



Research Article

Ethnomedicinal studies of some tree species of Chamba district (Himachal Pradesh) India.

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Abstract: The present study encompasses 121 ethno-medicinal uses of 26 tree species of 20 families deployed for 75 maladies and 16 body systems as included in WHO-ICD 11 by Gaddi and Gurjar tribes of Chamba region (Himachal Pradesh). Tribal's were more familiar to therapeutic plants used for digestive disorders i.e. 24 use reports of 16 tree species followed by skin maladies and localized infections. No citation regarding immune system, circulatory, sensory systems, mental, behavioral / neuro-developmental disorders, sleep-wake disorders, conditions related to sexual health and injury, poisoning or certain other consequences of external causes was obtained. *Taxus baccata* was found to be most versatile species of the region as it was deployed in 13 diseases of 8 body systems.

Keywords: Gaddi, Gurjar, Chamba, ICD 11, *Taxus baccata*

Introduction

Himachal Pradesh has been regarded as a veritable emporium of plant genetic resources housing huge diversified medicinal and aromatic plants. It is a rich repository of medicinal wealth and occupies an important place in the Vedic treatises. In ancient times, it has been the abode of saints and sages, who pursued meditational and scholarly endeavors. According to Ayurvedic Pharmacopoeia Committee, Government of India, out of 1100 single ingredient drugs, 350 plants belong to indigenous therapeutic group among which 225 species bloom in Himachal Pradesh and are utilized for commercial extraction. However, no proper records are available for such transactions (Chauhan, 2003). There is an urgent need to identify pertaining natural wealth and make people aware to know their utilities and its repercussions before they are extinct. The exploration is utmost important or this valuable and unbeatable information will be lost forever (Singh and Minoo, 2003).

According to the Census 2011, 5.71% of the state population belongs to Scheduled Tribes. The major tribes include - Bhot, Bodh, Gaddi, Gujjar, Jad, Lamba, Khampa, Kanaura, Kinnara, Lahaula, Pangwala, Swangla, Demba, Gara, Beta, Beda and Zoba. The highest tribal population resides in Chamba followed by Kangra and Kinnaur. These tribes are believed to be the descendent of Indo-Aryan lineages. Chamba district is also considered as one of the richest areas of traditional and potential medicinal wealth. It has 10 tehsils viz. Bhalai, Bhattiyat, Brahmaur, Chamba, Chaurah, Dalhousie, Holi, Pangi, Saluni and Sihunta and inhabits 1110 villages. Tribal's rich Pangi tehsil falls

in between north latitude 32^o-33' and 33^o-19' and between east longitude 76^o-15' and 77^o-21' and the Bharmour tehsil is situated approximately between the north latitude 32^o-11' and 32^o-41' and in between the east longitude 76^o-22' and 76^o-53'. Snow glaciers, high altitudes and highly-rugged terrain, fed by fast flowing rivers and their tributaries are the peculiar features of these tribal areas.

The earlier documented medicinal lore of Chamba includes that of Gupta (1964 and 1971); Shabnam (1964); Thakur (2007); Guleria and Vasishth, (2009); Rani *et al.* (2013); Dutt *et al.*(2014) and Thakur *et al.*(2016) while Singh and Sharma (2006) gave a detailed account of floristic wealth of Chamba. Despite of countable documentation of medicinal folk lore no special account of tree species has been enumerated yet. Rugged mountains inhabit woody flora utmost as they prevail throughout years whereas herbs account for a very short season. Traditional therapeutic proceedings rely on nearby vicinity resources and tribal's least count on storage of drugs or its parts, so in hilly tracts of Chamba the tree species play more important role as compared to other plant habits. Therefore, it's essential to indentify and conserve species of pivotal importance.

According to WHO the application efficacy of traditional formulation can be recognized on two arrays i.e. its application for an ailment and its application for body systems. Hence in present study the documentation and its analysis were carried out using ICD 11 (WHO, 2017) for both the

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arrays i.e. usage for maladies and body system so that both versatile and a disease specific species can be identified.

Materials and Methods

For the documentation of medicinal uses of tree species, field surveys were carried out all around the year from 2014 to 2017 in various tribal, rural and sub-rural pockets i.e. Banikhat, Bhalai, Brangal, Brahmaur, Chamba, Chaurah, Chuari Khas, Dalhousie, Harsear, Holi, Saluni, Sinhunata, Tissa etc. of Chamba region of Himachal Pradesh.

