



Butterfly Pea: The Flowering Plant That's Adding Color to Your Plate

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The butterfly pea, *Clitoria ternatea*, is a vibrant flowering plant native to Southeast Asia, gaining global recognition for its aesthetic appeal, traditional medicinal uses, and versatile applications. This perennial climber produces vivid blue flowers, rich in antioxidants, flavonoids, and other bioactive compounds, including ternatins, kaempferol, p-coumaric acid, and delphinidin-3,5-glucoside. Its most captivating feature is its ability to change color based on pH levels, due to its high concentration of anthocyanins, making it a popular natural food coloring and an interactive ingredient for beverages. Traditionally used in Ayurvedic medicine and Asian cuisines, the butterfly pea is associated with numerous potential health benefits. Modern research supports its use for its antioxidant and anti-inflammatory properties, brain-boosting effects, improved eyesight, reproductive health benefits, blood sugar stabilization, skin beautification, hair strengthening, aid in digestion, and respiratory health. The plant also contains cyclotides, which show preliminary evidence of toxicity to cancer cells and activity against HIV. Beyond its culinary and medicinal applications, butterfly pea serves as an eco-friendly natural dye for textiles, cosmetics, and food products. Its hardiness, nitrogen-fixing ability, and low maintenance make it suitable for sustainable agriculture.

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Introduction

Native to Southeast Asia, the butterfly pea, or *Clitoria ternatea*, is a flowering plant celebrated for both its stunning appearance and its extensive health advantages. For centuries, this botanical wonder has been a cornerstone of traditional medicine, and it is now achieving worldwide acclaim for its versatile uses and significant wellness benefits.

The butterfly pea plant is a perennial vine that yields brilliant blue blossoms. These flowers are frequently harvested for use in teas, extracts, and infusions. The plant's health-promoting properties are attributed to its high concentration of antioxidants, flavonoids, and other bioactive compounds. Consequently, manufacturers often incorporate butterfly pea flower into cosmetic products or use it as a natural colorant for food, beverages, and textiles. The flowers are popularly brewed into an herbal tea, often enhanced with ingredients such as lemongrass, honey, and lemon. Furthermore, its medicinal reputation is linked to a wide array of potential health improvements.

In traditional belief systems, the butterfly pea flower is associated with the planet Venus and the element of water, symbolizing love, emotion, tranquility, and protection. In India, the flower is named Aparajita after a Hindu goddess, which translates to "the

unconquered." It is a common offering in daily Puja worship rituals. In Thailand, the resulting beverage is known as Anchan tea. According to Thai folklore, a half-human, half-bird creature called a kinnari introduced the flower to a woman named Isra, instructing her to cultivate it for its healing abilities. The butterfly pea flower is also a staple in Thai and Malaysian cooking, where it imparts a blue hue to desserts and sticky rice. Despite its rich history and mythology, the flower's global popularity has surged primarily due to its remarkable color-changing abilities.

The Science of its Color-Changing Phenomenon

The most enchanting quality of the butterfly pea flower is its capacity to change color in response to different pH levels. This transformation is possible because of a high concentration of anthocyanins, the same natural pigments that color blueberries, raspberries, and purple cabbage.

When the flower is brewed, it produces a deep blue tea that remains stable in neutral or slightly alkaline environments. However, the introduction of an acidic substance, such as a squeeze of lemon juice or a bit of vinegar, initiates a captivating change. The anthocyanins react to the drop in pH, causing the blue pigment to shift through shades of violet before settling into a vibrant pink or reddish-purple. This property makes it an excellent natural food dye and an engaging, interactive element in beverages.

Nutritional Components of the Butterfly Pea Flower

Butterfly pea flowers are abundant in anthocyanin compounds known as ternatins, which are responsible for the plant's vivid color. Laboratory studies indicate that ternatins may help reduce inflammation and inhibit the growth of cancer cells. The plant also contains a variety of other antioxidants, as noted by Rachael and Ajmera (2021), including:

- **Kaempferol:** This compound has been widely investigated for its potential cancer-fighting capabilities.
- **p-Coumaric acid:** Research suggests this acid may possess anti-inflammatory, antimicrobial, and antiviral properties that could help defend against disease.
- **Delphinidin-3,5-glucoside:** According to one study, this antioxidant might help boost immune function and trigger cell death in colorectal cancer cells.

A History of Use: More Than Just a Pretty Color

While its color-shifting novelty has made it popular in Western kitchens recently, the butterfly pea flower has a deep-rooted history in Asian cultures, especially in Thailand, Malaysia, and India.

- **Culinary Uses:** In traditional Thai cooking, the flower is used to color sticky rice dishes like *khao niao mun sii anchan*. It is also a frequent ingredient in herbal teas, typically served with honey and lemon. In Malaysia, it is used to give color to the rice dish *nasi kerabu*.
- **Traditional Medicine:** It has long been esteemed in Ayurvedic medicine for a range of purported benefits, including promoting hair growth, enhancing memory, alleviating anxiety, and reducing stress. While many of these claims are based on traditional practices, modern scientific inquiry is beginning to validate them, highlighting the plant's rich antioxidant profile.

