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# A Study on Enhancement Of Nutrition Elements of Food Recipes Using Cassia Fistula

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**Abstract-Several wild plants have been used for several purposes by indigenous people since time immemorial. Some of them are cultivated, and some are collected from the forest. These are commonly used in human nutrition, as medicines, and for economic purposes. They are known to be excellent sources of nutrients such as carbohydrates, proteins, fats, vitamins and minerals, dietary fibers, and diverse secondary metabolites. Among the wild plants, Cassia fistula is one of them. It is used as food (a flower), medicine (all plant parts), and has economic values. It is planted as an ornamental plant along the roadside due to its beautiful flowers. Medicinally, these plants have various pharmacological compounds that cure several ailments. Keeping this in view, an attempt has been made to gather the food recipes, along with their role in upgrading the nutrition value. The results revealed that all plant parts are used for various purposes, and their cultivation and conservation are needed for sustainable utilization and development. Because of its beautiful flowers it is planted as an ornamental plant by the roadside. Medicinally, this plant contains various pharmacological compounds that cure many ailments. Keeping this in mind, an attempt has been made to increase the nutritional content of the food recipe using Cassia Fistula. The results show that using this Ayurveda herb in food preparation increases its nutritional value and has a positive effect on its taste, aroma and appearance.**

**Keywords-Cassia fistula, Amulthus, food recipes, Nutrition value. Ayurveda herb**

## I. INTRODUCTION

Cassia Fistula is a yellow-flowered tree native to the Indian subcontinent, also known for its medicinal uses. This tree is found in almost all parts of India. The trunk is thick but medium in height. In winter the tree bears pods one to one and a quarter cubits long, which are initially green in color and black when mature. These pods consist of several distinct chambers, filled with a black pulpy substance, called the capsule. Peeling the bark of this tree yields a red sap, which congeals and turns into a gum. A sweet, odorous, yellow volatile oil is obtained from its pods.

Food can be an effective medium to maximize the usefulness of the Ayurvedic Medicines in few vulnerable groups like children, women, and elderly people. The purpose of the study is to find innovative ideas to incorporate these Ayurvedic Medicines into the food recipes to treat and to prevent further damage in many health conditions, such as, Anaemia, Osteoporosis, Acidity, Insomnia, Diabetes, Respiratory disorders- Asthana, Cold, Fever, Cardio vascular disorders- Hypertension, Mental disorders- Lack of concentration, weak memory, Stress, Depression, Anxiety and many more. Cassia fistula commonly known as Amaltas. It has many vernacular names.

### 1.1 Objectives

- To incorporate Cassia Fistula in different food recipes.

- To evaluate the Nutritive value of Cassia Fistula incorporated food recipes.

**1.2 Research Methods :**

Selection of Ayurveda medicines based on their characteristics, formation, texture, uses, and availability. Experimental research methods use for this research paper.

**1.3 Importance Of Cassia Fistula :**

**1. Nutritional values:**

This medicinal plant has various nutritional values. Young leaves are edible. In India, some tribes of Odisha and Assam use flowers and flower buds as vegetable. The leaves are used to collect by the tribal communities during the month of February to June and cook as leafy vegetable. It is also food plants of wild animals like Bosgaurus (Haleem and liyas 2018; Kumar and Kumar 2023).

**2. Ethno medicinal values:**

In India, many plants and their parts are used to formulate traditional medicine to treat various diseases. C. fistula is one of them that is very well known in Ayurvedic, Unani, and Chinese traditional medicines. Extract of C. fistula is used in different health relieving conditions like asthma, leprosy, ringworm, heart-related disorders, and fever (Sanjeet et al. 2012; Khobragade et al. 2023).

The fruits are also used to treat throat disorders, inflammation, liver complications, chest problems, asthma, and rheumatism.

Golden Amaltas Seeds

In traditional Thai medicine, ripened fruits are used as a highly effective moderate laxative medicine prepared by boiling them in water and filtering the extract using a sieve. The extracted part is converted into small pellets by evaporating the excess water from the filtrate (Agarwal and Paridhavi 2005). Leaves are used to relieve pain, skin irritation, and swelling. Seeds are insect repellents and are also used as medicine for treating gastritis, diarrhoea, and biliousness and improving appetite. Large doses of leaves and bark can cause vomiting, nausea, abdominal pain, and cramps (Pawar et al. 2017). Roots are treated for flu and colds and are also used in the treatment of skin disorders, syphilis, and tuberculosis. The stem, bark, and fruits of this plant help to eliminate toxins from the blood. Ashes from burnt pods mixed with a little salt are used with honey and taken 3–4 times to relieve cough (Gupta 2010). The juice of leaves is used to treat skin diseases. The heated pods are applied to swellings on the neck to cure colds (Nadkarni 2009). The root is used in cardiac disorders, biliousness, rheumatic conditions, haemorrhages, wounds, ulcers, boils, and various skin diseases (Agarwal and Paridhavi 2005).

