A Feast of Flowers

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Amongst their varied uses, flowers are also used as food. The purpose of this article is to review the pros and cons of some well-known and less-known edible flowers.

Flowers, though widely appreciated for their beauty are primarily the procreating organ of plants. In order to attract insects and other pollinators, flowers are variously coloured and fragrant. Flowers also have great cultural significance, as an offering to God, as a token of love, or in paying homage to the dead. Besides these uses, there are many flowers around the world that are consumed and yet little is known about this aspect.

Flower Biology

Flowers are the reproductive organs of higher plants, i.e., phanerogams. However, what we typically consider as a flower is found in angiosperms only. Flowers have considerable disparity in structure and morphology and have long been used in the identification of plants.

Flowers are essentially modified shoots [1]. On its axis or thalamus, the floral members are arranged as the leaves are arranged on a stem. A typical flower (Figure 1) shows four sets of members arranged in four successive whorls – a calyx composed of sepals,
a corolla of petals, an androecium of stamens and a gynoecium or pistil composed of carpels.

**Flowers as Food**

The use of flowers in cooking started long ago. They have been used for many years in Chinese, Middle Eastern, and Indian cuisines and are known to have been cooked by the ancient Romans. In Europe, early writings have included the account of a medieval feast where venison was cooked with marigold (*Figure 2*), and salads were made with violets [2]. Besides, aboriginal communities have been using flowers in their cookery from time immemorial. In India, women still choose seasonal flowers for cooking curries in rural areas.

Though there are some unusual cases of consuming raw flowers, most of the flowers are eaten only after being properly processed. In conventional cuisine, flowers are used in various ways. Some flowers are cooked at the bud stages (*Figure 3*). In some cases (like arum, banana, figs, etc.), the entire inflorescence (*Figure 4*) is used in cooking. However, most of the time the whole flower or the parts of it, such as the petals, calyx, etc., are sorted out and cooked. Pollen grains of some flowers such as roses, magnolias, virgin’s bower (*Clematis gouriana*), reedmace (*Typha latifolia*), etc., are edible. Among all these flowers, reedmace flower (*Figure 5*) is most commonly used and it pollen can be eaten raw or cooked [3]. These pollen are known to be used as protein-rich additive to flour when making bread, porridge, etc. They can also be eaten along with the young flowers, which make them considerably easier to utilize.

**Figure 2.** Marigolds (*Tagetes tenuifolia*) are used in culinary processes from Medieval periods.

**Figure 3 (left).** Modern researches have revealed that Broccoli (*Brassica oleracea* var. *italica*) can prevent cancer.

**Figure 4 (right).** The entire inflorescence or its parts is consumed as food: (a) coloured spathe and the floral spike of common arum, (b) flowers and the inflorescence axis in case of banana and (c) the whole receptacle in case of figs.
Edible flowers may be preserved for future use after drying, freezing or steeping in oil. Besides as main dishes, flowers have other uses, too. They can be used in drinks, jellies, salads, soups and syrups [2]. For making flower-flavoured oils and vinegars, edible flower petals are steeped in these liquids. Candied flowers are crystallized using egg white and sugar (as a preservative).

In addition, certain fresh or dried flowers are consumed almost by compulsion, as they are believed to help in curing various diseases. The flowers used for this purpose are eaten sometimes in whole or in parts or their aqueous or alcoholic extracts are used [4]. In Jamaica, kapas (Gossypium herbaceum) flowers are eaten to treat amoebic dysentery. Keya (Pandanus tectorius) flowers are used to treat skin diseases, dandruff and diabetes insipidus. Flowers of champa (Michelia champaca) and nageshwar (Mesua ferrea) are eaten for relief from distension of abdomen in the Ayurvedic system of medicine. In the Unani system, juthika (Jasminum auriculatum) flowers are orally administered to maintain normal heart functions. In Malaysia and China, a similar application is seen in the case of salparh (Hibiscus mutabilis) flower.

