Mulberries Fruit: Nutritional values and their Products

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Mulberries are the fruit from mulberry trees, which are in the Moraceae family. Mulberry fruit shown in Fig.1. The three most common commercial mulberry species include white mulberry (Morus alba), black mulberry (Morus nigra), and red mulberry (Morus rubra) all having multiple cultivars ("Mulberry" – CRFG, 1997).



Fig.1. Mulberry

White mulberry is native to eastern and central China; red mulberry is native to areas of the central and eastern United States; and black mulberry is native to western Asia ("Mulberry" – CRFG, 1997).

Mulberry fruits range in size and length, but most resemble the size of a blackberry. Depending on the variety and ripeness, mulberries can exhibit an extremely sweet flavour to a tangy sweet flavour (McNatt, 2019). Fruits from black mulberry are said to have the best flavour with an equal blend of sweet and tart. The name of the mulberry species does not necessarily reflect the colour of the fruit: for example, fruit from white mulberry can be white, lavender or black, while fruit from red mulberry can be a deep red colour to almost black ("Mulberry" – CRFG, 1997)

Description

Mulberries are deciduous and have toothed, sometimes lobed leaves that are alternately arranged along the stems. Individuals can be monoecious (bearing both male and female flowers) or dioecious (bearing only male or female flowers). The minute flowers are borne in tight catkin clusters. Each fruit develops from an entire flower cluster and is formally known as a multiple. The fruits somewhat resemble blackberries and ripen to white, pink, red, or purple (Melissa Petruzzello, 2019)

Nutritional values

Fresh mulberries consist of 88% water and only have 60 calories per cup (140 grams).By fresh weight, they provide 9.8% carbs, 1.7% fiber, 1.4% protein, and 0.4% fat. Mulberries are often consumed dried, similar to raisins. In this form, they contain 70% carbs, 14% fiber, 12% protein, and 3% fat — making them fairly high in protein compared to most berries.Here are the main nutrients in a 3.5-ounce (100-gram) serving of fresh mulberries (USDA food composition databases).

- Calories: 43
- Water: 88%
- Protein: 1.4 grams
- Carbs: 9.8 grams
- Sugar: 8.1. grams
- Fiber: 1.7 grams
- **Fat:** 0.4 grams

Carbs

Fresh mulberries consist of 9.8% carbs, or 14 grams per cup (140 grams). These carbs are mostly simple sugars, such as glucose and fructose, but also contain some starch and fibre.

Fiber

Mulberries have a decent amount of fibre, corresponding to 1.7% of their fresh weight.

The fibers are both soluble (25%) in the form of pectin and insoluble (75%) in the form of lignin.

Fibres help you maintain a healthy digestive system, decrease cholesterol levels, and reduce your risk of many diseases (Pubmed Central highly respected database from the National institute of the health).

Vitamins and Minerals

Mulberries are rich in many vitamins and minerals, particularly vitamin C and iron (Pubmed



Central highly respected database from the National institute of the health).

Vitamin C

An essential vitamin that is important for skin health and various bodily functions

Iron

An important mineral that has various functions, such as transporting oxygen throughout your body.

Vitamin K1

Also known as phylloquinone, vitamin K is important for blood clotting and bone health.

Potassium

An essential mineral that may lower blood pressure and reduce your risk of heart disease.

Vitamin E

An antioxidant that protects against oxidative damage.

Other Plant Compounds

Mulberries are rich in plant compounds, such as anthocyanins, that contribute to their color and beneficial health effect (Pubmed Central highly respected database from the National institute of the health), (Masood Sodiq Butt, 2008)

The most abundant ones include:

- Anthocyanins: A family of antioxidants that may inhibit oxidation of LDL (bad) cholesterol and provide beneficial effects.
- Cyanidin: The main anthocyanin in mulberries is responsible for their black, red, or purple color.
- Chlorogenic acid: An antioxidant abundant in many fruits and vegetables.
- Rutin: A powerful antioxidant that may help protect against chronic conditions like cancer, diabetes, and heart disease.
- Myricetin: A compound that may have a protective effect against some cancers.
- Deep-coloured and mature mulberries are richer in plant compounds and have a higher antioxidant capacity than colourless and immature berries.

Mulberry fruits products

- Mulberry is consumed in several ways such as fruit wines, berries, jams, jelly or muesli.
- Product made from Mulberry leaves are shown in Fig. 2 and Fig. 3
- Product made from Mulberry fruit shown in Fig.4.
- Mulberry can also be consumed in the form of juices and syrups for the effective management of various diseases (Parida S *et al.*,2020).
- Fruit jam Mixed fruit jam prepared based on ratios of 70:30 rosella and mulberry fruit extract (Wongchalat and Chatthongpisut., 2016)
- Cupcake The concentrated amount of M. alba paste used to prepare cupcakes. (Jan et al., 2021)
- Alcoholic beverage Fruit of M. alba used to produce alcoholic beverage and also used as a raw material to brew fruit wine (Daris-Martin et al., 2003)
- M. alba fruits can also be used to prepare spiced squash and appetizers Hamid H *et al.*,2017)



Fig.2. Mulberry leaves uses in different ways





Fig 4. Mulberry fruit products

Conclusion

- Mulberry is known in India as "Kalpa Vruksha" as all the parts of the plant have many uses. It is essential to sericulture as the foliage constitutes the sole feed of the mulberry silkworm
- They're a good source of iron, vitamin C, and several plant compounds and have been linked to lower cholesterol, blood sugar, and cancer risk

• We need to grow mulberry because of its unique nutrition values and also, it's leaves have an important medicinal value.

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