IJPSR (2014), Volume 5, Issue 10 (Review Article)

INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH

Received on 23 March 2014; received in revised form, 11 June 2014; accepted, 01 July 2014; published 01 October 2014

A REVIEW ON ANTIASTHMATIC ACTIVITY OF TRADITIONAL MEDICINAL PLANTS

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Keywords:

Asthma, Antiasthmatic, Traditional, Medicinal plants

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ABSTRACT: Plants have played an important role as various medicinal agents since ages. Medicinal herbs have been used in one form or another, under indigenous systems of medicine like Ayurveda, Siddha, and Unani. The knowledge of Indian medicinal plants and their uses in the Ayurvedic and Unani system of medicine have led to many scientific investigations and researches throughout the world. Asthma is a common disease that is rising in prevalence worldwide with the highest prevalence in industrialized countries. Asthma affects about 155 million people worldwide, and it has been estimated that is further 100 million will be affected by 2025. It has affected 14-15 million people in the United States, including an estimated 4.8 million childhoods. It accounts for about 11 million hospital visits annually and the sixth most frequent reason for visits in the ambulatory setting. It the past decade's research has been focused on scientific evaluation of traditional drugs of plant origin for the treatment of various diseases. Since the time immemorial, various herbs are used as antiasthmatic with efficient therapeutic response. India has about 45,000 plant species, and among them, several thousand are claimed to possess medicinal properties.

INTRODUCTION: Asthma is a disease of the lung's airways. It affects 155 million individuals in the world. Its Prevalence and severity among children have increased significantly in the world over the past 40 years. It varies from 5-30 percent in different population [1, 2]. It has affected 14-15 million people in the United States, including an estimated 4.8 million children.

QUICK RESPONSE CODE

DOI: 10.13040/IJPSR.0975-8232.5(10).4109-16

This article can be accessed online on www.ijpsr.com

DOI link: http://dx.doi.org/10.13040/IJPSR.0975-8232.5(10).4109-16

It is the most common chronic disease of childhood. It accounts for about 11 million hospital visits annually and the sixth most frequent reason for visits in the ambulatory setting. About 4, 70,000 patients are hospitalized, and more than 5,000 patients die annually due to asthma [3]. Asthma closely correlates with the description of the disease "Tamak Shwasa" recorded thousands of years ago by the sages and eminent scholars of Ayurveda [4].

Bronchial asthma is a chronic respiratory disorder affecting a large proportion of population throughout the world [5]. The plant is referred to as 'Jivanti' in Ayurvedic text and considered to be Rasayana (tonic) drug and is thus used to vitalize,

nourish and rejuvenate the body [6]. Ethno medicinally the leaves and seeds are used in asthma and cough [7]. The major therapeutic claim is its galactagogue action, which has been proved in rats [8] along with the antimicrobial [9], anticarcinogenic [10] and hepatoprotective properties of plant [12, 13] in traditional system of medicine leaves of *L. reticulata* (Retz) Wight & Arn are mainly used for the treatment of cough, asthma, rheumatism [8, 14].

Many asthma attacks are triggered by allergens, such as dust, mould spores, mites, animal hair or feathers but the onset may equally be caused by cold air, or it may be preceded by an infection such as a cold. Certainly, stress and more specifically, acute anxiety is known to be the immediate trigger for many attacks, and this can sometimes give rise to a vicious circle of asthma - anxiety about asthma - further attacks. Thus a wide range of etiological factors can be involved in this all too common problem [15].

Several different groupings can be applied:

- **Extrinsic Asthma:** Caused by allergic responses to house dust, animal fur, or various foods. Such causes 10-20% of adult asthma.
- **Intrinsic Asthma:** Caused by genetics, structural problems, infections, pollutants, and stress - both physiological and psychological. Such causes 30-50% of adult asthma. The symptoms of people with asthma differ greatly in frequency and degree. Some have an occasional episode that is mild and brief; otherwise, they are symptom-free. Others have mild coughing and wheezing much of the time, punctuated by severe exacerbation's of symptoms following exposure to known allergies, viral infections, and exercise or nonspecific irritants. A series of stages have been characterized for describing the severity of an acute asthma attack:

Mild: Mild dyspnoea; diffuse wheezes; adequate air exchange.

