DETERMINATION OF PHYTOCHEMICAL COMPOSITION OF THE LEAVES AND SEEDS EXTRACT OF PAWPAW (Carica papaya)

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Abstract

Investigation on the determination of phytochemical screening of Carica papaya leaves and seeds extracts were carried out and percentage values of Tannin, saponin, alkaloid, flavonoid and glycoside were recorded. Results showed that the plant leaves extract contained the phytochemical component values in percentage with tannin 0.55% ppm, saponin 1.60%, alkaloid 2.3%, flavonoid 1.90%, glucoside 0.03% while the seeds extract showed by percentage; tannin 10.83 ppm, saponin 0.91%, alkaloid 6.76%, flavonoid 0.77% and glycoside 1.60%. The highest value of alkaloid 2.30% in the leaves extract was responsible for its anti-malaria property. The low value of saponin, flavonoid and glycoside in both leaves and seeds make the fruit not to be deleterious to the users. This study showed that Carica papaya can be of use in the herbal treatment of different diseases and as a potential source of useful elements for drugs formulation.

Key words: carica papaya, leaves, seeds and phyto-chemical

Introduction

Pawpaw (Carica papaya) belongs to the family caricaceae. Carica papaya is evergreen shrub or small trees that grow best in rill size, sun to light, shade the plant like lots of water and fertilization in warm weather, flower and similar in shape to the flower of plumeria but are much smaller and appear on the leaves, maturity into fruits (Eno, 2008). The milky juice of Carica papaya when extracted and dried is used as chewing gum, meat tender. It has been used to treat digestive problems and intestinal worms as well as warts, simusitive, coetaneous turbidness and hardness of the skin. The green unripe pawpaw has a therapeutic value due to its antiseptic quality. It cleans the intestine from bacteria. The tea, prepared with the green papaya leaf promotes digestion, overweight and obesity, arteriosclerosis, high blood pressure and weakening of the heart (Ezugwu, 2008).

Materials and Methods

Sample Collection: Papaya leaves and seeds was collected from the botanical garden of Oyo State College of Agriculture and Technology, Igboora at 7° 15 North and 3° 30 East of the equator with an annual rainfall of 1500mm and annual temperature of 27°c (Sanusi, 2011).

Sample Preparation: The papaya leaves and seeds were collected and air dried at room temperature (32-35°c) over a period of five (5) days respectively. The seeds were then oven dried at 50°c for a day. The dried leaves and seeds were grinded using blender. About 19 grams of the grinded leaves and seeds were measured separately and introduced into 20ml of ethanol and distilled water, stirred and allowed to stay for 48 hours before filtering with Whatman filter paper. The filtrate was exposed under air and allowed to evaporate in other to obtain the concentrated extract. The concentrated extract was stirred in a clean bottle until usage.

Phytochemical screening of Carica papaya leaves and seeds extract (According to Harbone, 1973).

Test for tannin: The amount of 0.01g of Carica papaya leaves and seeds were weighed and measured 20ml of methanol was added to the extract and shake and centrifuge for 10 minutes 1.5ml of the filtrates were measured into 50ml flask and 0.3ml of folin D reagent was added with 0.6ml of 50% Na_2CO_3 solution. Each of them were allowed to stand for 25 minutes and blue colour of absorbance was read at 760ml

$$Calculation:- \ Tannin\ (ppm) = \frac{absorbance \times extract \times slipe\ gradient}{Weight\ of\ the\ sample}$$

Test for Saponin: About 10g of the two samples (leaves and seeds) were weighed separately. To remove any trace of fat present 30ml of n-hexane was added respectively 30ml of methanol was also added to the extracts and filtered. 100ml of cold acetone was added and place in a refrigerator for 50 minutes. It was then filtered again by the use of weighed filter paper and then re-weighed after dried.

$$Calculation:- \ Saponin\ (\%) = \frac{W_2 - W_1}{W_0} \times 100$$

W_0 = Weight after drying, W_1 = Weight of empty filter paper, W_2 = Weight of sample

