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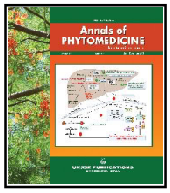

Review Article : Open Access

A critical review of medicinal plants and usage in folk medicine in tribal area of Chintapalle region of Eastern ghats in Andhra Pradesh

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Abstract

Tribal communities are forest inhabitant with their environment and they depend profoundly on forest products for their livelihood. They have developed a great deal of knowledge on the use of plants and plant products as therapies to cure human ailments. The explored medicinal plants from Chintapalle forest range were *ex situ* conserved, documented their usage in folk medicine to treat several human ailments by the tribal communities. It is noted that the Kondadora tribe in Visakhapatnam agency have knowledge on folk medicine to cure diseases, *viz*., general fevers, skin diseases, menstrual problems, wounds and snake bite, *etc*. The *ex situ* conserved medicinal plants were pertaining to various botanical families were documented. Among them, Fabaceae family with 10 species, Apocynaceae (8 spp.), Lamiaceae (7 spp.), Zingiberaceae, Poaceae, Lauraceae, *etc*., herbal plant diversity exists in this forest region. The most widely pursued plant parts root, stem bark, leaves, tubers, bulbs and seed, *etc*., used in preparations to cure different ailments in the agency. The local tribal people pulverized the flowers of *Butea superba* with *Cinnamomum zeylanicum* leaves and used to cure fever and snake bite. The pounded flower buds of *Alangium salvifolium* mixed with the fruits of *Phyllanthus emblica* and turmeric used to cure diabetes. The *ex situ* conserved herbal plants were reported more than 20 plant species to cure respiratory problems; 12 plant species used against snake bite followed by 10 plants species reported to cure skin diseases. The present review mainly emphasized to enlighten the importance of these natural herbal plants chiefly used in folk medicine in the agency area to cure various human diseases.

1. Introduction

Indian forest has rich diversity of flora of medicinal plants which are nature's gift to the folk. In India, three traditional systems of medicine, *viz.,* Ayurveda, Siddha and Unani are notable. In India, more than 5000 years back, the use of plants for medicinal treatment was existed. The plant based traditional medical systems continue to provide the primary healthcare to 75 per cent of world's population. The classical indigenous systems of Indian medicine recommend 10,000 nominated formulations used in folk medicine (Padal and Vijaykumar, 2013; Padal *et al*., 2013). The predominant tribal communities dwelling in Chintapalle forest range of Andhra Pradesh, *viz.,* Bagata, Nookdora, Kondadora, Koya,Valmiki, Kondakammara, Gadaba, Mali, Kotia, Jatapu, Porja and Khond, *etc.* All these tribal communities are well versed with the herbal plants and widely used in preparation of natural products in folk medicine (Padal *et al*., 2013). Most of the plant parts and their extracts are used in folk medicine to cure various human ailments (Kumar and Bhatt, 2006). Keeping in view of the above, the present review article is sumptuously described the diversity of medicinal plants available in Chintapalle forest region and their in-practice in tribal medicine to cure various human ailments. The study area is under the forest range of eastern ghats in northern Andhra Pradesh; the highest peak in these ghats is Sambari Konda near Gudem kothaveedhi village with an elevation of 2527 m. The major amount of rainfall (1350 mm) received during the south-west monsoon period. The relative humidity is ranged from 85-90 per cent and the temperature ranges from 20-43^{0}C during summer and 10-20^{0}C during winter (Naidu and Kumar, 2015). The Chintaplle region has rich biodiversity and it has luxuriant forest with floristically and ecologically important habitat and harbor for various medicinal plants, used by indigenous tribal communities to cure numerous diseases and disorders prevailed in the agency (Rao *et al*., 2000; Padal *et al.,* 2012). The notable contributions and observations were evidenced on the medicinal plants used in folk medicine from the forest region of eastern ghats by various authors are reviewed hereunder. Hemadri (1981) reported the plants used in tribal medicine for rheumatism; Hemadri and Rao (1987); Hemadri *et al.* (1987); Ramarao *et al.* (1984) enlisted the plant species from Andhra Pradesh used in tribal medicine to cure leucorrhea, menorrhagia and jaundice, *etc*. Padal *et al.* (2013) studied the traditional expertise of the community Kondadora to cure the disease like jaundice, piles, stomachache and also documented the medicinal plants and their products used in folk medicine, *viz.,* rhizome paste of *Acorus calamus* used to treat fever; flowers of *Butea superba* are minced with the leaves of *Cinnamomum zeylanicum* and the paste is used against snake bite. Flower buds of *Alangium salvifolium* mixed with fruits of *Phyllanthus emblica* and turmeric powder to cure diabetes and bone fractures. The traditional

