



TRADITIONAL MEDICINAL HERBS FOR ASTHMA: A CRITICAL REVIEW

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ABSTRACT

This review describes information on the efficacy of Ayurvedic herbs and some plant originated medicine in bronchial asthma (Shwasa roga). It as a substance or product that is used or intended to be used, to modify or explore physiological system or pathological status for the benefit of the recipient. In Ayurveda, Aushadha is considered as one of the four fold constituents of Chikitsa-Chatushapada. The consideration of recipes during the line of treatment for particular ailments has a great importance. In the modern ages WHO also stresses importance of drug and defines first to give an elaborate description of various therapeutic measures calculated to aim at, not merely the radical removal of the causative factors but also at the restoration of Doshika equilibrium. Asthma is one of the most common chronic diseases in modern society and there is increasing evidence to suggest that its incidence and severity are increasing. There is a high prevalence of usage of complementary medicine for asthma. Herbal preparations have been cited as the third most popular complementary treatment modality. In the past decade, research has been focused on scientific evaluation of Ayurvedic drugs of plant origin for the treatment of respiratory disorders. Since the time immemorial, various herbs are used as antiasthmatic with efficient therapeutic response.

Key words: *Asthma, Chikitsa-Chatushapada, Complementary medicine, Shwasa roga, Tamaka Shwasa, Traditional herbs.*

INTRODUCTION

Asthma is a syndrome characterized by airflow obstruction that varies markedly, both spontaneously and with treatment. Asthmatics harbor a special type of inflammation in the airways that makes them more responsive than non asthmatics to a wide range of triggers, leading to excessive narrowing with consequent reduced airflow and symptomatic wheezing and dyspnea. Narrowing of the airways is usually reversible, but in some patients with chronic asthma there may be an element of irreversible airflow obstruction. The increasing global prevalence of asthma, the large burden it now imposes on patients, and the high health care costs have led to extensive research into its mechanisms and treatment [1]. Modern medicine considers Asthma as a manageable disease, and it is incurable. The WHO and International Asthma Council (IAC) consultation report published in 1998 on implementation of Asthma Guidelines, highlights that wherever there is the use of Traditional Medicines in Asthma care, the Conventional therapy should not be stopped because of the lack of evidence of safety and

efficacy of these therapies [2].

In *Ayurvedic* literature numbers of herbal preparations are described for the management of *Tamaka Shwasa*. These textual recipes have been tried clinically and efficacy has been Proved by many workers but as disease is chronic in nature one has to continue medicine For longer period. In such condition a cheaper remedy with greater palatability & having Better results should be used by physician. Various *Acharyas* have given guiding principles for management of *Tamaka Shwasa*. Drugs having *Vata Kaphahar, Ushna* and *Vatanulomana* properties are prescribed. Herbal medicines remain the major source of health care for the world's population. WHO has recognized herbal medicine as an essential building block for primary health care of vast countries like India In spite of advances in modern system of medicine, there are various areas like tropical diseases, herpes, AIDS, cancer, bronchial asthma etc., which still remain a challenge to present day drug therapy [3, 4].

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Table 1. Bronchodilators

S. No.	Name of plant	Part used/extract/fraction	Major Chemical constituent
1.	<i>Artemisia caerulescens</i> [5]	Aerial parts/Butanol	Quercetin, isorhamnetin
2.	<i>Adhatoda vasica</i> [6]	Leaves	Vasceine
3.	<i>Azadirachta indica</i> [7]	Leaves/Juice	Nimbin, nimbinine, Nimbandiol, quercetin
4.	<i>Bacopa monniera</i> [8]	Leaves/Ethanol	Bacosides, Alkaloids, Glycosides
5.	<i>Belamcanda chinensis</i> [9]	Leaves/Ethanol	Tectorigenin
6.	<i>Cissampelos sympodialis</i> [10]	Leaves and root bark/Aqueous	Warifteine, alpha-bisbenzylisoquinoline alkaloid
7.	<i>Desmodium adscendens</i> [11]	Aqueous	Triterpenoid Saponin
8.	<i>Elaeocarpus sphaericus</i> [12]	Fruits/Aqueous, Pet-ether, Benzene, Acetone and esthanol	Glycoside, Steroids, Alkaloid, Flavanoids
9.	<i>Ferula sinaca</i> [13]	Roots/Ethanol	Resins
10.	<i>Gardenia latifolia</i> [14]	Bark	Saponins
11.	<i>Ginko biloba</i> [15]	Leaves	Ginkgolides
12.	<i>Lepidium sativum</i> [16]	Seeds/Ethanol fractions	Alkaloids, Flavonoids
13.	<i>Mikania glomerata</i> [17]	Leaves/Aqueous, hydroalcohol	Coumarin
14.	<i>Ocimum sanctum</i> [18]	Leaves/Ethanol	Myrcenol, Nerol, Eugenol
15.	<i>Piper nigrum</i> [19]	Fruit	Piperine, Piperidine
16.	<i>Rosmarinus officinalis</i> [20]	Shrub/Aqueous	Caffeic acid (CA) and Rosmarinic acid
17.	<i>Sarcostemma brevistigma</i> [21]	Twigs/Alkaloidal fraction	Bregenin

