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**Review Article**

# Convovulus Pluricaulis: A Potent Ethanopharmacological Herb

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## ABSTRACT

Convolvulus pluricaulis, widely recognized as shankhpushpi, stands out as a vital plant in traditional medicine, notably within the Ayurvedic system. This robust perennial wild plant flourishes in the sandy and gravelly soils of Northern India, thriving under xerophytic conditions. Renowned for its comprehensive medicinal properties, shankhpushpi is validated as a potent brain tonic, antioxidant, nerve tonic, and laxative. Extensive research substantiates its effectiveness in addressing numerous health conditions, including anxiety, neurosis, insomnia, stress, burns, seizures, edema, and urinary tract disorders. Recent investigations have rigorously examined the antibacterial properties of the methanol extract from the entire bindweed plant. These studies specifically targeted its action against Gram-negative bacteria such as Escherichia coli (ATCC 8739) and Gram-positive bacteria like Staphylococcus aureus (ATCC 6538), conducted through the container route. The results have consistently demonstrated that the methanol extract from shankhpushpi possesses remarkable antibacterial activity, particularly against Staphylococcus aureus and Escherichia coli. Notably, the extract exhibited greater effectiveness against E. coli than against S. aureus, confirming its significant therapeutic potential in fighting bacterial infections. Shankhpushpi is therefore an invaluable asset in the realm of alternative medicine.

## INTRODUCTION

### CONVOLVULUS PLURICAULIS

- **Synonym: Convolvulus Pluricaulis**
- **Common Name: Shankh Pushpi**
- **Family: Convolvulaceae**

Shankh Pushpi is considered a gift of Ayurveda; it's an indigenous and truly important seasoning. It's a medicine that helps to meliorate memory. [1] Convolvulus pluricaulis is a imperishable seasoning set up in the sand and gravels of northern India in xerophytic conditions. The leaves and flowers of this remarkable plant possess powerful hypotensive properties and are effectively used to treat anxiety neurosis. It is highly recommended as a cognitive enhancer, actively strengthening intelligence and memory, alleviating jitters, and managing high blood pressure. Its reputation extends to being an anthelmintic, beneficial for dysentery, and a valuable asset for both brain and hair health. Furthermore, it effectively addresses various skin conditions and is a proven solution for lowering

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blood pressure. The assessment of exertion was conducted using the reliable standard tetracycline mug and scrap system..[2] Shankh Pushpi has multitudinous medicinal parcels analogous as adding intelligence, perfecting memory and amping the nervous system. It's also used to relieve stomach pain, treat cough, venoms, and seizures, and to help treat urinary tract infections and high blood pressure. Antianxiety, anticonvulsant, antistress, memory enhancing exertion, antide pressant and antiepileptic exertion.[3] Neurological findings analogous as paralysis, neuropathy and seizures are present but are not adequately treated. Despite significant advances in laboratories and medical installations,treatment is still constantly delicate [4]

**TRADITIONALUSES**

Many previous studies have shown the use of C. pluricaulis. It is used as a memory enhancer, psychostimulant and tranquillizer to reduce anxiety. This drug is indeed used as a brain tonic for hypotensive syndrome in Ayurvedic literature. It improves Nit, Vata, pitta, head and Dosha balance.[5] Its blood pressure lowering and calming effects have been shown by pharmacological studies. Clinical studies show positive results for patients with anxiety. neurosis. This plant works by changing the neurochemistry of the brain. This plant also brings happiness, peace and joy from mental fatigue, provides good sleep and reduces anxiety[5]

**WHOLE PLANT**

Shankh Pushpi demonstrates a promising ability to reduce strep-induced toxicity, including learning and memory impairments, while facilitating the reactivation of biochemical enzymes in animal models. Its beneficial effects extend to enhancing cholinergic function, mitigating oxidative stress, and improving mood. Notably, Shankh Pushpi plays a crucial role in preventing aluminium-induced neurotoxicity in the brain by effectively blocking oxidative damage and normalizing protein levels in cholinergic synapses.

