



Traditional medicinal plants used to treat arthritis by tribal people in Eastern Ghats of Andhra Pradesh, India

NV Jayanth Babu¹, P Prayaga Murty^{2*}, GM Narasimha Rao³

^{1,3} Department of Botany, Andhra University, Visakhapatnam, Andhra Pradesh, India

² Department of Botany, Govt. Degree College, Yeleswaram, East Godavari, Andhra Pradesh, India

Abstract

Pain in human bone joints is called arthritis. Arthritis is also known as age related bone degenerated ailment, caused due to wear and tear, wherein, the protective tissues in the joints get damaged, by which, the quality of life is affected. The methodology were adopted which were described by earlier scientists. In the present study, 60 species of plants belongs to 54 genera and 39 families have been recorded which are being potentially exploited by the tribal and non-tribal groups in curing arthritis. There is an urgent need for follow-up ethno pharmacological screening based on tribal claims

Keywords: traditional medicinal plants, arthritis, Eastern Ghats, Andhra Pradesh

Introduction

Pain in human bone joints is called **arthritis**. Arthritis is also known as age related bone degenerated ailment, caused due to wear and tear, wherein, the protective tissues in the joints get damaged, by which, the quality of life is affected. If neglected, the pain is accompanied by, stiffness, swelling, decrease in mobility. In human body, in adults, there are totally 206 bones and 190 synovial joints. The term arthritis is like an umbrella, covering more than 100 types of different arthritis and related diseases. Out of which, the following are very common.

1) Osteoarthritis (O A) 2) Rheumatoid Arthritis (R A) 3) Osteoporosis (O P) 4) Gouty Arthritis 5) Psoriatic Arthritis 6) Fluorosis Arthritis- Skeletal Fluorosis

As per the Latest census, in Urban areas and cosmopolitan cities, about 53 percent of male population, 38 percent of female population, and 9 percent in children are suffering from Rheumatism. In advanced countries like America, more than 50 million adults and 3 lakhs children are suffering from some type of Arthritis. In India over 180 Million people are suffering from Arthritis. In Europe over 120 million people are being affected and on an average spending 200 billion of dollars per year. In view of the larger interest and severity of sufferings of the highest number of Billions of Arthritis patients from all the countries in the world, for creating awareness 12 October is Declared as World's Arthritis Day. In our country National Arthritis Week (NAW) is declared and marked from 19 — 25 th. JUNE. On these days, it was proposed to create awareness among the people, on Arthritis in detail and on several aspects including therapeutical practices, through wide publicity. If arthritis is in acute stage it cannot be cured completely i.e., if the damage caused to joints is more than 70 percent, if not diagnosed and treatment neglected in early stages. For further sustenance, major surgeries are to be resorted to and harmful pain killers, medicines are to be used for a longer period. Finally, patients may be confined to wheel chair.

Almost all the animals are Quadrupeds i.e., they stand and move on their 4 legs keeping their spinal cords parallel to

the ground, so that the body weight is distributed equally on 4 legs and hence no Rheumatism for Animals. In case of man, in the ancient days, was a quadruped and in the process of evolution, became homo-erectus, standing and moving on his 2 legs, keeping his spine perpendicular to the ground. As a result, the load bearing big joints like, both the knees, and spinal cord are affected in most of the people. For this reason, Knee pain and Back pain are very much common in human beings, after they cross the age of 40 years in general. Other Factors responsible are 2) Obesity 3) Addiction to Alcohol 4) Smoking 5) Lack of proper physical exercise 6) Over usage of Joints 7) Presence of abnormal levels of uric acid in blood for a longer period 8) Less intake of Calcium, Vitamin- D, Phosphorus, Magnesium, 9) presence of toxins, free radicals in more quantities in body for a longer period 10) Chronic Constipation 11) Usage of drugs like steroids and other drugs NSAIDS, DMRDS, Immune suppressants for treatment of other diseases 12) Un wanted and un healthy food habits and life style 13) Genetical factors 14) Injuries sustained to bone joints 15) Hormones imbalance 16) Stress and mental worry 17) Living Environment.