Table 2. Anti-allergic Drugs

S. No.	Name of Plant	Part used /extract /fraction	Major Chemical constituent
1.	<i>Adhatoda vasica</i> Nees [22]	Leaves, Roots	Alkaloids
2.	<i>Albizia lebeck</i> [23]	Stem bark/Aqueous	Saponins
3.	<i>Alisma orientale</i> [24]	Rhizomes/Aqueous, Methanol	Alisol B monoacetate, Alismaketones-B 23-acetate and -C 23-acetate
4.	<i>Aquillaria agallocha</i> [25]	Stem/Aqueous extract	Triterpenoids
5.	<i>Asiasarum sieboldi</i> [26]	Roots/Methanol	Methyleugenol, gamma-asarone, Elemicin, Asarinin
6.	<i>Camellia sinensis</i> [27]	Leaves	Flavanoids
7.	<i>Cassia torosa</i> [28]	Seeds	Gentiobiosides
8.	<i>Centipeda minima</i> [29]	Aerial parts	Flavanoids, Pseudoguaienolide, sesquiterpene lactones
9.	<i>Citrus unshiu</i> [30]	Peels	Flavanoids
10.	<i>Clerodendron serratum</i> [31]	Stem bark/Aqueous	Phenolic glycoside
11.	<i>Cnidium monnieri</i> [32]	Fruits/Ethanol	Osthol
12.	<i>Dalbergia odorifera</i> [33]	Heart Wood	Flavanoids, Tannins
13.	<i>Galphimia glauca</i> [34]	Aerial/Alcohol extract/Ethyl-acetate	Tetragalloylquinic acid, Quercetin
14.	<i>Ginko biloba</i> [35]	Leaves	Ginkgolides
15.	<i>Gleditsia sinensis</i> Lam [36]	Leaves/Decoctions	Ethanolic extract
16.	<i>Hydrangea Dulcis Folium</i> [37]	Leaves	Glycosides, Hydrangenol, Phylloolulcin
17.	<i>Impatiens textori</i> [38]	Flowers/Ethanolic	Apigenin, uteolin, chrysoeriol
18.	<i>Inula racemosa</i> [39]	Roots/Alcohol	Inulolide-a new Sesquiterpene lactone
19.	<i>Lycopus lucidus</i> [40]	Whole plant/Aqueous	Betulinic acid, pentacyclic Triterpenes
20.	<i>Magnolia officinalis</i> [41]	Bark/Aqueous	Honokiol, Magnolol
21.	<i>Mentha piperita</i> [42]	Leaves	Flavanoidal glycosides
22.	<i>Nidularium procerum</i> [43]	Leaves/Aqueous extract	-
23.	<i>Picrorrhiza kurroa</i> [44]	Roots	Androsin
24.	<i>Terminalia chebula</i> [45]	Fruits/Aqueous	Ellagic acid, Tannins Chebulagic acid

25.	<i>Tinospora cordifolia</i> [46]	Stem/Aqueous	Tinosporin
26.	<i>Sarcostemma brevistigma</i> [47]	Twigs/Alkaloidal fraction	Bregenin
27.	<i>Solanum xanthocarpum</i> [48]	Roots/Alkaloidal fraction	Solasodine
28.	<i>Vitex negundo</i> [49]	Leaves/Ethanol	Casticin, isoorientin Chrysophenol D, Luteolin

