


**Book Chapter**


**Under Review**


**Under Preparation**

1. Simultaneous estimation and validation of HPTLC method for scopoletin, mangiferin, and rutin for the identification and differentiation on four commercialized shankhpushpi ethanobotanicals.

2. Simultaneous estimation and validation of HPTLC method for Betulinic acid, ursolic acid, stigmasterol and lupeol for the identification and differentiation on four commercialized shankhpushpi ethanobotanicals.


5. Shankhpushpi botanicals and their isolate—An in vitro and in vivo comparative preclinical evaluation of age related memory decline

6. Comparative antioxidant potential of shankhpushpi botanicals and their isolate used in brain supplement.


8. Preliminary application of TLC-DPPH—differentiation and identification based on antioxidant among various sources of shankhpushpi in a multicomponent extracts.

**Conference, symposia and presentation (2008-2011)**

1. Poster presentation in International Conference on New Developments in Drug Discovery from Natural Products and Traditional Medicines, entitled as “Isolation, Characterization and Memory enhancing activity of Mangiferin isolated from Canscora decussata Schult.” Held in NIPER Mohali, India. Dated 16-20 November-2008.


4. Oral Presentation in 2nd Biennial International Conference on New Developments in Drug Discovery from Natural Products and Traditional Medicines, entitled as “Assessment of various identification and differentiation parameters on four ethanobotanicals traditionally used as Shankhpushpi in India” Held in NIPER Mohali, India. Dated 20-24 November-2010.


**Training**

➢ Three days HPTLC instrument handling training by Anchrom Pvt. Ltd. Mumbai, India.
Review on ethnomedicinal uses and phytopharmacology of memory boosting herb *Convolvulus pluricaulis* Choisy

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*Convolvulus pluricaulis* Choisy: a rasayana drug which is mainly advocated for use in mental stimulation and rejuvenation therapy. It is known as Shankhpushpi by Ayurvedic practitioners in ancient systems of Indian medicine as it was a prominent memory improving drug, a psychostimulant and tranquiliser in traditional Indian medicine. The plant contains several alkaloids, flavonoids and coumarins as active chemicals that bring about its biological effects. Little human research has been published in the Western medical literature regarding this plant. Preclinical (in vivo and vitro) investigations have demonstrated nootropic, anxiolytic, tranquilising, antidepressant, antistress, neurodegenerative, antiinflammatory, analgesic, antimalarial, antifungal, antibacterial, antidiabetic, antilucre, anticonvulsant and cardiovascular activity. Clinical studies of its polyherbal formulation justified its potential for the ancient claim of brain tonic. The present review is an attempt to compile information on various ethnomedical aspects of *Convolvulus pluricaulis*, Shankhpushpi of Indian traditional medicine.

**Key words:** Shankhpushpi, rasayana, brain tonic, alkaloids

**Introduction**

Drugs acting in the central nervous system (CNS) were among the first to be discovered by primitive human and are still the most widely used group of pharmacological agents. The CNS acting drugs are invaluable therapeutically as they can produce specific physiological and psychological effects. From the vast array of materia medica of the indigenous system, many plants have been reported to have activity against CNS disorders and act as very useful remedies for the alleviation of human suffering (Suba 2002).

All critical analyses on commercial and other information available on traditionally known CNS active herbal remedies indicate that the most popular amongst such remedies are those which are clinically and preclinically the most well studied and which are also recommended for therapeutic purposes by the health authorities of many Western and other countries outside the USA (Kumar 2006). Shankhpushpi is a Sanskrit word meaning ‘the plant with flowers shaped like a conch’. The conch or Shankha is one of Lord Shiva’s sacred instruments often used in worship.

Shankhpushpi of the Ayurvedic Pharmacopoeia of India consists of the whole plant of *Convolvulus pluricaulis* Choisy (*Convulvulaceae*) syn *Convolvulus microphyllus* Sieb. ex Spreng (MHFW 2001). Plants other than *Convolvulus pluricaulis* use the name Shankhpushpi in different parts of the country. These include *Evolvulus alsinoides* Linn, *Clitorea ternatea* Linn and *Cancscora decussata* Schult. The Indian Council of Medical Research has given quality standards for *C. pluricaulis* drug in its publication (Gupta 2005).

