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Nutritional composition of cassia *auriculata* flower powder

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Abstract

The Various parts of *Cassia auriculata* L. provide health and nutrition promoting compounds in human diet. The present review aims to compile the nutritional composition of *Cassia Auriculata* flower powder. The nutritional composition was determined in the extract of *Cassia auriculata* flower using standard methods. The result showed the total antioxidant content of cassia flower was found to be high i.e. 546.3µg/100g and the total phenols and flavonoids content of cassia flower powder was 249.13 mg of GAE/100gm and 304 mg of QE/100gm and the high amount of antinutrient such as tannin (1.82 mg/100g), oxalates (54.55 mg/100g) and phytates (23.90 mg/100g) also present. It is also rich in Physico-chemical properties such as moisture (11.73%), protein (9.54%), ash (5.51%), and fat (2.98%) fiber (1.89%), iron (189.95mg/kg) and zinc (17.53mg/kg). Due to their nutritional quality it is used for the treatment of pain, urinary tract disorders, conjunctivitis and liver diseases etc.

Keywords: *Cassia auriculata* flower powder, nutritional composition

Introduction

In recent times, focus on plant research has increased all over the world. The plants having medicinal properties as therapeutic foods and pharmacological agents are age old practice. These medicinal plants play an important role in the public health especially in the developing countries as the modern medicines are becoming expensive day by day. Henceforth use of plants sources which are safe, biodegradable as therapeutic agents gaining importance. It was found that nearly 50% of the medicines in the modern world are made up of plant materials and many of the bioactive components present in these plants cannot be artificially synthesized. World health organization has estimated that 80% of people in the developing counties rely on the traditional medicine for the primary health care needs (Doshi *et al.* 2011) [5].

In the scenario of increasing rate of metabolic disorders among all the age groups traditional medicinal plants can be used to develop safe and cost effective therapeutic foods to address the current public health problems. One among most medicinally valued plants is *cassia auriculata*. It has its roots in the traditional medicine since ancient times. It was used in traditional system of medicine to treat various infectious disease caused by various microbes. *Cassia auriculata* has been used in the ayurveda as tonic, astringent in the treatment of diabetes. *Cassia auriculata* is the constituent of Indian herbal formulation called 'Avaaripanchangachooranam' (Gupta *et al.* 2009) [6].

Cassia auriculata one of the most valued traditional medicinal resources of Telangana was selected as state flower due to its distinctive characteristics; ability to grow in almost all types of soil, have medicinal properties, it has the ritual respect equivalent to goddess durga and most important is it is associated with famous festival bathukamma.

Cassia auriculata is one among the medicinal plants which is widely used in the treatment of diabetes. The plant is also known to have antihyperlipidemic, hepatoprotective, antipyretic, antimicrobial activity.

Hence the present study was conducted and formulated standardized *Cassia auriculata* tea and determined and characterizes the chemical constituents present in *Cassia auriculata* flower by using qualitative and quantitative analytical techniques.

Materials and Methods

Cassia auriculata flowers procured from PJTSAU and open fields of villages in and around Hyderabad. Initially the selected flowers *Cassia auriculata* was properly cleaned and washed under tap water. Petals of the *cassia auriculata* flowers were blanched @ 2 min in little hot water to soften the petals. In blanching petals were heat treated at 85 °C and brighten the color

of petals. Then blanched petals were strained through stainless steel strainer. After that in cabinet dryer, blanched flowers (2 mins) was spread over perforated aluminum trays and dried using hot air at 105°C for 10-14hrs. In mixture machine, dried flowers were powdered and analyzed the nutritional quality characteristics such as moisture (AOAC, 2005) ^[4], protein (AOAC, 2005) ^[4], crude fiber (AOAC, 2005) ^[4], ash (AOAC 2005) ^[4] and Fat (AOAC,1997), Iron(AOAC 953.01.3.2.01), 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 Chandran and Indira, 2016), oxalates (Naik *et al.*, 2014) and phytates (Wheeler and Ferrel, 1971) using standard methods.

Results and Discussion

Cassia auriculata flower powder was analyzed for nutritional composition using standard methods. Details are presented in table 1 and figure 1-4

The moisture content of *Cassia auriculata* flower powder was 11.73%. The moisture content of a powder plays a significant role in the flow and other mechanical properties of the food. However, it depends largely on the method, extent of drying and the humidity in the surrounding atmosphere (Lawal, 2004).The protein content *Cassia auriculata* flower powder was 9.54% which indicates a good source of protein which would require dietary supplementation, the ash content present in the *Cassia auriculata* flower powder was 5.51% Ash is the inorganic residue remaining after the water and organic matter have been removed by the food, which is an indication of good amount of minerals and the fibre content of cassia flower powder was 1.89%. Further, the mineral content

i.e. Iron (189.95 mg/kg) and zinc (17.53 mg/kg) was also found to be high in *Cassia auriculata* flower powder, which helps in managing micronutrient deficiencies.

