



REGULAR ARTICLE

ETHNOMEDICINAL PLANTS FROM PADERU DIVISION OF VISAKHAPATNAM DISTRICT, A.P, INDIA

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SUMMARY

Paderu division of Visakhapatnam district is the higher altitude zone in the hilly tracts of Eastern Ghats of Andhra Pradesh. It has the second highest tribal population in Andhra Pradesh. It lies in between latitudes of 17° 50' and 18° - 35' North and longitude of 82° 17' and 83° 01' East with a total geographical area of 3, 24,965 ha. The tribal population of Andhra Pradesh is 41.99 lakhs which is 6.3% of the total population. There are 33 tribal groups in Andhra Pradesh. Of these, 13 tribal groups who inhabit this agency area are, Bagata, Gadaba, Kammara, Konda Doras, Khondus, Kotia, Kulia, Malis, Manne Dora, Mukha Dora, Porja, Reddi Doras or Nooka Dora and Valmiki in Visakhapatnam District and whose population is 3, 58,447 according to the 1991 Census reports. All these 13 groups are present in this division. The present paper deals with about 455 plant species of 354 genera belong to 115 families have been recorded which are potentially used by the 13 tribal groups in this division. Of these 455 ethnobotanical plants, 426 plants are used for ethnomedicine to cure 126 ailments. The tribal people of this division largely depend on herbal medicines, plants products for primary health care and their daily life.

Key words: Ethnobotanical plants, Uses, Paderu division, Visakhapatnam, A.P, India

S.B. Padal et al. Ethnomedicinal Plants from Paderu Division of Visakhapatnam District, A.P, India. J Phytol 2/8 (2010) 70-91.

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1. Introduction

The use of plants by man is as old as the human civilization itself. The term ethnobotany refers to the interrelationship between the primitive people and plants growing around them. The beginning of ethnobotanic enquiry can be traced back to Stephen powers used the term "Aboriginal Botany" which included the total primitive people or aboriginals dependence on plants for food, medicine etc. Ford (1) It assumed a new sense ever since Harshberger (2) gave a new purpose to it the study of plants used by primitive and "aboriginal people" He introduced the word "Ethnobotany" for the first time which has been derived from the word Ethic, which means classification of human beings into social and cultural groups, Singh (3) Modern anthropologists and ethnobotanists adopted this term to denote the cultural importance and significance of plants in the lives of people. Ford (1) including psychological importance and mythological reference. Robins *et al.* (4)

defined the term ethnobotany as a "Study and evolution of the knowledge of all phases of plant life amongst primitive societies and of the effect of the vegetal environment upon the life, customs, beliefs and history of the people of such societies. Kirtikar and Basu (5) used the term ethnobotany for the first time in India and stated that "The ancient Hindus should be given the credit of cultivating what is now called ethnobotany." In Vedic period the curative properties of some herbs were documented in Rigveda. Schulters (6) stated that ethnobotany as the study of relationship between man and his ambient vegetation. Jones (7) defined ethnobotany as interrelations of primitive man and plants Castetter (8) confined ethnobotany to man in primitive state of culture. Faulks (9) stated that ethnobotany as "the multitudinous connections direct or indirect between man and plants. Therefore, now a day's ethnobotanical research is

crucial amongst aboriginal people, Maheshwari, (10).

Although different workers have documented the use of various medicinal plants from different parts of Andhra Pradesh Hemadri *et al* (11-12) Prayaga Murty *et al.*, (13-14) detail information on ethnomedicinal plants is unavailable. Very little literature was available on herbal folk medicine of Paderu division. The present study carried out on the Paderu division is one such attempt to document the traditional knowledge of medicinal plants used by the tribal people.

Study area

Paderu Division of Visakhapatnam District, Andhra Pradesh, is the higher altitude zone in the hilly tracts of Eastern Ghats of Andhra Pradesh. It has the second highest tribal population in Andhra Pradesh. It lies in between latitudes of 17°-50' and 18° - 35' north and longitude of 82°-17' and 83°-1' East with a total geographical area of 3, 24,965 Ha. Out of which the forest area under the control of the Division is 104811.91 Ha. The division comprises of a series of hills having an altitude ranging from 900 to 1680 mtrs above M.S.L. The area receives an average annual rainfall of 1800 mm and support a rich diversity of plant wealth. It includes three Forest Ranges i.e. 1.Araku Forest Range 2.Paderu Forest Range and 3.Pedabayalu Forest Range.

The Paderu division harbours luxurious forest vegetation. The coffee and pepper plantations are in Ananthagiri, Araku, Dumbbriguda, Paderu (Minumuluru), G. Madugula, and Munchingiputtu mandals of this division. The famous Araku Valley" is located in this division, which is known as the "Ooty of Andhra Pradesh" the tourist's attractive centre for its natural beauty and environment. The entire Paderu forest division has eight mandals i.e. Ananthagiri, Araku Valley, Dumbbriguda, G.Madugula, Hukumpeta, Munchingiputtu, Paderu and Pedabayalu. Based on Champion' and Seth (15) classification, the forests in the Paderu Division can be divided into the following types.

1. Southern tropical semi-evergreen forests,
2. Southern tropical moist deciduous forests,
3. Southern tropical dry deciduous forests, 4. Savannahs or hill top forest:

Ethnology of the tribal people

Generally the Paderu Division of Visakhapatnam district is with full of tribal population. The tribal communities live in forests, hilly tracts and naturally isolated areas from the civilized urban society. That's why in nature they developed their cultures of their own. They depend up on the nature for their food, shelter, and livelihood, thus the vegetation has much influence on the tribal life. In this division the tribal people are present in almost all villages. The total population of scheduled tribes in India is 683.81 lakhs and constitutes 8.08% of the total population as per 1991 census report. The tribal population of Andhra Pradesh is 41.99 lakhs which is 6.3% of the total population. There are 33 tribal groups in Andhra Pradesh. Of these, 13 tribal groups who inhabit this agency area are, Bagata, Gadaba, Kammara, Konda Doras, Khondus, Kotia, Kulia, Malis, Manne Dora, Mukha Dora, Porja, Reddi Doras or Nooka Dora and Valmiki in Visakhapatnam District and whose population is 3, 58,447 according to the 1991 Census reports. All these 13 groups are present in this division

2. Materials and Methods

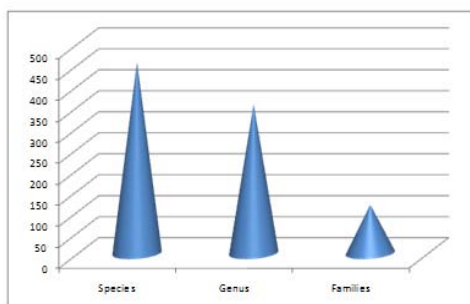
The various methods used for the study of ethnobotany of Paderu Division Visakhapatnam District, Andhra Pradesh, India, were essentially the same as described by Jain (16-18); Chadwick and Mars (19) and Martin (20). Study was under taken during the period 2005-2009. It is the outcome of intensive field trips were made in the 102 interior tribal pockets of the forest areas. Village wise information was gathered about the plants, which have medicinal values from the Tribal / Viadys / Villagers who secured from their hereditary and ancestral line. Collecting information from them is not an easy task as they treat it will be an utmost secret, which was not even shared among their community members. While carrying out the fieldwork, help was taken from the

traditional healers in the ethnomedicinal information, as they are familiar with the plants around them. Enquiries were made on type of plants they use and their usage in their daily life. Information about the uses of plants was obtained from the tribal doctors, elders and housewives. Tribal houses, fields, place of worships, gardens, and weekly markets were also visited. Communication with these people was made in Telugu. Exploration trips were frequently made to all the representative localities of the study area by following the methods suggested by Jain (21). During these trips, voucher specimens of the representative taxa were collected and field numbers were given after making critical observation on the habit, habitat, ecological association, branching pattern, flower colour and fruits. Herbarium specimens have been prepared. The identifications were later confirmed with the help of Flora of Presidency of Madras Gamble(22) Flora of Andhra Pradesh, Pullaiah and Chennaiah (23), Pullaiah and Ali Moulali, (24). and local floras like Srikakulam district Rolla S. Rao & Harasriramulu (25) Vizianagarm district, Venkaiah(26), Visakhapatnam district, G.V Subba Rao (27), East Godavari District, Rolla S. Rao et al (28), West Godavari district, Rolla S. Rao et al (29) Krishna district, Venkanna, et al (30), Guntur district, Ramakrishnaiah (31) North Coastal districts, Prayaga Murty(32).

3. Results

In the present work “Studies on Ethnobotany of Paderu Division” about 455 plant species of 354 genera belong to 115 families (Fig.1) have been recorded which are potentially used by the 13 tribal groups in Paderu division.

