

## Medicinal Potentials and Health Benefits of Black Mulberry

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### Abstract

People across the globe still use plants as medicinal source due to its easy access and at low cost availability. Among the genus *Morus* species *Morus nigra* (black mulberry) are used in traditional remedies since ancient time. As they are rich source of a great variety of various amounts of nutritive and biologically active components like vitamins, proteins, minerals, anthocyanin, polysaccharides, quercetin etc that are mainly linked with the possible effective pharmacological actions and also play an important role against various disorders. Moreover, extracts from these fruits also confirmed several biological activities including antimicrobial activity, anti-Alzheimer's activity, anti-tumor and anticancer activity, because of which different medicinal companies and researchers paying great attention to this plant fruits. Human research on the medicinal activities of this black mulberry fruit is limited. Therefore, more study is needed to explicate the compounds present in it and their possible effect on human health. This review will reveal the broad spectrum of its medicinal importance, antioxidant potential, pharmacological uses and the phyto-chemical compositions.

**Keywords:** Blackberry, biological activities, human health and pharmacological actions.

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*Review article*

## INTRODUCTION

Fruits and vegetables are the rich source of valuable bioactive constituents playing a vital role in many traditional remedies and the basis for several synthetic drugs. These biological compounds from plants used in cure of various health disorders for long time. Consumption of fresh fruits and vegetables on daily basis maintain good health, reduces the risks of some serious health hazards such as cardio-vascular illness, gastrointestinal disorders, improvement in eyesight and also helpful to decrease the threat of diseases like cancer, diabetes, various strokes and persistent complaints (Golberg, 2003).

The phytochemicals available in these plants have got more consideration due to its economic importance and potential strategy and its antioxidant functions (Ma & zhang 2017; Cao et al., 2018; Veeresham, 2012). Almost 50% of the medicines are attainable from natural products. Around 80% of people in developing countries across the globe mainly depend on folk remedies and the plant-derivative drugs market to be nearly \$35 billion in 2020 [Veeresham, 2012; Gryn-Rynko et al., 2016]. The efficiency and safety of therapeutic plants have been well recognized because of these bioactive containing plants become an integral portion of basic health system (Thaipitakwong et al., 2018).

Amongst the classes of various plants used for medicinal reasons from those of genus *Morus*, commonly known as black mulberry (*Morus nigra*), belongs to the family Moraceae. It is an important medicinal plant known by various names across the globe as moreira in Portuguese, murier in French, morera in Spanish, tut in Urdu, sahtut in Hindi and karadut in Turkish. As the leaves of this plant are the main nutritional source of for silk worm therefore Asian countries, mainly grows these plants for the production of silk worms (*Bombyx mori* L.) (Vijayan et al., 1997). While, the European region uses this fruit plant in the preparation of various food products as marmalades, jams, juices, vinegars, wine, and some cosmetic products also (Natic et al., 2014). Besides this various parts of the plants have also been used as traditional herbal medicines (Sánchez-Salcedo et al., 2016). In Turkey, *Morus nigra* is mainly cultured for fruit production and also for shade purpose in hot areas (Yaltirik, 1982). While in Pakistan the black mulberry is mainly is used for fuel purpose, for shade purpose and in herbal medicines for various disorders. Black mulberry is significantly valued for its delicious fruits (2-3cm in length) with an approximately weight of 4-6 grams. The fruits are black purple in color (Koyuncu et al., 2004). The harvesting of black mulberry fruits is not an easy task. The fruits can be collected in nets by spreading under the tree and carried by a tree shaking then followed by hand sorting. Its fruit can be taken as fresh, cooked and dried, while in Japan its leaves are used for powder juice and tea purpose. (Gerasopoulos et al., 1997; Ercisli et al., 2007) Mulberry fruits are the rich source of various phytochemical including phenolic compounds, a series of vitamins, high amount of anthocyanin and it has been also reported that it contains hypoglycemic and antioxidant activities which are broadly used in traditional medicines for the cure of various health illness. Recently, black mulberry has gained a significant place in the local soft drink market. The main aim of this review is to documentary the medicinal and pharmacological potential of Black mulberry in human diseases.

