

A Study of the Correspondence Between Traditional Medicinal Uses and Phytochemical Profiles of 38 Plants Used by the Thakar Adivasi tribe in Chinchwadi, Maharashtra

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Traditional ethnobotanical knowledge remains a crucial yet frequently undocumented resource for modern pharmacology. This knowledge is increasingly threatened by environmental change and urbanization. This study documents medicinal plant knowledge shared by a knowledgeable member of the Thakar tribe and compares the traditional uses with the published phytochemical profiles of the plants. A field survey with one knowledgeable local resident was conducted to document local names, plant part used, method of preparation and ailment treated. Scientific identification of the documented plants was performed, and published literature was then examined to compare the traditional uses of the plants to their reported phytochemical profiles and pharmacological activities. 38 Medicinal plant species representing 21 botanical families were documented. The most frequently used part was the leaf, and pastes and diluting pastes with water were predominant methods of preparation. Multiple medicinal uses were consistent with published evidence regarding bioactive compounds reported for the documented species of plants. The findings of this study contribute to the preservation of traditional ethnobotanical knowledge while highlighting the correlation between the traditional uses and phytochemical profiles of the 38 plants listed. The species that were documented may serve as candidates for future biochemical and phytochemical research.

The table below documents the primary dataset, consisting of the information recorded according to what was detailed by the local guide from the Thakar tribe.

No.	Scientific name	Family	Local name	Part used	Traditional use	Preparation method	Route of administration
1	<i>Ficus racemosa</i>	Moraceae	umbar tree	roots	inflammation/acidity	cut root at night and place pot under to collect fluid, next day filter it with muslin cloth and drink filtrate	oral
2	<i>Embelia tsjeriam</i> -cottam	Primulaceae	phatakdi	leaves	diabetes	cook leaves and ingest	oral
3	<i>Madhuca longifolia</i>	Sapotaceae	mahua	seed	joint pain	peel seed, dry under sun and extract oil using mechanical stone press, apply oil to affected areas	topical
4	<i>Anamirta cocculus</i>	Menispermaceae	kokhera	seed	treat snake envenomation	ingest seed and induce emesis	oral
5	<i>Holarrhena pubescens</i>	Apocynaceae	kuda	roots	fever in children	rub root on a stone and mix the paste with water and ingest 1 tsp	oral
6	<i>Hemidesmus indicus</i>	Apocynaceae	Kavli paan /Anantmul	root	lactation insufficiency	boil root with 1-2 cup of cows milk and drink	oral
7	<i>Terminalia elliptica</i>	Combretaceae	Ain	sap	improving maternal health during the puerperium	extract sap and mix in food items(eg; laddoos)	oral
8	<i>Lantana camara</i>	Verbenaceae	ghaneri	root	pus filled boils on hands/skin infection	rub off top layer of root on a stone, mix the paste which is formed with water and drink	oral
9	<i>Vitex negundo</i>	Lamiaceae	nirgudi	leaf and stem	fever/cough	soak stem with attached foliar tissue in boiling salt water and then pour water over body, and inhale steam	topical, inhalation
10	<i>Ficus benghalensis</i>	Moraceae	bargad	root ends	kidney stones	ingest raw root for 10-15 days daily	oral
11	<i>Pogostemon benghalensis</i>	Lamiaceae	phangli	leaves	gastritis/stomach infection/indigestion	crush leaves and drink juice (1/2 glass) for 2-3 days	oral
12	<i>Butea monosperma</i>	Fabaceae	palash	flowers	skin health/eczema/heatstroke protection	steep flowers in water and drink	oral