Fig-1. Represent the species, genus and families of the ethnobotanical plants



Out of the 455 species, 448 species are Angiosperms followed by 6 species of Pteridophytes and one species of Gymnosperm. Among the angiosperms dicotyledons are 369, and monocotyledons are 79 (Fig.2). Based on the morphological classification habit-wise herbs 138, shrubs 128, trees 136, stragglers and climbers 50, ferns 6, and parasites / epiphytes 7, are utilized in the ethnobotanical uses (Fig.3).

Fig. 2. Taxa-wise classification of ethnobotanical plant

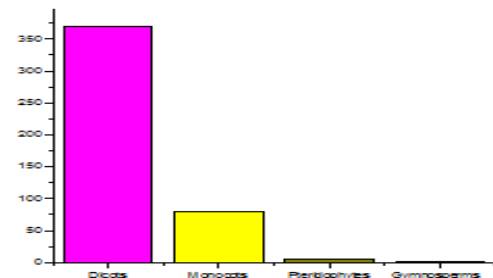
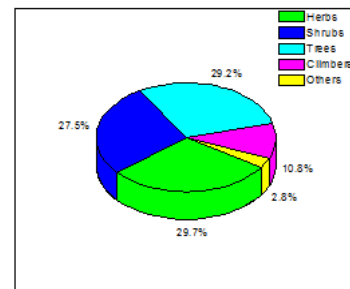
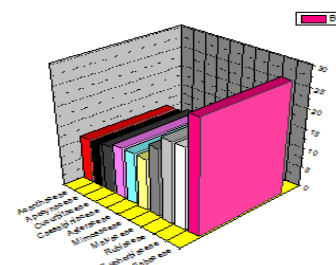


Fig. 3. Habit-wise classification of ethnobotanical plants



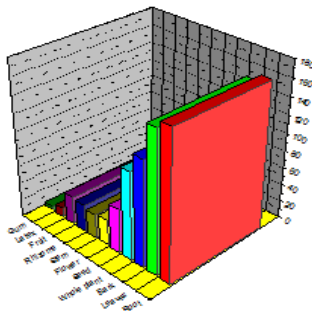
In the present work a total number of 115 families are recorded. Out of 110 Angiosperm families the first ten dominating families are given (Fig. 4). Fabaceae is the dominating family with 28 species followed by Euphorbiaceae and Rubiaceae with 20 species each, Malvaceae with 17 species, Mimosaceae, Asteraceae and Caesalpinaceae with 13 species each, Cucurbitaceae with 12 species, Acanthaceae and Apocynaceae with 11 species each.

Fig. 4. Dominant families of ethnobotanical plants from paderu division



Based on the part used for ethnobotanical purpose these 455 Plants are classified in to roots / tubers / rhizomes / bulbs / stems / stem bark / leaves / flowers / fruits / seeds / latex or gums and whole plant. Roots / Rhizomes / tubers / bulbs / stem plants - 160, leaves -155, barks - 121, whole plant- 99, seeds -50, flowers-29, fruits-28, and latex or gum-10. In this the root/ rhizome constitutes the highest percentage (35.16) of utilization followed by leaves (34.06) stem and root bark (26.59), whole plant (21.75) seeds (10.98), fruits (6.15), flowers (6.37) and latex or gums (2.19) (Fig.5).

Fig. 5. Percentage wise plant parts used by tribal people



Out of the 455 ethnobotanical plants, 426 plants are used for ethnomedicine to cure 126 ailments. In this the number of plants used for each ailment are given in the brackets i.e. Abortion (10), Abscess (2), Acidity (12), Alexipharmic (2), Allergy (1), Alopecia (2), Anaemia (4), Anthelmintic (14), Antifertility (6), Aphorodisiac (5), Asthama (15), Antiemetic (6) (Table-1). Blisters (3), Blood purification (3), Body pains (1), Boils (11), Bronchitis (6), Burns(8), Chest pain (7), Chicken pox(3), Chronicbronchitis (1), Chronic dysentery (1), Constipation (2), Cold (10), Contraception (2), Cooling effect (10), Cough (15), Cracks (1), Cuts (4), Cough in children (2),(Table-2). Dandruff (5), Diabetes

(20), Diarrhoea(26), Dysentery(40), Dysmenorrhoea (5), Dysopia (5),(Table-3). Earache (6), Eczema (3), Emetic (1) Epilepsy (10), Enlargement of abdomen (1), Eruptions (1), Excessive heat (1), Eye diseases (6), (Table-4). Facial paralysis (1), Family planning (2), Fever(35), Fever in children(4), Fertility (4), Fits(6), Fluent talk in children (2), Fractures (10), (Table-5). Gastric problems (2), Gonorrhoea (4), Gum bleeding (1), Gum infections (2), Gynec problems (1), Haematuria (1), Haemorrhage from mouth (1), Head ache (11), Heart pain (3), Hepatic disorders (1), Herpes (4), High blood pressure (2), (Table-6). Indigestion (1), Infantile diarrhoea (4), Intermittent fever (1), Intestinal worms (3), Itches (5), Jaundice (8), Joint pains (11), Kidney Stones (3), Knee Swellings (1), (Table-7). Lactation (2), Leprosy (7), Leucorrhoea(6), Liver problems(3), Liver problems in children (2), Malaria fever (4), Memory power (2), Menorrhagia (1), Mental disorder (1), Menstrual problem (11), Mouth sores (3), Muscle pain (2), Nervous disorder (5), Oedema (1), (Table-8). Pains (8), Palpitation of heart (1), Paralysis (11), Peptic ulcers (1), Peripheral neuritis (7), Piles (15), Post delivery backache (1), Premature greying of hair (1), Premature hair fallen (1), Psoriasis (1), Puerperal fever (1), Purgative (5), Pyorrhoea (1), Rheumatic pains (21), (Table-9). Scabies (5), Scalp infection (1), Sexual disease (1), Skin disease (29), Small - pox (3), Sperm production (1), Sprains (1), Sores (4), Spleen problems (3), Stomachache (15), Stomach problems (4), Sterility (2), Suppuration of boils (1), Swellings (8), Tongue ulcers (1), Tooth ache (13), Throat infection (2), Tuberculosis (7), Tumours in stomach (3), Typhoid (2), (Table-10). Ulcers (14), Urinary problems (10), Vermifuge (1), Vomiting (7), Wounds (27), (Table-11).

Table-1: Plants and Plant parts used in Different Human Diseases

| S.NO | Disease | Botanical Name | Useful Part (s) |
|------|---------------|--|--|
| 1. | Abortion | <i>Annona squamosa</i> L. <i>Carica papaya</i> L. <i>Cassia fistula</i> L. <i>Costus speciosus</i> (Koeing exRetz.) J.E. Smit. <i>Dendrocalamus strictus</i> (Roxb.) Nees <i>Gloriosa superba</i> L. <i>Phyllanthus amarus</i> Schum. & Thm. <i>Plumbago indica</i> L. <i>Plumbago zeylanica</i> L. <i>Musa rosacea</i> Jacq. | Root Latex Rhizome Tender leaves Tuber Root Root Fruit Root Rhizome Root |
| 2 | Abscess | <i>Datura metel</i> L. <i>Holoptelea integrifolia</i> (Roxb.) Planch | Leaves Tender leaves |
| 3 | Acidity | <i>Acacia sinuat</i> (Lour.) Merr. <i>Bauhinia racemosa</i> Lam. <i>Cassia auriculata</i> L. <i>Cissampelos pareira</i> L. <i>Curcuma longa</i> L. <i>Emblica officinalis</i> Gaertn. <i>Jatropha curcas</i> L. <i>Phoenix acaulis</i> (Roxb.) Nees <i>Soyimida febrifuga</i> Roxb. <i>Terminalia bellirica</i> (Gaertn.) Roxb. <i>Ziziphus oenoplia</i> (L.) Mills. <i>Ziziphus xylopyrus</i> (Retz.) Willd. | Roots Bark Stem Bark Leaves Rhizome Stem Bark Stem Bark Fruit Stem Bark Stem Bark Stem Bark Stem Bark |
| 4 | Alexepharmic | <i>Pavetta indica</i> Sm. <i>Woodfordia fruticosa</i> (L.) Kurz. | Root Root |
| 5 | Allergy | <i>Lepidagathis cristata</i> Willd. | Whole plant |
| 6. | Alopacia | <i>Hibiscus rosa-sinensis</i> L. <i>Jatropha curcas</i> L. | Seed Flower |
| 7 | Anaemia | <i>Boerhaavia diffusa</i> L. <i>Centella asiatica</i> (L.) Urban. <i>Murraya paniculata</i> (L.) Jack. <i>Toddalia asiatica</i> (L.) Lam. | Root Leaves Root Root |
| 8 | Anthelmintic | <i>Annona reticulata</i> L. <i>Aristolochia bracteolata</i> Lamk. <i>Asadirachta indica</i> Juss. <i>Butea superba</i> Roxb. <i>Cymbopogon citrates</i> Dc. <i>Entada pursaetha</i> DC. <i>Ervatamia coronaria</i> Stopf. <i>Erythroxylum monogynum</i> Roxb. <i>Gloriosa superba</i> L. <i>Hugonia myrtax</i> L. <i>Melia azedarachta</i> L. <i>Naringi crenulata</i> (Roxb.) Nicols. <i>Sphaeranthus indicus</i> L. <i>Urena lobata</i> L. | Tender fruits Leaf Tuber Seeds Leaf Root Root Root Seeds & Root Root Leaves Leaf Fruit Leaves Cotyledons |
| 9. | Antifertility | <i>Butea superba</i> Roxb. <i>Myristica fragrans</i> (Benth.) Hook f <i>Semicarpus anacardium</i> L f <i>Tamarindus indica</i> L. <i>Gossypium herbaceum</i> L. <i>Plumbago indica</i> L. | Stem bark Fruit Bark Bark Seed Whole plant |
| 10 | Aphorodisiac | <i>Hemidesmus indicus</i> L. <i>Asparagus racemosus</i> Willd <i>Capparis zeylanica</i> L. <i>Terminalia arjuna</i> (DC.) Wt. & Arn. <i>Boswellia serrata</i> Colebr. | Root Root Root Bark Resin |
| 11. | Asthama | <i>Aristolochia indica</i> L. <i>Bacopa monnieri</i> Wettst <i>Balanitis aegyptica</i> (L.) Delile. <i>Biophytum nervifolium</i> Thw. <i>Cassia sophera</i> L. <i>Cissus quadrangularis</i> L. <i>Clematis smilacifolia</i> Wall. <i>Coccinia grandis</i> (L.) Voigt. <i>Dendrophthoe falcata</i> (L. f) Ettinagsh <i>Erythrina stricta</i> Roxb. <i>Indigofera tinctoria</i> L. <i>Rauwolfia serpentina</i> (L.) Benth. ex Kurz <i>Terminalia bellirica</i> (Gaertn.) Roxb. <i>Terminalia chebula</i> Retz. <i>Tylophora indica</i> (Burm. f) Meit. | Root Plant Root Leaves Leaf Stem Leaves Root tubers Bark Bark Root Root Fruit Fruit Leaf |
| 12 | Antiemetic | <i>Crotalaria sericea</i> Gamble. <i>Curcuma longa</i> L. <i>Solanum melongena</i> L. <i>Dichrostachys cinerea</i> (L.) Wt. & Arn. <i>Mangifera indica</i> L. <i>Ziziphus xylopyrus</i> (Retz.) Willd. | Stem Bark Rhizome Root Root Shoot Leaf |

