International Journal of Botany Studies
www.botanyjournals.com
ISSN: 2455-541X
Received: 23-11-2021, Accepted: 08-12-2021, Published: 24-12-2021
Volume 6, Issue 6, 2021, Page No. 1380-1383

Herbal drugs used in the treatment of asthma: An overview

Devshree Gayakwad[1*], Nirmal Dongre[2], G N Darwhekar[3]
[1] Research Scholar, Institute of Pharmaceutical Sciences, SAGE University, Indore, Madhya Pradesh, India
[2] Institute of Pharmaceutical Sciences, SAGE University, Indore, Madhya Pradesh, India
[3] Acropolis Institute of Pharmaceutical Education and Research, Indore, Madhya Pradesh, India

Abstract
Asthma and other respiratory illnesses are on the rise around the world right now. Pollution, environmental factors, genetic factors, chemical variables, obesity, cold air, air pollutants, and respiratory infections are the leading causes of growing allergic illnesses. With the rapid growth of development around the world, many excellent improvements have been made, as well as its drawbacks. Every day, the risk, harmful effects, and sensitivity of asthama increase. Despite the fact that a medical treatment for asthama has been created, allopathic medications have been shown to have negative effects. In the next years, evaluating the existing state of the health-care system in terms of synthetic drug adequacy will become increasingly evident. It has been stated that the number of diseases and disorders caused by synthetic medications has increased alarmingly, forcing a shift to traditional herbal medicine. Herbal phytochemicals have been found to have excellent anti-asthmatic effects. Taking everything into account the many side effects of synthetic agents, as well as their inability to control respiratory problems, particularly asthma, necessitate the development of a more safe, effective, and cost-effective anti-asthmatic medicine. Plant ingredients are the most effective treatment for this problem. In the present review herbs used for the treatment of asthma has been mentioned.

Keywords: anti-asthmatic, allergic, herbal, phytochemicals

Introduction

In current scenario, worldwide people are suffering from number of respiratory infections. A global increase in respiratory infections has occurred in both children and adults in recent decades. In many areas, the rise of respiratory ailments has been seen as communities adopt of western lifestyles and become urbanized. With the projected increase in the urban proportion of the world's population from 45% today to 59% in 2025, the increase in respiratory disorders is likely to continue over the next two decades. It is estimated that there may be an additional 100 million persons with respiratory infections by 2025. Today, respiratory infections are one of the most common chronic diseases in the world, according to the Global Burden of Asthma Report [1-2].

Allergies are one of the most frequent disorders that impact people in a variety of ways. Despite improvements in the general health of the population, the prevalence of allergy and asthma has increased in recent years. Allergic illnesses cause significant morbidity and have a major economic effect. The causes of an increase in the prevalence of upper and lower respiratory tract allergy illnesses have been established through several epidemiological investigations. Asthma is a chronic inflammatory illness of the airways characterised by the tracheobronchial tree's heightened susceptibility to a variety of stimuli. It is characterised by a broad constriction of the airways, which may be resolved naturally or as a result of treatment, and clinically by dyspnea, cough, and wheezing paroxysms [3-4].

Traditional medicines still remain the major source of medicines today for the majority of global population. In recent time, focus on herbal medicine research has increased all over the world and a number of evidences have established the immense potential of medicinal plants used in various traditional systems. Herbal medicine has also become increasingly popular because of the undesirable side effects associated with allopathic drugs. The quality control of herbal drugs and their bio-constituents is of paramount importance in justifying their acceptability to modern systems of medicine. Therefore, steps should be taken in right direction in order to ensure that these drugs meet the WHO standards. Phyto-therapeutic agents are in use since ancient times for disease control but there use is greatly increased in last decade. By the end of twentieth century, 170 herbal drugs got ofcial recognition. According to the WHO, 80% world population satisfy their primary health related needs by the use of phyto-therapeutic agents and 11% drugs are of plant origin among the essential drugs [5-6].

