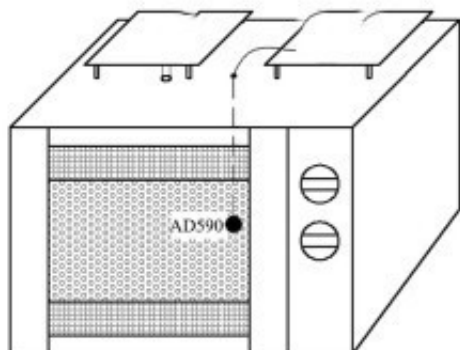


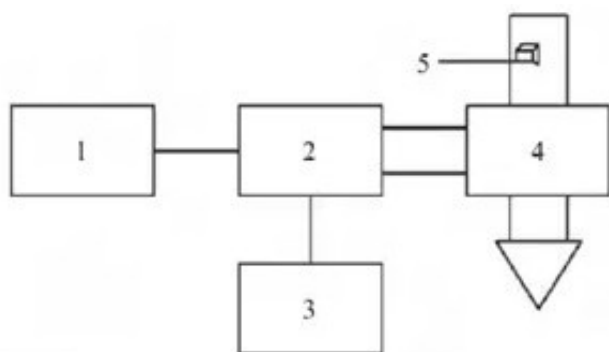
## Effect of drying methods on the content of hypoglycemic active ingredients in mulberry leaves



Schematic diagram of microwave drying temperature control system

Abstract: The effects of freeze drying, [microwave drying equipment](#), vacuum drying and hot air drying on the hypoglycemic active ingredients of mulberry leaves were studied. The content of 1-deoxynojirimycin in mulberry leaves was determined by high performance liquid chromatography, the content of polysaccharide in mulberry leaves was determined by phenol-sulfuric acid method, and the content of total flavonoids in mulberry leaves was determined by sodium nitrite method.

Key words: [mulberry leaf microwave drying](#); 1-deoxynojirimycin; flavonoids; polysaccharides



Mulberry leaf is the leaf of mulberry, also known as iron fan. It tastes bitter, sweet and cold. It belongs to the lung and liver meridians. It has the effect of soothing wind, clearing heat and calming the liver. Traditional Chinese medicine books such as "Compendium of Materia Medica" and "Shennong Herbal Classic" all recorded that mulberry leaves can treat diabetes. Modern pharmacological studies also showed that mulberry leaves have many pharmacological activities, such as lowering blood sugar, lowering blood lipid, lowering blood pressure, anti-inflammatory, anti-tumor and preventing coronary heart disease. The Ministry of Health of China listed mulberry leaves as one of the medicinal and food dual-use traditional Chinese medicines.

At present, diabetes mellitus has become one of the major diseases threatening human health, and hypoglycemic substances in mulberry leaves can effectively reduce the blood sugar level of patients and promote their recovery.

Scholars at home and abroad have carried out some research reports on the function and mechanism of hypoglycemic effect of mulberry leaves. Jeszka-Skowron et al. mixed the alcohol extract of mulberry leaves into high-fat diet and then given streptozotocin-induced diabetic rats. It was found that the alcohol extract of mulberry leaves can effectively reduce blood sugar and promote insulin secretion in diabetic rats. Chung et al. gave different doses of water extract of mulberry leaves to 50 healthy subjects, and found that water extract of mulberry leaves could effectively inhibit the increase of blood sugar level after dinner.

The hypoglycemic substances in mulberry leaves are mainly alkaloids, flavonoids and polysaccharides. Sheng Linbo et al. studied the factors affecting the content and stability of 1-deoxynojirimycin. It was found that the content of DNJ in mulberry milk was relatively stable in a short time (within 28 days) at room temperature, 4 and - 20 (?) C, while the content of DNJ in its crude extract was easy to degrade. Zhang Jun et al. studied the effect of ethanol on the extraction of Flavonoids from mulberry leaves at different temperatures. It was found that the yield of flavonoids was the highest at about 60 and 70 degrees C, and decreased at about 85 degrees C.

Liu Fan et al. studied the extraction conditions of polysaccharide, flavonoids and alkaloids from mulberry leaves, and found that the polysaccharides and flavonoids of mulberry leaves reached the peak when the extraction temperature of aqueous solution reached 80 ~C. In order to retain these hypoglycemic ingredients more during the drying process of mulberry leaves, different methods were used to dry mulberry leaves, and the changes of hypoglycemic ingredients before and after drying were compared, so as to select the best drying method and provide an ideal drying route for the development and utilization of mulberry leaves products, in order to achieve better hypoglycemic effect.