Mulberry leaves

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Origin of the mulberry tree

Mulberry trees (Latin name morus alba) are among the oldest known trees. In traditional Chinese medicine, they have been known about for over 5000 years and they also occur in the Bible. Zacchaeus climbed in to a mulberry tree in order to see Jesus. King David received instructions from God, in the treetop of a mulberry tree. There are 16 species, which grow all over the world in tropical, subtropical and even in the northern temperate zones. However, the main growing area is still in China.

mulberry tree

mulberries und mulberry leaves

Where does the knowledge come from that mulberry leaves are beneficial to health?

In Chinese folk medicine tea was brewed from mulberry leaves, which was used against fever and colds, but also to preserve the youthful skin and black hair.

For centuries, the mulberry leaves were used mainly to feed silkworms who eat virtually nothing else. When silk was the finest fibre of choice, before synthetic fibres were discovered, large Mulberry plantations were found in Italy. These plantations in Italy have since almost totally died out and are mostly forgotten.

Recently, medical research undertaken in Japan has been responsible for a resurgence of interest in the healing properties of the mulberry leaves. The FAO (Food and Agricultural Organization of the UN) designated mulberry leaves as an ideal food for cows and other ruminants in 1990.

Ingredients of mulberry leaves

Mulberry leaves contain **15 – 25 % protein**, which for a plant is a very high proportion. The abundance of nutrients when compared to green tea are seen below: (based on 100 g of dried leaves)

substance	Mulberry leaves	green tea
calcium iron sodium potassium	2700 mg 44 mg 3,4 mg 3100 mg	440 mg 20 mg 3 mg 2200 mg
carotene vitamin A vitamin B1 vitamin B2 vitamin B3 vitamin C	7,4 mg 4200 IU 0,6 mg 1,4 mg 4,0 mg 32 mg	13 mg 7200 IU 0,4 mg 1,4 mg 4,0 mg 250 mg
fibers insoluble in water soluble in water	53 g 45 g 7 g	11 g

It is important to note that, compared to Green Tea, mulberry leaves have 6 times more calcium and twice as much iron.

Also important are the following micronutrients:
zinc, copper, boron, manganese, fluorine and phosphorus.

Yet these factors around vitamins, minerals and trace elements is not what is of particular interest. Much more important is the content of amino acids, saccharides and phytochemicals. There are around 17 different amino acids to be found in mulberry leaves (building blocks of proteins), especially aspartic and glutamic acid.

Among the saccharides (sugars) we find sucrose, fructose, fructose and glucose.
Various healing effects are the result of the flavones (rutin, isoquercetin, including carotene amongst others, a total of 3.3 g per 100 g).

The absolutely spectacular thing about mulberry leaves is an alkaloid called 1-deoxynojirimycin (DNJ). This has a proven effect in diabetes mellitus (sugar diabetes) and is a substance that currently is not found in any other plant in the world.

How does this combat high blood sugar?

DNJ as a secondary plant material has a triple effect against type 2 diabetes, formerly called adult-onset diabetes:

1. In the upper small intestine, an enzyme occurs called "alpha-glucosidase", which breaks down complex sugars (disaccharides and polysaccharides), so that they can pass through the intestine into the blood. DNJ blocks this enzyme, the sugars are not split and thus absorbed much less, which leads to a lower blood sugar level shortly after eating (postprandial hyperglycaemia is lower).
2. DNJ prevents the binding of glucose to haemoglobin molecules. Therefore less glucose is being transported in the blood, which in many cases reduces the late complications of diabetes.
3. DNJ has the ability to repair the insulin-forming islet of Langerhans cells in the pancreas. More natural insulin is then re-formed, which increases the blood sugar metabolism in the body.

Apart from DNJ, Mulberry leaves also contain a large amount of glutamic acid, which is converted in the body into gamma-amino butyric acid (GABA). Diabetics have an elevated level of glucagon, resulting in an increase blood sugar level and thus act as an antagonist to insulin. GABA inhibits glucagon, and as a consequence also lowers the blood sugar.

Mulberry and diabetes

Mulberry leaves can thus be used for DNJ and GABA as a natural remedy for diabetes. In a comparative study with the diabetes drug glibenclamide (eg. Daonil, Glibenorm) 3 grams of mulberry leaves per day have lowered blood sugar more than the drug.

In addition to the main effect for the treatment of high blood sugar, other effects are also seen. Mulberry leaves lower cholesterol, by blocking the absorption of cholesterol from the intestine. LDL-cholesterol and triglycerides are reduced, however, increasing levels of "good" HDL cholesterol.

Mulberry and blood pressure

The mulberry leaves also have an effect of lowering of blood pressure (approx. 10%) and acting as diuretic. This not only increases water excretion by the kidneys, but also removes excess water from the cells.

Finally, also the "historical" effects are to be mentioned, which already were known to the ancient Chinese, namely as a cough mixture, for fever and for a cough with sputum. Only suspected, but not proven, are positive effects on the stomach, intestines and liver.

There also appears to be some effect against cancer resulting from the content of catechins and tannins. These polyphenols occur in many other plants, and are known as scavengers, which are anti carcinogenic substances. Mulberry leaves are therefore not primarily indicated for this disease.

The following diseases can be treated with mulberry leaves:

Main application:

- Diabetes mellitus type 2

Other indications:

- Hypertension
- Hyperlipidaemia (cholesterol and triglycerides)
- atherosclerosis
- edema
- Caries
- Cough with expectoration