

## Research Article

### "Preliminary Phytochemical Screening of Fruit of *Cassia spectabilis* D.C."

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## ABSTRACT

Plants are the "old companion" of humankind. Without plants there would be no people on Earth. A huge extent of the world's population relies on upon conventional prescription. *Cassia* L. is a huge genus of around 500 species of flowering plants in the family *Caesalpinaceae*. In the present study the fruits of *Cassia spectabilis* D.C. prepared by using solvents like Distilled Water, Ethanol, Acetone and Chloroform are screened for the detection of presence phytochemicals at preliminary level. *Cassia spectabilis* D.C. fruit is very rich in compounds like flavonoids and tannins and remaining significant compounds are also in the moderate amounts.

**Keywords:** *Cassia spectabilis* D.C., *Caesalpinaceae*, phytochemicals, flavonoids and tannins.

## 1. INTRODUCTION:

Plants are the "old companion" of humankind. Without plants there would be no people on Earth, since we depend completely on the Oxygen created by plants amid photosynthesis. In addition plants likewise help human kind to maintain its wellbeing by supplying phytochemicals with corrective quality through different food stuffs and home grown cures [1&2]. A huge extent of the world's population relies on upon conventional prescription on account of the shortage and high expenses of customary pharmaceutical [3]. The phytochemical investigations of the medicinal plants have given some biochemical premise to their ethno pharmacological utilizes as a part of the treatment and counteractive action of different infections and scatters [4]. *Cassia* L. is a huge genus of around 500 species of flowering plants in the family *Caesalpinaceae* showing worldwide distribution [5]. The therapeutic estimation of plants lies in some synthetic substances or gathering of aggravates that create an unequivocal physiological activity in the human body. These concoction substances are called auxiliary or secondary metabolites [6].

### 1.1. *Cassia spectabilis* D.C. :

These are trees with pubescent branches. Leaflets are 8 -15 pairs and are oblong – lanceolate,

pubescent beneath. Flowers are golden yellow in colour and are arranged in erect racemes. Each flower is having sepals and petals 5 each. Pods are turgid. These plants are distributed in Tirumala gardens. These plants flower during August – December every year.[7]

## 2. METHODOLOGY

*Cassia spectabilis* D.C. is collected from the Tirumala hills of the Chittoor Dist. A.P. and the plant is identified by using the Botanical keys in the Department of Botany, P.V.K.N. Government College, Chittoor. The collected above said plant species of *Cassia* L. are washed thoroughly in the running tap water and rinsed with distilled water, after these species are shade dried and then the leaves of these species are separated from each plant species.

The shade dried leaf parts of the each species are pulverized and are kept in Soxhelt apparatus for the extraction process by using various solvents such as Distilled Water, Ethanol, Acetone and Chloroform. Soxheltation is advantageous process of extraction of phytochemicals as almost all the chemical compounds are soluble in this process and impurities are insoluble in this process. This process is made for the period of considerable time period. Samples are stored till and then subjected sequentially to the various qualitative

chemical tests to analyze the each sample for the presence of phytochemicals at preliminary level.

### 2.1. Phytochemical screening:

Different qualitative tests are carried out for each of the sample prepared in different solvents to screen various phytochemicals at preliminary level as per the standard procedures prescribed by the Phytochemists like Harborne [8], Sofowara [9], Edeoga [10] and Trease & Evans [11]. Qualitative tests are made for the determination of phytochemical compounds such as Alkaloids, Tannins, Saponins, Phenols, Flavonoids, Carbohydrates, Proteins, Steroids, Terpenoids, Cardiac Glycosides etc.

#### 2.1.1. Detection of Alkaloids:

Extracts were dissolved in Dil. HCl and filtered and subjected to the following tests for the identification of Alkaloids.

**a. Mayer's Test:** Yellow coloured precipitate formation takes place when filtrate is treated with Mayer's reagent (Potassium Mercuric Iodide) if Alkaloids are present in the sample.

**b. Dangendroff's Reagent:** Red coloured precipitate formation takes place when filtrate is treated with Dangendroff's reagent ( Potassium Bismuth Iodide Solution) if Alkaloids are present in the sample.

#### 2.1.2. Detection of Tannins:

**Gelatin Test:** Extract is added with 1% (W/V) Gelatin Solution and 10% Sodium Chloride (NaCl) Solution. Formation of White precipitate indicates the presence of Tannins

#### 2.1.3. Detection of Saponins:

**a. Froth Test:** Extract is diluted with distilled Water to 20 ml and this is shaken in a graduated cylinder for 15 minutes. Formation of 1 cm layer of foam indicates the presence of Saponins.

**b. Foam Test:** 0.5 g of extract is shaken with 2 ml of Distilled water, if the produced foam persists for ten minutes, it indicates the presence of Saponins.

#### 2.1.4. Detection of Flavonoids:

**a. Alkaline Reagent Test:** Extract is treated with few drops of Sodium hydroxide solution. Presence of Flavonoids is indicated by the formation of

intense Yellow colour which becomes colourless on addition of Dilute Acid.

**b. Lead Acetate Test:** Extract is treated with few drops of Lead Acetate Solution. Yellow coloured precipitation indicates the presence of Flavonoids.

#### 2.1.5. Detection of Phenols:

**Ferric Chloride Solution:** 3-4 drops of Ferric Chloride Solution are added to the extract and the formation of Bluish black colour indicates the presence of Phenols.