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knowledge of tribals on folk medicine to cure human diseases like diarrhea, dyspepsia, general fevers, skin diseases, menstrual problems, joint pains, wounds, snake bite, *etc.,* as reported by Ramarao *et al*. (1984); Pullaiah *et al.* (2001); Padal *et al. (*2013); Satyavathi *et al.* (2014).

1.1 *Ex situ* conservation of medicinal plants

The high altitude tribal zone of Andhra Pradesh headquarters at Chintapalle lies between 17º-34' 11" and 18º-32' 57" latitude; 18º-51' 49" and 83º-16' 9" longitude. The Visakhapatnam district having major 11 tribal mandals with an area of 11, 161 km$^{2.}$ It is confined on north by Odisha; south by East Godavari district; on west by Odisha and east by Bay of Bengal. The study area map is presented below. The main emphasis of the *ex situ* conservation is exemplified on medicinal plants and its usage in folk medicine by the tribal people of agency of Andhra Pradesh.

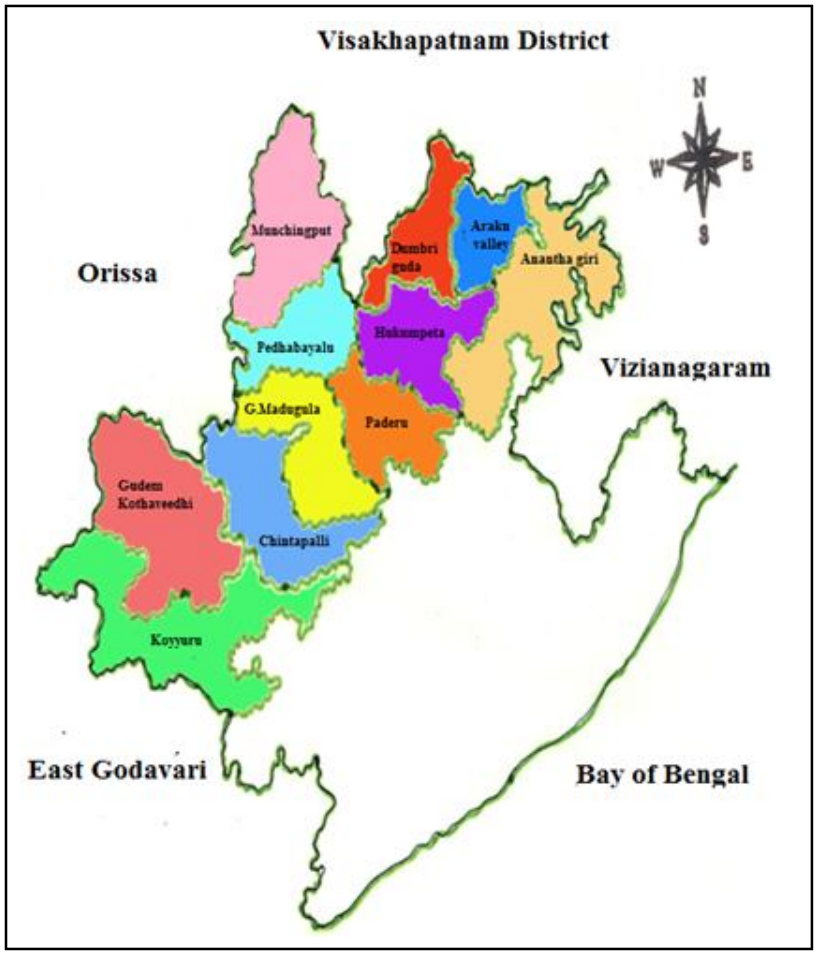

Figure: Map of the Visakhapatnam agency area.

