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Nutritional Composition of *Cassia Auriculata* Flowers

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ABSTRACT

Background: Medicinal plants were used for traditional treatments in curing numerous human diseases since thousands of years in many parts of the world. In rural areas of the developing countries, many plants are used as the primary source of medicine. *Cassia auriculata* L. is one type of plant which provides health and nutrition promoting compounds in human diet. The present experiment was carried out at Department of Food and Nutrition, College of Community Science, Dr. Rajendra Prasad Central Agricultural University, Samastipur, Bihar during the year 2021-2022 to analyze different nutritional parameters of *Cassia auriculata* flowers by using standard methods.

Methods: To analyze different nutritional parameters of *Cassia auriculata* flowers by using standard methods during the year 2021-2022.

Result: The result showed the total antioxidant content of *Cassia auriculata* flowers were found to be high *i.e.*, 553.5 µg/100 g, the flavonoids and total phenols content of *Cassia auriculata* flowers were 310 mg of QE/100 gm and 265.12 mg of GAE/100 gm and the high amount of antinutrient such as, oxalates (64.55 mg/100 g), phytates (28.70 mg/100 g) and tannin (1.92 Mg TAE/100 g) also present. It was also rich in physico-chemical properties such as moisture (12.37%), protein (10.54%), ash (7.15%), iron (190.50 mg/kg), fiber (2.08%) and zinc (18.35 mg/kg). Due to their nutritional quality, it is used for the treatment of urinary tract disorders, conjunctivitis, pain and liver diseases *etc*.

Key words: *Cassia auriculata* flowers, Nutritional composition of *Cassia auriculata* flowers.

INTRODUCTION

In many parts of the world medicinal plants were used for traditional treatments in curing of numerous human diseases since thousands of years. Many plants are used as the primary source of medicine in rural areas of the developing countries, (Chitme *et al.,* 2003) and in developing countries about 80% of the population use traditional medicines for their healthcare (Kim *et al.,* 2005). There are many natural products derived from medicinal plants which has proven to be an abundant source of biologically active compounds, many of which have been the basis for the development of new lead chemicals for pharmaceuticals.

There are many types of medicinal herbs which has been used in our daily life, in view of the fact, that the plant derived medicines are considered to be safe and effective. The World Health Organization (WHO) estimates that about 80% of the world 's population use herbal medicines in all aspects of primary health care needs (Gurib-Fakim, 2006) *Cassia auriculata L.* (Family: Caesalpiniaceae) is a bush with giant bright yellow flowers, found growing wild in central and western Asian nations and cultivated in alternative areas of the country. This basically cures tumors, skin diseases; asthma and leaves were used for anthelmintic, ulcers, diarrhea and Hansen's disease. The flowers were utilized in the treatment of urinary discharge, diabetes and infectious disease. The foremost parts of *C. auriculata* are additionally used in beverages *i.e.*, Kalpa seasoning tea that has been widely consumed by individuals suffering from diabetes, constipation and tract diseases. An alternate preparation for polygenic disorder medication was avarai panchaga choornam made from dried and powdered plant components (equal quantity of leaves, roots, flowers, bark and unripe fruits) and unremarkably used for ophthalmic, conjunctivitis, diabetes and urinary infections (Khader *et al.,* 2017).

Hence the present study was conducted to determine and characterize the chemical constituents present in *Cassia auriculata* flowers by using qualitative and quantitative analytical techniques.

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MATERIALS AND METHODS

Procurement of raw materials

Cassia auriculata flowers (Fig 1 and Fig 2) were procured from Professor Jayasanker Telangana State Agricultural University, Rajendranagar, Hyderabad and the open fields of villages in and around Hyderabad. The experiment was carried out at Department of Food and Nutrition, College of Community Science, Dr. Rajendra Prasad Central Agricultural University, Samastipur, Bihar during the year 2021-2022.

Washing and cleaning of *Cassia auriculata* flowers

Initially the selected flowers *Cassia auriculata* were properly cleaned and washed under tap water, were presented in Fig 3 and Fig 4.

Blanching of *Cassia auriculata* flowers

Petals of the *Cassia auriculata* flowers were blanched (Fig 5) for 2 minutes in hot water to soften the petals. In blanching petals were heat treated at 85°C and brightened the color of petals.

Drying of *Cassia auriculata* flowers

Blanched petals were strained through stainless steel strainer. After that in cabinet dryer, blanched flowers (2 mins) were spread over perforated aluminum trays and dried using hot air at 105°C for 10-14 hrs. The details were presented in Fig 6.

Storage

Dried *Cassia auriculata* flowers were stored in zip lock covers and kept at room temperature (Fig 7) to determine and characterize the chemical constituents present in *Cassia auriculata* flowers.