For recording and documentation, field interviews were made from different practitioner's i.e. ritual therapist, herbalist, grain diviner, priest and ancestral practitioner through local transcends to avoid language ambiguity and data was recorded in information retrieval form. According to CBD guidelines prior informant consent (PIC) was

obtained and inscribed for usage, dose, mode of dose, tenure/ time interval etc.

Usage reports were categorized for both body systems and disease categories to evaluate the versatility and uniqueness of the reported plant. In case of poly-herbal preparation ratio of respective drug/s and mode of usage was specifically noted. As some of the herbs prevents usage of other food/s and supplements/s as they directly or passively interacts with others, in such cases special notes were made for check modes.

In order to determine the authenticity of information collected during field visit, data was cross checked with published data of the same array and region. Data was also authenticated in criss cross manner by interviewing other informants.

Observation

Table 1.1: Ethno-medicinal enumeration of trees species used by tribal communities of Chamba district (Himachal Pradesh) to treat human diseases and disorders

S.No.	Botanical name (Family) Local name	Plant part/s used	Form of usage; Application	Usage time / Tenure	Usage amount	Ailment/Disorder/Used as (Disease category - ICD 11)
1.	<i>Albizia lebbek</i> (L.) Benth. (Fabaceae) Fuli	Seeds	Oil; Smear	Film over incision	-	Wound (14)
		Roots	Decoction with cider vinegar (4:1); Orally	Twice or thrice as prescribed Early morning, empty stomach	One cup	Obesity (05) and As Carminative (13)
2.	<i>Bauhinia variegata</i> L. (Caesalpiniaceae) Karale	Bark	Paste; Topically	-	-	Skin rashes (14) and Leprosy(01)
		Floral Buds	Powder; Orally	Twice with luke warm water	One teaspoon	Dysentery(01) and Piles(13)
		Flowers & Pods	Vegetable	-	-	As Anthelmintic (23)
3.	<i>Celtis australis</i> L. (Cannabaceae) Khidak	Roots	Paste; Topically	-	-	Wounds(14)
			Decoction with turmeric; Orally as tea	After supper, before bed	One cup	Cold and Cough (12) and Asthma(12) Bronchitis(12)
4.	<i>Cinnamomum tamala</i> Nees & Eberm. (Lauraceae) Tejpata	Leaves	Powder; Orally	Daily empty stomach	One glass	Tuberculosis(01)
			Infusion; Orally	With lemon before meals	One cup	Carminative(13)
			Powder; with boiled rice filtrate	During menstrual days	One cup	Menstrual Cramps(16)
5.	<i>Citrus limon</i> L. (Rutaceae) Nimbu	Unripe Fruits	Roasted peel powder; Orally	Twice a day with like warm water	One tea spoon	Liver complaints(13)
6.	<i>Eucalyptus citriodora</i> Hook. (Myrtaceae) Safeda	Leaves	Decoction; Orally	-	-	To wash wounds (14) and Sores(01)
7.	<i>Eucalyptus hybridum</i> L. (Myrtaceae) Safeda	Stem & Leaves	Juice; Poulitice	-	-	Febrifuge(21)
8.	<i>Ficus carica</i> L. (Moraceae) Anjir	Ripe fruits	Raw; Orally	-	2-3	In Cancer(02) and As Antispasmodic (15)
		Leaves	Extract; Orally	Twice a day	Half tea spoon	Tuberculosis*(01)
9.	<i>Grewia optiva</i> Drumm. (Malvaceae) Beyul	Leaves	Paste; Poulitice	-	-	Joint pains(15)

*Smoke of Ficus Bark is inhaled in some ethnic localities but this use was denied if a patient is suffering from migraine.

