



MULTIFUNCTIONAL UTILIZATION OF *HIBISCUS SABDARIFFA* AS A FOOD SOURCE

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ABSTRACT:

Since long time *Hibiscus sabdariffa* L. (roselle), belonging to the *Malvaceae* family, is known as medicinal plant mainly found in the countries like Africa, South-east Asia and Central America in Mexico. It is reported to contain paramount level of organic acids such as citric, malic, tartaric and allo-hydroxycitric acids. Also important plant metabolites like beta carotene, vitamin c, protein and total sugar are found in *Hibiscus sabdariffa* by many researcher. Roselle is also known for its nutritional and medicinal properties. During olden days, people were using hibiscus *sabdariffa* L. (roselle) in different foods forms like jam, jelly, syrup, tea, etc. but in between the technique extinguished. The present study highlights the utilization of hibiscus *sabdariffa* L. (roselle) plant part specially flower as an edible source for human being. Different food items like syrup, gongura pickle, gongura calyces, roselle tea/iced tea gongura leaves powder, chatpata has been made by following different standard methods. The present study give future scope of using these plant as common food items. Also further studies are needed to prove the effectiveness of roselle in variety of food under the various conditions

Keywords: - *Hibiscus Sabdariffa* L. (Roselle), Organic Acids, Plant Metabolites, Roselle Made Food Items.

INTRODUCTION :

Since long time plants are at forefront for fulfilling the basic needs of human including medicines (Ali et al. 2005). Till date many plants have been discovered and recorded having medicinal properties against various diseases (Souri et al. 2022). One of the candidates among this list of plants with medicinal benefit is *Hibiscus sabdariffa* having a rich source of phytochemicals like polyphenols especially anthocyanins, polysaccharides and organic acids which make them suitable for medicinal preparations. *Hibiscus sabdariffa* L., also known as roselle (roselle), belonging to the *Malvaceae* family, is widely grown in many countries like India, Indonesia, Philippines, and Malaysia as part of multi-cropping systems and can be used as food and fibre. It is commonly known in India as Gongura or Patwa in Hindi, Lal mista or Chukka (Bengali), Lal Ambadi (Marathi). Roselle is an annual plant which takes about six

months to mature. It is mainly cultivated for its different parts (leaves, seeds, stem and calyces) which are used as food products. *Hibiscus sabdariffa* L. (roselle) also noted for its prevention of chronic and degenerative diseases that are associated with oxidative stress. Also reported having positive effect on blood pressures and cholesterol and prevent cardiovascular diseases.

Initially people were utilizing plant in different traditional food dishes like food (jam, jelly, syrup, tea) but now a days it has been extinguished. It was laced with commercial potential as a natural food and colouring agent that can replace some synthetic products. In some places the plant is primarily cultivated for the production of Bast fibre from the stem of the plant. The fibre may be used as a substitute for jute in making burlap. health benefits of Roselle tea include assisting in digestion, strengthening immunity, working as an anti-inflammatory

agent, and reducing the risk of cancer. Roselle tea is also rich in vitamin C, minerals, and various antioxidants, while also helping in the treatment of hypertension and anxiety. Roselle tea can be made by steeping parts of the hibiscus plant in boiling water, particularly the calyx. It has distinct maroon colour along with sweet and tart flavour similar to that of cranberries. It can be enjoyed both hot and cold depending on the preferences like most of the other teas. So there is a need to assess the potential use of this plant in variety of dishes of this plant.

The key ingredients prepared in traditional food are fresh or dried calyces of *H. sabdariffa* (cHs) are used in the preparation of herbal drinks, hot and cold beverages, fermented drinks, wine, jam, jellied confectionaries, ice cream, chocolates, flavouring agents, puddings and cakes (Bako et al. 2009; Bolade et al. 2009). In Egypt, the fleshy calyces are used in making “cacody tea” and fermented drinks (Kochhar, 1986), while in Sudan and Nigeria, the calyces are boiled with sugar to produce a drink known as “Karkade” or “Zoborodo” (Gibbon & Pain, 1985). In Mexico this drink is called Jamaica or “agua de Jamaica” or “té de Jamaica”. In the West Indies the calyces can also be used as colouring and flavouring ingredient in rum (Ismail, Ikram, & Nazri, 2008). The seeds are eaten roasted or ground in meals, while the leaves and shoots are eaten raw or cooked, or as a sour-flavoured vegetable or condiment (Wilson & Menzel, 1964). In Sudan, the leaves are eaten green or dried, cooked with onions and groundnuts, while in Malaysia the cooked leaves are eaten as vegetables (Ismail, Ikram, & Nazri, 2008).

Based on above background, the present study has been undertaken to use this herb in different form of food items. The aims & objectives of present research is to study the characteristics of *Hibiscus sabdariffa* plant. Mainly focusses on preparation of edible

products from *Hibiscus sabdariffa*, also highlighting its nutritional and medicinal properties.

MATERIALS & METHODS :

Preparation of Roselle syrup

For preparation of roselle syrup, fresh calyx was collected from plant grown in garden of college premises. Calyx was pulled away from seedpod. All the ingredients like calyces, sugar and salt were mixed together in liquid and it was boiled thoroughly for proper mixing of extract in liquid. The mixture was separated using fine, clean mesh for solid & liquid extract separation. The filtered syrup was spread onto plate for cooling. The syrup was then packed in glass jar and stored in refrigerator for further usage. This syrup can be diluted and served to people with ice in it as refreshing drink.

