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Ethnomedicinal Claims on Wound Healing Activity of Certain Leaf Drugs - A Review

Review Article

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Abstract

Plants are traditionally being used as a source of medicine by indigenous people of different ethnic groups inhabiting various terrains for the control of various ailments effecting both human and animals. Recently, focus on plant research has been increased, all over the world, due to the huge potential of medicinal plants used in various traditional systems. Wounds are the result of injuries to the skin that disrupt the soft tissue. Various plants have been used in treatment of wounds over the years in many tribal areas. Many ethno botanical survey reports and books have been published highlighting the use of plant as a whole or its various parts for the management of wounds. Recent research shows that some of these plants are established either experimental or clinical studies for their wound healing activities. Single hand information regarding these plants with their specific parts used for wound healing activity is lacking.

Hence, the present study is an attempt to compile the leaf drugs reported for their wound healing activity from 85 research articles and 14 books related to ethno medicine and ethno botany. It is observed that ethno medicinal plants belonging to 100 families (Asteraceae-51, Fabaceae-38, Euphorbiaceae-34, Lamiaceae-19, Rubiaceae-17 etc.) are reported for their wound healing activity. Among them 202 plants reported for topical application, 11 for oral administration and 9 for both (oral and topical).

Keywords: Ethno medicine, leaf drugs, traditional medicine, wound healing.

Introduction

In today's conventional medical system, ethno medicinal plants plays a great role for new drug development. Relying on the ethnobotanical information, potential biological activities of the plants have been investigated. Wound is one among common health problem in present era. Wounds are one of the major case of physical disabilities (1). Wounds are physical injuries that result in an opening or break of the skin that causes disturbance in the normal skin anatomy and function. They result in the loss of continuity of epithelium with or without the loss of underlying connective tissue (2). Wounds, that are most difficult to heal, includes delayed acute wounds and chronic wounds. Current estimates indicate that nearly 6 million people suffer from chronic wounds worldwide (3). In traditional medicine all over the world, a wide range of plant preparations are employed as wound healing agents. Through scientific studies, many plants used for wound healing have been investigated intensively, in order to validate them for their reported usage. Therefore, the search for natural products as new wound healing agents becomes a great target (4).

Wound healing is a complex mechanism for the repairment of tissue integrity, and comprises of four main phases of haemostasis, inflammation, proliferation and tissue remodelling. Any trauma penetrating into the dermis results in bleeding and the blood vessels immediately contract to reduce the blood loss. Due to platelet aggregation, the clotting process starts to continue the coagulation cascade. A scab occurs by the formation of a fibrin mesh to temporarily close the wounded site and wound continues to produce the blood and serous fluid, in order to cleanse the wound surface from the contaminants (5).

Various plants in different dosage forms, are used by tribals and folklore traditions all over world for treatment of cuts, wounds, and burns. Many ethno botanical survey reports and books were published highlighting the use of plant drug for the management of wound healing (6). Single hand information regarding the plant with their specific parts used for wound healing activity is lacking. Leaves are the most easily available parts used as its sustainable collection does not hamper the growth of the plant. Hence, it is considered as one of the best part used for clinical research. Present research work was planned with an aim to compile the leaf drugs reported for their wound healing activity in published ethno botanical and ethno medicinal books and research articles.

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Materials and Methods:

Various books and research articles related to ethno botany and ethno medicine were scrutinized and reviewed in respect to reported wound healing activity of ethno-medicinal plants. The details of the books including title, publisher, year of publication and page number were noted. The ethno-medicinal plants which have been reported for their use in wounds, cuts, burns etc., where in leaf is the part used, were noted down in a specially designed format in regards to their botanical names, family, local name, dosage form, route of administration and tribal areas. The review was carried out dring January 2017 to November 2017.

Available 14 books on ethnomedicine and 85 research articles on ethnobotany and ethnopharmaocolgy were reviewed. All the books and research articles referred, for easy recording purpose, were assigned with a serial referencing number. The details of the referencing number assigned are: Ethnobotany and medicinal plants of Indian Subcontinent (7), Ethnobotany in South Asia (8), Medicinal plants: Ethnobotany approach (9), A lexicon of medicinal plants in India, vol.-I (10), The medicinal and poisonous plants of India (11), Medicinal plants in India, vol.-I (12), Medicinal plants in India, vol.-II (13), Ethnobotany of Santhal Pargana (14), Medicinal plants of Uttaranchal State (15), An appraisal of tribal-folk medicines (16), Glimpses of medico-botany of Bastar district (M.P.) (17), Medico-botanical exploration of Phulbani and Koraput district of Orissa (18), Medicinal plants of Nagpur and Wardha forest division, Maharashtra (19) and Notable plants in ethnomedicine of India (20). The numbers in bracket in reference column of table 1 are denoting the page numbers of books.

The details of the referencing number for Research articles, presented according to first author, assigned are: Abdul Lateef k et al. 2014 (21), Ayyanar M et al. 2009 (22), Adewale Adetutu et al. 2011 (23), G. D. Wadankar et al. 2011 (24), Chellaiah Muthu et al. 2006 (25), N. Savithramma et al. 2014 (26), Patel DK 2014 (27), Sujata Bhardwaj et al. 2005 (28), Bikram et al. 2012 (29), Prabhat k. Das et al. 2016 (30), Das Amar Jyoti et al. 2012 (31), Ezekiel Amri et al. 2012 (32), Binu Thomas et al. 2004 (33), Kari Inngjerdingen et al. 2004 (34), Sahu P. K. et al. 2014 (35), Sainkhediya Jeetendra et al. 2015 (36), Sarita Das et al. 2003 (37), Abhijeet Dey et al. 2012 (38), Chopda MZ et al. 2009 (39), Patil SB et al. 2009 (40), Senthil KM et al. 2006 (41), VP Silja et al. 2008 (42), Nallella Sreeramulu et al. 2013 (43), Alok Ranjan Sahu et al. 2011 (44), P.N. Arul Manikandan 2005 (45), Soma Manjula et al. 2013 (46), Subramoniam A et al. 2001 (47), Santhapu H. 1953 (48), Naresh Kumar Ghodela et al. 2017 (49), Srivastava SC et al. 2003 (50) and Revathi P et al. 2010 (51).

The data collected were reflecting the words or terminology used by the tribal people and was being retranslated to equivalent English terms by the concerned ethno botany experts. The above generated data were presented in a tabular form (table 1) under above headings including the references. The shortlisted plants were cross checked from the classical texts of Ayurveda with regards to their pharmacological properties and actions.

Abbreviations were made for local name of plants. Details of abbreviation used are: S-Sanskrit, H-Hindi, Mr-Marathi, Kn-Kannada, Tm-Tamil, Snt-Santali, O-Oriya, E-English, Bn-Bengali, Ml-Malayalam, Asm-Assamaese, Kd-Kadar, Mur-Muria, Tel-Telugu Sik-Sikkimese, Andm-Andamanese, Ldk-Ladakhi, Mnd-Mundari, Pun-Punjabi, Ncb-Nicobarese, Mut-Muthwan, Nag-Nagaland, Mlb-Malabar, Guj-Gujarati, Lut-Local Uttaranchal, Raj-Rajasthani, Kmn-Kumaon, Hp-Himachal and Kur-Kurumban.

In route of administration, “T” is denoting topical application and “O” is for oral administration.

Results and Discussion:

In the present study, 434 plants with leaf as useful part, reported for their wound healing activity in 14 books and 31 published research articles related to ethno botany and ethno medicine were scrutinized and are presented in table 1.

Table 1: Ethno medicinal leaf drugs highlighted for their Wound healing activity

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
1	*Abutilon indicum* (L.) Sweet (Malvaceae)	Atibala (S), Thuthi	Smeared with castor oil	T	Uttarakhand	7(391), 8(292), 11(447), 15(103)
2	*Acacia Arabica* Willd, (Mimosaceae)	Babbula(S)	Ash + ghee	-	-	16(304)
3	*Acalypha hispida* Burm.f. (Euphorbiaceae)	Muktajhuri (Ben); Vattattali (Ml)	Paste	T	-	10(23)
4	*Acalypha fruticosa* Forssk. (Euphorbiaceae)	Balamunja Kuppameni	Paste	T	Attappady, Kerala	21

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
5	*Acalypha indica* L. (Euphorbiaceae)	Kuppaimeni	Paste	O	Tirunelveli hills, southern India	22
		Kuppameni; Aritamanjari (S)	Powder	T	Tirunelveli, Tamil Nadu; Uttarakhand	7(363), 8(381), 9(259), 10 (24), 11(186), 12(18), 15 (400)
6	*Acalypha wilkesiana* Müll. Arg. (Euphorbiaceae)	Aworoso	Poultice	T	South-west Nigeria	23
7	*Achyranthes aspera* L. (Amaranthaceae)	*Aghada*	-	-	Washim, Maharashtra	24
		Naayuruvi	Paste	T	Kancheepuram, Tamilnadu	25
		Apamarga (S)	Paste, juice	T	Bhadrak, Odisha; Santhal Pargana, Bihar; Uttarakhand	7(499), 7(645), 8(37), 8 (192), 9(147), 9(259), 14 (19), 15(386), 16(314)
8	*Actinodaphne maderaspatana* Bedd. (Lauraceae)	Panidiripatra	Paste	T	Tirumala hills, A. P.	12(29), 26
9	*Adhatoda vasica* Nees. (Acanthaceae)	Vasaka	-	-	Bilaspur, Chhattisgarh	27
		Kawl-dai	Paste	T	Lunglei, Mizoram	28
		Vasa (S); Basanga (K, O)	Powder	T	Jajpur, Odisha; Uttarakhand	10(53), 13(467), 15(356)
10	*Adenanthera pavonia* L. (Fabaceae)	Kucndanah (S)	-	-		12(29)
11	*Aegle marmelos* L. Corr. (Rutaceae)	Bilva	Paste	T	Bilaspur, Chhattisgarh Andhra Pradesh	7(331), 8(112), 12(29), 27
12	*Aerva lanata*. Juss-ex Schult (Amaranthaceae)	Kukrabocha	Paste	T	Kalahandi, Odisha; Santhal Pargana, Bihar	7(545), 12(33), 14(20), 29
13	*Aerides multiflorum* Roxb. (Orchidaceae)	Lawh-leng-per	Paste	-	Uttarakhand	8(439), 15(438)
14	*Agave americana* L. (Agavaceae)	Jangli keora	Paste	T	Uttarakhand	10(66), 15(448)
15	*Agave angustifolia* Haworth (Agavaceae)	Ram bans (H)	Paste	T	Uttarakhand	15(448)
16	*Agave cantala* Roxb. (Agavaceae)	-	-	O	Khargone, M.P.	30
		Bilati anarash (Bn)	Paste	-	Uttarakhand	10(69), 15(449)
17	*Ageratina adenophora* (Sprengel) R.Kings & H. Robinson (Asteraceae)		Juice	-	Shevaroy hills, Tamil Nadu	7(391)
18	*Ageratum conyzoides* L. (Asteraceae)	Imin-esu	Paste	T	South-west Nigeria	23
		Ghondva Bon	Paste and juice	T	Tezpur, Assam	31
		Appachedi	Paste	T	Attappady, Kerala	21