10.	<i>Jacaranda mimosifolia</i> L.(Bignoniaceae) Jacaranda	Bark	Decoction; Orally	As prescribed by traditional birth attendant	As Lube during childbirth (18)	
		Fruits	Infusion; Orally	Once or twice a day	One cup Fever (21)	
		Leaves	Juice; Orally Paste; Poultice / Extract; Smear	Thrice a day	One teaspoon	Syphilis (01) and Gonorrhea (01) Syphilitic sores (01) , Eczema (14) and Psoriasis (14) Buboec (01)
11.	<i>Litsea glutinosa</i> (Lor.) Robins. (Lauraceae) Chandna, Singrau	Bark	Paste; Poultice	-	-	Sprain (15)
		Leaves	Paste; Poultice	-	-	Wounds (14) and Bruises (14)
12.	<i>Mallotus philippensis</i> Muell. Arg. (Euphorbiaceae) Kamala	Fruits peel	Powder; Smear/ Poultice	-	-	As Anthelmintic (23) , Scabies (01) , Eczema (14) , Ringworm (01) and Boils (13)
		Fruits	Decoction; Orally	After supper	-	As Aphrodisiac (17)
13.	<i>Melia azedarach</i> L. (Meliaceae) Bakain, Dainkan	Bark	Decoction; Orally	As prescribed by local therapist (Disease-stage dependent)	-	Bile troubles (13) and Ulcers (13)
		Leaves	Paste ; Poultice	-	-	Wounds (14) and Suppuration of boils (13)
		Whole plant	Decoction; Orally	As prescribed by local therapist (Disease-stage dependent)	-	Depression (06)
		Stem	Raw; Chewed	-	-	Gum problem (13)
		Bark	Powder; Orally Decoction; Orally	During ache	Half spoon	Stomachic (13) As Carminative (13)
14.	<i>Murraya koenigii</i> L. (Rutaceae) Gandala/ Kari patta	Leaves	Raw; Orally	Chewed early morning	4-6 leaves	Obesity (05)
		Leaves	Decoction; Orally	As prescribed by local therapist (Disease-stage dependent)	-	To reduce cholesterol (05)
		Fruits	Extract; Topically	-	-	As Astringent (14)
		Roots	Decoction; Orally	Once or twice a day Early morning; empty stomach	One cup One cup	Leucoderma (14) Renal problems (16)
15.	<i>Myrica esculenta</i> Buch.-Ham. ex D. Don (Myricaceae) Kaifal	Bark	Powder; Orally Decoction; Orally Decoction; Gargle	2/3 times as required As tea with clove and black pepper	Half spoon	As Carminative (13) Asthma (12) , Bronchitis (12) and Lung affections (12) Toothache (13)
		Flowers	Oil; Orally Oil; Topically-massage	Twice to thrice a day	-	Diarrhea (01) and Dysentery (01) Paralysis (08)
		Seeds	Oil; Orally	-	One teaspoon	As Laxative (13)
16.	<i>Prunus amygdalus</i> Roxb. (Rosaceae) Badam	Seeds	Oil; Massage	-	-	Inflammations (15)
		Seeds	Powder; Orally	After meals	3-5 g	Stone problem (13,16)
17.	<i>Prunus cerasoides</i> D.Don. (Rosaceae) Padmakh	Heart wood	Powder; Orally	As requisite	3-5 g	Vomiting (13) , Nausea (12) and Gastritis (13)
		Heart wood	Decoction; Orally	Three to four times a day	One cup	As Febrifuge (21)

			Decoction; Orally	Early morning, empty stomach	40-50 ml	To stop abortions (18) and to promote conception (18)
		Whole plant	Paste; Topically	A thin film is applied over infected parts		Herpes (01) and to improve skin complexion (14)
18.	<i>Punica granatum</i> L. (Punicaceae) Anar	Fruits	Powdered rind with luke warm water.	Empty stomach for 30-45 days	2-3g	Diabetes (05)
19.	<i>Pyracantha crenulata</i> (Don.) Roemer (Rosaceae) Chota seb	Fruits	Powder with yogurt; Orally	Twice a day	5g	Blood dysentery (01)
		Seeds	Decoction; Orally	Thrice a day	10 ml	Dysentery (01) and Diarrhea (01)
20.	<i>Quercus leucotrichophora</i> Camus.(Fagaceae) Ban	Fruits & Bark	Decoction; Orally	Twice a day	One cup	Asthma (12)
			Powder; Orally	After meals	One teaspoon	Piles (13)
		Flowers	Powder; Orally	At an interval of 6 hrs	1-3 gm	Blood dysentery (01) and Diarrhea (01)
			Infusion; Orally	As prescribed by local therapist (Disease-stage dependent)		Fever (21)
21.	<i>Rhododendron arboreum</i> Sm. (Ericaceae) Burans		Tincture; Orally	Twice a day	50-100 ml	Gout (15) and Rheumatism (15)
		Leaves	Powder; Orally	Before meals	5-10 g	Diabetes (05)
			Infusion; Orally	Once or twice	One cup	Hepatic disorders (13)
22.	<i>Rhus cotinus</i> L. (Anacardiaceae.)Tung	Fruits	Powder; Orally	As prescribed	One teaspoon	Gastrointestinal disorders (13)
		Leaves,	Paste; Poulitice	Over affected parts		Cuts (14) , Bruises (14) and Swollen joints (15) As Galactagogue (18)
23.	<i>Ricinus communis</i> L. (Euphorbiaceae) Arind		Juice; Poulitice	Tied on the breast		
		Seeds	Oil; Orally	After an hour after supper	Two spoon	Constipation (13)
		Flowers	Infusion; Orally	Information among informants	varied	Gastrointestinal problems (13)
24.			Extract; Topically	Over ruptured skin	-	Skin rashes (14)
	<i>Salix tetrasperma</i> Roxb. (Salicaceae) Biyunsh	Leaves	Extract; Topically	Poulitice over joints	-	Rheumatism (15)
			Infusion; Orally	Before going to bed	One cup	Piles (13)
		Bark	Decoction; Topically	Over forehead	-	Febrifuge (21)
		Roots	Paste; Poulitice	Tied over effected part/s.		Arthritis (15) and Rheumatism (15)
		Leaves	Infusion; Topically	Used in baths		Joint pains (15) and Gout (15)
25.	<i>Sapindus mukorossi</i> Gaertn. (Sapindaceae) Ritha	Fruits	Paste; Poulitice	Applied externally 3-4 times a day	-	Eczema (14) and Psoriasis (14)
			Infusion; Orally	As prescribed by local therapist	One to two spoon	Epilepsy (08) and Migraine (08)
		Seeds	As tooth powder; Topically	-	-	Dental caries (13)
26.	<i>Taxus baccata</i> L. (Taxaceae)Thuno,	Leaves	Extract; Orally	As required	~ 5 ml	As Antispasmodic (15)

