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Phytochemical Screening Of The Leaf And Seed Extracts Of *Carica Papaya* L.

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ABSTRACT

Carica papaya is a shrub plant with prominent leaves (20-60 cm) and is a member of caricaceae family. The present study was designed for the evaluation of preliminary phytochemical screening of papaya leaf and seed. Bioactive compounds of the leaves and seeds of papaya were extracted using petroleum ether, chloroform, ethyl acetate and investigated for the presence of phytochemicals. All the extract revealed the presence of alkaloid, flavonoid, phenol and tannin in leaf. Whereas alkaloid, tannin were absent in the petroleum ether extract of seed.

Key word: *Carica papaya*, phytochemical, bioactive compound

Introduction

Papaya is a short lived, evergreen plant that can grow up to 25 feet high. Papaya leaf extract have phenolic compounds such as protocatechuic acid, p-coumaric acid, 5, 7-dimethoxy coumarin, cafferic acid, kaempferol, quercetin, chlorogenic acid (Romasi et al., 2011). Phytochemicals are bioactive substances of plants that have been associated in the protection of human health against chronic degenerative diseases (Fukumoto and Muzza, 2000). Phytochemicals are non nutritive plant chemicals that have protective or disease preventive properties (Ahamed and Urooj, 2010). Papya produces these chemicals to protect itself but recent research demonstrates that many phytochemicals can protect human against disease. Most of the pharma ceutical industries are highly dependent on wild populations for the supply of raw materials for the extraction of medicinally important compounds. Some of the important bioactive compounds are flavanoids, glycosides, anthroquinones, steroles, triterpenoids and phenolic compounds widely distributed in plants and the largest group of the plant secondary metabolite containing fifteen carbon atoms.

Materials and methods

The fresh papaya leaves and seed were collected from Chenkal village located at Trivandrum district, Kerala state.

1.1Qualitative Analysis

1.1.1Alkaloid:2mL of extract and 2mLof Wagner's reagent is added. Brownish precipitate indicates the presence of alkaloid.

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1.1.2Flavonoid:2ml of extractwas treated with 2ml of 10% lead acetate solution. Appearance of yellowish green colour indicates the presence of flavanoid.

1.1.3 Tannin:2mL of each extract of plant was mixed with few drops of 0.1% $FeCl_3$ solution in test tubes separately. Test tubes were observed for the appearance of brownish green colour.

1.1.4 Phenol:10mg of plant extract was mixed with 0.5 ml of Lead acetate (10%) and observed for the presence of white precipitate.

2.1. Quantitative analysis

2.1.1. Determination of carbohydrates

Anthrone's methods were used to determine carbohydrates (Sadasivam and Thayumanavan 1984). 1 g of plant material were ground with 10 ml of 80% acetone. The crude extracts were filtered. To 1 ml of the supernatant, 5 ml of anthrone's reagent were added. The test tube were kept in a water bath for 3 minutes and cooled in an ice bucket and the absorbance was measured at 660nm.

2.1.2. Determination of protein

Lowery,s method (1951) was used to determine protein content of the sample. To 1 ml of the extract 1 ml of distilled water were added with an ice bucket filter and centrifuge at 5000 rpm for 5 minutes make up the volume of the supernatant using 10ml distilled water. Pipette out 1 ml of extract and add 5 ml of folin- ciocalteu phenol reagent. After 10 minutes absorbance were measured at 500nm.

2.1.3. Determination of sugar

To 1 ml of the plant extract add 10 ml of distilled water. Filter and centrifuge at 3000 rpm for 10 minutes. Adjust the total volume of 10ml using distilled water. Take 0.1 ml of the extract and add 1ml of 5% phenol and 5 ml of conc.H_2SO_4. The mixture is mixed well. It is hot hence it is cooled for 30 minutes. Measure the OD 490 nm and extrapolate the value in the standard

2.1.4. Determination of starch

To 1 ml of the extract add 10 ml of distilled water. Filled it using cheese cloth. 0.5 ml of the filtrate add 4 ml of distilled water. Then add 1 ml of iodine. Heat it in the water bath for 10 minutes. Blue colour is developed. Read the OD at 650nm.

2.1.5. Determination of aminoacid

To 1 ml of extract added 10 ml of 80% ethanol. Make up the volume of the supernatant to 10ml distilled water. Pipette out 2 ml of extract and added 2 ml of ninhydrin solution shaked well. Heat it in boiling water bath for 15 minutes until bluish purple colour appear. Cool it and add 50% ethanol read OD value at 510 nm.

Results

Qualitative analysis of phytochemical constituents

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All the extracts were subjected to systematic phytochemical screening for the presence or absence of chemical constituents. The results of phytochemical screening of leaf extracts of *Carica papaya* are mentioned in the table(1). All the extact exhibit positive result. The results of phytochemical screening of seed extracts of *Carica papaya* are mentioned in the table(2). Petroleum ether extract exhibit positive result for flavonoid and phenol. Chloroform extract shows positive result for alkaloid, flavonid, tannin and phenol. Ethyl acetate extract exibit positive result for alkaloid, flavonoid, tannin and phenol.

Table 1. Phytochemical screening of papaya leaf.