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
18	*Ageratum conyzoides* L. (Asteraceae)	White weed	-	-	Bilaspur, Chhattisgarh	27
		Appachi cheppu (Kd)	Juice	-	Santhal Pargana, Bihar; Uttarakhand	7(583), 8(175), 8(192), 8 (260), 9(251), 10(70), 13 (312), 14(21), 15(258), 16 (301)
19	*Ailanthus excelsa* Roxb. (Simaroubaceae)	Maharukh (H)	Paste	T	Uttarakhand	8(192), 9(259), 10(75), 12 (35), 15(132)
20	*Ajuga bracteosa* Wallich ex Benth (Lamiaceae)	-	Juice	-	Almora, Uttarakhand	7(247)
21	*Albizia chinensis* (Osb.) Merr. (Fabaceae)	Kanujera, Siran (H)	Juice	-	Mahabubnagar, A.P.	7(341), 8(439), 10(81)
22	*Albizia procera* (Roxb.) Benth. (Fabaceae)	Safed shiris, Gurar, Karra, Karro (H)	Poultice	T	Amravati, Maharashtra Uttarakhand	7(283), 8(439), 10(85), 15 (160), 19(14)
23	*Aloe vera* (L.) Burm. f. (Liliaceae)	-	Gel	T	Khargone, M.P.	30
		Mlovera	Crushed or Pounded	T	Kimboza forest, Tanzania	32
		Korphad	Juice	-	Washim, Maharashtra	24
		Chirukatthaall a	Paste	T	Kuruma tribes, Wayanadu, Kerela	33
		Gawar patha	Juice	-	Kanyakumari, Tamil Nadu	7(369), 8(192), 10(100), 16(311)
		Gwarpatha	-	-	Bilaspur, Chhattisgarh	27
24	*Alterrnanthera tenella* Colla. (Amaranthaceae)	Vishal karani	Crushed	-	Bhadrak, Odisha	7(499)
25	*Amaranthus spinosus* Linn. (Amaranthaceae)	Marish (S)	Poultice	T	Uttarakhand	15(387), 16(318)
26	*Amaranthus tricolor* L. (Amaranthaceae)	Bishalya Karani	Paste	T	Tezpur, Assam	31
27	*Ampelocissus grantii* (Baker) Planch. (Vitaceae)	En`eginnu-omulu	Powder	T	Dogonland, Mali, West Africa	34
28	*Ampelocissus latifolia* (Roxb.) Panch (Vitaceae)	Panibel (H)	Juice	T	-	10(130), 12(51), 16(320)
29	*Anaphalis adnata* (Asteraceae)	Bugla (Lut)	Paste	-	Uttarakhand	15(279)
30	*Anaphalis brevifoloia* (Asteraceae)	-	-	-	-	8(82)
31	*Anaphalis busua* (Asteraceae)	-	Juice	-	Uttarakhand	15(279)
32	*Anaphalis contorta* (Asteraceae)	-		-	Uttarakhand	15(279)
33	*Anaphalis cuneifolia* Hk.f. (Asteraceae)	Kat-plaster	Crushed	T	-	8(62)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
34	*Anaphalis margaritacea* (Asteraceae)	-		-	Uttarakhand	15(279)
35	*Anaphalis neelgerriana* DC. (Asteraceae)	Raktaskandana, Vranapatra (S)	Crushed and applied as plaster	T	-	10(141)
36	*Anaphalis triplinervis* Clarke(Asteraceae)			-	Uttarakhand	15(279), 16(324)
37	*Andrographis paniculata* (Burm. f.) Wall. ex Nees (Acanthaceae)	Kiriyath Kaikati (Mur)	Paste	T	Attappady, Kerala; Tirunelveli, Tamil Nadu	7(363), 8(201), 21
38	*Annona muricata* Linn. (Annonaceae)	Sour sop (E)	Pounded	-	-	11(162)
39	*Annona senegalensis* Pers. (Annonaceae)	-	Paste	T	Kimboza forest, Tanzania	32
		Abo	Decoction	T	South-west Nigeria	23
		Jankoonno	Decoction	O	Dogonland, Mali, West Africa	34
40	*Annona squamosa* Linn. (Annonaceae)	Sitaphal	Juice	O	Dantewada, Chhattisgarh	35
		Sitaphal	Paste	T	Washim, Maharashtra; Koraput, Odisha; Santhal Pargana, Bihar; Uttarakhand	7(473), 9(387), 11(161), 14(22), 15(71), 16(309), 18(112), 24
		Sitaphal	Poultice	T	Nagpur and Wardha; Bilaspur, Chhattisgarh	19(18), 27
41	*Anogeissus leiocarpa* Guill. & Perr. (Combretaceae)	Sigilu	Dried leaves powder mixed with water	T	Dogonland, Mali, West Africa	34
42	*Anthocephalus chinensis* (Lamk.)A.Rich ex Wall (Rubiaceae)	Kadamba, neepa (S)	-	-	-	10(160)
43	*Argemone maxicana L.* (Papaveraceae)	Pili / Piwala	-	-	Washim, Maharashtra	24
		Dhamoi (Snt)	Juice	-	Dharmapuri, Tamil Nadu; Santhal Pargana, Bihar	7(395), 8(192), 10(178), 11(237), 12(65), 14(22), 16(314)
		Pili kateri	-	-	Bilaspur, Chhattisgarh	27
44	*Argyreia bella* Raizada (Convolvulaceae)	Tamrabel	-	-	Nimar region, M.P.	36

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
45	*Argyreia nervosa* (Burm.f.) Bojer (Convolvulaceae)	Samudraphala (S)	Poultice	T	Amravati dist., Maharashtra	7(273), 10(180), 12(67), 16(306), 16(317)
46	*Aristolochia bracteata* (Aristolochiaceae)	Aduthinapalai ; Kiramar	Poultice	T	Tirunelveli, Tamil Nadu Mahabubnagar, A.P. Santhal Pargana, Bihar	7(341), 7(363), 9(147)
47	*Aristolochia indica* L. (Aristolochiaceae)	Irukodi Karlakam	Paste	T	Attappady, Kerala	21
48	*Artemisia absinthium* Linn. (Asteraceae)	Indhana, Amar (S), Dammar (S); Vilayati afasantin (H)	Paste	T	-	8(50), 10(189), 11(317)
49	*Artemisia nilagirica* (Clarke) Pamp. (Asteraceae)	Nagadamani (S); Nagduana, Dona, Gathivana, Majtari (H)			Assam; Uttarakhand	7(599), 8(322), 10(192), 15(260),
50	*Artocarpus heterophyllus* J. B. Lamark. (Moraceae)	Fanas Panasa (S); Kanthal (H)	-	O & T	Dantewada, Chhattisgarh	35 10(195), 12(75)
51	*Asparagus racemosus* Willd. (Liliaceae)	Tinampori, Chatavalli	Paste	T	Attappady, Kerala	21
52	*Asystasia gangetica* (L.) T. Anderson (Acanthaceae)	Valukkai keerai	Leaf powder is mixed with coconut oil	T	Kancheepuram, Tamilnadu	25
53	*Atalantica monophylla* (Roxb.) DC. (Rutaceae)	-	-	-	-	10(212)
54	*Atylosia lineata* Wt. & Arn. (Fabaceae)	Rantur, Janglitur	Paste	-	-	8(169)
55	*Atylosia scarabaeoides* Benth. (Fabaceae)	Chowkhara ki kheti (H)	Paste	-	-	16(308)
56	*Azadirachta indica* A. Juss (Meliaceae)	Afoforo-oyimbo	Paste	T	South-west Nigeria	23
		Gonji	Decoction	T	Dogonland, Mali, West Africa	34
		Neempat	Leaf paste	T	Tezpur, Assam	31
		Neem	-	-	Mayurbhanj, Odisha	37
		Neem	Juice	T	Nagpur and Wardha, Washim, Maharashtra	19(20) 24
		Neem	-	-	Bilaspur, Chhattisgarh	27

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
57	*Baliospermum montanum* Mull-Arg. (Euphorbiaceae)	Danti (S)	-	-	Uttarakhand	11(190), 15(400)
58	*Bambusa arundinacea* Roxb. (Poaceae)	Vamsha (S)	Paste	-	Uttarakhand	10(233), 15(464), 16(309)
59	*Bambusa vulgaris* Schrad. ex Wendl.non Nees (Poaceae)	Balkubans (Snt)	-	-	-	10(236)
60	*Barbarea vulgaris* R.Br. (Brassicaceae)	Bitter winter cress	-	-	-	10(238)
61	*Barleria cristata* Linn. (Acanthaceae)	Jhinit, Tadrelu (H)	-	-	Uttarakhand	15(354)
62	*Barleria prionitis* Linn. (Acanthaceae)	Itola	Juice	O	Dantewada, Chhattisgarh	35
		Kantamalati	Leaf paste	T	Kalahandi, Odisha; Uttarakhand	9(147), 10(241), 15(354), 16(303), 29
63	*Basella alba* L. (Basellaceae)	Upodika (S)	Poultice	T	-	12(80)
64	*Bauhinia rufescens* Lam. (Fabaceae)	S´es´eg´er´e	Powder of dried leaves	T	Dogonland, Mali, West Africa	34
65	*Begonia fallox* DC. (Begoniaceae)	Earan-kolli	Paste	T	Tirunelveli hills, southern India	22
66	*Begonia picta* Smith (Begoniaceae)	Longsilawa (Nag)	Juice	T	Nagaland	10(256), 20(40)
67	*Bergia odorata* Edg. (Elatinaceae)	Gangharun	Poultice	T	-	11(444)
68	*Berginia ciliata* (Haw.) Stemb. (Saxifragaceae)	Pakharabheda (H); Pashaabheda (S)	-	-	-	10(267)
69	*Bidens biternata* (Lour.) Merril & Sheriff ex Sheriff (Asteraceae)	Chirchitt (H)	-	-	-	8(175), 9(259), 10(273)
70	*Bidens fistulosa* (Roxb.) Kurz. (Asteraceae)	Bir nagula-ba (Mnd)	-	-	-	10(286)
71	*Bidens lacera* (Burm.f.) DC. (Asteraceae)	Kukundara (S)	-	-	-	10(287)
72	*Bidens pilosa* L. var. *minor* (Blume) Sherff. (Asteraceae)	Mulkutthi (Tm)	Paste	T	Dharmapuri dist., Tamil Nadu	7(395), 8(272), 11(323), 16(304)
73	*Biebersteinia odora* Stepf. ex Fisch. (Biebersteiniaceae)	Drakspose (Ldk)	Paste	-	-	8(92), 10(275)
74	*Biophytum nervifolium* Thw. (Oxalidaceae)	Lajjalu (S)	-	-	-	12(96)
75	*Biophytum sensitivum* (L.) DC. (Oxalidaceae)	Lajalu, Lakchana (H); Jhallapushpa (S)	Paste	-	Tirunelveli, Tamil Nadu	7(363), 9(259), 10(276), 16(311)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
76	*Bischofia javanica* Bl. (Euphorbiaceae)	Bhillar (H); Malaichandan (Tm)	Juice	-	Dharmapuri dist., Tamil Nadu	7(395), 11(190)
77	*Blepharis edulis* Pers. (Acanthaceae)	-	-	-	-	10(283)
78	*Blepharis maderaspatensis* (L.) B. Heyne ex Roth. (Acanthaceae)	Pappadak-kodi	Juice extracted from the leaf	T	Tirunelveli hills, southern India	22
79	*Blumea aurita* DC. (Asteraceae)	Morang-puru, Soan puru (Mnd)	-	-	-	10(284)
80	*Blumea balsamifera* DC. (Asteraceae)	Kakaronda (H)	Decoction	-	-	11(324)
81	*Blumea lacera* DC. (Asteraceae)	Hul hul Randoi (Snt.)	Juice	T	Bilaspur, Chhattisgarh; Santhal Pargana, Bihar	27 14(24)
82	*Blumea membranacea* DC. (Asteraceae)	Kukraunda		-	-	8(138)
83	*Boeninghausenia albifora* (Hk.) Reichb. Meissn (Rutaceae)	Pishumar, Upniyaghas (Lut)	Paste	-	Uttarakhand	10(293), 15(128)
84	*Boerhavia diffusa* Linn. (Nyctaginaceae)	punarnava	-	-	Bilaspur, Chhattisgarh	27
85	*Borreria articularis* (L.f.) (Rubiaceae)	Madanaghanti (H)	-	-	-	10(302)
86	*Borreria hispida* Spruce ex K. Schum. (Rubiaceae)	Madanghanti, Satgithia	Paste	T	Purulia district, West Bengal	38
87	*Brassica nigra* (L.)Koch (Brassicaceae)	Kali rai	Paste	T	-	8(228), 9(387)
88	*Bridelia ferruginea* Benth. (Euphorbiaceae)	Ira	Poultice	T	South-west Nigeria	23
89	*Bryophyllum pinnatum* (Lam.) (Crassulaceae)	-	Paste	T	Dantewada, Chhattisgarh; Uttarakhand	35 13(187), 15(207), 16 (317)
		Sugulujiinloo	Juice	T	Dogonland, Mali, West Africa	34
90	*Bryophyllum calycinum* Salisb. (Crassulaceae)	Panfuti	-	-	Washim, Maharashtra	24
		-	Juice	T	Jalgaon, Maharashtra; Khargone, M.P.	39 30
91	*Buchanania lanzan* Spr. (Anacardiaceae)	Priyala (S); Tarop (Snt)	Paste	-	Santhal pargana, Bihar; Uttarakhand	10(320), 14(22), 15(151)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
92	*Cadaba fruticosa* (L.) Druce (Capparaceae)	Kodhab; Dabi	Poultice	T	-	9(147), 10(332)
93	*Cajanas cajan* (L.) Millsp. (Fabaceae)	Adhaki (S.)	Decoction	T	-	10(337), 12(108)
94	*Cajanaus indica* Spreng. (Fabaceae)	Aadhaki(S)	Paste fried in ghee	-	-	16(312)
95	*Callicarpa cana* L. (Verbenaceae)	Arusha (Bn)	Poultice	T	-	10(341)
96	*Callicarpa longifolia* Lamk. (Verbenaceae)	Kin-vi-taong (Ncb)	Paste in coconut oil	-	-	8(375)
97	*Calotropis gigantea* (Linn.) R. Br. ex Ait. (Asclepiadaceae)	Aak, Rui(M); Akav(K)	-	-	Bilaspur, Chhattisgarh; Amravati, Maharashtra; Koraput, Odisha; Uttarakhand	7(273), 7(473), 10(346), 15(309), 16(315), 27
98	*Calotropis procera* (Ait.) R. Br. (Asclepiadaceae)	Rui	-	-	Washim, Maharashtra	24
		-	Paste	T	Khargone, M.P	30
99	*Calycopteris floribunda* (Roxb) Lam. (Combretaceae)	Pullanni, Pullanji, Varavalli	Juice	T	Attappady, Kerala	12(113), 21
100	*Canavalia gladiata* (Jacq) DC. (Fabaceae)	Phatadi; Asisimbi, Masimbi (S)	Ointment from burning in mustard oil	T	Amravati, Maharashtra	7(283), 10(353), 12(115)
101	*Cannabis sativa* L. (Cannabaceae)	Bhanga (S)	-	-	Uttarakhand	8(112), 10(356), 15(418)
102	*Capparis zeylanica* L. (Capparaceae)	Asaria (S)	Paste	-	Santhal pargana, Bihar; Uttarakhand; Nagpur & Wardha	14(25), 15(86), 19(28)
103	*Capsicum frutescence* L. (Solanaceae)	Atarodo	Leaves are mixed with palm oil	T	South-west Nigeria	23
104	*Carica papaya* L. (Caricaceae)	Ibepe	Roasted leaf pulp is applied	T	South-west Nigeria	23
		Papita	-	-	Bilaspur, Chhattisgarh	27
105	*Carissa carandas* L. (Apocynaceae)	Karandakoli	-	-	Mayurbhanj, Odisha	37
106	*Cassia absus* L. (Fabaceae)	Chaksu (H)	-	-	-	10(26)
107	*Cassia alata* L. (Fabaceae)	-	-	-	Bilaspur, Chhattisgarh	27
108	*Cassia angustifolia* Linn. (Fabaceae)	Swarnapatri (S)	Paste	-	-	16(320)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
109	*Cassia auriculata* L. (Caesalpiniacea)	-	Paste	T	Sangli, Maharashtra; Khargone, M.P.	40 30 12(132)
110	*Cassia fistula* Linn. (Fabaceae)	Amaltas	Juice	O & T	Dantewada, Chhattisgarh	10(388), 35, 41
111	*Cassia italica* (Mill.) Lam. Ex F.W. Andrews (Fabaceae)	Anrangun gangalu	Powder of dried stem with leaves	T	Dogonland, Mali, West Africa	34
112	*Cassia obtusifolia* L. (Fabaceae)	Chakragaja (S); Banarh, Chakwar (H)	Fried in castor oil	-	-	12(135)
113	*Cassia podocarpa* Guill. & Perr. (Fabaceae)	Anranwee	Powder	T	Dogonland, Mali, West Africa	34
114	*Cassia tora* L. (Fabaceae)	Chakunda	-	-	Mayurbhanj, Odisha	37
		Charota	Paste	-	Bilaspur, Chhattisgarh; Uttarakhand	27 10(394), 15(176)
115	*Cayratia pedata* (Lamk.) Juss.ex Gagnep. (Vitaceae)	Pannikodi; Godhapadi, Suraha (S)	Paste	-	-	8(284), 10(401)
116	*Cayratia trifolia* (L.) Domin. (Vitaceae)	Gandira (S)	Poultice	T	-	12(146)
117	*Ceiba pentandra* Gaerth (Malvaceae)	Genhu	Decoction is used as eye drops	T	Dogonland, Mali, West Africa	34
118	*Celastrus paniculatus* Willd. (Celastraceae)	Kangoge chedi	Juice	T	Attappady, Kerala	21
119	*Centella asiatica* (Linn.) Urban (Apiaceae)	Bor manimuni	Paste	T	Tezpur, Assam	31
		Mandukparni	-	-	Bilaspur, Chhattisgarh	27 10(413), 9(259), 16(307)
120	*Chasalia chartacea* Craib. (Rubiaceae)	Vellakurinji (Tm)	-	T	-	10(422)
121	*Chenopodium album* L. (Chenopodiaceae)	-	Crushed	T	Khargone, M.P.	30
		Bathua	-	-	Bilaspur, Chhattisgarh	27
122	*Chenopodium ambrosioides* L. (Chenopodiaceae)	Medicated tea	Juice	-	North East India	7(583)
123	*Chloroxylon swietenia* DC. (Rutaceae)	Bhirra (H)	Paste	T	Bastar, M.P.	10(428), 17(102)
124	*Chromolaena odorata* (L.) R. M. King & H. Robins. (Asteraceae)	Communist Pacha	Paste	T	Attappady, Kerala	21
		Awolowo Akintola Taku	An infusion is used for wash	T	South-west Nigeria	23