In allopathy 25 percent of Allopathic drugs, that are being produced from all pharmaceutical companies in the world, are derived from plants and herbs only. In Homeopathy more than 60 percent of the drugs are manufactured from Plants and Herbs only. In the Forests of Eastern Ghats of our state Andhra Pradesh, occurrence of a rich and varied biodiversity of plant species and valuable medicinal plants could be seen. Tribal and other people who live in nature from the time immemorial and other native doctors living in the villages located in fringes of forest areas are well versed with the wonderful therapeutic uses of several plants and herbs naturally available to them. When compared to modern allopathic medicine and other medicinal practices, the ethno botanical medicinal practices in vogue are effective, cost effective and are safe without any side effects. Now, the value and the importance of ethno medicine is slowly coming out in to lime light. Whereas, lot of efforts are to be made, by the government to bring out

such hidden treasure of knowledge and to be made accessible to the public for their benefit. Pharmacognostic studies are to be conducted extensively from time to time for the plants which are not yet covered, to ascertain the active ingredients responsible for curing Arthritis effectively. Certain plants are having the medicinal properties to cure Arthritis for ex. *Vanda cristata* is having 13 Flavonoids and is very much useful in curing Bone Fractures and Arthritis. *Bamboosa arundanaceae* contains Benzoic acid, Cynogenicglycoside, Silicon, Calcium, Phosphorus, Zinc and is used in curing Bone Fractures and Arthritis. *Cannabinus sativa* makes bones much stronger. Plants containing Gamma linoleic acid, Glucosamine sulphate and Chondroitin sulphate and Glycol reduces inflammation in joints and are responsible for the health of the bones. Silica present in Horse tail equisetum of equisetum family, fixes calcium to be absorbed by the body for repairing damaged bone tissues. It also contains a key protein called collagen, ie., present in bone cartilage, ligaments and bones.

In spite of enormous progress in modern medical system, about 80% of the world population still depends on traditional systems of medicine for primary health care, which is true in Indian scenario also (Anonymous, 2002)^[2]. Medicine in contemporary India is a fascinating blend of traditional system with conventional one and often been used for various historical, cultural and ecological and socio economic reasons (Khan, 2006; Kunwar *et al.*, 2010)^[10, 11]. Based on the information presented in above paragraphs, present investigation was carried out to explore the treatments methodologies and medicinal plants species are utilized to treat the arthritis.

Study area

The Eastern Ghats are a long chain of broken hills that pass mainly through three states viz., Orissa, Andhra Pradesh and Tamilnadu^[3]. They run about 1750 km with an average width of about 100 km between Mahanadi and Vaigai rivers along the Indian east coast. In Andhra Pradesh and Telangana they situated between 120 38' – 22° N latitudes and 780 50' – 840 46' E longitudes. The altitudes range from 300 – 1000 M above MSL and the vegetation varies from semi-evergreen forests to scrub jungles. Tribes like Koyas, Kondareddis, Valmikis, Chenchus, Lambadas, Jatapus, Savaras, Bagatas, Porjas, Khonds, Yanadis and Yerukalas are inhabitants of the forest regions of Eastern Ghats.

Materials and Methods

Survey on ethno medicinal plants

The various methods used for the study of ethno medicinal plants used for the arthritis, were essentially the same as

described by (Jain 1981, 1987, and 1989; Chadwick and Mars, 1994 and Martin, 1995)^[6, 7, 8, 3, 12]. The main emphasis was given to intensive field. The field trips were planned in such a way so as to cover the selected tribal pockets in every month of a year. Each field trip was of 2-3 days duration covering 2-3 pockets in a day.

Following types of informants were chosen by selected sampling and random sampling methods.

- The tribal doctors (Vaidyas) and other local herbal medical practitioners.
- Village headmen, priests and other prominent persons.
- Those who are collecting timber, fuel, herbs and other forest produce in the forest areas.
- Tribal people working in the fields, preferably elders.

Discussions were made at times with local practitioners not only for gathering information but also for confirmation of the uses of same plant recorded from different informants at different places of the study area.

During the field work, personal observations were made in the field book and recorded the data on phenology, habit, habitat. Every attempt was made to locate the plants and voucher specimens were collected in triplicate in both flowering and fruiting stages. Each plant was critically studied and identified with the help of Gamble's "Flora of the Presidency of Madras" (Gamble, 1915-1936)^[4] using the field observations. The identifications were later confirmed with the help of Flora of Andhra Pradesh (Pullaiah and Chennaiah, 1997, Pullaiah and Ali Moulali, 1997, Pullaiah, 1997)^[16, 17, 18] and by comparison with authentic literature which are locally available.