13	Phanera vahlii	Fabaceae	apta tree	leaves	cold/cough	Roasted Trachyspermum ammi seeds were wrapped in the leaf, which was then rolled into a cylindrical form, ignited, and the resulting smoke was inhaled	inhalation
14	Sterculia urens	Malvaceae	kandol tree	sap	throat infections	soak a small piece of dried gum (1-2g) in a glass of warm water and drink	oral
15	Cordia dichotoma	Boraginaceae	bhokar tree	fruit	digestion/joint pain	cook fruit and ingest	oral
16	Radermachera xylocarpa	Bignoniaceae	khadshingi	beans	stomach pain/digestion	cook beans and ingest	oral
17	Tinospora cordifolia	Menispermaceae	gulvel	stem	flu/cough/fever	cut, crush and boil stem in 3 cups of water and drink 1 cup	oral
18	Aegle marmelos	Rutaceae	bel	fruit	cooling/inflammation	extract juice of fruit and drink	oral
19	Cassia fistula	Fabaceae	bahava	beans	constipation/food poisoning	eat dark gum present inside the bean	oral
20	Dioscorea bulbifera	Dioscoreaceae	kadu kand	tuber	fracture/swelling in cattle limbs	crush roots and make poultice and apply to affected area. wrap in bandage and immobilise using bamboo strips	topical
21	Mangifera indica	Anacardiaceae	amba	bark	jaundice	mix powdered bark with slaked lime and use to wash hands before sunrise 3x a week	topical
22	Cordia dichotoma	Boraginaceae	bhokar tree	bark	cough	cut into the bark, remove a small piece and suck on the inside layer of the bark	oral
23	Carissa carandas	Apocynaceae	karvanda	new leaves	cough	ingest 2-3 clean leaves	oral
24	Chrysopogon zizanioides	Poaceae	vala	root	inflammation	soak cleaned root in water for 2 hours and then drink the water	oral
25	Ehretia aspera	Boraginaceae	ragatroda	bark	anemia/blood purification	cut bark and boil in 3 cups of water, allow evaporation till 1 cup is remaining and drink the remaining infused water	oral
26	Calotropis gigantea	Apocynaceae	Rui	new leaves	migraine	smear both sides of the leaves with mustard oil, gently heat and place on the side of the head which is experiencing physical distress, secure with bandage and leave for 1 hour	topical
27	Calotropis gigantea	Apocynaceae	Rui	mature leaves	joint pain	smear leaf with mustard oil, warm leaf, spread turmeric powder on the sides and tie tightly around affected area	topical
28	Jatropha curcas	Euphorbiaceae	chandaryoti	sap	acute toothache (pain relief)	use cotton swab to place sap on cavity (do not ingest)	topical
29	Garuga pinnata	Burseraceae	kakad	fruit	digestion	store fruit in salt water with a layer of oil on top and ingest after meals	oral
30	Ricinus communis	Euphorbiaceae	aerand	stem	enhancing auditory function	place cotton into lumen of one side of hollow stem and ignite, place the other side next to the external auditory canal	otic
31	Terminalia anogeissiana	Combretaceae	dhawda	sap	postnatal nutrition	cut bark, extract sap and mix in food items (eg, laddoos)	oral
32	Derris trifoliata	Fabaceae	karanjvel	leaves	body pain	boil leaves, crush and apply paste on body	topical
33	Erythrina variegata	Fabaceae	pangari	Bark	intestinal parasites in children	boil bark in water and drink	oral
34	Getonia floribunda	Combretaceae	ukshi	leaves	intestinal parasites	extract juice and drink	oral
35	Kalanchoe pinnata	Crassulaceae	panfuti	leaves	kidney stones	ingest	oral
36	Helicteres isora	Malvaceae	murudsheng	beans	pediatric diarrhea	rub bean on a stone, mix paste formed with water, drink 1 tsp of mixture	oral
37	Pterocarpus marsupium	Fabaceae	bivla	Bark	diabetic anemia	Steep in water and drink warm	oral

38	Tamarindus indica	Fabaceae	imli	seed	treat scorpion poisoning	rub seed on stone and apply paste to affected area	topical
39	Dioscorea bulbifera	Dioscoreaceae	kadu kand	tuber	nutrition/nourishment	core the tuber, boil,mix with wood ash and water and ingest the mixture	oral
40	Justicia adhatoda	Acanthaceae	ardulsa	leaves	fever/cold/cough	boil leaves in water for 5-10 mins and then drink	oral
41	Curcuma amada	Zingiberaceae	amba haldi	root	cuts/swelling	crush root and apply paste on affected areas	topical

This next table details the published phytochemical and biological evidence of each of the 41 plant parts documented. This permitted the segregation of the traditional uses into one of the 3 classifications, allowing identification of species which seemed promising for future investigation.