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
124	*Chromolaena odorata* (L.) R. M. King & H. Robins. (Asteraceae)	Communist paccha	Juice	T	Mulla Kuruma tribes, Wayanadu, kerela	42
		Kuppa pacha	Juice and paste	T	Kuruma tribes, Wayanadu, kerela; Phulbani, Odisha; Andaman & Nicobar; North East India; Santhal Pargana.	7(569), 7(515), 7(583), 8 (439), 8(350), 8(253), 8 (381), 9(219), 12(154), 14 (25), 33
125	*Chrozophora prostrata* Dalz. (Euphorbiaceae)	Pujbantago (Phr)	Paste	-	Santhal Pargana, Bihar	14(27)
126	*Cirsium arvense* (L.) Scop. (Asteraceae)	Vangstar/ Canada thistle	Juice	-	-	8(92)
127	*Cissampelos pareira* L. (Menispermaceae)	Malaithangi	Juice	O	Tirunelveli hills, southern India	22
		Akaabindu (O)	Crushed and tied	T	Koraput, Odisha	18(119)
		Patha (S) ; Tubuki lot (Asm)	Juice, Paste	-	Uttarakhand	8(284), 8(338), 9(259), 10 (441), 15(67), 16(324)
128	*Citrullus lanatus* (Thunb.) Matsum. & Nakai (Cucurbitaceae)	Osan	Softened warm leaf is applied	T	South-west Nigeria	23
129	*Claoxylon indicum* Hassk (Euphorbiaceae)	Sing-ke-ra (Ncb)	Paste	-	-	8(375)
130	*Cleistanthus collinus* (Euphorbiaceae)	Nalla kodisha	-	-	Nalgonda & Warangal, A. P.	43
131	*Clematis buchananiana* DC. var. vitifolia (Ranunculaceae)	Kehinha Veraphul	Paste	T	Nagaland	20(71)
132	*Clematis gouriana* Roxb. (Ranunculaceae)	Elivallu	leaves are crushed	T	Paniya tribes, Nilgiri, Tamil Nadu	45 8(228)
133	*Cleome gynandra* Linn. (Cleomaceae)	Tilaparna (S)	Crushed leaves	T	Uttarakhand; Nagpur and Wardha	15(88), 19(32)
134	*Cleome viscosa* L. (Cleomaceae)	Kukka vaminta	-	-	Nalgonda & Warangal, A. P.	43
		Naai kadugu	Leaf paste	T	Tirunelveli hills, southern India	22
		Ellukkusakkal athi	Paste	T	Kuruma tribes, Wayanadu, kerela	33
		Naikadugu	Paste	T	Kancheepuram, Tamil Nadu	25
		Tilwan	-	T	Nagpur and Wardha	19(33)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
135	*Clerodendrum infortunatum* L. (Verbenaceae)	Peruku perukila	Tender Leaves crushed with Lime ($Ca(OH)_2$)	T	Attappady, Kerala	21
136	*Clerodendrum paniculatum* L. (Verbenaceae)	Tang-vong (Ncb)	Paste	-	-	8(375)
137	*Clerodendrum serratum* (L.) Moon. (Verbenaceae)	Sarom-lutur, Bhetkona (Snt); Nekti (Paniyan)	Paste	-	Santhal Pargana, Bihar	8(272), 14(28)
138	*Clerodendrum viscosum* Vent. (Verbenaceae)	Bhandirah (S); Tinabharmi, Bhutes (H), Barni (Snt)	Paste	-	Santhal Pargana, Bihar	10(457), 14(29)
139	*Clitoria ternatea* Linn. (Fabaceae)	Butterfly flower	-	-	Bilaspur, Chhattisgarh	27
140	*Cocculus hirsutus* (Menispermaceae)	Hulhul	Paste	-	-	9(387), 16(315)
141	*Colebrookea oppositaefolia* Sm. (Lamiaceae)	Tile, Pulhadi mandardoo (Phr); Binda, pansra (H)	Paste	-	Santhal Pargana, Bihar Uttarakhand	8(423), 11(388), 12(178), 14(29), 15(380)
142	*Colocasia esculenta* (L.) Schott (Araceae)	Alu	-	-	Washim, Maharashtra	24
143	*Combretum flagrocarpum* C.B. Clark (Combretaceae)	Leihrui-sen	Juice	T	Lunglei, Mizoram	28 8(439)
144	*Combretum ghasalense* Engl. & Diels (Combretaceae)	Gujapilu	Powder	T	Dogonland, Mali, West Africa	34
145	*Combretum glutinosum* Perr. ex DC. (Combretaceae)	Bannakile	Powder	T	Dogonland, Mali, West Africa	34
146	*Combretummolle* R.Br. ex G. Don. (Combretaceae)	Mlamweusi	Decoction	O	Kimboza forest, Tanzania	32
147	*Combretum roxburghii* Spreng. (Combretaceae)	Aten, Atin (Snt)	Paste	-	Santhal Pargana, Bihar	14(29)
148	*Commelina nudiflora* Linn. (Commelinaceae)	Kanshura (H), Katsapriya (S)	Poultice	T	-	11(126)
149	*Commiphora caudata* (Wight & Arn.) Engl. (Burseraceae)	Kiluvai	Juice	T	Kuruma tribes, Wayanadu, Kerela	33
150	*Corchorus depressus* Stocks (Tiliaceae)	-	-	-	-	11(475)
151	*Cordia dichotoma* Forst.f. (Boraginaceae)	Shleshmataka (S), Lasora	-	-	Uttarakhand	9(147), 15(324)
152	*Cordia macleodii* Hook. (Boraginaceae)	Pinaki	-	-	Sohela block, Western Odisha	17, 18, 44

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
153	*Coscinium fenestratum* (Gaertn.) Colebr. (Menispermaceae)	Jhar-i-haldi (H); Daruharidra (S)	Decoction	T	-	10(478), 11(171), 12(184)
154	*Costus speciosus* (Koen.) Sm. (Costaceae)	Keu kand	-	-	Bilaspur, Chhattisgarh	27
		Kostak-kilangu	Juice	T	Tirunelveli hills, southern India	22
155	*Cousinia thomsonii* C.B.Clarke (Asteraceae)	Megthan	-	-	-	8(92)
156	*Crassocephalum crepidioides* (Benth.) S. Moore (Asteraceae)	Ebolo	Chopped leaves are applied	T	South-west Nigeria	23 8(260)
157	*Cremanthodium ellisii* (Hook) Kitam (Asteraceae)	Phunchuk	-	-	-	8(92)
158	*Crotalaria spectabilis* Roth. (Fabaceae)	Nirmisi	Juice	T	Bhadrak, Odisha	37 7(499)
159	*Crotalaria verrucosa* Linn. (Fabaceae)	Shanapushpi (S)	Paste	-	-	16(319)
160	*Croton roxburghii* Balak. Euphorbiaceae	Kuti (Mundari)	-	-	-	10(495)
161	*Cyathea albo-setacea* (Bedd.) Copel (Cyatheaceae)	-	Pounded	-	-	8(375)
162	*Cyathea spinulosa* Wall. ex Hook. (Cyatheaceae)	-	Pounded	-	-	8(375)
163	*Cyathula prostrata* (L.) Bl. (Amaranthaceae)	Raktapamarga (S); Devil's grass	Juice	-	North East India	7(583), 12(200)
164	*Cynodon dactylon* Pers. (Poaceae)	Phaitualhlo	Juice	T	Lunglei, Mizoram	28
		Arugampillu	Paste	T	Paniya tribes, Nilgiri, Tamil Nadu	45
165	*Cyperus rotandus* L. (Cyperaceae)	Garika	-	T	Thadvai Mandal, Warangal, A.P.	46
166	*Daemia extensa* R.Br. (Asclepiadaceae)	Velliparuthi (Ml)	Juice with honey	-	-	16(321)
167	*Datura metel* Linn. (Solanaceae)	Dhattura (S)	-	-	Uttarakhand; Nagpur and Wardha	15(331), 19(38)
168	*Datura stramonium* L. (Solanaceae)	-	latex	T	Khargone, M.P.; Dharmapuri, Tamil Nadu; Uttarakhand	7(395), 15(331), 16(314), 30
		Apikan	Crushed leaves	T	South-west Nigeria	23

