

Compositions of *Hibiscus rosasinensis* floral extract infusion and its prospects of use as a health tonic

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ABSTRACT

Herbal remedies are being practiced expeditiously. The beneficial effects of these herbal remedies on health problems have been observed and experienced by humans for thousands of years. Indigenous medicinal plants are more valued because they are acquirable and have low side effects. Nutritional composition and medicinal use of *Hibiscus rosa-sinensis* flowers have been conducted in this study.

Hibiscus rosa-sinensis has medicinal properties for anti-tumor, anti-fertility, antipyretic, hypoglycemic, anti-inflammatory, analgesic, antimicrobial, CNS depressant, and hypertensive activity and is a primary ingredient in many herbal teas. Among the different bioactive compounds contained in the flowers, polyphenol compounds are of the utmost importance for their antioxidant properties.

Flowers have a wide range of pharmacological actions, which may be therapeutically beneficial for overall health and wellness of population, the need of the hour is for further research in clinical aspects. Consumption of tea made from the above-mentioned flower petals is being followed by a large number of people to control various lifestyle diseases. Since plants are easily available and no special conditions are required to cultivate and collect them, it could be a better choice to treat ailments.

Figure : 01

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KEY WORDS : Flower extracts, Health, *Hibiscus rosasinensis*, Medicinal plants, Pharmacological

Introduction

Lifestyle diseases are prevailed over by use of many indigenous medicinal flowers / plants that are edible. Since ancient times, several types of edible flowers have been utilized for nutritional and therapeutic purposes. Recently, a growing interest in finding prospective new edible flowers for cookery has emerged⁷. Edible flowers are non-toxic and consumed in human diet because of the health benefits¹³. They confer distinctive and potent color, flavor and aroma to the food, and therefore have gained popularity in the culinary world as an innovative ingredient⁴. Edible flowers are regarded as ornamental elements as their nutritional content is unrecognized by most people. However, all flowers cannot be considered edible due to the risks of presence of certain toxic chemicals^{12, 15}. Therefore, more focus is needed to determine the presence of macro and micronutrients and effect of antinutritional factors found in common edible flowers. Generally, edible flowers are known to contain components similar to those contained in other parts of the plant from which they are sourced. They have a high water content, low content of

fats and protein, carbohydrates and minerals in varied proportions. They possess various substances such as phenolic compounds, nitrogenous substances, carotenoids, vitamins, and their metabolites^{17, 20}

Studies on the extraction of antioxidants of edible flowers have been achieved by several procedures.

Therefore, in the present work, edible petals of *Hibiscus rosa-sinensis* (Vernacular Hindi: gudhal) were characterized and evaluated in terms of nutritional and mineral constitution, and presence of bioactive compounds in different extracts.

Materials and Methods

Samples

The flowers of *Hibiscus rosa-sinensis* (Gudhal) were procured from various sites of Ajmer city, Rajasthan. Flowers were dried at room temperature and pulverized. Then their powder passed through a mesh sieve and stored in airtight polyester containers until further use and for analysis (Fig. 1.).

Proximate Analysis

Proximate Analysis was done². The six analyses

included moisture, ash, fat, protein content, fiber and carbohydrates.

Moisture content was determined ^{28, 29}.

Ash content was measured by calcinations.

Crude Protein content was estimated ⁶.

Crude lipid content was assessed gravimetrically after hexane extraction.

Crude fibre content: The Acid-alkaline-gravimetric method was used to determine crude fibre content.

Available carbohydrates: Carbohydrate was estimated by difference using the relation: 100 - (% crude proteins + %crude lipid + % Crude fibre + %ash).

Energy content: The Atwater general factors system was estimated the energy content in kcal/100g⁹.

Analysis of Vitamin and Mineral Elements

The Vitamins and Minerals were determined ².

Vitamin C: Estimation was carried out by titrating ascorbic acid with 2, 6 dichlorophenol indophenols solution.

The mineral constituents namely, Iron and zinc were analyzed using (AAS) atomic absorption spectrophotometer. Sodium and potassium contents were determined using flame photometer method ¹¹.

Calcium and magnesium contents of the sample were determined using complexometric titration

method²⁵. All analyses were conducted in triplicates and results were based per 100 g of dried sample.

Result and Discussion

The value obtained for carbohydrate ranged from 60.91 to 63.23%, crude protein 11.94 to 15.66%, crude fat 3.6 to 5.18%, ash content 5.85 to 6.26%, crude fiber 3.95 to 9.08% and moisture content 7.06 to 8.12% as shown in Table 1. On comparative study of proximate analysis of flowers with other researchers' data and the data obtained, differences were revealed. It led to the interpretation, that several factors like, geographical location and climatic conditions of the places from where flowers were collected, seasonal variations during collection of flowers and nutritional profile of soil in which the plants were grown might be responsible for the disparity.

