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## A REVIEW ON ANTI ALLERGIC HERBS IN SIDDHA SYSTEM OF MEDICINE

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**Abstract:** Allergy is one of the most common conditions that affect mankind with diverse manifestations. Allergic diseases such as asthma, allergic rhinitis, atopic dermatitis and food allergy afflict up to 20% of the human population in most countries. Allergies have become big problem around the world. The prevalence of allergic diseases like Asthma has risen in the recent years despite an improvement in the general health of the population. It is roughly estimated that one in three people have an active allergy at any given time and at least three in four people develop an allergic reaction at least once in their lives. The drugs used for allergy in allopathy are steroids, Anti histamine, decongestants, Mast cell stabilizer and leukotriene receptor antagonists. Anti histamine drugs can have undesirable side effects, most notably drowsiness, dry mouth etc. The use of medicinal plants becomes more popular due to the adverse effects of such allopathic drugs. In recent years, a safe and effective management of diseases through plant resources has received much attention. Many herbs are used for their anti histamine and anti inflammatory properties. Siddha, an Indian system of medicine has better remedies for the treatment and management of all type of allergic diseases. This article reviews the anti allergic properties of the most commonly used herbs in Siddha system of medicines.

**Keywords:** Indian system of Medicine, Anti-histamines, Mast cell stabilizers, Medicinal Plants.



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## INTRODUCTION

India has an ancient history of the use of plants in the indigenous systems of medicine (Siddha, Ayurveda and Unani) dating back to over 5000 years. It has been estimated that over 8000 plants are used in traditional, folk and herbal medicines<sup>1</sup>. Siddha system of Medicine is a complete holistic medical system that has been practiced in India for 5000 years and above. The Siddha System of medicine, which had its presence in the ancient Tamil land, is the foremost of all other medical systems in the world. The Siddha System is said to have emerged in antiquity, from the highly evolved consciousness of the Siddhars. The clarified intellect and heightened intuition of the Siddhars, resulting from their Yogic powers, enabled them to explore the world around them and exploit its natural resources for the sake of humanity. Herbal medicine is the oldest and still the most widely used system of medicine in the world today. It is the medicine made exclusively from plants. It is used in all societies and is common to all cultures. There are many different "types" of herbal medicine that spring from different cultures around the world. All these have the use of medicinal plants in common, but they vary in the plants they use, the way they prepare and use medicines from these plants, and the philosophy of their treatment approaches<sup>2</sup>. Different cultures may also use the same plants but differ in how it is used, or the part they use. Allergy, a serious health problem worldwide, is due to immune dysfunction. Substances that cause allergic reactions are called allergens, including dust mites, pollen, cosmetics, food, and mold spores. Immediate hypersensitivity (type I allergy), is an immunoglobulin E (IgE)-mediated immune response, resulting in conditions such as food allergies, hay fever, asthma, and drug-induced allergies<sup>3</sup>. The prevalence of allergy and asthma has risen in the recent years despite an improvement in the general health of the population<sup>4</sup>. Two of the most common types are pollen allergies and atopic dermatitis. In the past fifty years, these problems have dramatically increased. Allergic diseases such as asthma, allergic rhinitis, atopic dermatitis, and food allergy afflict up to 20% of the human population in most countries<sup>5</sup>. Pharmacological management of allergic diseases includes antiallergic medication and immunotherapy for specific allergens, most commonly antihistamines, anticholinergics and topical corticosteroids<sup>6</sup>. However, the use of these drugs also suffers adverse effects like sedation, dry mouth and immunosuppression<sup>7</sup>. Siddha, an Indian system of medicine, has described several drugs from indigenous plant sources in the treatment of all the variety of allergic disorders.

### Pathogenesis:

Degranulation of mast cells and basophils with antigen cross-linked IgE releases histamine, prostaglandins, leukotrienes, and cytokines affecting lymphocytes, macrophages, eosinophils, and neutrophils. Finally cytokine- induced reaction causes tissue injury. Therefore anti-allergic agents with anti-inflammatory actions may be beneficial drugs for allergic diseases (6). Mast cells, which are constituents of virtually all organs and tissue, are important mediators of

inflammatory responses such as allergy and anaphylaxis. Anaphylaxis is mediated by histamine released in response to antigen cross linking of immunoglobulin E (IgE) bound to Fc $\epsilon$ RI on mast cells. Mast cell activation causes the process of degranulation those results in releasing of mediators, such as histamine and an array of inflammatory cytokines<sup>8</sup>.