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
169	*Delonix regia* Raf. (Fabaceae)	Krishnochura	Leaves are crushed	T	Tezpur, Assam	31
170	*Dendrophthoe falcata* (L.f) Etting. (Loranthaceae)	Ottunichedi / Pulluruvi	Paste	T	Tirunelveli hills, southern India	22
171	*Desmodium gangeticum* DC. (Fabaceae)	Shalaparni(S)	Paste	-	-	16(307)
172	*Desmodium pulchellum* (L.) Benth. (Fabaceae)	Salange chedy (Mlb)	Paste	T	Koraput, Odisha	7(473), 8(260), 9(259)
173	*Desmodium triflorum* (L.)DC. (Fabaceae)	Tripadi (S); Kudaliya (H); Janngli methi	Juice, Paste	-	Kullu dist.	7(185), 9(259), 12(216)
174	*Dichrostachys glomerata* Chiov. (Fabaceae)	Kara	An infusion of the leaves	T	South-west Nigeria	23
175	*Dimorphocalyx lawianus* (Muell.-Arg.) Hook. f. (Euphorbiaceae)	Sirukottai maram	Paste	T	Tirunelveli hills, southern India	22
176	*Dioscorea hirtiflora* Benth.and Hook. (Dioscoreaceae)	Isanyinahun	Paste	T	South-west Nigeria	23
177	*Diospyros canaliculata* De Wild (Ebenaceae)	Orile ijebu	Paste	T	South-west Nigeria	23
178	*Diospyros malabarica* (Desr.) Kostel (Ebenaceae)	Tinduka (S)	Juice	-	Uttarakhand	8(423), 15(282), 12(223)
179	*Diotacanthus albiflorus* (Bedd.) Benth. (Acanthaceae)	Kodi urinji	Paste	T	Tirunelveli hills, southern India	22
180	*Dissotis rotundifolia* (Sm.) Triana. (Melastomataceae)	Kinzasu	Crushed or pounded	T	Kimboza forest, Tanzania	32
181	*Drymaria cordata* L. (Caryophyllaceae)	Lai Jabor	Leaves are crushed with spit	T	Tezpur, Assam; Rajbanshis, Assam	7(609), 8(260), 31
182	*Echinops cornigerus* DC. (Asteraceae)	Akjema	Paste	-	-	8(92)
183	*Eclipta alba* Hassk. (Asteraceae)	Bhringraj	Juice	-	Bilaspur, Chhattisgarh; Bhadrak and Phulbani, Odisha	7(515), 7(499), 9(259), 11 (339), 15(265), 16(301), 27
184	*Eclipta prostrata L.* (Asteraceae)	Bhingraaj	Pounded and paste	T	Bastar, M.P.	17(108)
185	*Elytraria acaulis* (L.f.) Lindau (Acanthaceae)	Sahastra musari	Paste	T	Banda dist., U.P.	20(104)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
186	*Emilia sonchifolia* (L.) DC. (Asteraceae)	Elichevianveru	Paste	T	Attappady, Kerala	8(260), 12(233), 16(320), 21
187	*Ermania lanuginosa* (Hk.f. & T.) O. E. Schulz (Brassicaceae)	-	Infusion	-	-	7
188	*Erythrina indica* Lam. (Fabaceae)	Poa ban; Gadela	Paste	-	-	9(243), 9(259)
189	*Erythrina varaegata* L. (Fabaceae)	Pangara	-	-	Washim, Maharashtra	24
190	*Eupatorium adenophorum* Spreng. (Asteraceae)	Banamara, Kalojhar, Muk; Shamathoru (Trib)	Juice	-	-	8(332), 8(268)
191	*Eupatorium cannabinum* Linn. (Asteraceae)	Hemp agrimony, Holy rope (E)	Crushed	-	Assam	7(599), 11(344)
192	*Eupatorium odoratum* Linn. (Asteraceae)	Aana vanthan	Paste	T	Tirunelveli hills, southern India	22 16(309)
		Gondri	Juice	T	Koraput, Odisha	18(125)
		Jarmani bon	Paste	T	Tezpur, Assam	31
		Tlangsam	Crushed	T	Lungsen, Mizoram	28
193	*Eupatorium triplinerve* Vahl. (Asteraceae)	Ayaparnah (S); Ayapana (H)	Juice	-	-	12(241)
194	*Euphorbia atoto* Forst.f. (Euphorbiaceae)	Mupet (Ncb)	Paste	-	-	8(375)
195	*Euphorbia heterophylla* L. (Euphorbiaceae)	Oro	Leaf ash in a cloth is dipped in the oil	T	South-west Nigeria	23
196	*Euphorbia hirta* L. (Euphorbiaceae)	Amampatchai arisi	Paste	T	Kuruma tribes, Wayanadu, kerela Bhadrak, Odisha	7(499), 11(202), 33
		Dudhi	-	-	Bilaspur, Chhattisgarh	27
197	*Euphorbia nyikae* Pax ex Engl. (Euphorbiaceae)	Mngwede	Crushed and pounded	T	Kimboza forest, Tanzania	32
198	*Euphorbia poissonii* L. (Euphorbiaceae)	Oro-adete	Fresh leaves are applied	T	South-west Nigeria	23

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
199	*Euphorbia thymifolia* Linn. (Euphorbiaceae)	Choti dudhi, dudhi (H)	Paste	-	-	9(259), 11(206)
200	*Evolvulus alsinoides* L. (Convulvulaceae)	Khurnighas	Juice	T	North Gujarat	20(111)
201	*Excoecaria agallocha* Linn. (Euphorbiaceae)	Agaru	Decoction	-	-	11(208)
202	*Ficus asperifolia* Hook. ex Steud. (Moraceae)	Mkoya	Crushed or pounded	T	Kimboza forest, Tanzania	32
		Eripin	Paste	T	South-west Nigeria	23
203	*Ficus benjamina* L. (Moraceae)	Konda goluga (Tel)	-	-	-	12(253)
204	*Ficus benghalensis* L. (Moraceae)	Aalamaram	Leaf powder is mixed with coconut oil	T	Tirunelveli hills, southern India	22
		bargad	-	-	Bilaspur, Chhattisgarh	27
		Madar/ Marmada	-	T	Dantewada, Chhattisgarh	35
		-	Powder	T	Khargone, M.P.	30
205	*Ficus racemosa* Linn. (Moraceae)	Udumbara(S)	Paste	-	-	16(317)
206	*Ficus retusa* auct. non (Moraceae)	Plaksah(S); Chilkan(H)	Decoction	T	-	12(256)
207	*Flabellaria paniculata* Cav. (Malpighiaceae)	Lagbolagbo	Decoction of the leaf	T	South-west Nigeria	23
208	*Flacourtia indica* (Burm.f.) Merill. (Flacourtiaceae)	Swadukantaka , Vikankata (S), Bilangara (H)	Paste	-	Uttarakhand	15(94), 16(318)
209	*Flueggea leucopyrus* Willd (Phyllanthaceae)	Svetakamboja , Bhuriphala (S)	Juice	-	-	11(209)
210	*Fluggea virosa* Willd. (Euphorbiaceae)	Mkalananga	Infusion	O	Kimboza forest, Tanzania	32
		Patali (S)	Leaves juice/ paste	-	-	11(210)
211	*Garcinia gummigatta* (L.) N. Robson. (Clusiaceae)	Vrksamla(S); Bilatti amli (H)	-	-	-	12(263)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
212	*Gardenia latifolia* (Rubiaceae)	Pedda karinga	-	-	Nalgonda &Warangal, A. P.	43
213	*Gelsemium elegeans* Benth. (Loganiaceae)	Hnam-tur	-	T	Haululong, Mizoram	28
214	*Gentianella moorcroftiana* Wallich ex Don (Gentianaceae)	Chhukmu	Paste	-	-	8(92)
215	*Gloroisa superba* L. (Liliaceae)	Kal-lawi	-	-	Washim, Maharashtra	24
216	*Glycosmis arborea* (Roxb.) DC. (Rutaceae)	Girgiti, Potali (H); Kupiluh, Asvasakhtah (S)	Pounded	-	-	8(423), 12(270)
217	*Gmelina arborea* Roxb. (Verbenaceae)	Gambhari (S), Kumhar	-	-	Uttarakhand	9(147), 15(362)
218	*Grangea maderaspatana* (Linn.)Poir. *(*Asteraceae)	Mukhataru , Mustaru (H); Badagudari	Crushed	T	Phulbani, Odisha	7(515), 11(347)
219	*Grewia obtusa* Wall. ex Gamble (Tiliaceae)	Kule taro (Snt)	Paste	-	Santhal Pargana, Bihar	14(34)
220	*Grewia umbellata* Roxb. (Tiliaceae)	Akar chenderai (Ml)	-	-	-	11(481)
221	*Gymnema sylvestre* (Retz.) R. Br. ex Schult (Asclepiadaceae)	Chakkarakkol i	Paste	T	Mulla Kuruma tribes, Wayanadu, kerela	42
222	*Gynandropsis gynandra* Merrill. (Capparidaceae)	Ajagandha (S)	Crushed	-	-	11(275)
223	*Haldina cordifolia* (Roxb.) Ridsdale (Rubiaceae)	Haldu, Halsava, Hardu (H); Nondong, Haridru (S)	Paste of leaves with *Sida cordata* leaves and *Sida acuta* leaves	-	Koraput and Phulbani, Odisha; Uttarakhand	7(515), 7(473), 13(279), 15(253)
224	*Hedyotis herbacea* L. (Rubiaceae)	Chayaparpatik a(S); Paper bhed(H)	Paste	-	-	13(281)
225	*Hedyotis scandens* Roxb. (Rubiaceae)	Baina Haniktu	Paste	T	Assam	20(124)
226	*Helianthus annus* Linn. (Asteraceae)	Adityabhakta (S); Sunflower	-	-	Nilgiri dist., Tamil Nadu; Lucknow	7(381), 7(223), 13(282)
227	*Heliotropium indicum* L. (Boraginaceae)	Indian Turnsole	-	-	Bilaspur, Chhattisgarh	27
		Hatisar, Bhurundi (S)	-	-	Mayurbhanj, Odisha; Thane, Maharashtra	7(265), 13(283), 16(305), 37
228	*Heliotropium strigosum* Willd. (Boraginaceae)	Hasthishundi (S)	Juice	-	Uttarakhannd	15(321)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
229	*Hemidesmus indicus* (L.) R. Brown (Asclepiadaceae)	Suganti Jad	-	T	Dantewada, Chhattisgarh	35
230	*Hemigraphis colorata* Hallier f. (Acanthaceae)	Murikootti	Paste	T	Attappady, Kerala	21
		Murikoodi	Juice	T	Mulla Kuruma tribes, Wayanadu, kerela	42, 47
231	*Hernandia peltata* Meissn. (Hernandiaceae)	Talo (Andm) Minhont (Ncb)	Paste	-	-	8(375)
232	*Hibiscus ficulneus* L. (Malvaceae)	Lal ambary	-	O	-	9(147)
233	*Hibiscus pandulaeformis* Burm. (Malvaceae)	Kochli	Paste	T	Nagpur and Wardha	19(52)
234	*Hibiscus sabdariffa* Linn. (Malvaceae)	-	Lotion	T	-	11(458)
235	*Hibiscus surattensis* L. (Malvaceae)	Lumotomoto	Crushed or pounded	T	Kimboza forest, Tanzania	32
236	*Hibiscus tiliaceous* L. (Malvaceae)	Bola, Chelwa (H)	Infusion	-	-	13(289)
237	*Hippophae salicifolia* D. Don. (Elaeagnaceae)	Amil	Paste	-	-	16(304)
238	*Hiptage benghalensis* (L.) Kurz. (Malpighiaceae)	Madhavi (S)	-	-	Dharmapuri, Tamil Nadu	7(395), 13(290)
239	*Holarrhena antidysenterica* (Linn.) Wall. (Apocynaceae)	Kutaja (S)	-	-	Uttarakhand	14(304), 16(301)
240	*Hoya parasitica* Wall. (Asclepiadaceae)	Lanvush	Paste	-	-	8(381)
241	*Hydrocotyle sibthorpioides* Lamk. (Apiaceae)	Khoru manimuni	Leaves paste	T	Tezpur, Assam	31
242	*Hygrophila salicifolia* (Vahl.) Nees. (Flacourtiaceae)	Jianti (Snt)	Juice	-	Santhal Pargana, Bihar	14(34)
243	*Hygrophilla auriculata* (Schumach) Hein (Acanthaceae)	Kuila khada (S)	-	-	Bankura, West Bengal	7(545)
244	*Hyoscymus niger* Linn. (Solanaceae)	Khurasani yamani (S)	-	-	Uttarakhand	15(332)
245	*Hyptis suaveolens* (L.) Poit. (Lamiaceae)	Van tulsi	-	-	Bilaspur, Chhattisgarh	8(423), 13(303), 27
	Hyptis suaveolens (L.) Poit. (Lamiaceae)	-	Juice	T	Dogonland, Mali, West Africa	34

