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A MINI REVIEW OF *COLEUS FORSKOHLII*

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ABSTRACT

Coleus forskohlii / *Coleus barbetus* (family Lamiaceae) is an important project of the Indian Ayurveda medicine. Forskolin is used for the treatment of eczema, asthma, psoriasis, superficial vascular lesions and hypertension, a decrease in intracellular CAMP levels which is considered an important factor in the development of the disease. The tubers possess medicinal properties and significantly rich source of both enzymatic and non-enzymatic antioxidants. The active ingredient (forskolin) a labdane diterpene, is an adenylyl cyclase activator and cAMP stimulator, used in research studies by medical professionals and pharmacologists. The main forskolin forks still reside in the roots of *C. forskohlii* whether wild or cultivated. Micropropogation from the tip of the shoot and callus extracts outbreaks several leaves and roots in coleus. This review paper presents a brief communication of the plant, *in vitro* and uses of *Coleus*.

KEYWORDS: *Coleus forskohlii*, Lamiaceae, Forskolin, medicinal plant, tissue culture.

INTRODUCTION

Coleus forskohlii Briq. is an herbaceous plant with every year stem and chronic root stock of the mint family (Lamiaceae), with a strong, camphor-like flavour that was first detected in the low ascent of India. *Coleus forskohlii* is a herbaceous plant that normally become at a height of 600 - 1500 ft. and is advance over the tropical hot agreeable aerial area of India, Nepal, Myanmar, Srilanka, Thailand and Africa. Nepal, Myanmar, Srilanka, Thailand and Africa. In India. It is generally shared in tarried dune of Western Uttar Pradesh, Gujarat, parts of Orissa, and Western Ghats. *Coleus* Forskolin is recycled for cardiovascular disorders, audio-visual issue (loss in intraocular stress) and also for skin diseases, e.g. psoriasis. Almost 1-500 g of root actual perhaps access from a lone plant. In coleus forskolin content of the roots part from 0.07% to 0.58% of arid being. Somatic embryos copied from like mesh may also program

change that is mostly mesh art lured. *Coleus forskohlii* were excited in advance a contract for the add construction of forsohlii from leaf art of coleus forskohlii. In this division, the induction of callus from matured leaves of coleus forskohlii and presentation of the fusion and growth of forskolin in leaf callus at above length is report. Lone expert of forskolin is still the roots of cultivated. Much powerful work has not been complete in advance the contract for tissue culture of *Coleus forskohlii*. Therefore, needs to be developed for the useful and rapid mass more reproduction of *Coleus forskohlii*.

Importance

This plant share to the emergence of *C. forskohlii* as a tax on interest in modern medicine.The presence of yellowish to fresh brown plastic vesicles in cork cells of C. forskohlii tubers is unique aspect of this plant and cell store secondary stabilities including forskolin.[1]

SPECIES STATUS *C. forskohlii* Briq.is a member of the family of the mint, Lamiaceae. Indigenous in India is registered in Ayurveda Material Medical with the Sanskrit number "Mahanadi" and "Mayan".[2]

The following taxonomic position of forskohlii is the following.

Kingdom- Plantae

Division- Magnoliophyta

Class- Magnoliopsida

Order- Lamiales

Family- Lamiaceae

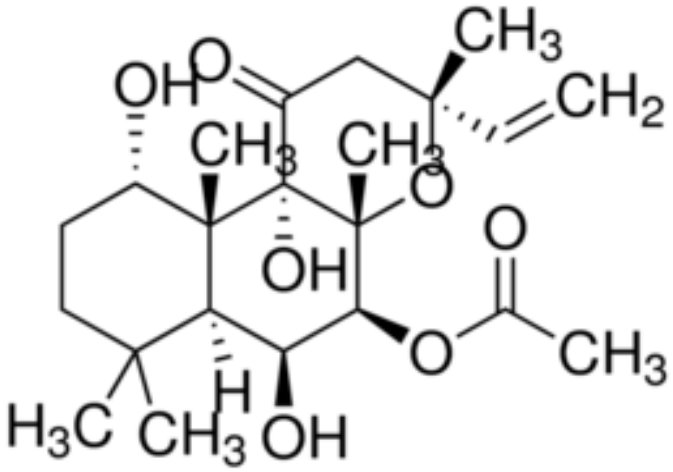
Genus- *Coleus*

Species- *forskohlii*

Genera and Lamiaceae included in series of medical doctors. It includes 236 genera and 7000 species, the largest family of the order of the Lamiales. The plants are usually aromatic with collared leaves and have been used since ancient times for their pharmaceutical product. The genus Coleus has been described for the first time by Flourier in 1790; from the Greek word "COLEOS" 150 times apart from the genre, which have colourful leaves and which have been used as ornamental plants.