Moderate: Respiratory distress at rest; hyperpnea, use of accessory muscles; marked wheezes.

Severe: Marked respiratory distress; cyanosis; use of accessory muscles; marked wheezes or absent breath sounds.

Respiratory Failure: Severe respiratory distress; lethargy; confusion; prominent pulses paradoxus. Use of accessory muscles [16, 17].

Medicinal Plants used in Asthma: Asthma is a global problem. Many synthetic drugs are used to treat acute symptoms of asthma, but they are not completely safe for long term use. Hence, search has been started once again to look back to traditional medicine, which can be used to treat asthma. Some traditional plants with antiasthmatic potential are discussed in **Table 1**.

TABLE 1: LIST OF MEDICINAL PLANTS USED IN ASTHMA [1-122]

S. no.	Plant Name	Plant part used	Mechanism of action
1	*Abutilon crispum* (L.) Medicus.	Leaves	Antiasthmatic
2	*Abutilon indicum* (L.) Sweet.	Seed	Antiasthmatic
3	*Aerva lanta* Linn	Aerial parts	Antiasthmatic
4	*Acalypha indica*	Leaves, roots, stalk, and flowers	Bronchodilator
5	*Achillea mellifolium*	flowers	Bronchodilator, Mast cell stabilizer
6	*Acorus alamus*	Rhizome	Mast cell stabilizer
7	*Ailanthus excels*	Leaves	Antiasthmatic, Antiallergic
8	*Achyranthes aspera, Allium cepa*	Fruit	Mast cell stabilizer
9	*Ageratum conyzoides* L	Leaves	Antiasthmatic
10	*Adhatoda vasica* Nees	Bulb	Mast cell stabilizer, Lipoxygenase inhibitor, PAF inhibitor, COX inhibitor
11	*Albizzia lebbeck*	Bark	Bronchodilator Mast cell stabilizer
12	*Asystasia gangetica*	Leaves	Bronchodilator Anti-inflammatory
13	*Ammi visnaga*	Seeds	Bronchodilator
14	*Amburana cearensis*	Bark	Bronchodilator
15	*Allium cepa* Linn.	Bulbs/Juice	Mast cell stabilizer,
16	*Alstonia scholaris* R. Br.	Leaves	Bronchodilator

