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Proximate Analysis and Phytochemical Analysis of Papaya Leaf Jelly

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ABSTRACT

The aim of present study was to investigate the proximate analysis, phytochemical constituentswere analyzed following standard and reported methods. The results obtained were reported and discussed. The Phytochemical screening of different solvent extracts revealed that papaya leaf jelly contained a number of medicinally active Secondary metabolites. The study suggest that papaya leaf jelly could be a good source of health promoter like vitamin, antioxidant, nutritionaland studied further for its beneficial effect in human health. It wasidentified as rich nutritional value as cultivated one play an important role to the rural poor and tribal communities in the form of food and nutrient supplement.

Keywords: Phytochemicals, papaya leaf, metabolites, rich nutrional value.

Introduction

Papaya, a fruit that was reputedly called the “fruit of the angels” by Christopher Columbus, comes from a North American tree (Asimina triloba of the family Annonaceae) with purple flowers and an edible yellow fruit.The whole fruit, as well as other parts of the papaya tree, are beneficial to health in several ways. While the health benefits of the fruit are widely known, it is only in recent times that the healing properties of its flowers and leaves have come to be recognized.C. papaya leaves. belongs to the family Caricaceae and is commonly known as papaya, pawpaw, andKates. It is a perennial horticultural shrub originated from Mesoamerican Centre, Central America, and southern Mexico and is mainly cultivated in the tropical and subtropical regions of Brazil, Australia, Malaysia, China, India, Thailand, Myanmar, Philippines, and other adjoining. Papaya is not only cultivated for the ripe sweet fruit, even other parts of the plant such as seeds, leaves, roots, flowers, barks, and latex have been traditionally used worldwide for the preparation of various medicinal formulations. However, leaves have been emerged as one of the most useful parts with plethora of health-promoting compounds and activities. In traditional medicines, the decoction of papaya fresh leaves is added into a tea to cure malaria, whereas dry and cured leaves are used as cigar for smoking by persons suffering from respiratory disorders such as asthma. Fresh young leaves of papaya are consumed as a leafy vegetable after steaming in some countries. In India, boiled leaves of papaya are recommended by Ayurveda practitioners as relief from malarial and dengue fevers as papaya leaf extract is considered effective to elevate platelet count and red and white blood cells in patients after suffering from viral fever. The extract has also been known to protect the patients against the sickling of red blood cells. In many parts of Asia, papaya leaves are used for the treatment of beriberi. Papaya leaves have been identified to have more than fifty bioactive components and therefore useful in the treatment of different human diseases.

MATERIALS AND METHODS

Chemicals

Dilute Hcl, sodium hydroxide, methanol, aluminum chloride, ferric chloride, potassium acetate, diethyl ether, ethanol, sodium chloride, concentrated ammonium hydroxide, chloroform, dragondroff reagent, hager’s reagent, dichlorophenolindophenol, Copper sulfate, Sodium hydroxide, and Potassium Sodium Tartrate, iodine solution, ethanolic extract, distilled water, alcohol, acetone, dichloromethane, ether etc.

Proximate analysis of jelly

Determination of moisture content

The moisture content was determined following AOAC method. 5 g of the freeze dried sample was heated in a hot air oven at 65°C for 6-7h, cooled in desiccator, weighted and the moisture content was calculated by the following formula.

Moisture (%) =Weight of the sample taken(Weight of sample – Dry weight) x 100

Determination of ash content

The ash content was determined by the AOAC method.Silica crucible was first heated in a muffle furnace, cooled in a desiccator and the initial weight was taken. 5 g of the Sample was heated in a muffle furnace at 560°C for 5h, Cooled in desiccator, weight of the ash was taken and ash Content calculated.

Ash (%) =weight of ashWeightOf thesample ×100

Determination of crude fat

The crude fat content was determined following AOAC method. The initial weight of the flask was taken by heating in a hot air oven for overnight at 105°c followed by Cooling in a desiccator. 3–5 g of the sample was extracted with petroleum ether using Soxhlet apparatus for about 6 h. The extracted fat was dried in a rotary evaporator and the weight was measured.