The scientists of RARS, Chintapalle conducted vigorous field surveys along with the tribal farmers in selected tribal habitations and explored the medicinal plants prevailed in the Chintapalle forest range. The collected medicinal plants were *ex situ* conserved, maintained in medicinal block at RARS, Chintapalle and also documented their usage in folk medicine against human diseases in the agency area.

General view of medicinal block

Stevia rebaudiana

Dillenia indica

Rauwolfia tetraphylla

Figure : Plants found in Chintapalle region of Eastern ghats in Andhra Pradesh.

The *ex situ* conserved medicinal plant species of various botanical families were documented and are maintained in medicinal block at RARS, Chintapalle. Among the conserved medicinal plants, 8 genera and 10 species belong to Fabaceae family, followed by Apocynaceae (8 spp.), Zingiberace (7 spp.), Lamiaceae with 4 species, Poaceae with 4 species, Malvaceae, Moraceae, Phyllanthaceae and Rutaceae with 2 species each, *etc.* The enormous diversity of flora and primitive tribal population involved in folk medicine have fascinated for ethnobotanical studies.

Medicinal plants and their usage in tribal medicine by various tribal communities as reported by various ethanobotanists of Andhra

Pradesh and other neighboring states in India are reviewed hereunder. The roots and root powder of *Abrus precatorius* is used for joint pains and antidote for snake bite by the tribal's of West Godavari and Vizianagaram, respectively, as reported by Lakshmi (2002); Kalpana (2008). The medicinal plants, *viz., Andrographis paniculata, Aristolochia bracteolata, Gymnema sylvestres*, *Heliotropium indicum, Plumbago zeylanica, Strychnos nuxvomica, Tiliacora acuminata, Tinospora cordifolia* and *Wattaka kavolubilis* used a remedy for snake bite by Adivasis in Nallamalai of Andhra Pradesh as reported by Johnson *et al*. (2008). Medicinal plants, *viz., Coccinia grandis* and *Gymnema sylvestres* are used for ailments like asthma, paralysis, gastric problems, diabetes and *Cleome aspera* and *Neolamarckia cadamba* are used for curing fever either single or in combination by the tribes of West Godavari and Visakhapatnam districts (Kalpana, 2008; Padal *et al.,* 2010; Padal *et al.,* 2014). Sandhyasri and Reddi (2011) studied the usage of medicinal plants against snake bite by the predominant tribal bagata community and enlisted the plant species of *Achyranthes aspera, Andrographis paniculata, Aristolochia indica, Calotropis gigantea, Cipadessa baccifera, Gymnema sylvestres*, *Rauvolfia serpentina, Tinospora cordifolia* and *Wattaka kavolubilis* against the poisonous snakes bite and *Achyranthes aspera, Holoptelea integrifolia and Trianthema portulacastrum* are particularly used against King cobra bite. The plant species used by tribal communities either singly or in combination to cure ailments, *viz.,* fever, respiratory problems, blood dysentery, rheumatism, galactagogue, jaundice, cough, menorrhea, stomachache, scabies, wounds, itching, chickenpox, boils, backache, earache, diabetes, snake bite, weakness, asthma, purgative, headache, leg pain, tooth decay, heel crakes, paralysis, dandruff, heart pain, bone fracture, sprain, leucorrhea, scorpion sting and leg pain, *etc.,* as reported by Rao *et al.* (2000); Pullaiah *et al.* (2001); Rao *et al*. (2005); Rao *et al*. (2006); Padal *et al*. (2015). Ethnomedicinal plants like *Chrysanthemum indicum, Jasminum angustifolium, Nerium odorum* and *Tagetes erecta* were used by the tribal people of Vizianagaram district of Andhra Pradesh to cure sexually transmitted diseases and skin diseases, *viz.,* gonorrhea, syphilis, ringworm, leprosy, rheumatism and the flowers paste of *Catharanthus roseus* used to treat insect and scorpion bites (Parijatham *et al.,* 2016). The Sugali tribals used 21 genera and 18 families of medicinal plants for the treatment of diabetes in Yerramalai forest region in Kurnool district of Andhra Pradesh as reported by Basha *et al.* (2011). *Adhatoda vasica* used for the treatment of respiratory tract problems, antidiabetic, antiimplantation, antiallergic, antiulcer and antigenotoxicity reported by Srivastava *et al*. (2006); Jahangir *et al*. (2006); Megraj *et al*. (2011). *Andrographis paniculata* has the medicinal properties to cure cardioprotective, antihyperglycemic, anticancer, immune stimulatory, antimalarial and antiviral disease and the roots of *Rauwolfia serpentina* is used for the treatment of scorpion sting and snake bite from Malwa region of Madhya Pradesh as reported by Singha *et al*. (2003); Kumar *et al. (*2004); Sheeja *et al*. (2007). *Achyranthes aspera, Aristolochia indica, Calotropis gigantea, Aristolochia bracteata, Andrographis paniculata, Hemidesmus indicus, Strychnos nuxvomica* and *Vitex negundo* used in folk medicine to cure jaundice and snake bite by the tribes of Chitradurga, Karnataka and Vellore of Tamil Nadu Dwivedisumeet *et al*. (2009); Hiremath and Taranath (2010); Thirumalai *et al*. (2010). The reviewed medicinal plants used in folk medicine are presented in Table 1.

