REVIEW ON: PHARMACOLOGICAL ASPECT OF MEDICINAL HERB

**COLEUS FORSKOHLLII**

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Received 27 Aug. 2018; Revised 3 Sep. 2018; Accepted 7 Sep. 2018, Available online 10 Oct. 2018

**ABSTRACT**

*Coleus forskohlii*is a perennial herb belongs to family Laminaceae is an important used in Ayurvedic medicine curing various disease. *Coleus forskohlii* tuberous root are found to have rich source of Forskolin used as a potential drug have pharmacologically therapeutic benefit as in asthma, angina, cancer, psoriasis, overweight, hypertension, polycystic ovarian syndrome(POS), antimicrobial, antifertilty, antifeedant, anti-oxidant and anti-stress activity.

**Keywords**: *Moringa Olifera*, Tissue culture, anti-oxidant, Biopesticide

**INTRODUCTION**

*Coleus forskohlii* is a botanical that has been used since ancient times in Hindu and Ayurvedic traditional medicine. The existence of traditional medicine depends upon plant diversity and the related knowledge of their use as herbal medicines. India is one of the twelve mega diversity hot spot regions of the world and the fifth of all plants found in India are used for medicinal purpose.

Coleus forskohlii Briq is a perennial, branched herb belonging to the botanical Family of Laminaceae(labiatae). It is called Gandhamulika in Shanskrit, Pashanbhed in Hindi, Makandiberu in Karnataka, Marunthu kookankizhanku in Tamil.
Taxonomical Description:

Table-1 Taxonomical Classification of Coleus forskohlii

<table>
<thead>
<tr>
<th>Kingdom</th>
<th>Plantae</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phylum</td>
<td>Angiospermae</td>
</tr>
<tr>
<td>Class</td>
<td>Dicotyledoneae</td>
</tr>
<tr>
<td>Order</td>
<td>Tubiflorae</td>
</tr>
<tr>
<td>Family</td>
<td>Laminaceae</td>
</tr>
<tr>
<td>Genus</td>
<td>Coleus</td>
</tr>
<tr>
<td>Species</td>
<td>Forskohlii</td>
</tr>
</tbody>
</table>

Botanical Description:

Table-2 Botanical Description of Coleus forskohlii

<table>
<thead>
<tr>
<th>Height</th>
<th>40-60 cm tall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stem</td>
<td>It has four angled stems that are branched and nodes are often hairy</td>
</tr>
<tr>
<td>Leaves</td>
<td>Leaves are 7.5 to 12.5 cm in length and 3-5 cm in width, usually pubescent, narrowed into petiol</td>
</tr>
<tr>
<td>Inflorescence</td>
<td>Raceme, 15 to 30 cm in length</td>
</tr>
<tr>
<td>Flowers</td>
<td>Are sout, 2-2.5 cm in size, usually perfect &amp; calyx hairy inside</td>
</tr>
<tr>
<td>Calyx</td>
<td>The upper lip of calyx is broadly ovate</td>
</tr>
<tr>
<td>Corolla</td>
<td>The blue and lilac corolla is bilabiate. Lower lobes are elongated and concave so that it inclose the essential organ.</td>
</tr>
<tr>
<td>Ovary</td>
<td>It is four parted &amp; stigma is two lobed &amp; flowers are cross pollinated by insects or wind</td>
</tr>
<tr>
<td>Root</td>
<td>The root is typically golden brown, thick, fibrous and radially spreading. Roots are tuberous, fasciculate, 20 cm long &amp; 0.5 to 2.5 cm in diameter, conical fusiform, straight, orangish within an strongly aromatic. Coleus forskohlii is the only species of genus to have fasciculate tuberous root.</td>
</tr>
<tr>
<td>Odour</td>
<td>The entire plant is aromatic. The leaves and tubers have quite different odours.</td>
</tr>
</tbody>
</table>
PHARMACOLOGICAL APPLICATION:

(1) Metabolic Syndrome in Overweight and Obese Subject \(^6\):

*C.forskholi* extract in conjunction with a hypocaloric diet significantly improved insulin and insulin resistant and thus may be useful in the management of metabolic risk factor. Which significantly increase the HDL –Cholesterol.

(2) Hypertension \(^7\):

*Forskholin* is the extract from the tuber of the *C. forskholi* (wild) Briq plant which has been proven to have blood pressure lowering and antispasmodic effect. It has been described as an activator of adenylate cyclase in rabbit heart membrane. It bypass the \(\beta\) receptor and G protein. Lowering of blood pressure is not mediated by centeral effect of *C.forskholi* rather it directly vasodilatory action, through its smooth muscle relaxation property.