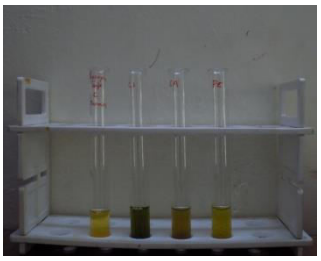
Sl No	Chemical cnstituents	petroleum ether	Chloroform	Ethyl acetate
1	Alkaloid	+	+	+
2	Flavonoid	+	+	+
3	Tannin	+	+	+
4	phenol	+	+	+

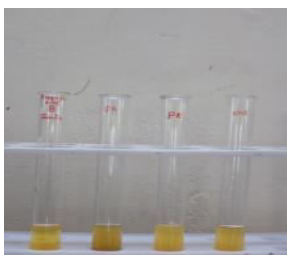
Table 2. Phytochemical screening of papaya seed

Sl No	Chemical Cnstituents	petroleum ether	Chloroform	ethyl acetate
1	Alkaloid	-	+	+
2	Flavonoid	+	+	+
3	Tannin	-	+	+
4	phenol	+	+	+

Test for Alkaloid, Flavonoid, Tannin and phenol in papaya leaf and seed





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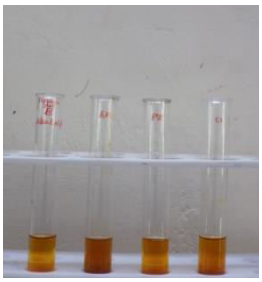

Quantitative analysis

The leaf showed (1.20 mg/g) protein, (0.053 mg/g) starch, (2.502mg/g) carbohydrate, (0.954 mg/g) amino acid, (2.42 mg/g) sugar.The papaya seed showed (0.962mg/g) protein, (0.56 mg/g) starch, (2.3mg/g) carbohydrate, (0.25mg/g) aminoacid, (2.02mg/g)

Table 3. Quantitative analysis of papaya leaf

Sl.No	Quantitative analysis	Papaya leaf
1	Carbohydrate	2.502mg/g
2	Protein	1.20mg/g
3	Amino acid	0.954mg/g
4	Starch	0.053mg/g
5	Sugar	2.42mg/g

Table 4. Quantitative analysis of papaya seed

Sl.No	Quantitative analysis	Papaya seed
1	Carbohydrate	2.30mg/g
2	Protein	0.962mg/g
3	Amino acid	0.25mg/g
4	Starch	2.3mg/g
5	Sugar	2.02mg/g

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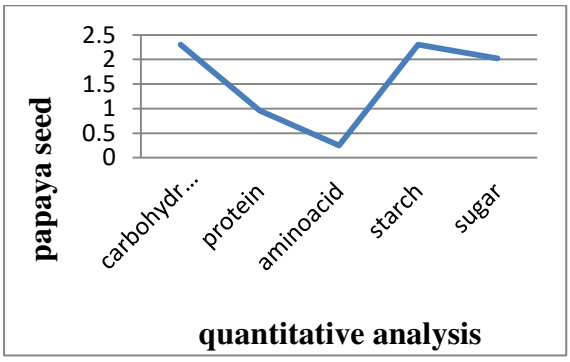

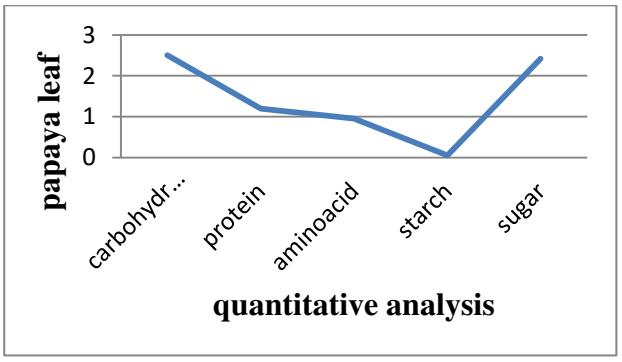

Quantitative analysis of papaya leaf **Quantitative analysis of papaya seed**

Discussion

In the present study, papaya leaf and seed extract indicate the presence of alkaloids, flavonoids, tannin and phenol. Alkaloids are the most efficient therapeutically significant plant substance. Alkaloids isolated from plant are commonly found to have antimicrobial properties (Jose et al., 2005). Biological functions of flavonoids include protection against allergies, inflammations, platelets, ulcer and tumour (Okawu andOkawu 2004). The presence of tannin in the papaya can support strong use for healing of wounds, ulcers, burns (ighoko, 1953). The presence of phenolic compounds in the seed of papaya shows that seed may have antimicrobial potential (Oakenful, 1981). Comparing the protein content value was maximum in papaya leaf and minimum in papaya seed. The starch content value was maximum in papaya seed and minimum in papaya leaf. The carbohydrate value was maximum in papaya leaf and minimum in papaya seed. The aminoacid content value was maximum in papaya leaf and minimum in papaya seed. The sugar content value was maximum in papaya seed and minimum in papaya leaf.

The results correlated with papaya seed are the highest supplier of carbohydrate. Papaya seed containing highly digestible starch (Gomes et al., 2005 and Promthong et.al., 2005) found that papaya starch contains 17% amylase and 83% amylopectin. The papaya leaf contains approximately 75.38 resistant starch (Onyango et al., 2006).

Conclusion

The preliminary phytochemical evaluation of studies on papaya leaf and seed was done by successive solvent extraction and identified by chemical tests. These tests showed the presence of various phytochemical constituents like alkaloid, flavonoids, tannin and phenol. Papaya leaf was found to be rich in carbohydrates, starch, sugar, protein. The fat content of the papaya was negligible, making it s good constituent in functional foods which can be consumed safely without any concern of health risk of fat free diet.

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