**Edible Flowers in Different Cultures**

Needless to say, not all kinds of flowers are edible. Basically those flowers that are familiar either as the flowers of vegetables or as of some traditional flavouring herbs, are picked as edible the world over. For instance, flower buds of artichoke (Cynara scolymus), broccoli (Brassica oleracea var. italica), cauliflower (Brassica oleracea var. botrytis) and caper (Capparis spinosa) as well as flowers or buds of chives (Allium schoenosprasum) and clover (Trifolium repens), etc., are consumed widely (Figure 6 on p.1009). Again there are many examples of edible flowers (such as Ficus racemosa, Madhuca indica, Seshania grandiflora, etc.) that are used chiefly as vegetables irrespective of the rest of the plant parts which are never used in cooking preparations. Besides, the flowers of certain garden ornamentals are also included in the recipe list (see also Table 1).
### Table 1. List of some ornamental flowers which are used in various European, Mediterranean, Oriental and Pan American preparations that satiate the human taste buds.

<table>
<thead>
<tr>
<th>Common Name</th>
<th>Latin Binomial</th>
<th>Family</th>
<th>Parts Used</th>
<th>Taste</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bachelor’s Button</td>
<td>Centaurea cyanus</td>
<td>Asteraceae</td>
<td>Flowers</td>
<td>Sweet to spicy, clove-like</td>
<td>Used as an European delicacy</td>
</tr>
<tr>
<td>Calendula</td>
<td>Calendula officinalis</td>
<td>Asteraceae</td>
<td>Petals with white heel removed</td>
<td>Spicy, tangy, peppery</td>
<td>Poor people’s saffron, adds a golden hue to Mediterranean foods.</td>
</tr>
<tr>
<td>Carnation</td>
<td>Dianthus chinensis</td>
<td>Caryophyllaceae</td>
<td>Flowers</td>
<td>Spicy, peppery, clove-like</td>
<td>Used in European preparations</td>
</tr>
<tr>
<td>Chicory</td>
<td>Cichorium intybus</td>
<td>Asteraceae</td>
<td>Flower buds</td>
<td>Coffee flavour</td>
<td>Makes pickle from buds and used in Mediterranean foods</td>
</tr>
<tr>
<td>China-Rose</td>
<td>Hibiscus rosa-sinensis</td>
<td>Malvaceae</td>
<td>Petals and flower buds</td>
<td>Slightly acidic buds</td>
<td>Makes a nice beverage in Oriental cuisine</td>
</tr>
<tr>
<td>Chrysanthemum</td>
<td>Chrysanthemum coronarium</td>
<td>Asteraceae</td>
<td>Petals with heel removed</td>
<td>Slightly bitter or pungent</td>
<td>Used in Continental dishes</td>
</tr>
<tr>
<td>Dandelion</td>
<td>Taraxacum officinale</td>
<td>Asteraceae</td>
<td>Flowers and flower buds</td>
<td>Similar to mushrooms</td>
<td>Makes a potent wine in America.</td>
</tr>
<tr>
<td>Day Lily or Golden Needle</td>
<td>Hemerocallis fulva</td>
<td>Xanthorrhoeaceae</td>
<td>Flowers and flower buds</td>
<td>Sweet, crunchy, mostly like crispy lettuce leaf or beans</td>
<td>May act as a laxative</td>
</tr>
</tbody>
</table>

