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RESEARCH ARTICLE

CONTROVERSIAL REVIEW OF SHANKHAPUSHPI (CONVOLVULUS PLURICAULIS CHOIS.)AND ITS CONSERVATION W.S.R. TO CONSERVATION AND PROPAGATION OF MEDICINAL PLANTS

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Abstract

Shankhapushpi (Convolvulus pluricaulis Chois.) quoted best *Medhya Rrasayana* in Ayurveda samhitas. It is perennial herb belongs to Convolvulaceae family. All parts of the Shankhapuspi are known to possess therapeutic benefits. The plant is used locally in India and Chinese medicine to cure various diseases. It is also one of a most important controversial drug mentioned in Ayurveda. Material and methods-information on the Shankhapushpi (Convolvulus pluricaulis Chois.) was collected from Ayurvedic samhitas and textbooks. It was also collected via electronic search (using Pub Med, Sci-Finder, Google scholar and Web of science) and library search for Articles published in peer reviewed journals.

Introduction:-

Shankhpushpi is an indigenous and very significant herb that consider as a gift of nature in Ayurveda. It is a natural medicine which enhances the memory power. It rejuvenates the nervous functions. It is also a natural tonic for mental development of children. It is very bitter, pungent, alternative tonic, brightens intellect, useful in bronchitis, improve complexion, biliousness, epilepsy and teething troubles of infants etc. This article review includes all the aspects of shankhpushpi. Shankhapushpi (Convolvulus pluricaulis Chois) belong to Convolvulaceae family.It is a small prostrate plant covered with white or tawny hairs.Convolvulus pluricaulis is a prostrate, spreading, perennial, wild herb commonly found on sandy or rocky ground under xerophytic conditions in northern India. It is one of the most important MedhyaRasayana drugs in Ayurveda. Its use improves the balance and vitiation in Kapha-vata-pitta doshas and the herb is astringent and bitter. Herbalists believe that Shankhpushpi calms the nerves by regulating the body's production of the stress hormones, cortisol and adrenaline. This drug shows antidepressant, antidiabetic, cardiovascular, anxiolytic, antioxidant, neuroprotective, hypolipidemic activity. It also shows antimicrobial, insecticidal, antifungal, antibacterial and anthelmintic, anticonvulsant, antiulcer and anticatatonic activity.

Ayurveda is an Indian traditional system of medicine. In present era, world is looking towards herbal medicine because of acceptability and safety. In India, about 80% of the rural population depends on herbal medicines in primary health care level. A large percentage of plants used in herbal industries are subject of controversy. Non-availability of plants, poor understanding and parallel evolved knowledge systems are some of the reasons attributed to it, the purpose of this study is to define and determine the controversy of this plant and how to conserve this endangered species.

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Concept of Controversy-

Controversial drugs or *Sandigdha* Dravyas are those plants which are mentioned in Ayurveda classics but their botanical identification is not clear. The Ayurvedic and Sanskrit literature has described a herb with many synonyms, which do not precisely indicate the botanical source but many a times attribute to therapeutic utility of the plant by using different similes which are leading causes of controversy India is a country having a variety of languages and population dependent on different tribal and folklore medicine. Sometimes this is also responsible for confusion in the nomenclature of different plants having similar name.

Controversy of Shankhapushpi in Ayurvedic Literature

Five different plant species i.e.Evolvulus alsenoides, Clitorea ternatea, Convolvulus pluricaulis, and Canscora decussata were to be taken in the name of Shankhapushpi by Ayurveda practitioners in different parts of the country.

Rasa Panchaka of Shankhapushpi-

In Ayurvedic textbook following Properties are given-

Rasa :	Katu, Kashaya
Guna :	Guru, Sara, Snigdha, Pichchila
Virya :	Ushna
Vipaka :	Madhura
Dosha :	Balances and alleviates all the three doshas viz Vata, Pitta and Kapha
Karma :	Medhakrita, Svarakara, Grahabhutadidoshaghna, Vashikaran Siddhi

The scientific classification of Convolvulus pluricaulis

Botanical name : Convolvulus pluricaulis Choic
Kingdom : Plantae
Sub kingdom :Tracheobionta
Super division : Spermatophyta
Division :Magnoliophyta
Class : Magnoliopsida
Order :Solanales
Family : Convolvulaceae
Genus : Convolvulus
Species: pluricaulis
Popular names : Shankhpushpi, Shankhini, Kambumalini,Shankhahuli etc.
Parts used : mainly root and an entire plant
Habitat : found in Bihar ,Rajasthan,Gujraat in India.