Pharmacological values: It is a plant with numerous medicinal benefits. Around the world, various studies have reported that this plant provides different pharmacological properties like antioxidant, antimicrobial, anti-inflammatory, ant diabetic, CNS activities, leukotriene inhibition activity, antitumor, hepatoprotective, antitussive, antibacterial, antifungal, hepatoprotective activity, wound healing activity, laxative activity, antipyretic, larvicidal, and homicidal activity, among others (Danish et al. 2011; Mwangi et al. 2021; Figure 1).

Amaltas Flower

Amaltas pulp juice

## II. TRADITIONAL USES

The root is prescribed as a tonic, astringent, febrifuge and strong purgative. The leaves extract reduced mutagenecity in E. coli Extract of the root bark with alcohol can be used for backwart fever. The leaves are laxative and used externally as emollient, a poultice is used for chilblains, in insect bites, swelling, rheumatism and facial paralysis Leaves possess antiperiodic and laxative properties, the leaves are used in jaundice, piles, rheumatism ulcers and also externally skin eruptions, ring worms, eczema. The leaves and bark mixed with oil are applied to pustules, insect bites. The roots are used in chest pain, joint pain, migraine and blood dysentery. The extract of the root lowered the blood sugar level up to 30 %.

Leaves and flowers are both purgative like the pulp. Ashes from burnt pods mixed with little salt are used with honey taking 3- 4 times to relieve cough. Root is useful in fever, heart diseases, retained excretions and biliousness. Fruits are used as catharatic and in snake bite. Juice of leaves is used in skin diseases.

Flowers and pods are used as purgative, febrifugal, biliousness and astringent. The ethanolic 50% extract of pods show antifertility activity in female albino rats. The heated pods are applied to swellings on the neck due to cold. The fruits are reported to be used for asthma .Pulp is given in disorders of liver. The drug is used as analgesic as an antipyretic, it is a remedy for malaria and fever. It is also applied in blood poisoning, anthrax and antidysentric, leprosy and ant diabetic, for the removal of abdominal obstruction. The extract of the flower inhibits the ovarian function and stimulate the uterine function in albino rats. Fruits are used in the treatment of diabetes, antipyretic, abortive ancient, demulcent, lessens inflammation and heat of the body; useful in chest complaints, throat troubles, liver complaints, diseases of eye and gripping.

Juice of leaves is useful as dressing for ringworm, relieving irritation and relief of dropsically swelling. The pulp of the fruit around the seeds is a mild purgative. It is also used in biliousness and in diabetes. Externally, it is useful for evacuation in flatulent colic, as dressing for gouty or rheumatic joints. The pith is particularly useful if there is swelling in stomach, liver or intestine. The seeds are emetic, used in constipation and have cathartic properties. The seeds are slightly sweet and possess laxative, carminative, cooling, improves the appetite, and antipyretic activity. They are useful in jaundice, biliousness, skin disease and in swollen throat. A seed dried produce marked hypoglycemic activity.

Seed powder is used in amoebas. The fruit pulp is used for constipation, colic, chlorosis and urinary disorders. The bark possess tonic and ant dysenteric properties, it is also used for skin complaints, the powder or decoction of the bark is administered in leprosy, jaundice, syphilis and heart diseases. The aqueous extract of the root bark exhibits anti-inflammatory activity. The root is used in cardiac disorders biliousness, rheumatic condition, hemorrhages, wounds, ulcers and boils and various skin diseases. The stem bark is used against amenorrhea, chest pain and swelling.

## III. NUTRITIONAL ANALYSIS OF RECIPES USING CASSIA FISTULA

Table No: 5.1 Nutrient content of Cassia Fistula

| Ayurveda medicine | Amt. | Energy | Cho | Protein | Fat | Ca | Iron | Vita A | Vita C |
|---|---|---|---|---|---|---|---|---|---|

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Cassia Fistula | 100 | 184.96 | 26.3 | 19.94 | - | - | - | - |

**Recipes Made By Incorporating Cassia Fistula**

**1. Beetroot Halwa**

Table No. 5.1.1 Nutrient content before cooking beetroot halwa

| Ingredients | Amt. | Energy | Cho | Protein | Fat | Ca. | Iron | Vita. A | Vita C |
|---|---|---|---|---|---|---|---|---|---|
| Beetroot | 50 g | 21.5 | 5 | 0.8 | 0 | 6 | 2.2 | 0.3 | 0 |
| Sugar | 10 g | 38.5 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coconut | 10 g | 35 | 1.52 | 0.33 | 3.35 | 1 | 0.24 | 0 | 0 |
| Ghee | 10 g | 112 | 82 | 0 | 10 | 0 | 0 | 0 | 0 |
| Cardamom | 2 g | 128 | 6 | 0.22 | 0.14 | 8 | 0.28 | 0 | 0 |