Continued...
<table>
<thead>
<tr>
<th>Common Name</th>
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<th>Family</th>
<th>Parts Used</th>
<th>Taste</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Daisy</td>
<td>Bellis perennis</td>
<td>Asteraceae</td>
<td>Flowers</td>
<td>Tangy, leafy</td>
<td>Makes European dishes more tasty</td>
</tr>
<tr>
<td>Gardenia</td>
<td>Gardenia jasminoides</td>
<td>Rubiaceae</td>
<td>Petals and flower buds</td>
<td>Light sweet flavour</td>
<td>Used in Oriental dishes</td>
</tr>
<tr>
<td>Gladiolus</td>
<td>Gladiolus communis</td>
<td>Iridaceae</td>
<td>Flowers</td>
<td>Similar to lettuce</td>
<td>Preferably used in Mediterranean cuisine</td>
</tr>
<tr>
<td>Hollyhock</td>
<td>Alcea rosea</td>
<td>Malvaceae</td>
<td>Flowers</td>
<td>Very bland unique flavour</td>
<td>Used in European dishes</td>
</tr>
<tr>
<td>Johnny Jump Up</td>
<td>Viola tricolor</td>
<td>Violaceae</td>
<td>Petals</td>
<td>Sweet to bland flavour</td>
<td>Contains saponin and may be toxic in large amount</td>
</tr>
<tr>
<td>Lavender</td>
<td>Lavandula angustifolia</td>
<td>Lamiaceae</td>
<td>Flowers</td>
<td>Slightly perfumery flavour</td>
<td>Used as an European delicacy</td>
</tr>
<tr>
<td>Lilac</td>
<td>Syringa vulgaris</td>
<td>Oleaceae</td>
<td>Flowers</td>
<td>Lemony to pungent</td>
<td>Mainly applied in salads</td>
</tr>
<tr>
<td>Sage</td>
<td>Salvia officinalis</td>
<td>Lamiaceae</td>
<td>Flowers</td>
<td>Unique</td>
<td>May be toxic in large amount</td>
</tr>
<tr>
<td>Snapdragon</td>
<td>Antirrhinum majus</td>
<td>Plantaginaceae</td>
<td>Flowers</td>
<td>Bland to bitter flavor</td>
<td>Used in Mediterranean dishes</td>
</tr>
<tr>
<td>Storksbills</td>
<td>Pelargonium graveolens</td>
<td>Geraniaceae</td>
<td>Flowers and flower buds</td>
<td>Lemony to mint</td>
<td>Used in European cuisine</td>
</tr>
<tr>
<td>Violet</td>
<td>Viola sororia</td>
<td>Violaceae</td>
<td>Flowers</td>
<td>Sweet</td>
<td>Mainly used raw in salads for decoration</td>
</tr>
</tbody>
</table>
There is significant contribution of some flowers in increasing the essence of food as many spices do. The flavour of food has been enhanced by using different aromatic (organic) compounds, essential oil, and nectar (chiefly composed of sucrose together with glucose and fructose) extracted from the petals. For instance, coriander (*Coriandrum sativum*) flower is a prime ingredient in ‘salsa’ and many Latin American and Oriental dishes. Fennel (*Foeniculum vulgare*) flower gives a licorice flavour to food. Celery-flavoured holyghost (*Angelica archangelica*) flowers are used in European cuisine and are good with fish. Again, mint (*Mentha arvensis*) and basil (*Ocimum basilicum*) flowers are sometimes used in the soups for the same purpose as their leaves. Besides, borage (*Borago officinalis*) flower adds a light cucumber flavour whereas arugula (*Eruca vesicaria*) flower adds a peppery tang to Continental food. Yet, a gourmand always opines that pea (*Pisum sativum*) and squash (*Sechium edule*) flowers ginger up curries more proficiently than their fruits which are used as vegetables.
Again, the aroma of some flowers adds piquancy to beverages and drinks. For example, lemon verbena (*Aloysia triphylla*) flower is usually steeped for lemony flavour in tea. Moreover, bee balm (*Monarda fistulosa*) flower is used in place of bergamot to make tea more savoury. Chamomile (*Chamaemelum nobile*) flowers produce a faint apple flavour, after adding into the tea. Besides, the flowers of lemon (*Citrus limon*) and pumelo (*C. grandis*) are used sparingly as an edible garnish as well as for making citrus water.

