

Pakistani Medicinal Plants Used to Treat Asthma

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Abstract

A long-term inflammatory respiratory disease that presents serious health hazards is asthma. Traditional medicine is used to treat it in Pakistan and other nations where it is common. With an emphasis on their pharmacological characteristics, traditional applications, and medicinal efficacy, this review investigates the use of Pakistani medicinal plants in the management of asthma.

*According to a thorough analysis of literary and ethnobotanical sources, asthma is traditionally treated in Pakistan with a variety of herbs. These include herbs with bronchodilator, anti-inflammatory, and antioxidant properties such as *Piper nigrum* (black pepper), *Eucalyptus globulus* (eucalyptus), and *Zingier officinal* (ginger). The study assesses the evidence supporting these plants' potential to enhance lung function and reduce asthma symptoms from in vitro, in vivo, and clinical investigations.*

The processes by which these plants influence inflammatory pathways and enhance lung health are also examined in this study. The study emphasizes the necessity of thorough clinical trials to support conventional claims and guarantee safety and efficacy, even in the face of encouraging evidence. To give a thorough understanding of the role Pakistani medicinal plants play in the treatment of asthma and the potential integration of these plants into existing therapeutic methods, a synthesis of traditional and scientific knowledge has been carried out.

1. Introduction

Chronic respiratory tract inflammation, coughing, wheezing, and chest pain are all symptoms of asthma. The most prevalent debilitating syndrome among the several respiratory distresses that affect humans is bronchial asthma, which affects 7 to 10 percent of people worldwide [1]. Environmental variables such as dust, pollen, cold, and psychological impacts can induce asthmatic characteristics. According to a National Asthma Campaign survey, 60–70% of persons with moderate-to-severe asthma treated their illness with complementary and alternative medicine [2].

Currently, methylxanthines, chromones, anticholinergics, and antagonists are utilized to treat asthma. They originated at least 5000 years ago as herbal remedies [3]. More than thirty percent of plant species are utilized medicinally. Plant-based medications make up as much as 25% of all medications in the United States, whereas around 80% of pharmaceuticals in underdeveloped nations are made from plants [4]. Asthma is caused by a variety of cells and cellular byproducts, such as mast cells, eosinophils, T lymphocytes, neutrophils, macrophages, and epithelial cells. High concentrations of certain IgE antibodies that attach to mast cell receptors are seen in asthmatic patients [5]. Bronchoconstriction and smooth muscle contraction result from the IgE antibody's cellular response to the antigen.

The therapy of asthma is effectively aided by medicinal herbs that possess anti-inflammatory, immunomodulatory, antihistaminic,

smooth muscle relaxant, and anti-allergic properties [6]. Asthma is a global issue that affects about 300 million people worldwide, causes 0.25 million deaths globally each year, and is expected to affect 0.1 billion people by 2025 [7, 8]. Because of so many negative side effects, asthma therapy does not achieve the desired results. As a result, people are drawn to complementary and alternative medicine for the treatment of asthma [9].

Achieving wide clinical control is the primary goal of the treatment, which calls for achieving a symptom-free state and reducing future dangers to the patient. It involves developing lung function, reducing the need for an inhaler, and alleviating symptoms. The lack of acute asthmatic exacerbations results in an improvement in lung function [10].

Historically, people have utilized herbs to cure a variety of illnesses. Historically, asthma has been treated using a variety of medicinal plants. There is utilization of bark, fruit, roots, flowers, leaves, even entire plants. Easy to obtain and collect, inexpensive, and with fewer side effects in a region that is good for the environment [11]. The use of medicinal plants is therefore recommended. The management of asthma is aided by the anti-inflammatory, anti-histaminic, and mast cell stabilizing properties of numerous herbs. When using plants in combination, managing a disease is typically successful. According to certain theories, using a mixture of plants to treat asthma will have a synergistic impact that is more potent than using each plant alone [12, 13].

