# Phytochemical Investigation of Cross Flow Dried Jamun (*Syzygium Cumini*) Pulp Powder

Reginold Jebitta S[1], Ramanathan. M[2], Parveen. S[3]

*1-Research scholar, Department of Food Processing and Engineering, Karunya University, India.*

*2- Head and Professor, Department of Food Processing and Engineering, Karunya University, India.*

*3-Tamil Nadu Agricultural University, India.*

## Abstract

*Phytochemical investigation was carried out on the crude methanol and ethanol extracts of Jamun Syzygium cumini pulp powder dried at various temperatures 60°C, 70°C, 80°C and control as raw pulp. Preliminary Phytochemical studies revealed the presence of flavonoids, alkaloids, amino acids, glycosides, steroids, triterpenoid, reducing sugar and tannins and the absence of saponin, , anthroquinoes as the chemical class present in the extracts. In this study we found that most of the biologically active phytochemicals were present during in all the three drying temperature, when subjected to both methanol and ethanol extract. Further this study will be helpful for the production of jamum pulp products and quantifying the active components in the products.*



## 1. INTRODUCTION

*Syzygium cumini (*Family Myrtaceae) *is* also known as *Syzygium jambolanum* and *Eugenia cumini*. Other common names are Jambul, Black Plum, Java Plum, Indian Blackberry, Jamblang, Jamun etc. Today these trees are found growing throughout the Asian subcontinent (P. Warrier, 1996). *Syzygium cumini* (L.) is belonging to the family Myrtaceae. Large trees cultivated throughout India for the edible fruits (Black Plum) and are reported to contain vitamin C, gallic acid, tannins, anthocyanins, includes cyanidin, petunidin, malvidinglucoside and other components. The juice of unripe fruits is used for preparing vinegar that is considered to be a stomachic, carminative and diuretic. The ripe fruits are used for making preserves, squashes and jellies. The fruits are astringent. A wine is prepared from the ripe fruits (CSIR, Vol X).

Drying is one of the oldest methods of food preservation and it is a difficult food processing operation mainly because undesirable changes in quality. Different drying methods are used for drying of fruits, berries and vegetables. Air-drying is the most common method in the drying of foodstuffs. However, this method leads to serious changes in food such as the loss of the taste colour and nutritional value of the product, decrease in the density and water absorbance capacity and migration of the solutes from the internal part of the drying material to the surface, due to the long drying period and high temperature.

## 2. MATERIAL AND METHODS

### 2.1 Plant Materials

Jambola mature fruits, were directly obtained from producers in the region of Pollachi. The fruits were sorted by its maturity and the fully ripped fruits were washed in normal tap water. The free water in the fruit was removed using hair dryer and wiped out with tissue papers. Pre weighed 100g of the Jamun fruit was packed in each PP zip lock bag and kept in deep freezer at -30°C for further use.

### 2.2 Drying condition

The stored Jamun fruits were taken from the deep freezer and kept in room temperature to reach its normal state. Jamun pulp was extracted manually by

separating the pulp from the seed. Approximately 500g of pulp was taken for drying experiment. Equipment Cross flow drier (Sakav Oven Dryers & Furnaces with tray type dryers, 32''×16''×1.25'',heat load- 27Kw) with temperature varied from 60 °C,70 °C and 80 °C is used for drying of Jamun pulp. The drying process was performed in duplicate for each drying temperature.

### 2.3 Preparation of sample extracts

#### 2.3.1 Solvent extraction

Dried sample extract was prepared by Soxhlet extraction method. About 20gm of powdered plant material was uniformly packed into a thimble and extracted with 250ml of different solvents separately. Solvents used were methanol and ethanol. The process of extraction continues for 24 hours. After that the extract was taken in a beaker and kept on hot plate and heated at 30-40ºC till all the solvent get evaporated. Dried extract was kept in refrigerator at 4ºC for their future use in phytochemical analysis (RNS Yadav, 2011)

### 2.4 Preliminary Phytochemical screening:

One gram of the methanol and ethanol extract of *Syzgium cumini* pulp was dissolved in 100ml of its solvents to obtain a stock of concentration 1% (v/v). The extract thus obtained were subjected to phytochemical screening following the methodology of A.Kumar 2009, and S.Shyamala Gowri , 2010 .