**Botany**

*Convolvulus pluricaulis* Choisy is a prostrate spreading perennial wild herb commonly found on sandy or rocky ground under xerophytic conditions in northern India. *Convolvulus* is known from the margins and within the Sahara and Sind deserts, a distribution that Sa’ad (1967) called Saharo Sindian (Sa’ad 1967). In India it is widely distributed in and grows on the waste land in the plains of Punjab, Bihar and Chhotanagpur. The herb produces flowers during the months of September and October which are white to light pink in colour (Dandiya 1970). The shape of the flower is like a shankh (a marine shell) giving it the name is Shankhpushpi. Different botanical features of *Convolvulus pluricaulis* are shown below.

**Classification (taxonomic)**

| Kingdom | Plantae, plants |
| Sub kingdom | Tracheobionta, vascular plants |
| Super division | Spermatophyta, seed plants |
| Division | Magnoliophyta, flowering plants |
| Class | Magnoliopsida, dicotyledons |
| Sub class | Asteridae |
| Order | Solanales |
| Family | Convulvulaceae |
| Genus | Convolvulus |
| Species | pluricaulis |
An update on Shankhpushpi, a cognition-boosting Ayurvedic medicine

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Abstract: Shankhpushpi is an Ayurvedic drug used for its action on the central nervous system, especially for boosting memory and improving intellect. Quantum of information gained from Ayurvedic and other Sanskrit literature revealed the existence of four different plant species under the name of Shankhpushpi, which is used in various Ayurvedic prescriptions described in ancient texts, singly or in combination with other herbs. The sources comprise of entire herbs with following botanicals viz., Convulvulus pluricaulis Choisy. (Convulvulaceae), Evolvulus alsinoides Linn. (Convulvulaceae), Clitoria ternatea Linn. (Papilionaceae) and Canscora decussata Schult. (Gentianaceae). A review on the available scientific information in terms of pharmacognostical characteristics, chemical constituents, pharmacological activities, preclinical and clinical applications of controversial sources of Shankhpushpi is prepared with a view to review scientific work undertaken on Shankhpushpi. It may provide parameters of differentiation and permit appreciation of variability of drug action by use of different botanical sources.

Keywords: Convulvulus pluricaulis; Evolvulus alsinoides; Clitoria ternatea; Canscora decussata; medicine, Ayurvedic; cognition disorders

Ayurveda is the oldest medical science in the Indian subcontinent and has been practiced since the 12th century BC. Its objective is to accomplish physical, mental, social and spiritual well-being by adopting preventive, health promoting and holistic approach towards life. Drugs acting
COMPARATIVE EVALUATION ON COMMERCIAL SOURCES OF INDIGENOUS MEDICINE SHANKHPUUSHPI FOR ANTI-STRESS POTENTIAL
A PRELIMINARY STUDY


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Summary

The present study was undertaken to determine a comparative account of the effects of methanolic extract of the aerial parts of the plants available as commercial sources of Shankhpushpi in India and one of its marketed formulation (Brand name - Shankhpushpi), on the experimental induced stress in albino rats. The parameters selected were CAR, stress induced epinephrine level and potentiation of barbiturate induced hypnosis for the purpose of present investigation. All the examined plant extracts were effective against experimental stress, and the results are comparable with marketed formulation. Out of the plant tested, the methanolic extract of Convolvulus pluricaulis (100 mg/kg.b.w.) in rats has shown significant anti-stress activity.

Keywords: Convolvulus pluricaulis, Anti-stress, Shankhpushpi, CAR, Epinepherine.