**Aetiology:**

- Allergic triggers
  - Dust mites
    - -carpeting, Upholstered furniture
  - Animals
    - Furry or Feathered
  - Pollens
    - Fit, Recess
  - Cockroaches
  - Molds
  - Foods

**COMMONLY USED SOME ANTI-ALLERGIC HERBS IN SIDDHA MEDICINE**

S.No	Botanical name	Family	Name in Siddha medicine	Part Used	Ref.No
1	<i>Abrus precatorius</i>	Fabaceae	Kundremani	Leaves	10
2	<i>Acalypha indica</i>	Euphorbiaceae	Kuppaimeni	leaves	11
3	<i>Allium cepa</i>	Liliaceae	Vengayam	Bulb	12
4	<i>Aristolochia bracteolata</i>	Aristolochiaceae	Aadu theendapaalai	Whole part	13
5	<i>Curcuma longa</i>	Zingiberceae	Manjal	Rhizome	14
6	<i>Cyperus rotundus</i>	Cyperaceae	Korai kizhangu	Rhizome	15
7	<i>Dolichos biflorus</i>	Fabaceae	Kollu	Seed	16
8	<i>Leucas aspera</i>	Lamiaceae	Thumbai	Whole part	17
9	<i>Solanum xanthocarpum</i>	Solanaceae	Kantakathiri	Flower	18

### 1. *Abrus precatorius*:

*Abrus precatorius* leaves extract has expectorant action<sup>9</sup>. The study was conducted to evaluate anti histamine activity of *Abrus precatorius* using clonidine induced catalepsy in mice. The ethanol extract of *Abrus precatorius* leaves (EAPL) at doses 100,125,150 mg/kg i.p were evaluated for antihistaminic activity using clonidine and haloperidol induced catalepsy in mice. It showed that chlorpheniramine maleate (CPM) and EAPL inhibit clonidine induced catalepsy significantly ( $P < 0.001$ ) when compare to control group, while CPM fail to inhibit haloperidol induced catalepsy. So, the study was concluded that EAPL possesses antihistaminic activity<sup>10</sup>.

### 2. *Acalypha indica*:

In siddha medicine, *Acalypha indica* is used for treating Asthma, piles, Allergic rhinitis, Burns<sup>9</sup>. The study was evaluated to know the bronchodilator activity of aqueous extract of *Acalypha indica* leaves in experimental animals at the dose 200 and 400 mg/kg. Bronchodilator activity of aqueous extract of *Acalypha indica* studied on the histamine and acetylcholine aerosol induced bronchospasm in guinea pigs and bronchial hyperactivity was studied on broncho alveolar lavage fluid (BALF) in the egg albumin sensitized guinea pigs and histopathological studies. Treatment with aqueous extract of *Acalypha indica* showed significant protection against histamine and acetylcholine aerosol induced bronchospasm in guinea pigs. Significant decreased in the total leukocyte and differential leukocyte count in the BALF of the egg albumin sensitized guinea pigs. So, it was decided that aqueous extract of the *Acalypha indica* has not only bronchodilating activity but also decreases bronchial hyper reactivity by decreasing the infiltration of inflammatory cells in the airway and inhibition of release of histamine like mediators<sup>11</sup>.

### 3. *Allium cepa*:

In siddha medicine, *Allium cepa* is used for treating piles, scabies, Hypertension, Diarrhoea<sup>9</sup>. The study was conducted to know the Antiallergic activity of *Allium cepa* against various events responsible for Type I allergic reactions. The herbal fraction (ALC-02) from *A. cepa* (bulb) inhibited histamine release and attenuated intracellular calcium levels in Compound 48/80-induced rat peritoneal mast cells. It also prevented Compound 48/80-mediated systemic anaphylaxis while lowering histamine levels in plasma. It inhibited eosinophil peroxidase activity and protein content in bronchoalveolar lavage fluid (BALF) of ovalbumin-challenged mice. ALC-02 suppressed erythrocytic lysis caused by Triton X-100. A significant quenching of 1, 1-diphenyl-2-picrylhydrazyl radical by ALC-02 was observed. The results showed that promising

anti-allergic profile of ALC-02 that could be attributed to its potential antihistaminic, anti-inflammatory activities<sup>12</sup>.

