

Applications of Ethno medicine to treat bone fractures in Eastern Ghats region of AP, India.

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Abstract: Bone fractures are caused due to accidents or violent acts caused by others either willfully or negligently. In some cases it may be due to falling or due to pathological reasons or due to osteoporosis. The present survey provides information on the therapeutic properties of 37 plants species belonging to 35 genera and 23 families used for bone fractures by the natives of AP region in Eastern Ghats of India. Information on botanical name, vernacular name, family, part used, mode of drug preparation administration and mode of poultice is provided. Information gathered in this study will act as vital data for scientific community.

Key words: Bone fractures, ethno medicine, Eastern Ghats of India.

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I. Introduction

Bone fractures are caused due to accidents and fractures are accompanied by severe pain, swelling and injuries also. Fractures include 1) Hair line bone fractures 2) Incomplete fractures (Green stick fractures) 3. Simple bone fractures (Chalk stick Fractures) 4) Multiple fractures. In nature there are some wonderful plants and traditional medical practices in vogue from the time immemorial for healing the fractures quite effectively. In Tribal and Folk (Jaanapada) medicine, hair line fractures, incomplete fractures, simple fractures can be healed safely and easily. Whereas, for treating multiple fractures, or compound fractures proper attention, care, Diagnosis through X Rays and expertise. Medical treatments are essentially required to re-set the fractured bone/bones, as well as for taking up surgery if required. After X Ray, resetting the fractured bone to its original alignment/after surgery, for ensuring effective, qualitative, quick re-union of broken bones as well as for alleviating severe pain, the proven, Ethno Botanical/ Tribal/Folk/Jaanapada medicinal practices in vogue are required to be followed. For alleviating unbearable pain, usage of powerful Pain killers and injections for longer period, may harm the health of the individuals. More over there is no specific treatment in Allopathy for joining the fractured bones effectively. Hence there is a need to follow traditional proven Ethno botanical/Jaanapada medicinal practices after Allopathic treatment which are safe, effective and are without side effects.

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 ; Anonymous,(2002) [1] 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 economical reasons ;(Khan, (2006)[2] Kunwar et al., (2010) [3]. It is very important to document, analyze and evaluate this knowledge not only for their cultural reasons, but also for their commercial value, as ethno medicinal uses of plants is one of the most successful criteria used by the pharmaceutical industry in finding new therapeutic agents(Cox andBalick,1(994) [4]. In the present study information was collected on the use of some medicinal plants in the East Ghats of India to treat the bone fractures.

II. Study area

The Eastern Ghats are a long chain of broken hills that pass mainly through three states viz., Orissa, Andhra Pradesh and Tamilnadu (Legris and Meher-Homji, (1982) [5]. 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.

III. Materials and methods

Generally Jaanapada/ folklore and Tribal medicinal practices are not easily revealed or shared with anyone. They avoid by saying that, if they tell the names of the Plant species their medicine will not work. Tribal people may share their knowledge with certain people under special circumstances. Whereas, the village

folk native Doctors living in the villages located in the fringes of forest areas, generally will not reveal their secrets and inherited methods of treatment so easily. As a Forest officer, senior author (Jayanth Babu) was privileged to work and perambulate in all the interior Forest areas of Eastern Ghats located in Andhra Pradesh as well as in Telangana State for more than 35 years of his service. In that process, he came across with so many tribal people, as well as many native doctors who are well versed in treating ailments easily with the plants available in Nature locally. As a field Botanist, very much enthusiastic and inquisitive to know the wonderful healing properties of certain plants, from the beginning, and he spent most of his valuable time i.e., years together to meet them repeatedly for interacting with such knowledgeable people to know the proven, effective, established secret formulae and therapeutic values of such wonderful plants. In the process, He was successful in acquiring the valuable knowledge from them for treating many ailments. While doing so, He used to compare the medicinal practices and medicinal uses of herbs in vogue in different areas, being used for curing different ailments. Senior author also used to enquire/ verify and ascertain in the field, with the local doctors and Tribal people about the information available in various books/papers already published. The methodology was adopted as described by Jain (1964, 1981, 1987, 1999) [6-9] Chadwick and Marsh (1994) [10], Hemadri (1994) [11] and Martin (1995) [12].