Table-2: Plants and plant parts used in different human diseases

| S.No | Disease | Botanical name | Useful part(s) |
|------|--------------------|---|--|
| 1 | Blisters | <i>Acacia chundra</i> (Roxb.ex.Rottl.) Willd. <i>Argyreia nervosa</i> (Burm.f.) Boj. <i>Desmodium gangeticum</i> (L.) DC | Leaves Leaves Leaves |
| 2 | Blood Purification | <i>Enicostema axillare</i> (Lam.) Raynal. <i>Ichnocarpus frutescens</i> (L.) R. Br. <i>Schleichera oleosa</i> (Lour.) Oken. | Plant Root Bark |
| 3 | Body pains | <i>Eucalyptus camaldulensis</i> Dehn. | Leaves |
| 4 | Boils | <i>Abutilon indicum</i> (L.) Sweet. <i>Acacia chundra</i> (Roxb.ex.Rottl.) Willd. <i>Achyranthes aspera</i> L. <i>Albizia lebbek</i> (L.) Benth. <i>Argyreia nervosa</i> (Burm.f.) Boj. <i>Arisaema tortuosum</i> Wall. <i>Buchanania lanzan</i> Spr. <i>Desmodium gangeticum</i> (L.) DC. <i>Ficus hispida</i> L.f. <i>Hibiscus rosa-sinensis</i> L. <i>Xanthium indicum</i> Koenig in Roxb. | Leaf Leaf Plant Flower Leaves Root Stem bark Leaves Leaves Leaves Root |
| 5 | Bronchitis | <i>Albizia odoratissima</i> (L.f.) Benth. <i>Annona sqamosa</i> L. <i>Cassia sophera</i> L. <i>Hibiscus rosa-sinensis</i> L. <i>Indigofera tinctoria</i> L. <i>Terminalia chebula</i> L. | Stem bark Bark Leaf Flower Root Fruit |
| 6 | Burns | <i>Cardiospermum halicacabum</i> L. <i>Cassia auriculata</i> L. <i>Evolvulus nummularius</i> (L.) L. <i>Garuga pinnata</i> Roxb. <i>Lantana camara</i> L. <i>Madhuca longifolia</i> Koeng. <i>Momordica dioca</i> L. <i>Tamarindus indica</i> L. | Leaf Leaf Plant Leaf Leaves Leaves Leaves Seed |
| 7 | Chest pain | <i>Biophytum neroifolium</i> Thw. <i>Bridelia retusa</i> (L.) Spr. <i>Buchanania lanzan</i> Spr. <i>Chloroxylon swietenia</i> DC. <i>Diospyros melanoxylon</i> Roxb. <i>Ixora pavetta</i> Andrews. <i>Naravelia zeylanica</i> (L.) DC | Plant Stem bark Stem bark Leaves Root Leaf Bark |
| 8 | Chicken pox | <i>Bombax ceiba</i> L. <i>Costus speciosus</i> L. <i>Dichrostachys cinerea</i> (L.) Wt. | Flower Rhizome Root |
| 9 | Chronic bronchitis | <i>Solanum trilobatum</i> L. | Plant |
| 10 | Chronic dysentery | <i>Ocimum basilicum</i> L. | Seeds |
| 11 | Constipation | <i>Canthium parviflorum</i> Lam. <i>Calamus rotang</i> L. | Leaves Bark |

| | | | |
|----|-------------------|---|---|
| 12 | Cold | <i>Abrus precatorius</i> L. <i>Bidens pilosa</i> L. <i>Cassia sophera</i> L. <i>Clematis smilacifolia</i> Wall. <i>Commelina longifolia</i> Lam. <i>Diospyros melanoxylon</i> <i>Erythrina variegata</i> L. <i>Eucalyptus camaldulensis</i> Dehn <i>Naravelia zeylanica</i> (L.). DC. <i>Wattakaka volubilis</i> (L.f.) Stapf | Root Wholeplant Leaf Leaf Wholeplant Bark Leaf Leaves Plant Leaf |
| 13 | Contraception | <i>Bombax ceiba</i> L. <i>Cucumis sativus</i> L. | Flower Fruit |
| 14 | Cooling effect | <i>Bacopa monnieri</i> (L.) Wettstein. <i>Cocculus hirsutus</i> (L.) Diels. <i>Cucumis sativus</i> L. <i>Enseta glaucum</i> Roxb. <i>Hemidesmus indicus</i> (L.) R. Br. <i>Monochoria vaginalis</i> Burm. <i>Ougeinia oojeinensis</i> Roxb. <i>Rungia pectinata</i> (L.) Nees <i>Sarcostemma acidum</i> (Roxb.) Voigt. <i>Setaria italica</i> L. | Plant Leaf Fruit Stem Root Root Bark Leaves Plant Leaves |
| 15 | Cough | <i>Abelmoschus manihot</i> (L.) Medicus. <i>Abrus precatorius</i> L. <i>Abutilon crispum</i> (L.) Medicus <i>Acacia torta</i> (Roxb.) Craib. <i>Anogeissus latifolia</i> (Roxb. ex DC.) Wall.ex Bedd. <i>Barleria prionitis</i> L. <i>Bidens pilosa</i> L. <i>Calamus rotang</i> L. <i>Cassia sophera</i> L. <i>Clematis smilacifolia</i> Wall. <i>Cyathea gigantea</i> wall. <i>Embelia ribes</i> Burm. <i>Piper hymenophyllum</i> <i>Piper nigrum</i> L. <i>Pueraria tuberosa</i> Roxb. | Root Root Root Stem bark Stem bark Leaves Plant Bark Leaf Leaf Rhizome Root Root Seeds Root |
| 16 | Cracks | <i>Anacardium occidentale</i> L. | Seeds |
| 17 | Cuts | <i>Evolvulus nummularius</i> . (L.) L. <i>Gloriosa superba</i> L. <i>Semecarpus anacardium</i> L. <i>Urena lobata</i> L. | Plant Tuber Pericarp Leaf |
| 18 | Cough in Children | <i>Erythrina variegata</i> L. <i>Pterolobium hexapetalum</i> (Roth.) Sant. & Wagh) | Leaf Stem bark |

