

## A review on Typical Plants approached in the management of asthma from the Maharashtra

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**ABSTRACT:** Asthma is a chronic obstructive lung disease that affects over 230 million people globally and is a major cause of morbidity in individuals of all ages. This review will provide a quick summary of the various mechanisms involved in the pathophysiology of asthma, as well as a range of cells and mediators released by these cells, all of which play a significant role in the pathophysiology of asthma. Throughout human history, herbs have been regarded as a valuable source of medicine. They are frequently employed today, demonstrating that herbs are becoming an increasingly important aspect of modern, high-tech treatment. Plant-derived chemical moieties are found in 25-30% of today's prescription medications. Bronchial asthma is an airway illness that causes swelling and narrowing, resulting in wheezing, shortness of breath, chest tightness, and coughing. Bronchial asthma is an airway illness that causes swelling and narrowing, resulting in wheezing, shortness of breath, chest tightness, and coughing.

Keywords: Bronchial asthma; Etiology; Pathophysiology ; Oxidative stress; Herbal product

### INTRODUCTION:

The National Institute of Health Guidelines for Asthma (NY Guidelines) C37 from 1991, 1997 and 2007. The inflammation causes an increase in the already present bronchial hyperresponsiveness to a number of stimuli. [8]. It is estimated that over 5.4 million individuals in the UK are currently diagnosed with asthma, with 11 million of them being children. Asthma kills 1,200 people in the United Kingdom per year, or one person each time every eight hours. Despite increased knowledge, this figure has remained steady in recent years[2].

Although regular use of inhaled corticosteroids (ICS) lowers mortality, the incidence and prevalence of asthma are growing. Therapies and therapeutic targets are required for better control of symptoms and exacerbations in severe asthma patients, as well as to minimize harmful effects produced by the administration of oral Corticosteroids (Coc) [4]. Asthma is most likely transmitted by numerous genes, with considerable variance in locus heterogeneity and polygenic inheritance resulting in diverse asthma manifestations. Atopy or IgE antibodies target specific antigens or contaminants, which can exacerbate the condition. According to research, asthma is directly associated with total IgE serum levels.

Definition : Asthma is the chronic disease of the air passage characterized by inflammation and narrowing of airway[1].

### Symptoms :

1. Dyspnea (shortness of breath) : Shortness of breath is a major source of pain for asthma patients.
2. Wheezing: The attack begins with a little wheezing and quick inhalations, and as it grows more severe, breathing becomes more difficult.
3. Coughing : In a few cases, an ineffective cough is the first sign of asthma.
4. Sweating and fast heart rate : The conclusion of an attack Coughing that produces thick mucus is a common symptom.
5. Chest tightness : Preliminary chest tightness without other symptoms may be an early warning indication of a severe attack. Even though it lacks strength, it can be incredibly

severe. essential In relation to the security of the asthma attack [6].

#### Available treatment:

The goals of asthma treatment for children and adults are to reduce both the symptom load (daily symptoms, disturbed sleep, ) and activity limitation) and the risk of unfavorable asthma outcomes. Exacerbations, prolonged airflow limitation, and drug adverse effects are also possible [7] . There are a variety of treatments available to assist effectively control or soothe asthmatic symptoms. Treatment is focused on two major goals: (I) particular regimens for treating acute attacks by opening enlarged airways that are impeding breathing, and (ii) preventative methods to minimize inflammation and airway resistance while maintaining airflow. Treatment and prevention entail a combination of medications, lifestyle recommendations, and recognizing and avoiding potential asthma triggers [18].

For the treatment of asthma symptoms, inhaled quick acting beta agonists are preferable to reliver medicine and should be provided to all asthma patients. Most pulmonary function laboratories utilize a Ploo valve less than 4.8 mg Imb as the threshold for certain short acting beta agonist SABAS: eg salbutamal terbutaline and formoteralmethacholine. PC20 for a positive result indicating airway hyperreachvis supporting an asthma diagnosis. Spirometry is used to assess the patients blockage and to check for a reversible change after a bronchodialator 15. Suggestive of an asthma diagnosis.l [8] .