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
246	*Ichnocarpus frutescens* (L.) R. Br. (Lamiaceae)	Paravalli	Paste	T	Kuruma tribes, Wayanadu, kerela	[33]
247	*Imperata cylindrical* (Linn.) P. Beauv. (Poaceae)	Darbha gaddi	As bandage	T	Koraput, Odisha	[18(129)]
248	*Indigofera oblongifolia* Forsk. (Fabaceae)	Jheel (Guj)	Ash + ghee	-	-	[16(304)]
249	*Indigofera obscura* L. (Fabaceae)	Utran	-	-	Nagpur and Wardha	[19(54)]
250	*Inula obtusifolia* Kerner (Asteraceae)	Rupmak	Decoction	O	-	[8(92)]
251	*Ipomoea carnea* Jacq. (Convolvulaceae)	Amari; Behaya	-	-	Bhadrak, Odisha	[7(499), 8(112)]
252	*Ipomoea hederifolia* L. (Convolvulaceae)	-	Paste	T	-	[8(118)]
253	*Ipomoea reptans* Poir. (Convolvulaceae)	Kalambi (S)	Paste	-	-	[16(306)]
254	*Jasminum auriculatum* (Oleaceae)	Adavi malli	-	-	Nalgonda & Warangal, A. P.	[43]
255	*Jasminum dispermum* Wall. (Oleaceae)	Basilla (Lut)		-	Uttarakhand	[15(290)]
256	*Jasminum multiflorum* (Burm.f.) Andrews (Oleaceae)	Kundah (S)	Dried leaves	-	-	[13(314)]
257	*Jasminum pubescens* Willd. (Oleaceae)	Kundphul	Poultice	T	-	[8(56)]
258	*Jasminum sambac* (L.) Ait. (Oleaceae)	Mallika (S)	Poultice	T	-	[13(314)]
259	*Jatropha curcas* L. (Euphorbiaceae)	Botuje, Lapalapa	Leaf juice	T	South-west Nigeria	[23]
		Dhodajji; Dravanti (S)	Juice	T	Bhadrak, Odisha	[7(499), 8(253), 11(212), 13(315)]
		Mbono	Crushed and pounded	T	Kimboza forest, Tanzania	[32]
		Botuje, Lapalapa	Leaf juice	T	South-west Nigeria	[23]
		Dhodajji; Dravanti (S)	Juice	T	Bhadrak, Odisha	[7(499), 8(253), 11(212), 13(315)]
		Mbono	Crushed and pounded	T	Kimboza forest, Tanzania	[32]
260	*Jatropha gossypifolia* L. (Euphorbiaceae)	Ramjada	Dried leaf powder	T	Kalahandi, Odisha	[29]
		Jatanjot	-	-	Nimar region, M.P.	[36]
261	*Justicia adhatoda* L. (Acanthaceae)	Basang	Dried leaf powder	T	Kalahandi, Odisha	[29]

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
262	*Justicia gendarussa* Burm. (Acanthaceae)	Karunachi (Trib.) Nilinargandi (H)	Paste	-	-	8(268)
263	*Kalanchoe pinnata* (Lam.) Pers. (Crassulaceae)	Runakalli (Tm), Asthibhaksha (S); Chigari	Juice	T	Dharmapuri, Tamil Nadu	7(395), 8(244), 13(322), 16(308)
264	*Kalanchoe spathulata* DC. (Crassulaceae)	Haiza, Tataru, Rugru; Hathi kane (N)	-	-	Madhubani and Sitamarhi, Bihar	7(651), 9(147), 16(311)
265	*Kirganelia reticulate* Baill (Euphorbiaceae)	Kambal (Raj.) Smeldam (Snt)	Juice, Paste, Powder	T	Nagpur and Wardha; Santhal Pargana, Bihar	14(37), 16(310)
266	*Lagescea mollis* Cav. (Asteraceae)	Kosia patta (Snt)	Juice	T	Santhal Pargana, Bihar	14(34)
267	*Lantana camara* Linn. (Verbenaceae)	Ghaneri	Leaf juice	T	Washim, Maharashtra; Uttarakhand; Bhadrak, Odisha; Dharmapuri, Tamil Nadu	7(395), 7(499), 8(439), 8 (260), 8(272), 15(363), 16 (321), 24
268	*Lantana indica* Roxb. (Verbenaceae)	Gul sitara	Paste	-	-	9(259)
269	*Lawsonia inermis* L. (Lythraceae)	Mehandi	-	-	Bilaspur, Chhattisgarh	13(326), 15(218), 16 (307), 27
		Lali	An infusion of the leaves is used as wash	T	South-west Nigeria	23
		Maruthani	Leaf powder is mixed with coconut oil	T	Kancheepuram, Tamil Nadu	25
		Mehndi		-	Nagpur and Wardha Washim, Maharashtra	19(56) 24
270	*Leea crispa* L. (Vitaceae)	Kum-tin-tuai	Juice	-	-	8(439)
271	*Leea indica* (Burm. f.) Merr. (Vitaceae)	Kurkurjiwah (Ncb)	Paste	-	-	8(375)
272	*Leptadenia reticulata* (Retz.) Wt. & Arn (Asclepiadaceae)	Dudhkadi	-	T	Nagpur and Wardha	19(57)
273	*Leucas indica* Linn. (Lamiaceae)	Guma (Lut)	Poultice	T	Uttarakhand	15(371)
274	*Limnophila heterophylla* (Roxb.) Benth. (Scrophulariaceae)	*Nerugida*	The plant leaves are crushed with coconut oil	T	Paniya tribes, Nilgiri, Tamil Nadu	45
275	*Lippia nodiflora* Mich. (Verbenaceae)	Poduthalai	Paste	T	Kancheepuram, Tamil Nadu	25

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
276	*Litsea monopetala* (Roxb.) Pers. (Lauraceae)	Poja (S)	Pounded and paste	-	Santhal Pargana, Bihar	8(350), 14(34)
277	*Lycopersicon esculentum* L. (Solanaceae)	Igi Tomato	Fresh leaves are used	T	South-west Nigeria	23
278	*Lycopus europaeus* Linn. (Lamiaceae)	Jalnim (Pun), Gipsywort (E)	Poultice	T	-	11(399), 13(340)
279	*Macaranga peltata* (Roxb.) Muller. (Euphorbiaceae)	Malavetta Puthatamara	Paste	T	Attappady, Kerala	21
280	*Mallotus philippensis* (Lamk.) Muell. Arg. (Euphorbiaceae)	Rora (Snt); Kampillka(S)	Powder	T	Santhal Pargana, Bihar; Uttarakhand	9(147), 9(259), 11(217), 14(40), 15(412), 16(307)
281	*Malva parviflora* Linn. (Malvaceae)	Panrik (H); Bakoul (Arabic)	Hot poultice	T	Uttarakhand	11(462), 15(103)
282	*Malvastrum coromandelianum* (L.) Garcke (Malvaceae)	Bala bheda (H), Ouade-Ouade (French Guiana)	-	-	Uttarakhand	13(345), 11(464), 15(106)
283	*Mangifera indica* L. (Anacardiaceae)	Amra (S); Amba	Juice	-	Thane, Maharashtra	7(265), 13(346)
284	*Manihot esculenta* Crantz. (Euphorbiaceae)	Mhogo	Infusion	O	Kimboza forest, Tanzania	32
285	*Maytenus emarginata* (Willd.) Ding Hou (Celastraceae)	Danthi(Tel.)	Crushed with Betel Leaves	-	-	16(301), 16(311)
		Dantapa chettu	Powder	T	Bastar, M.P.	17(112)
286	*Melastoma malabathricum* L. (Melastomataceae)	Palore (M); Tinrok (Ncb)	Paste	-	-	8(375), 13(350)
287	*Melia azedarach* Linn. (Meliaceae)	Mahanimba (S)	Decoction	T	-	16(314)
288	*Melochia umbellata* (Houtt.) Stapf. (Sterculiaceae)	To Hu O Ka	Pounded with sugar	-	-	8(381)
289	*Merremia umbellata* (L.) Hallf. ssp. *orientalis* Hk. f. (Convolvulaceae)	Vawktesen-til	Poultice	T	Assam	7(591), 8(439)
290	*Mentha viridis* (Lamiaceae)	Podina	-	-	Bilaspur, Chhattisgarh	27
291	*Microsorium punctatum* (L.) Copel (Polypodiaceae)	-	-	-	-	8(24)
292	*Mikania micrantha* H.B.K. (Asteraceae)	Japan-hlo	Juice	T	Lunglei, Mizoram Sonitpur, Assam	28 7(604)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
293	*Mimosa pudica* Linn. (Fabaceae)	Uskadpoda	-	T	Dantewada, Chhattisgarh	35
		Lajalu Lajwanti	Juice	T	Nagpur and Wardha; Washim, Maharashtra	8(166), 8(253), 9(387), 9 (147), 13(358), 19(61), 24
		Thotta vaadi	Juice	T	Kuruma tribes, Wayanadu, kerela	33
		Nilaj bon	Crushed leaves	T	Tezpur, Assam	31
		Thottasurungi	Pinch of leaf paste	T	Kancheepuram, Tamil Nadu	25
		Chui-mui	-	-	Bilaspur, Chhattisgarh	27
294	*Mirabilis jalapa* L. (Nyctaginaceae)	Badhrakshi	Crushed	T	Tirumala hills, A. P.	13(361), 38
295	*Mitracarpus villosa* (Sw.) DC. (Rubiaceae)	-	Paste	-	-	8(260)
296	*Mitragyna inermis* Kuntze (Rubiaceae)	Sadeene	The vapour of a decoction is inhaled	O	Dogonland, Mali, West Africa	34
297	*Mitragyna parviflora* (Roxb) Korth. (Rubiaceae)	Vitanah (S); Kalmi(H)	-	-	-	13(361)
298	*Momordia charantia* L. (Cucurbitaceae)	Karvellam	Juice	-	Assam	7(591), 13(363)
299	*Morinda citrifolia* L. (Rubiaceae)	Nibase (Ncb); Asyaka (S)	Paste	-	Nagpur And Wardha	8(375), 13(366), 19(63)
300	*Morinda lucida* Benth (Rubiaceae)	Oruwo	Paste	T	South-west Nigeria	23
301	*Morinda pubescens* J.E. Smith. (Rubiaceae)	Manjanatthi / Nuna	Paste	T	Tirunelveli hills, southern India	22
302	*Morinda tinctoria* Roxb. (Rubiaceae)	Aal (Guj)	Paste	-	-	16(312)
303	*Moringa oleifera* Lam. (Moringaceae)	-	Paste	T	Khargone, M.P.	30
		Munga	-	-	Bilaspur, Chhattisgarh	27
		Shewaga	-	T	Nagpur and Wardha; Washim, Maharashtra	19(63), 24
304	*Morus alba* L. (Moraceae)	-	Paste	T	Tirunelveli hills, southern India	22
		-	Paste	T	Khargone, M.P.	30
305	*Morus australis* Poiret (Moraceae)	Nooni	Infusion	-	Assam	7(591)
306	*Mucuna pruriens* (L.) DC. (Fabaceae)	Etka (Snt); Khajkuri, Kapikachchhu (S)	Paste	-	Amravati, Maharashtra; Santhal Pargana; Uttarakhand	7(283), 14(41), 15(188)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
307	*Murraya paniculata* (L.) Jack (Rutaceae)	Meetha neem	Powder	-	Bilaspur, Chhattisgarh	9(147), 27
308	*Nerium indicum* Mill. (Apocynaceae)	Kaneri	-	-	Washim, Maharashtra	24
		Kaner	-	-	Bilaspur, Chhattisgarh	27
		-	Juice	T	Sangli, Maharashtra; Khargone, M.P.	30, 40
309	*Nicotiana rustica* Linn. (Solanaceae)	Calcuttia tambaku (H)	-	-	Uttarakhand	15(332)
310	*Nicotiana tobacum* L. (Solanaceae)	Pukayila	Paste	T	Attappady, Kerala Uttarakhand	13(380), 15(334), 21
		Vaihlo	Juice	T	Thlabung, Mizoram	28
311	*Nipa fruiticans* Wurmb. (Arecaceae)	Nipa palm	Lotion	T	-	11(20)
312	*Nymphaea lotus* L. (Nymphaeaceae)	Ira	poultice	T	South-west Nigeria	23
313	*Ochradenus baccatus* Del. (Resedaceae)	Kalirram (Baluchistan)	-	-	-	11(277)
314	*Ocimum gratissimum* L. (Lamiaceae)	Effirin	An infusion of the leaves is used as a wash	T	South-west Nigeria	23
315	*Ocimum kilimandscharicum* Guerke. (Lamiaceae)	Karpuratulasi (S)	-	-	-	13(386)
316	*Ocimum sanctum* L. (Lamiaceae)	Tulsi	-	-	Washim, Maharashtra Uttarakhand	13(387), 15(374), 24
317	*Olax subscorpioides* Oliv. (Olacaceae)	Ifon	Fresh leaves	T	South-west Nigeria	23
318	*Orthosiphon thymiflorus* (Roth.) Sleasen (Lamiaceae)	Pratanika (S)	Pounded	-	-	13(391)
319	*Oxalis corniculata* Linn. (Oxalidaceae)	Tinpatiya	Decoction	O	Dantewada, Chhattisgarh	35
		Puliyaarila	Paste	T	Kuruma tribes, Wayanadu, kerela	33
320	*Oxytropis lapponica* (Wahlenb.)Gay (Fabaceae)	Chilsut	-	-	-	8(92)
321	*Passiflora edulis* Sims. (Passifloraceae)	Krinshakamal	-	T	Nagpur and Wardha	19(66)
322	*Pedalium murex* L. (Pedaliaceae)	Gokshura (S); Vilayati gokharu	-	-	-	9(147), 13(398)
323	*Pedicularis cheilanthifolia* Screnk (Scrophulariaceae)	Chukchuk	Extract	-	-	8(92)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
324	*Pedilanthus tithymaloides* Poit. (Euphorbiaceae)	Hemsagar	Warmed	-	Bhadrak, Odisha	7(499), 116(317)
325	*Pentanema indicum* (L.) King. (Asteraceae)	Banjhouri, Seema (Snt)	Paste	-	Santhal Pargana, Bihar	8(253), 14(41)
326	*Pergularia daemia* (Forssk.) Chiov. (Asclepiadaceae)	Juttupu	-	-	Nalgonda & Warangal, A. P.	43
		Dushtupu aaku	Crushed and tied	T	Bastar, M.P.	17(114)
327	*Peristrophe bicalyculata* (Retz.) Nees (Acanthaceae)	Kakajangha (S)	-	-	Uttarakhand	15(357)
328	*Peristrophe paniculata* (Forsk.) Brummitt (Acanthaceae)	Kakajangha	-	T	Nagpur and wardha	19(67)
329	*Phyla nodiflora* (L.) Greene (Verbenaceae)	Jalapippali (S)	Poultice	T	-	9(147), 13(402)
330	*Phyllanthhus emblica* (Euphorbiaceae)	Avala	Paste	T	Bastar, M.P.	17(115)
331	*Phyllanthhus virgatus* Forst.f. (Euphorbiaceae)	-	-	-	-	9(147)
332	*Phyllanthus reticulatas* Poir. (Euphorbiaceae)	Buinowla, Makhi, Panjoli (H); Krsnakamboji (S)	Powder; Pounded and tied	T	Bastar, M.P.	11(223), 13(406) 17(115)
333	*Phyllanthus urinaria* L. (Euphorbiaceae)	Tandimeral, Kanthad (Snth.)	Paste	-	Santhal Pargana, Bihar	14(41)
334	*Phyllanthus virgatus* G. Foster (Euphorbiaceae)	Bhiuavate (Lut)		-	Uttarakhand Nagpur and Wardha	15(413) 19(68)
335	*Phyllochlamys spinosa* Bur. (Moraceae)	Jee (M), Jhumpuri (O)	Powder sprinkled	T	Jajpur, Odisha	7(467)
336	*Pieris ovalifolia* D.Don. (Ericaceae)	Anyar, Ayar (Hp)	Decoction	T	-	16(304)
337	*Pinus roxbirghii* Sarg. (Pinaceae)	Sarala (S); Chir, Sal	Decoction	T	Kumaun Himalaya Uttarakhand	7(253), 9(251), 15(50)
338	*Piliostigma thonningii* (Schumach.) Milne-Redh. (Fabaceae)	Abafe	Young leaves are macerated in water	T	South-west Nigeria	23
339	*Piper betle* L. (Piperaceae)	Vettilakodi	Paste	T	Attappady, Kerala	21
340	*Plantago brachyphylla* Edgew. (Plantaginaceae)	Parsharpangi; Pushtu	-	-	-	8(70)
341	*Plantago depressa* Willd. (Plantaginaceae)	Isabgol (H)	Paste	-	Uttarakhand	15(384)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
342	*Plantago erosa* Wall. (Plantaginaceae)	Nila chakka, Njaramboori	Paste	-	Kerela	7(451)
343	*Plantago lanceolata* L. (Plantaginaceae)	Battanga	-	-	-	8(75)
344	*Plantago major* Linn. (Plantaginaceae)	Isabgol (H)	Pounded	-	Uttarakhand	15(384), 16(301)
345	*Pogostemon benghalensis* (Burm. f.) O. Kunze. (Lamiaceae)	Kal-basingu (H), Phangla	-	-	Uttarakhand	9(147), 15(376)
346	*Pogostemon parviflorus* Benth. (Lamiaceae)	Phangla, Phang (H)	Fresh leaves	T	-	11(414)
347	*Pogostemon pubescens* Benth. (Lamiaceae)	Vanjira (Lut)	Paste	-	Uttarakhand	15(376)
348	*Polygonum orientalis* L. (Liliaceae)	Bishkatali (M)	Pounded	-	-	9(219)
349	*Polygonum rumicifolium* Royle ex Bab. (Liliaceae)	Divya kand (Hp)	Paste	-	-	16(317)
350	*Pothos scandens* L. (Araceae)	Money plant	-	-	Bilaspur, Chhattisgarh	27
351	*Portulaca oleracea* Linn. (Portulacaceae)	Brihalloni, Lonika (S); Kulfa	Paste poultice	T	-	9(259)
352	*Potentilla sericea* L. (Rosaceae)	Tasmo		-	-	8(92)
353	*Pouzolzia zeylanica* (L.) Benn. (Urticaceae)	Kallurki (Tm)	poultice	T	-	13(427)
354	*Premna herbacea* Roxb. (Verbenaceae)	Bhumijambu (S)	Poultice	-	Uttarakhand	15(365)
355	*Prosopis cineraria* Linn. (Mimosaceae)	Shami(S)	Fresh juice	-	-	16(301)
356	*Psidium guajava* Linn. (Myrtaceae)	Beloti	Decoction	O	Dantewada, Chhattisgarh	35
		Mausala (S) Kayya (Tm & Ml.)	Wrapping the leaves	T	Khargone, M.P.; Dharmapuri, Tamil Nadu	7(395), 30
		Amrud	-	-	Bilaspur, Chhattisgarh	27
357	*Pterocarpus marsupium* Roxb. (Fabaceae)	Asan (S) Murga (Snt.)	Juice	T	Santhal Pargana, Bihar	8(244), 13(434) 14(44)
358	*Pterospermum acerifolium* Willd. (Sterculiaceae)	Kanakchampa (H)	-	-	-	11(489)
359	*Punica granatum* L. (Punicaceae)	-	Juice inhaling	O	Assam	7(591)
360	*Radermachera xylocarpa* (Roxb.) K. Schum (Bignoniaceae)	Manjakadambe (Kur)	Paste	-	-	8(272)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
361	*Rhynchiglossum obliquum* Bl. (Gesneraceae)	Tipri-char	Paste	T	Nagaland	20(175)
362	*Ricinus communis* L. (Euphorbiaceae)	Mnyonyo	Crushed and pounded	T	Kimboza forest, Tanzania	32
		Eranda (S); Mu-tih	Crushed	-	Uttarakhand	8(439), 11(225), 15(414), 16(306)
		Ewé ogohoun	Paste	T	South-west Nigeria	23
363	*Rosa brunonii* Lindley (Rosaceae)	Kubjak (S)	Juice	-	Uttarakhand	15(203)
364	*Rosa damascena* P. Miller (Rosaceae)	Rose	-	T	Dantewada, Chhattisgarh	35
365	*Rosa indica* L. (Rosaceae)	Rose	-	-	Bilaspur, Chhattisgarh	27
366	*Roscoea alpina* Royle (Zingiberaceae)	Kakoli (S)	Powder	-	Uttarakhand	15(443)
367	*Rubus fruticosus* L. (Rosaceae)	Alish	Infusion	-	-	8(56)
368	*Rumex nepalensis* Spreng. (Polygonaceae)	Ghandruk	Paste	T	-	8(408)
369	*Sagitteria sagittifolia* L. (Alismataceae)	Choto-kut, Muya muya (Bn)	-	-	-	13(450)
370	*Salvia glutinosa* Linn. (Lamiaceae)	Cetrode Jupiter (Spanish)	Lotion	T	-	511(416)
371	*Salvia moorcroftiana* Wall. (Lamiaceae)	Kali jarri (H), Gurgumma (Pun)	Poultice	T	Uttarakhand	11(416), 15(379)
372	*Salvia nubiloca* Wall. ex Sweet (Lamiaceae)	Ganya (Lut)	Paste	-	Uttarakhand	15(379)
373	*Sauropus androgynus* Merr. (Euphorbiaceae)	Thavasai murungai (Tm)	Poultice	-	-	13(460)
374	*Schima wallichii* (DC.) Korth. (Theaceae)	Khiang	Juice	-	-	8(439)
375	*Scoparia dulcis* L. (Scrophulariaceae)	Sarak-kotthini	Paste	T	Tirunelveli hills, southern India	22
376	*Securinega leucopyrus* (Willd.) Muell (Phyllanthaceae)	Thumari, Humari	Gel	T	Jamnagar	48, 49
377	*Selinum vaginatum* Clarke (Apiaceae)	-	Crushed and paste	-	Kullu, H.P.	7(185)
378	*Senecio nudicaulis* D.Don. (Asteraceae)	Ratpatia (H)	Paste	-	-	16(307)