Table-3: Plants and Plant parts used in Different Human Diseases

| S. No | Disease | Botanical name | Useful part(s) |
|-------|----------|---|---|
| | Dandruff | <i>Hibiscus rosa-sinensis</i> L. <i>Limonia elephantum</i> (Correa.) Panigrahi. <i>Pterospermum xylocarpum</i> (Gaertn.) Sant. & Wagh <i>Urena lobata</i> L. <i>Gmelina asiatica</i> L. | Leaf Fruits Leaves Leaves Fruit |

| | | |
|-----------|---|--|
| Diabetes | <p><i>Abutilon crispum</i> (L.) Medicus. <i>Acampe praemorsa</i> (Roxb.) <i>Adiantum lunulatum</i> Burm. <i>Albizia odoratissima</i> (L.f.) Benth. <i>Andrographis paniculata</i> (Burm. f.) Wall. Ex Nees <i>Calotropis procera</i> (Ait.) R. Br. <i>Clitoria ternatea</i> L. <i>Coffea arabica</i> L. <i>Corallocarpus epigaeus</i> Hook. <i>Curcuma pseudo montana</i> Graham. <i>Ficus racemosa</i> L. <i>Glochidion zeylanicum</i> (Gaerth) Juss. <i>Guazuma ulmifolia</i> Lam. <i>Gymnema sylvestre</i> (Retz.) R. Br. ex Roem & Schult. <i>Hibiscus lunariifolium</i> Willd. <i>Hugonia mystax</i> L. <i>Justicia glauca</i> Rottl. <i>Mesua ferrea</i> L. <i>Strychnos nux-vomica</i> L. <i>Zizyphus rugosa</i> Lam.</p> | <p>Leaves Plant Rhizome Bark Leaves Root Flower Seeds Plant Tuber Fruit Roots Bark Leaves Leaf Root Plant Seed oil Wood Leaves</p> |
| Diarrhoea | <p><i>Aegle marmelos</i> (L.) Correa. <i>Alternanthera sessilis</i> (L.) R. Br. <i>Azadirachta indica</i> A. Juss. <i>Bauhinia racemosa</i> Lam. <i>Boswellia serrata</i> Roxb. <i>Canavalia gladiata</i> (Jacq.) DC. <i>Cassia sophera</i> L. <i>Cassia occidentalis</i> L. <i>Catharanthus roseus</i> L. <i>Cyathea gigantea</i> Wall. <i>Embelia ribes</i> Burm. <i>Emilia sonchifolia</i> DC. <i>Gymnema sylvestre</i> (Retz.) R. Br. ex Roem. & Schult. <i>Kylling melanospermae</i> Whight. <i>Nelumbo nucifera</i> Gaerth. <i>Ocimum basilicum</i> L. <i>Oroxylum indicum</i> (L.) Vent: <i>Ougeinia oojenensis</i> Roxb. <i>Pterocarpus marsupium</i> Roxb. <i>Rivea hypocrateriformis</i> (Desr.) Choisy <i>Rostellularia diffusa</i> willd. <i>Scindapsus officinalis</i> roxb. <i>Sida cordata</i> (Burm.f.) Borssum. <i>Soymida febrifuga</i> (ROxb.) A. Juss. <i>Tylophora indica</i> (Burm. t.) Merr. <i>Woodfordia fruticosa</i> (L.) Kurz.</p> | <p>Fruit pulp Plant Bark Root bark Bark Root Root Plant Plant Rhizome Root Root Leaves Leaves Plant Seeds Root bark Bark Gum Plant Plant Inflorescence Plant Flower Root Bark</p> |

| | | |
|---------------|--|--|
| Dysentery | <p><i>Abelmoschus crinitus</i> Wall. <i>Acacia chundra</i> (Roxb.ex.Rottl.) Willd. <i>Achyranthus aspera</i> L. <i>Ageratum conyzoides</i> L. <i>Amaranthus gangeticus</i> L. <i>Anogeissus acuminata</i> Wall. Ex Bedd. <i>Arisaema tortuosum</i> Wall. <i>Artemisia vulgaris</i> L. <i>Artocarpus heterophyllus</i> Lam. <i>Asparagus recemosus</i> Willd. <i>Bauhinia purpurea</i> L. <i>Bauhinia vahlii</i> Wt & Am. <i>Bixa orellana</i> L. <i>Boswellia serrata</i> Roxb. <i>Caesalpinia bonduc</i> (L.) Roxb. <i>Calycopteris floribunda</i> (Roxb.) Poir <i>Cyperus rotandus</i> L. <i>Dalbergia sissoo</i> Roxb. <i>Elephantopus scaber</i> L. <i>Enseta glaucum</i> Roxb. <i>Euphorbia hirta</i> L. <i>Gymnema sylvestre</i> (Retz.) R. Br. ex Roem. & Schult. <i>Helicteres isora</i> L. <i>Hemidesmus indicus</i> (L.) R. Br. <i>Holarrhena pubescens</i> (Buch-Ham.) Wall. Ex Don. <i>Jatropha curcas</i> L. <i>Mesua ferrea</i> L. <i>Murraya koenigii</i> (L.) Spr. <i>Naringi crenulata</i> (Roxb.) Nicolson. <i>Oroxylum indicum</i> (L.) Vent. <i>Pithecolobium dulce</i> (Roxb.) Benth. <i>Psidium guajava</i> L. <i>Pterocarpus marsupium</i> Roxb. <i>Sida cordata</i> (Burm.t.) Borssum <i>Sida cordifolia</i> L. <i>Soymida febrifuga</i> (Roxb.) A. Juss. <i>Tephrosia villosa</i> (L.) Pers. <i>Toddalia asiatica</i> (L.) Lam. <i>Tylophora indica</i> (Burm. t.) Merr. <i>Zornia gibbosa</i> Span.</p> | <p>Leaves Stem bark Plant Plant Plant Stem bark Root Leaves Bark Root Bark Root Leaves Gum Root Leaves Tuber Root Root Flower Leaf & Root Root Fruit Root Stem bark Root Seeds Root Leaves Root Stem bark Bark Root bark Stem bark Gum Leaves Plant Bark Root Plant</p> |
| Dysmenorrhoea | <p><i>Madhuca longifolia</i> (Koenig) Macbride. <i>Plumbago zeylanica</i> L. <i>Sida cordifolia</i> L. <i>Trichosanthes tricuspidata</i> Lour. <i>Delonix regia</i> (Boi.ex Hook.) Rat.</p> | <p>Root Root Seeds Tuber Flower</p> |
| Dysopia | <p><i>Alternanthera sessilis</i> (L.) <i>Cassia fistula</i> L. <i>Commelina longifolia</i> Lam. <i>Gloriosa superba</i> L. <i>Terminalia chebula</i> Retz.</p> | <p>Plant Fruit Plant Bark Rhizome</p> |

Table-4: Plants and plant parts used in different human diseases

| S.No | Disease | Botanical name | Useful part(s) |
|------|------------------------|--|--|
| 1 | Earache | <i>Bidens pilosa</i> L. <i>Canna indica</i> L. <i>Capparis zeylanica</i> L. <i>Leptadenia reticulata</i> (Retz.) Wt. & Arn. <i>Ocimum basilicum</i> L. <i>Trichosanthes tricuspidata</i> Lour. | Leaf Seed Root bark Plant Seeds Plants |
| 2 | Eczema | <i>Aristolochia bracteolata</i> Lamk. <i>Butea superba</i> Roxb. <i>Jatropha gossypifolia</i> L. | Leaf Root Leaf |
| 3 | Emetic | <i>Sarcostemma acidum</i> (Roxb.) yoigt. | Stem |
| 4 | Epilepsy | <i>Adiantum lunulatum</i> Burm. <i>Anisomeles indica</i> L. <i>Bacopa monnieri</i> Wettst. <i>Bauhinia racemosa</i> Lam. <i>Canavalia gladiata</i> (Jacq.) DC. <i>Chloroxylon swietenia</i> DC. <i>Cuscuta reflexa</i> Roxb. <i>Dodonaea viscosa</i> (L.) Jacq. <i>Hibiscus rosa-sinensis</i> L. <i>Pavetta indica</i> L. | Rhizome Plant Plant Stem bark Root Stem bark Young plant Leaf Stem bark Stem bark |
| 5 | Enlargement of abdomen | <i>Citrullus colocynthis</i> (L.) Schr. | Root |
| 6 | Eruptions | <i>Albizia lebeck</i> (L.) Benth | Flowers |
| 7 | Excessive heat | <i>Pseudarthria viscida</i> (L.) Wt. & Arn. | Root |
| 8 | Eye diseases | <i>Aegle marmelos</i> (L.) Correa. <i>Celosia argentea</i> L. <i>Dalbergia sissoo</i> Roxb. <i>Ficus benghalensis</i> L. <i>Hibiscus aculeatus</i> Roxb. <i>Wattakaka volubilis</i> L.f.) Stapf. | Stem bark Seed Leaves Latex Leaves Plant |