Pholctains can diagnose asthma and the severity of blockage using spirometty. The air is spirometry of five or less than 08, and the B. When the FFUL/FVC ration is less than 0.70, the no for FEA/fve ration FEV1/FVC ration is lower [9] . A prescription is given to an adult patient asix-to-eight week trial of Inhaled beclometasone 200 Aug twice a day or two weeks of or Prednisolone 30 my daily, A improvement in FEUL OF 400 ml or more after trials very suggestive[2] .

Depending on the severity of the asthma illness, the British Thoracic Society advises a five-step approach to therapy

- Step 1: Inhaled short-acting p2 adrenoceptor agonists for mild intermittent asthma.

- Step 2: Begin regular preventer medication with an inhalation steroid dose suitable to the severity of the condition.
- Step 3: Add-on therapy consists of inhaling a long-acting P2 agonist.
- Step 4: If poor control persists, consider increasing the dose of inhaled steroid and/or adding a fourth medicine.
- Step 5: Continuous or frequent use of oral steroid — use daily steroid tablet in lowest dose to give acceptable control, maintain high dose inhaled steroid as in Step 4; investigate alternative treatments to reduce steroid tablet use

The British Thoracic Society also advised a therapy plan that is likely to result in speedy recovery[17].

#### Pathophysiology:

Asthma is a condition characterized by acute, totally reversible airway inflammation, which frequently occurs after exposure to an environmental cause. The pathogenic process begins with inhalation of an irritant, such as cold air, or an allergen (such as pollen), which causes airway inflammation and a rise in murous production due to bronchial hypersensitivity [1] . Asthma is usually caused by an allergic reaction to an allergen and is mediated by immunoglobulin F (IgE). IgE is produced in reaction to allergens such as pollen or animal dander. Initially, sensitisation occurs. Expausere produces allergen-specific Ige antibodies that bind to the surface of mast cells. Allergens attach to allergen-specific IgE antibodies on the surface of most cells, resulting in an antigen-antibody complex. Inflammatory mediators such as leukotrienes, histamine, and prostaglandins are released. There is a branchopalm causing an asthma attack to a attack [2] . The majority of asthmatics have type & inflammation, which is named after the type 2 T helper cell lymphocyte. Type 2 inflammation is related with a specific take profile (interleukin [IL]-4, IL-S, and IL-14) and inflammatory cells Ceosinophiles, mast cells, basophiles, Type-II helper lymphocytes, and immunoglobulin found in allergy generating plasma cells [3] .

#### Etiology:

The etiology of bronchial asthma is uncertain, however its pathophysiology is thought to be influenced by both hereditary and environmental factors. Indoor allergens (such as dust mites, dogs, and cockroaches) are examples of environmental substances that can induce asthma. In the case of the addition mutation The ORM gene has been found to be closely associated to the onset of asthma in research on single nucleotide polymorphisms (SNPs), (13). Asthma is also linked to tobacco smoke and other inflammatory substances such as matter Co. Particulate. Genetic factors are known to play a role, with asthma coith heritability ranging from 35 to 95 percent. 4. Hundreds of genetic variants associated with an elevated risk of asthma have been found in big genetic studies [3].

#### Diagnoses and risk factors :

The risk factors for each identified phenotype of asthma include genetic, environmental, and host factors; however, while a family history of asthma is common, it is not sufficient nor essential for the development of asthma [10].