Table No. 5.1.2 Nutrient content of recipe after incorporation of the Ayurveda medicine

| Recipe | Amt. | Energy | Cho | Protein | Fat | Ca. | Iron | Vita. A | Vita C |
|---|---|---|---|---|---|---|---|---|---|
| CONTROL | 82 | 335 | 104.52 | 1.35 | 13.49 | 15 | 2.72 | 0.3 | 0 |
| $V_1$ (5 g) | 87 | 344.248 | 105.82 | 2.347 | 13.49 | 15 | 2.72 | 0.3 | 0 |
| $V_2$ (8 g) | 90 | 408.98 | 106.624 | 2.94 | 13.49 | 15 | 2.72 | 0.3 | 0 |
| $V_3$ (11 g) | 93 | 436.77 | 107.413 | 3.543 | 13.49 | 15 | 2.72 | 0.3 | 0 |

- Control- recipe without incorporating Cassia Fistula powder
- V 1, V 2, V 3 contains 5, 8, & 11 g Cassia Fistula powder respectively

Analysis of the table no. 5.1.1 and 5.1.2 had shown the incorporation of Cassia Fistula pulp in the recipe had increased the values of energy, carbohydrates and protein, but there was no change in any other nutrient values such as iron, calcium fat, vitamin A and C.

**2. Coconut Balls**

Table No. 5.2.1 Nutrient content before cooking Coconut Balls

| Ingredients | Amt. | Energy | Cho | Protein | Fat | Ca. | Iron | Vita. A | Vita C |
|---|---|---|---|---|---|---|---|---|---|
| Coconut | 30 g | 106 | 4.57 | 1 | 10.05 | 4 | 0.73 | 0 | 1 |
| Milk | 20 ml | 12 | 0.09 | 0.64 | 0.65 | 23 | 0.01 | 6 | 0 |
| Sugar | 10 g | 38.5 | 10 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cardamom | 5 g | 16 | 3.42 | 0.54 | 0.34 | 19 | 0.7 | 0 | 1 |

Table No. 5.2.2 Nutrient content of recipe after incorporation of the Ayurveda medicine

| Recipe | Amt. | Energy | Cho | Protein | Fat | Ca. | Iron | Vita. A | Vita C |
|---|---|---|---|---|---|---|---|---|---|
| CONTROL | 65 | 172.5 | 18.80 | 2.18 | 11.04 | 46 | 1.44 | 6 | 2 |
| $V_1$ (5 g) | 70 | 181.748 | 20.1 | 3.177 | 11.04 | 46 | 1.44 | 6 | 2 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| $V_2$ (8 g) | 73 | 246.48 | 20.904 | 3.77 | 11.04 | 46 | 1.44 | 6 | 2 |
| $V_3$ (11g) | 75 | 274.27 | 21.693 | 4.373 | 11.04 | 46 | 1.44 | 6 | 2 |

- Control- recipe without incorporating Cassia Fistula powder
- Cassia Fistula powder respectively

Analysis of the table 5.2.1 and 5.2.2 had shown that there was a significant rise in the values of calories, carbohydrates and protein but there was no such change seen in terms of fat, iron, calcium, vitamin A and C.

## IV. FINDINGS

- 82 g beetroot halwa serves 332 kcal, while calories are increased by using 5 grams of Cassia Fistula, which was more than the calories obtained from standard beetroot halwa. Similarly, by incorporating 8 and 11 grams of Cassia Fistula in the preparation of standard beetroot halwa, the amount of energy has increased. Similarly, there has been a change in the amount of carbohydrate, protein and fat.
- 65 grams of coconut balls contained, 172.5 kcal are obtained from 65 grams of coconut balls, while calories are increased after incorporating 5 grams of Cassia Fistula, which was more than the calories obtained from the standard coconut balls. Similarly, by incorporating 8 and 11 grams of Cassia Fistula in the standard coconut balls the amount of energy has found to be increased. Similarly, there has been a change in the amount of carbohydrate, protein and fat.

## IIV. CONCLUSION

This experimental study had proved that the incorporation of the Ayurvedic medicine in different recipes cannot only enhance its organoleptic attributes such as flavour, colour, texture taste and overall acceptability but also helped to increase its some of the macro nutrients values. But the medicinal impact of the researched recipes are still under investigation which requires thorough study to prove their therapeutic effectiveness.

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