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ETHNOMEDICINAL PLANTS USED BY THE TRIBES IN BEERANGI KOTHAKOTA MANDAL OF ANNAMAYYA DISTRICT, ANDHRA PRADESH, INDIA

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Abstract
Traditional knowledge is now fast disappearing due to rapid urbanization,habitat destruction,modernization,deforestation and tendency of the younger generations to discard the traditional health system. Hence,it was thought necessary to investigate the ethnomedicinal plants used by the tribals.The primary objective of the present study is to find out the use of ethno-medicinal practices among tribals of the Beerangi kothakota Mandal of Annamayya district of Andhra Pradesh.Old and experienced men.women and medicine men(Vaidhya) were interviewed for the first hand information on ethnomedicinal uses of the plants this area,during the year 2019-2021 and interacted several tribal groups namely Yerukula,Irulas,Nakkalas,Sugali and some knowledge holding non tribal rural people in the area.For collection of data the approaches and methodologies suggested by Jain 1987; Nima et al.,2009 were followed.Keys and botanical descriptions found in regional floras by the Madras presidency's flora (J.S. Gamble, 1915), Flora of Andhra Pradesh (vol. 1-5) were used to identify the plant specimens.During survey, a total 45 species were collected and their different uses recorded. Asclepiadaceae is the dominant family with 4 species followed by Euphorbiaceae, Fabaceae,Compositae,Apocynaceae,Verbenaceae, Menispermaceae,Malvaceae,Mimosaceae.Most of the local plants used for the treatment of cuts and wounds and Pyorrhea, Diarrhoea, Musclepains,Leucorrhoea,Fever, Asthma,Fever,Scabies,Ulcer, Tonsillitis,Ringworm,Dysentery,piles,contraceptive,spermatorrhea.The study depicts that Irula tribes of these area possess very good knowledge about herbal medicine along with their age old traditional knowledge.Present study may provide the basis for further scientific investigation on the medicinal plants used by the tribes. This may leads to discovery of new bio active molecules with therapeutic potential for the development of new drugs and drug intermediates.

Key words: Ethnomedicinal plants, Primitive tribals,Ailments,Beerangi Kothakota.

Introduction

Through the creation and use of traditional botanical knowledge, indigenous populations have managed to survive in the natural world.Because of their interactions with nature, these traditional cultures have amassed a wealth of knowledge that is crucial to their socioeconomic activities and survival.Many developing and underdeveloped nations have historically relied on traditional medicine, which is based on herbal medicines.In developed nations, the value of traditional medicine has also grown significantly.Approximately 85% of traditional primary healthcare medicines used worldwide are made from plants.When the literature and fieldwork data have been adequately assessed, traditional medicine and ethnobotanical knowledge are significant components of scientific study.Since ancient times, plants have been a model source of pharmaceuticals. Many of the medications that are currently on the market were either directly or indirectly produced from plants.Plants are an excellent source of bioactive chemicals and can be used to create new medicines .To address their basic medical needs, the tribes use medicinal herbs that are readily available in the area.The world at large, as well as the tribal peoples themselves, benefit from this ancient knowledge that is being passed down from generation to generation.Numerous hints

regarding plants that were unknown or poorly understood from a therapeutic perspective have been provided by ethnomedicinal research on the traditional Phytomedicine of India's tribal regions .The present study was undertaken in the tribal villages of Beerangi kothakota mandal which lies approximately between $13^0 35^I 0^{II}$ and $13^0\ 46^I\ 0^{II}$ Northern latitude and $78^0\ 13^I\ 30^{II}$ and $78^0\ 24^I\ 30^{II}$ Eastern longitude. Kothakota Mandal consist of 156 Villages and 11 Panchayat .Total area of Beerangi kothakota Mandal is 276 km².The temperature range in this area varies usually in between 15 ^{0}C to 40 ^{0}C. Hills,valleys and plateaus with altitude of 1290 metre are characteristic features of this area. The nature of soil of this area is red soil,The soil pH usually 5.6 to 7.1,and mean relative humidity is 45% .The vegetation of this area represents the characteristic Dry Deciduous Forests,thorny scrub type.From Socio-cultural point of view,this area exhibits great ethnic and cultural diversity.The predominant tribes in this area are Yerukalas, Irulas,Guvvalas,Sugalis communities along with dynamic Floristic diversity and treasure of medicinal plants. Tribals are symbiotically associated with the forests. Due to close association with the forests,the tribes of this area possess a unique knowledge regarding medicinal uses of plant wealth of their surroundings from many generations. This traditional knowledge is now fast disappearing due to rapid urbanization,habitat destruction,modernization,deforestation and tendency of the younger generations to discard the traditional health system. Hence,it was thought necessary to investigate the ethnomedicinal plants used by the tribals of Beerangi kothakota mandal.The primary objective of the present study is to find out the use of ethno-medicinal practices among tribals of the Beerangi kothakota Mandal of Annamayya district of Andhra Pradesh. Apart from this the present study also try to find out their cultural festivals, food habits, and their traditional systems among the studied people and area to document and conserve the traditional ethnobotanical knowledge of the area for future generations.It is revealed through available literature that few workers. Therefore,these mandal have been selected for extensive ethnobotanical exploration.