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
379	*Senna occidentalis* (L.) Link (Fabaceae)	Guinjimognu	Powder of leaves	T	Dogonland, Mali, West Africa	[34]
380	*Sida acuta* Burm. f (Malvaceae)	Isekete	Decoction	T	South-west Nigeria	[23]
		Arival manai poondu	Paste	T	Kancheepuram, Tirunelveli and Dharmapuri, Tamil Nadu	[7(395), 7(363), 8(228), 25]
381	*Sida cordata* (Burm. f.) Barssum (Malvaceae)	Bhumibala, Rajabala (S), Daravan talai (Kd)	Ground to paste	T	Uttarakhand; Phulbani, Odisha	[8(260), 15(108), 16(312), 18(138)]
382	*Sida orientalis* (Malvaceae)	-	Paste	T	-	[9(387)]
383	*Sida schimperiana* Hochst. (Malvaceae)	-	Paste	-	-	[8(260)]
384	*Sida veronicaefolia* Lam. (Malvaceae)	Rajabala(S)	Pounded	-	-	[11(469), 16(301)]
385	*Sida rhombifolia* Linn. (Malvaceae)	Arrow leaf	Paste	-	Bilaspur, Chhattisgarh	[9(387), 27]
386	*Skimmia anquetilia* Taylor & Airy Shaw (Rutaceae)	Patranga (H)	-	-	Uttarakhand	[15(130)]
387	*Skimmia laureola* (DC.) Zucc. (Rutaceae)	Masturipath	Juice	-	Kangra, H.P.	[20(178)]
388	*Solanum nigrum* L. (Solanaceae)	Kakamachi (S)	Infusion	-	Dharmapuri dist., Tamil Nadu; Uttarakhand	[7(395), 13(473), 15(337)]
389	*Solanum incanum* Linn. (Solanaceae)	Inrimbudu	Decoction	T	Dogonland, Mali, West Africa	[34]
390	*Solanum surratense* Burm. f. (Solanaceae)	Kateri vangi	-	-	Thane, Maharashtra	[7(265), 16(315)]
391	*Sonchus asper* (L.) Hill (Asteraceae)	Garwa, Machal; Jalymniar	Pounded	-	Uttarakhand	[8(175), 11(364), 15(270), 15(279)]
392	*Sorindeia madagascariensis* DC. (Anacardiaceae)	Mpilipili	Crushed or pounded	T	Kimboza forest, Tanzania	[32]
393	*Spermacoce articularis* L. f. (Rubiaceae)	Kudalurukki	Paste	T	Attappady, Kerala	[21]
394	*Spermacoce ocymoides* Burm.f. (Rubiaceae)	Sirupeelai	Paste	T	Tirunelveli hills, southern India	[22]
395	*Stachys palustris* Linn. (Lamiaceae)	All heal, clown's woundwort (E)	Pounded	-	-	[11(418)]

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
396	*Stephaniajaponica* (Thunb.) Miers (Menispermaceae)	-	Crushed	O	Darjeeling, W.B.; Khargone, M.P.; Bhadrak, Odisha	7(499), 30, 50
397	*Strychnos nux-vomica* L. (Loganiaceae)	Etti (Trib) Kuchla (H)	Poultice	T	-	8(268)
398	*Suaeda fruticosa* (L.) Forsk. (Chenopodiaceae)	Lana, lani	-	-	-	9(147)
399	*Syzygium cumini* (L.) Skeels (Jam) (Myrtaceae)	Jambu (S)	Juice	-	-	8(329)
400	*Tabernaemontana crispa* Roxb. (Apocynaceae)	Thikarothung (Ncb)	Decoction	-	Wounds, ulcers	8(375)
401	*Tagetes erecta* Linn. (Asteraceae)	Genda	Pounded and tied	T	Dantewada, Chhattisgarh; Bastar, M.P.	35 17(119)
402	*Tagetes patula* L. (Asteraceae)	Chandani genda	Crushed, Juice	-	Bilaspur, Chhattisgarh; Bhadrak, Odisha	7(499), 8(219), 27
403	*Tamarindus indica* Linn. (Fabaceae)	Omolo	Decoction	T	Dogonland, Mali, West Africa	34
404	*Tephrosia purpurea* (L.) Pers. (Fabaceae)	Wild indigo	Powder	-	Bilaspur, Chhattisgarh; Dharmapuri, Tamil Nadu	7(395), 16(301), 27
405	*Terminalia arjuna* (Roxb. ex DC.) Wight and Arn. (Combretaceae)	Kahua	-	O	Dantewada, Chhattisgarh	35
		Arjuna (S)	Paste	T	Uttarakhand	8(439), 9(147), 13(499), 15(213)
406	*Terminalia tomentosa* W. & A. (Combretaceae)	Sal(S)	Juice	-	-	16(310)
407	*Thevetia peruviana* (Pers.) Schum. (Apocynaceae)	Peeta karavira (S) Konyaari (O)	Boiled in mustard oil; tied over wounds	T	Phulbani, Odisha	16(306), 18(143)
408	*Thunbergia fragrans* Roxb. (Acanthaceae)	Kolikka (Kur) Koligokke (Irular)	Paste	-	-	8(228), 8(272)
409	*Tinospora cordifolia* Miers. (Menispermaceae)	Seendil	Paste	T	Kancheepuram, Tamil Nadu	25
410	*Trichodesma zeylanicum* (Burm. f.) R. Br. (Boraginaceae)	Mulluthumbai chedi	Paste	T	Tirunelveli hills, southern India	22
411	*Tridax procumbens* L. (Asteraceae)	Tongal modi	-	-	Washim, Maharashtra	24
		Kodele yiri	Paste	T	South-west Nigeria	23