Introduction

The CNS acting drugs are invaluable therapeutically; because they can produce specific physiological and psychological effects [1]. All critical analysis on commercial and other information available on traditionally known CNS active herbal remedies indicate that the most popular amongst such remedies are those which are clinically and preclinically the most well studied ones, and which are also recommended for therapeutic purposes by the health authorities of many Western and other countries outside the USA [2]. Shankhpushpi is a drug of ayurvedic ‘Medhya Rasayana’ category which was used to boost memory and intellect. In India, Convolvulus pluricaulis Choisy., Evolvulus alsinoides Linn., and Clitoria ternatea Linn. and Canscora decussata Schult. are generally used as shankhpushpi by practitioners of ayurveda [3-10], Ayurvedic medicine regards Evolvulus alsinoides highly effective for impairment of the central nervous system. Laboratory studies revealed the herb as anticitatonic and central nervous system depressant with an LD$_{50}$ of 450 mg/kg [11]. The cyto-protective effects of E. alsinoides on hippocampal cells in mice suggested that in addition to improving memory the drug also has cytoprotective anti-stress effects [12].
Phytopharmacologic aspects of *Canscora decussata* Roem and Schult

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**ABSTRACT**

Nature is an inexhaustible source of secondary metabolites—different types of alkaloids, terpenoids, phenolics, and other classes of organic compounds. In the process of isolation, purification, and determination of the structures of lead, with their biological effectiveness, every type of experimental tool and strategy, known to and developed over the years by practitioners, is used. The present review is an attempt to compile information on various aspects of *Canscora decussata*, "Shankhpushpi" of Indian traditional system of medicine. The phytoconstituents, such as phenolic compounds, xanthones, and triterpenoids were isolated from different parts of the plant. The plant possesses immunomodulatory, analgesic, anticonvulsant, antitubercular, and anti-inflammatory, spermicidal, central nervous system–depressive, and cardiostimulant properties. Clinical trials of marketed formulation showed very encouraging results.

**Key words:** Shankhpushpi, phenolic compounds, xanthones, triterpenoids

**INTRODUCTION**

India has an ancient heritage of traditional medicine. *Materia Medica* of India provides a lot of information on the folkloric practices and traditional aspects of therapeutically important natural products. Alternative systems of medicine, namely, Ayurveda, Siddha, and Chinese Medicine have become more popular in recent years.[10] Natural products have been our single most successful source of medicine. Each plant is like a chemical factory capable of synthesizing a limited number of highly complex and unusual chemical substances derived from plants that are considered as important drugs currently in use, while several other drugs are simple synthetic modifications of the natural products.[11] Numerous drugs have entered the international pharmacopoeia through the study of ethnopharmacology of traditional medicine.[12] The research and development thrust in the pharmaceutical sector is focused on the development of new innovative/indigenous plant-based drugs through the investigation of leads from the traditional system of medicine.[13] Drugs acting on the central nervous system (CNS) were among the first to be discovered by the primitive human and are still the most widely used group of pharmacologic agents. The drugs that act on the CNS are invaluable therapeutically, because they can produce specific physiologic and psychologic effects. From the vast array of *Materia Medica* of the indigenous system, many plants have been reported to have activity against CNS disorders and thus act as very useful remedies for the alleviation of human suffering.[16]

**CANSCORA DECUSSATA SCHULT. (GENTIANACEAE)**

In India, *Canscora decussata* Schult. is popularly known as “Shankhpushpi” and found throughout India, up to an altitude of 1300 m. It is also grown in Sri Lanka and Myanmar. It is a much branched, annual plant propagated by seeds. The flowering season of this plant is from Oct–Dec. The plant is cultivated in the gardens as ornamental plant for its flowers. This is an erect annual herb with 4-winged stem and half a meter in length with decussate branches. It grows well in moist conditions. Leaves are sessile, 2.5–4 cm in length, lanceolate, decussate with 3 prominent vertical lines; flowers are axillary, solitary, and white or yellowish in color. The entire plant, as well as fresh juice, is used in the traditional medicine for the treatment of insanity, epilepsy, and nervous debility. This plant contains bitter substances and an oleoresin. It is also found to contain triterpines, alkaloids, and xanthones.[17] It is also a natural source of penta-oxygenated, hexaoxygenated, and dimeric xanthones.[18]