Procedure to be followed for collection of the required plant materials and further processing including the methods of preparation of infusions, dosages, different poultices used for curing bone fractures, and for pain management

1. Fully developed /mature leaves/Flowers are to be collected in the morning time preferably at the time of sunrise and to be use the same preferably before one month.
2. Bark, from stem / Roots is to be collected from healthy trees, preferably at the time of flowering or fruiting. Cuticle / dead material/ flakes are to be rejected.
3. Underground rhizomes roots are to be collected:
 - a) From the annuals before flowering
 - b) From the bi-annuals before flowering or at the end of the year
 - c) From the perennials before leaves begin to appearThe collected plant materials like Flowers, leaves are to be dried in shade under sunlight
4. The dried plant material is to be stored in dry place after short exposure to sunlight to avoid fungus attack and to be stored in bags/boxes duly labelling the details.
5. Roots, Stems and Bark of stem/roots can be dried under sun directly labelled and preserved.

Preparation of Infusions and Decoctions.

Stainless steel vessels are to be used for boiling pure and soft water. Vessels of aluminium, copper, brass, zinc and other metal vessels are to be avoided.

Hot water infusion: pure water is to be boiled in stainless steel vessel. The collected flowers or pounded leaves, or powders of roots, or stem or stem bark, root powders or seeds, Rhizomes etc., as specified /indicated to be added in the boiling water and flame is to be put-off. Steep for 15 minutes and allowed to stain.

Cold water infusion: Indicated plant material is to be Steeped in cold water for a night and to be used in the morning.

Decoction: The Root/ Stem/ Bark etc., powders are gently boiled in pure water for 10 minutes.

Dosage for adults: 5 grams per 1 day. 5 grams of plant material powder as indicated can be mixed in 100 ml. of water can be used /consumed twice a day in two split doses in the form of Decoction/Hot or Cold water infusions. The decoctions/infusions are to be prepared every day afresh and should not be stored.

Dosage for children: Age 2 to 5 years 1 gram of plant powder is specified. Age 6 to 10 years 2 grams of plant powder is specified. Age 11 to 14 years 3 grams of plant powder specified.

Poultice is a soft and paste like medicated plant moss, mixed along with other ingredients in various forms, applied on the body i.e., on the affected body parts to overcome inflammation, as well as for joining the fractured Bones. Poultice is applied on the skin around the fractured bone as a coat with uniform thickness. A thin, clean white cloth or muslin cloth is to be wrapped over the poultice tightly, in the form of bandage and splints are placed over the bandage and again wrapped with the same cloth for arresting the movements of the fractured limb, as well as for ensuring stability.

Hot poultice: If the poultice ingredients are applied in heated condition, to ward off severe inflammation, it is called Hot poultice.

Cold poultice: cold poultices have cooling effect on the swollen /inflamed Sprains, Fractures, Dislocations and Rheumatism.

Along with the specified /indicated plant material to be used for bone setting certain ingredients are to be mixed and applied as poultice for the purpose of

1. Enhancing or increasing the effectiveness of the medicinal properties the plant/ herb being used
2. Supply of required elements like calcium, Magnesium, phosphorous, and other essentials required for causing, quick healing of fractured bone as well as for creating strong, qualitative and effective Bond in between fractured bone. Depending on the intensity of fracture/fractures, and usage or applicability the other ingredients of poultice change and accordingly poultices are classified as detailed below.

IV. Results and discussion

In the present study a total of 37 plant species belonging to 35 genera and 23 families have been identified as potential source for treating bone fracture. The scientific names of the species along with families, vernacular names, part(s) used, doses and mode of preparation are recorded in Table1-4 and three types of poultice were recorded. Special diet is also recorded. Our study of crude drugs yielded 35 species used for bone fractures. Among them *Vanda tessellate*, *Sterculia urens*, had been previously reported for bone fractures (Jain,(1991) [13]; Kirtikar and Basu, (1935) [14] Rama Rao and Henry, (1996) [15]. Similarly *Vanda tesellata* and *Dodonea viscosa* reported by Venkata Ratnam and Venkata Raju ,(2008) [16] Information on the remaining crude drugs was not found in the literature.