No.	Scientific name	Traditional use	part used	Major phytochemicals	Reported biological activities	Correspondence
1	Ficus racemosa	inflammation/acidity	roots	Triterpenoids, Sterols, Lignans, Coumarins ^{10,11,12}	Anti-inflammatory, Antimicrobial, Antioxidant ^{13,14}	High
2	embelia tsjeriam-cottam	diabetes	leaves	Phenols, Cardiac Glycosides, Flavonoids, Tannins, Alkaloids ^{15,16,17}	Anti-inflammatory, Antimicrobial, Antibacterial, Antioxidant ^{18,19}	High
3	Madhuca longifolia	joint pain	seed	Fatty Acids, Triterpenoids, Saponins, Amino Acids ²⁰	Anti-inflammatory ²² , Antioxidant, Antimicrobial, Anti-diabetic ²¹	High
4	anamirta cocculus	treat snake envenomation	seed	Alkaloids, Picrotoxin	Antibacterial, Neurotoxic ²³	Low
5	Holarrhena pubescens	fever in children	root	Alkaloids, Conessine, Holarrhine, Conessimine ²⁴	Anti-inflammatory ²⁵ , Antimicrobial, Antidysenteric, Anti-plasmodial ²⁵	Medium
6	Hemidesmus indicus	lactation insufficiency	root	Pregnane glycosides, Triterpenoids, Steroids, 2-hydroxy-4-methoxybenzaldehyde ²²	Stress and Cortisol Reduction ²⁶ , Antimicrobial, Antioxidant, Anti-inflammatory ²⁶	Medium
7	Terminalia elliptica	improving maternal health during the puerperium	sap	Pyrogallol, Catechol, Tannins ³⁰	Antiseptic, Antioxidant	Low
8	Lantana camara	pus filled boils on hands/skin infection	root	Oleanolic acid, Verbascoside, Stachyose ³¹	Antimicrobial, Antioxidant, Antipyrctic ³²	High
9	Vitex negundo	fever/cough	leaf and stem	Flavonoids, Iridoid Glycosides, Triterpenes, Volatile Oils ³³	bronchodilator, Anti-inflammatory, Antioxidant, Antimicrobial ³⁴	High
10	Ficus benghalensis	kidney stones	root ends	triterpenoids, β -sitosterol, d-glucoside, Flavonoids, saponins, tannins, steroids ³⁵	Diuretic Tendencies, Antioxidant, Anti-inflammatory, Antidiabetic, Antibacterial	High ³⁶
11	Pogostemon benghalensis	gastritis/stomach infection/indigestion	leaves	Flavonoids (e.g., rutin, naringenin), Phenolic compounds (e.g., epigallocatechin, resveratrol), Terpenoids, Pogostone ³⁷	Antimicrobial and antibacterial, Anti-inflammatory, Antioxidant capacity	High
12	Butea monosperma	skin health/eczema/heatstroke protection	flowers	Flavonoids, Glucosides, Aurones, tannins, butrin	Anti-inflammatory, astringent, Thermoregulatory Support ³⁸	High
13	Phanera vahlii	cold/cough	leaves	flavonoids, taraxerol, saponins, tannins, gallic acid	Anti-inflammatory, Antimicrobial, Antioxidant, Immune Support ³⁹	High
14	Sterculia urens	throat infections	sap	D-galacturonic acid, D-galactose, phenolic compounds, flavonoids, tannins	demulcent, Antimicrobial, Anti-Adhesive ⁴⁰	High
15	Cordia dichotoma	digestion/joint pain	fruit	steroids, caffeic acid, gallic acid, phytosterols, quercetin, kaempferol	Anti-ulcer, Laxative, demulcent, Anti-inflammatory, Cartilage Protection ⁴¹	High
16	Radermachera xylocarpa	stomach pain/digestion	beans	Phenolic Acids, Quercetin Glycosides, Alkaloids, Terpenoids	analgesics, anti-inflammatory, antioxidant ⁴²	High
17	Tinospora cordifolia	flu/cough/fever	stem	Alkaloids, Diterpenoid Lactones, α -D-glucan	Immunomodulatory, antispasmodic, Anti-inflammatory ⁴³	High
18	Aegle marmelos	cooling/inflammation	fruit	marmelosin, rutin, phenolic acids, alkaloids	anti-inflammatory, Antipyretic ⁴⁴	High