Table 3. Mast Cell stabilizers

S. No.	Name of plant	Part used/extract/fraction	Major Chemical constituent
1.	<i>Achyranthes aspera</i> [50]	Aerial parts/Aqueous	Oleanolic acid
2.	<i>Albizia lebbbeck</i> [19]	Stem bark/Aqueous	Saponins
3.	<i>Aquillaria agallocha</i> [51]	Stem/Aqueous extract	Triterpenoids
4.	<i>Azadirachta indica</i> [52]	Leaves/Juice	Nimbin, nimbinine, Nimbandiol, quercetin
5.	<i>Bacopa monniera</i> [53]	Leaves/Ethanol	Bacosides, Alkaloids, Glycosides
6.	<i>Bidens parviflora</i> [54]	Aerial parts	Glycosides
7.	<i>Cassia alata</i> [49]	Leaves/Ethanol	Anthraquinones, Flavanoids
8.	<i>Cassia obtusifolia</i> [55]	Seeds/Glycosidal fraction	Anthraquinones, Betulinic acid
9.	<i>Cedrus deodara</i> [56]	Wood oil	Himacholol
10.	<i>Clerodendron serratum</i> [31][56]	Bark/Aqueous	Phenolic glycoside
11.	<i>Citrus unshiu</i> [30]	Peels	Flavanoids
12.	<i>Coleus forskohlii</i> [57]	Roots	Forskolin (Diterpenoid)
13.	<i>Crinum glaucum</i> [58]	Leaves/Aqueous	Alkaloids, lycorine, crinamine
14.	<i>Ferula ovina</i> [59]	Aerial parts/Ethanol	Carvacrol, alpha-pinene, geranyl isovalerate and geranyl propionate
15.	<i>Gleditsia sinensis Lam</i> [36]	Leaves/Decoctions	Ethanolic extract
16.	<i>Magnolia officinalis</i> [41]	Bark/Aqueous	Honokiol, Magnolol
17.	<i>Striga orobanchioids</i> [60]	Aerial parts/Ethanol	
18.	<i>Tephrosia purpurea</i> [61]	Aerial parts/Ethanol extract	Flavanoids, Tephrosin
19.	<i>Terminalia chebula</i> [62]	Fruits/Aqueous	Ellagic acid, Tannins Chebulagic acid
20.	<i>Trichopus zeylanicus</i> [63]	Leaves/butanol	Lipoprotein/Glycolipoprotein
21.	<i>Tylophora indica</i> [64]	Leaves/Alkaloidal fraction	Tylophorine
22.	<i>Tylophora asthmatica</i> [65]	Leaves/Alkaloidal	Tylophorine
23.	<i>Vitex negundo</i> [66]	Leaves/Ethanol	Casticin, isoorientin Chrysophenol D, Luteolin
24.	<i>Xanthii fructus</i> [67]	Whole plant/Aqueous	Saponin, flavones, Caffeic acid, 1,4-dicaffeoylquinic acid, sesquiterpene lactones

Table 4. Anti-anaphylactic Drugs

S. No.	Name of plant	Part used/extract/fraction	Major Chemical constituent
1.	<i>Acanthopanax senticosus</i> [68]	Stem/Aqueous	Acanthoside A, B & C, Chiisanoside, Senticoside, Saponin, flavones,
2.	<i>Alisma orientale</i> [69]	Rhizomes/Aqueous, Methanol	Alisol B monoacetate, Alismaketones-B 23-acetate and -C 23-acetate
3.	<i>Aquillaria agallocha</i> [70]	Stem/Aqueous extract	Triterpenoids
4.	<i>Coleus forskohlii</i> [71]	Roots	Forskolin (Diterpenoid)
5.	<i>Crinum glaucum</i> [72]	Leaves/Aqueous	Alkaloids, lycorine, crinamine
6.	<i>Cryptotympana atrata</i> [73]	Whole plant/Aqueous	oleanolic acid
7.	<i>Ginko biloba</i> [35]	Leaves	Ginkgolides
8.	<i>Gleditsia sinensis Lam.</i> [36]	Leaves/Decoctions	Ethanolic extract
9.	<i>Hydrangea Dulcis Folium</i> [37]	Leaves	Phyllodulcin, Hydrangenol, Glucosides
10.	<i>Magnolia officinalis</i> [41]	Bark/Aqueous	Honokiol, Magnolol
11.	<i>Terminalia chebula</i> [45]	Fruits/Aqueous	Ellagic acid, Tannins Chebulagic acid
12.	<i>Vitex rotundifolia</i> [70]	Fruit/Aqueous	Flavonoids

