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Role of *Convolvulus pluricaulis* in Longevity through Mental Health Promotion: A Review

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ABSTRACT: -

Ayurveda is a life science that aspires for the achievement of complete health. According to *Acharya Charaka*, the first aim of *Ayurveda* is to maintain health and the second is to cure diseases. *Acharya Sushruta* describes the definition of health and it is the most appropriate definition which includes all the aspects of quality of life. According to W.H.O. health is a state of complete physical, mental, spiritual and social well-being and not merely the absence of disease or infirmity. In *Ayurveda*, mental health is described as a balance of *Manas Gunas* like *Satva*, *Raja*, *Tama* and the use of medicinal plants has been mentioned for maintenance of physical and mental health for life longevity. *Shankhapushpi* (*Convolvulus pluricaulis* Choisy) is a prostrate, spreading, perennial, wild herb commonly found on sandy or rocky ground under xerophytic conditions in northern India having *Tikta*(Pungent), *Katu*(bitter), *Kashaya Rasa*(astringent), *Sara Guna*, *Sheeta Virya*, *Katu Vipaka* and *Smarti Vardhak*, *Medhya Rasayan* properties. Many previous research works on *Convolvulus pluricaulis* have been reported its antiepileptic, brain tonic, nervine tonic, antioxidant, laxative, anti-ulcer effects. Thus, *Convolvulus pluricaulis* by their medicinal properties has been described in longevity through mental health promotion.

Keywords: *Ayurveda*, Mental health, *Convolvulus pluricaulis*, Longevity.



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INTRODUCTION

Ayurveda is a life science that aspires for the achievement of complete health. According to *Acharya Charaka*, the first aim of *Ayurveda* is to maintain health in healthy persons and to cure diseases in diseased persons. *Acharya Sushruta* describes the definition of health and it is the most appropriate definition which includes all the aspects of quality of life. *Ayurveda* also includes the concept of rejuvenation. According to W.H.O. “health is a state of complete physical, mental, spiritual and social well-being and not merely the absence of disease or infirmity”. In *Ayurveda*, mental health is described as a balance of *Manas Gunas* like *Satva*, *Raja*, *Tama* and the use of various medicinal plants has been mentioned for the maintenance of physical and mental health for life longevity.

Shankhapushpi (*Convolvulus pluricaulis* Choisy) is a horizontal spreading, a perennial wild herb that seems like morning glory with blue flowers shaped like a *Shankha* and commonly found on sandy or rocky land under xerophytic conditions. *Convolvulus pluricaulis* is considered the most wonderful gift of nature to mankind. From

screening the classics of *Brihatrayi* and *Nighantu*, it becomes clear that *Shankhapushpi* has been used to treat a wide range of diseases and it is mentioned as one of the most important *Medhaya Rasayana* drugs means “rejuvenating to intellect or brain” in *Ayurveda*, which is commonly used as brain stimulator and memory enhancer in a way to improve its capacity, ability etc. *Shankhapushpi* is mainly used medicinally to treat nervous debility, insomnia, fatigue, low energy level and loss of memory.^[1-3] By this review article I would like to explore the medicinal properties of *Shankhapushpi* (*Convolvulus pluricaulis* Choisy) in longevity through mental health promotion.

MATERIALS AND METHODS

A review of drug *Shankhapushpi* according to *Ayurveda*, Modern science, Scientific journals, Research papers, Manuscripts etc and its previous experimental and clinical studies was carried out.

Taxonomical Classification:**Taxonomical classification of *Shankhapushpi* as follows [4]**

Kingdom:	Plantae
Sub-kingdom:	Tracheobionta
Super-division:	Spermatophyta
Division:	Magnoliophyta
Class:	Magnoliopsida
Sub-class:	Asteridae
Order:	Solanales
Family:	Convolvulaceae
Genus:	Convolvulus
Species:	pluricaulis

Ayurvedic Pharmacodynamic Properties:

Ayurvedic pharmacodynamic Properties of *Shankhapushpi* are as follows [6, 7]:

<i>Rasa</i>	<i>Tikta</i> (Bitter), <i>Katu</i> (Pungent), <i>Kashaya</i> (Astringent)
<i>Guna</i>	<i>Sara</i> (Unstable)
<i>Vipaka</i>	<i>Katu</i> (Pungent)
<i>Virya</i>	<i>Sheeta</i> (Cold)
<i>Karma</i>	<i>Pittahara</i> , <i>Kaphahara</i> , <i>Medhya</i> , <i>Balya</i> , <i>Mohanasaka</i> , <i>Ayushya</i> , <i>Rasayana</i> .