Barmi		Extract is ingested with 3-5 drops of almond oil	One teaspoon	Nervousness(08), Hysteria(07) and Epilepsy(08)
	Infusion; Orally	Twice a day, before meals	One cup	Stone problem(13,16)
Tender shoots	Tincture; Orally	-	~ 5 ml	Headache (08) and Giddiness(21)
	Extract; Orally	-	3-5 drops	Feeble and falling pulse (21)
	Infusion; Orally	-	One cup	Diarrhea (01) and Bilioussness(13)
	Powder; Orally	Twice a day with onset of tumor	One teaspoon	Tumor(02) and Cancer(02)
Roots	Paste; Poultice	Root paste in olive oil is smeared over affected parts		Leprosy(01)

Disease category (DC):

01.Certain infectious or parasitic diseases	13.Diseases of the digestive system
02.Neoplasms	14.Diseases of the skin
03.Diseases of the blood /blood-forming organs	15.Diseases of the musculoskeletal system or connective tissue
04.Diseases of the immune system	16.Diseases of the genitourinary system
05.Endocrine, nutritional or metabolic diseases	17.Conditions related to sexual health
06.Mental, behavioural / neuro-developmental disorders	18.Pregnancy, childbirth or the puerperium
07.Sleep-wake disorders	19.Certain conditions originating in the perinatal period
08.Diseases of the nervous system	20.Developmental anomalies
09.Diseases of the visual system	21.Symptoms, signs or clinical findings, not elsewhere classified
10.Diseases of the ear or mastoid process	22.Injury, poisoning or certain other consequences of external causes
11.Diseases of the circulatory system	23.External causes of morbidity or mortality
12.Diseases of the respiratory system	24.Factors influencing health status or contact with health services

("Three teaspoons" equals "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). No prohibitory food supplements were recorded in any citation.

Result and Discussion

Ethno-medicinal survey of various tribal localities of Chamba district with respect to tree species reveals 121 therapeutic usages of 26 trees for 16 body system and 75 disease category/ ailments as included in ICD-11. No therapeutic usage report regarding diseases of the immune system, visual system, ear or mastoid process and blood /blood-forming organs or circulatory system was observed. Among local therapies, doses of drugs are generally measured through household implement or utensils (Cetto and Heinrich, 2011). Indigenous peoples were highly aware about various topical and internal infections and used various anti-microbial/s accordingly as *Bauhinia variegata* and *Taxus baccata* for leprosy, *Cinnamomum tamala* and *Ficus carica* for tuberculosis, *Jacaranda mimosifolia* and *Sapindus mukorossi* for psoriasis, *Jacaranda mimosifolia*, *Mallotus philippensis* and *Sapindus mukorossi* for eczema and *Prunus cerasoides* for herpes. Biomolecules are either cidal or static to micro-organisms as they interfere in their biochemical pathways or hinder the substrate product equilibrium (Lal and Singh, 2008; Jain et al., 2017).