Table-5: Plants and Plant parts used in Different Human Diseases

| S.No | Disease | Botanical name | Useful part(s) |
|------|-------------------------|--|---|
| 1 | Facial paralysis | <i>Alangium salvifolium</i> (L.f.) Wanger. | Stem bark |
| 2 | Family planning | <i>Abrus precatorius</i> L. <i>Cuscuta reflexa</i> Roxb. | Seeds Seeds |
| 3 | Fever | <i>Acacia torta</i> (Roxb.) Craib <i>Acorus calamus</i> L. <i>Haldinia cordifolia</i> (Roxb.) Hook. f. ex Brandis <i>Alternanthera sessilis</i> L. <i>Anacardium occidentale</i> L. <i>Artocarpus heterophyllus</i> Lam. <i>Bridelia retusa</i> (L.) Spr. <i>Calycopteris floribunda</i> (Roxb.) Poir. <i>Canna indica</i> L. <i>Canthium dicoccum</i> (Gaertn.) Tajj. & Binn. <i>Chloroxylon swietenia</i> DC. <i>Cissampelos pareira</i> L. <i>Clematis smilacifolia</i> Wall. <i>Commelina longifolia</i> Lam. <i>Crotalaria verrucosa</i> L. <i>Cyperus rotandus</i> L. <i>Delonix alata</i> L. <i>Diplocyclos palmatus</i> (L.) Jeffrey <i>Evolvulus alsinoides</i> (L.) L. <i>Evolvulus nummularius</i> . (L.) L. <i>Hyptis suaveolens</i> (L.) Poir. <i>Ipomoea carica</i> L. <i>Leonotis nepetifolia</i> (L.) R. Br. Prodr. <i>Manilkara hexandra</i> (Roxb.) Dubard. <i>Operculina turpethum</i> (L.) Manso <i>Phaseolus trilobus</i> Ait. <i>Phyla nodiflora</i> L. <i>Pogostemon benghlensis</i> (Bunn.f.) O. Ktze <i>Pseudarthria viscida</i> (L.) Wt. & Am. <i>Pueraria tuberosa</i> Roxb. <i>Scoparia dulcis</i> L. <i>Selaginella rependa</i> Spreng. <i>Sida cordifolia</i> L. <i>Tephrosia purpurea</i> . (L.) Pers. <i>Tragia involucrata</i> L. | Root bark Root Stem bark Plant Bark Stem bark Stem bark Leaf Root Bark Stem bark Root Leaf Plant Leaves Tuber Bark Fruit Plant Plant Root Plant Plant Bark Plant Leaves Plant Leaf Root Root Plant Root Leaves Root Plant |
| 4 | Fever in Children | <i>Ailanthus excelsa</i> Roxb. <i>Clerodendrum serratum</i> (L.) Moon. <i>Eclipta prostrata</i> (L.) L. <i>Strychnos potatorum</i> L. f. | Bark Root Plant Bark |
| 5 | Fertility | <i>Cassia glauca</i> Lam. <i>Diplocyclos palmatus</i> (L.) Jeffrey <i>Myristica fragrans</i> L. <i>Sterculia urens</i> Roxb. | Bark Leaves Fruit Root |
| 6 | Fits | <i>Adiantum lunulatum</i> Burm. <i>Dodonaea viscosa</i> (L.) Jacq. <i>Hemidesmus indicus</i> (L.) R. Br. <i>Maytenus emarginata</i> (Willd.) Ding Hou <i>Pavetta indica</i> L. <i>Plumbago zeylanica</i> L. | Rhizome Leaves Root Stem bark Root Root |
| 7 | Fluent talk in children | <i>Cleistanthus collinus</i> (Roxb.) Benth. Ex. Hook.f. <i>Mangifera indica</i> L. | Stem bark Stem bark |

| | | | |
|---|-----------|--|---|
| 8 | Fractures | <i>Canthium dicoccum</i> (Gaertn.) Taij. & Binn. <i>Cissus quadrangularis</i> L. <i>Desmodium triflorum</i> (L.) DC. <i>Dichrostachys cinerea</i> (L.) Wt. & Am. <i>Dioscorea oppositifolia</i> L. <i>Dioscorea pentaphylla</i> L. <i>Garuga pinnata</i> Roxb. <i>Vanda tessellata</i> (Roxb.) Hook. f. ex. G. Don. <i>Viscum articulatum</i> Bunn. Fl. <i>Litsea glutinosa</i> (Lour.) C.B. Robinson | Bark Stem Plant Root bark Tuber Tuber Stem bark Aerial root Stem Stem bark |
|---|-----------|--|---|

Table-6: Plants and Plant parts used in Different Human Diseases

| S.No | Disease | Botanical name | Useful part(s) |
|------|------------------------|---|--|
| 1 | Gastric problems | <i>Coccinia grandis</i> (L.) Voigt. <i>Hibiscus rosa-sinensis</i> L. | Leaf Flower |
| 2 | Gonorrhoea | <i>Clitoria ternatea</i> L. <i>Gmelina arborea</i> Roxb. <i>Sida cordifolia</i> L. <i>Xylia xylocarpa</i> (Roxb.) Taub. | Root Leaf Seeds Root bark |
| 3 | Gum bleeding | <i>Jatropha curcas</i> L. | Tender shoots |
| 4 | Gum infections | <i>Phyllanthus reticulata</i> Poir. <i>Albizia lebeck</i> (L.) Benth. | Tendershoots Tendershoots |
| 5 | Gynic problems | <i>Memecylon umbellatum</i> Burm. f. | Root bark |
| 6 | Haematuria | <i>Butea superba</i> Roxb. | Stem bark |
| 7 | Haemorrhage from mouth | <i>Ichnocarpus frutescens</i> (L.) JR. Br. | Root |
| 8 | Head ache | <i>Abelmoschus crinitus</i> Wall. <i>Aerva lanata</i> (L.) Juss. <i>Cissus quadrangularis</i> L. <i>Cleome gynandra</i> L. <i>Clerodendrum serratum</i> L. Moon <i>Cucurma longa</i> L. <i>Iphigenia indica</i> L. <i>Manilkara hexandra</i> (Roxb.) Dubard. <i>Passiflora foetida</i> L. <i>Ricinus communis</i> L. <i>Tephrosia purpurea</i> (L.) Pers. | Root Root Stem Leaves Leaves Rhizome Corms Root Leaf Leaves Leaf |
| 9 | Heart pain | <i>Angiopteris evecta</i> (Forst.) Hoffin. <i>Pseudarthria viscida</i> L. <i>Rauwolfia serpentina</i> (L.) Benth. Ex Kurz. | Rhizome Root Root |
| 10 | Hepatic disorders | <i>Ixora pavetta</i> Andrews | Stem bark |
| 11 | Herpes | <i>Adiantum lunulatum</i> Burm. <i>Entada pursaetha</i> D.C <i>Hemidesmus indicus</i> (L.) R. Br. <i>Zizyphus oenoplia</i> (L.) Mill. | Rhizome Kernel Root Root |
| 12 | High blood pressure | <i>Rauwolfia serpentina</i> (L.) Benth. Ex Kurz. <i>Strychnos potatorum</i> L.f. | Root bark Seed |

Table-7: Plants and Plant parts used in Different Human Diseases

| S.No | Disease | Botanical name | Useful part(s) |
|------|---------------------|---|---|
| 1 | Indigestion | <i>Pogostemon benghalensis</i> (Burm. f.) O. Ktze. | Root |
| 2 | Infantile diarrhoea | <i>Aristolochia indica</i> L. <i>Buchanania lanzan</i> Spr. <i>Canthium dicoccum</i> (Gaertn.) Taij. & Binn <i>Orthosiphon rubicundus</i> (Don.) Benth | Root Stem bark Root bark Plant |
| 3 | Intermittent fever | <i>Cleome viscosa</i> L. | Leaf |
| 4 | Intestinal worms | <i>Borassus flabellifer</i> L. <i>Entada pursaetha</i> DC. <i>Naringi crenulata</i> (Roxb.) Nicolson. | Fruit Cotyledons Fruit |
| 5 | Itches | <i>Erythrina stricta</i> Roxb. <i>Enicostema axillare</i> (Lam.) Raynal. <i>Abutilon indicum</i> (L.) Sweet. <i>Jatropha gossypifolia</i> L. <i>Operculina turpethum</i> (Don.) Benth. | Bark Plant Leaf Leaves Plant |
| 6 | Jaundice | <i>Abutilon crispum</i> (L.) Medicus <i>Acalypha indica</i> L. <i>Acanthospermum hispidium</i> DC <i>Achyranthus aspera</i> L. <i>Azadirachta indica</i> A. Juss. <i>Barleria prionitis</i> L. <i>Bixa orellana</i> L. <i>Bridelia retusa</i> (L.) Spr. | Leaves Leaves Leaves Tender leaves Leaves Leaves Leaves Bark |
| 7 | Joint Pains | <i>Abrus precatorius</i> L. <i>Aeschynomene aspera</i> L. <i>Alangium salvoifolium</i> (L.f.) Wanger. <i>Barringtonia acutangula</i> (L.) Gaertn. <i>Canavalia virosa</i> (Roxb.) Wt. & Arn. <i>Canthium parviflorum</i> Lam, <i>Capparis zeylanica</i> L. <i>Cassia auriculata</i> L. <i>Murraya paniculata</i> (Linn.) Jack. <i>Tephrosia purpurea</i> (L.) Pers. <i>Viscum articulatum</i> Burnm. F. | Root Leaf Stem bark Stem bark Root Stem bark Plant Stem bark Root Root Stem |
| 8 | Kidney stones | <i>Aerva lanata</i> (L.) Juss. <i>Euphorbia hirta</i> L. <i>Trianthema portulacastrum</i> L. | Plant Plant Leaf |
| 9 | Knee swellings | <i>Capparis zeylanica</i> L. | Plant |