#### 2.1.6. Detection of Cardiac Glycosides:

**a. Killer Killiani Test:** 0.5 g of the each extract is treated with 2 ml of Glacial acetic acid and a drop of 5%(W/V) Ferric Chloride added along with few drops of Conc. Sulphuric Acid, Greenish blue colour appears within few minutes indicates the presence of Cardiac Glycosides.

**b. Bromine Water Test:** Each extract is added with Bromine water, formation of Yellow coloured precipitate indicates positive test for Glycosides.

#### 2.1.7. Detection of Steroids:

**Salkowski's Test:** 2 ml of extract is treated with 2 ml of Chloroform and filtered and then filtrate is treated with few drops of Conc. Sulphuric Acid, shaken and allowed to stand. Appearance of Golden Yellow colour at the interface indicates the presence of Steroids.

#### 2.1.8. Detection of Terpenoids:

**Liebermann Burchard's Test:** Each of the extract is added with Chloroform and filtered. Filtrates are treated with few drops of Acetic anhydride boiled and cooled and then Conc. Sulphuric Acid is added, Red colour in the lower layer indicates the presence of Terpenoids.

#### 2.1.9. Detection of Carbohydrates:

Extracts are dissolved individually in 5 ml Distilled water and filtered. The filtrates are used to test for the presence of Carbohydrates.

**a. Molisch's Test:** Filtrate is added with 2 drops of Alcoholic  $\alpha$  - naphthol solution in a test tube. Formation of violet ring at the junction indicates the presence of Carbohydrates.

**b. Benedict's Test:** Filtrate is added with Benedict's reagent and heated gently orange red precipitate indicates the presence of Carbohydrates.

**c. Fehling's Test:** Filtrate is added with Dilute Hydrochloric Acid, Neutralised with Alkali and heated with Fehling's A & B Solutions, formation of Red precipitate indicates the presence of Reducing Sugars.

#### 2.1.10. Detection of Proteins:

**a. Xanthoproteic Test:** The extract is added with few drops of Conc. Nitric Acid, formation of Yellow colour indicates the presence of Proteins.

**b. Biuret Test:** Each extract is added with 5% (W/V) of Sodium Hydroxide and 1% (W/V) Copper sulphate, formation of violet coloured complex indicates the presence of Proteins in the sample.

#### 2.1.11. Detection of Amino Acids:

To the test solution 0.25% (W/V) Ninhydrin reagent is added and boiled for few minutes, formation of Blue coloured complex indicates the presence of Amino acids.

#### 3. RESULTS:

All the samples of each plant species extracted in three different solvents viz, Distilled Water, Ethanol, Acetone and Chloroform are subjected to qualitative tests for the detection of various Phytochemicals and following Results are obtained in the observations. Results are described in the following tables.

**3.1. TABLE: Preliminary Phytochemical Screening Tests for Fruit Extracts of *Cassia spectabilis* D.C. in Distilled Water, Ethanol, Acetone and Chloroform**

S. No.	Qualitative Phytochemical Screening Test	Distilled Water Extract	Ethanol Extract	Acetone Extract	Choroform Extract
1.	Alkaloids				
	Mayer's Test	-	+	+	-
	Dangendroff's Reagent:	-	+	+	-
2.	Tannins (Gelatin Test)	++	+	+	-
3.	Saponins				
	Froth Test	+	-	-	-
	Foam Test	+	-	-	-
4.	Flavonoids				
	Alkaline Reagent Test	-	-	-	-
	Lead Acetate Test	++	+	-	-
5.	Phenols (Ferric Chloride Test)	+	+	+	-
6.	Cardiac Glycosides				
	Killer Killiani Test	-	-	+	-
	Bromine Water Test	-	-	+	-
7.	Steroids (Salkowski's Test)	-	-	-	-
8.	Terpenoids (Liebermann Burchard's Test)	-	-	-	-
9.	Crabohydrates				
	Molisch's Test	++	++	++	+
	Benedict's Test	++	++	++	+
	Fehling's Test	++	++	++	+
10.	Proteins				
	Xanthoproteic Test	++	+	+	-
	Biuret Test	++	+	+	-
11.	Amino Acids	+	+	-	-

(++ Indicates Presence, + Indicates Moderate Presence, - Indicates Absence)

**4. DISCUSSION:**

*Cassia spectabilis* D.C. Fruit extracts prepared by using solvents like Distilled Water, Ethanol, Acetone and Chloroform are showing following observations in the qualitative tests of preliminary phytochemical screening. Alkaloids are present in two samples viz. the extracts of ethanol and acetone. Remaining two samples, in the extracts of Distilled water and chloroform alkaloids are absent. Tannins and phenols are present in all the samples considered for our experimentation except in chloroform extract. Saponins and cardiac glycosides are present in only one sample i.e. in Distilled water and acetone extracts respectively and both the samples are completely absent in the remaining three samples. Carbohydrates are present in all the four samples but proteins are present in the first three extracts and amino acids are present in the first two samples i.e. in the extracts of Distilled Water and Ethanol but absent in the extracts of acetone and chloroform. Steroids and terpenoids are absent in all the four samples i.e. in the fruit extracts prepared by using solvents like Distilled Water, Ethanol, Acetone and Chloroform.

**5. CONCLUSION:**

*Cassia spectabilis* D.C. fruit is very rich in compounds like flavonoids and tannins and remaining significant compounds are also in the moderate amounts. Distilled water and Ethanolic extracts are showing the positive tests for most of the compounds for which the qualitative tests are conducted at preliminary level and moderate compounds are showed positive results for acetone extract and chloroform extract is showing negative results for the most of the qualitative tests.

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