



## ETHNO-MEDICINAL STUDIES OF PLANTS USED FOR THE TREATMENT OF ASTHMA BY INDIGENOUS COMMUNITIES OF CHAMBA (HIMACHAL PRADESH)

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### ABSTRACT

The present study deals with usage of ethno-medicinal plants deployed in asthma by indigenous communities of Pangi and Bharmour region of Chamba district, Himachal Pradesh. The therapeutic information from the traditional healers, the herbal medicine practitioners and other local healers was collected through questionnaire and personal interview during field trips. The scientific name, family, mode of usage, dosage and tenure for 21 species was documented and noted for precautions and other remedial measurements. In maximum applications plant parts were used as decoction or inhaled as a smoke. In maximum applications either roots or leaves of species were used for local therapeutic recipes. Usage of *Solanum khasianum* and *Rumex hastatus* was cited by all the informants but no specific information about usage and mode of application was obtained for *Yucca gloriosa* although its application in asthma was affirmed by all the informants.

### KEY WORDS

*Ethno-medicine, Asthma, Pangi, Bharmour, Chamba, Himachal Pradesh*

### INTRODUCTION

Asthma is a long term complex inflammatory disease with narrowing airway and is characterized by variable and recurring symptoms, bronchospasm and reversible airflow obstruction. It also goes with altered levels of mast cells, eosinophils, lymphocytes, cytokines and other cyto-inflammatory products. Clinically asthmatic patients show high levels of specific IgE which either binds to mast cells receptors and / or other inflammatory cells which in turn results in the activation of multiple inflammatory reactions, including release of cellular mediators- histamines, prostaglandins and leukotrienes which subsequently compress smooth airway muscle and broncho-constriction [1-3]. It is triggered by many factors among which climatic

conditions adverse utmost. Common climatic triggers that exacerbate asthma symptoms include cold air, wind and rain, heat, lightning and air pressure fluctuations. Exposure to low temperatures and inhalation of dry air causes constriction of airways and in turn asthmatic patients become manifold prone to severe asthmatic attacks. Sensitivity to cold in asthmatic patients has been confirmed in clinical provocation studies using hyperventilation and cold dry air [4,5]. Worldwide population residing in colder areas are more prone to asthmatic subsequences therefore despite allopathic medications they rely more on their indigenous drugs as it has been part of their daily therapeutic system through ages.

Chamba district of the northern Himachal Pradesh lies between north latitude 32° 11' 30" and 33° 13' 6" and east longitude 75°49 and 77° 3' 30"; covered with long range of Himalayas with altitude ranging from 2,000 - 21,000 feet. During winters temperature frequently drops to zero and below zero forming frizzed mountains tops. Despite many government primary health centre's and hospitals, indigenous communities of this region depend upon their plant sources of immediate vicinity to treat various maladies [6-13]. Despite large number of enumerations of medicinal plants, no important compendium regarding asthma can be cited for this region. The present study was carried out in the tribal pockets of Pangi and Bharmour area of Chamba district to enlist only those plants which are specifically deployed for asthma and its associated symptoms.

#### MATERIALS AND METHODS

The ethno-medicinal survey was carried out from 2015 to 2017 in various ethnic localities of Pangi and

Bharmour area of Chamba district and folklore data was collected from 61 informant's viz. local healers, ritual therapists and users. Informants were cross checked thrice and information re-authenticated at least twice by healers was only included in present documentation. As per CBD guidelines prior informant consensus was obtained from each informant and data regarding it dosage, mode and usage was recorded accordingly. Herbarium sheets of documented plants were prepared and species was identified using local flora and secondary sources. Herbarium sheets were deposited in Department of Botany, PAHER University, Udaipur (Raj.). Local therapist generally measures doses using household implement or utensils. Standard measures for such doses was calculated and compared with standard values. Three teaspoons equal one tablespoon or generally as spoon where one teaspoon equals approximately 5ml or 4 g. Half-glass equals 100 or 120 ml whereas one cup measures 80 to 100 ml.

**Table 1.1: Ethno-medicinal enumeration of plants used by indigenous communities of Chamba district (Himachal Pradesh) to treat Asthma**

S.No	Botanical name (Family)	Plant part/s used	Form of usage; Application	Usage time / Tenure	Usage amount
1.	<i>Adhatoda vasica</i> Nees (Acanthaceae)	Leaves	Decoction; Orally	-	-
2.	<i>Boerhavia diffusa</i> Linn. (Nyctaginaceae)	Roots	Decoction; Orally	As tea; 2-3 times a day	Half cup
3.	<i>Cinnamomum tamala</i> Nees & Eberm. (Lauraceae)	Leaves	Decoction with turmeric; Orally as tea	After supper, before bed	One cup
4.	<i>Cissampelos pareira</i> L. (Menispermaceae)	Leaves	Extract; Orally	After supper	Half tea spoon
5.	<i>Delphinium denudatum</i> Wall ex Hook (Ranunculaceae)	Roots	Powder; Orally	Once a day	1-2 g
6.	<i>Hedychium spicatum</i> Smith (Zingiberaceae)	Rhizomes	Decoction; Orally	Twice or thrice a day	-
7.	<i>Justicia adhatoda</i> L. (Acanthaceae)	Leaves	Decoction; Orally	2-3 times a day	Half cup
8.	<i>Lepidium sativum</i> L. (Brassicaceae)	Whole Plant	Decoction with cloves; Orally	2-3 times a day	One cup
9.	<i>Myrica esculenta</i> Buch. -Ham. ex D. Don (Myricaceae)	Bark	Decoction; Orally	As tea with clove and black pepper	-
10.	<i>Nicotiana tabacum</i> L. (Solanaceae)	Roots	Smoke; Inhalation	-	-
11.	<i>Phytolacca acinosa</i> Roxb. (Phytolaccaceae)	Roots	Smoke; Inhalation	-	-
12.	<i>Plantago lanceolata</i> Linn. (Plantaginaceae)	Leaves	Infusion; Orally	Twice a day before meals	Half cup