Nutritional and chemical properties of dried *cassia auriculata* flowers

Dried *Cassia auriculata* flowers were analyzed for the nutritional quality characteristics such as moisture (AOAC,

Fig 1: *Cassia auriculata* tree.

Fig 2: *Cassia auriculata* flowers.

Fig 3: Fresh *Cassia auriculata* flowers.

Fig 4: *Cassia auriculata* flowers after cleaning.

Fig 5: Blanching of *Cassia auriculata* flowers.

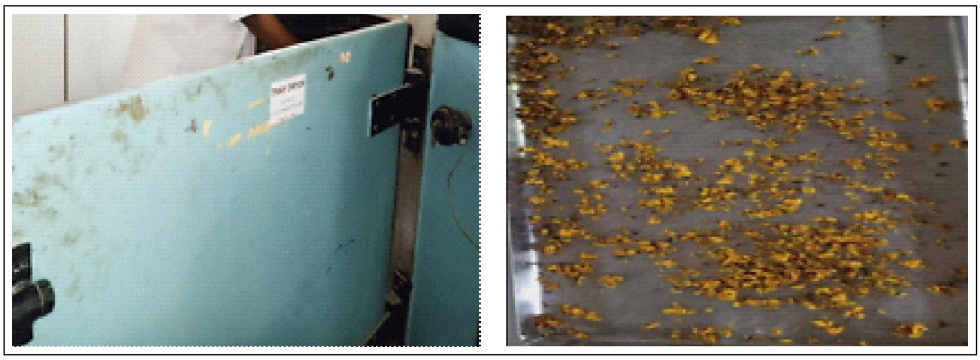

Fig 6: Drying of *Cassia auriculata* flowers.

2005), protein (AOAC, 2005), fiber (AOAC, 1995), ash (AOAC 2005) and Iron (AOAC, 1990), Zinc (Poitevin *et al.,* 2009) and Antioxidants activity (Nayak *et al.,* 2013), phenolics (Slinkard and Slingleton 1997), total flavonoid (Meda *et al.,* 2005), tannin (Kavitha and Indira, 2016), oxalates (Naik *et al.,* 2014) and phytates (Wheeler and Ferrel, 1971) using standard methods.

RESULTS AND DISCUSSION

Cassia auriculata flowers were analyzed for nutritional composition by using standard methods. Details were presented in Table 1 and Fig 8-10.

The moisture content of *Cassia auriculata* flowers were 12.37%. The moisture content of *Cassia auriculata* flowers plays a significant role in the flow and other mechanical properties of the food. However, it is depending largely on the method, extent of drying and the humidity in the surrounding atmosphere. The protein content *Cassia auriculata* flowers were 10.54% which had indicated a good source of protein which would require for dietary supplementation, the ash content present in the *Cassia auriculata* flowers was 7.15% whereas ash is the inorganic residue remaining after the water and organic matter has been removed by the food, which has showed an indication of good amount of minerals and the fiber content of *Cassia auriculata* flowers was 2.08%. The mineral content *i.e*., zinc (18.35 mg/kg) and Iron (190.50 mg/kg) were also found to be high in *Cassia auriculata* flowers, which would be helping in managing micronutrient deficiencies.

The total antioxidant content of *Cassia auriculata* flowers were found to be high *i.e*., 553.5 µg/100 g, the flavonoids and total phenols content of *Cassia auriculata* flowers were 310 mg of QE/100 gm and 265.12 mg of GAE/100 gm. Ashok *et al.* (2015) was studied inhibitor activity of flowers of senna or *Cassia auriculata* (Linn.) using Diphenyl-1-picrylhydrazyl (DPPH) scavenging assay and *Cassia auriculata* flowers showed most antioxidant activity in all assay systems due to higher phenolics and flavonoids content. Antioxidants plays a critical role in physiological functions of liver, digestive system, kidney and prevention of cancer and cardiovascular diseases. Hence *Cassia auriculata* flowers can be used as good antioxidant.

The anti-nutrients were also analyzed and Phytates content was 28.70 mg/100 g, oxalates 64.55 mg/100 g and tannin 1.92 Mg TAE/100 g. But these can be removed in all processing treatments.

Fig 7: Packing and storage of dried *Cassia auriculata* flowers.

Table 1: Nutritional composition of standardized *Cassia auriculata* flowers.

