

Diversity of Edible Flowers in Sri Lanka

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Abstract

The world of flowers can be considered as the most amazing gift offered by Mother Nature. Some of the flowers can be considered as functional foods due to their medicinal and nutritional values. This review was carried out with the objectives of enlisting edible flowers in Sri Lanka, to explore the culinary methods and to explore the nutritional and medicinal values of them. The information was gathered from ayurvedic and traditional texts, open interviews, an old as well as recent recipe books, and from scientific articles. There are about 26 edible flowers currently used by Sri Lankan community. Some of them are recorded as poisonous to animals, but there are specific methods to cook them. Sri Lankans do not eat these flowers in fresh forms like other countries; therefore specific fragrance is not expected, except flowers like clove. As these flowers are not commercially cultivated, they are not contaminated with agrochemicals. Some parts of certain flowers have to be removed before cooking. Ayurveda theories describe their properties as *Thridosha Shamaka* (pacifying three bio energies) and *Dhathu Poshaka* (body tissues nourishing) etc. They are also beneficial in treating diseases in gastrointestinal tract, eye disorders, respiratory disorders and urinary disorders according to Ayurvedic teachings. This data can be used to promote the use and medicinal values of edible flowers among the community.

Keywords: Functional Foods, *Thridoshashamaka*, *Dhathuposhaka*

1. Introduction

In Sri Lanka, there is unique culture and civilization inherited from the past. She also has idiosyncratic culinary heritage and it is one out of sixty four arts in the country. The traditional food culture in Sri Lanka can be considered as a part of medicine system like Traditional medicine system or Ayurveda that are popularly practiced in the country. This heritage consists of diverse food sources available in natural habitats. Sri Lankan cuisine has been influenced by many historical, cultural and other factors. In later periods, the Sri Lankan food culture was either amended, blended or disturbed by the foreign gastronomic practices introduced by Portuguese, Dutch, English, Indians, Arabs and Malays,. This infusion disturbed, discouraged the use of some natural food sources and culinary methods. The main staple of the country is rice and curries containing a wide range of vegetables, leaves and non vegetable based preparation using chilies, spices and other condiments. The vegetable sources include any plant part hence edible flowers come under this category. Sri Lankan curries are known for their fiery hot spicy flavors and coconut milk is very distinct feature of Sri Lankan cuisine that different regions of country specialize in different types of dishes.

According to *Charaka Samhita*, “*Ahara*”(food) has been considered as one of the three elementary pillars of the well being¹and also food is taken in various forms eaten, drunk, licked and devoured², which is wholesome for the person, being consumed properly by the respective *agnis* (digestive fire), participating in the non-stopping process (metabolism) of conversion of all *dhatu*s (body tissues). The science of food and nutrition in Ayurveda was well developed that *Charaka* has categorized all the food items into twelve classes³: corns with bristles, pulses or legumes, meat, leafy vegetables, fruit, vegetables which are consumed raw, wines, water from different sources, milk and milk products, products of sugarcane, food preparations, and accessory food items such as oils and salts, and has further subcategorized these food groups. Dietary diversity and variety have been considered as a way of healthy eating since ancient times. Ayurveda medicine system discusses the importance of healthy (sathvika) diet for being healthy⁴, which consists of six tastes⁵, panchabhautika (natural)⁶. And also Ayurveda explains as the vitiated doshas are over powered by a healthy

person, similarly the six taste even if used in excess get overpowered by the healthy⁷. Ayurveda extensively describes quantitative dietetics⁸, classification of food commodities and their properties⁹ and also qualitative dietetics as per the seasonal variations (Cha/Su/7). In Ayurveda, the importance of particular diet in prevention and treatment of diseases was well known even in 1000 BC. Flowers have been classified as “*Pushpa Varga*” under the vegetable foods. Their properties have been described as *Thridosha Shamaka* (pacifying three bio energies i.e. *vata*, *pitta* and *kapha*) and *Dhathu Poshaka* (tissue nourishment) etc¹⁰. Some of them can be considered as functional foods. Sri Lankans have been consuming functional foods from immemorial time being a country with rich bio diversity. The flora consists of different categories of fruits, vegetables, spices and medicinal herbs. Functional foods presumably enable the consumer to lead a healthier life without changing eating habits. A diverse diet increases the probability of nutrient adequacy among adults¹¹. The diverse diet leads to positive health outcomes such as reducing complications of diabetes¹² incidence of several cancers^{13,14}. Currently Sri Lanka faces major diet associated health problem like protein energy malnutrition¹⁵, Non-Communicable Diseases (NCDs) overweight, obesity and central obesity¹⁶ and metabolic problems such as diabetes and hypertension¹⁷. Micronutrient malnutrition is a global public health problem contributing directly and indirectly to morbidity and mortality of billions of persons worldwide. Vitamin and mineral deficiencies are widespread, affecting one third of the global population¹⁸. Food security has been identified as another diet related health issue¹⁹. Plants with potential therapeutic value have been used from time immemorial to cure various ailments and infectious diseases (Voon, 2012). Secondary metabolites or the bioactive compounds (phytochemicals) present in plants have been reported to be accountable for various observed biological activities.