1. Genetic: family and twin investigations have revealed this. that genetics play a substantial influence in the development of asthma and allergies, most likely through several genes with a modest effect. We suspect that there is significant variation in the genetic foundation of asthma and in gene-environment interaction [10].
2. Air pollution: Both indoor and outdoor air pollution have increased in tandem with urbanization and population growth. Factors that contribute to the development and aggravation. asthma, particularly in the underdeveloped world. The polluter. Nitrogen dioxide, ozone, and volatile organic compounds are all involved in asthma. Pollutants [11]. compounds Type 2 response can be induced in the airways of an allergic asthma mouse model. - Following contact with a home dust mite (HDP).
3. Parental Danger: Parental risk factors for the development of asthma include ethnicity, low socioeconomic position, stress, Caesarean delivery, and maternal tobacco smoking, whereas pot-postnatal risk factors include

endotoxins and allergens in the house, as well as antibiotics.

4. Bacterial pathogens : Along with the possibility of the intestinal microbiota being involved in asthma, there is growing recognition that the presence of microorganisms in the respiratory tract, including the upper airways, and how the immune system responds to these, is likely to have an effect on respiratory health. [11] The nasal, lungs, and gut microbiota all play critical roles in the development, control, and maintenance of health and immune response [9].
5. Supplement, nutriating , and antacid medication: The effects of genetic and microbial dysbioses on fatty acid metabolism are briefly reviewed. A Korean study discovered that fast food consumption was connected to asthma incidence in adolescents but not in adults, with instant noodles having higher Impad in adults than in adolescents. Vitamin D is another supplement that has been studied as an early preventative strategy for asthma. Tomita et al. proposed a relationship wager? the use of acid-suppressive medications such as histamine 2 receptor antagonists and proton pump inhibitors in excess [4].
6. Parental tobacco smoke : Materia antenatale Smoking has consistently been linked to childhood obesity. wheeze, and there is a dose response relationship between exposure and reduced in early life.
7. Obesity : Both in children and adults. Obesity and being overweight have been related to an increased risk of acquiring asthma. Obese people are more likely to have severe asthma that is difficult to manage.

#### Diagnosis :

The diagnosis is based on probability and takes into account symptoms and variable expiratory airflow in limitation. Asthma is a varied disease, and one or both of these symptoms may not be present in some patients [1] . Children and adults with a high likelihood of asthenia usually begin a therapy trial in which their response is measured using spirometry. Lung function tests are frequently performed on children and people who

have an intermediate risk of asthma. Spirometry, peak flow, and airway responsiveness are a few examples [2] . Trial of treatment (8-12 weeks of daily ICS and short lasting bronchodilator as needed for rescue medication) is a good approach of verifying diagnosis in young children [8] .Asthma is a lower respiratory tract condition that affects men and women of all ages. It is clinically diagnosed, but there is no single gold standard test available; there is significant heterogeneity in the etiology and clinical presentation of asthma, and clinical overdiagnosis can occur, particularly in

those lacking spirometric confirmation [12] . Broncho provocation test Testing and screening for airway inflammatory indicators may also be useful in detecting the disease, especially when objective measurements of lung function are normal despite the presence of asthma symptoms [5].

Classification of asthma: Based on the stimuli initiating bronchial asthma, two broad etiologic types are traditionally described: extrinsic (allergic, atopic) and intrinsic pattern. Contrasting features of the two major types of asthma.

TABLE 1: TYPES OF ASTHAMA [20]

Feature	Extrinsic asthma	Intrinsic asthma
Age at onset	In childhood	In adult
Serum IgE level	Elevated	Normal
Personal/family history	Commonly	Absent
Preceding allergic illness (atopy)	Present (e.g. rhinitis, urticaria, eczema)	Absent
Allergens	Present (dust, pollens, andesitic.)	None
Drug hypersensitivity	None	Present (usually in Aspirin)
Drug associated chronic bronchitis nasal polyps	Absent	Present
Emphysema	Unusual	Common

**Herbal formulations:**

Many Ayurvedic plants have been described as effective in the treatment of bronchial illnesses such as bronchial asthma (Kumar Suresh 1979). In the last two decades, the usage of therapeutic herbs and natural products has expanded dramatically all over the world. More than 400 medicinal plant species have been used ethanopharmacologically and traditionally to treat the symptoms of asthmatic and allergy illnesses around the world.