Table-1 Statement showing the plants used for curing bone fractures, dosages and method of usage (for external application only)

S. NO	Name of Species/ Family / Local name	Plant Parts Used and Doses	Mode of Preparation and Usage
1	<i>Achyranthus aspera</i> Amaranthaceae Vuttareni	Whole plant paste 25 grams.	Fine pastes of the specified plant parts of <i>Achyranthus</i> and <i>Wrightia</i> are to be made into fine paste , and to be applied externally as poultice. For better results, the two plant pastes are to be mixed with other ingredients specified in the formula furnished under POULTICE II preparation and applied as poultice on the skin around fractured bone. This results in alleviation of pain and for re-union of fractured bone
2	<i>Wrightia tinctoria</i> Apocynaceae Palabarika	Leaves paste 25 grams.	
3	<i>Pedaliium murex</i> Pedaliaceae Yenugu Palleru	Leaves, Fruits/seeds paste 25 grams	Fine pastes of the specified plant parts of <i>Pedaliium murex</i> and <i>Wattakaka volubilis</i> are to be made and applied externally as a poultice. For better results, the two plant pastes are to be mixed with other ingredients specified in the formula furnished under POULTICE II preparation and applied as poultice on the skin around the fractured bone. This alleviates pain and joins the fractured bones qualitatively and effectively.
4	<i>Wattakaka volubilis</i> Asclepiadaceae Dudi paala teega	Leaves and Roots Paste 25 grams	
5	<i>Ipomea sepiaria</i> Convolvulaceae Golla jiddu or Gorre jiddu	Leaves paste 25 grams	Fine paste of the specified plant parts of <i>Ipomea sepiaria</i> or <i>Ipomea hedirfolia</i> to be applied externally as a poultice. For better results, any one of the plant paste is to be mixed with other ingredients specified in the formula furnished under POULTICE –II preparation and applied as poultice on the skin around the fractured bone and bandaged.. This alleviates pain and joins the fractured bones qualitatively and effectively.
6	<i>Ipomea hedirfolia</i> Convolvulaceae Golla jiddu or Gorre jiddu	Leaves paste 25 grams	
7	<i>Pergularia daemia</i> Asclepiadaceae Dustapaaku, Jittapaaku	Leaves paste 25 grams	25 grams of the leaves paste of <i>Pergularia daemia</i> and shell lime powder 3 grams are to be mixed made into fine paste and applied externally as poultice for relieving pain and for uniting the fractured bones. For better results the poultice is prepared with the ingredients specified in the formula furnished under POULTICE-I and bandaged. This alleviates pain and unites fractured bones effectively.
8	<i>Cocculus hirsutus</i> Menispermaceae Dusari teega	Leaves paste of male plants 25 grams	Fine paste of the leaves of male plants of <i>Cocculus hirsutus</i> is to be mixed with lime stone powder, jaggery and egg white yolk, grinded to get fine paste and applied around the skin on the fractured bone. Or for better results the plant paste is to be mixed with other ingredients furnished under POULTICE- I and applied on the fractured bone and bandaged for quick healing of fractures and for alleviation of pain
9	<i>Securiniga virosa</i> Euphorbiaceae Tella Pooli	Leaves paste 25 grams	Leaves paste of securiniga plant is mixed with the ingredients mentioned in poultice I and applied on the skin around the fractured bone and bandaged for quick setting of fractured bone and for pain relief.
10	<i>Senna occidentalis</i> Caesalpinoidae Kasintha or Kasivenda	Leaves paste 25 grams	Fine paste of leaves of <i>Senna occidentalis</i> is to be mixed with egg white yolk and lime powder and applied on the skin around the fractured bone twice in a week for 3 weeks or mixed with other ingredients of POULTICE I for the better results.

