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A Review Article On Antioxidant Properties Of Clitoria Ternatea (Butterfly Pea)

CH. NIREESHA

Department of Microbiology

Siddhartha Women's Degree and PG college

Kukatpally, Hyderabad

ABSTRACT

The butterfly pea, or Clitoria ternatea L., is a medicinal plant that is abundant in bioactive substances and possesses exceptional anticancer and antioxidant qualities. The Clitoria ternatea plant has significant therapeutic properties and is frequently planted as an attractive plant. Its edible flower is also referred to as butterfly pea or blue pea. The high concentration of polyacylated anthocyanins, or ternatins, is what makes blue pea blooms unusual among anthocyanins. Polyacylated derivatives of delphinidin 3,3′,5′-triglucoside are called ternatins. The biosynthesis, extraction, stability, and antioxidant activity are all covered in this review. Strong free radical scavenging action and the ability to stop the growth of cancer cells are displayed by its floral pigments, which are primarily anthocyanins (ternatins), flavonoids, and phenolic compounds.According to DPPH free radical scavenging experiments, the antioxidant capacity of butterfly pea flower extracts was highest between pH 4 and pH 7 and rapidly declined above pH 7. The aforementioned findings suggest that butterfly pea blossoms have a lot of potential in the food business and offer a theoretical foundation for their use.

INTRODUCTION

Clitoria ternatea (CT), a perennial herb in the Fabaceae family, is also known as butterfly pea, Aparajita, or Shankhapushpi. It is well-known for its vivid deep blue blooms and is found throughout tropical and subtropical areas. This plant's memory-boosting and wound-healing qualities have long been utilized in Ayurvedic and traditional medicine . [1]. CT is well known for being a significant source of polyphenols, which have strong antioxidant properties. [2]. The presence of polyphenols as secondary metabolites, such as tannins, phenols, flavonoids, flavanol glycosides, and phlobatannin, was discovered through the examination of CT floral constituents. The ternatins A1, A2, B1, B2, D1, and D2 are the six main anthocyanins found in CT flowers. Extracts from the flowers of Clitoria ternatea are reported to have biological properties like anti-inflammatory, anti-microbial, antidiabetic, and antioxidant properties.[3]

The massive amount of trash generated annually by the food industry can be turned into a rich source of premium nutrients such as proteins, fibers, p aromatic compounds. New meals, medications, cosmetics, and other goods can be developed using these chemicals.[4]

Antioxidant properties of Clitoria ternatea

One of the main features that has attracted scientific interest is antioxidant activity. Antioxidants are compounds that help the body fight off dangerous free radicals, protecting cells from potential harm and oxidative damage.

Action Mechanism

The antioxidants in Clitoria ternatea neutralize ROS by giving electrons, therefore reducing oxidative damage. The two primary processes are ferric reducing capacity (FRAP assay) and free radical scavenging (by DPPH and ABTS assays). Inhibition of lipid peroxidation and metal chelation

Important Bioactive Substances

• **Anthocyanins:** In charge of the blue hue and potent antioxidant properties. Depending on the pH of the surrounding environment, the presence of anthocyanins contributes to the broad range of hues, which range from blue to purple. Anthocyanins are present in blue pea flowers in both concentration and composition. Anthocyanins have potent antioxidant properties. Because of their antioxidant qualities, anthocyanins may offer a number of health benefits.

• **Flavonoids:** Prevent inflammation and lipid peroxidation

• **Phenolic acids:** Add to the overall antioxidant Importance for health

Clitoria ternatea's antioxidant capacity aids in the reduction of disorders linked to oxidative stress, such as cancer, diabetes, and aging.

Encourage the health of the neurological system and heart.

shields skin from premature aging and UV damage.[5],[6].

Applications of Antioxidant properties of Clitoria ternatea

• **Drug development**: Natural antioxidant-based medications for the treatment of disorders linked to oxidative stress can be created using potent antioxidant molecules such anthocyanins and flavonoids.

• **Neuroprotection:** By lowering oxidative damage to neurons, extracts may find application in anti-aging and memory-boosting medications. potential. Polysaccharides, antioxidants, etc.

• **Hepatoprotection**: Antioxidant activity aids in shielding liver cells from oxidative stress brought on by drugs or toxins.

• **Natural food coloring:** the anti-oxidant properties of the deep blue anthocyanin pigment make it a safe natural colorant.

• **Food preservation**: By stopping lipid oxidation and spoiling, antioxidant extracts can increase the shelf life of foods.

• **Anti-aging cream:** Free radicals that lead to wrinkles and skin aging are countered by antioxidants.

• **Natural formulations**: utilized for their calming and cell-regenerating qualities in shampoos, face masks, and lotions.

• **Supplements for animal feed**: Give animals immunity, growth, and antioxidant protection.

• **Plant stress tolerance**: Antioxidant residues or extracts can be applied to crops to increase their resistance to environmental stress.

• **Biosensors:** In antioxidant detection systems, extracts can serve as organic redox markers.

• **Nanomedicine**: Clitoria ternatea antioxidant compounds are being investigated for use in the creation of nanoparticles for therapeutic and drug delivery purposes.[7].

Conclusion:

Clitoria ternatea's high antioxidant activity is highly supported by phytochemical and functional studies. In addition to blue petals, extracts exhibit lipid peroxidation inhibition and free radical scavenging properties that may find value in the culinary, nutraceutical, and cosmetic sectors. Converting in vitro activity into comparable in vivo efficacy still presents difficulties; considerably more through clinical trial testing and safety validation are needed. antioxidants with potential medicinal benefits.

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