Management of asthma by traditional medicines

Asthma affects around 155 million people worldwide, with an additional 100 million expected to be impacted by 2025. In the United States, it has afflicted 14-15 million individuals, including 4.8 million children. It accounts for around 11 million hospital visits each year and is the sixth most common reason for ambulatory visits. The smooth muscle cells in the bronchi constrict, the airways become inflamed and swollen, and breathing becomes difficult during asthma attacks (exacerbations of asthma). Asthma is a worldwide issue. Many synthetic medications are used to treat acute asthma symptoms, but they are not entirely safe to use over time. As a result, a new quest has begun to explore for traditional medication that can be utilised to treat asthma. In recent decades, research has concentrated on the

scientific examination of traditional plant-derived medications for the treatment of a variety of ailments. 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 [7].

Ayurveda is a traditional Indian Medicinal System practiced for thousands of years. Considerable research on pharmacognosy, chemistry, pharmacology and clinical therapeutics has been carried out on ayurvedic medicinal plants. The polyherbal formulations described in Ayurveda have been the basis of treatment of various human diseases. Selection of scientific and systematic approach for the biological evaluation of herbal formulations based on their use in the traditional systems of medicine forms the basis for an ideal approach in the development of new drugs from plants [8].

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 by2025 [9].

Since ancient times, plant and animal products have been successfully used to treat human ailments. Every country on the planet has compiled a collection of indigenous herbal treatments based on ailments and human needs. Ayurveda is a 5000-year-old holistic system of diagnosis and treatment that includes diet, hygiene, and rejuvenation. It was established and perfected in India. Ayurveda (Ayur-life, Veda-knowledge) is the science of healthy living that is not limited to illness treatment. Ayurvedic medicine is mostly composed of herbal and herbo-mineral formulations, and it follows certain diagnostic and therapeutic concepts. Recent advancements provide promising results for the development of formulations for respiratory infections [10-13].

Table 1: Some Medicinal Plants with Antiasthmatic Activity [14-47].

S.No.	Plant	Part Used	Medicinal Use
1.	*Abutilon crispum (L.)Medicus*	Leaves	Antisthmatic
2.	*Acalypha indica*	Leaves, roots, stalk and flowers	Bronchodialator
3.	*Acorus alamus*	Rhizome	Mast cell stabiliser
4.	*Ageratum conyzoides L*	Leaves	Antisthmatic
5.	*Adhatoda vasica Nees*	Bulb	Mast cell stabilizer, Lipoxygenase inhibitor, PAF inhibitor, COX inhibitor
6	*Argemone Mexicana*	Stem	Bronchodialator
7.	*Atropa belladonna*	Seeds	Asthma, Bronchitis, Muscuar Pain
8.	*Boerhavia diffusa Linn*	Roots	Asthma, Bronchitis
9.	*Brassica camperstris Linn*	Seeds	Bronchodialator
10.	*Clematis smilacifolia Wall*	Leaves	Antiasthmatic
11.	*Cuminum cyminum Linn*	Roots	Bronchodialator
12.	*Curcuma longa*	Rhizome	Mast cell stabilizer, Antiallergic & Anti Inflammatory
13.	*Datura metel Linn*	Whole plant	Asthma
14.	*Ephedra gerardiana*	Stem	Bronchodialator
15.	*Emblica officinalis*	Fruits	Asthma, Bronchitis
16.	*Euphorbia hirta*	Ariel parts	Antiasthmatic
17.	*Ficus racemosa Linn*	Latex	Antiasthmatic
18.	*Lepidium sativum Linn*	Seeds	Bronchodialator
19.	*Moringa olieifera*	Seeds	Bronchodialator
20.	*Myrica esculenta Buch*	Stem bark	Bronchodialator
21.	*Nigella sativa*	Seeds	Bronchodialator
22.	*Nyctanthus arbortristis Linn*	Stem bark	Mast cell stabilizer, Bronchodilator
23.	*Ocimum sanctum*	Leaves	Mast cell stabilizer
24.	*Olea*	Ripe fruits	Antiasthmatic
25.	*Paederia foetida*	Leaves	Bronchodialator
26.	*Piper betel Linn*	Leaves	Bronchodialator
27.	*Piper nigrum Linn*	Fruits	Bronchodialator
28.	*Punica granatum*	Seeds	Asthma, cough
29.	*Solanum nigrum Linn*	Roots	Mast cell stabilizer
30.	*Swertia chirata*	Leaves	Bronchial asthma
31.	*Tamarindus indica*	Leaves	Bronchodialator, Antihistaminic, Anti-inflammatory
32.	*Taxus baccata Linn*	Leaf	Asthma, Bronchitis
33.	*Terminalia belerica*	Leaf galls	Asthma
34.	*Tylophora asthmatica Weight & Arn*	Leaves	Mast cell stabilizer & Anti-inflammatory
35.	*Vitex negundo L.*	Leaves	Bronchodilator, Antiallergic & Mast cell stabilizer
36.	*Zingiber capitatum Roxb.*	Rhizomes	Antiasthmatic
37.	*Zingiber officinale*	Rhizomes	Antiasthmatic