The historical significance of herbal medicine in the treatment of asthma is undeniable. Four of the five families of medications currently used to treat asthma, namely analogues, anticholinergics, methylxanthines, and cromones, have their beginnings in herbal remedies dating back at least a few years [19].

**Prevention :**

Doctors don't know what causes asthma to develop in the first place. The condition appears to be caused by a combination of hereditary and environmental factors. Having said that, there are known risk factors for asthma. Breathing Air pollution including allergens, irritants, or poisons in the air can increase a person's risk of having asthma [15].

Allergens avoidance : Specific allergy avoidance and alm techniques to reduce asthma have resulted. Disappointing outcomes. This finding could imply that allergic sensitization has no effect on asthma, or that the process of allergic sensitization in general, rather than sensitization to specific allergens, is important in the condition.

Dietary measure : Breast feeding is one of the most well-researched asthma preventive methods. A big the recently finished, but the results

have yet to be announced. Finally, dietary supplementation with fish oils, an important source of long chain Polyunsaturated fatty acids, has received attention due to the immune modulatory activities of metabolically produced altered and less active eicosanoid derivatives rather than those derived from arachidonic acid.

Despite the theoretical benefits of fish oil supplementation, attempts to use fish oil to prevent asthma have proven futile.

Microorganism exposure: Microbial exposures play an important role in priming immunological responses, especially early in development. Exposure sources include. Certain allergies and lifestyle conditions. Environmental factors, such as preventative strategies, can help with various types of asthma. Avoidance of active and passive cigarette smoke, obesity, and attainment of a balanced diet are all Risk factors. Including appropriate micronutrients like Vitamin D [15].

**1) *Aerva lanta* linn.**

Synonyms -kumra , Bui (Marathi)  
 Geographical source -it's found in the Europe to America, Asia. Chemical constituents-alkaloids, cevrine, methyl leriun, ervoside, ervolanin, lupieol, and aervolanine, flavonoids, methyl grevillate, acetate benzoic acid and tannic acid.  
 Family – Amaranthaceae  
 Use – Diuretic , anti-inflammatory, anti-biotic, anti-asthmatic, anti-fertility , antimicrobial



Figure 1. *Aerva lanta* linn

Table no 2 : Taxonomy [21]

Kingdom	Plantae
Sub. kingdom	Tracheobionta
Division	Magnoliophyta
Class	Magnoliopsida

Subclass	Caryophyllidae
Order	Coryophyllaies
Family	Amaranthaceae
Genus	Aerva

**2) *Aregemone Mexicans***

Synonyms – Maxican prickly poppy, agar , phirangi dhotra (Marathi)

Geographical source -its native topical America which has distributed in tropical and subtropical region of the world. In India, it grows in the temp region as weed in waste land cultivating fields and rod side [23].

Chemical constituents- Beberine, protopine, argenaxine , ferulic acid, cinnamic acid, benzoic acid

Family – papaverceae

Use – Antioxidant , antibacterial, antimal6, antias6, antidibetic, wound helling property



Figure 2 *Aregemone Mexicans* [32]

Table no 3 : Taxonomy [22]

Kingdom	Plantae
Phylum	Spermatophyte
Division	Angiosperms
Class	Picotyledone
Order	Papaverales
Family	Papaveraceae
Genus	<i>Aregemone</i>
Species	<i>Aregemone Mexicana</i>

**3) *Asystasia gangetica***

Synonyms – chinese Violet , lavana valli (Marathi)



Geographical source -it's found in Tamil Nadu, southern part India, Marudhmalai hills, southern Africa .