Results and Discussion

In the present study, ethno medicinal plants used for arthritis problems have been collected from the tribal groups inhabiting in the area by frequent visits and interaction with the tribal communities. In the present study 60 species of plants included in 54 genera and 39 families have been recorded which are being potentially exploited by the tribal and non-tribal groups in curing arthritis. The in detailed information like remedies, part used, dosage and mode of preparation are presented in (Tables 1-6). Several researchers like (Ramadasa *et al.* 2000, Sudhakar Reddy and Raju, 2000, Nagalakshmi, 2001, Jeevan Ram and Venkata Raju, 2001, Muralidhar Rao and Pullaiah, 2001, Ramarao Naidu, 1996, Abbas, 2003, Imam *et al.*, 2003, Venkataratnam and Venkata Raju, 2005, Mubeen *et al.*, 2005, Raju and Reddy, 2005, Rao *et al.*, 2006, Reddy *et al.*, 2006)^[20, 24, 15, 9, 14, 21, 1, 5, 25, 13, 19, 22, 23] have been worked on the ethnobotanical aspects but they have not concentrated exclusively on the arthritis.

Table 1: Plants are used for oral administration, act as purgatives and are very much effective in curing arthritis.

S. No.	Name of the species Family Local name	Part used	Dose	Method of Preparation and usage
1.	<i>Ricinus communis</i> Euphorbiaceae Aamudamu	Seeds and roots	1kg	1 kg of fresh and clean roots of castor plants are to be pounded and to be placed in a stainless-steel vessel containing 4 litres of water. To be boiled till to get finally 1 litre of decoction. This is to be filtered and to be transferred to another vessel containing 1 litre of pure castor oil and boiled till to get finally 1 litre of concentrated castor oil. This oil is given to Arthritis patients @ 10 ml. mixed in milk or Luke warm water and administered orally in the night, before bed time daily or on alternate days for a period of 40 days. This acts as not only a purgative, but removes and drains out from all the bone joints, all the deposited salts as well as unwanted wastes, causing damage and inflammation. Dosage is adjusted depending on the condition of the patient.

2.	<i>Anisomeles malabarica</i> Lamiaceae Magabeera/Magalinga	Leaves Juice	5 to 10 ml	Juice obtained from leaves is to be mixed in the milk of she-buffalo, in Luke warm state and made into curds. The milk of a buffalo given birth to male calf is preferred. The curds thus prepared are to be mixed with rice and eaten in the morning. The vitiated "vaatham" along with all the deposited salts as well as unwanted wastes piled up in the body including free radicles causing damage and inflammation of joints due to RA are drained out completely. This process is to be repeated periodically to achieve anticipated results.
3.	<i>Moringa tomentosa</i> Rubiaceae Togaru	Stem Bark Powder	10 gms	Stem bark powder is to be mixed in water, 60 ml. decoction is prepared and is given orally for relieving vitiated "vaatham" and for draining out toxins from the body.
4.	<i>Euphorbia antiquorum</i> Euphorbiaceae Bonthajemudu	Latex or Viscous acid milky juice	2 to 5 drops	Latex is mixed in boiled and Luke warm milk, made into curds and eaten with rice. This act as purgative, acts very much effectively on "Aamavaatham" (RA) and drains out all the unwanted salts, toxins, free radicles waste materials deposited in joints and from the body
5.	<i>Senna alexandrina</i> Caesalpinioideae Sunamukhi/ senna	Leaves power	3 to 10 grams	Leaf powder is to be mixed in 50 ml of water and given orally at bed time every day or on alternate days for 20 days. This acts not only as a purgative but expels all types of toxins, free radicals, "vaatham" present in arthritis patients.

Table 2: Plants that strengthens kidneys and help in excretion of nitrogenous waste materials, unwanted salts, and free radicals generated in arthritis patients.

S. No.	Name of the species Family Local name	Part used	Dose	Method of Preparation and usage
1	<i>Boerrhavia diffusa</i> Nyctaginaceae Punarnava / telligalijeru	Whole plant powder	2 gms	The indicated powders of these 3 species are to be mixed in 60 ml of water and boiled to get decoction and given orally every day, for 40 days.
2	<i>Abutilan indica</i> Malvaceae Tutturubenda	Root powder	2 gms	
3	<i>Aervalanata</i> Amaranthaceae Konda pindi	Root powder	2 gms	

Table 3: Plants used for boosting immunity, preventing and curing Arthritis effectively in the early stages