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11	<i>Dodonea viscosa</i> Dodonaceae Bandedu	Fresh green leaves. The mid linier veins of the leaves are to removed manually, pounded to get moist powder of the leaves weighing 25 grams.	Moist leaf powder of Dodonia 25 Grams is to be mixed with the ingredients of POULTICE- I, and applied on the skin around the fractured bone for the best results
12	<i>Aerva javanica</i> Amaranthaceae Pedda konda pindi	Whole plant powder or paste about 25 grams.	Whole plant powder or paste of <i>Aerva javanica</i> is to be mixed with the ingredients mentioned in POULTICE-I formula and applied on the skin around fractured bone for re union of fractured bone and for alleviation of pain.
13	<i>Sterculia urens</i> Malvaceae Yerra Poliki	Root /stem bark powder 25 grams and it's gum 10 grams	Root bark powder , Gum 10 grams are to be mixed with the specified ingredients of POULTICE I and applied on the skin around the fractured bone for alleviation of pain and for effective re union of fractured bones.
14	<i>Acacia nilotica</i> Mimosoideae Nalla thumma	Fine stem bark powder 25 grams and its gum 10 grams	Stem bark powder, Gum powder are to be mixed with the specified ingredients of POULTICE III and applied on the skin around the fractured bone and bandaged for alleviating the pain and for joining the fractured bones.
15	<i>Manilkara hexandra</i> Sapotaceae Paala	Stem Bark powder 25 grams	Fine Stem bark powder is to be mixed with the specified ingredients of POULTICE I and applied on the skin around the fractured bone and bandaged for alleviating the pain and for joining the fractured bones very much effectively.
16	<i>Albizia amara</i> Mimosaceae Chigara, Cheekireni	Leaves paste 25 grams	Fine leaves powder/ paste is to be mixed with the specified ingredients of POULTICE-I and applied on the skin around the fractured bone and bandaged for alleviating the pain as well as for joining the bones effectively.
17	<i>Tinospora cordifolia</i> Menispermaceae Tippa Teega	Stem paste 25 grams	Fine stem paste is to be mixed with the specified ingredients of POULTICE-III and applied on the skin around the fractured bone and bandaged for alleviating pain and for joining fractured bones.
18	<i>Bamboosa arundanaceae</i> Poaceae Mullem Veduru, Hallow / Thorny Bamboo	Leaves and juvenile shoots paste 25 grams	Fine paste is to be mixed with the specified ingredients mentioned in POULTICE-II I and applied on the skin around the fractured bone and bandaged for alleviating pain and for joining fractured bones.
19	<i>Nerium indicum</i> Apocynaceae Ganneru (with white flowers only)	Leaves paste of the plants having white flowers only – 25 grams	Fine paste of leaves is to be mixed with the specified ingredients mentioned in POULTICE -III and applied on the skin around the fractured bone and bandaged for alleviating pain and for joining fractured bones.
20	<i>Mimosa pudica</i> Mimosoideae Athapathi, Lajjavathi	Fine paste of leaves 25 grams	Fine paste of leaves is to be mixed with the specified ingredients mentioned in POULTICE -III and applied on the skin around the fractured bone and bandaged for alleviating pain and for joining fractured bones.
21	<i>Lagenaria siceraria</i> Cucurbitaceae Chedu sorakaaya/chedu anapakaaya	Fruit paste/ Fruit powder – 25 grams (only bitter tasting fruit to be used)	Fine fruit paste or fruit powder is to be mixed with 3 grams of shell lime powder and a paste is to be prepared by adding and grinding with sheep milk. This paste is to be applied on the skin around the fractured bone and bandaged.
22	<i>Dendrocalamus strictus</i> Poaceae Sadana veduru	Leaves and juvenile shoots paste 25 grams	Fine paste is to be mixed with the specified ingredients mentioned in POULTICE-I and applied on the skin around the fractured bone and bandaged for alleviating pain and for joining fractured bones.
23	<i>Cuscuta reflexa</i> Convolvulaceae Bangaruteega	Whole plant paste 100 grams	Plant paste is to be mixed with the ingredients of poultrice – III , applied on the skin around the fractured area and bandaged
24	<i>Cassytha filiformis</i> Lauraceae Bangaru pasi	Whole plant paste 100 grams	Plant paste is to be mixed with the ingredients of poultrice – III , applied on the skin around the fractured area and bandaged
25	<i>Venda tesellata</i> Orchidaceae	Whole plant paste 100 grams	Plant paste is to be mixed with the ingredients of poultrice – III , applied on the skin around the fractured area and bandaged
26	<i>Aegle mormelos</i> Rutaceae Maredu	Fine bark powder/paste 25 grams	Bark paste is to be mixed with the ingredients of poultrice – III , applied on the skin around the fractured area and bandaged