Objectives

I. To recognize and document the geographical distribution of medicinal plants.
II. To conduct extensive exploration to record the first hand information from aboriginal tribes in Beerangi kothakota mandal.
III. To prepare herbarium specimens and voucher specimens of ethnomedicinal plant products.

Material and Methods

Old and experienced men.women and medicine men(Vaidhya) were interviewed for the first hand information on ethnomedicinal uses of the plants this area,during the year 2019-2021 and interacted several tribal groups namely Yerukula,Irulas,Nakkalas,Sugali and some knowledge holding non tribal rural people in the area. Repeated and cross queries were also done for conformation and verification of the ethnomedicinal information. For collection of data the approaches and methodologies suggested by (Jain 1987; Nima et al.,2009;were followed.Documented ethnobotanical claims are cross checked with help of available literature. Keys and botanical descriptions found in regional floras by the Madras presidency's flora (J.S. Gamble, 1915), Flora of Andhra Pradesh (vol. 1-5),were used to identify the plant specimens. The plant specimens were collected either at the flowering or fruiting stages and further specimens were processed as per stranded Herbarium techniques and deposited at Department of Botany,Sri Venkateswara university,Tirupati. This ethnomedicinal data had been collected from local people including local healers (Vidyas), elderly people and Lady practitioners. The collected ethnomedicinal data included:

1 Species name,Family name. 2 Vernacular or common name. 3 Regions explore.
4 Habitat, Habit,Distribution,Mode of occurrence. 5 Vegetative Characters.
6 Floral Characters. 7 Informants. 8 Name of Tribal Community.
9 Disease or Symptoms treated for. 10 Preparation of Drug.

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11 Other than medicinal uses explored by the tribes. 12 Ethnobotanical Herbarium Number.
Quantitative data analysis: Data collected was analyzed using the following indices.

Fidelity level (FL)

The fidelity level (FL) is the proportion of informants who reported using a certain plant for the same primary purpose.
It was computed using the following formula.
FL = Np/ N × 100
where N is the number of informants who use a plant species to treat a specific ailment, and Np is the number of informants who say they use a plant species to cure a specific disease.

RESULT AND DISCUSSION

Table 1

Botanical Name, Voucher Number, Vernacular Name	**Family**	**Habit of plant**	**Parts Used**	**Route of Admini-stration**	**Ethnomedicinal Preparation**
Acacia leucophloea (Roxb.) Willd. EH-1301, Tella thumma.	Mimosaceae	Tree	Stem bark	Topical	Stem bark paste is mixed with pinch of turmeric powder and applied on the effected area for 2 days in morning and evening for wounds and cracks.
Acacia nilotica (L.)Del. ssp.indica (Benth.) Brenan. EH-1307, Nalla tumma.	Mimosaceae	Tree	Seed	Oral	Decoction of Pods and seed is given in the morning and evening for the treatment of diarrhoea.
Agave americana L. EH-1305,Sanga.	Agavaceae	Shrub	Flower	Oral	Flowers are boiled on fire and extracted the juice (2ml) is given to treat cough.
Argyreia nervosa (Burm.f.) Boj. EH-1304, Samudrapala.	Convolvulacea e	Shrub	Leaf	Oral	15 gm leaf and 50 gm each of *Terminalia chebula*,*T.bellirica* and *Phyllanthus emblica* are boiled in 500 ml of water it becomes 100 ml, 30 ml of this decoction is taken thrice a day for 11 days to cure chronic ulcers.
Azadirachta indica A.Juss. EH-1309,Vepa.	Meliaceae	Tree	Leaf	Topical	Leaves ground with water and applied on the affected part on skin diseases, Leaves are spread on the bed of child suffering with viral infections like chicken fox,cow fox.