S. No.	Name of the species Family Local name	Part used	Dose	Method of Preparation and usage
1	<i>Allium sativum</i> Liliaceae Garlic / vellulli	Bulb's paste	4 clefts	These 3 ingredients are to be mixed in 100 ml of water, boiled for 10 minutes, cooled and filtered. This is to be taken early in the morning for 40 days.
2	<i>Zinziberoffinialis</i> Zinziberaceae adrak / allam	Rhizome paste	1 cm length of rhizome (skin peeled)	
3	<i>Citrus aurantifolia</i> Rutaceae Acid lime / nimma	Fruits	1 fruit juice	
4	<i>Terminalia chebula</i> Combretaceae Karaka	Dry fruit pulp powder	1 gram	The species shown against the Sl. nos.4 to 9 are to be mixed together, made into decoction and taken orally every day for a period of 3 months.
5	<i>Terminalia bellerica</i> Combretaceae Taani	Dry fruit pulp powder	1 gram	
6	<i>Phyllanthus emblica</i> Euphorbiaceae Usiri	Dry fruit pulp powder	1 gram	
7	<i>Tribulus terrestris</i> Zygophyllaceae palleru	Fruits powder	1 gram	
8	<i>Pedaliium murex</i> Pedaliaceae Enugapalleru	Fruits powder	1 gram	
9	<i>Hygrophylla auriculata</i> Acanthaceae Neerugobbi	Seed powder	1 gram	Green leaves of Nyctanthus are crushed and mixed in 100 ml water. Emblica fruit powder and soaked Trigonella seeds are also to be added and boiled to get decoction. This is to be taken orally in 3 split doses in a day for 1 month.
10	<i>Nyctanthes arbortristi</i> Oleaceae Paarijaatamu	Green leaves	8 nos	
11	<i>Phyllanthus emblica</i> Euphorbiaceae Vusiri	Fruit pulp powder	5 gms	
12	<i>Trigonella foenum- graecum</i> FaboideaeMenthulu	Seeds	2 gms / 1 tea spoon soaked in water	