(3) Polycystic Ovarian Syndrome \(^8\):

*C.forskholii* decreased IL-2 and IL-G in rat with androgen induced Polycystic Ovarian Syndrome. Opioid and immune system were impaired in hyper androgenized rat (Polycystic Ovarian Syndrome model) and the *C. forskholii* treatment could restore most of these functions indicating.

(4) Antimicrobial activity \(^9,10\):

Antimicrobial activity of root extract (Petroleum ether, diethyl ether, chloroform, methanol) against some bacteria Staphylococcus aureus, pseudomonas fluorescence, Sericea, Kebesiella pneumonia and bacillus pumilus. Plan extract in polar and less polar organic solvent against some fungi Aspergillus flavus, Aspergillus parsiticus, Trichoderma rubum, Microsporium gypseum causing skin disease. The leave extract of *C.forskholii* have a potential broad spectrum antibacterial against Staphylococcus aureus, Staphylococcus epidermidis, Salmonella typi and Kebesiella pneumonia.

(5) Antifeedant Activity \(^11\):

The plant extract of *forskolin* *C.forskholi* was found to have significant antifeedent effect on the fourth instar larva of *Papilio demoleus*. The present plant extract of *forskolin* had both suppressant and aeterrent properties.
(6) Lipid lowering action 12:

*C. forskohlii* interfere with pancreatic lipase which results in inhibition of absorption of dietary fat and the weight loss effect, due to this specific mechanism of action, the undigested fat may results in gastrointestinal side effect and poor absorption of fat soluble nutrient e.g Vitamin A, D, E and K.

(7) Female sexual disorder 13:

*Coleus forskohlii* contains forskolin as a main active moiety. Activation of adenylate cyclase by forskolin results in marked increases in levels of intracellular cyclic AMP in a variety of eukaryotic cells. In turn, Cyclic AMP reduces the calcium level which causes relaxation of smooth muscles and increase in the vaginal secretion.

(8) Skin Eruption and Acne 14:

*Coleus forskohlii* oil effectively inhibit the growth of skin pathogen including *propionbacterium acne* micro-organism associated with acne and other skin infections. Staphylococcus aureus a bacterial strain found in infected wound and skin eruption including acne. Bornyl acetate is responsible for this activity.

(9) Anti-Stress Activity 15:

Forskolin isolated from hydroalcoholic extract of rhizome *Coleus forskohlii* using column chromatography and TLC purification. The potent compound forskolin reveal that compound used in the treatment of Neurological disorder (Stress).

(10) Anti-Oxidant 16:

*Coleus forskohlii* is responsible for free radical scavenging activity. The leaf and callus extract of *Coleus forskohlii actas* free radical inhibitors and thus as primary anti-oxidant that react with radical due to the addition of sugar, phosphate, nitrate and calcium. *Coleus forskohlii* producing rosamarinic acid in larger quantities produces anti-oxidant activity.

(11) Hyperglycemia 17,18,19,20,21,22:

*Coleus forskohlii* predominant decreased basal glucose in healthy rats and attenuated the severity of hyperglycemia in diabetic rats. The level of 8-OHdG also tends to decrease in diabetic rats. *Coleus forskohlii* stimulated insulin release via elevation of intracellular cAMP on pancreatic β cells. It is conferred cytoprotective by decreasing and that it increased the expression of insulin gene.
(12) **Abortive Action** 23:

Extract of *Coleus forskohlii* have been used in folk medicine to interrupt pregnancy. A study on pregnant rat showed that treatment with the highest dose of *Coleus forskohlii* extract (880 mg/Kg per day) an anti-implantation effect. These finding justify the use of *Coleus forskohlii* extracts for abortive purpose23.

(13) **Anti-cancer** 24:

Ethanolic extract exploits this possess by selectively inducing cell death through ROS dependent apoptotic pathway in Hep G2 cells, which possess anticancer properties.

**CONCLUSION:**

*Coleus forskohlii* is a natural source of *diterpenoid forskolin* having various pharmacological treatment in various disease. *Coleus forskohlii* is an ornamental plant have been medicinal diversity used in cosmetic like cream, perfume because of presence of volatile oil is an indigenous. Indian medicinal plant having a lot of pharmacological activities because of stimulation of adenylate cyclase by increasing cAMP by which it inhibits platelet aggregation, vasodilation, bronchodilation, etc. In this review article we focus on various aspect of pharmacological activity of plant.

**REFERENCES:**

6. Hayley L. *C. forskohlii* extract supplementation in conjunction with a hypocaloric diet reduces the risk factors of metabolic syndrome in overweight and obese subjects: A randomized controlled Trial. Nutrients. 2015:7,9508-9522.