Test for alkaloids: About 5g of the samples (leaves and seeds) were weighed and treated separately respectively. 10% of acetic acid were added to ethanol (100ml) under 4 hours room temperature and filtered. A drop of NH_4OH was added to precipitate and precipitated alkaloid was filtered in a weighing filter paper.

$$Calculation:- \ Alkaloid\ (\%) = \frac{W_2 - W_1}{W_0} \times 100$$

W_0 = Weight after drying, W_1 = Weight of empty filter paper, W_2 = Weight of sample

Test for Flavonoid: The amount of the samples (leaves and seeds) weighed was 5g and 50ml of 2mHcl was added to each of them respectively. It was boiled for 30 minutes, allows cooling, and filtered. The amount specific filtrate was measured and 50ml of ethyl acetone was added. The precipitate flavonoids were filtered by using weighed filter paper and it was re-weighed after oven drying.

$$Calculation:- \ Alkaloid\ (\%) = \frac{W_2 - W_1}{W_0} \times 100$$

W_0 = Weight after drying, W_1 = Weight of empty filter paper, W_2 = Weight of sample

Test for glycoside: About 1g of the samples (leaves and seeds) was weighed separately into conical flask and 25ml of distilled water was added and filtered. 5ml of ammonia solution was added to each of the filtrates with 2ml of 10% Kl was added 5 drops of DPC was added as an indicator and lastly, 0.05m $AgNo_3$ was added and filtered until yellow Kl become turbid which indicate the end point.

Calculation: - Glycoside = T × 0.5204kg where T = Titre value

Result and Discussion

The result shows the phytochemicals compositions of Carica papaya leaves and seeds in Table 1 and Table 2

Table 1: Phytochemical screening of Pawpaw leaves

S/N	Constituents	Values
1	Tannin ppm)	0.55
2	Saponin (%)	1.60
3	Alkaloid (%)	2.30
4	Flavonoid (%)	1.90
5	Glycoside (%)	0.03

Table 2: Phytochemical screening of *Carica papaya* seeds

S/N	Constituents	Values
1	Tannin (ppm)	10.83
2	Saponin (%)	0.91
3	Alkaloid (%)	6.76
4	Flavonoid (%)	0.77
5	Glycoside (%)	1.60

Discussion

From the result, tannin has the value of 0.55ppm in leaves and 10.83ppm in seeds. Tannins are dietary and anti-nutrient that are responsible for astringent of foods and drinks which could quicken the healing of wounds and burns (Chikezic et al., 2008). The values of saponin in leaves 1.6% and 0.91% in seeds were observed not to differ from each other with that of Neem leaves (1.5%) and bitter kola (1.4%). The percentage composition of saponin in pawpaw is of moderate quantity, this suggest that they may not be deleterious to the user (Sodipo, 2000). From the result of alkaloids, the highest value 2.3% for leaves and 6.76% for the seeds justify the therapeutic use of the plant. The presence of alkaloids in the leaves and seeds show that this plant can be an effective anti-malarial since alkaloid consists of quinine (Robinson, 1985). From the result, flavonoid has the value of 1.9% in leaves and 0.77% in seeds. The amount of flavonoids investigated infer that the plants have biological functions such as protection against allergies, inflammations, free radical, tumor, viruses, ulcer, microbes and platelet aggregation (Okwu, 2014). Flavonoids in the intestine lower the risk of heart diseases (Akinmalodun et al., 2007). From the result, the glycoside has the value of 0.03% in leaves and 1.6% in seeds. Cyanogenic glycosides are compound that yield glucose, hydrogen, cyanide and aldehyde or ketone upon hydrolysis with an acid or enzyme.

Conclusion and Recommendation

It is concluded that the qualities of these phytochemicals in the extract of Carica papaya leaves and seeds was observed and suggesting their antioxidant potentials and justifying therapeutic uses which could be utilized in drug formation and usage in herbal medicine, this is in accordance with the work of Wilson *et al.*, 2007. It is recommended that phytochemicals of composition extract of Carica papaya leaves and seeds could be useful for drug development in treating or preventing diseases like skin rashes, malaria, killing of parasitic worms and treatment of liver cirrhosis.

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