The mineral elements present in the flowers followed the decreasing order: Potassium > Sodium > Calcium > Magnesium > Zinc > Iron. These results were studied, tabulated (Table 2) and compared with other researchers. It was found that Potassium, Calcium and Iron contents were analyzed by several workers.

Hibiscus rosa-sinensis, usually referred to as China rose, is an evergreen, glabrous shrub, of the family Malvaceae. Flowers and leaves of *Hibiscus rosa-sinensis* are extracted for specific chemical compounds and are used for their effectiveness against tumors, spasms, pyrexia, inflammations, body pains, microbes

TABLE-1: Nutritional analysis of three samples of *Hibiscus rosa sinensis* flowers obtained from three places in Ajmer city.

Parameter	HRS (A)	HRS (B)	HRS (C)
Moisture	7.91± 0.746	7.06 ± 0.144	8.12 ± 0.151
Ash	5.85±0.289	6.11± 0.164	6.26±0.486
Crude Protein	12.64±0.408	11.94± 0.348	15.66±0.657
Crude Fiber	9.08±0.316	8.06± 0.145	3.95±0.160
Crude Fat	3.61±0.278	3.6± 0.183	5.18±0.085
CHO	60.91±0.873	63.23 ±0.465	60.83±1.453
Energy (kcal/100g)	326.69 ± 6.582	333.08 ±1.763	352.58±1.097
Vitamin C (mg/100g)	0.80±0.021	0.83± 0.036	0.86±0.026

TABLE-2: Macro and micro elements present in floral powders (mg/100g)

Parameter	HRS (A)	HRS (B)	HRS (C)
Calcium*	45.33±4.619	48.00±8.000	48.00±8.000
Magnesium	32.40±2.806	50.22±7.424	46.98±10.117
Potassium*	271.70±1.375	206.29±5.412	199.61±0.569
Sodium	78.27±6.583	63.17±2.790	75.94±2.612
Iron*	6.02±0.618	6.06±0.593	13.46±1.121
Zinc	6.91±1.101	5.20±0.269	7.92±0.840

and, hypertensive effects^{5,10,22} and as antiasthmatic agents^{23,26}. A component of the essential oil was found to be active against human cancer cells and also has antifungal activity¹⁶. Aerial parts of *Hibiscus rosasinensis* were extracted using ethanol and used for treatment of constipation and diarrhea⁸, epilepsy, bronchial catarrh and leprosy¹⁹.

Flowers are highly perishable owing to their high moisture content. Dehydration is one of the most convenient methods of food preservation practiced worldwide. *Hibiscus* is a principal constituent in many herbal teas and has medicinal properties with health

benefits. It can be prepared with dried or fresh flowers and can be served hot or ice cold. The *Hibiscus* petals are separated from rest of the floral parts, washed and taken in a pan of water to boil. If dried floral powder is available, it may be used easily without the steps of separating and washing. Once the fresh petals or dried floral powder starts boiling, 3-4 black peppers, a clove, and a small piece of cinnamon (roughly crushed) and a few mint leaves are added. The mixture is allowed to steep for a few minutes until the petals turn pale. Then the infusion is strained and honey is added. It is garnished with some mint leaves and served hot.



(a) Flowers



(b) Petals



(c) Dried Powder

Fig.1: *Hibiscus rosa sinensis*

Alternatively, ice cubes may be added and iced tea may be served.

Polyphenol molecules obtained from flowers are significant for their antioxidant properties²¹. These are widely exploited to preserve oxidative stability^{3, 1} due to their function of scavenging³, and extending the shelf-life of products^{14,18}.

Ancient medicinal literature report *Hibiscus rosa-sinensis* to be a highly potential and beneficial plant against various human disorders²⁴. *Hibiscus rosa-sinensis* flowers are reported to contain quercetin, anthocyanins, flavonoids, cyclopeptide alkaloid and vitamins⁶. The *Hibiscus* flower is significant in traditional Indian systems of medicine as a prominent herbal remedy of indigenous practices across the world used in treatment of hair loss, female sexual disorders, piles,, diseases of pitta and as female contraceptives¹¹. In Ayurveda infusion of flower petals is used as a demulcent in fever⁸

Conclusion

As this plant grows widely in a variety of habitats, its extracts can be used for several health issues, enumerated above instead of allopathic medications. Concomitantly, evaluation of the *Hibiscus* flowers for interrelationships along with chemical drugs is required for side effects, if any. This is a totally unexplored area and very much need of the hour. Value addition of floral parts is gaining prominence. Plants offer comprehensive medicinal activities, which may be explored and harnessed to ameliorate general health and well-being of the community, which is the pressing priority for further research. The only precaution that should be taken is that consumption of herbal infusions in small quantities and with less or no accompanying spices will be more beneficial, so as that no other side effect arises. This *Hibiscus* tea, on consumption will substantiate to provide better well-being of people. Eventually, good health and well-being of people will be ensured by use of plant products as 'nutraceuticals' instead of pharmaceuticals.

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