Bacopa monnieri(L.) Pennel. EH-03,Brahmi.	Plantaginaceae	Herb	Leaf	Oral	Leaf juice is extracted and orally administrated (5-10 ml) twice a day for period of 11 days to cure chronic fever.
Barleria prionitis L. EH-1302, Mundla gorinta.	Acanthaceae	Herb	Root	Oral	Root decoction is used to treat postpartum fever.
Biophytum sensitivum (L.) DC. EH-1306, Jala pushpa.	Oxalidaceae	Herb	Whole plant	Oral	Plant paste is mixed with black peppers (2-5) for 1 month in treatment of burning sensation in limbs.
Bombax ceiba L. EH-1308, Buruga.	Malvaceae	Tree	Root	Oral	5 gm of root paste is mixed with Pueraria tuberosa ,Curculigo orchiodes root ground in goat milk and taken with warm milk daily to cure spermatorrhea.
Calotropis gigantea (L.)R.Br. EH-1310, Tella jilledu.	Asclepiadaceae	Shrub	Latex	Topical	Latex is applied topically in scabies.
Calotropis procera (Ait.) R.Br. EH-1314, Erra jilledu.	Asclepiadaceae	Shrub	Leaf	Topical	Coated with caster oil,slightly heated and kept on mumps.
Celosia argentea L. EH-1319, Gurugu.	Amaranthaceae	Herb	Leaf	Topical	Leaf juice applied on tooth. I.e Pyorrhea
Cissus quadrangularis L. EH-1323, Nalleru.	Vitaceae	Climber	Stem	Oral	Curry prepared from stem is eaten along with rice to cure rheumatoid arthritis.
Clitoria ternatea L. EH-1328, Sankupulu.	Fabaceae	Climber	Seed	Oral	50 gm seed powder are mixed in a cup of water and given to the patient once a day for 2 days for laxative.
Cocculus hirsutus (L.)W.Theob. EH-1333, Chinna dusara teega.	Menispermaceae	Climber	Leaf	Oral	Paste of fresh leaves is mixed with jaggery and make small pills, one pill is given everyday in the morning with curd for period of 21 days to cure leucorrhoea.
Curculigo orchioides Gaertn. EH-1336, Nelathati.	Hypoxidaceae	Herb	Root	Oral	Fresh tubers are made into paste and taken orally for lactation
Cuscuta reflexa Roxb. EH-1340, Bangaru teegalu.	Cuscutaceae	Climber	Whole plant	Oral	Plant decoction is administrated orally for twice a day for 3 days to cure fever.

Cyclea peltata Hook.f.& Thoms. EH-1312, Ballepu aku teega.	Menispermaceae	Climber	Leaf	Oral	Leaf paste mixed with butter milk and take thrice a day for 3 days to cure diarrhoea.
Cyperus rotundus L. EH-1316, Thunga,	Cyperaceae	Herb	Rhizome	Oral	Fresh rhizome is crushed and 5 ml of the extract is mixed with one tea spoon honey taken orally thrice daily for 3 days to cure diarrhoea.
Digera muricata (L.) Mart. EH1318, Chenchela koora.	Amaranthaceae	Herb	Leaf	Oral	Leaf juice is given in stomach pain.
Dodonaea viscosa (L.) Jacq. EH-1311, Banderu	Sapindaceae	Shrub	Leaf	Topical	Leaf,stem paste mixed with egg white and lime stone are used for curing of bone fabrics.
Emilia sonchifolia (L.)DC. EH-1320, Sadamandi.	Asteraceae	Herb	Whole plant	Oral	Fresh cleaned whole plant is chewed along with jaggery and onion before sun rise for tonsillitis.
Euphorbia nivulia Buch- Ham. EH-1322, Akukalli.	Euphorbiaceae	Tree	Whole plant	Topical	Plant paste is applied on externally on big boils and wounds. Latex is mixed with turmeric powder along with Vaseline and applied on piles to dry outgrowth.
Jatropha curcas L. EH-1327, Adavi amudamu.	Euphorbiaceae	Shrub	Stem	Oral	Stem bark collected from 15 years old tree is ground and paste is mixed with 5 or 6 spoonful of ragiflour administrated before breakfast for 11 days to treat rheumatoid arthritis.
Jatropha gossypifolia L. EH-1317, Yerranepalamu,	Euphorbiaceae	Herb	Root	Oral	Roots are ground with 6 ml of goat milk mixes with *acacia catechu* powder and made into tablets and one tablet is given daily on empty stomach for 21 days to cure leucorrhoea.
Justicia adhatoda L.Nees. EH-1331, Addasaramu.	Acanthaceae	Shrub	Leaf	Oral	Two or Three spoonful of leaf extract given for about a month to cure asthma.

