehling solution A and B (each) was added to the mixture and boiled for 15 min in a water bath.

RESULTS

The qualitative test for alkaloid, tannin, flavonoid, saponin and Glycoside from powered *Carica papaya* leaves using their reagents. The changes associated with their reagents are shown in Tables 1, 2, 3, 4 and 5 below.

Table 1: Qualitave Test for Alkaloid

Material	Reagent	Colour Change	Confirmation
Carica Papaya extract	Mayer	Cream Yellow ppt	Positive
Carica Papaya extract	Wagner	Brown ppt	Positive

Table 2: Qualitave Test for Tannin

Material	Reagent	Colour Change	Confirmation
Carica Papaya extract	$FeCl_3$	Greenish	Positive
Carica Papaya extract	KOH	Dirty White ppt	Positve

Table 3: Qualitave Test for Flavonoid			
Material	**Reagent**	**Colour Change**	**Confirmation**
Carica Papaya extract	NaoH + $AlCl_3$ + H_2SO_4	Yellow PPt	Positive

Table 4: Qualitave Test for Saponin			
Material	**Reagent**	**Colour Change**	**Confirmation**
Carica Papaya extract	Olive oil	It formed a stable emulsion	Positive
Carica Papaya extract	Distilled water	Formed a persistant foam	Positive
Carica Papaya extract	Fehling solution	Brick ppt	Positive

Table 5: Qualitave Test for Glycoside			
Material	**Reagent**	**Colour Change**	**Confirmation**
Carica Papaya extract	Distilled water.H_2SO_4, KOH and Fehling solution	Brick red ppt	Positive

DISCUSSION AND CONCLUSION

The qualitative test has already been carried out using *Carica papaya* leaves which gave results that *Carica papaya* leaves contain, saponin, tannin, flavonoid, alkaloid and Glycoside. The standard method of analysis used was able to identify really that *Carica papaya* leaves contain Alkaloid, Saponin, Tannin, Glycoside and Flavonoids.

CONCLUSION

It is therefore, concluded that *Carica papaya* leaves contain Alkaloid, Saponin, Tannin, Glycoside and Flavonoids and this is in agreement with the work of [Willson *et al*., 2007]. Also, from the result, it can be deduced that phytochemicals can be extracted more when the leaves are dried and pulverized to powered form. To this, it then means that phytochemicals can be made available commercially. The study has shown that *Carica papaya* can be seen as a potential source of useful food and drug items.

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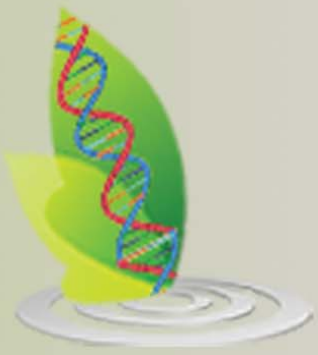

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