Informants were not aware about the concept of malignancy with respect to cancer and tumor. Therefore, the plant usages in cases where the patient was clinically diagnosed for cancer were included in cancer subcategory while all clinically undiagnosed masses of tissues were included under tumors. *Ficus carica* and *Taxus baccata* are used to

treat malignant tumors. Plant derived flavanoid/s are effective anti-cancerous molecules and reported plants are the good sources of flavanoid/s group therefore, they are ought to have anti-cancerous properties (Cragg and Newman, 2005).

Among studied communities obesity is considered to be an outcome of over eating and they do not relate it to any other metabolic disorder. Among tree species *Bauhinia variegata* and *Murraya koenigii* are used to reduce the stuffed body fat. *Murraya koenigii* is rich in fiber which in turn may help in early satiety, less uptake and weight loss. Symptoms related to sugar anomaly was recorded to differentiate the sub-category of diabetes. Among diabetes mellitus no juvenile or gestational record was obtained and the informants were not aware about diabetes insipidus. Therefore, in present documentation diabetes generally refers to diabetes mellitus II. *Punica granatum* and *Rhododendron arboretum* are used to reduce high glycemic levels. The active components of these plants effectively seizes post prandial hyperglycemia (Arora and Paliwal, 2015).

According to local therapist *Prunus cerasoides* and *Taxus baccata* are used to get rid of stone problems but they were unable to demarcate between kidney and gall bladder stones. *Citrus limon* and *Rhododendron arboretum* are used to treat liver disorders. These plants may affect the transaminase activity and

thereby effecting SGOT and SGPT levels in hepatocytes. Amidst mental, behavioural / neuro-developmental disorders the stress and depression sounds aloud. *Murraya koenigii* is used in either ways to treat depression. Paralysis is a loss of muscle function in part of the body. It can be temporary or permanent. The most common causes are stroke, spinal cord injury and multiple sclerosis. Gaddi tribe specifically uses *Myrica esculenta* for the treatment of paralysis (Table 1.1).

Chamba (HP) is a region of harsh conditions which forms a colder desert with a pertaining low temperature leading to slow biochemical processes and abundance of parasitic activity, thereby making people more prone to internal and external infections (Lal et al., 1996). In addition roughed hilly areas also affect musculo-endothelial tissues of the higher biotic communities. Therefore, people residing in such harsh conditions are more aware about their remedies (Badola, 2001).

Rheumatism tends to be used as synonym for variety of symptoms such as joint pain and inflammation. Among inflammatory joint diseases rheumatoid arthritis represents the most common form of chronic and systemic inflammatory disease and is marked by synovial hyperplasia with local invasion of bone and cartilage leading to joint destruction (Ahmed et al., 2005). *Rhododendron arboretum*, *Salix tetrasperma* and *Sapindus mukorossi* are used to treat rheumatism and are in accordance to criss-cross tally among different ethnic pouches.

Conclusion

Maximum citation i.e. 24 use reports were obtained for disease related to digestive system i.e. the indigenous tribal peoples were more versed to the plants that can be deployed to get relief from the disorders and discomforts of digestive tract followed by maladies of skin. Local groups also expertise in therapeutic access to the diseases and affects of parasites on internal (with 21 use reports) and external milieu leading to various skin diseases followed by therapeutic usages for endo-muscular ailments. Among local herdsman least information prevailed for therapeutic uses of tree species for mental, behavioural / neuro-developmental disorders, sleep-wake disorders, conditions related to sexual health and injury, poisoning or certain other consequences of external causes. Among documented tree species *Taxus baccata* was found to be highest multi-purpose medico species as it is deployed in 13 ailments belonging to 8 disease categories followed by *Murraya koenigii*, *Prunus cerasoides* and *Sapindus mukorossi* which are used in 9 ailments. Among these three species *Prunus cerasoides* is comparatively more versatile as it is used in six categories of disease followed by *Murraya koenigii* and *Sapindus mukorossi*. *Albizia lebbbecke*, *Celtis australis*,

Citrus limon, *Eucalyptus hybridum*, *Punica granatum*, *Pyracantha crenulata* and *Rhus cotinus* are used in solo pan i.e. they are used for single maladies. It can be also be inferred that they are more specific in their mode of action contrary to versatile multi-purpose *Taxus baccata*.


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