#### **4. *Aristolochia bracteolata***

In siddha medicine, *Aristolochia bracteolata* is used for treating scabies, all skin diseases, and for normal delivery<sup>9</sup>. Antiallergic activity of *Aristolochia bracteolata* was evaluated by using compound 48/80 induced anaphylaxis, dermatitis, rhinitis and pruritis, as a preclinical model for acute phase of hypersensitivity reactions. The possible antiallergic mechanism was evaluated by using compound 48/80 induced mast cell activation and estimated serum nitric oxide (NO), rat peritoneal fluid NO, bronchoalveolar fluid NO and blood histamine levels. The present study implied that the chloroform extract of *Aristolochia bracteolata* had potent and significant inhibitory effect on compound 48/80 induced pruritis and dermatitis activity in Swiss albino mice. Mast cell membrane stabilization activity was also observed in compound 48/80 induced mast cell activation. A significant reduction was observed in serum nitrate levels, rat peritoneal fluid nitrate levels and BAL nitrate levels. The extract was also found to possess significant inhibitory effect on blood histamine levels. It was concluded that chloroform extract of *A. bracteolata* possess potent antiallergic activity<sup>13</sup>.

#### **5. *Curcuma longa***

In siddha medicine, *Curcuma longa* is used for treating fever, dysuria, peptic ulcer, Itching, skin diseases, non healing ulcer, chickenpox, diarrhea, etc<sup>9</sup>. The main active ingredient of *Curcuma longa* is curcumin alkaloid. Curcumin suppressed compound 48/80-induced rat peritoneal mast cell (RPMC) degranulation and histamine release from RPMCs. Curcumin inhibited compound 48/80-induced systemic anaphylaxis *in vitro* and anti-DNP immunoglobulin E (IgE) mediated passive cutaneous anaphylactoid response *in vivo*. Curcumin has an ability to inhibit nonspecific and specific mast cell-dependent allergic reactions<sup>14</sup>.

#### **6. *Cyperus rotundus*:**

In siddha medicine, *Cyperus rotundus* is used for treating Hypertension, fever, arthritis, vomiting, diarrhoea<sup>9</sup>. From the 70% ethanol extract of the rhizomes of *Cyperus rotundus* (CRE), several major constituents including the sesquiterpene derivatives (valencene, nootkatone, and caryophyllene  $\alpha$ -oxide), monoterpenes ( $\beta$ -pinene, and limonene) and 4-cymene were isolated and examined for their anti-allergic activity *in vitro* and *in vivo*. In rat basophilic leukemia (RBL)-1 cell, the sesquiterpenes strongly inhibited 5-lipoxygenase-catalyzed leukotrienes production. In addition, they inhibited  $\beta$ -hexosaminidase release by antigen-stimulated RBL-2H3 cells, with valencene having the highest inhibitory effect. CRE inhibited leukotrienes production and  $\beta$ -hexosaminidase release at 300  $\mu$ g/mL. CRE, valencene and nootkatone significantly inhibited the delayed-type hypersensitivity reaction in mice when administered orally at 50-300 mg/kg.

So it was finalized that *C. rotundus* and its constituents, valencene, nootkatone, and caryophyllene  $\alpha$ -oxide, exerted anti-allergic activity in vitro and in vivo<sup>15</sup>.

### **7. *Dolichos biflorus*:**

*Dolichos biflorus* is commonly known as 'Horse Gram'. The seeds are used in the treatment of piles, constipation, wounds, urinary calculi, cough, edema, obesity and asthma<sup>9</sup>. The present study was designed for evaluation of antihistaminic activity of seeds of *Dolichos biflorus* in the management of asthma. Antihistaminic activity of ethanolic extract of *Dolichos biflorus* seeds (DB) was evaluated by using histamine induced contraction on goat tracheal chain preparation and histamine induced bronchoconstriction in Guinea pigs. The ethanolic extract of *Dolichos biflorus* seeds (DB) significantly inhibited histamine induced contraction of isolated goat tracheal chain preparation and significantly protected the guinea pigs against histamine induced bronchospasm as indicated by delay in the preconvulsive dyspnoea time (PCT) following the exposure of histamine aerosol. So, it was determined that ethanolic extract of *Dolichos biflorus* seeds (DB) has antihistaminic activity<sup>16</sup>.