Potential Health Benefits of the Butterfly Pea Flower

The butterfly pea flower is linked with numerous health advantages:

1. **Antioxidant and Anti-inflammatory Properties:** The flowers are exceptionally rich in ternatins, antioxidant compounds that not only provide the bright color but have also been shown to reduce inflammation. The plant also contains other potent antioxidants like kaempferol (cancer-fighting), p-coumaric acid (anti-inflammatory, antimicrobial), and Delphinidin-3,5-glucoside (immune-boosting), which contribute to its overall health benefits (Rachael and Ajmera, 2021).

2. **Cognitive Support:** In Ayurvedic medicine, it is renowned as a brain-enhancing herb used to improve memory and address conditions like anxiety, depression, and stress. This is due to the compound acetylcholine, which is crucial for memory and brain health. Studies indicate that consuming the flower's tea may lessen symptoms of stress-induced ulcers (netmeds.com).
3. **Improved Eyesight:** The flower contains the antioxidant anthocyanin, which is known to increase blood flow to the eyes. This can aid in treating conditions like glaucoma, retinal damage, and blurred vision. It is also reported to enhance night vision and protect the eyes from damage (Oguis et.al, 2019).
4. **Reproductive Health:** The plant's botanical name, *Clitoria ternatea*, stems from its physical resemblance to the female clitoris, as noted by Hippocrates. Evidence supports its traditional use for women's health, including addressing menstrual issues. It is also said to aid in normal sperm production and act as an aphrodisiac. In some Indian villages, pregnant women traditionally wear the plant's roots to ensure a safe delivery (Mishra, 2015).
5. **Blood Sugar Stabilization:** The flower has demonstrated an ability to stabilize blood sugar levels by inhibiting glucose absorption, which may help protect against diabetes. One study involving 15 men showed that drinking the flower tea led to increased antioxidant levels and reduced blood sugar.
6. **Skincare Benefits:** When applied topically, butterfly pea has shown remarkable benefits. Studies report it can increase skin hydration by 70% within an hour of application. This is attributed to its antioxidants, polyphenols, and flavonoids, which stimulate natural collagen and elastin production and possess anti-glycation properties that slow skin aging. Its anti-inflammatory nature helps soothe skin irritation and redness (Daniela, 2020).
7. **Hair Strengthening:** The flower contains a bioflavonoid, anthocyanin, that improves blood flow to the scalp. This helps fortify hair follicles, promote growth, and may reduce the appearance of grey hair (Daniela, 2020).
8. **Digestive Aid:** As an anti-inflammatory, butterfly pea tea can soothe stomach muscles to relieve nausea and indigestion. Its anthelmintic properties inhibit the growth of harmful bacteria, and it also stimulates bile flow from the liver, acting as a mild laxative and aiding in overall digestive health (Jasmine, 2021).
9. **Respiratory Support:** Its anti-inflammatory effects can reduce irritation in the lungs and other respiratory organs, making it a useful treatment for colds and coughs. A 2018 study suggested it could be a therapeutic alternative for managing asthma and allergies (Singh, 2018).
10. **Disease-Fighting Peptides:** Butterfly pea is one of the few known plants to produce specific peptides called cyclotides. Preliminary medical research shows these cyclotides are toxic to cancer cells and exhibit properties that may fight HIV and other serious diseases (Oguis, 2019).
11. **Symbol of Transformation:** The flower's ability to change color serves as a powerful metaphor for personal growth and inner transformation, much like a butterfly symbolizes the soul's evolution.
12. **Natural Dye and Other Uses:** It is an eco-friendly natural dye for textiles and is also used in cosmetics and food products, meeting the rising consumer demand for sustainable ingredients.
13. **Sustainable Cultivation:** As a hardy, nitrogen-fixing plant, it enriches soil fertility, making it an excellent choice for sustainable agriculture in tropical climates.
14. **Enhanced Cognitive Function:** Containing acetylcholine, a neurotransmitter vital for learning, studies suggest the plant may enhance cognitive function.
15. **Stress Reduction:** Traditionally, it has been used as an adaptogen to help the body resist stressors and reduce anxiety.

How to Enjoy This Adaptable Flower

Incorporating the butterfly pea flower into your routine is simple:

- **Magical Tea:** Steep the dried flowers in hot water. Add a squeeze of lemon to witness the dramatic color change from blue to pink.
- **Natural Food Coloring:** Use the blue infusion to color rice, noodles, desserts, and beverages.
- **Smoothies and Lattes:** Blend the flowers or powder into smoothies or create visually striking blue lattes.
- **Cocktails and Mocktails:** Create layered drinks that change color as acidic ingredients are added.

Whether you are a food enthusiast, a home mixologist, or someone seeking to add natural beauty to your life, the butterfly pea flower offers a unique experience. Its captivating properties and potential health benefits make it a remarkable addition to the world of superfoods and herbal remedies.

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