The culinary use of flowers dates back thousands of years with the first recorded in 140 B.C. Chinese, Indians, Romans, Italians and Hispanic cultures make use of flowers in many of their traditional recipes. Most of the edible flowers use in Sri Lanka is not subjected to validate their nutritional values. Medical texts describe some of their medicinal properties on the basis of pacifying and balancing **tridosha**. Most edible flowers contain vitamin C, D and A. Many of them are good source of potassium and iron. A study has shown that cooked Pumpkin flowers is low in Saturated Fat and Sodium, and very low in Cholesterol. It is also a good source of Dietary Fiber, Vitamin B₆, Calcium, Phosphorus and Potassium, and a very good source of Vitamin A, Vitamin C, Folate, Iron, Magnesium and Copper²⁰. The vivid colors of edible flowers suggest the presence of beneficial compounds called phytonutrients, flavonoids and antioxidants, all of which can lower your risk of certain health problems such as cancer and heart disease²¹.

According to Ayurveda, key to healthy life is mainly based on foods. Eating a wide variety of foods in the right proportions, and consuming the right amount of food and drink is the path to achieve and maintain a healthy body. The knowledge on edible flowers including identification, preparation with various culinary methods in Sri Lanka is gradually erasing from knowledge bases. The community is unaware about the uses, their nutritional and medicinal values. As a solution for issues such as food safety, micro-nutrients deficiency, poverty, the conservation, awareness and dissemination of knowledge are a major requirement.

A survey has been carried out with an aim to enlist edible flowers in Sri Lanka, explore their traditional culinary methods and to explore their nutritional and medicinal values.

2. Methodology

Secondary data were extracted from Ayurvedic & traditional books, old and recent recipe books, and scientific articles. In addition, information was gathered through open interviews of knowledgeable people living in rural areas.

3. Results

1. Among the edible flowers identified from the study, nearly 28 flowers have been used as salads or curries in Sri Lankan cuisines.

	Common Name	Botanical Name	Family
1.	Lolu	<i>Cordiadihotomafrost. f</i>	Boraginaceae
2.	Wada/Pokuru Wada	<i>Hibiscus rosa –sinensis L.</i>	Malvaceae
3.	Katurumurunga	<i>Sesbaniagrandiflora (L.) Poir</i>	Fabaceae
4.	Maila	<i>Bauhinia recemosa Lam.</i>	Olacaceae
5.	Siyambala	<i>Tamarindusindica L.</i>	Fabaceae
6.	Kesel	<i>Musa paradisiaca L.</i>	Musaceae
7.	Kekatiya	<i>Aponogetoncrispus Thunb.</i>	Aponogetonaceae
8.	Telatiya	<i>OloximbricateRoxb.</i>	Olacaceae
9.	Pol	<i>Cocosnucifera L.</i>	Arecaceae
10.	Wetahira	<i>Gliricidiamaculata</i>	Fabaceae
11.	Tora	<i>Cassia tora L.</i>	Fabaceae
12.	Mee	<i>Madhucalongifolia (L.) Macbride</i>	Sapotaceae
13.	kitul	<i>Caryotaurens L.</i>	Arecaceae
14.	Murunga	<i>Moringaoleifera Lam.</i>	Moringaceae
15.	Diyahabarala	<i>Monochoria hastate (L.) Solms-Laub.M. vaginalis (Burm.f.) Presl</i>	Pontederiaceae
16.	Thampala	<i>Amaranthusviridus L.</i>	Amaranthaceae
17.	Gandapana	<i>Lantana camara L.</i>	Verbenaceae
18.	Demata	<i>Gmelinaasiatica L.</i>	Verbenaceae
19.	Pepol	<i>Carica papaya L.</i>	Caricaceae
20.	Hana	<i>Agave americanus</i>	Agavaceae
21.	Balunakuta	<i>Stachytarphetaindica L.</i>	Verbenaceae
22.	Doorian	<i>DuriozibethinusL.</i>	Malvaceae
23.	Kotta	<i>Ceibapentandra L.</i>	Malvaceae
24.	Del	<i>ArtocarpusnobilisThw.</i>	Moraceae

25.	Sapu	<i>Micheliachampaca</i> L.	Magnoliaceae
26.	Na	<i>Mesuaferrea</i> L.	Calophyllaceae
27.	Ranawara	<i>Cassia auriculata</i> L.	Fabaceae
28.	Beli	<i>Aeglemarmelos</i> L. Correa	Rutaceae
29.	Pana	<i>Artocarpusheterophyllus</i> Lam.	Moraceae
30.	Domba	<i>Calophylluminophyllum</i> L.	Clusiaceae
31.	Erabadu	<i>Erythrina variegata</i> L.	Fabaceae
32.	Kohila	<i>Lasiaspinosal</i> .	Araceae
33.	KatuAla	<i>Dioscorea</i> Sp.	