Mimusops elengi L. EH-1338, pagada	Sapotaceae	Tree	Bark	Oral	Bark powder and candy sugar mixed in equal quantity and ground into powder,one spoonful of powder is taken in morning and evening in hot water for 21 days to cure leucorrhoea.
Nerium oleander L. EH-1337, Erra ganneru.	Apocynaceae	Shrub	Stem bark	Topical	Stem bark paste mixed with cow urine is plastered on the effected part I.e Tumour.
Pergularia daemia (Forsk.) Chiov. EH-1335, Thummula teega.	Asclepiadaceae	Climber	Latex	Topical	Latex is applied topically in ringworm.
Phyla nodiflora (L.) Greene. EH-1330, Mosali pappu.	Verbenaceae	Herb	Whole plant	Topical	Whole plant is ground with buds of garlic and the paste is applied on teeth and gums to cure pain and infection for about 5-7 days.
Phyllanthus amarus Schum.& Thonn. EH-1325, Kila nelli.	Phyllanthaceae	Herb	Whole plant	Oral	Fresh whole plant is ground and mixed with curd and taken orally once a daily for 7 days to cure ulcer
Pongamia pinnata (L.) Pier. EH-1334, Kanuga.	Fabaceae	Tree	Flower Seed	Oral Topical	Flower decoction is prescribed to reduce sugar levels in diabetes. Seed oil is used for to cure Eczema.
Psidium guajava L. EH-1326, Jama.	Myrtaceae	Tree	Leaf	Topical	Leaf paste is applied on the effected area once a day till to cure tumour.
Selaginella bryopteris (L.) Baker. EH-1324, Sangivani.	Selaginellaceae	Herb	Whole plant	Oral	Plant is kept into water for overnight and that water is taken empty stomach next morning in the treatment of gastric trouble.
Smilax zeylanica L. EH-1329, Phirangi chekka.	Smilacaceae	Climber	Root	Oral	A spoonful root decoction is administrated daily for one month to treat rheumatoid arthritis.
Solanum virginianum L. EH-1332, Challamulaka	Solanaceae	Herb	Whole plant	Oral	The whole plant is dried,powdered and stored about 1 gm of powder mixed with equal quantity of black pepper is given with honey to relive asthma.
Sphaeranthus indicus L. EH-1339, Bodasaramu	Asteraceae	Herb	Leaf	Topical	Fresh leaves are ground and mixed with *Curcuma longa* powder and applied externally on the skin diseases.
Tectona grandis L.f.	Verbenaceae	Tree	Root	Oral	Roots are pasted and given with

EH-1345,Teku.					goat milk to check excessive bleeding during menstruation period.
Terminalia chebula Retz. EH-1341, Nalla karaka.	Combretaceae	Tree	Fruit	Topical	Equal quantities of fruit powder and ash of dried cow-dung are mixed and used as tooth powder to brush teeth till cure toothache.
Thespesia populnea (L.)Sol.ex Correa. EH-1315, Ganga ravi.	Malvaceae	Tree	Stem bark	Oral	Stem bark paste is applied on wounds.
Trichodesma zeylanicum (Burm.f.) R.Br. EH-1321, Adavi nuguteega.	Boraginaceae	Herb	Whole plant	Topical	Whole plant paste is applied around the wound except centre.
Tylophora fasciculata Thwaites. EH-1313, Telegapala	Asclepiadaceae	Climber	Root	Topical	Root paste with warmed caster oil applied locally on body in the treatment of paralysis.
Vitex altissima L.f. EH-1343, Nemaliadugu	Lamiaceae	Tree	Stem bark	Oral	Bark and leaf are boiled in water and this water is used for bathing women after child birth for few weeks.
Wrightia arborea (Dennst.)Mabb. EH-1342, Potla pala.	Apocynaceae	Tree	Fruit	Topical	Fruit paste are applied on Teeth and gums.
Ziziphus mauritiana Lam. EH-134 Regi chettu.	Rhamnaceae	Tree	Stem bark	Topical	Juice of bark 5ml thrice a day is given for Dysentery.