The vernacular name of Shankhapushpi(C. pluricaulis) in different languages

Sanskrit	Sankhapuspi
Hindi	Shankhpushpi, Aparajit
English	English speedwheel
Urdu	Sankhali
Punjabi	Shankhpushpi
Bengali	Sankhapuspi
Gujarathi	Shankhavali
Kannada	Bilikanthisoppu
Malayalam	Krsnakranti, Vishnukranthi,
Marathi	Shankhabela
Oriya	Krishna-enkranti
Tamil	Sanghupushpam, kakkurattai
Telugu	Shankhapushpi
Tibetan	Shankhpushpi

Description of the plant-

The branches of this herb are spread on the ground level having more than 30 cm long. The leaves are elliptic in shape (2mm), are located at alternate positions with branches or flowers. The flowers are blue in color (5mm), the herb is commonly found in India, especially in the state of Bihar.

Macroscopic Characters Preliminary macroscopical characters of ethanolic extracts of C. pluricaulis

C. pluricaulis		Characters
Leaf structures	Dimension	Length = 1.12 cm; breadth = 0.1 cm
	Attachment	Leaf stalk absent
	Lamina	Thin
	Stipules	Exstipulated
	Leaf lamina shape	Linear
	Leaf margin	Entire
	Leaf apex	Acute
	Leaf base	Decurrent
	Leaf texture	Whole (brittle)
	Venation	Parallel
	Phyllotaxy	Alternate
	Leaf surface	Hairy
Stem structure	Length	Several prostrate stems (10-30 cm)
	Surface	Clothed with silky hairs
	Internodes	10-12 mm
	Taste	Tasteless

Microscopic Characters

Preliminary microscopical characters of ethanolic extracts of C. pluricaulis

C. pluricaulis		Characters
Leaf Structures	Outline in transverse section	Concave – convex
	Collenchymas	Present beneath upper epidermis
	Calcium oxalate	Plenty, along veins
	Lamina	Isobilateral
	Cuticle	Striated
	Trichomes	Present
	Stomata	Both anisocytic and paracytic types on either side
Stem Structures	Outline in transverse section	Terete, wings absent
	Cuticle	Striated
	Trichomes covering	Present, conical, unicellular
	Glandular	Present, stalk unicellular, head multicellular
	Chlorenchyma	Present
	Collenchymas	Present
	Endodermis	Indistinct
	Pericyclic fibres	Present
	Phloem fibres	Present
	Pith	Cells pitted in older stem

Traditional Uses-

Shankhapushp(Convolvulus pluricaulis Chois), have been used for centuries in India for treatment of many disorders like anxiety, insomnia and to promote longevity and prevent diseases by providing strength and immunity. It improves strength, digestive power, complexion and voice and cures intestinal worms, dysuria, animal poisoning, dyspnea, cough, diabetes, and uterine disorder It is helpful in epilepsy, insomnia, heart disease and hematemesis. The leaves and flowers possess hypotensive properties used for treating anxiety neurosis.

The tribals in Chhindwara, Madhya Pradesh, India describe it as an anthelmintic, good in dysentery, and a one herb which cures skin ailments and reduces high blood pressure. In Gonda Uttar Pradesh, India, the leaves are recommended for mental disturbance and depression.

The herb is non-toxic and its use does not bring into being any side effects. On the other hand, there is stimulating effect in strengthening of health and weight gain. According to Ayurvedic concept, Rasayana therapy simultaneously affects the body and mind and brings about psychic and physical improvement. This therapy prevents the effects ageing, develops intelligence and augments the body resistance against diseases.

It is one of the most important MedhyaRasayana drugs in Ayurveda. Its use improves the balance and vitiation in Kapha- vata-pitta doshas and the herb is astringent and bitter. Herbalists believe that Shankhpushpi calms the nerves by regulating the body's production of the stress hormones, cortisol and adrenaline

Actions according to Ayurveda

Medhya	Promotes intellectual capacity
Swarakarini	Improves voice
Grahabhootadi Doshaghni	Useful in diseases of supernatural origin
Rasayani	Rejuvenates the body
Kantida	Enhances the aura of the body and gives it a healthy look
Majjadhaturasayana	Rejuvenates the nervous tissue
Unmadaghna	Alleviates insanity and emotional Instability
Vrishya	Aphrodisiac
Pachambala	Increases the strength of the digestive System
Chedana	Laxative
Nidrajnana	Promotes sleep

Phytoconstituents present in shankhpushpi

The chemical constituents in Shankhpushpi consist of carbohydrate-D-glucose, rhamnose, maltose, sucrose and starch. It also contains proteins, amino acids and the alkaloids- convolvine, convolamine, confoline, phyllabine, convolidine, convoline, convosine, subhirsine and convolvidine along with fatty acid and wax constituents, hydrocarbons, aliphatic and sterol and certain other bio-chemicals which include scopoletin, glacial acetic acid, three coumarins, β-sitosterol, kaempferol, tropane alkaloids, linoleic acid, palmitic acid and straight chain hydrocarbon hexatriacontane, 20- oxodotriacontanol, tetratriacontanoic acid and 29- oxodotriacontanol. Alcoholic extract of plant yield Di-oh- cinnamic acid, kaempferol and Betastosterolglucos steroid of microphyllic acid. Hydroxy Cinnamic acid, Octacosanol tetracosane along with glucose, sucrose also have been isolated from the plant.