And also there are many flowers which have been used as beverages for many centuries. E.g.: The flowers of Pana (flower of *Artocarpusheterophyllus*) Ranawara (*Cassia auriculata*), Beli (*Aeglemarmelos*), Wada (*Hibiscus rosa-sinensis*) etc. Sri Lankan community use homemade herbal teas with different plant parts. It is highly depending on the availability and being used as preventive measures for various diseases mainly environment related conditions.

- Beverage prepared with *Cassia auriculata* is popular especially in dry zone of the country which prevents urinary disorders like urinary calculi and conditions occur due to excess heat.
 - Beverage prepared with *Hibiscus rosasinensis* (Shoe flowers) is a good blood purifier which can control skin disorders. It is also an excellent remedy for weight loss, as the flowers are found to contain hydroxycitric acid. Also they contain antioxidants that help prevent cholesterol deposits and aids liver disorders.
 - Boiled flowers of jack fruit, *Artocarpusheterophyllus* (**Pana**) have the ability in quenching thirst. Therefore this is being used in management of diabetes and also it pacifies *Pitta dosha*
2. Some flowers are not known as edible by the present community. The methods of using were not described in the texts. eg: **Domba**, **Sapu**, **Na** Therefore they were not included into the above mentioned list, considering them as exceptions.
 3. Some of them are effective for constipation and bleeding piles due to its high fiber content e.g.: **Kohila**, **Thampala**
 4. The flowers such as **Kekatiya**, **Diyahabaralacompr**ise the cleansing effect of urine and also they are excellent remedy for burning sensation of urine. In addition to that, the flowers of **Kekatiya** consist the ability of nourishing the body tissues (*dhatu*) i.e sperms and recommend as a wholesome food (*pathyaahara*) in treating male fertility.
 5. Some of them are act as good appetizers. eg: **Kolom**, **Kesel**, **Katurumurunga** and **Siyambala**. Specially the flowers of **Kesel** are rich in vitamin C. The flowers of **katurumurunga** They are rich in calcium, iron as well as Vitamins A and B. While the flowers of **kesel** reducing Kaphadosh whereas the flowers of **Katurumurunga** have kapha aggravating property. Curry prepared with siyambala flowers is given in indigestion conditions.
 6. Some flowers act as mild purgatives, which is helpful in eliminating toxins (*Ama*) from the body. Eg: **Kesel** and **Erabadu**. Therefore they can be used to treat toxicosis. The flowers of **Erabadu** are also recommended in treatment of worm infestations; specially in children.
 7. Since ancient times, the flowers of **Katurumurunga**, are being used to treat “*Nakthandhatha*” which is known as “Night Blindness” in modern medicine, that occurs due to Vitamin A deficiency; hence it is already been identified by Ayurvedic physicians long back.
 8. Buds of clove is a world famous spice and is rich in medicinal values. It is used as a condiment as well.
 9. The flowers of **Murunga** provide good amounts of calcium and potassium. All the plant parts have the ability in controlling high cholesterol levels.

4. Different methods of preparations

1. Some flowers have to be cooked after boiling and straining water eg: *Maila, Siyambala, Kitul*. This is a method used traditionally to remove the mal effects/ allergens/ harmful chemicals of those flowers if there is any.
2. The flowers of *Wetahira* and *Katurumurunga* have to be cooked after removing floral parts like stamen in order to eliminate the bitterness and also to get a substantial flavor.
3. *Mee* flowers have been used in preparing sweet meat due to high content of honey. i.e *Mee mal halapa*. This is the only occasion found that flowers being used in preparation a sweet.
4. Some flowers have to be collected before blooming so as to get softer and less leathery food with maximum effect. E.g. *Katurumurunga, Lolu and Clove*. *Wada* flowers are taken when fully bloomed.
5. Many different dishes can be prepared with some flowers. The blossoms of Banana can be made in to a good appetizer, when it is tempered or make as a pickle.
6. Addition of little lime juice enhances the absorption of some nutrients like iron. It is good to add little bit of lime juice for most of the curries after taking off from the fire, to enhance the dietary iron absorption.

5. Medicinal and Nutritional Values of Edible Flowers according to Ayurveda

In general, these flowers consist the abilities of ThridoshaShamaka (pacifying three bio energies) and Dhathu Poshaka (nourishment of body tissues). They are also beneficial for treating disease of any system due to imbalance of doshaic constitution. Loss of appetite, thirst, constipation as well as diarrhoea, vomiting, burning sensation of the body, Eye disorders, respiratory disorders like cough, wheezing, catarrh etc, urinary tract disorders are the most common disorders which can be subsided by having edible flowers.

6. Discussion

This paper gives an overview about the edible flowers use by the Sri Lankan community. Most of them are out of use due to lack of knowledge in identifying, methods of preparation and their medicinal and nutritional values. As there are huge number of food items available in the market, none of the community take effort to find, collect and prepare them which is time consuming. The use of flowers as a food should be encouraged because of the food security, one of the major food related issue. Meantime the utility can be a solution to the concept of the “nutrition gap”- the gap between what foods are grown and available and what foods are needed for a healthy diet. More information on various food typologies or consumption patterns should be collected and disseminated among the community.

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