Table 4: External Applications--On Painful Joints- For Pain Relief

S. No.	Name of the species Family Local name	Part used	Dose	Method of Preparation and usage
1	<i>Ricinus communis</i> Euphorbiaceae Castor, Aamudam	Pure seed oil + Roots extract	1 kg. 1 lit.	1 kg of castor roots powder is mixed in 4 lits. of water and to be boiled in earthen vessel and screened to get 1 lit. of concentrated solution mixed with one lit. of pure caster seed oil, and applied every day on the painful joints.
2	<i>Vitex negundo</i> Verbinaceae Vaavili	Leaves	1kg	1 kg. of vitexnegundo leaves are to be pounded, mixed in 4 lits.of water in a earthen vessel. Boiled till 4 lits.of water become to 1 lit.and filtered. This solution is to be mixed in 1 lit. of gingelly oil in another vessel and boiled to get finally one lit of the concentrated oil. 10 to 15 grams of pepper powder is added to this. This is applied every day on painful joints of Arthritis.
3	<i>Dodonea viscosa</i> Sapindaceae	Leaves	1 kg	1 kg. of Dodoneaviscosa leaves are to be pounded, mixed in 4 litsof water in a earthen vessel. Boiled till 4 lits. of water become to 1 litand filtered. This solution is to be mixed in 1 lit.of gingelly oil in another vessel and boiled to get finally one lit.of the concentrated oil. This is applied every day on painful joints of Arthritis. Dodonea leaves can also be pounded and tied around painful joints with a thin cloth.
4	<i>Celastrus paniculata</i> Celastraceae Jyothishmathi/ Malkangani	Seed	10ml	Oil extracted from the seed is applied on painful joints of arthritis.
5	<i>Litsia glutinosa</i> Linaceae Naramamidi	Seed	10ml	Oil extracted from the seed is applied on painful joints of arthritis
6	<i>Simaroubaglauca</i> Simaroubaceae	Seed	10ml	Oil extracted from the seed is applied on painful joints of arthritis
7	<i>Barlaria montana</i> Acanthaceae Mulugorinta	Leaves juice	25gram	Leaves juice is applied gently on painful joints of arthritis.
8	<i>Calophyllum inophyllum</i> Clusiaceae Ponnachettu	Seed	10ml	Oil extracted from seed is applied gently on painful joints of Arthritis
9	<i>Allium sativum</i> Liliaceae Garlic/ vellulli	Bulbs	400grm	400 gms. of garlic bulbs paste is mixed in 1 lit of gingili oil stirred thoroughly on gentle fire for 5 minutes- fire is put off, allowed to be cooled and applied daily on painful joints of arthritis.
10	<i>Ruta chalepensis</i> Rutaceae Sadapaku	Whole plant	10ml	Oil extracted from whole plant is applied externally on the painful joints.
11	<i>Pinus sps</i> Pinaceae	Resin	10gram	Resin obtained from stem bark is applied on the painful joints.
12	<i>Brassica napus</i> Brassicaceae Canola, Aavalu	Seed	250 grams	a. 250 grams of Canola / Mustard oil is taken in a glass bottle and to keep it aside. b. In a separate glass bottle place and mix 100 grams of pure camphor (cinnamomumcamphora/ karpuram) + 100 grams of Menthol crystals (Mentha species called pudinapuvvu) + 100 grams of Vaamupuvvuie., (crystals of the extract of the plants Trachyspermumammi) together. A chemical reaction takes place and within 10 minutes these three solids would be converted in to a liquid/ oil. Add A+B = to get a mixture of an oil. The application of the above oil gives relief for all types of rheumatic pains. (OR) A and B can also be used separately.
13	<i>Cissus pallida</i> Vitaceae Adavigumjadi	Roots	50 grams	Bruised roots are applied on swellings of arthritic joints
14	<i>Cleome viscosa</i> Cleomaceae Vaaminta	Leaves and fruits	25 grams	Leaves along with fruits are to be made into paste and applied on the painful joints
15	<i>Cleome gynandra</i> Cleomaceae Tellavaaminta	Leaves and fruits	25 grams	Leaves along with fruits are to be made into paste and applied on the painful joints
16	<i>Cuscuta reflexa</i> Cconvolvulaceae Bangaaruteega, chetlameedapaachi	Whole plant	50 grams	Whole plant's paste is applied and bandaged on painful joint
17	<i>Vanda cristata</i> Orchidaceae Badanika, kodikallachettu	Whole plant	50 grams	Whole plant's paste is applied and bandaged on painful joints
18	<i>Argyrea nervosa</i> Convolvulaceae Samudrapaala	Leaves	100 grams	Leaves are made into paste and bandaged on the painful joints.
19	<i>Merrimeea tridantata</i> Convolvulaceae Seethammavaarijada	Whole plant	100 grams	Whole plant is made into paste and applied on painful joints
20	<i>Achyranthus aspera</i> Amaranthaceae Vuttareni	Whole plant	100 grams	Whole plant is made into paste and applied on painful joints
21	<i>Cardiospermum helicacabum</i> Sapindaceaevekkuduteega	Whole plant	100 grams	Whole plant is made into paste and applied on painful joints
22	<i>Delonix alata</i> Caesalpinaceae Sunkesula	Leaves	100 grams	Leaves paste is applied on the painful joints.
23	<i>Crateva roxburghii</i>	Leaves	100	Leaves paste is applied on the painful joints.

	Capparidaceae Isukaraasi		grams	
24	<i>Euphorbia tirucalli</i> Euphorbiaceae kaadajemudu, sannajemudu	Latex	10ml	Latex of this plant is applied externally on painful joints.
25	<i>Abutilon indicum</i> Malvaceae Tutturubenda	Leaves	100 grams	Leaves paste is applied externally
26	<i>Coldenia procumbens</i> Boraginaceae Chepputtattaku	Leaves	100 grams	Leaves paste is applied externally
27	<i>Commifera mukul</i> Burseraceae Guggulu	Resin	5 grams	Gum resin mixed with Zingiberofficianalis rhizome paste is applied externally on the painful joints.
28	<i>Pergularia daemia</i> Asclepiadiaceae Dustapaaku	Whole plant paste	25 grams	Whole plant's paste is mixed with turmeric powder and applied externally on painful joints of arthritis
29	<i>Nerium oleander</i> Apocynaceae Tellaganneru	Leaves	10gr	Leaves paste is applied externally on painful joints.
30	<i>Plumbo zeylanicum</i> Plumbaginaceae Tellachitramulam	Leaves	10gr	This plant is a Vesicant and applied in acute conditions.
31	<i>Plumbago rosea</i> Plumbaginaceae Yerrachitramulam	Leaves	10gr	Leaves of this plant are Vesicant and applied in severe/acute conditions.
32	<i>Holoptelia integrifolia</i> Ulmaceae Nemalinaara	Leaves	10gr	Leaves are vesicant. Leaf is dipped in water for a while and placed on knee/ painful joint and bandaged in severe and acute condition.
33	<i>Sansevieria roxburghii</i> Agavaceae	Leaves juice	10gr	Leaves are gently heated on fire and squeezed to get juice and applied on painful joints.
34	<i>Pueraria tuberosa</i> Fabaceae Nelagummu	Tuber paste Fabaceae	50 grams	The plant parts shown against sl. Nos. 34 and 35 are made into a paste and applied externally on painful joints of Arthritis.
35	<i>Brassica juncea</i> Braicaceae Mustard	Seed	5 grams	
36	<i>Capparis zeylanica</i> Are-donda	Leaves	15 grams	Leaves paste is mixed with egg white yolk, poultice is prepared and applied on painful joints of Arthritis
37	<i>Phyla nodiflora</i> Verbinaceae Jalapippalii	Whole plant	50 grams	Whole plant's paste is applied on painful joints of Arthritis.