Pharmacological activities

This drug shows antidepressant, antidiabetic, cardiovascular, anxiolytic, antioxidant, neuroprotective, hypolipidemic activity. If improve learning and memory which was clearly identified in simple memory tests such as pole-climbing apparatus, passive avoidance paradigm and active avoidance paradigm tests. The ethanolic extract of Convolvulus Pluricaulis and its ethyl acetate and aqueous fractions were evaluated for their memory enhancing properties. Experiments was done on rats with two different doses like 100 and 200 mg/kg and the drug significantly improved memory and learning in rats. It also shows antimicrobial, insecticidal, antifungal, antibacterial and anthelmintic, anticonvulsant, antiulcer and anticatatonic activity.

The root extract of Convolvulus pluricaulis Choisy. (0.4 mg / kg.d) for 30 days administered to L-thyroxine induced hyperthyroid mice decreased serum concentration of T3 and hepatic 5-D activity. These results point out that the plant extract-induced inhibition in thyroid function is primarily mediated through T4 to T3 conversion.

The juice of the whole plant prevents excessive menstruation. The fine paste made by grinding the plant is helpful for the cure of abscesses.

Establishment of the correct plant -
Five different plant species i.e.Evolvulus alsenoides, Clitorea ternatea, Convolvulus pluricaulis, and Canscora decussata were to be taken in the name of Shankhapushpi by Ayurveda practitioners in different parts of the country.

Ayurvedic Pharmacopoeia of India has established Convolvulus pluricaulis that is the plant species which should be taken in the name of Shankhapushpi and put an end to the controversial status ofthe plant. API described this plant as Shankhapushpi consists of whole plant of Convolvulus pluricaulis Choisy (Fam. Convolvulaceae); a prostrate, sub-erect, spreading, hairy, perennial herb with a woody root stock, found throughout the country.
But in a certain parts of India, Clitoria ternatea Linn, and Evolvulus alsinoides Linn both are used as Shankhapushpi.

Conservation of Shankhapushpi plant-
Medicinal plants are globally valuable sources of new drugs. About 90 % are harvested from wild resource.Furthermore, up to 80 % of people in developing countries are totally dependent on herbal drugs for their primary healthcare, and over 25 % of prescribed medicines in developed countries are derived from wild plant species. With the increasing demand for herbal drugs, natural health products, and secondary metabolites of medicinal plants, the use of medicinal plants is growing rapidly throughout the world.
For medicinal plants with increasingly limited supplies, sustainable use of wild resources can be an effective conservation alternative.

Conclusion:-

The conservation and sustainable use of medicinal plants have been studied extensively. Various sets of recommendations have been compiled regarding their conservation, including the establishment of systems for species inventorying and status monitoring, and the need for coordinated conservation practices based on both in situ and ex situ strategies for medicinal plants with increasingly limited supplies, sustainable use of wild resources can be an effective conservation alternative.

Despite the existence of various sets of recommendations for the conservation and sustainable use of medicinal plants, only a small portion of these have achieved adequate protection of Shankhpushpi resources through conventional conservation in natural reserves or botanic gardens.We can also conserve it by farming this plant use it for medicine purpose. As Shankhpushpi is considered as *Medhya* (brain tonic) *Rasayana* (Immunomodulator) in Ayurvedas. It is a well-known medicinal herb and is believed to enhance certain aspects related to intellect and memory improvement. It also contains active constituents mainly in the form of proteins, amino acids and the alkaloids- convolvine, convolamine, confoline, phyllabine, convolidine along hydrocarbons, aliphatic and sterol and certain other bio- chemicals. Which reviewed by this paper, but there is still lack of clinical data for its effectiveness and clinical trials are necessary to justify its traditional use. The herb induces a feeling of calm and peace, good sleep and a relief in anxiety, stresses and mental fatigue. The herb modulates the neuro chemistry of the brain to produce its action. In future the standardization and stabilization studies on Convolvulus pluricaulis leaves extract can be carried out which can help in proving it to be a promising source in pharmaceutical, medicinal as well as nutraceutical industry. It is a nontoxic herb and its use does not produce any side effect.

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