Phytochemistry

Which increases the levels of cyclic adenosine monophosphate (camp) in cells, which is the most important regulatory cell compound.[3] Activation of camp results in the inhibition of platelet activation, increased contraction force of the heart muscle, smooth muscle relaxation, increased insulin secretion and increased thyroid function. The forskohlii in roots were reported by.[4] Comprehensive plant database of India for biology activities and the Farmakis Central Research Institute, Lucknow. Methanol was re-established until it was interrupted by circulation arterial conditions and living conditions.[5]



Forskolin

Forskolin was first discovered in 1974 and was originally called coleonol.Cereuskohlii tuberous root extracts contain minor diterpenoid, namely detylforskolin, 9 - deoxyforskolin, 1, 9 - deoxyforskolin, 1, 9 - dideoxy - 7 - acetylforskolin added to forskolin (7-acetoxy-8,13-epoxy-1, 6,9-trihydroxylabd-14-en-11-one).[6] generation of forskolin, namely, 5-6-deoxy-7-desacetyl-7-methylamino-carbon forskolin (HIL 568), a potential ant glaucoma agent and6-(3-dimethylamino-propionyl) forskolin hydrochloride (NKH 477), a potential cardio tonic agent. Newer compound are being identified from the root extracts of *C. forskohlii*. Six compounds from the root of *C. forskohlii* and identified structures as 14-deoxycoleon U, dimethyl cryptojaponol, alpha-amylin; botulin acid, alpha-carol and sterol or the compound viz., alpha-amylin and botulin acid were isolated from *C. forskohlii* for the first time.[7] From Yunnan Province two new diterpenoidforskolin I (1alpha, 6 betadiacetoxy-7 beta, 9alpha-dihydroxy-8,13-epoxylabd-14- en-11-one) and J, (1alpha,9alpha-dihydroxy-6beta, 7betadiacetoxy -8,13-epoxylabd-14-en-11-one) two more new labdanediterpene glycosides, forskoditerpenoside A, B were also isolated from the ethanol extract of the were isolated

from *C. forskohlii* plant.[9] That was the first report in the occurrence of glycoside derives from labdane diterpene in the nature and these compound showed relative effects on isolated guinea pig tracheal spirals *in vitro*. A from the ethanol extract of the whole plant of *C. forskohlii* were isolated.[10] Forskoditerpenoside C, D and E showed relative effects on isolated guinea pig tracheal spirals in vitro and an unusual 8, 13-epoxy-labd- 14-en-11-one glycoside pattern.

Mechanism of Action

Forskolin is the main chemical constituent of the tuber, its herbal preparations act on various pharmacological mechanisms. Forskolin, by increasing the level of captivity, in turn inhibits the degranulation of basophils and mast cells and the release of histamine.[11] lowers blood pressure and intraocular pressure inhibits platelet aggregation.[12] promotes vasodilatation bronchodilatation and secretion of thyroid hormones and stimulates lipolysis in fat cells.[12] The anti-spasmodic effects of C. forskohlii root extracts on blood pressure have been reported by Forskolin directly activates almost all hormone-sensitive adenylatecyclase in intact cells and tissues, and even a solubilized adenylatecyclase preparation. Forskolin can activate all types of adenylatecyclase in humans, with the exception of type IX, present in spermatozoa.[14] Forskolin directly activates almost all adenylatecase-sensitive hormones in intact cells, tissues and even a solubilized preparation of adenylatecyclase. The peculiarity of this activation is that the forskolin site of action is the catalytic subunit of the enzyme or a closely associated protein Forskolin, in turn increasing the level of cAMP, inhibits depreciation of basophils and mast cells.[14,15]

Medicinal Uses

C. forskohlii has been used in the traditional traditions of Ayurveda medicine to treat heart disease, abdominal cramps, respiratory disorders, insomnia, convulsions, asthma, bronchitis, intestinal disorders, burning sensation, constipation, epilepsy and angina. The essential oil has potential uses in the flavour industry and can be used as an antimicrobial agent. Forskolin is widely used in the preparation of medical supplies for redness of the hair and to restore its normal colour to gray hair.