Plants used for relieving pain through hot water herbal bath

The following plants provide immediate relief from all types of body pains, like pains of Arthritis, pains of all limbs of body, Back pain, Knees pain and also muscular pains caused due to lactic acid secretion, in excess, resulted from out of

physical exertion. A medicated bath is to be taken in the evening i.e., at the end of the day, with hot water containing the infusions of the indicated plants, to the maximum bearable temperature. This is very much effective and by this, a person can get immense relief from all types pains for a period of 1 to 3 days, without using harmful pain killers

Table 5: Plants used for relieving pain through hot water herbal bath

S. No.	Name of the species Family Local name	Par used	Dose	Method of Preparation and usage
1	<i>Vitex negundo</i> verbinaceae vaavili	Leaves	1 kg	About 20 lits. Of water is to be boiled in a vessel by mixing about 1 kg of green leaves in the water and taken hot water bath to get immediate relief.
2	<i>Bambusa arundinaceae</i> Poaceae	Leaves	1 kg	About 20 lits. Of water is to be boiled in a vessel by mixing about 1 kg of green leaves in the water and taken hot water bath to get immediate relief.
3	<i>Azadirachta indica</i> Meliaceae Neem	Leaves	1 kg.	About 20 lits. of water is to be boiled in a vessel by mixing about 1 kg of green leaves in the water and taken hot water bath to get immediate relief
4	<i>Eucalyptus globulus</i>	Leaves	1 kg	About 20 lits. of water is to be boiled by mixing about 1 kg of green leaves in the water and taken hot water bath to get immediate relief
5	<i>Abutilon indicum</i> Malvaceae Tuthurubenda.	Leaves	0.5 kg	About 20 lits. of water is to be boiled in a vessel by mixing about 500 grams of leaves and taken bath to get immediate relief
6	<i>Senna occidentalis</i> Caesalpinaceae Kasinda	Leaves	0.5 kg	About 20 lits. of water is to be boiled in a vessel by mixing about 500 grams of leaves and taken hot water bath to get immediate relief
7	<i>Dodonaea viscosa</i> Sapindaceae Bandedu	Leaves	1 kg	About 20 lits. of water is to be boiled in a vessel by mixing about 1 kg of green leaves and taken hot water bath to get immediate relief
8	<i>Achyranthus aspera</i> Malvaceae Vuttareni	Whole plant	1 kg	About 20 lits. of water is to be boiled in a vessel by mixing about 1 kg of green leaves and taken hot water bath to get immediate relief
9	<i>Hibiscus planifolius</i> Malvaceae	Leaves	1 kg	About 20 lits. of water is to be boiled in a vessel by mixing about 1 kg of green leaves in the water and hot water bath is taken to get immediate relief

	Konda pratti			
10	<i>Clearodendron phlomidus</i> Verbenaceae	Whole plant	1 kg	About 20 lits. of water is to be boiled in a vessel by mixing about 1 kg of green leaves and hot water bath is taken to get immediate relief
11	<i>Cardiospermum helicacabum</i> Sapindaceae. Vekkuduteega	Whole plant	0.5 kg	About 20 lits. of water is to be boiled in a vessel by mixing 500 grams of green leaves and hot water bath is taken to get immediate relief
12	<i>Albizia amara</i> Mimosaceae Cheekireni/ chigara	leaves	1 kg	About 20 lits. of water is to be boiled in a vessel by mixing about 1 kg of green leaves and hot water bath is taken to get immediate relief. Soap need not be used for this bath.