Phyto-Chemical Compositions:

Various chemical compositions are found in the *Convolvulus pluricaulis* plant. These constituents have a very profound impact on the health and wellbeing: [8-11]

Class	Chemical constituents
Carbohydrates	D-glucose, maltose, rhamnase, sucrose, starch and other carbohydrates
Proteins and amino acids	Proteins and amino acids
Fatty acids/ volatile acids/ fixed oil	Volatile oils, fatty acids, fatty alcohols, hydrocarbons, myristic acids, palmitic acids and linoleic acids
Phenolic/glycosides/ triterpenoids/steroids	Scopoletin, β -sitosterol, ceryl alcohols, 20-oxodotriacontanol, tetratriacontanoic acids, flavonoid-kampferol, steroids-phytosterols
Alkaloids	<i>Shankhapushpine</i> , convolamine, convoline, convolidine, convolvine, confoline, convosine

Experimental And Clinical Studies:

Available pharmacological studies of *Convolvulus pluricaulis* were compiled by collecting data in order to provide sufficient information to evaluate the action of *Convolvulus pluricaulis* with its potential properties. Pharmacological applications are described as follows.^[12-39]

1. Learning, memory and behaviour:

Significant improvement was noted in paradigms and active avoidance tests in rats using different laboratory models to evaluate learning and memory assessment using ethanolic extract and ethyl acetate and aqueous fractions of *Convolvulus pluricaulis*.^[12,13]

Highly significant improvement was observed in the long-term memory of healthy volunteers of 16-25 years age-group with *Convolvulus pluricaulis* tablets made with three *Bhavana* of its juice.^[14, 15]

2. Brain nourishment:

The increasing acquisition which increases the brain protein content and enhances neuropeptide synthesis of the brain was observed by using ethanolic extract of the plant when administered to rats through gastric intubation at different time intervals.^[16]

Therapeutically the whole plant is used in various formulae as a nervine tonic (brain tonic) for improvement of memory and intellect.^[17, 18]

3. Anxiolytic:

An antagonist effect against amphetamines and tremorine, a potentiation of the acetylcholine effect of pentobarbitone induced hypnosis and morphine analgesia, without having its sedative properties were found by using alcoholic extract of *Convolvulus pluricaulis*.^[19]

The leaves and flowers have hypotensive properties used for treating anxiety neurosis. It is recommended as a brain tonic to promote

intellect and memory, eliminate nervous disorders and treat hypertension.^[20]

4. Muscle relaxant:

The neuromuscular coordination indicative of the muscle relaxant activity at a higher dose of 200 mg/kg p.o. was significantly reduced by using ethyl acetate fraction.^[21]

5. Antidepressant:

On interaction with the adrenergic, dopaminergic and serotonergic system by using chloroform fraction of total ethanolic extract, the significant effect of antidepressant was observed.^[20, 22]

6. Antistress:

Reduction in exploratory behavioural pattern and suppression of aggressive behaviour, reduction in spontaneous motor activity, hypothermia, alterations in the general behaviour pattern and potentiation of pentobarbitone sleeping time was observed by methanolic extract of the whole plant.^[23]

7. Anxiolytic, Neurodegenerative and Antistress:

Barbiturate potentiation effect in albino rats was observed in the dose of 100 mg/100 g body weight, and this effect was weaker than that of diazepam but stronger than that of *Centella asiatica* Linn. and urban *Hydrocotyle asiatica* Linn. This plant has also been reviewed and reported for its potent anxiolytic, neurodegenerative and antistress activity by various researchers.^[12, 24-27]

8. Anticonvulsant activity:

Animals with tonic convulsion induced by transcorneal electroshock, treated with the methanolic extracts of stem callus, leaf callus and whole plant (200 mg/kg orally) showed significant protection against tonic convulsion comparable with that of the standard drug Phenytoin. A potent anticonvulsant activity was shown by *Convolvulus pluricaulis*.^[28]

The water-soluble portion of an alcoholic extract eliminated spontaneous motor activity and fighting response but did not affect the escape response; electrically induced convulsive seizures and tremorine-induced tremors were antagonized by the extract.^[29]