Table 5. Antispasmodic drugs

S. No.	Name of plant	Part used/extract/fraction	Major Chemical constituent
1.	<i>Aegle marmelos</i> [71]	Leaves/Ethanol	Aegelin, Aegelemine, Aegeline
2.	<i>Benincasa hispida</i> [72]	Fruits/Methanol	Triterpenes, Glycosides, Sterols
3.	<i>Cissampelos sympodialis</i> [73]	Leaves and root bark/Aqueous	Warifteine, alpha-bisbenzylisoquinoline alkaloid
4.	<i>Crinum glaucum</i> [74]	Leaves/Aqueous	Alkaloids, lycorine, crinamine
5.	<i>Curcuma longa</i> [74]	Rhizome	Tumerones, curcuminoids
6.	<i>Desmodium adscendens</i> [74]	Aqueous	
7.	<i>Drymis winteri</i> [75]	Bark	Terpene
8.	<i>Ferula ovina</i> [59]	Aerial parts/Ethanol	Carvacrol, alpha-pinene, geranyl isovalerate and geranyl propionate
9.	<i>Ferula sinaca</i> [13]	Roots/Ethanol	Resins
10.	<i>Galphimia glauca</i> [34]	Aerial/Alcohol extract/Ethyl-acetate	Tetragalloylquinic acid, Quercetin
11.	<i>Ginkgo biloba</i> [35]	Leaves	Ginkgolides
12.	<i>Passiflora incarnata</i> [76]	Leaves/Methanol	Alkaloids
13.	<i>Pavetta crassipes</i> [77]	Leaves/Aqueous	Flavanoids, tannins, anthraquinones
14.	<i>Picrorrhiza kurroa</i> [78]	Roots	Androsin
15.	<i>Saussurea leppa</i> [79]	Alkaloidal fraction	Sesquiterpene lactone, Terpenoids
16.	<i>Thymus vulgaris</i> [80]	Ethanol	Flavanones

Table 6. Anti-inflammatory drugs

S. No.	Name of plant	Part used/extract/fraction	Major Chemical constituent
1.	<i>Aloe vera Tourn.ex Linn.</i> [81]	Leaves/Aqueous, Chloroform and ethanol	Anthraquinones, sterols, saponins and carbohydrate
2.	<i>Asystasia gangetica</i> [82]	Leaves/Methanol, Ethyl Acetate	Isoflavone glycoside, dalhorinin
3.	<i>Bryonia laciniata</i> [83]	Leaves/chloroform extract	Flavonoids
4.	<i>Butea frondosa</i> Koen. [84]	Leaves/Aqueous	Flavonoid, glycosides, proteins and amino acids.
5.	<i>Calocedrus formosana</i> [85]	Bark/alcohol	Sugiol
6.	<i>Calotropis procera</i> [86]	Latex	α -amyrin, β -amyrin calotropin (Triterpenoid)
7.	<i>Crataegus pinnatifida</i> [87]	Fruit	Flavanoids
8.	<i>Curcuma longa</i> [74]	Rhizome	Tumerones, curcuminoids
9.	<i>Dalbergia odorifera</i> [33]	Heart Wood	Flavanoids, Tannins
10.	<i>Elaeocarpus sphericus</i> [12]	Fruits/Aqueous, Pet-ether, Benzene, Acetone and ethanol	Glycoside, Steroids, Alkaloid, Flavanoids
11.	<i>Gleditsia sinensis</i> Lam. [36]	Leaves/Decoctions	Ethanol extract
12.	<i>Indigofera tinctoria</i> [88]	Whole plant/methanol	Polyphenols
13.	<i>Magnolia obovata</i> [89]	Stem bark	Magnolol and honokiol
14.	<i>Nelsonia canescens</i> [90]	Leaf/ethanol extract	Flavonoids
15.	<i>Ocimum sanctum</i> [91]	Leaves/Ethanol	Myrcenol, Nerol, Eugenol
16.	<i>Ophiopogon japonicus</i> [92]	Root/aqueous extract	Ruscogenin and ophiopogonin D
17.	<i>Pavetta crassipes</i> [93]	Leaves/Aqueous	Flavanoids, tannins, anthraquinones
18.	<i>Picrorrhiza scrophulariiflora</i> [94]	Rhizomes/Pet. ether, Diethyl ether and methanol	Apocynin, androsin and picroside II
19.	<i>Proustia pyrifolia</i> [95]	Whole plant/methanol	B-sitosterol, quercetin and dihydroquercetin
20.	<i>Tylophora asthmatica</i> [95]	Leaves/Alkaloidal	Tylophorine
21.	<i>Xanthii fructus</i> [96]	Whole plant/Aqueous	Saponin, flavones, Caffeic acid, 1,4-dicaffeoylquinic acid, sesquiterpene lactones