S/no	Botanical Name	Local Name	Family Name	Parts Used
1.	<i>Arnebiabenthamii</i> Wall. ex G. Don	Kazaban	Boraginaceae	Leaves, Flowers
2.	<i>Astragaluszankarensis</i> Fisch	Hapocho	Papilionaceae	Roots
3.	<i>Fragaria nubicola</i> L	Ichja, Bursay	Rosaceae	Whole Plant
4.	<i>Hippophaerhamnoides</i>	Boroh	Elaeagnaceae	Fruits
5.	<i>Hyocyamusniger</i> L	Bazarbung	Solanaceae	Flowers, seeds, Leaves and Bark
6.	<i>Amaranthus spinosus</i> L	Chalvere	Amaranthaceae	Pollen grain and roots
7.	<i>Coriandrum sativum</i> L	Dhanya	Brassicaceae	Fresh leaves
8.	<i>Datura stramonium</i> L	Datoora	Solanaceae	Flowers and seeds
9.	<i>Solanum xanthocarpum</i> L	Mara gone	Solanaceae	Roots
10.	<i>Artemisia macrocephala</i>	Jahoo	Asteraceae	Shoot and Leaves
11.	<i>Taxus baccata</i> L.	Thonri	Taxaceae	Whole Plant
12.	<i>Cousiniastocksii</i> C. Winkler	Naryan Band	Asteraceae	Gum and roots
13.	<i>Ephedra intermedia</i> Stapf	Naromb	Ephedraceae	Whole plant
14.	<i>Adhatodavastica</i>	Baker/Arusa	Acanthaceae	Whole plant
15.	<i>Euphorbia hirta</i> L.	Dudhi	Euphorbiaceae	Whole plant
16.	<i>Solanum surrattense</i>	Kandiari	Solanaceae	Whole plant
17.	<i>Achyranthes aspera</i> L.	Puthkanda	Amaranthaceae,	Whole Plant, Stem, Leaves, Root
18.	<i>Amaranthus viridis</i> L.	Ganhar	Amaranthaceae	Leaves, Seed, Root.
19.	<i>Calotropis procera</i> Br.	Akh	Asclepiadaceae	Stem and Leaves
20.	<i>Sonchus asper</i> Hill.	Asgandh	Asteraceae	Leaves, Root, Shoots, Whole Plant
21.	<i>Euphorbia helioscopia</i> L.	Chhatri dodak	Euphorbiaceae	Root, Whole Plant, Shoot,Seed
22.	<i>Euphorbia pilulifera</i> L.	Doddak	Euphorbiaceae	Leaves, Flower, Seed, Whole Plant.
23.	<i>Acacia modesta</i> Wall.	Phulai	Fabaceae	Stem, Leaves, Bark.
24.	<i>Alhagimaurosum</i> Medik	Jawansa	Fabaceae	Root, Flower, leaves
25.	<i>Prosopis juli</i> oraSwartz	Mosquit pod	Fabaceae	Whole plants, Flower, Leaves, stem
26.	<i>Hibiscus rosa-sinensis</i> L.	Gurhal	Malvaceae,	Flower, Leaves, Root
27.	<i>Malvastrumtricuspidatum</i> A. Gray	DhamniButi	Malvaceae,	Leaves, whole plant
28.	<i>Ficus religiosa</i> L.	Pipal	Moraceae	Leaves, fruit, stems, roots.
29.	<i>Morus nigra</i> L.	Kala toot	Moraceae,	The whole plant, Root, Fruit, Leaves.
30.	<i>Boerhaviadiffuse</i> aL.	Itsit	Nyctaginaceae	Whole Plant; Leaves. Root.
31.	<i>Cenchrus pennisetiformis</i> Hoschst. &Steud.	Cheetah gha	Poaceae	Leaves, Fruit, Stem
32.	<i>Triticum aestivum</i> L.	Kanak	Poaceae	Shoot, Seed, Root
33.	<i>Ranunculus sceleratus</i> L.	Gul-e-ashrafi	Ranunculaceae	Whole plant, Seed, Root.
34.	<i>Zizyphusmauritiana</i> Lam.	Bairi	Rhamnaceae,	Leaf, Bark, Root.
35.	<i>Cannabis sativa</i> L.	Bhang	Urticaceae,	Leaves, Seed, Whole Plant.
36.	<i>Abutilon indicum</i> L. Sweet	Pat-tir.	Malvaceae	Leaves.
37.	<i>Caesalpinia bonduc</i> L. Roxb.	Kharpat.	Caesalpinaceae	Leaves and Seeds
38.	<i>Eclipta alba</i> . L. Hassk.	Bhangro	Compositae	Leaves.
39.	<i>Mangifera indica</i> L.	Anmb / Amm	Anacardiaceae	Fruit

Distribution of some Medicinal Plants used in the Management of Asthma in Pakistan.

2. Discussion

The immunological response to antibodies is promoted by T-helper cells. It facilitates the synthesis of IgE and cytokines. They cling to the mast cells and move through the bloodstream. The IgE antibody attaches itself to the antigen upon preexposure. This causes the mast cell to become disrupted, which in turn releases chemical mediators that cause hypersensitivity. Among the chemical mediators are kinin, thromboxane-A, prostaglandin, histamine, and serotonin. These chemical mediators cause

smooth muscle contraction, bronchoconstriction, and an increase in mucus production. IgE-mediated inflammation is the reason for the airways.

The current approach to managing asthma is to use bronchodilators to ease bronchospasm and corticosteroids to minimize inflammation. This is a symptomatic treatment that lasts a long time before becoming recurrent.

Medicinal herbs are made up of several chemical components. Secondary metabolites are thought to be responsible for the pharmacological properties of medicinal plants, which in turn lead to the development of novel medications. In Pakistan, receiving care according to custom is typically encouraged. Many people are dependent on conventional forms of care. Comparing synthetic medications to complementary and alternative medicine reveals a multitude of adverse effects. As a result, individuals are going back to using natural remedies. Different sections of plants are employed, and they are classified into different families. The best families to treat asthma include Solanaceae, Fabaceae, and Amaranthaceae.

Solanum anthocauli, *Datura stramonium*, and *Hyocyamusniger* are members of the Solanaceae family. The Fabaceae family includes *Acacia modest* Wall, *Alhagimaurosum* Medic, and *Prosopis juliform* Swartz, whereas the Amaranthaceae family includes *Amaranthus spinous*, *Achyranthes aspera*, and *Amaranthus veridic*. It's common to employ leaves, flowers, roots, bark, fruit, and entire plants. According to the review above, leave is primarily utilized for administration. Decoctions, extracts, juices, and powders are how they are given. Compared to complementary and alternative treatment, synthetic medications have a lot of adverse effects. As a result, more people are going back to natural medicine. Because there are few hazards involved with using herbs, they are the preferred treatment for asthma.

3. Conclusion

Medicinal herbs are widely used in traditional medicine. It is necessary to critically and impartially examine the traditional medical system. Subsequent research is necessary to determine the chemical responsible for the anti-asthmatic effect. Many herbs have anti-inflammatory, anti-histaminic, and mast cell stabilizing qualities that can be very helpful in the treatment of asthma. To see the aforementioned events, model screening is necessary. Investigating the efficacy of individual plants as well as plant combinations is crucial.

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