17	*Aquillaria agallocha* Roxb.	Stem	Mast cell stabilizer & Antiallergic
18	*Argemone Mexicana*	Stem	Bronchodilator
19	*Aristolochia indica* L	Roots	Bronchodilator
20	*Asclepias curassavica* L	Roots	Antiasthmatic
21	*Asystasia gangetica*	Leaves	Antiasthmatic
22	*Atropa belladonna*	Seeds	Asthma, Bronchitis, Muscuar Pain
23	*Azadirachta indica* A. Juss	Leaves	Mast cell stabilizer
24	*Azima tetracantha* Lam	Leaves	Mast cell stabilizer
25	*Bacopa monniera* Linn.	Leaves	Mast cell stabilizer
26	*Balanites roxburghii*	Stem bark	Bronchodilator, Mast cell stabilizer
27	*Benincasa hispida* (Thunb.) Cogn.	Fruits	Bronchodilator
28	*Boerhaavia diffusa* Linn.	Root	Asthma, Bronchitis
29	*Brassica camperstris* Linn.	Seed	Bronchodilator
30	*Biophytum nervifolium* Thw	Leaves	Mast cell stabilizer
31	*Cassia absus* L	Leaves	Bronchodilator
32	*Casuarina equisetofolia* Linn	Bark	Antiasthmatic
33	*Cedrus deodara*	Wood	Mast cell stabilizer
34	*Cnidium monnieri*	Leaves	Bronchodilator
35	*Curculigo orchioides*	Rhizomes	Antihistaminic Anti-inflammatory
36	*Centipeda minima*	Whole plant	Mast cell stabilizer
37	*Clerodendron phlomidis*	Leaves	Antihistaminic, Mast cell stabilizer
38	*Casuarina equisetifolia* Linn	Wood, Bark	Antiasthmatic
39	*Chlorophytum laxum* R. Br.	Tuber	Antiasthmatic
40	*Cissus quadrangularis* L	Stem	Antiasthmatic
41	*Clematis smilacifolia* Wall	Leaves	Antiasthmatic
42	*Clerodendrum serratum* Linn	Roots	Antiasthmatic
43	*Coccinia grandis* (L.) Voigt	Tuber	Antiasthmatic
44	*Cynodon dactylon*	Whole Plant	Antiasthmatic
45	*Calotropis procera* (Ait) R.Br.	Latex	Mast cell stabilizer & Anti-inflammatory
46	*Cassia tora* Linn.	Seeds	Mast cell stabilizer
47	*Clerodendron serratum* Linn. Moon.	Stem bark	Bronchodilator, Mast cell stabilizer
48	*Cuminum cyminum* Linn.	Roots	Bronchodilator
49	*Curcuma longa* Linn.	Rhizome	Mast cell stabilizer, Antiallergic & Anti Inflammatory
50	*Cynodon dactylon* Pers.	Rhizome	Mast cell stabilizer
51	*Cassia sophera*	Leaves	Bronchodilator, Antihistaminic
52	*Dendrophthoe falcate* L. f.	Bark	Antiasthmatic
53	*Desmodium gangeticum*	Roots	Cough, Asthma, Vomiting
54	*Dhatura metel* Linn.	Whole Plant	Asthma
55	*Elaeocarpus sphaericus* K. Schum	Fruits	Bronchodilator
56	*Ephedra gerardiana*	Stem	Bronchodilator
57	*Eclipta alba* Linn	Leaves	Antiasthmatic
58	*Emblica officinalis*	Fruits	Asthma, Bronchitis
59	*Euphorbia hirta*	Aerial parts	Antiasthmatic
60	*Ficus bengalensis* Linn	Bark	Antiasthmatic
61	*Ficus exasperate* Yahl	Root	Bronchodilator
62	*Ficus racemosa* Linn.	Latex	Antiasthmatic
63	*Glycyrrhiza glabra*	Roots	Antihistaminic, Antiallergic
64	*Hemidesmus Indicus* R.Br.	Roots	Antiasthmatic
65	*Inula racemosa* Hook. F.	Roots	Mast cell stabilizer & Antiallergic
66	*Labisia Pumila*	Leaf	Antiasthmatic
67	*Leptadenia Reticulata*	Leaves and Roots	Cough and AsthmaS
68	*Lepidium sativum* Linn.	Seeds	Bronchodilator
69	*Lannea coromandelica* Merr	Whole Plant	Antiasthmatic
70	*Leucas aspera* (Willd.) Link	Leaves	Antiasthmatic
71	*Mangifera indica* Linn.	Seed & Bark	Asthma
72	*Manilkara hexandra* Dubard.	Leaves	Antiasthmatic
73	*Mimosa pudica* L	Leaves	Antiasthmatic
74	*Mentha spicata* Linn. Emend. Nethh.	Leaves	Leaves Mast cell stabilizer
75	*Momordica dioica* Roxb. Ex Wild.	Bulb	Mast cell stabilizer, Antiallergic