Table 1: List of medicinal plants and their usage in folk medicine in the forest region of Eastern ghats of Visakhapatnam, Andhra Pradesh

S. No.	Vernacular name	Botanical name	Family	Useful part	Use against human diseases/ ailments	References
1	Naga mushini	*Strychnos nuxvomica*	Loganiaceae	Bark	Snake bite	Padal *et al.* (2013); Naidu and Kumar (2015)
2	Chandra kantha/ Pattidi puvvu	*Mirabilis jalapa*	Nyctaginaceae	Tuber	Jaundice	Dwivedisumeet *et al.* (2009)
3	Nela vusiri	*Phyllanthus amarus*	Phyllanthaceae	Leaf	Dysentery	Naidu and Kumar (2015)
4	Adde pathi	*Mimosa pudica*	Fabaceae	Root	Blood dysentery	Seetharamu *et al*. (2022)
5	Billa ganneru	*Catharanthus roseus*	Apocynaceae	Leaf, Root	Cancer	Padal and Vijaykumar (2013)
6	Barma kothimera	*Eryngium foetidum*	Apiaceae	Leaf	Boost digestion	Padal *et al.* (2015)
7	Rana paala	*Kalanchoe lanceolata*	Crassulaceae	Leaf	Rheumatism	Padal and Vijaykumar (2013)
8	Konda benda	*Abelmoschus moschatus*	Malvaceae	Root	Cough	Padal *et al.* (2010)
9	Stevia/sugar plant	*Stevia rebaudiana*	Asteraceae	Leaf	Tuberculosis	Basha *et al.* (2011)
10	Uvva chettu	*Dillenia indica*	Dilliniaceae	Fruit	Dandruff, Hair fall	Rahman and Parvin (2014); Naidu and Kumar (2015)
11	Adda saram	*Adhatoda vasicosa*	Acanthaceae	Leaf, Flower	Tuberculosis	Srivastava *et al*. (2006); Jahangir *et al*. (2006); Megraj *et al*. (2011)
12	Dalchina	*Cinnamomum zeylanicum*	Lauraceae	Leaf, Bark	Diabetes, Cold, Cough	Sandhyasri and Reddi (2011); Padal *et al.* (2013); Parijatham *et al.* (2016)
13	Maadi phalam	*Citrus medica*	Rutaceae	Fruit, Root	Dysentery	Padal *et al.* (2013); Parijatham *et al.* (2016)