### **8. *Leucas aspera*:**

In Siddha medicine, *Leucas aspera* is used for treating headache, cough, Nasal disorders, and tuberculosis<sup>9</sup>. The study was designed to evaluate the anti-asthmatic activity of *L. aspera* using various experimental animal models. Methanolic extract of dried whole plant of *L. aspera* was prepared and used in the dose of 100 mg/kg. Various in-vivo models like histamine induced bronchospasm in guinea pigs, passive paw anaphylaxis in rats and milk induced eosinophilia mice and in vitro model like mesenteric mast cell degranulation by egg albumin and inhibition of histamine and acetylcholine induced contraction in guinea pig tracheal chain and ileum preparations were used for evaluating anti-asthmatic activity of the drug. Methanolic extract of the drug showed a significant bronchodilatory and anti-histaminic, anti-inflammatory, mast cell stabilization, and anticholinergic activity in histamine induced bronchospasm. Thus, it was concluded that methanolic extract of dried whole plant of *Leucas aspera* have significant antihistaminic and antiasthmatic activity<sup>17</sup>.

### **9. *Solanum xanthocarpum***

In Siddha medicine, *Solanum xanthocarpum* is used for treating asthma, dyspnoea, cough, fever and joint pain<sup>9</sup>. The anti-asthmatic property of petroleum ether, ethanol (95%), water extract of flowers of *Solanum xanthocarpum* obtained by successive extraction on in-vitro and in-vivo animal models. Ethanolic (95%) extract (SXEX) showed promising result as relaxed the histamine pre-contracted isolated goat tracheal chain ( $P < 0.05$ ). A dose dependent contraction of goat tracheal chain is observed. Treatment with SXEX (100 mg/kg, i.p.) treatment significantly ( $p < 0.05$ ) reduced milk induced eosinophilia ( $18.16 \pm 0.912$ ), while mast cells were protected at a dose of (50 & 100 mg/kg, i.p) by 74.39% and 78.26 % respectively by SXEX. The

result suggested that the SSEX possess antihistaminic, mast cell stabilizing and decreased capillary permeability effect and hence possesses potential role in the treatment of asthma and allergic disorders<sup>18</sup>.

#### 10. *Taxus baccata*:

In siddha medicine, *Taxus baccata* is used for treating Fever, Asthma, vomiting, diarrhoea, indigestion<sup>9</sup>. The study was designed to evaluate the bronchodilator effect and bronchial hyperreactivity of alcoholic extract of *Taxus baccata* (AET) leaves in experimental animals. Bronchodilator activity of AET was studied on the histamine and acetylcholine aerosol induced bronchospasm in guinea pigs. Treatment with AET (200 and 400 mg/kg, p.o., for 7 days) showed significant protection against histamine and acetylcholine aerosol induced bronchospasm in guinea pigs. Significant decrease in the total leukocyte and differential leukocyte count in the BALF of the egg albumin sensitized guinea pigs was observed by administration of AET (200 and 400 mg/kg, p.o., for 15 days. AET dose dependently protected the mast cell disruption induced by compound 48/80. So it was decided that AET not only has bronchodilating activity but also decreases bronchial hyper-reactivity by decreasing the infiltration of inflammatory cells in the airway and inhibiting the release of histamine like mediators from the mast cell by stabilizing it<sup>19</sup>.

#### CONCLUSION:

From this article it is proved that many Siddha herbs have anti-histaminic and anti-allergic activity. Allergy patient has to take medicine for long duration and intake of biomedicine for long duration further deranged body immunity and worsen the pathology. All the medicinal plants discussed in this review have shown significant potential anti histaminic activity and mast cell stabilizing activity. So, Herbs with cost effectiveness, high value, easy availability and least side effects give an opportunity for explore and expect for complete cure of Allergic diseases.

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