In addition, Convolvulus extract—whether sourced from alcohol, chloroform, or water—shows great potential in preventing oxidative stress within mitochondria and safeguarding DNA from harmful toxins. These extracts not only contribute to lowering glucose biochemical markers but also exhibit notable antiseptic properties[6]. Research indicates that Convolvulus pluricaulis Choisy contains valuable components such as Shank pushpin and scopolamine, along with ceryl alcohol, the flavonoid kaempferol, and steroids like phytosterol and alpha-sitosterol. These substances act as GABA-A agonists, which may be linked to their CNS depression effect and a reduction in overall body activity. Additionally, bindweed has been found to possess effective antipyretic and anti- inflammatory properties, further underscoring its therapeutic potential.[7]

**LEAF**

The leaves exhibit short petioles and sharp tips,showcasing a linear-lanceolate shape with hairs on both surfaces. The light stream dimensions are notably defined, ranging from 0.5 to 2 cm in length and 0.1 to 0.5 cm in width, which could be valuable for further study or application**.**

**FLOWER**

Pink or faded, single or double, petals sessile o r subsessile, linear,lanceolate, narrow sepals, s hort discoid corolla, sparsely hairy stamens 5, white, alternating with petals, white upper peta ls borne deep in corolla; body; ovary superior and has two carpels.

**STEM**

Shankh Pushpi stems are light green, thin, cylindrical, about 0.1 cm or less thick, with pronounced hairy nodes and internodes. When we examine the stem under a microscope, a layer of epidermis covered with a thick cuticle can be seen; Under the microscope, 1-2 layers of parenchymal tissue with round to oval, thin, convex and concave upper and lower middle veins. Vascular bundles 4-5 layers of parenchyma cells and phloem and xylem contents, epidermis and hair layers, one cell on each side, palisade in two layers, spongy parenchyma with a small number of vascular bundles. , the number of blood vessels is 20-25 per

square millimetre, the pore index at the bottom is 16.9-19.8, and the surface is 13.8- 17.0; the number of pores on the surface is 202-
238. Mm

**ROOTS**

Extract of Convolvulus pluricaulis Choisy (0.4 mg/kg) demonstrates a significant impact on thyroid function. In a study involving L-thyroxine-induced hyperthyroidism in rats over a 30-day period, there was a notable decrease in serum T3 concentration and hepatic 5-D activity. These findings clearly indicate that the plant extract effectively suppresses thyroid function primarily by inhibiting the conversion of T4 to T3.

**Botanical Description [10]**

| Parts | APEARENCE |
|---|---|
| BRANCHE S | flowers that are conch shaped and it is cited as 'Medhya rasayana' Monoecious, 1-3 together, 2 small bract |
| LEAVES | Nearly stalkless, alternately arranged, linear to oblong, lance shaped or invert lance shaped, velvety to hairy |
| FLOWER | flowers that are conch shaped and it is cited as 'Medhya rasayana'Monoeciou s, 1-3 together, 2 small bracts |

**Taxonomical Description of plant [10]**

| TAXONOMIC AL | TAXON |
|---|---|
| Kingdom | Plantae |
| Sub kingdom | Tracheophyte |
| Super division | Spermatophyta |
| DIVISION | Magnoliophyte |
| CLASS | Magnoliopsid a |

| SUB CLASS Series | Asteroidea |
|---|---|
| Order | Solanales |
| Family | Convolvulace ae |
| Sub family | Pluricaulis |
| Genus | Convolvulus L |
| Species | C. pluricaulis Forssk |
| Habit | Perennial herb |
| English name | Bindweed |
| Vernacular name | Shankh Pushpi |

**PHYTOCHEMICALS**

The good medicinal value of C. pluricaulis is attributed to its many phytoconstituents such as flavonoids ,coumarin,alkaloids and polyphenol. The plant is enriched with Shankh pushpin, an alkaloid recognized as a chemotaxonomic extract [11]. Its botanical extract contain convolvin, fillabine,confolin subhasini convolin alkaloids as

well scopolamine and beta-sitosterol as the main botanical element[12]. Ethanol extracted from CP can reduce total cholesterol as well as phospholipids and some hazardous fatty acids in the body [13]

**PHARMACOLOGICAL PROPERTIES**

Convolvulus pluricaulis (CP) has been thoroughly studied for its various health benefits. It is known for its positive effects on the nervous system, including reducing anxiety, depression, and stress. CP also helps improve cognitive functions and has properties that prevent seizures. This evidence supports its use in treating conditions related to the central nervous system in Ayurvedic medicine. Additionally, CP has benefits such as lowering blood sugar, reducing fever, and fighting inflammation and infection. It can also kill insects, act as a diuretic, and relieve pain. The wide range of health effects from CP shows its strong potential for treatment and highlights the need to learn more about its traditional uses in Indian medicine.[14]

**REDUCED STRESS**

Traditionally, Shankh Pushpi is one of many herbs used to reduce stress and promote relaxation. Animal studies suggest that Shankhpushpi has properties that relieve stress and depression. More research is needed on stress reduction techniques.[15]