Table-8: Plants and Plant parts used in Different Human Diseases

| S.No | Disease | Botanical name | Useful part(s) |
|------|----------------------------|---|--|
| 1 | Lactation | <i>Curcuma pseudomontana</i> Graham. <i>Streblus aspera</i> Lour. | Tubers Leaves |
| 2 | Leprosy | <i>Albizia odorantissima</i> (L.f.) Benth. <i>Argemone mexicana</i> L. <i>Centella asiatica</i> (L.) Urban. <i>Dalbergia latifolia</i> Roxb. <i>Ipomoea hederifolia</i> L. <i>Mangifera indica</i> L. <i>Schrebera swietinoides</i> Roxb. | Stem bark Seeds Leaves Bark & Leaf Tuber Bark Root |
| 3 | Leucorrhoea | <i>Calotropis procera</i> (Ait) R. <i>Cassia auriculata</i> L. <i>Celastrus paniculatus</i> Willd. <i>Coccinia grandis</i> (L.) Voigt. <i>Mirabilis jalapa</i> L. <i>Smilax zeylonica</i> L. | Flowers Flowers Root bark Root tuber Root Root |
| 4 | Liver problems | <i>Amaranthus spinosus</i> L. <i>Curculigo orchiodes</i> Gaertn. <i>Momordica charantia</i> L. | Root Rhizome Leaves |
| 5 | Liver problems in children | <i>Oroxylum indicum</i> (L.) Vent. <i>Trianthema portulacastrum</i> L. | Root Leaf |
| 6 | Malaria fever | <i>Cynodon dactylon</i> Pers. <i>Desmodium triflorum</i> (L.) DC. <i>Scindapsus officinalis</i> Roxb. <i>Vernonia cinerea</i> (L.) Less. | Grass Plant Stem Leaf |
| 7 | Memory power | <i>Centella asiatica</i> (L.) Urban. <i>Bacopa monnieri</i> (L.) Wettstein. | Plant Plant |
| 8 | Menorrhagia | <i>Calotropis procera</i> (Ait.) R. | Flower |
| 9 | Mental disorder | <i>Calotropis gigantea</i> (L.) R. Br. | Flower |
| 10 | Menstrual problem | <i>Acacia caesia</i> (L.) Willd. <i>Amaranthus gangeticus</i> L. <i>Artemesia vulgaris</i> L. <i>Bombax ceiba</i> L. <i>Cannabis sativa</i> L. <i>Cardiospermum halicacabum</i> L. <i>Catharanthus roseus</i> L. <i>Dendrophthoe falcata</i> (L.f.) Ettingsh. <i>Ficus benghalensis</i> L. <i>Leonotis nepatiifolia</i> (L.) R. Br. Prodr. <i>Wrightia arborea</i> (Dennst.) Mabblerly. | Flower Plant Leaf Root Plant Root Plant Bark Root Plant Bark |
| 11 | Mouth sores | <i>Celosia argentea</i> L. <i>Centella asiatica</i> (L.) Urba. <i>Crotalaria verrucosa</i> L. | Seed Plant Leaves |
| 12 | Muscle pain | <i>Nyctanthes arbor-tristis</i> L. <i>Ixora pavetta</i> Andrews. | Leaves Root, |
| 13 | Nervous disorder | <i>Abrus precatorius</i> L. <i>Centella asiatica</i> L. <i>Mucuna pruriens</i> (L.) DC. <i>Pueraria tuberosa</i> (Roxb. Ex. Willd.) DC. <i>Taramnus labialis</i> (L.f.) Spr. | Seeds Leaf Seeds Tubers Pod |
| 14 | Oedema | <i>Ailanthus excelsa</i> Roxb. | Stem bark |

Table-9: Plants and Plant parts used in Different Human Diseases

| S.No | Disease | Botanical name | Useful part(s) |
|------|---------------------------|---|--|
| 1 | Pains | <i>Ardisia solanacea</i> (Poir.) Roxb. <i>Calophyllum inophyllum</i> L. <i>Clerodendrum serratum</i> L. <i>Ficus religiosa</i> L. <i>Phyla nodiflora</i> L. <i>Momordica charantia</i> L. <i>Solanum melongena</i> L. <i>Terminalia chebula</i> Retz. | Young leaves Seed Bark Stem bark Plant Leaves Root Stem bark |
| 2 | Palpitation of heart | <i>Cipadessa baccifera</i> (Roth) Miq. | Stem bark |
| 3 | Paralysis | <i>Atlantia monophylla</i> (Roxb.) DC. <i>Coccinia grandis</i> (L.) Voigt. <i>Dichrostachys cinerea</i> (L.) Wt. & Am. <i>Ficus religiosa</i> L. <i>Jatropha gossypifolia</i> L. <i>Murraya paniculata</i> (Linn.) Jack. <i>Ocimum gratissimum</i> L. <i>Sida cordata</i> (Burm.f.) Borssum. <i>Smilax zeylonica</i> L. <i>Solanum surattense</i> Burm. f. <i>Tephrosia purpurea</i> (L.) Pers. | Seed oil Root Tubers Root Leaves Root & stem Root Root Leaves Leaf |
| 4 | Peptic ulcers | <i>Cissampelos pareira</i> L. | Root |
| 5 | Peripheral neuritis | <i>Ailanthus excelsa</i> Roxb. <i>Andrographis paniculata</i> (Butm.f.) Nees. <i>Barringtonia acutangula</i> (L.) Gaertn. <i>Citrus aurantifolia</i> (Christm.) Sw. <i>Derris indica</i> (Lam.) Bennet. <i>Holoptelea integrifolia</i> (Roxb.) Planch <i>Mallotus philippensis</i> (Lam.) Muell. Arg. | Stem bark Plant Stem bark Stem bark Stem bark Stem bark Stem bark |
| 6 | Piles | <i>Abutilon crispum</i> (L.) Medicus. <i>Abutilon indicum</i> (L.) Sweet. <i>Achyranthes aspera</i> L. <i>Amorphophallus paeoniifolius</i> (Dennst.) Nicolson. <i>Arisaema tortuosum</i> Wall. <i>Carica papaya</i> L. <i>Chlorophytum laxum</i> R. Br. <i>Ficus recemosa</i> Linn. <i>Homonium comberi</i> (Haiw.) Merr. <i>Lannea coromandelica</i> (Houtt.) Merr. <i>Leucas aspera</i> (Willd.) Link <i>Manilkara hexandra</i> (Roxb.) Dubard. <i>Orthosiphon rubicundus</i> (Don.) Benth. <i>Oryza sativa</i> L. <i>Rivea hypocratoriformis</i> (Desr.) Choisy. | Leaves Seeds Plant Corm Root Latex Tuber Latex Root Plant Stem bark Tuber Grass Grains Plant |
| 7 | Post delivery backache | <i>Buchanania lanzan</i> Spr. | Gum. |
| 8 | Premature growing of hair | <i>Citrullus colocynthis</i> (L.) Schr. | Seed oil |
| 9 | Premature hair fallen | <i>Urena lobata</i> L. | Leaf |
| 10 | Psoriasis | <i>Argemone mexicana</i> L. | Seed |
| 11 | Puerperal fever | <i>Naringi crenulata</i> (Roxb.) Nicolson. | Stem bark |

| | | | |
|----|-----------------|--|--|
| 12 | Purgative | <i>Baliosperum montanum</i> Willd. <i>Chrozophora prostrata</i> Dalz. <i>Cuscuta reflexa</i> Roxb. <i>Ricinus communis</i> L. <i>Rivea hypocrateriformis</i> (Desr.) Choisy | Seed Seeds Seeds Seed oil Plant |
| 13 | Pyorrhoea | <i>Streblus aspera</i> Lour. | Twigs |
| 14 | Rheumatic pains | <i>Atlantia monophylla</i> (Roxb.) DC. <i>Bridelia retusa</i> (L.) Spr. <i>Capparis zeylanica</i> L. <i>Celastrus paniculatus</i> Willd. <i>Cocculus hirsutus</i> (L.) Diels <i>Corallocarpus epigaeus</i> Hook. <i>Cucurma longa</i> L. <i>Delonix elata</i> L. <i>Dichrostachys cinerea</i> (L.) Wt. & Arn. <i>Enicostema axillare</i> Lam. <i>Litsea glutinosa</i> (Lour.) C.B. Robinson. <i>Nyctanthes arbor-tristis</i> L. <i>Ocimum gratissimum</i> L. <i>Pueraria tuberosa</i> (Roxb. ex Willd.) DC <i>Solanum surattense</i> Bunn. F. <i>Tephrosia purpurea</i> (L.) Pers. <i>Tinospora cordifolia</i> (Willd.) Hook. f. & Thoms. <i>Urena lobata</i> L. <i>Vitex negundo</i> L. <i>Woodfordia fruticosa</i> (L.) Kurz. | Seed oil Stem bark Plant Seed oil Root Root Rhizome Leaves Root Plant Fruit Leaves Leaves Tubers Leaves Root Fruit & stem Plant Leaves Leaves |