Antioxidants inhibit oxidation and are are substances or compounds have scavenging power of free radicals produced inside the human body which are responsible for many of the metabolic disorders such as atherosclerosis, arthritis, cancer, AIDS, central nervous system injury, and gastrointestinal disorders. *C. forskohlii* is used as a tonic in South India. The roots

are also used in treatment of worms. The root paste allays burning in festering boils. Root is ground in mustard oil and the paste is applied on eczema and skin infections. It is also used as antiaging and antioxidant agent and as a remedy for heart, abdominal and respiratory disorders The medicinal medicinal value of *C. forskohlii* and its forskolin in plant has been reported to be used by Bhotias of the district Pitthoragarh for the treatments of ailments like psoriasis, eczema and cardiac diseases.[17] The different extracts of *C. forskohlii have* antioxidative potential and this property may be useful in the preparation of drug formulations, health tonics, and cosmetics.[18] Forskolin has a positive inotropic action on cardiac tissue through high levels of cAMP. Forskolin reduced normal or high blood pressure in different animal species through a vasodilator effect and had a positive inotropic action in the cardiac muscle. *C. forskohlii* extracts reduced body weight, food intake and fat accumulation in those rats. *Coleus forskohlii* is also useful within the treatment of obesity. Forskolin had no lasting effect on intraocular pressure in monkeys with glaucoma. The topical application of forskolin lowered the intraocular pressure in rabbits, monkeys and healthy human volunteers and it was associated with a reduction in aqueous inflow and no change in outflow facility indicating the potential of forskolin as a therapeutic agent in the treatment of glaucoma.

Forskolin is studied to likely to be used in the treatment of concrete .Many metastasizing tumour cell lines induce platelet aggregation both in vitro and in vivo aggregation platelets release substances that promote tumour growth. Researchers demonstrated forskolin'sablilty to block platelet aggregation its stimulation of adenylatecase cyclise and increase of intracellular Camp. Forskolin reduced tumour in the lungs by 70 per cent.[19] The use of obscene *C. forskohlii* extract as analyticalphoto therapeutic antithrombotic has been expected Anti-obesity effects of *C. forskohlii* were checked in overreacted betrayer and control of *C. forskohlii* excerpt decreased body weight, foodabsorption and heavy growth in those rats implying that *C. forskohlii* may be useful in the analysis off aptness.[20] *C. forskohlii* does not develop to promote weight loss but may help reduce weightbenefitin overweight females with allegedly no clinic important lateral effects.[15,16,21]

In Vitro Propagation

The propagation *in vitro* is useful for the propagation in mass and the conservation of the genetic material of any plant species. *C. forskohlii* is of succulent nature, corresponds well to the propagation *in vitro*. It is used for various purposes, knowing, nodal segments, sprout tips,

leaves, etc. A leaf sowing protocol was developed and found in plants grown *in vitro*, produced a comparable amount of forskolin with the wild plants.[22] Completed plots of *C. forskohlii* in a period of 35 to 40 days cultivating explants of sprout tip in medium MS that contained 0.57µAAM and kinetin of 0.46 µm by direct multiplication to 12.5 Buds per explant.[23] The importance of the protocol lies in the formulation of regulators of growth that have affected a very rapid multiplication of the plant in less time, that is, once less than the methods known so far. The explants of leaf of *C. forskohlii* showed a callus grown in MS supplemented with 1 mg / L of BAP and 2 mg / L of NAA. The regeneration of stems was observed with 7 weeks of cultivation.[24,25]

CONCLUSION

Coleus forskohlii is medicinal plant with a great potentialfor future for further investigations medicinally. The physiological and chemicals research entrenched that forskolin acquire multi-faceted organic action in appropriateness of forskolin for benefial human ailments on the bioactive basis of forskolin. However, oral forskolin in humans has not been well entrenched. Other compounds of *C. forskohlii* also need to be assessed medically.

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