Table 7. Immunomodulatory drugs

S. No.	Name of plant	Part used/ extract/ fraction	Major Chemical constituent
1.	<i>Angelica sinensis</i> [97]	Roots/Aqueous and ethanolic	Polysaccharides
2.	<i>Boerhaavia diffusa</i> [98]	Roots/ethanol	Alkaloids
3.	<i>Cedrela tubiflora</i> [99]	Leaf/Aqueous	Gallic acid, polysaccharides
4.	<i>Clausena excauata</i> [100]	Wood/Aqueous	Phenolic compounds, furanocoumarins, flavanoids and carbazole alkaloid
5.	<i>Cleome viscosa</i> [101]	Aerial parts/Aqueous, ethanolic	Alkaloids, saponins
6.	<i>Ipomoea carnea</i> [102]	Leaf/Aqueous	Nortropane alkaloids, calystegines β_2
7.	<i>Magnifera indica</i> [103]	Bark/Alcohol, ether	Magniferin
8.	<i>Plantago ovata</i> [104]	Seeds/Aqueous	Polysaccharides glycosides
9.	<i>Picrorhiza scrophulariiflora</i> [105]	Rhizomes/Pet. ether, Diethyl ether and methanol	Apocynin, androsin and picroside II
10.	<i>Syzygium aromaticum</i> [106]	Flower bud/Aqueous	Phenols
11.	<i>Tephrosia purpurea</i> [107]	Aerial parts/Ethanol	Flavanoids
12.	<i>Trichilia glabra</i> [108]	Leaf/Aqueous	Polysaccharides
13.	<i>Typhae angustifolia</i> [109]	Pollen/ethanol	Phenolic compounds, flavones Triterpenes And β -sitosterol
14.	<i>Withania somnifera</i> [110]	Coded extracts	-

Table 8. Miscellaneous

S. No.	Name of plant	Part used/extract/fraction	Major Chemical constituent
Leukotriene biosynthesis inhibitors			
1.	<i>Boswellia serrata</i> [111]	Gum resin/Ethanol	Boswellic acid
2.	<i>Cassia torosa</i> [28]	Seeds	Gentiobiosides
3.	<i>Coleus forskohlii</i> [115]	Roots	Forskolin (diterpenoid)
4.	<i>Galphimia glauca</i> [34]	Aerial/Alcohol extract/Ethyl-acetate	Tetragalloylquinic acid, Quercetin
5.	<i>Solanum xanthocarpum</i> [112]	Roots/Alkaloidal fraction	Solasodine
Cyclooxygenase inhibitors			
1.	<i>Allium cepa</i> [113]	Bulbs/Juice	α and β unsaturated Thiosulphinates
Lipoxygenase inhibitors			
1.	<i>Allium cepa</i> [113]	Bulbs/Juice	α and β unsaturated Thiosulphinates
2.	<i>Asiasarum sieboldi</i> [114]	Roots/Methanol	Methyleugenol, gamma-asarone, Elemicin, Asarinin
3.	<i>Boswellia serrata</i> [111]	Gum resin/Ethanol	Boswellic acid
4.	<i>Cedrus deodara</i> [55]	Wood oil	Himacholol
5.	<i>Coleus forskohlii</i> [115]	Roots	Forskolin (diterpenoid)
Platelet Activating Factor inhibitors			
1.	<i>Ginko biloba</i> [35]	Leaves	Ginkgolides
2.	<i>Impatiens textori</i> [116]	Flowers/Ethanol	Apigenin, uteolin, chrysoeriol
3.	<i>Picrorrhiza kurroa</i> [44]	Roots	Androsin
Interleukine Biosynthesis Inhibitor			
1.	<i>Walthenia indica</i> [117]	Whole plant	flavanoids

CONCLUSION

In the past decade, research has been focused on scientific evaluation of traditional drugs of plant origin for the treatment of various diseases. A survey by the National Asthma Campaign found that 60% of people with moderate asthma and 70% with severe asthma have used complementary and alternative medicine to treat their condition. In addition to prescription and non-prescription drugs, there are an increasing number of herbs that can be used to treat many of the precursor

or chronic conditions of asthma. Precautions should be taken when combining herbs with prescription or nonprescription drugs, as there is always the possibility of a drug reaction or adverse condition occurring. Herbs for asthma should not be used in the case of a moderate or severe asthma attack but they are often very effective in controlling the chronic symptoms of asthma. Herbs for asthma can be used in conjunction with prescribed medications but they should not replace prescription medications unless the patient is under the care of a physician.

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24. <http://www.ncbi.nlm.nih.gov/pubmed/9178931> *Alisma orientale*
25. <http://www.ncbi.nlm.nih.gov/pubmed/9324002> *Aquillaria agallocha*
26. <http://www.ncbi.nlm.nih.gov/pubmed/8202562> *Asiasarum sieboldi*
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33. <http://www.ncbi.nlm.nih.gov/pubmed/9525107> *Dalbergia odorifera*
34. <http://www.ncbi.nlm.nih.gov/pubmed/11137344> *Galphimia glauca*
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