Table-10: Plants and Plant parts used in Different Human Diseases

| S.No | Disease | Botanical name | Useful part(s) |
|------|-----------------|---|---------------------------------------|
| 1 | Scabies | <i>Abutilon indicum</i> (L.) Sweet. <i>Argemone mexicana</i> L. <i>Calophyllum inophyllum</i> L. <i>Dalbergia sissoo</i> Roxb. <i>Passiflora foetida</i> L. | Leaf Seed Seed Wood Plant |
| 2 | Scalp infection | <i>Phyllanthus amarus</i> Schum. & Thonn. | Leaves |
| 3 | Sexual disease | <i>Hybanthus enneaspermus</i> (L.) Meull. | Fruit |

| | | | |
|----|-------------------|---|---|
| | Skin disease | <i>Abelmoschus crinitus</i> Wall. <i>Achyranthes aspera</i> L. <i>Ageratum conyzoides</i> L. <i>Aristolochia bracteolata</i> Lamk. <i>Artemesia vulgaris</i> L. <i>Azadirachta indica</i> A. Juss. <i>Borassus flabellifer</i> L. <i>Boswellia serrata</i> Roxb. <i>Calamus rotang</i> L. <i>Cipadessa baccifera</i> (Roth.) Miq. <i>Costus speciosus</i> (Koeing ex Retz.) J.E. Smith. <i>Cucurma longa</i> L. <i>Desmodium gangeticum</i> (L.) DC. <i>Ervatamia coronaria</i> Stopf. <i>Eupatorium odoratum</i> L. <i>Flacourtia indica</i> Merr. <i>Jasminum grandiflorum</i> L. <i>Leonotis nepatiifolia</i> (L.) R. Br. Prodr. <i>Leptadenia reticulata</i> (Retz.) Wt. & Arn. <i>Mesua ferrea</i> L. <i>Oroxylum indicum</i> (L.) Vent. <i>Physalis minima</i> L. <i>Plumbago zeylanica</i> L. <i>Pterocarpus marsupium</i> Roxb. <i>Pueraria tuberosa</i> (Roxb. ex. Willd.) DC. <i>Sphaeranthus indicus</i> L. <i>Tabernaemontana divaricata</i> L. <i>Zingiber roseum</i> Roxb. | Root Plant Root Leaf Leaves Seed oil Fruit Bark Bark Leaves Rhizome Rhizome Leaves Root Leaf Root Plant Leaves Plant Seed oil Stem bark Leaves Root Leaves Tubers Plant Flower Rhizome |
| 5 | Small-pox | <i>Andrographis paniculata</i> (Burm.f.) Nees. <i>Azadirachta indica</i> Juss. <i>Rungia pectinata</i> (L.) Nees. | Plant Leaves Leaves |
| 6 | Sperm production | <i>Smilax zeylanica</i> L. | Root tuber |
| 7 | Sprains | <i>Semecarpus anacardium</i> L. | Periarip |
| 8 | Sores | <i>Ageratum conyzoides</i> L. <i>Bidens pilosa</i> L. <i>Calycopteris floribunda</i> (Roxb.) Poir. <i>Eupatorium odoratum</i> L. | Root Leaves Leaves Leaves |
| 9 | Spleen problems | <i>Amaranthus spinosus</i> L. <i>Curculigo orchioides</i> Gaertn <i>Momordica charantia</i> L. | Root Rhizome Leaves |
| 10 | Stomachache | <i>Acorus calamus</i> L. <i>Boswellia serrata</i> Roxb. <i>Calotropis gigantea</i> (L.) R. Br. <i>Cedrella toona</i> Roxb. <i>Cymbopogon Citratus</i> DC. <i>Cyperus rotundus</i> L. <i>Dillenia pentagyna</i> Roxb. <i>Elephantopus scaber</i> L. <i>Garuga pinnata</i> Roxb. <i>Holarrhena pubescens</i> (Buch-Ham.) Wall. Ex. <i>Hugonia mystax</i> L. <i>Madhuca longifolia</i> (Koenig) Macbride. <i>Rauvolfia serpentina</i> (L.) Benth. ex. Kurz <i>Triumfetta rhomboidea</i> J acq. <i>Zingiber roseum</i> Roxb. | Root Gum Root Bark Leaves Tuber Bark Stern bark Root Root Root Root Bark Rhizome |
| 11 | Stomach problems. | <i>Caesalpinia bonduc</i> (L.) Roxb. <i>Gloriosa superba</i> L. <i>Guazuma ulmifolia</i> Lam. <i>Pterospermum xylocarpum</i> (Gaertn.) Sant. & Wagh. | Root Tuber Seeds Fruit |

| | | | |
|----|----------------------|---|---|
| 12 | Sterility | <i>Carica papaya</i> L. <i>Dioscorea bulbifera</i> L. | Seeds Tuber |
| 13 | Suppuration of boils | <i>Datura metal</i> L. | Capsule |
| 14 | Swellings | <i>Albizia lebbeck</i> (L.) Benth. <i>Cardiospermum halicacabum</i> L. <i>Dalbergia paniculata</i> Roxb. <i>Delonix alata</i> L. <i>Elephantopus scaber</i> L. <i>Euphorbia thymifolia</i> L. <i>Gmelina asiatica</i> L. <i>Phyllanthus reticulatus</i> Poir | Flowers Plant Leaf Leaves Root Fruit Stem bark Plant |
| 15 | Tongue ulcers | <i>Cuscuta reflexa</i> Roxb | Plant |
| 16 | Tooth ache | <i>Bidens pilosa</i> L. <i>Calotropis gigantea</i> (L.) R. Br. <i>Carica papaya</i> L. <i>Elephantopus scaber</i> L. <i>Euphorbia thymifolia</i> L. <i>Gmelina asiatica</i> L. <i>Indigofera tinctoria</i> L. <i>Jatropha curcas</i> L. <i>Naravelia zeylanica</i> (L.) DC. <i>Phyllanthus reticulatus</i> Poirt <i>Tabernaemontana divaricata</i> L. <i>Wrightia arborea</i> (Dennst.) Mabblerly <i>Ximenia americana</i> L. | Leaf Latex Root Root Plant Leaf Tender shoots Stem Latex Tender stem Root Leaves Root |
| 17 | Throat infection | <i>Bixa orellana</i> L. <i>Terminalia chebula</i> Retz. | Leaves Fruit |
| 18 | Tuberculosis | <i>Abelmoschus manihot</i> (L.) Medicus <i>Barleria strigosa</i> Willd. <i>Cassia fistula</i> L. <i>Mangifera indica</i> L. <i>Oroxylum indicum</i> (L.) Vent. <i>Terminalia chebula</i> Retz. <i>Thespesia lampas</i> (Cv.) Dalz & Gibs | Root Root Bark Bark Bark Fruit Root |
| 19 | Tumours in stomach | <i>Gymnema sylvestre</i> (Retz.) R. Br. ex Roem. & Schult <i>Trichosanthes tricuspidata</i> Lour. | Root Tuber |
| 20 | Typhoid | <i>Adiantum lunulatum</i> Burm. <i>Thespesia lampas</i> (Cav.) Dalz & Gibs | Plant Root |