14	Vokka podi	*Areca catechu*	Aracaceae	Nut	Boost digestion	Kar *et al*. (2013)
15	Rudhra jada	*Ocimum basilicum*	Lamiaceae	Leaf, Seeds	Earache, Dysentery	Padal *et al.* (2013); Padal and Vijaykumar (2013); Parijatham *et al.* (2016)
16	Paacha ambira	*Chromolaena odorata*	Asteraceae	Tuber	Jaundice, Neck sprain	Parijatham *et al.* (2016)
17	Sanjivani	*Selaginella bryopteris*	Selaginellaceae	Root	Improve Energy, Muscle power	Kumar *et al*. (2004); Padal *et al.* (2010)
18	Pudina	*Mentha arvensis*	Lamiaceae	Leaf	Nerves weakness	Rao *et al*. (2006)
19	Krishna tulasi	*Ocimum sanctum*	Lamiaceae	Leaf	Wounds	Padal and Vijaykumar (2013); Parijatham *et al.* (2016)
20	Pilli adugu	*Oxalis corniculata*	Oxalidaceae	Leaf, Tuber	Piles	Padal *et al.* (2013)
21	Lakshmana phalam	*Annona muricata*	Annonaceae	Fruit	Cancer	Megraj *et al*. (2011); Padal *et al. (*2015)
22	Vishnu tulasi	*Ocimum sanctum*	Lamiaceae	Leaf, Stem, Seeds, Whole plant	Malaria, Bronchitis, Skin diseases	Padal and Vijaykumar (2013); Parijatham *et al.* (2016)
23	Kaada jamudu	*Euphorbia tirucalli*	Euphorbiaceae	Latex	Joint pains, Sustain pregnancy	Parijatham *et al.* (2016)
24	Konda kasimi	*Zanthoxylum armatum*	Rutaceae	Leaf, Bark	Skin diseases and Tooth problems	Naidu and Kumar (2015); Parijatham *et al.* (2016)
25	Pippali modi	*Piper longum*	Piperaceae	Root, Fruit	Asthma, Respiratory problems, Shivering fever	Satyavathi *et al*., (2014); Parijatham *et al.* (2016)
26	Lavanga tulasi	*Ocimum gratissimum*	Lamiaceae	Leaf	Toothache, Wounds, Improve digestion	Padal *et al*. (2015); Parijatham *et al.* (2016)
27	Kasthuri pasupu	*Curcuma aromatica*	Zingiberaceae	Tuber	Fever, Fits	Parijatham *et al.* (2016)
28	Yerra gurivinda	*Abrus precatorius*	Fabaceae	Root	Abortion, Muscle pain, Snake bite	Tirkey (2006); Kalpana (2008); Samy *et al*. (2008); Padal *et al*. (2013); Ramakrishna and Ranjalkar (2020); Seetharamu *et al.* (2022)
29	Thella eswari/ gadidagadapa	*Aristolochia indica*	Aristolochiaceae	Root, Leaves	Snake bite, Wounds	Padal *et al*. (2010); Sandhyasri and Reddi (2011)
30	Podapathri	*Gymnema sylvestre*	Apocynaceae	Root, Leaf	Diabetes, Asthma, Cough, Malaria	Sandhyasri and Reddi (2011); Parijatham *et al.* (2016)
31	Thella sankupushti /sankhu puvvu	*Clitoria ternatea*	Fabaceae	Flowers, Seeds, Bark, Leaf, Root	Hair growth, Skin diseases, Eye diseases, Reproduction system	Sanyasi *et al.* (2020); Ramakrishna and Ranjalkar (2020); Seetharamu *et al.* (2022)
32	Neeli sankupushti	*Clitoria ternatea*	Fabaceae	Flowers, Seeds, Root	Anticancer, Cough, Leukoderma, Eye problems	Ramakrishna and Ranjalkar (2020); Seetharamu *et al.* (2022)
33	Nalla maddi	*Terminalia tomentosa*	Combretaceae	Seed	Energy booster	Megaraj *et al*. (2011)
34	Asma thega	*Tylophora indica*	Asclepidaceae/ Apocynaceae	Root, Leaf	Asthma, Diarrhea	Padal *et al*. (2010); Parijatham *et al*. (2016)