During survey, a total 44 species were collected and their different uses recorded (Table 1). Asclepiadaceae is the dominant family with 4 species followed by Euphorbiaceae(3 sps),Fabaceae,Compositae,Apocynaceae,Verbenaceae,Menispermaceae,Malvaceae,Mimosaceae (2 spp.each), and others with one specimen each. Habit wise analysis showed the dominance of Herbs (15 sps) followed by trees(14 sps),Shrubs and Climbers 8 species each. Morphological analysis showed maximum utilization of leaf (12),followed by Whole plant (10),Stem bark (7),Root(7),Seed(3),Flower,Stem,Latex(2 each), Fruit (1),Rhizome (1). They are administered either in the form of paste, powder, Juice,extract,decoction,or pills along with either water,honey,jaggery.Self medication is very rampant among tribal and rural people of this area for meeting their primary health care because the traditional knowledge is very practical and passed on from generation to other through the word of mouth. Most of the local plants used for the treatment of cuts and wounds (6),and Pyorrhea(4), Diarrhoea(3),Musclepains(3),Leucorrhoea(3),fever(2),Asthma(2), Scabies,Ulcer,Tonsillitis,Ring worm,Dysentery,piles,contraceptive,spermatorrhea, has one claims. When four or more informants mentioned using a medicinal plant to treat a particular condition, the plant's fidelity level (FL) was determined. The most cited plants mentioned by the respondents are *Pongamia pinnata, Dodonaea viscosa,Euphorbia nivulia,Azadirachta indica,Nerium oleander* were the ones scoring the highest

values.Pharmacological investigation on these herbal medicines should be a multidisciplinary research involving observation and discovery of chemical compounds of biological importance which can be of great significance in therapeutic treatments. Sembian Suriyamoorthy et al. (2012) reported *Acacia leucophloea* are used for wound healing,Mounirou Tchatchedre (2019) reported *Acacia nilotica* have similar use in the present study,Bula Kere Oda et.(2024) reported that *Dodonaea viscosa* species are used fore bone fracture,Akhilesh Kumar (2015) reported that *Jatropha curcas* are used for Rheumatism and body pains.Khuraijam Jibankumar Singh et al.(2013) reported *Justicia adhatoda* used for asthma.Sena Carine M. J et al.(2024) reported similar ethnobotanical claim in the present study.Cabugatan et al.(2022) reported that *Psidium guajava* used for cure tumour s.Nishant Tyagi reported that *Selaginella bryopteris* used for gastric trouble.D Panda (2018) reported *Smilax zeylanica species* used for rheumatoid arthritis. Tiwari et al.(2022) reported *Sphaeranthus indicus* used for skin diseases.Nataru Savithramma et al.(2017) reported *Thespesia populnea* used for curing wounds.V. Nandagoapalan et al.(2016) reported that similar ethnobotanical claim to present study.Chaiyong et al.(2023) reported *Wrightia arborea* fruit paste are used for tooth and gums. Birendra Mall et al.(2015) reported *Ziziphus mauritiana* used for dysentery.Due to less interest of young generation towards traditional knowledge,urbanization and unscientific exploration of natural forests,these valuable knowledge as well as plant species are getting depleted leading to their extinction.Thus, before they completely disappear, it is vital to gather and record this priceless knowledge from tribal and isolated regions. It is also vital to raise awareness among tribal populations about the protection and sustainable use of plant resources. The Medicine men (Vaidya) were not sharing their traditional knowledge of uses and identification of medicinal plants to the general public.They generally shared their knowledge either to their junior followers or close relatives like son after ages, whey they are unable to go to forest areas for collection of plants.They are generally giving medicinal plants after making paste,powder,decoction,extract,so that all people could not recognize the specific plant. The medicine men were used to collect plant parts only whenever required to cure diseases/ailments and quantity taken was also per requirement.They never over-exploited nor storage much plant parts and kept only small stock for emergency.Exploitation of some rare and high quality plants were prohibited to maintain superior genetic stock ensuring good population in next generation. In contrary now a day the greedy outside contractors are approaching tribal areas and force them to leave their age old beliefs,cultural traditions and taboos.They are paying to younger generations for exploitation of high demand medicinal plants from the wild for commercial purposes. Therefore it is suggested that these precious traditional knowledge should be documented before their extinction.The plants with medicinal value should be chemically analyzed so that active constituents from them can be identified and used for the development new drugs. The study depicts that Irula tribes of these area possess very good knowledge about herbal medicine along with their age old traditional knowledge.They have good knowledge of herbs for cuts and wounds which they face during their routine schedule of working in forests.These forests are fast depleting day by day and thereby ethnomedicinal plants of promise will also be lost in the course of time. These tribal people may be encouraged to cultivate them and to sell them in the local markets to supplement their income for their livelihood.