9. Hypolipidemic:

Significantly reduced serum cholesterol, LDL cholesterol, triglycerides and phospholipids found in cholesterol-fed gerbils by using ethanolic extract of the whole plant for 3 months.^[30]

10. Antioxidant activity:

An ethanolic extract of *Convolvulus pluricaulis* possesses significant antioxidant activity when tested in vitro.^[31]

11. Antimicrobial, insecticidal, antifungal, antibacterial and anthelmintic activity:

A new compound, 29-oxodotriacontanol, isolated from the chloroform fraction of the plant extract was shown to be a potent antifeedant constituent under laboratory evaluations whereas another compound, tetratriacontanoic acid, was found for the first time in this plant. The whole plant was bio-assayed by the leaf disc method by feeding deterrence using *Spilosoma obliqua* Walker as a test insect. The azadirachtin and crude neem extracts were considered standard. A new compound (29-oxodotriacontanol) produced 85.74% inhibition at 8000 ppm concentration.^[15]

The alcoholic extract of *Convolvulus pluricaulis* possessed potent antifungal activity.^[32]

12. Effect on glands:

Effect on various glands through neurohumours, particularly acetylcholine, by the nitrogen-containing active principle of the drug, which produced a marked reduction in I-131 uptake, protein-bound iodine and acetylcholine.^[33]

13. Effect on thyroid gland:

Root extract-induced inhibition in thyroid function is primarily mediated through T4-T3 conversion. A potent effect was observed in the management of thyrotoxicosis.^[34]

14. Analgesic:

The extract caused a reduction in fighting behaviour in mice but was devoid of analgesic activity although it potentiated morphine analgesia.^[35]

15. Cardiovascular:

Marked and prolonged hypotension in dogs and inhibited the frog myocardium was found by the total water-soluble fraction of the plant. Negative inotropic action on amphibian and mammalian myocardium exerted spasmolytic activity on smooth muscles was observed by using the ethanolic extract of the entire plant.^[36]

16. Reproductive system:

A fine paste made by grinding the plant is helpful for the cure of abscesses, and juice of the whole plant prevents excessive menstruation.^[37]

In sexual and seminal debility, it is recommended.^[15]

17. Antiulcer and Anticatatonic:

The antiulcerogenic effect was observed because of the augmentation of mucosal defensive factors such as mucin secretion, the lifespan of mucosal cells and glycoprotein rather than of the offensive factors such as acid pepsin.^[38]

Medicinal Importance Of *Shankhapushpi*:

Shankhapushpi is known to have been used traditionally for ages as a nervine tonic. It is one of the finest and outstanding natural medications that help in improving memory. In the Ayurvedic preparation of *Shankhapushpi*, the entire plant is used to create medicinal remedies^[40-46]

1. *Shankhapushpi* best for hypotension

Shankhapushpi herb is used as medicine for many diseases it is also the most important ingredient for the treatment of syndromes-disorders, such as stresses, hypotension, anxiety neurosis, etc. *Shankhapushpi* herbs control the production of the body's stress hormones like adrenaline and cortisol in our body and help in reducing anxiety and stress. *Shankhapushpi* works as Rejuvenation therapy and works as a tranquilizer and psychostimulant.

2. *Shankhapushpi* for neurodegenerative diseases

Due to its memory-enhancing property, the *Shankhapushpi* herb is useful to treat neurodegenerative diseases like Alzheimer's disease.

3. *Shankhapushpi* for Improve Memory

Shankhapushpi is one of the best and prominent natural medicines for improving memory due to its chemical composition, including phytonutrients like Scopolin, β Sitosterol, Convolvulin, Subhirsine, Convolvulin, Phyllabine, Convulin and Confolin. *Shankhapushpi* is mainly used as a brain tonic and brain stimulator. Daily consumption of *Convolvulus pluricaulis* prevents memory loss.

4. *Shankhapushpi* for ulcers & hypothyroidism

The *Shankhapushpi* herb is very helpful in fighting various ulcers which are formed in the body due to mucous secretions and glycoprotein, it also improves the nerve tissues and increases bone marrow quality and nerve tissues. *Shankhapushpi* includes anti-ulcer due to mucosal defensive factors like mucin secretion and glycoproteins. It also has been studied that

Shankhapushpi is the best remedy for hypothyroidism.