35	Thella parimi	*Ziziphus oenoplia*	Rhamnaceae	Root	Fits	Padal *et al*. (2015)
36	Kanuga	*Pongamia pinnata*	Fabaceae	Stem Bark, Seed, Root, Leaf	Itching, Leucoderma, Allergy, Carminative, Paralysis, Bleeding, Mosquito repellent, Ulcers	Saxena and Bhahmam (1995); Ratnam and Raju (2005); Madhu and Suvartha (2009); Patel (2012); Seetharamu *et al*. (2022)
37	Sathavari	*Asparagus racemosus*	Asparagaceae	Tuber	Jaundice, Dysentery	Parijatham *et al*. (2016)
38	Nelavemu	*Andrographis paniculata*	Acanthaceae	Leaf	Diabetes	Reddy *et al*. (2006); Johnson *et al*. (2008)
39	Yerra chithramulam	*Plumbago indica*	Plumbazinaceae	Root	Improve blood, Snake bite, Diarrhea, Fever, Piles	Sandhyasri and Reddi (2011); Parijatham *et al*. (2016)
40	Thella chithramulam	*Plumbago zeylanica*	Plumbazinaceae	Leaves	Rheumatism, Laryngitis	Kirtikar and Basu (2003)
41	Nalla chithramulam	*Plumbago zeylanica*	Plumbazinaceae	Root	Stomachache, Fits	Padal *et al*. (2010)
42	Pasanabedhi	*Coleus amboinicus*	Lamiaceae	Root, Leaf	Malaria, Blood pressure, Snake bite, Asthma	Parijatham *et al*. (2016)
43	Devakasthuri	*Hedychium coccineum*	Zingeberaceae	Tuber	Fever, Body heat, Regular menstruation	Padal *et al*. (2013)
44	Neeli mandumokka	*Indigofera tinctoria*	Fabaceae	Leaf	Hair fall, Toothache	Padal *et al*. (2010)
45	Jammu neredu	*Eugenia jambolana*	Myrtaceae	Fruit	Improve blood, Diabetes, Constipation	Parijatham *et al*. (2016)
46	Aadavi yerra ulli	*Urginea indica*	Liliaceae	Tuber	Fits, Dandruff, Menstrual disorders	Padal *et al*. (2013)
47	Edakulapaala	*Alstonia scholaris*	Apocynaceae	Bark	Stimulate lactating glands, Diarrhea, Dysentery, Snake bite	Sandhyasri and Reddi (2011); Padal and Kumar (2013); Naidu and Kumar (2015)
48	Konda chepuru	*Thysanolaena maxima*	Poaceae	Root	Skin boils, Epilepsy	Parijatham *et al*. (2016)
49	Aadavi dumpa	*Dioscorea oppositifolia*	Diascoreaceae	Tuber	Energy boosting, Boils	Padal *et al*. (2010)
50	Rudra chema	*Argyreia nervosa*	Convolvulaceae	Leaves, Stem, Tuber	Broken bones, Boils, Wounds	Padal *et al*. (2010)
51	Citronella	*Cymbopogon winterianus*	Poaceae	Root, Leaf	Skin diseases	Sandhyasri and Reddi (2011)
52	Nalla pasupu	*Curcuma caesia*	Zingiberaceae	Branch	Skin care	Padal *et al*. (2010)
53	Aadavi nimma	*Atalantia monophylla*	Rutaceae	Fruit	Body heat, Rhumatism	Naidu and Kumar (2015)