Special diet being prescribed by the local village vidyas for Strong & Healthy Bones, Development of Synovial fluid and cartilage in the Bone joints

- *Setariaitalica/* Fox millets. Family. Poacea, Local name: Korraluand
- *Triticumdicocum/* wheat. Family. Poaceae, Local name: Godhumalu, seeds of Godhumalu andkorralu are made in to Rawa (broken in to small pieces), cooked and eaten daily in place ofRice/pulka.
- *Eleusinecoracana/* Finger millet. Family: Poaceae, Local name: Ragi. Ragi seeds powder is cookedwith water to make Jawa/ soup, to be consumed with curds/jaggery made from ie., *Saccharumofficinarum/sugar* cane juice and to be taken orallydaily.
- *Sorghum bicolour/*Great millet, Family: Poaceae. Local name: Jonna. Jonna seeds powder is usedto prepare Rotis and eaten along with palak/Bhendi currydaily.
- *Vigna mungo/*Black gram, Family: Fabaceae. Local name: Minumulu. Seeds are soaked in water, grinded into paste roasted in gingely oil- olive oil and vadas are prepared and consumed daily.or, seeds are tofried in ghee, powdered, mixed with cow ghee and jaggery powder made into round balls called Sunni vundalu (each weighing about 20 grams) and eaten daily.
- *Sesamumindicum/*Gingelly seed, Family: Pedaliaceae, Local name: Nuvvulu. Nuvvulu seeds are tobe powdered and to be mixed with pure jaggery and eaten daily. Egg white yolk 2 nos. are to be consumed / swallowed in raw along with jaggery daily followed by intake of one glass of cow milk mixed with one to two grams of Gomuthra Shilajith.
- *Abelmoschusesculanthus/* Ladies finger. Family: Malvaceae, Local name: Bhendi is to be consumed daily.
- Piper betle / Betel leaves, Family: Piperaceae. Local name: Tamalapaku: Betel leaves 3 to 4 nos are to be chewed alongoptimum quantity of shell lime powder daily and to be gulped without spitting.
- *Annona sqamosa/*Custard apple, Family: Anonaceae. Local name: Seethaphal. Fruits are to be taken before meal
- *Annona reticulate /* Family: Anonaceae. Local name: Ramaphal. Fruits are to be taken before meal
- *Psidiumguajava/* Guava, Family: Myrtaceae. Fruits are to be taken before meal
- *Musa paradisiaca /* Banana, Family: Musaceae. Fruits are to be taken before meal
- *Phonixdactylifera /* Date palm, Family:Arecaceae, Local name; khajoor fruits are eaten daily.
- *Citrus sinensis/* Batevia, Family: Rutaceae, Local name: Bathhaii, Fruit juice is to be consumed.

- *Citrus lanatus/*Indian squash melon. Family: Cucurbitaceae,Puchhakaya, Juice of fruit pulp along with seeds is to consumed daily.
- *Spinaciaoleracea/* spinach, Family: Chenopodiaceae. Leaves are made into curry and taken.
- *Basella alba /* Basellarubra, Bachhali, Family: Basellaceae, Leaves are made in to curry and eaten daily for cartilage development.
- *Lycopersiconesulentum/*Tometo, Family: solanaceae. local name :Tometo.
- *Daucascarota/*carrot, Family: Apiaceae
- *Beeta vulgaris /*Beet root, Family:Chenopodiaceae
- *The above 3 items each weighing 100 grams each are to be made into juice byadding adequate water and to be taken orally everyday*
- *Moringaolefera/* drumstick leaves, Family:Moringaceae
- *Cajanuscajan /* Red gram seed, Family:Fabaceae

The Above two items are to be cooked and consumed along with Jowarroti. Intake of Rice andothercurries are to be avoided completely. Optimum quantities of the above-mentioned qualitative food is to be taken.

- *Cocosnucifera /* coconut, Family: Arecaceae. Coconut water is to be consumed profusely every day.
- *Amaranthusviridis/* *Thotakura /* Family: Amaranthaceae is to be made it to curry and to be consumed with jowar roti

Conclusion

There is an urgent need for follow-up ethno pharmacological screening based on tribal claims and beliefs and formulates and standardizes some herbal medicines based on ethno therapeutics either with single plant or in combination for their safe and sustained use for human welfare.

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