Table-11: Plants and Plant parts used in Different Human Diseases

| S.No | Disease | Botanical name | Useful part(s) |
|------|---------|---|--|
| 1 | Ulcers | <i>Albizia odoratissima</i> (L.f.) Benth. <i>Annona squamosa</i> L. <i>Buchanania lanzan</i> Spr. <i>Calycopteris floribunda</i> (Roxb.) Poir. <i>Canna indica</i> L. <i>Cassia tora</i> L. <i>Heliotropium indicum</i> L. <i>Homonoia comberi</i> Merr. <i>Hyptis suaveolens</i> (L.) Poir. <i>Ipomoea nill</i> L. <i>Pouzolzia zeylanica</i> (L.) Bennett. <i>Sida cordifolia</i> L. <i>Waltheria americana</i> L. <i>Xanthium indicum</i> Koenig. | Stem bark Leaves Stem bark Leaves Rhizome Leaves Leaves Root Seeds Plant Leaves Leaves Plant Root |

| | | | |
|---|------------------|--|---|
| 2 | Urinary problems | <i>Abutilon indicum</i> (L.) Sweet <i>Acacia nilotica</i> (L.) Willd. Ex Del. <i>Anogeissus acuminata</i> Wall. Ex Bedd <i>Euphorbia thymifolia</i> L. <i>Hybanthus enneaspermus</i> (L.) Meull. <i>Knoxia mollis</i> R. Br. <i>Pavetta indica</i> L. <i>Physalis minima</i> L. <i>Tragia involucrata</i> L. <i>Oxalis corniculata</i> L. | Tender parts Pod Gum Plant Plant Root Root Fruit Root Plant |
| 3 | Vermifuge | <i>Clitoria ternatea</i> L. | Seed |
| 4 | Vomiting | <i>Canavalia gladiata</i> (Jacq.) DC <i>Cymbopogon citratus</i> DC. <i>Cyperus rotundus</i> L. <i>Elephantopus scaber</i> L. <i>Nelumbo nucifera</i> Gaerth. <i>Tarenna asiatica</i> (L.) O.Ktze. ex Schum. <i>Wrightia tinctoria</i> (Roxb.) R.Br. | Root Leaf Tuber Root Flower Stem bark Stem bark |
| 5 | Wounds | <i>Acacia chundra</i> (Roxb. ex. Rottl.) WiHd. <i>Haldinia cordifolia</i> (Roxb.) Hook. f. ex. Brandis. <i>Ageratum conyzoides</i> L. <i>Argemone mexicana</i> L. <i>Argyrea nervosa</i> (Burm.f.) Boj. <i>Bauhinia vahlii</i> Wt. & Am. <i>Cassytha filiformis</i> L. <i>Centella asiatica</i> L. <i>Chloroxylon swietenia</i> D.C <i>Clematis gouriana</i> Roxb. <i>Cleome viscosa</i> L. <i>Clerodendrum infortunatum</i> L. <i>Dendrophthoe falcata</i> (L.f.) Ettinagsh. <i>Emilia sonchifolia</i> (L.) DC. <i>Evolvulus nummularius</i> . (L.) L. <i>Garuga pinnata</i> Roxb. <i>Gloriosa superba</i> L. <i>Gmelina asiatica</i> L. <i>Heliotropium indicum</i> L. <i>Lantana camara</i> L. <i>Litsea glutinosa</i> (Lour.)C. B. <i>Semecarpus anacardium</i> L. <i>Tridax procumbens</i> L. <i>Urena lobata</i> L. <i>Waltheria americana</i> L. <i>Zizyphus oenoplia</i> (L.) Mill. | Gum Stem bark Root Stem Leaves Bark Leaves Leaves Stem Leaves Leaves Plant Bark Plant Leaf Fruit Leaves Root Leaves Bark Leaf Leaf Bark Leaves |

Of the 426 plants the highest number of plants (40) are used for dysentery, followed by fever (35) skin diseases (29) wounds (27) diarrhoea (27) rheumatic pains (21) diabetes (20) and least number of plants (1) used for boils, psoriasis and pyorrhea etc.

A total of 126 different ailments / diseases are being treated by the 426 plant species either single or in combination with other species. The number of ailments for which a single species is used ranges from 1-9. Out of these 426 species, 71 plants, each

plant curing single ailment, 81 plants, each plant used to treat two ailments, 50 plants, each used for curing 3 ailments, 40 plants curing 4 diseases each, 29 plants curing 5 ailments, 7 plants, each curing 6 ailments each, 5 plants, each curing 7 diseases, 4 plants, each curing 8 diseases and another 3 plants, each curing 9 diseases.

136 plants species are used in combination with other plants, out of these 73 species are used in single combination, followed by 26 species in double

combination, 12 plants used in triple combination, and the 25 plants used in multiple combinations, where as 290 plants find their single use to treat different ailments.

In addition to these ethnomedicinal plants some plant species are used in both ethnomedicine and in material culture i.e. *Anogeissus acuminata*, *Chloroxylon swietenia*, *Dalbergia latifolia*, *Dalbergia sisso*, *Haldinia cordifolia*, *Pterocarpus marsupium*, *Terminalia arjuna* and *Xylia xylocarpa*. Some plants which are available only in Paderu division, they are *Ensete glaucum*, *Mesua ferrea*, *Thalictrum foliolosum*, are promising in curing in certain diseases / ailments. *Mesua ferrea* seed oil is used in skin diseases, dandruff and hair fall; flowers used in cough; buds used in dysentery and piles. The flower juice of *Ensete glaucum* is used in dysentery and in excess bleeding during menstruation period in young girls. The roots of *Thalictrum foliolosum* are used in ophthalmia (eye disease).

4. Discussion and Conclusion

The Anthropological studies on south Indian tribes have been carried out since the beginning of the 20th century [Thurston, (33) Ragavaiah, (34)] Janakiammal, (35) worked on ethnobotany and stressed the importance of ethnobotany and need for seeking the help of the aboriginals or tribes in the tribal regions of Assam, Himalayas, Andaman and Nicobar islands and Western Ghats for ethnobotanical findings. 1963 onwards, S.K Jain studied about the tribal and folklore medicine in Northern India. The earlier workers showed much interest on the plants used for food and culture than the plants used for medicines. In recent years many attempts were made to study the medicinal plants used by various aboriginal tribes and other people in India, particularly in Western Ghats and Eastern Ghats. So many research institutes and universities showed much interest in studying the Ethnobotany in the Eastern Ghats. Visakhapatnam is one of the rich districts of Andhra Pradesh with good forests and rich biodiversity. Visakhapatnam district is situated on the East Coast of India. Paderu Division is the biggest forest division of Visakhapatnam known

as Agency area, situated in the hilly tracts of Eastern Ghats of India.

In Paderu division of several remedies or therapies are made in combination with different plants. Sometimes the recipes are made of 2 to 3 different plant species. Some ingredients such as mustard seeds, black pepper, seeds of cumin, caraway and sesamum oil are used in the preparation of recipes. Some medicinal plants are used for more than one human ailment, for example *Coccinia grandis* is used for snake bite, and other ailments like asthma, paralysis and gastric problems. It also reveals that the same parts of the same plants are used by different tribals of different regions. For example *Gymnema sylvestre* in combination with some other plants is used to cure diabetes by the tribals of Paderu division. The same plants are used for diabetes in West Godavari district [Kalpana (36)] in Chittore district [(Madhavachetty & Rao (37)] Prakasam district [Vijayakumar & Pullaiah (38)] and Vizianagaram district [Lakshmi (39)]. The roots of *Aristolochia indica* are used in combination with other parts of plants for the treatment of snake bite, scorpion bite and for toothache in Paderu division, Visakhapatnam district. Others reported the same uses in West Godavari district [Kalpana (36)] Vizianagaram district [Lakshmi (39)] and in Mahaboobnagar district [Dharmachandra Kumar and Pullaiah (40)]

The same plant species in different forms is used for various ailments in different regions for example *Andrographis paniculata* plant decoction is used for fever and leaves is used for diabetes by the tribals of Paderu division (Visakhapatnam district) and plant decoction used for fever in Vizianagaram district. The roots of *Andrographis paniculata* in combination with other plant is used for snake bite in West Godavari districts [Kalpana (36).]

In the same way the roots of *Abrus precatorius* used for joint pains by the tribals of West Godavari district. [Kalpana (36).] Where as, the root powder is used as antidote for snake bite in Vizianagaram district [Lakshmi (39)] The grain of the same plant is used for family planning in Paderu division and more than 3 seeds are used for suicide in Paderu division.

One plant species is used in curing different ailments in different areas. The whole plant of *Tinospora cordifolia* is used for

stomachache and fever and fruits with honey, in rheumatic pains and stem decoction for rheumatic pains in Paderu division. The whole plant is used for fever in Chittore district also. The roots are used for snake bite in Paderu as well as in West Godavari [Kalpana (36).] The whole plant is used for leprosy in Ananthapur district [Reddy *et. al* (41)] where as aerial roots are used in Paderu division. The root paste of *Plumbago zeylanica* with pepper is used for fits in Paderu but in West Godavari district ([Kalpana (36).] it is used for fits and for skin diseases. In some regions, various parts of the same plant are used to cure the same ailments. For example the roots of *Helicteres isora* are used in Paderu division and seeds of the same plant are used by chenchus for snake bite in Nallamali [Hemambara Reddy *et.al* 42)]

Attempts have been made in the present study to list out various plant resources and their utilization in the Paderu division. The basic data provided here can be utilized for further studies on conservation and cultivation of plant species and for the development of traditional medicine and economic welfare of tribal people of these divisions by different Governmental or Non-Governmental organizations in the state. The information gathered from the tribal people whom reveals cheap crude drugs obtained from plant sources still plays an important role in the interior forest areas for curing various ailments. The therapeutic efficiency of the plants as claimed by the tribal people has to be conformed by scientific scrutiny like phytochemical analysis and drug trial testing. Phytochemical and pharmacological studies of above said plants need to be taken up to find out the exact ingredients that help in the different ailments.

Acknowledgement

The authors are thankful to the Forest officials, tribal doctors and local tribal people of Andhra Pradesh for their help during my field trips.

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