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
411	*Tridax procumbens* L. (Asteraceae)	Vettukayapundu	Paste	T	Kancheepuram , Tamil Nadu	25
		Pukavetti	Paste	T	Attappady, Kerala; Amravati and Dharmapuri, Maharashtra; Tirunelveli and Kanyakumari; North East India; Phulbani, Odisha; Uttarakhand	7(273), 7(363), 7(369), 7 (583), 7(395), 7(515), 8 (89), 8(166), 8(175), 8 (206), 8(192), 8(292), 9 (387), 13(517), 915(275), 16(301), 21
		-	Paste	T	Erode District, Tamil Nadu; Khargone, M.P.	30, 51
		Coat button	-	-	Bilaspur, Chhattisgarh	27
412	*Trigonella foenum* Linn. (Fabaceae)	Methika (S)	Infusion	T	Uttarakhand	9(259), 13(517), 15(191)
413	*Triumfetta pilosa* Roth. (Tiliaceae)	Vattai gida	Paste	-	-	8(272)
414	*Tylophora indica* (Burm. f.) Merr. (Asclepiadaceae)	Arkapatri (S)	Paste with turmeric	-	Dharmapuri, Tamil Nadu	7(395), 16(303)
415	*Urena labata* L. (Malvaceae)	Katshinin (Andm) Kasinrih (Ncb)	Pounded, boiled in coconut oil	-	-	8(375), 16(323)
416	*Urtica dioica* L. (Urticaceae)	-	Crushed leaves and warmed	T	-	7
417	*Vanda teastacea* (Orchidaceae)	Godorli	Juice	T	Bastar, M.P.	17(121)
418	*Verbascum chinense* (Linn.) Santapau (Scrophulariaceae)	-	Juice	-	Uttarakhand	15(346)
419	*Verbena officinalis* L. (Verbenaceae)	Pamukh	-	-	-	13(526)
420	*Vernonia amygdalina* L. (Asteraceae)	Ewuro	Decoction	T	South-west Nigeria	23
421	*Vernonia cineria* L. (Asteraceae)	Sahadevi (S); Pokosungha (O)	Decoction of leaves with *Ocimum sanctum* leaves	-	Koraput, Odisha	7(473), 9(259), 13(527)
422	*Vernonia conyzoides* Wt. (Asteraceae)	Communist	Crushed leaf	T	Paniya tribes, Nilgiri, Tamil Nadu	45

S.No.	Botanical Name (Family)	Local name	Mode of administration	Route of administration	Tribal Area	References
423	*Vernonia divergens* (Roxb.) Edgew. (Asteraceae)	Appale (Kur)	Paste	-	-	8(272)
424	*Viola sylvestris* Lam. (Violaceae)	-	Crushed	T	-	11(284)
425	*Vitex altissima* L. (Verbenaceae)	Mayilai maram	Decoction	O	Tirunelveli hills, southern India	22
426	*Vitex negundo* Linn. (Verbenaceae)	Negur	-	-	Bilaspur, Chhattisgarh; Amravati, Maharashtra; Bihar	7(645), 7(273), 8(206), 9 (147), 9(219), 16(307), 27
427	*Vitex peduncularis* Wall. ex Schauer (Lamiaceae)	Oreij ata daru	Paste	T	Purulia district, West Bengal	38
428	*Wedelia biflora* (L.) DC. (Asteraceae)	Kotan (Ncb)	-	-	-	8(375)
429	*Withania somnifera* (L.) Dunal (Solanaceae)	Ashvagandha (S); Asgandh	-	-	Uttarakhand	9(147), 15(338)
430	*Wrightia tinctoria* (Roxb.)R. Br. (Apocynaceae)	Pala kodisha	-	-	Nalgonda &Warangal, A. P.	43
431	*Xanthium strumarium* L. (Asteraceae)	Godhara	Crushed	-	Bhadrak, Odisha	7(499), 11(375), 16(318)
432	*Xylopia aethiopica* (Dunal) A. Rich. (Annonaceae)	Eeru	Fresh leaves	T	South-west Nigeria	23
433	*Ziziphus mauritiana* Lam. (Rhamnaceae)	Oruwo	Fresh leaves	T	Dogonland, Mali, West Africa	34
434	*Zizyphus xylopyrus* (Retz.) Willd. (Rhamnaceae)	Ghonta (S) Karkat (Snt.)	Juice	-	Santhal Pargana, Bihar	16(320) 14(51)

Table 2: Classification of wound healing leaf drugs reported according to route of administration

S. No.	Route of administration	Number of plants
1.	Topical	202
2.	Oral	11
3.	Both (Topical and Oral)	9

Table 3: Family wise classification of wound healing leaf drugs

S. No.	Name of families	Total number of enlisted families	Plants found in each
1	Alismataceae, Arecaceae, Basellaceae, Biebersteinaceae, Bignoniaceae, Burseraceae, Caesalpiniaceae, Cannabaceae, Capparidaceae, Caricaceae, Caryophyllaceae, Clusiaceae, Commelinaceae, Costaceae, Cyperaceae, Dioscoreaceae, Elaeaghaceae, Elatinaceae, Ericaceae, Gentianaceae, Gesneraceae, Hernandiaceae, Loranthaceae, Lythraceae, Malpighiaceae, Moringaceae, Nymphaeaceae, Olacaceae, Papaveraceae, Passifloraceae, Pedaliaceae , Piperaceae, Pinaceae, Polypodiaceae, Polygonaceae, Portulacaceae, Punicaceae, Resedaceae, Saxifragaceae, Simaroubaceae, Theaceae, Violaceae and Zingiberaceae	43	1

S. No.	Name of families	Total number of enlisted families	Plants found in each
2	Araceae, Aristolochiaceae, Begoniaceae, Ebenaceae, Capparaceae, Celastraceae, Cleomaceae, Cucurbitaceae, Cyatheaceae, Flacourtiaceae, Loganiaceae, Lauraceae, Melastomataceae, Meliaceae, Mimosaceae, Myrtaceae, Nyctaginaceae, Orchidaceae, Phyllanthaceae, Ranunculaceae, Rhamnaceae, Sterculiaceae and Urticaceae	23	2
3	Agavaceae, Anacardiaceae, Apiaceae, Brassicaceae, Chenopodiaceae and Oxalidaceae	6	3
4	Annonaceae, Crassulaceae, Poaceae, Scrophulariaceae, Tiliaceae	5	4
5	Boraginaceae, Liliaceae, Menispermaceae, Oleaceae, Plantaginaceae and Rosaceae	6	5
6	Amaranthaceae, Apocynaceae, Convolvulaceae and Vitaceae	4	6
7	Rutaceae	1	8
8	Asclepiadaceae, Combretaceae and Moraceae	3	9
9	Solanaceae	1	11
10	Verbenaceae	1	15
11	Acanthaceae and Malvaceae	2	16
12	Rubiaceae	1	17
13	Lamiaceae	1	19
14	Euphorbiaceae	1	34
15	Fabaceae	1	38
16	Asteraceae	1	51

Table 4: Categorization of wound healing leaf drugs in *Ayurvedic* Classical texts

S. No.	Name of *Samhita*	*Gana* name	Classical name of drugs mentioned	Total No. of drugs	*Karma*
1.	*Charaka Samhita*	*Sandhaniya mahakashaya*(52)	*Madhuparni (Guduchi), Ambasthaki (Patha)* and *Samanga (Lajjalu)*	3	*Sandhan karma*
2.	*Sushruta Samhita*	*Aaragvadhadi gana* (53)	*Aaragvadha, Kantaki (Vikankata), Kutaja & Indrayava, Patha, Nimba, Saireyaka* and *Guduchi*	7	*Vrana shodhana* (54)
		Arkadi gana (55)	*Arka, Alarka, Mayuraka (Apamarga), Bharangi, Indrapushpi (Langali), Vrishikali (Uttmaarni)* and *Alavana (Jyotishmati)*	7	*Visheshad vrana shodhana* (56)
		Sursadi gana(57)	*Sursa (Tulasi), Bhustrana (Van Tulasi), Nirgundi, Prachibala (Kakajangha), Kakamachi* and *Vishamustika (Mahanimba)*	6	*Vrana shodhana* (58)
		Patoladi gana(59)	*Guduchi* and *Patha*	2	*Vranya* (60)
		Priyangvadi gana (61)	*Samanga (Lajjalu)*	1	*Vrana ropana* (62)
		Ambasthadi gana (63)	*Ambastha (Patha), Samanga (Lajjalu), Katvanga (Aralu)* and *Bilva*	4	*Vrana ropana* (62)
		Nygrodhadi gana (64)	*Nygrodha (Vata), Kakubha (Arjuna), Amra* and *Priyala*	4	*Vranya* (65)
		Lakshadi gana(66)	*Aarevat (Aaragvadha), Kutaja, Ashwamara (Karvira)* and *Nimba*	4	*Dusta vrana vishodhana* (67)
3.	*Ashtanga Hridaya Samhita*	*Aaragvadhadi gana* (68)	*Aaragvadha, Indrayava, Nimba, Amrita (Guduchi), Struv vriksha (Vikankata), Patha, Bhunimba* and *Saireyaka*	8	*Dusta vrana vishodhana* (69)
		Arkadi gana (70)	*Arka, Alarka, Pratayakpushpi (Apamarga), Bharangi, Vishalaya (Langali), Vrishikali (Uttmaarni)* and *Peet taila (Jyotishmati)*	7	*Visheshad vrana shodhana* (71)
		Sursadi gana (72)	*Sursa (Tulasi), Bhustrana (Van Tulasi), Bhootkeshi (Nirgundi), Bharangi, Kakamachi* and *Vishamustika (Mahanimba)*	6	*Vrana shodhana* (73)

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S. No.	Name of *Samhita*	*Gana* name	Classical name of drugs mentioned	Total No. of drugs	*Karma*
3.	*Ashtanga Hridaya Samhita*	*Priyangvadi gana* (74)	*Samanga (Lajjalu)* and *Bharangi*	2	*Vrana ropana* (75)
		Ambasthadi gana (76)	*Ambastha (Patha), Namaskari (Lajjalu), Kacchura (Kapikacchu), Katvanga (Aralu)* and *Bilva*	5	*Vrana ropana* (75)
		Nygrodhadi gana (77)	*Nygrodha (Vata), Arjuna, Amra* and *Priyala*	4	*Vranya* (78)

Tribal areas

Use of leaf drug by different tribal population in different tribal parts of the world are reported in table-1. Among these plants, many plants were reported for same activity from different tribal areas of the world indicating their ample uses. *Tridax procumbens* L. (Asteraceae) was reported from maximum 14 tribal areas while *Cleome viscosa* L. (Cleomaceae) and *Chromolaena odorata* (L.) R. M. King & H. Robins. (Asteraceae) were from 8 tribal areas; *Mimosa pudica* Linn. (Fabaceae), *Azadirachta indica* A. Juss (Meliaceae) and *Annona squamosa* Linn. (Annonaceae) were from 7 tribal areas. *Tridax procumbens* L. was reported from Maharashtra, Tamil Nadu, Kerala, Odisha, Chhattisgarh, Uttarakhand, North East India and South-west Nigeria; *Cleome viscosa* L. from Tamil Nadu, Andhra Pradesha, Kerela, Maharashtra, Odisha, Chhattisgarh and Uttarakhand; *Chromolaena odorata* (L.) R. M. King & H. Robins from Kerala, Odisha, Bihar, Andaman & Nicobar, North East India and South -west Nigeria; *Mimosa pudica* Linn. from Chhattisgarh, Maharashtra, Kerela, Assam and Tamil Nadu; *Azadirachta indica* A. Juss from Assam, Maharashtra, Chhattisgarh, South-west Nigeria and West Africa; *Annona squamosa* Linn. from Chhattisgarh, Maharashtra, Odisha, Bihar and Uttarakhand.

Route of administration

Among these ethno medicinal plants, 202 plants reported for topical application, 11 for oral administration and 9 for both oral and topical (table 2). Remaining 211 plants were not mentioned for any particular route of administration in the reffered sources.

