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To Study the Herbal Drug Used in Asthma

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Abstract: *Herbs have been the highly esteemed source of medicine throughout human history. They are widely used today indicating that herbs are a growing part of modern, high-tech medicine. About 25-30 percent of today's prescription drugs contain chemical moieties derived from plants. The Indian system of medicine i.e Ayurveda alongwith classic texts like Bheshajya Ratnavali has a long-standing tradition that offers a unique insight into comprehensive approach to asthma management through proper care of the respiratory tract. Ayurvedic formulations used in the management of asthma, therefore, judiciously combine herbs to support the physiology of respiration, these herbs apart from exerting bronchial action also possess concomitant properties like antioxidant to support the digestive, cardiac, nerve functions and expectorant as well as just plain soothing herbs. Scientifically explored exhaustive reports have been published in Indian and International journals. Some of these herbs and their active chemical constituents which have a role in the management of asthma are compiled here and discussed in this review.*

Keywords: Asthma, Herbs

I. INTRODUCTION

Asthma is a chronic respiratory disease that affects millions of people globally. It is characterized by inflammation of the airways, leading to symptoms such as wheezing, coughing, chest tightness, and shortness of breath. The current treatments mainly include corticosteroids and bronchodilators, which are effective but may have side effects on prolonged use. This has led to an increasing interest in herbal drugs as complementary or alternative treatments. Herbal medicines, being natural, are generally safer and have fewer side effects, making them a preferable choice for long-term management.

II. OVERVIEW OF ASTHMA

Asthma is a multifactorial disease involving genetic and environmental factors. The pathophysiology includes airway inflammation, bronchial hyperresponsiveness, and reversible airway obstruction.

Symptoms:

- Shortness of breath
- Wheezing
- Coughing, especially at night or early morning
- Chest tightness

Triggers:

- Allergens (dust mites, pollen)
- Cold air
- Exercise
- Air pollution
- Respiratory infections

Conventional Treatments:

- Inhaled corticosteroids
- Beta-agonists
- Leukotriene modifiers

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Despite their effectiveness, these treatments may cause side effects such as osteoporosis, immunosuppression, and growth retardation in children.

III. NEED FOR HERBAL DRUGS IN ASTHMA

There is a growing need for alternative therapies due to:

- Side effects of allopathic medications
- Resistance to conventional drugs
- Preference for natural remedies
- Cost-effectiveness
- Holistic health approach

Herbal medicines have been used in traditional systems like Ayurveda, Traditional Chinese Medicine, and Unani for centuries to treat respiratory disorders including asthma.

IV. HERBAL PHARMACOLOGY

Herbal pharmacology involves studying the biological activities of plant-based compounds used in medicine. Herbal anti-asthmatic agents can be classified into:

- Bronchodilators
- Anti-inflammatory agents
- Mucolytics
- Immunomodulators

Phytoconstituents:

- Alkaloids (e.g., vasicine)
- Glycosides
- Saponins
- Tannins

These constituents are responsible for the therapeutic actions of the herbs.

V. COMMONLY USED HERBAL DRUGS IN ASTHMA

Herb	Botanical Name	Active Constituents	Therapeutic Effect
Vasaka	Adhatoda vasica	Vasicine	Bronchodilator, expectorant
Licorice	Glycyrrhiza glabra	Glycyrrhizin	Anti-inflammatory
Turmeric	Curcuma longa	Curcumin	Antioxidant, anti- inflammatory
Holy Basil	Ocimum sanctum	Eugenol	Immune-modulator
Long Pepper	Piper longum	Piperine	Respiratory stimulant
Ginger	Zingiber officinale	Gingerol	Anti-inflammatory, antitussive
Tylophora	Tylophora indica	Tylophorine	Antiasthmatic

VI. DETAILED STUDY OF SELECTED HERBS

6.1 Adhatoda vasica (Vasaka)

- Family: Acanthaceae
- Active Constituents: Vasicine, Vasicinone
- Pharmacological Actions: Bronchodilator, expectorant, anti- inflammatory
- Mechanism: Vasicine relaxes the smooth muscles of the bronchi and helps clear mucus from the lungs.
- Dosage Forms: Syrups, decoctions, tablets

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Fig 1: Adhatoda vasica

6.2 Glycyrrhiza glabra (Licorice)

• Family: Fabaceae
• Active Constituents: Glycyrrhizin, flavonoids
• Actions: Anti-inflammatory, demulcent, immune-modulatory
• Use: Soothes sore throat, reduces bronchial irritation, and modulates cortisol metabolism
• Forms: Powders, teas, syrups

Fig 2: Glycyrrhiza glabra

6.3 Curcuma longa (Turmeric)

• Family: Zingiberaceae
• Active Constituent: Curcumin
• Action: Antioxidant, anti-inflammatory, antimicrobial
• Benefit: Reduces inflammation in the airways
• Usage: Capsules, decoctions, mixed with milk or honey