Crude fat (%) =Weight of the sampleWeight of fat x 100

Determination of crude protein

Crude protein was determined by Kjeldhal method following the AOAC method. 1 g of the sample was digested withConcentrated H_2SO_4 and Kjeldhal Catalyst (9 parts of K_2SO_4 and one part of $CuSO_4$) in a digestion chamber until it becomes clear. The blank test was performed without the sample. After digestion, it was distilled in Kjeldhal distillation chamber. The evaporated ammonia was condensed and then titrated against the known concentration (0.1 N) of HCl. The concentration of nitrogen was calculated by the following formula.

Nitrogen (%) = (A – B) x N of HCl x 14Weight of the sampleX 1000

Where, A = Volume (mL) of (0.1 N) HCl used in sample Titration.

B = Volume (mL) of (0.1 N) HCl used in blank Titration.

14 = Atomic weight of Nitrogen.

The nitrogen content thus obtained was multiplied by a Protein conversion factor of 6.25 to get the crude protein Content.

Protein (%) = Nitrogen (%) x 6.25.

Determination of total carbohydrate

The total carbohydrate content was determined by the difference method according to the following formula.

Carbohydrate (%) = 100 –[Moisture (%) + Ash (%) + Crude protein (%) + Crudefat)].

Determination of vitamin C

The vitamin C content present in fresh papaya leaf jellyjellywas determined by the dye titration method .

Calorific value of jelly

Calorific value or the total energy value of jelly in kcal/100 g was calculated with the help of following equation.

Calorific value (kcal/100 g) = 4 x Protein (%) + 9 x Fat (%) + 4 x Carbohydrate (%).

phytochemical analysis of jelly

The papaya leaf jellywere subjected to qualitative analysis for the presence of different phytochemical constituents by following the Standard methods.

Test for alkaloids

Wagner’s and Dragendroff’s tests

2 mL extract was mixed with 2 mL of 1% aqueous HCl, taken into two separate test tubes and 6 drops of Wagner’s and Dragendroff’s reagents were added. The formation Of a reddish brown precipitate with Wagner’s reagent and Orange-red precipitate with Dragendroff’s reagent indicated the presence of alkaloids.

Hager's test

A yellowish or white precipitate was formed, indicating the presence of alkaloids. Hager's test. Two millilitres of extract were treated with few drops of Hager's reagent. A yellow precipitate was formed, indicating the presence of alkaloids..

Test for saponins

1 mL extract was shaken vigorously with 20 mL of distilled in water in a graduated cylinder for 15 minutes. Persistence of Froth indicated the presence of saponins.

Test for Tannins

Ferric chloride test

A quantity (1 ml) of the filtrate was diluted with distilled water and added 2 drops of ferric chloride. A transient greenish to black color indicates the presence of tannins.

Test for terpenoid

Salkowski test was used to detect terpenoids. Extract (5 ml) was mixed with chloroform (2 ml), and concentrated sulphuric acid (3 ml) was carefully added to form a layer. A reddish brown coloration of the inter face was formed to show positive results for the presence of terpenoids.

Test for flavonoids

Alkaline reagent test. Two to three drops of sodium hydroxide were added to 2 mL of extract. Initially, a deep yellow colour appeared but it gradually became colourless by adding few drops of dilute HCL, indicating that flavonoids were present.

Result and Discussion

The following test was performed in lab and theresults of proximate analysis and phytochemical analysis was obtained.

TABLE

Proximate analysis

S. No.	Tests	Results
1.	Moisture	48
2.	Ash	0.35
3.	Fat	0.39g
4.	Protein	0.4g
5.	Carbohydrate	14g
6.	Energy	53.2kcal
7	Vitamin c	60mg/100g

Phytochemical analysis

S. No.	Tests	Results
1.	Alkaloids	Present
2.	Saponins	Present
3.	Tannins	Present
4.	Terpenoids	Absent
5.	Flavonoids	Present

Conclusion

The jelly was developed from papaya leaf, papaya, stevia powder, pectin, food color and citric acid. The nutritional composition of jelly was found as, Moisture content 48%, Ash content 0.35fat 0.39%,protein 0.4g,carbohydrates 14g,energy 53.2KCal,vitamin c 60mg/100g.

In phytochemical analysis Alkaloids was present, saponins was present, tannins was present, terpenoids was absent and flavonoids was also present in papaya leaf jelly.

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