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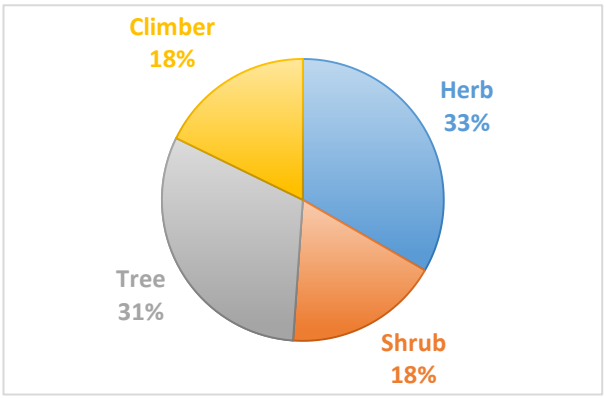

Fig 1 Documentation of medicinal plants according to their Habit.

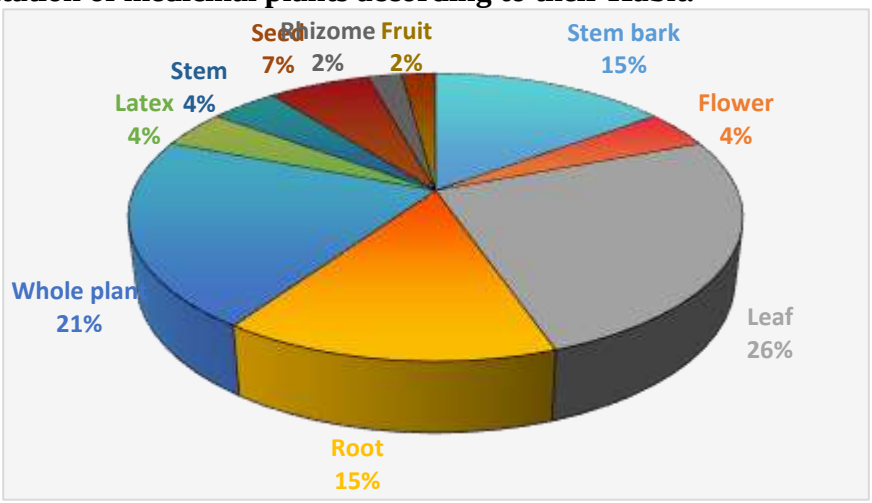

Fig 2 Percentage of medicinal plant parts used.

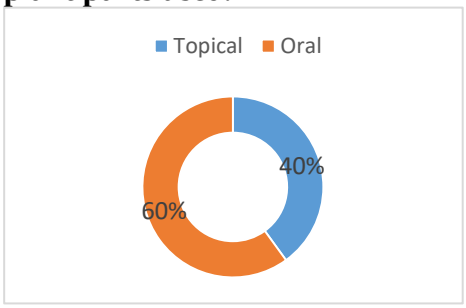

Fig 3 Percentage of mode of administration.

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Fig 4 Photographs of medicinal plants documented in Beerangi kothakota forest area.
A. *Azadirachta indica* A.Juss. **B.** *Cissus quadrangularis* L. **C.** *Clitoria ternatea* L. **D.** *Pergularia daemia* (Forsk.) Chiov. **E.** *Agave americana* L. **F.** *Cuscuta reflexa* Roxb. **G.** *Calotropis procera* (Ait.) R.Br. **H.** *Jatropha gossypifolia* L.

Conclusion

Beerangi kothakota mandal is mostly dominated by rural people.This area is occupied by tropical dry deciduous forests and the herbal claims recorded in the present study may provide the basis for further scientific investigation on the medicinal plants used by the Yerukula tribes. This may leads to discovery of new bio active molecules with therapeutic potential for the development of new drugs and drug intermediates.

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Conflict of interest

No conflict of interest.

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