54	Vattiveru	*Vetiveria zizanioides*	Poaceae	Root	Fever, Skin diseases	Padal *et al*. (2015)
55	Vasa	*Acorus calamus*	Acoraceae	Rhizome	Malaria, Asthma, Cough, Fever, Ulcers	Padal *et al*. (2014); Parijatham *et al*. (2016)
56	Kondapindi	*Aerva lanata*	Amaranthaceae	Leaf	Kidney stones, Cough	Padal *et al*. (2012)
57	Nara mamidi	*Litsea chinensis*	Lauraceae	Bark	Broken bones	Padal *et al*. (2014)
58	Yerra kasimi	*Zanthoxylum armatum*	Rutaceae	Root	Blood Dysentery	Naidu and Kumar (2015)
59	Saraswathi aaku	*Centella asiatica*	Apiaceae	Leaf	Wounds, Memory increaser, Leprosy	Padal *et al*. (2010)
60	Jyothismathi	*Celastrus paniculatus*	Celastraceae	Fruit, Root bark	Malaria, Fever	Padal *et al*. (2010)
61	Seema karaka	*Terminalia chebula*	Combretaceae	Fruit, bark	Cough, Boils	Naidu and Kumar (2015); Padal *et al*. (2015)
62	Dumpa rastram	*Alpinia calcarata*	Zingiberaceae	Rhizomes	Low blood pressure	Kar *et al*. (2013)
63	Allam	*Zingiber officinale*	Zingiberaceae	Rhizomes	Cold, Cough, Asthma, Improve digestion	Padal *et al*. (2010)
64	Thippathega	*Tinospora cordifolia*	Menispermaceae	Bark	Paralysis, Asthma, Snake bite	Sandhyasri and Reddi (2011)
65	Vepa	*Azadirachta indica*	Meliaceae	Leaf, Bark	Skin diseases, Snake bite	Sandhyasri and Reddi (2011); Padal *et al*. (2010)
66	Seetha ashoka chettu	*Saraca indica*	Fabaceae	Stem, Bark, Leaf, Flower	Ulcers, Urinary incontinence, Irregular menstruation	Rahman and Parvin (2014); Pooja and Vidyasagar (2015); Seetharamu *et al. (*2022)
67	Bilva pathra	*Aegle marmelos*	Rutaceae	Bark, Leaf	Piles, Diabetes	Satyavathi *et al*. (2014); Naidu and Kumar (2015)
68	Pakshikannu	*Thalictrum foliolosum*	Ranunculaceae	Root	Joint pains	Parijatham *et al*. (2016)
69	Singalikoostu	*Costus speciosus*	Coastaceae	Bark	Over body heat, Contraceptive	Padal *et al*. (2015)
70	Nalleru kaada	*Cissus quadrangularis*	Vitaceae	Stem	Improve digestion, Attach broken bones	Parijatham *et al*. (2016)
71	Rama tulasi	*Ocimum gratissimum*	Lamiaceae	Leaf	Gastric	Padal and Vijaykumar (2013); Parijatham *et al*. (2016)
72	Konda gummadi	*Pueraria tuberosa*	Fabaceae	Tuber	Blood pressure, Joint pains, Energy boosting	Kumar and Jain, (1998); Tirkey (2006); Madhu and Suvartha (2009); Seetharamu *et al*. (2022)
73	Puli dumpa	*Dioscoreahispida*	Dioscoreaceae	Tuber	Snake bites, wounds, Worms	Megraj *et al.* (2011)
74	Konda vusiri	*Emblica officinalis*	Phyllanthaceae	Bark	Dysentery	Megraj *et al.* (2011)
75	Sunamukhi	*Senna alexandrina*	Caesalpinaceae	Root	Dysentery	Megraj *et al.* (2011)