Chemical constituents- carbohydrates , protein, alkaloids, tannins, steroidal aglycans, saponins, flavonoids, triterpenoids, copper, zinc



Figure 3 Asystasia gangetica

Family – Acanthaceae

Use – hypoglycemic and hypolepidemic activity, Antioxidant activity, antiastmatic, Antimicrobia

Table no. 4 : Taxonomy [24]

Kingdom	Plantae
Division	Manganolipophyta
Order	Scrophulariales
Family	Acanthaceae
Genus	Asystasia Blume
Species	Asystasia gangetica

#### 4) Bacopa monnieri

Synonyms – Brami , Nira-brahmi (Marathi)

Geographical source -its found to the tropical regions like India,Nepal, srilanka,china, Pakistan,Taiwan, vaiwan, southern Africa, Australia

Chemical constituents- saponin glycoside, Asiatic acid, tannins, alkaloids, flavonoids

Family – plantaginaceae

Use – anti -depressnt, memory and thinking skills improvement epilepsy, ulcer, cancer, Antiasthma



Figure 4 Bacopa Monnieri -creeping herb [33]

Table no. 5 : Taxonomy [25]

Kingdom	Plantae
Division	Tracheophyta
Class	Mangnoliopsida
Order	Lamiales
Family	Plantaginaceae
Genus	Bacopa
Species	Bacopa monnieri

#### 5) cassia sophera

Synonyms - baner, algarrobilla, kasunda, kasaundi, Ram-takla (Marathi )

Geographical source -its found in Himalaya, western, eastern and southern India,Burma and srilanka

Chemical constituents- achrosin, aloe-emodin emodin, linolenic acid, chrysophanic acid, linolenic acid, kaempferol, mannitol, oleic acid

Family – fabaceae

Use – anti -asthmatic , constipation, Hepatities



Figure 5 cassia sophera

Table no. 6: Taxonomy [26]

Kingdom	Plantae
Division	Mangnoliophyta
Sub division	Spermatophyte
Class	Mangnoliopsida
Order	Fabales
Family	Fabaceae
Genus	Cassia
Species	Occidentalis

6) **Eclipta Alba Linn**

Synonyms – false Daisy , Bhringraja (Marathi)  
 Geographical source -its found growing wild in fallow lands of Bangladesh  
 Chemical constituents- ursolic acid , Amyrin, stigmaterol, oleanolic acid, ursolic acid, wedelol acetone  
 Family – Asteraceae  
 Use –antiasthmatic , hepatoprotective activity, gastrointestinal order, respiratory tract disorder, skin disorder, Anti-malarial



Figure 6 Eclipta Alba Linn (HassK) [34]

Table no. 7 : Taxonomy [27]

Kingdom	Plantae
Sub Kingdom	Viridaplantae
Infra Kingdom	Streptophyta
Division	Tracheophyta
Sub division	Spermatophytina
Infra division	Angiosperms
Class	Mangnoliopsida
Order	Asterales
Super order	Asterane
Family	Asteraceae
Genus	Eclipta L

Species	Eclipta Alba Linn
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7) **Hemidesmus indicus**

Synonyms – Anantmoool, Aantavel (Marathi)  
 Geographical source -its widely distributed India, Pakistan, srilanka, Bangladesh, Iraq and indones  
 Chemical constituents- Lupeol acetate , vanillin, 3-hydroxy-4-methoxy , benzaldehyde, coumarinoliqnoids  
 Family – Asclepiadaceae  
 Use – anti -asthmatic , Antileprotic, Antiacne , Antivenom



Figure 7 Hemidesmus indicus

Table no.8 : Taxonomy[28]

Kingdom	Plantae
Phylum	Tracheophyta
Class	Mangnoliopsida
Order	Gentianales
Family	Asclepiadaceae
Genus	Hemidesmus
Species	Indicus
Common name	Indian sarsaparilla

8) **Nyctanthes arbortistics**

Synonyms – night Jasmine, prajkta (Marathi)  
 Geographical source -its found in southern Asia, Northern, Pakistan and Nepal, southern Thailand also commonly found in Himalaya Jammu and Kashmir  
 Chemical constituents- alkaloids, tannins, glycoside, oleanolic acid , sitosterol, oleanolic acid, volatile oil, glucose  
 Family – Oleaceae  
 Use – anti – helminthic, Anti inflammatory, Anti oxidant, CNS depressant



