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Historical Origin of the Medicinal Godji Plant

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Annotation: Goji, goji berry, or wolfberry (Chinese: 枸杞; pinyin: Gǒuqǐ) is the sweet fruit of Lycium barbarum or Lycium chinense, two closely related species of boxwood in the nightshade family, Solanaceae. The fruits of L. barbarum and L. chinense are similar, but can be distinguished by differences in flavor and sugar content.

Keywords: Goji, Solanaceae, herba lycii, lycion, superfruit, Mindell, fenvalerate, cypermethrin and acetamiprid.

Both of these species are native to Asia and have long been used in traditional Asian cuisine.

The fruit has also been an ingredient in traditional Chinese, Korean and Japanese medicine since at least the 3rd century AD. In pharmacopoeias, the fruits of the plant are called by the Latin name lycii fructus, and the leaves are called herba lycii.

Since about 2000, goji berries and their products have become widespread in developed countries as health foods or alternative medicines, based on exaggerated and unproven health claims.

Etymology and name

The genus name Lycium was assigned by Linnaeus in 1753. The Latin name lycium comes from the Greek word λυκιον (lycion), used by Pliny the Elder (23-79) and Pedanius Dioscorides (c. 40-90) for the plant known as buckthorn, which was probably a member of the species Rhamnus. The Greek word refers to the ancient region of Lycia (ΛυκίΑ) in Anatolia, where the plant grew.

The common English name, wolfberry, is of unknown origin. It may have arisen from the mistaken assumption that the Latin name Lycium was derived from the Greek λύκος (lycos), meaning "wolf".

In the English-speaking world, the name goji berry has been used since about 2000. The word goji is an approximate pronunciation of gǒuqǐ (pinyin meaning 枸杞), the name of the berry plant L. chinense in several Chinese dialects.

In technical botanical nomenclature, L. barbarum is called the matrimony vine, while L. chinense is the Chinese desert thorn.

Usage

Traditional Asian cuisine

Wolfberry's young shoots and leaves are harvested commercially as a leaf vegetable. The berries are used in dishes either as a garnish or as a source of sweetness.

Food

Fresh goji berries (shrinking occurs due to post-harvest dehydration)

Dried goji berries

Oil obtained from the seeds of Lycium barbarum

Since the early 21st century, dried fruits, which are sometimes compared to raisins, have been marketed as a health food with unsubstantiated claims of health benefits. Following these claims, dried and fresh goji berries have been included in many snack foods and dietary supplements, such as granola bars. There are products made from whole and ground wolfberry seeds and oils from them.

Marketing controversies

Among the extreme claims used to promote a product often called a "superfruit", there is an unconfirmed story that a Chinese man named Li Qing Yuen, who was said to eat wolfberry daily, lived to be 256 years old (1677-1933). This claim appears to come from a 2003 pamphlet by Earl Mindell, who also claimed that goji has anti-cancer properties. The brochure contained false and unverified statements.

Such exaggerated claims about the health benefits of goji berries and their products have sparked strong reactions, including from government regulators. In 2006, the US Food and Drug Administration (FDA) notified two distributors of goji juice with letters warning of unproven therapeutic benefits. These statements were a violation of the U.S. Food, Drug, and Cosmetic Act [21 USC/321(g)(1)] because they "identify the product as a drug intended for the treatment, mitigation, or prevention of disease" while wolfberry or juice had no such scientific evaluation. Additionally, the FDA stated that goji juice "has not been generally recognized to be safe and effective for these conditions" and therefore should be considered a "new drug" under Section 21(p) of the Act. New drugs cannot be legally marketed in the United States without prior approval from the FDA.

In January 2007, marketing claims about a goji juice product were the subject of a Marketplace consumer protection program investigation by the Canadian television network CBC. In an interview, Earl Mindell (then employed by the direct marketing company FreeLife International, Inc.) falsely stated that Memorial Sloan-Kettering Cancer Center in New York City had completed clinical studies showing that the use of wolfberry juice would prevent 75% of breast cancer cases in people.