### 2.5 Screening procedure:

#### 2.5.1 Test for Alkaloids:

Five ml of the extract was added to 2ml of HCL. To this acidic medium, 1 ml of Dragendroff's reagent was added. An orange or red precipitate produced immediately indicated the presence of alkaloids.

#### 2.5.2 Test for amino acids:

One ml of the extract was treated with few drops of Ninhydrin reagents. Appearance of purple colour showed the presence of amino acid.

#### 2.5.3 Test for Reducing sugar Test:

Equal volume of Fehling A and Fehling B reagents were mixed together and 2ml of it was added to crude extract and gently boiled. A brick red precipitate appeared at the bottom of the test tube indicated the presence of reducing sugars.

#### 2.5.4 Test for Flavonoids:

Extract of about 0.2 g was dissolved in diluted NaOH and HCl was added. A yellow solution that turned colourless indicated the presence of flavonoids.

#### 2.5.5 Test of Saponins:

The extract was diluted with 20ml of distilled water and it is agitated in a granulated cylinder for 15 min. the formation of 1cm layer of foam showed the presence of saponins.

#### 2.5.6 Test for Steroids:

One ml of extract was dissolved in 10 ml of chloroform and equal volume of concentrated sulphuric acid was added by sides of the test tubes. The upper layer turned red and sulphuric acid layer showed yellow with green fluorescence. This indicated the presence of steroids

#### 2.5.7 Test for Tannins:

Crude extract was mixed with 2ml of 2% solution of $FeCl_3$. A blue-green or black coloration indicated the presence of phenols and tannins.

#### 2.5.8 Test for Triterpenoids

Ten mg of the extract was dissolved in 1ml chloroform; 1ml of acetic anhydride was added following the addition of 2 ml of con, sulphuric acid. Formation of reddish violet colour indicated the presence of triterpenoids.

#### 2.5.9 Test for Glycosides.

The extract was hydrolyzed with HCl solution neutralized with NaOH solution. A few drops of Fehling's solution A and B were added. Red precipitate in indicated the presence of glycosides.

#### 2.5.10 Test for Anthraquinones:

Five ml of extract solution was hydrolyzed with diluted con sulphuric acid, extracted with benzene. 1ml of dilute ammonia was added to it, rose pink colour suggested the positive response for anthraquinones.

## 3. RESULTS AND DISCUSSION

In this study the photochemical screening were performed with ethanol and methanol extract of Jamun pulp power. The results obtained in the present investigation are presented in Table No.1. *Syzygium cumini* pulp was rich in flavonoids, alkaloids amino acids, glycosides, steroids, triterpenoids, reducing sugar and tannins and the absence of saponin and

anthraquinones. From this study we conclude that most of the phytochemicals were present in both methanol and ethanol extract of pulp power. Since there is no degradation in phytochemical as the temperature increases, it is found that cross flow dryer with temperature range from 60 °C to 80 °C is suitable to dry Jamun pulp with all phytonutrients. These dried pulp powder can be used further for any food product which will give a positive impact on anti diabetic and analgesic activities.

## 4. CONCLUSION

In the study, we have found that most of the Phytochemical which is present in raw Jamun pulp were also found in Jamun pulp powder dried at (80°C) which was subjected to ethanol and methanol extract. The anti diabetic and analgesic activities properties of *Syzygium cumini* pulp extract may be due to presence of above mentioned phytochemicals. Further this study will be helpful for the production of Jamum pulp products and quantifying the active components in the products. Further work should be carried out to isolate, purify, and characterize the active constituents responsible for the activity of these plants.

Table No: 1- Phytochemical screening results in both methanol and ethanol extract.

| Phytochemicals | Control | Methanol | | | Ethanol | | |
|---|---|---|---|---|---|---|---|
| | | 60 °C | 70 °C | 80 °C | 60 °C | 70 °C | 80 °C |
| Alkaloids | + | + | + | + | + | + | + |
| Amino Acids | + | + | + | + | + | + | + |
| Reducing sugar Test | + | + | + | + | + | + | + |
| Flavonoids | + | + | + | + | + | + | + |
| Saponins | - | - | - | - | - | - | - |
| Steroids | + | + | + | + | + | + | + |
| Tannins | + | + | + | + | + | + | + |
| Triterpenoids | + | + | + | + | + | + | + |
| Glycosides. | + | + | + | + | + | + | + |
| Anthraquiones | - | - | - | - | - | - | - |



## 5. ACKNOWLEDGEMENT

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