76	*Moringa oleifera*	Seed	Bronchodilator
77	*Mucuna pruriens*	Seed	AntiasthmaticS
78	*Myrica esculenta* Buch-Ham	Stem bark	Mast cell stabilizer, Bronchodilator
79	*Nigella sativa*	Seed	Bronchodilator
80	*Nyctanthes arbortristis* Linn.	Stem bark	Mast cell stabilizer, Bronchodilator
81	*Ocimum sanctum*	Leaves	Mast cell stabilizer
82	*Ocimum tenuiflorum* Linn	Leaves	Antiasthmatic
83	*Ocimum sanctum*	Leaf	Bronchitis, Cough
84	*Olea*	Ripe Fruits	Antiasthmatic
85	*Orthosiphon rubicundus* Benth	Leaves	Antiasthmatic
86	*Oxalis corniculata* L	Whole Plant	Antiasthmatic
87	*Passiflora incarnate*	Leaves	Bronchodilator & Histmine
88	*Paederia foetida*	Leaves	Bronchodilator
89	*Phaseolus radiates*	Seed	Asthma, Chronic Bronchitis
90	*Physidis angulata* Linn	Leaves	Mast cell stabilizer
91	*Phymatodes scolopendria*	Aerial parts	Bronchodilator
92	*Piper betel* Linn	Leaves	Bronchodilator
93	*Pinus roxburghii*	Whole Plant	Asthma, Chronic Bronchitis
94	*Piper nigrum* Linn.	Fruits	Bronchodilator
95	*Picorrhiza kurroa*	Roots	Mast cell stabilizer, Bronchodilator
96	*Polygala elongate* Willd	Roots	Mast cell stabilizer
97	*Portulaca quadrifida* L	Whole Plant	Mast cell stabilizer
98	*Premna obtusifolia*	Roots	Asthma, Bronchitis
99	*Punica granatum* Linn.	Seed	Asthma, Cough
100	*Rauvolfia serpentina* (L.) Benth. ex	Whole Plant	Bronchodilator
101	*Rivea hypocratoriformis* Choisy.	Leaves	Mast cell stabilizer
102	*Sansevieria roxburghiana* Schult.	Leaves	Antiasthmatic
103	*Semecarpus ancardium*	Fruits	Asthma, Cough
104	*Solanum nigrum* Linn.	Roots	Mast cell stabilizer
105	*Solanum surattense* Burm. f	Whole Plant	Asthma, Bronchospasm
106	*Spondias pinnata* Linn.f	Seeds	Antiasthmatic
107	*Solanum xXanhocarpum*	Roots	Mast cell stabilizer
108	*Sphaeranthus indicus* Linn.	Flowers	Mast cell stabilizer
109	*Striga orobanchioides B*enth	Whole Plant	Mast cell stabilizer, Antihistamine
110	*Swertia Chirata*	Leaves	Bronchial asthma
111	*Tamarindus indica*	Leaves	Bronchodilator, Antihistaminic, Anti-inflammatory
112	*Taxus baccata* Linn.	Leaf	Asthma, Bronchitis
113	*Tephrosia purpuria*	Aerial parts	Mast cell stabilizer, Bronchodilator
114	*Terminalia belerica*	Leaf galls	Asthma
115	*Terminalia chebula* Retz.	Fruits	Mast cell stabilizer & Antiallergic
116	*Tinospora cardifolia* Wild Mier ex Hook f.	Stem	Mast cell stabilizer
117	*Trachyspermum ammi*	Fruits	Asthma
118	*Tylophora asthmatica* (L.f.) Wight & Arn.	Leaves	Mast cell stabilizer & Anti inflammatory
119	*Vitex negundo* L.	Leaves	Bronchodilator, Antiallergic & Mast cell stabilizer
120	*Zanthoxylem rhetsa* (Roxb.) DC	Fruit	Antiasthmatic
121	*Zingiber capitatum* Roxb	Rhizomes	Antiasthmatic
122	*Zingiber officinale* Thw	Rhizomes	Antiasthmatic

CONCLUSION: All the traditional medicinal plants discussed in the review have exhibited significant clinical and pharmacological activity. Some medicinal plants alternatives employed in these traditions are proven to provide symptomatic relief and assist in the inhibition of disease development as well asthma caused by dust, mites, pollen, exercise or even by air, which produce mucus, saline, pain on breathing or unusual breathing. It is diagnosed by some synthetic and remedies like cough drops, and *Glycyrrhiza glabra*, *etc*. the review revealed that too many of medicinal plants used by traditionally as an antiasthmatic agent are reported to have scientific evidence.

All the natural products discussed in this review exhibit antiasthmatic activities.

ACKNOWLEDGEMENT: The authors are very cordially grateful to my parents and my esteemed, respected guide Dr. Jay ram Patel, RKDF College of pharmacy, for his supervision advice and guidance for providing encouragement and facilities for compiling this work.

CONFLICT OF INTEREST: Nil

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How to cite this article:
Singh SK, Patel JR, Dubey PK and Thakur S: A review on antiasthmatic activity of traditional medicinal plants. Int J Pharm Sci & Res 2014; 5(10): 4109-16. doi: 10.13040/IJPSR.0975-8232.5(10).4109-16.