**Indian Delicacy**

India has an age-old tradition of cuisines that are unique and flowers can be very important ingredients [6]. Flowers of agastya (*Sesbania grandiflora*), drumstick (*Moringa oleifera*), lady’s finger (*Abelmoschus esculentus*), mustard (*Brassica juncea*), radish (*Raphanus sativus*), sweet gourd (*Cucurbita maxima*), etc., are commonly used. All these flowers and flower buds (*Figure 8*) are extensively used in making curries and are also consumed after being boiled or fried. Neem (*Azadirachta indica*) flowers are known for improving digestive health and are used in Indian cooking from time immemorial. Neem flowers are roasted, boiled and fried for use in sauces and rice dishes. Young inflorescence of gular or atti (*Ficus racemosa*), figs (*F. cunia*) and banana (*Musa paradisiaca*) flowers are put into practice for various cooking preparations (*Figure 9*). Moreover, these flowers are believed to improve anaemia.
Besides, young flowers (Figure 10) and buds of camel’s foot tree (Bauhinia purpurea and B. variegata) are used in curries. The Pagoda tree (Plumeria rubra) produces showy and fragrant flowers that have significant usage in omelets, salads, and in making a special tea. Fleshy petals of shalmali (Bombax ceiba) are used for curries. Unopened flower buds of sunflower (Helianthus annuus) are edible and can be steamed before eating. On the other hand, candahar (Gmelina arborea), garden balsam (Impatiens walleriana), gulmohur (Delonix regia), krishnachura (Caesalpinia pulcherrima), marigold (Tagetes patula), ribbed gourd (Luffa acutangula), rice bean (Vigna umbellata), runner bean (Phaseolus cocineus), etc., are some of the less known edible flowers that are yet to be tasted by many people.

Roses have a very significant position in Indian cuisine because of their many uses. Different species of roses, mainly their fresh or dried petals, after removing the bitter white portion, and rose hips are used in sweets, desserts, milkshakes, ice creams, salads and in main dishes. Crystallized or frozen preparations of rose petals are equally famous. Rose petals (Figure 11) add flavour and aroma to the recipe. In addition safflower (Carthamus tinctorius) and marigold petals are used as substitutes for saffron or keshar to colour foods. Imli (Tamarindus indica) flowers, sepals of chalta (Dillenia indica) and ripened heads of kadamb (An thoce phalus cadamba) are used to make chutneys.

Tribal Usage

Village markets are the backbone of the rural economy in India. Several bi-weekly and daily markets are a regular feature in many parts of our country. Villagers, especially tribal communities, from surrounding areas come to these markets to sell their agricultural products and forest produce. It is interesting that some flowers are sold as an alternative to vegetables. These flowers serve as diet supplements for the poor who cannot afford the cost of fresh vegetables. However, the food value of all these flowers are yet to be tested critically, though such traditional ethno-biological uses may have considerable value.
Box 1. Why Eat Flowers and When to Avoid

Most of the angiosperm flowers are with bright and vibrant colour, because their petals contain water soluble cell sap pigment anthocyanins (impart red, purple, violet or blue colours) and anthoxanthins (confer yellow to ivory white colours) or plastidial carotenoid (responsible for orange to yellow colours) pigments [5]. Flowers add a full spectrum of taste to dishes and also make dishes more appealing. In addition, edible flowers can have certain other benefits. Flower petals are rich in health protecting antioxidants. In addition, flowers are mineral and vitamin rich. Edible flowers like broccoli and cauliflower contain health protecting chemistry that may provide cancer protection. Edible reproductive parts of flowers provide essential amino acids. Dandelion, marigold, sunflower and other yellow coloured flowers are rich in carotenoids. Hawthorn blossoms and elder blossoms contain bioflavonoids that may protect the heart and strengthen capillaries. Drumstick flowers contain anti-pox principles. Certain flowers such as figs and bananas are rich in iron contents. Sour-tasting flower blossoms may contain ample amounts of vitamin C. Besides, an age-old Hindu ritual named ‘Ashoka Sashthi’ is celebrated each year in spring, when Indian ladies eat Saraca (= Ashoka) flowers to maintain the proper functioning of uterus.