Conclusion

Synthetic medications such bronchodilators, methylxanthines, Mast cell stabilisers, Leukotriene inhibitors, and steroids are currently utilised to treat the condition. Although synthetic medications provide immediate relief from asthma symptoms, they also have a number of side effects (like those of steroids). Furthermore, their efficacy diminishes with time as a result of their continued use. As a result of adverse effects such as tachycardia, muscular tremor, and convulsions, patients are seeking complementary and alternative therapy for asthma. Herbal medications, on the other hand, offer a longer duration of action and fewer adverse effects. Antiasthmatic activity can be found in herbal plants such as

Bacopamonnieri L., Eclipta alba Linn, Lepidium sativum Linn, Mentha spicata L, Piper betel Linn, and Euphorbia hirta. All of the traditional medicinal herbs mentioned in this review have shown clinical and pharmacological activity. Alternatives to medicinal plants used in these practises have been shown to provide symptomatic relief, relieves pain and aids in the prevention of disease.

References

1. Haq I. Safety of medicinal plants. Pak J Med Res,2004:43(4):203-10
2. Rida Zainab, Muhammad Akram, Muhammad Daniyal, Muhammad Riaz. Awareness and Current Therapeutics of Asthma Dose-Response; An International Journal, 2019, 1-11.
3. Santosh Kumar Singh, Jay Ram Patel, Prashant Kumar Dubey, Sonia Thakur. A Review on Antiasthmatic Activity of Traditional Medicinal Plants, IJPSR,2014:5(10):1000-07.
4. Vishal Hindurao Thorat, Sachin Ghorpade. *Argemone Mexicana Linn*. Having Medicinal Property: Review; International Journal of Pharmacognosy, 2018, 5(2)
5. Ranjeeta Prasad, Rahul Dev Lawania, Manvi, Rajiv Gupta. Role of Herbs in the Management of Asthma; Phcog Rev,2009:(6):247-258
6. Tejas Patel, Chimkode Rajshekar, Rakesh Parmar; Mast cell stabilizing activity of Myrica nagi bark Journal of Pharmacognosy and Phytotherapy,2011:3(8):114-117.
7. Farjana Rahman Chaity, Mohammad A. Rashid and Mohammad Sharifur Rahman; Biological Investigations of the Whole Plant of *Argemone mexicana (L.)* ; Journal of Pharmaceutical Sciences,2021:20(1):135-138
8. Neelmani Chauhan, Saurabh Rajvaidhya, Dubey BK. Antiasthmatic Effect Of Roots Of *Clitorea Ternatea Linn*; IJPSR,2021:3(4):1076-1079
9. Santosh Kumar Singh, Jay Ram Patel, Prashant Kumar Dubey, Sonia Thakur. A Review On Antiasthmatic Activity Of Traditional Medicinal Plants, IJPSR,2014:5(10):1000-08.
10. Samir Shah, Kintu Patel, Kerai Suraj. Evaluation Of Anti-Asthmatic Activity Of *Centratherum Anthelminticum Linn*. In Experimental Animals; Journal of Pharmaceutical Research, 2017, 16(1).
11. Singhal HK, Neetu. A review on antiasthmatic activity of ayurvedic herbs. Global J.Res.Med. Plants and Indigen. Med,2013:2(11):758-793.
12. Sharma RK, Bhagwan Dash. Charaka Samhita Chaukhambha Sanskrit Series Office, Varanasi. Chikitsa Sthana, Vimana sthana, 2009.
13. Tylers: Herbs of choice by James E Robbers, 2000, 112-115.
14. Anjaria JV, Gupta I. Studies on lactogenic property of Leptadenia reticulata (Jivanti) and leptaden tablets in goats, sheep, cows and buffaloes. Indian Veternary Journal,1967:44:967-974
15. Patel RP, Dantwala AS. Antimicrobial activity of Leptadenia reticulata. Indian Journal of Pharmacology,1988:20:241-244.