5. *Shankhapushpi* for enhancing the beauty

Shankhapushpi is an herb that is used as an alternative, tonic, and febrifuge it is also used for nourishing all the layers of skin and helps in enhancing beauty. *Shankhapushpi* is used in the form of decoction with milk and cumin.

6 *Shankhapushpi* helps to decrease the cholesterol level

The extract of *Shankhapushpi* herb helps to decrease the cholesterol level in the blood including triglycerides, phospholipids and helps in removing certain types of fatty acids that are harmful to the body.

Toxicological Profile:

No conspicuous information on the toxicity of *Shankhapushpi* is available so far. The sedative effect of *Shankhapushpi* in mice was observed at doses greater than 200 mg/kg, and moderate to marked decrease in locomotor activity was observed for approximately 12 hours by lethal dose (LD50) of the whole extract of *Shankhapushpi*.^[47]

DISCUSSION

Shankhapushpi is used to treat various disorders related to nervous weakness, problems like insomnia, mental as well as physical fatigue, loss of memory etc. Primarily *Shankhapushpi* is used as a brain tonic. *Shankhapushpi* is one of the best and effective natural medicine which helps in improving mental health. It has relatively well documented neuropharmacological actions such as nootropic, anxiolytic, tranquilizing, antidepressant, antistress, neurodegenerative, anticonvulsant, and sedative activities which

justify its use in CNS diseases in the Ayurvedic system of medicine. It has possessed antioxidant, hypolipidemic, immunomodulatory, analgesic, antifungal, antibacterial, antiulcer, anticatonic, anti amnesia, and cardiovascular activities. *Shankhapushpi* may be used in neurosis, epilepsy, burning sensation, edema and urinary disorders. It is reported to contain several types of Glycosides, flavonoids, alkaloids, carbohydrates, proteins, Fatty acids compounds as active chemicals that bring about its biological effects. A chemical composition containing Ethanol formula, which is extracted from the plant helps in reducing total serum cholesterol, phospholipids and some types of fatty acids from our body that are considered harmful. *Shankhapushpi* is also used as a tonic for those who want to achieve a healthy body. It is one of the ingredients in *Brahmarasayana*, *Aindrarasayana*, *Agastyaharitaki*, *Medhyarasayana*, *Manasamitram* and several other formulations. The drug possesses multiple-target actions and several therapeutic claims by its various active phytomolecules. Contemporary experimental and clinical studies confirm and establish the therapeutic validation of the herb. It is believed to be the herb that is capable of enhancing all the aspects related to mental health (brain power), such as learning, memory and the ability to recall. Clinical studies have exhibited demonstrable beneficial effects in patients with anxiety neurosis. The herb induces a feeling of calm and peace, sound sleep and relief from stresses and mental fatigue, producing a significant reduction in the level of neuroticism arising due to various levels of stress and has been tried successfully in Parkinson's syndrome and Alzheimer's disease. The herb appears to produce its action by modulation of the neuro-chemistry of the brain. Further, the herb is non-

toxic and its use does not produce any side effects. On the other hand, there is an invigorating effect on longevity through mental health promotion.

Probable Mode Of Action Of *Shankhapushpi*:

The drug *Shankhapushpi* has the properties *Snigdha*, *Pichchhila Guna*, *Tikta Rasa*, *Madhura Vipaka*, *Sheeta Virya*, and *Medhya Prabhava*. Its *Dosha-Karmata* is *Vata shamaka* due to *Snigdha*, *Pichchhila Guna* and *Madhura Vipaka*, *Pitta shamaka* due to *Sheeta Virya* and *Kapha shamaka* due to *Tikta Rasa*. Thus, It is considered as *Tridosha shamaka* specially *Vata-pitta shamaka* and *Medhya* (Intellect promoting).

CONCLUSION

On the basis of the above discussion, it can be concluded that *Shankhapushpi* has *Pittahara*, *Kaphahara*, *Medhya*, *Balya*, *Mohanasaka*, *Ayushya*, *Rasayana prabhava*. It acts as an antioxidant, hypolipidemic, immunomodulatory, analgesic, antifungal, antibacterial, antiulcer, anticatonic, anti-amnesia, and cardio-tonic agent. So, *Convolvulus pluricaulis* has been described in longevity through mental health promotion *by their medicinal properties*.

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