On the other hand, angiosperm flowers may contain a few excretory substances like glucosides, cyanogenic glycosides, tannins and latex as well as certain metallic and non-metallic salts. So some flowers are poisonous (Figure A) and others may be edible only after appropriate preparation. Toxic flowers like azalea, crocus, daffodil, foxglove, oleander, rhododendron, wisteria, etc., may be misidentified as edible when gathered. So, it is best to stick to the flowers that one knows. In general flowers of vegetables and herbs are safe to eat. Roadside flowers or flowers from florists and nurseries should be avoided because of potential chemical contamination. Damaged, dirty or insect-ridden flowers may be unsafe to eat. Eating flowers should be avoided by those who have asthma, food and flower (more precisely pollen) allergies. Removal of reproductive parts often makes an edible flower more palatable. In case of composite flowers only the petals are edible. The pollen of composite flowers is highly allergenic and may cause reactions in sensitive individuals. Sufferers of asthma, ragweed, and hay fever should not consume composite flowers, and may have extreme allergies after ingesting such flowers.

![Figure A. Some poisonous flowers that should be avoided:](image)

(a) Saffron (Crocus sativus), (b) Foxglove (Digitalis purpurea) and (c) Rhododendron (Rhododendron arboreum).
Mahuwa (*Madhuca indica*) is a forest tree, which is worshipped by a large number of tribes in India. It is also cultivated for its nutritious flowers that are the staple food of the many tribal and forest-dwellers. The flowers are eaten raw or cooked or made into sweetmeats. They are also fermented to produce the alcoholic drink ‘*mahuwa*’, a country liquor. Tribals of Bastar, Santhal Paraganas and tribes of North Maharashtra consider the drink as part of their cultural heritage [6].

Certain flowers such as tentul (*Tamarindus indica*), sahara baha (*Dillenia pentagona*), sahada baha (*Streblus asper*), phutkuli (*Phylloclamys taxoides*), pinder (*Randia uliginosa*), kujri (*Celastrus paniculatus*), hutur (*Indigofera pulchella*), hupu (*Cochlospermum religiosum*), kurchi (*Holarrhena antidiysenterica*) are eaten as vegetables by different tribes of Orissa, Jharkhand and West Bengal [7], mainly the Dharua, Kora, Lodha, Malhar, Mundari, Pentia, and Tharu people.

Palash (*Butea monosperma*), amaltas (*Cassia fistula*), chakunda (*C. tora*), rambasak (*Phlogacanthus thrysiflorus*) and bon mung (*Vigna vexillata*) flowers are cooked as vegetables by a large number of tribes, such as the Bhils, Gonds, Birhors, Baigas, Shabars, Kherias, Oraons, Rabhas, and Santhals. Moreover, edible flower buds of akarkara (*Spilanthes acmella*) are eaten in place of vegetables by the Bhumia, Paroja and Gadaba tribes of Orissa and the Bodo tribe of Assam.

Flowers of pandukuda (*Wrightia arborea*) as well as young inflorescences of dukkar kand (*Dioscorea bulbifera*) are sold by the Thakar and Katkari tribes of Maharashtra in their local markets. Also, the mature central crown of shidodi (*Holostemma annulare*) flowers is consumed raw by local people in Maharashtra.

**End Notes**

To conclude, it is clear that many cultures use flowers in their traditional cooking. Adding flowers to our food may be a nice way to add colour, flavour and little caprice. So flowers can be used not only to brighten up the garden, but also to add an exciting
touch to many a dish on the dining table. Besides, coming upto every day demand, edible flowers may be grown on small scale horticultural basis as well as in backyard.

Suggested Reading


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