On May 29, 2009, a class action lawsuit was filed against FreeLife in the United States District Court of Arizona. The lawsuit alleged false statements, misrepresentations, false and misleading advertising and other issues relating to FreeLife's Himalayan goji juice, gocha and TaiSlim products. This lawsuit sought remedies for consumers who had been purchasing these products for years. On April 28, 2010, a settlement was reached in which FreeLife took steps to ensure that its goji products were not sold as "unheated" or "raw" and contributed to an educational organization.

As is the case with many other new "health" foods and supplements, the lack of clinical data and poor quality control in the production of consumer products prevent goji from being recommended for clinical use.

Scientific research

Due to the numerous effects claimed by traditional medicine, significant basic research has been conducted to understand the biological properties of phytochemicals in the fruit. The composition of the fruits, seeds, roots and other components such as polysaccharides has been analyzed and extracts are under study. However, as of 2021, no biological effects or clinical effectiveness have been confirmed from consuming the fruit itself, its juice or extracts.

Safety

Drug interactions

In vitro testing has shown that unidentified wolfberry phytochemicals found in goji tea may inhibit the metabolism of drugs such as those processed by cytochrome P450 liver enzymes. Such drugs include warfarin and medications for diabetes, tachycardia, or hypertension.

Pesticide and fungicide residues

Organochlorine pesticides are commonly used in commercial wolfberry production to prevent insect infestation. The China Green Food Standard, developed by the China Green Food Development Center of the Chinese Ministry of Agriculture, allows the use of certain pesticides and herbicides. Agriculture on the Tibetan Plateau (where many berries of "Himalayan" or "Tibetan" origin are supposed to grow) traditionally uses fertilizers and pesticides, making claims of organic origin for locally sourced berries questionable.

Since the early 21st century, the US Food and Drug Administration has detected high levels of insecticide residues (including fenvalerate, cypermethrin, and acetamiprid) and fungicide residues (such as triadimenol and isoprothiolane) in some imported wolfberry and wolfberry products of Chinese origin. , which led to the withdrawal of these products.

Cultivation and commercialization

Dried goji berries are sold at a market in France

Thawed goji berries

Wolfberry is most often sold in dried form.

When ripe, the elongated red berries are tender and must be picked or shaken off the vine into trays to prevent spoilage. The fruit is preserved by drying in the open sun on open trays or by mechanical dehydration using a gradually increasing series of heat treatments over 48 hours.

China

China is the world's leading supplier of wolfberry products, with total exports worth US$120 million in 2004. The plant is grown on 82,000 hectares (200,000 acres) across the country and produces 95,000 tons of goji.

Most of the commercially produced wolfberry (50,000 tons in 2013, representing 45% of China's total harvest) comes from L. barbarum plantations in Ningxia and Xinjiang in northwest China. Cultivation is concentrated in Zhongning County, Ningxia Province, where wolfberry plantations typically range from 40 to 400 hectares (100 to 1,000 acres or 500 to 6,000 mu).

Ningxia goji has been grown along the fertile floodplains of the Yellow River for more than 700 years. Commercially they are sometimes described as "red diamonds". An industrial association of wolfberry producers, processors, marketers and scientists has been created in the region to promote the commercial and export potential of this berry. Ningxia goji is a variety used by practitioners of traditional Chinese medicine.

Every August, Ningxia hosts an annual goji festival to coincide with the berry harvest. The festival was originally held in Ningxia's capital, Yinchuan, and since 2000 it has been held in Zhongning County.

Besides Ningxia, commercial volumes of wolfberry are grown in the Chinese regions of Inner Mongolia, Qinghai, Gansu, Shaanxi, Shanxi and Hebei.

Great Britain

Lycium barbarum was introduced to the United Kingdom in the 1730s by the Duke of Argyll, but the plant was primarily used for hedging and ornamental gardening.

The UK Food Standards Agency (FSA) initially included the goji berry as an emerging food. Such a classification would require marketing authorization from the European Council and Parliament. However, on 18 June 2007, the FSA concluded that there was a significant history of consumption of the fruit prior to 1997, indicating that it was safe, and thus removed it from the list.

Canada and United States

In the first decade of the 21st century, farmers in Canada and the United States began growing goji on a commercial scale to satisfy potential markets for fresh berries, juices, and processed products.

Australia

Australia imports most of its goji berries from China due to the high cost of Australian labor compared to countries with the largest share of the current market.

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