Figure 8 Nyctanthes arbor-titica [35]

Table no. 9 : Taxonomy [29]

Kingdom	Plantae
Division	Angiosperms
Class	Eudicots
Order	Lamiales
Family	Oleaceae
Genus	Nyctanthes
Species	Arbor – titica

9) **cynodon dactylon**

Synonyms – Durva Grass, Bermud grass, Durva (Marathi)

Geographical source -its found in India

Chemical constituents- glycoside, saponins, tannins, flavonoids and carbohydrates

Family – poaceae

Use – anti-asthmatic diarrhoea, bronchitis, calculus, cancer, carbuncle, leucoderma, cramps,



Figure 9 cynodon dactylon

Table no. 10: Taxonomy [30]

Kingdom	Plantae
Division	Mangliophyta
Class	Liliopsida
Order	Lamiales
Family	Poaceae
Genus	Cynodon N
Species	Doctylon

10) **Momordia dicocia**

Synonyms – spiny gourd , kakora , karale (Marathi)  
 Geographical source -its found in generally indian ,Pakistan, Assam, and Grohills of Meghalya

Chemical constituents- crude protein 5.44%, crude lipid 3.25%, fiber 22.9%, carbohydrates 59.31%, carotene thiamine , ribosulfavin

Family – Asteraceae

Use –Antiasthmatic , dietary fibre mineral decrease sugar levels in blood, Anti cancer, Anti oxidant



Figure 10 Momordia dicocia

Table no. 11: Taxonomy [31]

Kingdom	Plantae
Sub Kingdom	Trancheobionta
Division	Mangliophyta
Sub division	Spermatophyte
Class	Mangnoliopsida
Sub class	Dillenide
order	Violales
Family	Cucurbitaceae
Genus	Momordica
Species	Dioica



11) withiniya somnifera  
 Synonyms – Balya , Vajikari , vajigandha , varahakarhi , Ashwagandha (Marathi)  
 Biological source –It is derived from the roots of withiniya somnifera.  
 Chemical constituents- alkaloids , steroidal lactones and saponins  
 Family – Boost energy and reduce stress and anxiety , Antiasthmatic



Figure 11 withiniya somnifera

Table no 12 : Taxonomy [36]

Kingdom	Plantae
Sub Kingdom	Tracheobionta
Division	Angiosperms
Sub division	Spermatophyte
Class	Dicotyledon
order	Tubifloare
Family	Solanceae
Genus	Withinia
Species	Somnifera Dunal

12) Zingiber officinale  
 Synonyms- Zingiber , Roscoe var , Sunti val  
 Biological source – It is herbaceous lowering plant that belongs to family zingiberaceae  
 Chemical constituents- Gingerols , shogalos , paradols , and essential oil  
 Family – Zingiberaceae  
 Use – Antioxidant , Anti-cancer, anti-inflammatory, antiasthmatic

Table no. 13 : Taxonomy [37]

Kingdom	Plantae
order	Zingiberales

Family	Zinzeberacea
Genus	Zingiber
Species	Zingiber officinale



Figure 12 Zingiber officinale

### CONCLUSION:

As a result of this review, we can conclude that there are numerous benefits to using herbal medicine to treat asthma. Many studies have shown and proven that many herbs or traditional methods such as CAM (complementary and alternative medicines) have a significant increase in the effectiveness of treating asthma. As a result, it is required for all. Clinicians should be aware of the high prevalence of herbal and ayurvedic interventions available for asthmatics, as opposed to using modern methods such as steroids and bronchodilators, which have negative side effects. Asthma is a diverse disease that affects millions of people worldwide. It is distinguished by airway hyperresponsiveness and inflammation, as well as variable airflow obstruction. Understanding the various phenotypes and pathophysiologies, as well as providing individualised treatment tailored to the patient's multiple conditions and lifestyle, is critical in asthma management.

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