76	Athi madhur	*Glycyrrhiza glabra*	Fabaceae	Root, Stem, Bark	Cough, Allergy, Joint pains	Padal *et al.* (2013)
77	Nelathadi	*Curculigo orchioides*	Hypoxidaceae	Root	Sexual desire	Joy *et al.* (2016)
78	Revadi chettu	*Dillenia indica*	Dellineaceae	Bark	Blood purifier	Patel (2012)
79	Uthareni	*Achyranthes aspera*	Amaranthaceae	Root, Leaf	Snake bite	Rao *et al.* (2005); Rao *et al.* (2006)
80	Sugandi paala	*Hemidesmus indicus*	Apocynaceae	Root, Tuber	Snake bite, Skin diseases, Toothache, Diarrhea	Satyavathi *et al.* (2014)
81	Rudhra chema	*Caladium bicolor*	Araceae	Tuber	Attach broken bones	Megraj *et.al.* (2011)
82	Saaga	*Sansevieria roxburghiana*	Asparagaceae	Tuber	Snake bite	Thirumalai *et al.* (2010)
83	Paalagandhi	*Rauvolfia tetraphylla*	Apocynaceae	Root	Blood pressure, Diabetes	Megraj *et al.* (2011)
84	Konda mamidi	*Spondia spinnata*	Anacardiaceae	Bark	Piles	Thirumalai *et al.* (2010)
85	Rela	*Cassia fistula*	Fabaceae	Bark, Leaf	Ring worm, Anesthesia	Patel (2012); Ramakrishna and Ranjalkar (2020)
86	Konda yaalakulu	*Alpinia galanga*	Zingeberaceae	Root	Body pains, Pains in pregnant women	Megraj *et al.* (2011); Padal *et al.* (2014)
87	Paccha ganneru	*Thevetia peruviana*	Apocynaceae	Bark	Stomachache	Rao *et al.* (2006)
88	Tella vaavili	*Vitex negundo*	Lamiaceae	Leaf	Swellings	Hiremath and Taranath (2010); Thirumalai *et al.*, (2010); Megraj *et al.* (2011); Naidu and Kumar (2015)
89	Purugudu	*Breynia vitisidaea*	Phyllanthaceae	Leaf, Root	Diabetes, Tuberculosis	Padal *et al.* (2015)

The biological activities of Indian medicinal plants and their usage in tribal medicine and Ayurveda as reviewed by Megraj *et al.* (2011) and reported that *Adhatoda vasica, Aegle marmelos, Aloe vera, Andrographis paniculata, Asparagus adscendents, Cinnamomum tamala, Coriandrum sativum, Cuminum cyminum, Curcuma longa, Emblica officinalis, Glycyrrhiza glabra, Hemidesmus indicus, Mucuna pruriens, Phyllanthus niruri, Solanum nigrum, Syzygium aromaticum, Terminalia chebula, Tinospora cordifolia, Withania somnifera, Zingiber officinale.* Kar *et al.* (2013) classified the plants used by the tribal people against diseases and enlisted that 42 plants are used to cure dysentery and 40 plants to cure diarrhea, 4 plants to cure cholera, 3 plants are for cholera and dysentery in Odisha. The plant extract of *Curculigo orchioides* in various combinations used by tribals to cure number of ailments like acidity, blood cancer, diabetes, rheumatism, ring worm, worm infection, wounds, *etc.,* at Kerala (Joy *et al*., 2016).

2. Conclusion

The present study overviewed that knowledge on medicinal plants and their usage in folk medicine by tribal communities and their momentous role in the management of human diseases in the agency. The people of the agency area possessing good knowledge in preparation of herbal drugs but as the people are in liberal exposure to modernization, their knowledge of traditional uses of plants may be lost in due course. So, it is important to envisage the sustainable use and conservation of indigenous knowledge and also for future research in phytomedicine towards effective management of human ailments.

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Conflict of interest

The authors declare no conflicts of interest relevant to this article.

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