13.	<i>Quercus leucotrichophora</i> Camus. (Fagaceae)	Fruits & Bark	Decoction; Orally	Twice a day	One cup
14.	<i>Rumex hastatus</i> Don. (Polygonaceae)	Roots	Semolina sweet meal; Orally	Semolina sweet meal is prepared with regular ingredients. After preparation <i>Rumex</i> roots and <i>Quercus</i> bark in 1:1 ratio (5g) is added. And adult patients are given three serving spoons.	
15.	<i>Sisymbrium irio</i> L. (Brassicaceae)	Seeds	Powder; Orally	Early morning, empty stomach	One teaspoon
16.	<i>Solanum khasianum</i> Clarke (Solanaceae)	Fruits	Smoke; Inhalation	-	-
17.	<i>Stephania glabra</i> (Roxb.) Miers. (Menispermaceae)	Roots	Extract; Orally	Twice a day after an hour to meals	3-5 drops
18.	<i>Urtica dioica</i> L. (Urticaceae)	Leaves	Smoke; Inhalation	-	-
19.	<i>Viola canescens</i> Wall. (Violaceae)	Whole Plant	Decoction; Orally	Twice day	One cup
20.	<i>Vitex negundo</i> Linn. (Verbenaceae)	Seeds	Powder with honey; Orally	Early morning (Fasting)	One teaspoon
21.	<i>Yucca gloriosa</i> Linn. (Agavaceae)	Whole Plant	-	-	-

## RESULT AND DISCUSSION

Low temperature, erratic winter rainfalls and snow-covered mountains make harsh conditions for survival. Population exposed to such conditions are prone to respiratory diseases and despite generalized cold and cough, bronchitis and asthma are tough to win maladies of such regions. Ethno-medicinal studies of Pangi and Bharmour area of Chamba district reveals usage of 21 plants i.e. *Adhatoda vasica*, *Boerhavia diffusa*, *Cinnamomum tamala*, *Cissampelos pareira*, *Delphinium denudatum*, *Hedychium spicatum*, *Justicia adhatoda*, *Lepidium sativum*, *Myrica esculenta*, *Nicotiana tabacum*, *Phytolacca acinosa*, *Plantago lanceolata*, *Quercus leucotrichophora*, *Rumex hastatus*, *Sisymbrium irio*, *Solanum khasianum*, *Stephania glabra*, *Urtica dioica*, *Viola canescens*, *Vitex negundo* and *Yucca gloriosa* for asthma and its related symptoms. These plants probably act as immuno-modulatory, anti-inflammatory, antihistaminic or smooth-muscle relaxants [14].

*Adhatoda vasica*, *Boerhavia diffusa*, *Cinnamomum tamala*, *Hedychium spicatum*, *Justicia adhatoda*, *Lepidium sativum*, *Myrica esculenta*, *Quercus leucotrichophora* and *Viola canescens* are used as decoction whereas roots of *Plantago lanceolata* are ingested as infusion. Smoke of *Nicotiana tabacum*,

*Phytolacca acinosa*, *Solanum khasianum* and *Urtica dioica* is inhaled to reduce inflow obstructions by dilating pulmonary passages. Informants disagreed each other on usage time / tenure and usage amount of smoke to be inhaled (Table 1.1).

Semolina recipe of *Rumex hastatus* is also used to treat the same but is less preferred as it makes high risk for patients also suffering from diabetes mellitus II and cardiac infraction or with high cholesterol levels. When an asthma patient comes in contact with an allergic substance, it behaves as an antigen and reacts with the corresponding antibodies already present in his bodies. The Histamine and other substances liberated during the allergic reactions cause the damage in the bronchi [15-17]. Documented plants probably possess biomolecules which repair mast cells of bronchi and serve as anti-asthmatic or serve as leukotriene antagonists [18-20]. Usage of *Solanum khasianum* and *Rumex hastatus* was cited by all the informants. No specific information about usage and mode of application was obtained for *Yucca gloriosa* although its application in asthma was affirmed by all the informants.

## CONCLUSION

Asthma has affected many lives since ages. In current scenario climatic changes has triggered and hiked its risk and therefore researchers are looking for remedial sources in both traditional and modern systems. Reported plants have been used since ages through local peoples of Chamba (HP). Among documented plants *Solanum khasianum*, *Rumex hastatus* and *Yucca gloriosa* are used by all the indigenous communities of the study area. Therefore, pharmacological and clinical evaluation of these plants will help in the confirmation of their efficacy and screening of authenticated species that can be used for the promissory formulation of novel drug/s.

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