16. Rastogi RP, Mehrotra BN. Compendium of indian medicinal plants. 1st Edition, CDRI Lucknow and PID New Delhi,1980-1984:3(224):294-376
17. Tripathi RM, Das PK. Studies on antiasthmatic and antianaphylactic activity of Albizzia lebbeck. Ind. J. Pharmacol,1977:9(3):189-194.
18. Shinde UA, Phadke AS, Kulkarni KR, Nair AM, Mungantiwar AA, Dixit VJ, et al. Mast cell stabilizing and lipoxygenase inhibiting activity of Cedrus deodara (Roxb.) wood oil. Indian J.Exp.Biol,1999:37(3):258-261.
19. Pandit P, Singh A, Bafna AR, Kadam PV, Patil MJ. Evaluation of antiasthmatic activity of Curculigo orchioides Gaertn. Rhizomes. Ind J Pharm Sci, 2008, 440-444
20. Patel KG, Bhalodia PN, Patel AD, Patel KV, Gandhi TR. Evaluation of bronchodilator anti anaphylactic activity of Myrica sapida. Iranian Biomedical Journal,2008:12(3):191- 196.
21. Nayampalli SS, Desai NK, Ainapure SS. Antiallergic properties of Tinospora cordifolia in animal models. Indian J. Pharmacol,1986:18:250-252
22. Tayade PM, Ghaisas MM, Jagtap SA and Dongre SH: Antiasthmatic activity of methanolic extract of leaves of Tamarandus indica linn. Journal of pharmacy research,2009:2(5):944-947.
23. Bhujbal SS, Kewatkar SM, Kumar D, Mudgade SC and Patil MJ: In vivo and in vitro antiasthmatic studies of Clerodendrum serratum Linn. Pharmacology online,2009:2:745-752.
24. Boskabady M, Kiani S, Azizi H. Relaxant effect of Cuminum cyminum on guineapig tracheal chains and its possible mechanism (s). Indian Journal of Pharmacology,2005:37:111-115.
25. Chitravanshi VC, Gupta PP, Kulshrestha DK, Kar K, Dhawan BN. Antiallergic activity of Solanum xanthocarpum. Ind J Pharmacol,1990:22:23-24.
26. Damre AS, Gokhale AB, Phadke AS, Kulkarni KR, Saraf MN. Studies on the immunomodulatory activity of flavonoidal fraction of Tephrosia purpurea. Fitoterapia,2003:74:257-261.
27. Ghai OP, Paul Vinod, Bagga Arvind. 7th edition Essential Pediatrics, CBC Publishers & Distributors Pvt Ltd, Delhi, 2009, 359
28. Kumar Suresh: Scientific Appraisal of Adhatoda vasica_Nees (Vasaka) J NIMA,1979:23:257-261.
29. Nair AM, Saraf MN. Inhibition of antigen and compound 48/80 induced contractions of guinea pig trachea by the ethanolic extract of the leaves of Vitex negundo Linn. Ind J Pharmacol,1995:27:230-233.
30. Nayampalli S, Desai NK, Ainapure SS. Anti-allergic properties of Tinospora cordifolia in animal models. Ind J Pharmacol,1986:18:250-252.
31. Nirmal SA, Pal SC, Mandal SC. Antihistaminic activity of Nyctanthes arbortristis Bark. Pharmacology online,2009:3:924-928.
32. Oli RG, Manikandan L, Swarna FB, Manikandan P, Khosa R. Evaluation of anti-inflammatory potential of Indigofera tinctoria extract in rats. Ind J Nat Prod,2005:21:12-15.
33. Patel KG, Rao NJ, Gajera VG, Bhatt PA, Patel KV, Gandhi TR. Antiallergic activity of stem bark of Myrica esculenta Buch. Ham. (Myricaceae) J Young Pharm,2010:2(1):74-78.
34. Rasool M, Varalakshmi P: Immunomodulatory role of Withania somnifera root powder on experimental induced inflammation: An in vivo and in vitro study. Vascul Pharmacol,2006:44:406-410
35. Savali AS, Biradar PR, Jirankali MC. Antianaphylactic and mast cell stabilization activity of Cynodon dactylon. Int J Pharm and Pharm Sci,2010:2(2):69-73.