Family wise classifications

Family wise classifications of plants are noted in table 3. It was found that plants belonging to Asteraceae -51, Fabaceae-38 and Euphorbiaceae-34 drugs were maximum. Recent review study (79) indicates that Asteraceae is an important plant family for being a valuable and potential source for the natural products possessing wound healing activity. Most of plants of Asteraceae family possess wound healing activity. The plants of Fabaceae and Euphorbiaceae families are mostly of sweet taste (*madhura rasa*) and astringent taste (*kashaya rasa*). In Ayurveda, *madhura rasa* and *kashaya rasa* have been highlighted for their *vrana-ropana* and *vrana-sandhana* (wound healing) properties (80). Hence may be used as wound healing agents in many disease conditions.

Ayurveda on Wound healing

In Ayurvedic classics, many drugs have been described for their *vranya, vrana-sodhana* and *vrana-ropana* actions (Table-4). Plants having these properties are classified under *Sandhaniya Mahakashaya* in *Charaka Samhita* and *Aaragvadhadi gana, Arkadi gana, Sursadi gana, Patoladi gana, Priyangvadi gana, Ambasthadi gana, Lakshadi gana in Sushruta Samhita* and *Aaragvadhadi gana, Arkadi gana, Sursadi gana, Priyangvadi gana, Ambasthadi gana* in *Ashtanga Hridaya Samhita*. *Patha* (*Cissampelos pareira* L.), *Guduchi* (*Tinospora cordifolia* Miers.) and *Lajjalu* (*Mimosa pudica* Linn.) have been mentioned in *Sandhaniya Mahakashaya* in *Charaka Samhita*.

Aaragvadha (*Cassia fistula* Linn.), *Vikankata* (*Flacourtia indica* (Burm.f.) Merill), *Kutaja* (*Holarrhena antidysenterica* (Linn.)Wall.), *Indrayava* (*Holarrhena antidysenterica* (Linn.)Wall.), *Patha* (*Cissampelos pareira* L.), *Nimba* (*Azadirachta indica* A. Juss), *Saireyaka* (*Barleria prionitis* Linn.) and *Guduchi* (*Tinospora cordifolia* Miers.) have been mentioned in *Aaragvadhadi* gana; *Arka* (*Calotropis procera* (Ait.) R. Br., *Alarka* (*Calotropis gigantia* (Linn.) R. Br. ex Ait.), *Apamarga* (*Achyranthes aspera* L.), *Bharangi* (*Clerodendrum serratum* (L.) Moon.), *Langali* (*Gloroisa superba* L.), *Uttmaarni* (*Pergularia daemia* (Forssk.) Chiov.) and *Jyotishmati* (*Celastrus paniculatus* Willd.) in *Arkadi gana*; *Tulasi* (*Ocimum sanctum* L.), *Van Tulasi* (*Hyptis suaveolens* (L.) Poit.), *Nirgundi* (*Vitex negundo* Linn.), *Kakajangha* (*Peristrophe bicalyculata* (Retz.) Nees), *Kakamachi* (*Solanum nigrum* L.) and *Mahanimba* (*Melia azedarach* Linn.) in *Sursadi gana*; *Guduchi* (*Tinospora cordifolia* Miers.) and *Patha* (*Cissampelos pareira* L.) in *Patoladi gana*; *Lajjalu* (*Mimosa pudica* Linn.) in *Priyangvadi gana*; *Patha* (*Cissampelos pareira* L.), *Lajjalu* (*Mimosa pudica* Linn.), *Aralu* (*Ailanthus excelsa* Roxb.) and *Bilva* (*Aegle marmelos* L. Corr.) in *Ambasthadi gana*; *Vata* (*Ficus benghalensis* L.), *Arjuna* (*Terminalia arjuna* (Roxb. ex DC.) Wight and Arn.), *Amra* (*Mangifera indica* L.) and *Priyala* (*Buchanania lanzan* Spr.) in *Nygrodhadi gana*; *Aargavadha* (*Cassia fistula* Linn.), *Kutaja* (*Holarrhena antidysenterica* (Linn.) Wall.), *Karvira* (*Nerium indicum* Mill.) and *Nimba* (*Azadirachta indica* A. Juss) in *Lakshadi gana* in *Sushruta Samhita*.

Aaragvadha (*Cassia fistula* Linn.), *Vikankata* (*Flacourtia indica* (Burm.f.) Merill), *Indrayava* (*Holarrhena antidysenterica* (Linn.) Wall.), *Patha* (*Cissampelos pareira* L.), *Nimba* (*Azadirachta indica* A. Juss), *Bhunimba* (*Andrographis paniculata* (Burm. f.)

Wall. ex Nees), *Saireyaka* (*Barleria prionitis* Linn.) and *Guduchi* (*Tinospora cordifolia* Miers.) have been mentioned in *Aaragvadhadi gana*; *Arka* (*Calotropis procera* (Ait.) R. Br., *Alarka* (*Calotropis gigantia* (Linn.) R. Br. ex Ait.), *Apamarga* (*Achyranthes aspera* L.), *Bharangi* (*Clerodendrum serratum* (L.) Moon.), *Langali* (*Gloroisa superba* L.), *Uttmaarni* (*Pergularia daemia* (Forssk.) Chiov.) and *Jyotishmati* (*Celastrus paniculatus* Willd.) in *Arkadi gana*; *Tulasi* (*Ocimum sanctum* L.), *Van Tulasi* (*Hyptis suaveolens* (L.) Poit.), *Nirgundi* (*Vitex negundo* Linn.), *Bharangi* (*Clerodendrum serratum* (L.) Moon.), *Kakamachi* (*Solanum nigrum* L.) and *Mahanimba* (*Melia azedarach* Linn.) in *Sursadi gana*; *Lajjalu* (*Mimosa pudica* Linn.) and *Bharangi* (*Clerodendrum serratum* (L.) Moon.) in *Priyangvadi gana*; *Patha* (*Cissampelos pareira* L.), *Lajjalu* (*Mimosa pudica* Linn.), *Kapikacchu* (*Mucuna pruriens* (L.) DC., *Aralu* (*Ailanthus excelsa* Roxb.) and *Bilva* (*Aegle marmelos* L. Corr.) in *Ambasthadi gana*; *Vata* (*Ficus benghalensis* L.), *Arjuna* (*Terminalia arjuna* (Roxb. ex DC.) Wight and Arn.), *Amra* (*Mangifera indica* L.) and *Priyala* (*Buchanania lanzan* Spr.) in *Nygrodhadi gana*, in *Ashtanga Hridaya Samhita*.

Recent studies

Many Indian medicinal plants are recommended for the treatment of wound. The wound healing activity of different medicinal plants has been evaluated. *Apamarga* (*Achyranthes aspera* L.), a *Krimighna* (antibacterial) plant mentioned in Ayurveda effectively shows wound healing activity on excision and incision wound of albino rats (81).

Vasa (*Adhatoda vasica* Nees.) shows significant wound healing activity. Wounds were created along the vertebral columns of buffalo calves, and alcoholic and chloroform extracts of Adhatoda in a powdered form were applied. As compared to control, the calves treated with *Adhatoda vasica* showed significantly improved healing. Improvement in breaking strength, tensile strength, absorption and extensibility in the wound repair tissue. In addition, the levels of elastin, collagen, hydroxyproline, hexosamine and zinc were greatly increased in the animals treated with *A. vasica.* The alcoholic extract of the herb was found to be the most effective (82).

In-vivo antioxidant activity of the methanolic leaf extracts of *Bilva* (*Aegle marmelos* L. Corr.) possesses good antioxidant power to heal the wounds in mice models equivalent to that of the Povidine Iodide used as a standard compound (83).

The topical application of *Ghrita kumari* (*Aloe vera* Burm. f.) gel significantly accelerated the wound contraction and marked wound closure. The effect produced by *Aloe vera* gel with reference to wound contraction, wound closure, decrease in surface area of wound, tissue regeneration at the wound site and histopathological characteristics were significant in treated rats (84). It also had a marked influence on the collagen level which is the precursor protein for wound healing mechanism.

Recent study (85) shows that the animals treated with methanol and aqueous extracts of *Satyanashi* (*Argemone maxicana* L.) possess faster rate of wound healing compared to other extracts under study. The wound healing effects of the chloroform, methanol and aqueous extracts may be attributed to the presence of phytoconstituents like alkaloids, triterpenoids, tannins and flavonoids in the extracts which are known to promote the wound healing process mainly due to their astringent, antioxidant and antimicrobial properties.

Recent study (86) study indicates, that not only topical application of water extract of *Pashanabheda* (*Bryophyllum pinnatum* Lam.) hastened the healing process in excision wound model, but also all the three extracts (petroleum ether, alcohol and water) administered orally, promoted the healing of resutured incision and dead space wounds, as indicated by increased breaking strength and hydroxyproline content of the granulation tissue, thereby justifying its use in traditional medicine.

Shikari (*Cordia macleodii* hook.) is also a potent leaf drug for wound healing. *Go-ghrita* (cow's ghee) based formulation of *C. macleodii* leaf, was evaluated through exploratory, open and controlled clinical study on 20 patients, in two groups. One group was managed with *Cordia macleodii* ghrita and control group was treated with Povidone Iodine as local application, for duration of 21 days. The effect of drug based on sign and symptoms was assessed at 7th, 14th and 21st days. Significant changes was observed in discharge, tenderness, wound margin and wound size in *C. macleodii* ghrita treated group while in Povidone Iodine treated group showed highly significant result (87).

Effect of topical administration of methanolic extract in ointment form of *Dodonea viscosa* Linn was studied on the wounds in rats. In the excision model the extract treated wounds were found to epithelialise faster and the rate of wound contraction was higher, as compared to control wounds. The extract facilitates the healing process as evidenced by increase in the tensile strength in the incision model. The results were also comparable to those of standard drug Povidine Iodide (88).

Ethanolic extract of leaves of *Hyptis suaveolens* L. was evaluated for its wound healing activity in ether-anaesthetized wistar rats at two different doses (400 and 800 mg/kg) using incision, excision, and dead space wound model. Significant increase in skin breaking strength, granuloma breaking strength, wound contraction, hydroxyproline content and dry granuloma weight and decrease in epithelization period was observed (89).

Tulsi (*Ocimum sanctum* L.), a well known herb in Indian medicine, possesses various therapeutic properties including healing properties and cytokine induction. Wound healing activity of cold aqueous extract of *O. sanctum* leaves along with its effect on tumor necrosis factor-alpha (TNF-alpha) was assessed using excision model of wound repair in Wistar albino rats. After application of the *O. sanctum* extract, rate of epithelization with an increase in wound contraction was observed. In animals, treated with 10% *O. sanctum* extract in petroleum jelly, wound healing was faster as compared to control group which were treated with petroleum jelly alone but significant accelerated healing

was noticed in animals which in addition to the topical application of 10% extract of *O. sanctum*, were prefed with 250 mg/kg body weight of aqueous *O. sanctum* extract daily for 20 consecutive days. During wound healing phase TNF-alpha level was found to be up regulated by *O. sanctum* treatment. Early wound healing may be pronounced due to *O. sanctum* extract, by elevating TNF-alpha production (90).

In excision wound model, 5% ointment of hydro-alcoholic leaf extract of *Shaka* (*Tectona grandis* Linn.) showed a reduction in wound area 8th day onwards. Reduction in wound area was very significant ($P < 0.01$) as compared to control. Whereas 10% ointment of hydro-alcoholic leaf extract of *T. grandis* and standard showed a reduction in wound area fourth day onwards, which was highly significant ($P < 0.001$) as compared to control. In incision wound model, animals treated with 5% ointment of *Tectona grandis* leaf extract showed significant ($P < 0.05$) increase in tensile strength as compare to control. However, animals treated with 10% ointment of *Tectona grandis* leaf extract showed very significant ($P < 0.001$) increase in tensile strength as compared with control. Animals treated with soframycin showed highly significant ($P < 0.001$) increase in tensile strength as compared with control (91).

Sarapunkha (*Tephrosia purpurea* (L.) Pers.) exhibited significant wound healing activity in diabetic rats. The hydro alcoholic extract of *Tephrosia purpurea* (L.) Pers. was evaluated for its wound healing activity in streptozotocin induced diabetic rats using excision and dead space wound models. Topical application, twice a day, of 5% w/w extract ointment shows more significant ($P<0.001$) wound contraction in normal and diabetic treatments when compare to control. The oral administration of 200 mg/kg bw/day also significantly increases the wet and dry granulation tissue weight when compare to the control (92).

Nirgundi (*Vitex negundo* Linn.) showed a definite, positive effect on wound healing, with a significant increase in the levels of hydroxyproline content, tensile strength and protein content of wounded skin in both incision and dead space wound model (93). The antioxidant enzymes level of superoxide dismutase and catalase increased in the granuloma tissue which support its wound healing property. The efficacy of this plant in wound healing may be due to its action on antioxidant enzymes, thereby justifying the traditional claim. So above description it can be said that many herbs which are mentioned in Ayurveda, claimed potent wound healing activity.

Conclusion

Present review reports, use of 434 leaf drugs for their wound healing activity. Leaf drugs of Asteraceae family have great potency for healing the wounds. Many of leaf drugs have been evaluated scientifically for their wound healing activity. Finding of the present review may give leads for new drug development for the management of wound. Now there is high demand of herbal drugs for the management of different disease conditions. If leaf drugs researched upon successfully, then rare plant population could be saved and society will get double benefit.

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