27	<i>Bauhinia vahlii</i> Caesalpiniaceae Addaku	Fine bark powder/paste 25 grams	Bark paste is to be mixed with the ingredients of poultice – III , applied on the skin around the fractured area and bandaged
28	<i>Canthium parviflorum</i> Rubiaceae Balusu	Fine bark powder/paste 25 grams	Bark paste is to be mixed with the ingredients of poultice – III , applied on the skin around the fractured area and bandaged
29	<i>Grewia hirsuta</i> Tiliaceae Gubathada	Fine bark powder/paste 25 grams	Bark paste is to be mixed with the ingredients of poultice – III , applied on the skin around the fractured area and bandaged
30	<i>Trichodesma indicum</i> Boraginaceae Guvvagutti	Whole plant	Whole plant paste is to be mixed with the ingredients of poultice –III , applied on the skin around the fractured area and bandaged
31	<i>Capparis zeylanica</i> Capparidaceae Aare	Leaf paste 25 grams	Leaf paste is to be mixed with the ingredients of poultice – III , applied on the skin around the fractured area and bandaged
32	<i>Capparis septaria</i> Capparidaceae Nalla uppi	Leaf paste and bark paste 25 grams	Leaf paste is to be mixed with the ingredients of poultice – III , applied on the skin around the fractured area and bandaged
33	<i>Azema tetraacantha</i> Salvadoraceae Tella uppi	Leaf paste and bark paste 25 grams	Leaf paste is to be mixed with the ingredients of poultice – III , applied on the skin around the fractured area and bandaged
34	<i>Shorea robusta</i> Dipterocarpaceae Guggilum	Stem bark powder/paste 25 grams	Stem bark paste is to be mixed with the ingredients of poultice –III , applied on the skin around the fractured area and bandaged
35	<i>Uraria picta</i> Fabaceae Pittagovu	Whole plant paste 25 grams	Whole paste is to be mixed with the ingredients of poultice –III , applied on the skin around the fractured area and bandaged
36	<i>Cissus quadrangularis</i> Vitaceae Nalleru	Whole plant paste 25 grams	Whole plant paste is to be mixed with the ingredients of poultice-I ,applied on the skin around the fractured area and bandaged.
37	<i>Senna auriculata</i> Caesalpinaceae Tangedu	Leaf paste 25 grams	Leaf paste is to be mixed with the ingredients of poultice – III , applied on the skin around the fractured area and bandaged.

POULTICES

Method of preparation of poultices

Specified or indicated plant material paste / powder is to added as per the dosage, to the following ingredients and to be made into a homogeneous paste for external application, as a coat, on the skin with uniform thickness, around the fractured bone, for re-union of fractured bone. After application poultice a thin, soft, clean, white cloth dipped and made wet in the poultice is to be wrapped tight around the poultice. Splints are to be placed around the limb to arrest the movements and wrapped with the cloth.

Table-2: Poultice no – I

S.No	Ingredient	Quantity
1	1. Specified plant material powder or paste and	quantity
2	Garlic clefts	3 nos. Paste (Acts as pain reliever)
3	Black pepper	8 nos. Powder.(Acts as pain reliever)
4	Shell lime powder	2 grams.(Required calcium is supplied to the bone)
5	Jaggery powder	5 grams(Calcium supplement+Binding/Adhesion)
6	Egg white yolk	optimum quantity to make all the above ingredients in to a paste (Calcium supliement +Binding)

(Poultice no –II is considered to be an excellent one used for treating simple as well as compound fractures)

Table-3: Poultice No- II.

S.No	Ingredient	Quantity
1	1. Specified plant material powder or paste and	quantity
2	Garlic clefts	3 nos. Paste (Acts as pain reliever)

3	Black pepper	8 nos. Powder.(Acts as pain reliever)
4	Mustard seed	5 grams. Powder.(Act as pain reliever)
5	Gomutra shilajit	5 grams. Powder.(An exudation obtained from rocks of certain hill ranges is called Shilajit, and if it is treated with cow urine is called Gomutra shilajit. It plays an excellent role in re-uniting the broken bones fatly)
6	Paluku sambrani	5 grams. Powder. (Benzoine available in Ayurveda pachari shopsa)
7	Egg white yolk	Optimum quantity for mixing all the ingredients in to paste.
8	Baalinta bolu	5 grams. Powder. (Gum of commifera sps. Available in ayurveda Pachari shops)

Table-4 :Poultice no – III.