The total antioxidant content of cassia flower was found to be high i.e. 546.3µg/100g and the total phenols and flavonoids content of cassia flower powder was 249.13 mg of GAE/100gm and 304 mg of QE/100gm. Antioxidants play critical role in physiological functions of liver, kidney, digestive system, and prevention of cardiovascular diseases and cancer. Hence cassia flower powder can be used as good antioxidant.

The anti-nutrients also analyzed and Phytates content was 23.90 mg/100g, tannin 1.82 MgTAE/100g, and oxalates 54.55 mg/100g. But these can be removed in all processing treatments.

Table 1: Nutritional composition of standardized *Cassia Auriculata* flower powder

Nutritional properties	Units	Value
Ash	%	5.51
Moisture	%	11.73
Protein	%	9.54
Fat	%	2.98
Fiber	%	1.89
Iron	mg/kg	189.95
Zinc	mg/kg	17.53
Antioxidant activity	µg/100g	546.30
Total phenols	mg of GAE/100g	249.13
Flavonoids	mg of QE/100g mg	304
Phytates	mg/100g	3.90
Tannins	Mg TAE/100g	1.82
Oxalates	mg/100g	54.55

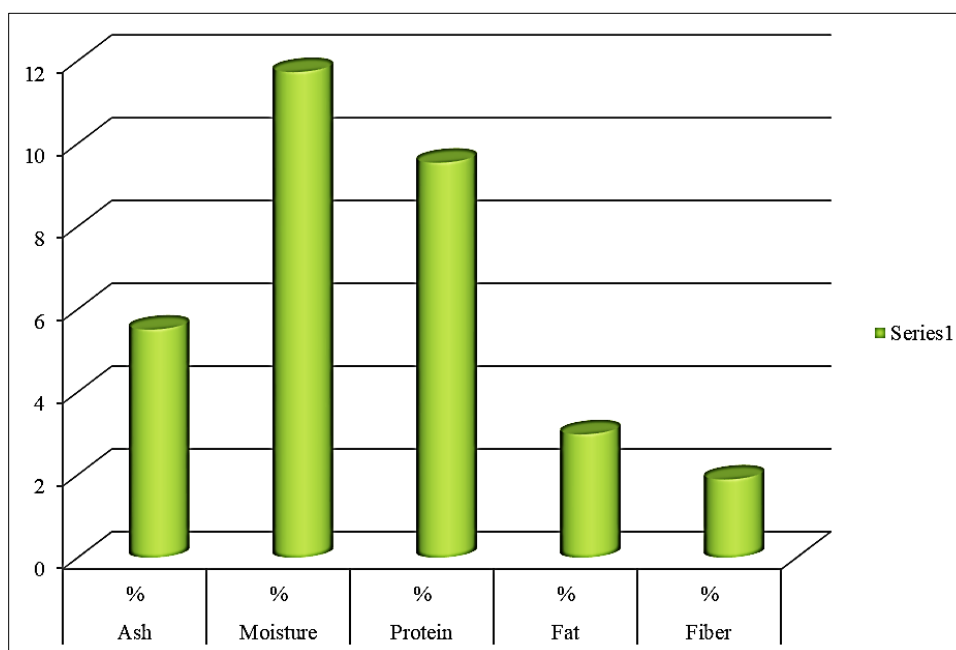


Fig 1: Proximate composition of *Cassia auriculata* flower powder

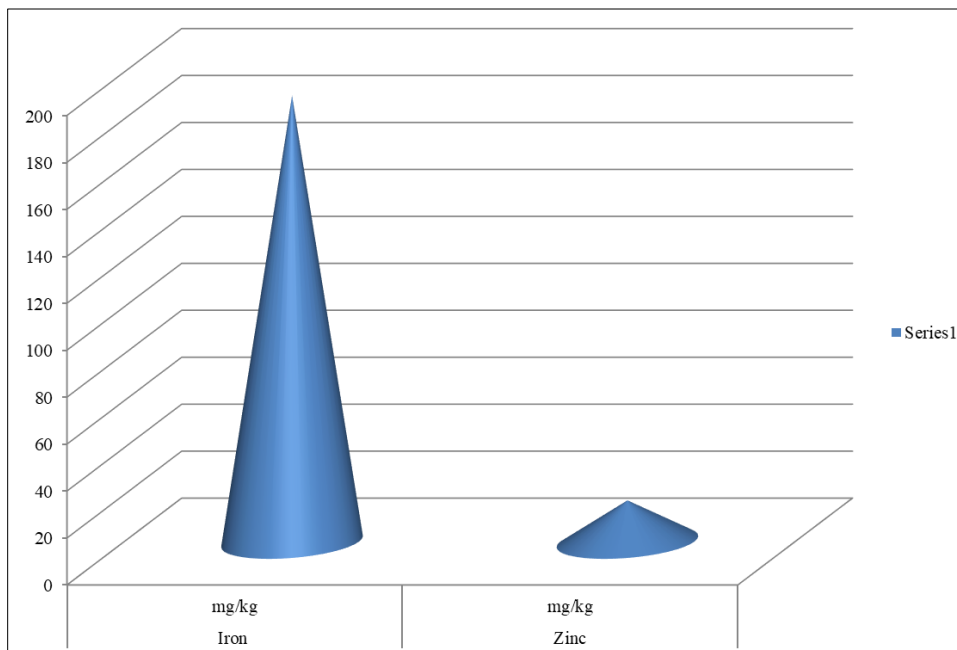


Fig 2: Mineral Content of *Cassia auriculata* flower powder

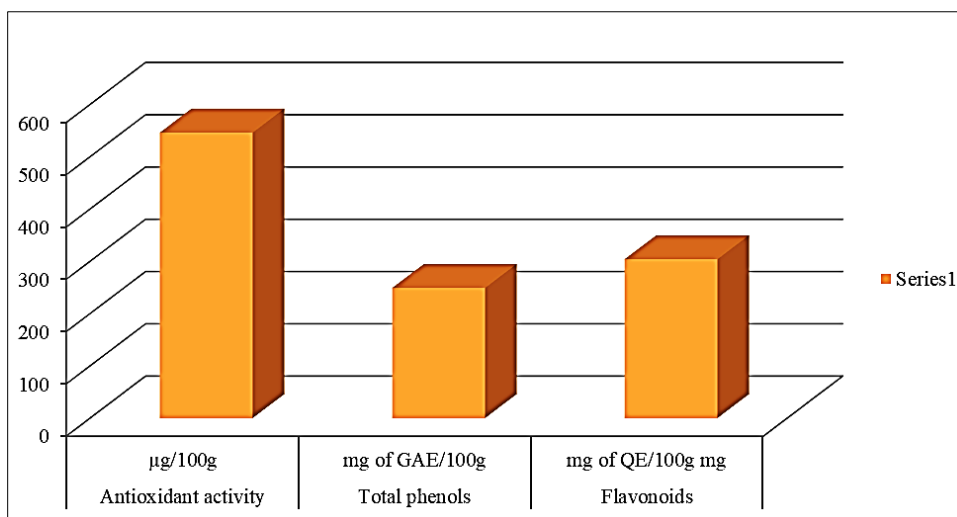


Fig 3: Antioxidant value of *Cassia auriculata* flower powder

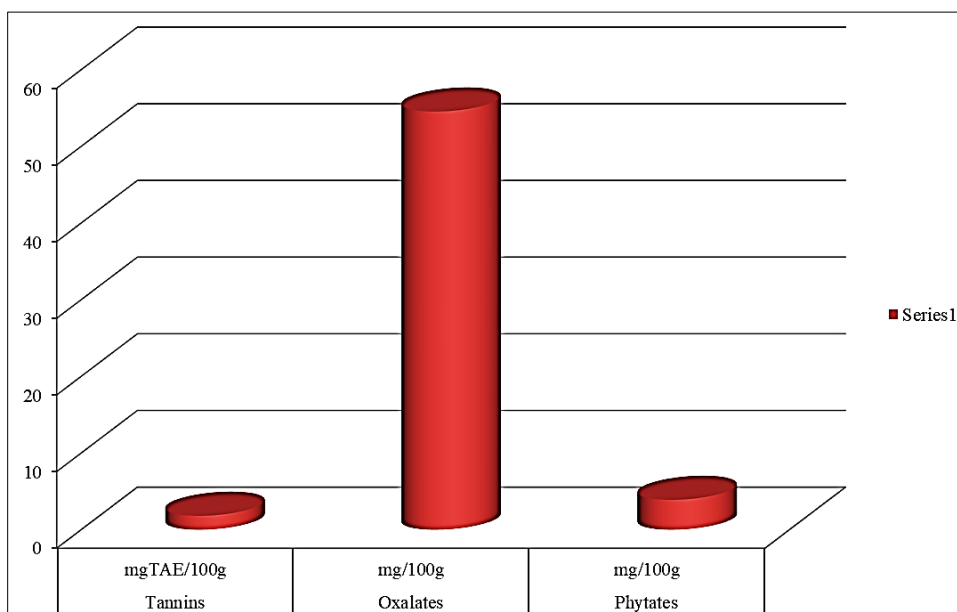


Fig 4: Antinutrient value of *Cassia auriculata* flower powder

Conclusion

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

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