36. Shin TY, Kim SH, Lim JP, Suh ES, Jeong HJ, Kim BD, *et al*. Effect of Vitex rotundifolia on immediate-type allergic reaction. J Ethnopharmacol,2000:72:443-450
37. Singh S, Agrawal SS. Anti asthmatic and antiinflammatory activity of Ocimum sanctum. Int J Pharmacog,1991:29:306-310
38. Tripathi KD. Updated reprint 4th edition; essential of Medical Pharmacology, Jaypee Brothers Medical Publishers (P) LTD, New Delhi,2001:229:232-236.
39. Luzia KAM Leal, Melina F Costa, Márcia Pitombeira, Viviane M Barroso, Edilberto R Silveira, Kirley Canuto M. Mechanisms underlying the relaxation induced by isokaempferide from Amburana cearensis in the guinea-pig isolated trachea. Life Sci, 2006, 79-98.
40. Mali Praha R, Asif K. Studies on antiasthmatic activity of aqueous extract of roots Mimosa pudica L. IRJP, 2011, 104-110.
41. Chetankumar N. Physico-Chemical and Phytochemical Evaluation of Leptadenia reticulata Roots, International Journal of Research in Pharmaceutical and Biomedical Sciences,2012:3(4):1791-1797.
42. Pathan AA, Kasture SB, Mahalaxmi M. Residue of Mucuna pruriens potentiate haloperidol and clonidine-induced catalepsy in mice. Pharmacology online,2009:3:652-658.
43. Ramanitrahasimbola D, Rakotondramanana DA, Rasoanaivo P, Randriantsoa A, Ratsimamanga S, Palazzino G. Bronchodilator activity of Phymatodes scolopendria (Burm.) Ching and its bioactive constituent. J Ethnopharmacol,2005:102:400407.
44. Harish MS, Nagur M, Badami S. Antihistaminic and mast cell stabilizing activity of Striga orobanchioide. J Ethnopharmacol,2001:76:197-200.
45. Subhose V, Narian A. Basic principles of pharmaceutical science in Ayurveda. Bull Indian Inst Hist Med Hyderbad,2005:35:83.
46. Dahanukar SA, Thatte UM. Therapeutic approaches in Ayurveda Revisited, Popular Prakashan, Mumbai, 1989, 74-130.
47. Samy PR, Iushparaj PN, Gopal akri shnakone PA. Compilation of bioactive compounds from Ayurveda, Bioinformation, 2008.