## **Medicinal Properties**

The fruit leaves are the rich source of various compounds rutin, sugars, quercetin, volatile oil, amino acid, vitamins and some micro elements that have pharmacological actions, which shows that it can enhance the lifespan of humans (Zou & Chen, 2003). It has been also reported that the fruits contain high pharmaceutical functions as many researchers stated the compounds such as Albafuran, Moranoline, Albanol, Calystegine, Morusin and Kuwanol. Therefore, it attracted the attention of many pharmaceutical industries and scientists (Andallu et al., 2001; Singhal et al., 2010). In herbal remedy different parts of the plant (flowers, stem, bark, roots, and even leaves) can be used to cure a number of disorder conditions related to human health. These various parts of the plants are helpful against diseases like diarrhea, constipation, intestinal worms, urinary tract infections, fever, asthma, diabetes, kidney complaints, migraines and depression (Song et al., 2010; Naowaboot et al., 2009). They are also beneficial in heart problems and prevents stroke. The vision can be straightened by drinking mulberry juice. Moreover, the fruit is also rich source of different nutritious vitamins and minerals.

## **Antimicrobial Activity**

The black mulberry is an active and strong activity against four different bacterial strains *Escherichia coli*, *Bacillus subtilis*, *Staphylococcus aureus* and *Streptococcus mutans* (Tahir et al., 2017). Mazzimba et al., 2011 conducted a research showing that six isolated components (namely oxyresveratrol, moracinM, cyclomorusin, morusin, kuwanon C, and a derivative of kuwanon C from aerial parts of mulberry shows antibacterial actions against *S. aureus*, *B. subtilis*, *Micrococcus flavus*, *S. faecalis*, *Salmonella abony*, and *P. aeruginosa*, with the most effective activity against *B. subtilis* (MIC value 3.91 g/mL).

## **Anti-Alzheimer's Activity**

This disorder particularly creates mental debilitate and loss of memory, research shows that compound amyloid beta peptide present in mulberry fruits in the etiology of this problem, it inhibit the weakening of neurotoxicity and fibril formation (Iyengar, 2007).

## **Anti-obesity mulberry fruit Juice**

A UK fruit juice company named "Fairjuice" has launched a super fruit drink prepared from pure fresh mulberry fruits which is rich source of antioxidants, which is considered to be helpful for heart health also. It also overwhelms the hunger that is why it has been stated as a useful drink against obesity (Fairjuice, 2008).

## **Anti-Tumor Activity**

*Helicobacter pylori* are known as one of the most well-known factors in activating the gastric carcinogenesis problems (Nishizawa and Suzuki, 2015). Huang et al., 2011 showed that anthocyanin rich fruits from the black mulberry fruits can be used to stop the formation of gastric carcinoma.

## Protection against Brain Damage

Kang et al., 2006 mentioned that a compound C3G extracted from mulberry fruit shown a cytoprotective result on PC12 cells exposed to hydrogen peroxide and also helpful in neuroprotective effect on cerebral ischemic damage caused by oxygen glucose deprivation (OGD).

## Anticancer Activity

Ahmed et al., 2016 studied the anticancer effect of black mulberry of fresh and dried fruits which shows that it slows down the activity of MCF-7 cells and it results the cell death of infected cells and causes morphological changes in cytoplasmic membranes. It converts the DNA into single strand which results to decrease the level of mitotic activities in the cell which results the good pharmacological functions.

## CONCLUSION

The black mulberry is the rich source of nutraceutical compounds, particularly its various parts of the plants exhibited numerous pharmacological properties including antimicrobial, anti-tumor, antidiabetic, protection against brain damage, anticancer activities and anti-Alzheimer's activity. *M. nigra* also presented the defensive and therapeutic properties on the central nervous system, liver, kidney and gastrointestinal tract. Therefore, these results and conclusions propose that the black mulberry can be used as a promising nutraceutical resource and an alternative for various medicinal products relayed on medicinal plants in order to prevent and control and numerous chronic ailments.

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