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Fig 3: Curcuma longa

6.4 Ocimum sanctum (Tulsi)
• Family: Lamiaceae
• Active Compounds: Eugenol, rosmarinic acid
• Action: Adaptogen, anti-allergic, expectorant
• Helps: Reduces allergic responses and inflammation

Fig 4: Ocimum sanctum

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6.5 Piper longum (Pippali)
• Family: Piperaceae
• Active Constituent: Piperine
• Action: Bronchodilator, respiratory stimulant
• Enhances bioavailability of other drugs

Fig 5: Piper longum

6.6 Zingiber officinale (Ginger)
• Family: Zingiberaceae
• Active Compounds: Gingerol, shogaol
• Uses: Anti-inflammatory, prevents nausea. antitussive

Fig 6: Zingiber officinale

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6.7 Tylophora indica

• Family: Asclepiadaceae
• Active Component: Tylophorine
• Action: Immunosuppressive, anti-asthmatic
• Used in chronic asthma and allergies

Fig 7: Tylophora indica

1. Mechanism of Action of Herbal Drugs

• Bronchodilation: Relaxation of bronchial muscles (e.g., vasicine)
• Anti-inflammatory Effects: Inhibition of inflammatory cytokines
• Immune Modulation: Regulation of T-helper cell response
• Antioxidant Activity: Scavenging of free radicals (e.g., curcumin)
• Expectorant Action: Enhancing mucociliary clearance

2. Dosage Form & Formulation

• Syrups: Herbal cough syrups containing vasaka, tulsi, and licorice

S. No.	Ingredient	Quantity (% w/v or as needed)
1.	Vasaka extract (Adhatoda vasica)	5gm
2.	Tulsi extract (Ocimum sanctum)	3gm
3.	Licorice extract (Glycyrrhiza glabra)	2gm
4.	Sugar (Sucrose)	60gm
5.	Glycerin	10ml
6.	Methylparaben (preservative)	0.1gm
7.	Propylparaben (preservative)	0.02gm
8.	Citric Acid (pH adjuster)	0.3gm
9.	Flavour (e.g., menthol or honey flavor)	q.s.
10.	Purified Water	Up to 100 ml

Procedure:

1. Preparation of Extracts (if not using ready-made extracts):

o Vasaka: Dry Vasaka leaves are coarsely powdered and boiled in water (1:10 ratio) for 30–45 minutes. Filter and concentrate to obtain a thick extract.

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o Tulsi & Licorice: Similar decoction process is followed for these herbs.
2. Preparation of Sugar Syrup:
o Dissolve sucrose in 70 ml of warm purified water with continuous stirring.
o Add citric acid and mix well.
o Cool the solution to room temperature.
3. Addition of Extracts:
o Add measured quantities of vasaka, tulsi, and licorice extracts to the sugar syrup.
o Stir thoroughly to ensure uniform mixing.
4. Addition of Excipients:
o Add glycerin to improve viscosity and palatability.
o Add preservatives (methylparaben and propylparaben) dissolved in a small amount of warm water or alcohol.
o Add flavoring agents like menthol, honey, or lemon (optional).
5. Make Up Volume:
o Add purified water to make up the final volume to 100 ml.
o Mix thoroughly to ensure a homogenous syrup.
6. Filtration:
o Filter the syrup through muslin cloth or appropriate filters to remove any suspended particles.
7. Filling & Packaging:
o Fill the syrup in sterilized amber-colored bottles to protect it from light.
o Label with batch number, manufacturing date, expiry date, and dosage instructions.

3. Advantages of Herbal Medicines over Allopathy
• Minimal side effects
• Suitable for long-term use
• Holistic approach (physical and mental health)
• Easily available and cost-effective
• Better patient compliance in chronic conditions

4. Limitations and Challenges
• Lack of standardization
• Inconsistent quality and potency
• Limited clinical trials
• Slower onset of action compared to allopathy
• Risk of adulteration or contamination

5. Evaluation Parameters:
• Physical appearance: Color, clarity, viscosity
• pH: Should be between 4.5 to 6.5
• Microbial limit test: Ensure absence of harmful microorganisms
• Shelf life: 6–12 months with preservatives

6. Result:
A polyherbal cough syrup was successfully formulated using aqueous extracts of Adhatoda vasica (Vasaka), Ocimum sanctum (Tulsi), and Glycyrrhiza glabra (Licorice). The formulation process yielded a dark brown, sweet, viscous liquid with a pleasant herbal aroma and taste.

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Parameter Observation/Result
Color Dark brown
Odor Characteristic herbal smell
Taste Sweet, palatable

Parameter Observation/Result
Consistency Syrupy, smooth
pH 5.8 (within acceptable range for oral syrup)
Microbial test Passed – No harmful microbial growth
Stability (1 month study) No changes in color, pH, or odor observed

Herbal drugs offer a promising alternative or complementary approach for asthma management. With further research and clinical validation, they can be incorporated into mainstream healthcare systems to improve patient outcomes and reduce dependence on synthetic drugs.

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