Roselle for pickle preparation (Gongura pickle)

For pickle preparation gongura cloves were collected and dried completely. The dried cloves were taken in pan and it that fenugreek powder, mustard seed, chilli powder, jaggery, salt were mixed together. Simultaneously oil was heated in another pan which was added to the mixture. The entire ingredients were mixed well and was ready to be used as pickled along with food.

Food items and beverages from Gongura calyces

The dried Roselle Petals have multiple usage but here we focused on one recipe which can be used widely and quickly.

Roselle Tea

One of the simplest and most rejuvenating recipes one can make is Roselle tea. For making tea calyces was boiled in water along with other ingredients. This process added aromatic flavor and fragrance to the tea. The presence of antioxidants in the Roselle makes for a perfect bedtime drink. The tea served with ice cubes can be taken as rosella iced tea to relax your mind.

Conversion of gongura leaves in powdered form as food item

The leaves of Gongura were collected and dried in sunlight for 3-4 days. The dried leaves were crushed and macerated in mortar and pestle. The powder is now ready to be used directly in any food items. Also the powdered form was mixed with powdered sugar and salt and stored in a bottle. This can be consumed as chatpata by people.

RESULT AND DISCUSSION :

Hibiscus sabdariffa is a plant which is known in different countries. The ease of growth makes this plant to be used in any season. Even many countries are optimizing the protocol for large propagation of roselle plant (El-Sherif and Sarwat 2007). In present study all parts of *Hibiscus sabdariffa* plant are tried to utilize in different form of food items. These products are relished for every age group and useful for health improvement. The novelty of these products is that they are all preservative free and are good for health. The natural and organic preservatives like oil, jaggery, sugar and salt are used in it. The roselle syrup made is ready to be used and also has a good taste and aroma (Figure 1). The petals of the Roselle are reported to be rich in nutrients and it may help relieve certain ailments. The nutritional analysis of Roselle plant was found to contain carbohydrate (68.7%) followed by crude fibre (14.6%) and ash content (12.2%) and others. The plant is also found to be rich in minerals especially potassium and magnesium. Roselle has a rich calcium content and as a result of that, it may be used to strengthen bones in the body. It is also rich in iron and boosts hemoglobin production required to transport oxygen to the blood. Vitamin C, which is present in the Roselle, helps in building the immune system. It also helps prevent cold. The presence of antioxidative properties found in nutrients such as magnesium induces sleep hormones and enhances sleep. Hence, we can

promote these plant products rather than synthetic products.

The preparation of gongura pickles is the new recipe in the list. It enhances the taste and can be consumed by any age group of people. The uniqueness of this preparation is that there is no addition of any preservatives and can be stored for longer duration. In Indian cuisine, pickles made from different vegetables and fruits are commonly used. The use of gongura pickles should be introduced in every household because of its paramount advantageous aspect. Also in other parts of the country the roselle flowers are used as salads, teas, juices, jams, jellies, ice-creams and other value added products (McClintock 2004).

Gongura Leaves Powder is a source of fiber that controls blood sugar levels and improves bowel movements. Dried Gongura leaves in powdered form are commonly used in Indian cookery to add a tangy, sour taste to dishes (Mahadevan and Shivali 2009). It is used for flavouring curries, chutneys and marinades. It is a souring agent like tamarind and has tenderising qualities like lime juice. Gongura powder can be used instead of dry mango powder (aamchur) to prepare sweet and sour Dal or Sambhar. It imparts a good flavour to kebabs and barbecued items.

Even though Gongura has many medicinal and useful properties, still we should consume it in moderation. Like everything else, too much of good things can be harmful. High levels of oxalic acid in leaves cause calcium absorption to be disrupted. Excessive leaf consumption can result in Kapha and Pitta imbalances. This might result in rashes, bleeding problems, and fungal infections on the skin. Gongura leaves should be consumed in moderation by people who suffer from asthma. Also lactating mothers should avoid use of items made from roselle as it can diminish milk.

CONCLUSION :

Rosella, a common name in every house hold, is part and parcel of different items which is taken as food or medicine. Traditionally, Gongura was widely used as an ingredient in many Indian traditional local foods. It has proven to have multidimensional impact on social, ecological, and health sector. The popularization of this plant is because of its ease to flourish and grown in any quality of soil. These crops are pest attracting hence it has the ability to protect the main crop. The farming of Gongura is cost effective and eco-friendly. The available information on *H. sabdariffa* shows a wide range of traditional as well as potentially application of its in different sector of edible food and health applications. World wide these plants are used on large scale but in India it was traditionally used during initial time. But, now-a-days the practice of using it on daily basis has been extinct. There is a need to propagate its recipe and its importance at larger level because of its rich source of different types of nutrients and inorganic content. The preparation of Gongura products can be scaled up to a small-scale level. The research has proved that the highly perishable Gongura leaves and flowers can be converted into a commercially viable value-added product appropriate for a variety of applications. However, it cannot be consumed in larger amount by the people who has certain allergy issues.

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Figure 1: Different food items prepared from Roselle