19	Cassia fistula	constipation/food poisoning	beans	Sennosides A & B, rhein, Alkaloids, tannins, emodin	Laxative, Antimicrobial, anti-secretory ⁴⁵	High
20	Dioscorea bulbifera	fracture/swelling in cattle limbs	tubers	dioscin, diosgenin, quercetin, kaempferol	anti-inflammatory, Angiogenesis, accelerate fibroblast and epithelial cell migration ⁴⁶	Medium
21	Mangifera indica	jaundice	bark	Mangiferin, polyphenols, tannins, flavonoids	Anti-inflammatory, Hepatoprotective, Antioxidant, Astringent, Antimicrobial ⁴⁷	Medium
22	Cordia dichotoma	cough	bark	Flavonoids, Phenolics, allantoin, Alkaloids, Terpenoids	Anti-inflammatory, Tissue Healing, Antimicrobial ⁴⁸	High
23	Carissa carandas	cough	new leaves	Ursolic Acid, Terpenoids, Flavonoids, Phenolic Acids, Tannins	anti-inflammatory, antioxidants, Antimicrobial ⁴⁹	High
24	Chrysopogon zizanioides	inflammation	root	khusimol, α -vetivone, and β -vetivone	anti-inflammatory, antimicrobial ⁵⁰	High
25	Ehretia aspera	anemia/blood purification	bark	Flavonoids & Phenols, Tannins, Triterpenoids	antioxidants, Anti-inflammatory ⁵¹	Low
26	Calotropis gigantea	migraine	new leaves	flavonoids, cardiac glycosides	anti-inflammatory, antioxidant ⁵²	Low
27	Calotropis gigantea	joint pain	mature leaves	Flavonoids (quercetin), triterpenoids (lupeol and amyriols), cardiac glycosides, Phenolic acids, Alkaloids	anti-inflammatory, Immunomodulatory, Antioxidant ⁵³	High
28	Jatropha curcas	acute toothache (pain relief)	sap	Flavonoids and saponins, Tannins, alkaloids, and phenolic acids, curcin	Anti-inflammatory & Analgesic, Antibacterial, Styptic, Wound Healing ⁵⁴	High
29	Garuga pinnata	digestion	fruit	Quinic Acid, Tannins and Phenols, 4H-Pyran-4-one	antioxidant, astringent ⁵⁵	High
30	Ricinus communis	enhancing auditory function	stem	Flavonoids, Ricinine, Triterpenoids	Antioxidant, Anti-inflammatory ⁵⁶	Low
31	Terminalia anogeissiana	postnatal nutrition	sap	Complex polysaccharides, Tannins, Flavonoids, Gallic Acid & Ellagic Acid, Triterpenoids	sustained energy release, astringent, antioxidant and anti-inflammatory, bioavailable nutritional source ⁵⁷	High
32	Derris trifoliata	body pain	leaves	Kaempferol and Baicalein, phenolics, rutin	Analgesic, antioxidant ⁵⁸	High
33	Erythrina variegata	intestinal parasites in children	bark	Alkaloids, Isoflavonoids and Flavonoids, Sterols and Triterpenoids	CNS Effects, Neuromuscular and Smooth Muscle Effects, Anti-inflammatory ⁵⁹	Low
34	Getonia floribunda	intestinal parasites	leaves	Flavonoids, Tannins, Phenolic Acids, Flavonols	Neuro-disruption, Protein binding, Antioxidant, Anti-inflammatory ⁶⁰	High
35	Kalanchoe pinnata	kidney stones	leaves	Flavonoids, Quercitrin, Saponins, Phenols, Kaempferol	Metal Ion Chelation, Anti-aggregation, Diuretic Action ⁶¹	High
36	Helicteres isora	pediatric diarrhea	beans	Catechin, epicatechin, saponins, flavonoids, Hydrolyzable ellagitannins, condensed tannins, phenolic compounds	astringents, Antisecretory, Antimotility, Antimicrobial ⁶²	High
37	Pterocarpus marsupium	Diabetic anemia	Bark	Flavonoids, Phenolic compounds, condensed tannins and phenols	antioxidant, anti-glycation, and erythropoietic-protective ⁶³	High
38	Tamarindus indica	treat scorpion poisoning	seed	Polyphenols, tannins, Phenolic acids, flavonoids	anti-inflammatory, Enzyme Inhibition, Protein Precipitation ⁶⁴	High
39	Dioscorea bulbifera	nutrition/nourishment	tuber	(after boiling) bound phenolics and flavonoids, lysine and methionine, polyphenols	(after boiling) Antioxidant Amplification, Amino Acid Preservation, low-glycemic source of sustained energy ⁶⁵	High
40	Justicia adhatoda	fever/cold/cough	leaves	Alkaloids (vasicine and vasicinone), Flavonoids & Saponins, Phenolics, Essential Oils	anti-inflammatory, antipyretic, antispasmodic, anti-allergic ⁶⁶	High
41	Curcuma amada	cuts/swelling	root	Curcuminoids, Terpenoids and Volatile Oils, Phenolic Acids	anti-inflammatory, antimicrobial, antioxidant ⁶⁷	High