**ANTIHYPERTENSIVE**

Convolvulus pluricaulis is a powerful herb renowned for its medicinal properties in treating various conditions. It plays a crucial role in managing syndromes and disorders such as anxiety neurosis, hypotension, hypertension, and stress. This remarkable herb effectively regulates the production of stress hormones like cortisol and adrenaline in the body, making it an essential ally in reducing stress and anxiety. Additionally, Convolvulus pluricaulis offers rejuvenation therapy benefits and acts as both a tranquilizer and psychostimulant, enhancing overall well-being.[16]

**ANTICONVULSANT**

The water-soluble component of an alcoholic extract plays a critical role in inhibiting robotic motor exertion and the fighting response, while maintaining the integrity of the escape response. This extract has also been shown to diminish electrically induced convulsive seizures and tremorine-induced tremors, highlighting its significant impact on motor function. Importantly, organisms treated with the methanolic extracts of stem callus, splint callus, and whole factory (200 mg/kg orally) of CP experienced notable protection against alcohol-induced disturbances following trans corneal electroshock. This protective effect was on par with that of the established anticonvulsant medication, phenytoin. Additionally, CP demonstrates strong potential as an effective anticonvulsant agent, suggesting promising avenues for further research and application**.** [17]

**ANTIDIABETIC**

The alcoholic extract of Shankh pushpi used for the treatment of hyperglycemia (In vitro) and which are effectively produced Antidiabetic effect in the human body[18]

**ANTIULCER**

**U**lcers are unclear and a satisfactory regimen but still remains elusive. Many factors are thought tube involved in pathogenesis of ulcer. Ulcers are caused by an imbalance between two sets of factors. The first set includes offensive factors like pepsin and acid. The second set consists of defensive factors such as mucin secretion, cell growth, and prostaglandins. Most medicines available today focus on the offensive factors. For example, antacids neutralize acid. H2 receptor blockers, like famotidine and ranitidine, reduce acid production. Anticholinergics, such as telanzepine and pirenzepine, and proton pump inhibitors like omeprazole also lower acid secretion. Sucralfate is a unique drug because it protects the stomach lining and is known to fight peptic activity as well.CP being rasayana akin to the modern adaptogens, which is mostly used for stress related disorders, it was thought prudent to experimentally evaluate the potential anti- ulcer activity of a juice of Convolvulus pluricaulis (CPJ). Further, studies were done to probe its

possible role in offensive and defensive factors involved in clcerogenesis

**NEUROPROTECTIVITY ACTIVITY**

Cholinergic synapses conclude signal transmission through the hydrolysis of acetylcholine into acetate and choline. In brain cells, the formation of beta-amyloid peptide complexes is associated with the deposition of amyloid plaques, which are linked to the progression of Alzheimer's disease. Encouragingly, recent studies suggest that methanol and arid fractions of Alsinoides L. show promise in effectively inhibiting this process, potentially offering more effective alternatives to galantamine, a commonly used treatment option. This highlights the importance of exploring new compounds for therapeutic interventions in Alzheimer's disease

**ANTIHELMINTIC ACTIVITY**

Shankh pushpi is a largely bitter in the taste and it's also known as anthelmintic medicine. In- vitro study was performed on the six adult Indian earthworms and the cattle worms to estimated the anthelmintic goods of medicine. It was set up that shankh pushpi is effective on the earthworm and it has anthelmintic exertion.

## CONCLUSION

Convolvulus pluricaulis, commonly reffered as Shankh Pushpi, is a highly regarded herb in both traditional and modern medicine,celebrated for its numerous health benefits. This plant has strong effects on the brain, fights infections, and acts as an antioxidant. In Ayurveda, it is known for improving memory, reducing stress, and helping with several neurological and systemic problems. The methanolic extract of Shankh Pushpi has shown good antibacterial activity against various bacteria, indicating its wide- reaching ability to combat infections. Although the potential of Convolvulus pluricaulis is clear, more research is needed to fully understand its health benefits. Future studies should focus on how it works, improving the methods to extract its active compounds, and conducting large clinical trials to confirm its effectiveness and safety. Biotechnological methods can help ensure sustainable growth and conservation of this important herb.Exploring new ways to deliver its active ingredients, such as using nano-based systems, could improve its effectiveness in treating patients. By combining traditional knowledge with modern science, Convolvulus pluricaulis could play a key role in creating natural and affordable treatments for neurological and systemic diseases

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**Conflict of Interest**

The authors have no conflict of interest

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