Nutritional properties	Units	Value
Moisture	%	12.37
Protein	%	10.54
Ash	%	7.15
Fiber	%	2.08
Zinc	mg/kg	18.35
Iron	mg/kg	190.50
Antioxidant activity	µg/100 g	553.5
Flavonoids	mg of QE/100 g mg	310
Total phenols	mg of GAE/100 g	265.12
Phytates	mg/100 g	28.70
Oxalates	mg/100 g	64.55
Tannins	Mg TAE/100 g	1.92

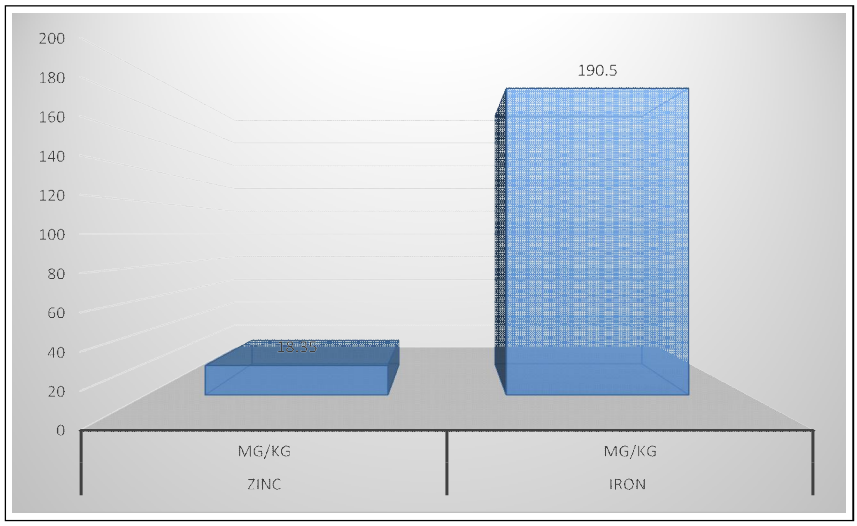

Fig 8: Mineral Content of *Cassia auriculata* flowers.

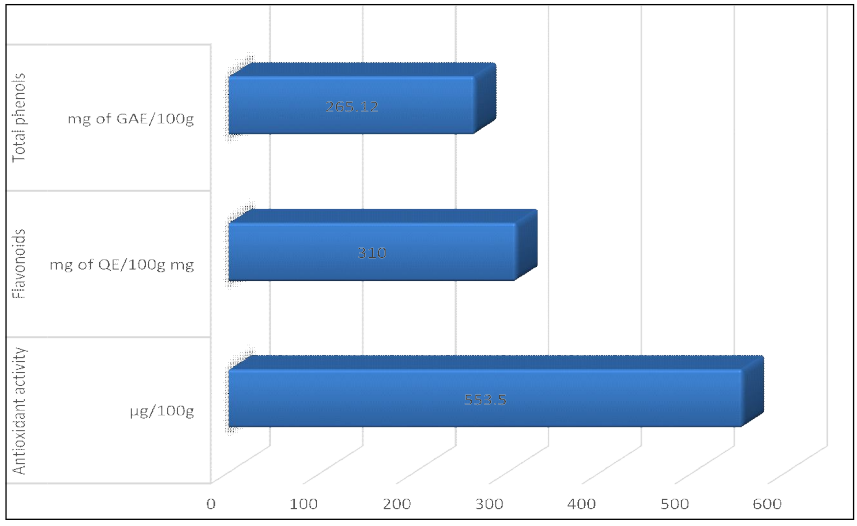

Fig 9: Antioxidant value of *Cassia auriculata* flowers.

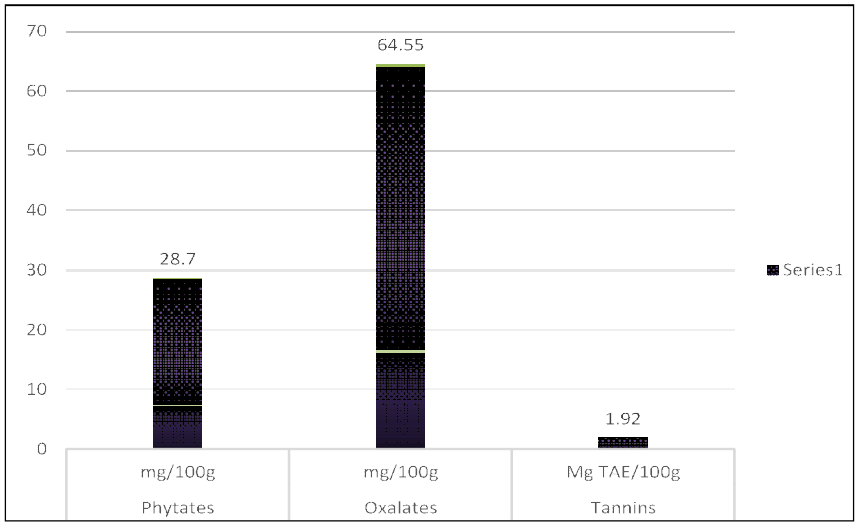

Fig 10: Antinutrient value of *Cassia auriculata* flowers.

CONCLUSION

From the findings of *Cassia auriculata* flowers it can be concluded that as natural sources of antioxidants and nutrients and it can be utilized in the treatment of diseases which have free-radical origin and as a substitute for artificial medication or development of value-added products.

Conflict of interest: None.

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