S.No	Ingredient	Quantity
1	1. Specified plant material powder or paste and	quantity
2	Albizia amara	5 grams fine leaf powder.
3	Wheat	5 grams of finely pounded and sieved seed powder.
4	Turmeric powder	3 grams.
5	Goat's milk	Optimum quantity for mixing all the ingredients in to paste.

Special diet being prescribed for effective and quick healing the bone fractures.

For Healing bone fractures effectively and faster, in addition to the External applications of specified plants, to support the body to form strong bonding /cementing in between fractured bones, certain special diets are recommended by the local Bone setters.

- *Setaria italica*/ Fox millets. Family. Poacea, Local name: Korralu and
 - *Triticum dicocum*/ wheat. Family. Poaceae , Local name : Godhumalu, , seeds of Godhumalu and korralu are made in to Rawa(broken in to small pieces) , cooked and eaten daily in place of Rice/pulka.
 - *Eleusine coracana*/ Finger millet. Family: Poaceae, Local name: Ragi. Ragi seeds powder is cooked with water to make Jawa/ soup, to be consumed with curds/jaggery made from ie., *Saccharum officinarum* /sugar cane juice and to be taken orally daily.
 - *Sorghum bicolor*/Great millet, Family: Poaceae. Local name: Jonna. Jonna seeds powder is used to prepare Rotis and eaten along with palak/Bhendi curry daily.
 - *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 to fried 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.
 - *Sesamum indicum*/Gingelly seed, Family: Pedaliaceae, Local name: Nuvvulu. Nuvvulu seeds are to be 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 two grams of Gomuthra Shilajith .
 - *Abelmoschus esculanthus* /Ladies finger. Family: Malvaceae, Local name : Bhendi is to be consumed daily.
 - Piper betle/Betel leaves, Family: Piperaceae. Local name: Tamala paku to be chewed along optimum quantity of shell lime powder daily and to be gulped.
 - *Annona sqamosa*/Custard apple, Family: Anonaceae. Local name: Seethaphal. Fruits are to be taken before meal
 - *Annona reticulata*/ Family: Anonaceae. Local name: Ramaphal. Fruits are to be taken before meal
 - *Psidium guajava*/ Guava, Family : Myrtaceae. Fruits are to be taken before meal
 - *Musa paradisiaca*/Banana, Family : Musaceae. Fruits are to be taken before meal
 - *Phonix dactylifera*/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.
 - ❖ *Lycopersicon esculentum*/Tometo, Family: solanaceae. local name : Tometo
 - ❖ *Spinacia oleracea*/spinach, Family: Chenopodiaceae. Leaves are made into curry and taken .
 - ❖ *Daucas carota*/carrot, Family: Apiaceae
 - ❖ *Beeta vulgaris* /Beet root, Family : Chenopodiaceae
 - ❖ The above four items each weighing 100 grms are to be made into juice by adding adequate water and to be taken orally every day
 - *Moringa olefera* / drumstick leaves , Family : Moringaceae
 - *Cajanus cajan* / Red gram seed , Family :Fabaceae
- The Above two are to be cooked and consumed along with Jowar roties .
Intake of Rice and other curries are to be avoided completely. Optimum quantities of the above mentioned qualitative food is to be taken.
- *Cocus nucifera* / coconut, Family: Arecaceae .Coconut water is to be consumed profusely every day.

- *Amaranthus viridis/Thotakura* / Family : Amaranthaceae is to be made it to curry and to be consumed with jowar roties

V. Conclusion

The revitalization of these indigenous systems can provide self-reliance in primary health care and can even contribute to the frontiers of herbal system of medicine Efforts in this direction may provide the benefit of regional information to the global community. Phytochemical studies of above said plants need to be taken up to find out the exact ingredients that help in the curing of bone fracture.

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