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Phytodiversity Survey with Ethnomedicinal Values in and Around the Industrial Sites of Rayagada, Odisha

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ABSTRACT

Ethnomedicine is a sub-branch of medical anthropology and deals with the cultured interpretations of disease, health and illness, healing and addresses the health care seeking process. The basic knowledge and use of ethnomedicinal plants by the traditional healers as well as community members was investigated in three industrial areas township, Rayagada district, Odisha. On the basis of ethnographic medicinal plants fieldwork with the help of standard survey methods it has been divulged that although the tribal people's concept of disease and treatment is focused on practices and religious beliefs but they are regularly depending on ethnomedicines along with grow in and around three industrial areas of Rayagada district, Odisha for which they get destroyed by different causes before knowing their ethnomedicinal values. In this paper 90 plants are studied under 60 families which having ethnomedicinal values of different disease and disorders still used by villagers present in and around three industrial areas township of Rayagada district, Odisha. The plants growing near industrial area township in Rayagada district are annual and they get most affected by the pollutions, cattles, people etc. Hence different steps have taken with record and study their ethnomedicinal values before these plants going destroyed.



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INTRODUCTION:

According to World Health Organization (WHO), traditional medicine is defined as the health practices, knowledge, approaches, spiritual therapies, exercises and manual techniques, applied in condition to treat, diagnose and prevent illness or maintain well being. The study of traditional medicine deals with core disciplines includes ethno-botany, ethno-medicine and medicinal or practice folk medicine based on the use of plants and plant extracts. Herbalism is otherwise called as herbal medicine, medical herbalism, medical botany, botanical medicine, herbology and phytotherapy. Ethnomedicine includes practices such as ayurvedic medicines, herbal medicine, traditional medicines, South African Muti Yoruba reported about the medical knowledge and practices. In India, the tribal people are living in forest or its adjoining areas and maintain their health with the help of their ethno-medicinal knowledge. Ethno-botany is called as direct relationship between plants and human beings. This relationship is divided into two major groups such as abstract and concrete. The medicinal use of plants is one of the most concrete relationships among them. Now-a-days, there is a more desire to unravel the ethnomedicinal studies in confining the centuries old traditional folk knowledge as well as searching new plant resources of food, drug^{1, 2}. The people of developing countries quite effectively on ethnomedicine for primary health care^{3, 4}. Gadgil, 1996 reported that Indian traditional medicine based in Ayurveda, Unani and Siddha used by various communities⁵. Ethnomedicinal uses of plants in various parts of Odisha are well studied⁶⁻¹³. But Rayagada district is often ignored. In spite of the move growth of ethnomedicinal plants in and around three industrial township, Rayagada district, Odisha, they have not been studied ethno botanically as well as taxonomically. The present study has been designed to report the ethnomedicinal uses of plants to treat many common diseases based on field surveys and taxonomical identification of plants. The prime objective of this study is to motivate the farmers or agriculturist tribal people, village people in and around three industrial township of Rayagada district, Odisha to come forward for the utilization, preservation, and cultivation of traditional plants.

MATERIALS AND METHODS:

Study Area:

Rayagada is known as the tribal industrial capital of the Odisha which is lying between the north latitudes 82°54' and 82°02'E which is shown in figure no. 1. Rayagada was conferred the district status in the early part of 1992. In district of Rayagada, about 94% population lives in

rural area and depends on agriculture . This district of Odisha covers an area 7073 sq km. Kalahandi borders it, whereas Phulbani district in North and Gajapati district in the south. The climate of this district is typically tropical to subtropical with summer, winter, and rain. The average temperature of Rayagada district is 20°C which reaches a maximum of 42°C in May. The average annual rainfall of this district varies from 1030.21 mm to 1569.50 mm. The rainfall in the area is mostly from southwest monsoon lasts from middle of June to October. The soils of the Rayagada district may be classified 2 groups namely Alfisols and Entisols. Alfisols includes red sandy soils and red loamy soils. Entisols consists of sand, silt, and clay. This type of soil in alkaline in nature and deficient in nitrogen and humus material. The Rayagada district belongs to the North-eastern Ghat agro climate zone. The abundance of natural mineral resource like Bauxite, manganese, China clay, graphite quartz, quartzite etc, water other infrastructure in and around Rayagada district are the main reasons for the starting of industrialization. Therefore, Rayagada district is known as “Tribal industrial capital of Odisha”. There are three main industries found in and around Rayagada district namely JK Paper Limited, at Jaykaypur, Rayagada (Odisha), IMFA Limited, at Therubali, Rayagada (Odisha), Utkal Alumina International Limited, at Tikiri, Rayagada (Odisha). JK Paper Limited is located at Jaykaypur, district- Rayagada, Odisha. It is the flagship company of J.K Organization was established in 1938 and JK Paper mills, an integrated pulp and paper mills were set up in 1962. It is a manufacturer of pulp, unwanted and coated quality writing, and printing papers. Indian Metals and Ferro Alloys Limited (IMFA) was incorporated on 20th November 1961 and obtained the certificated to commence business on 7th May, 1962. IMFA is today the country’s largest producer of Ferro Alloys with an installed furnace capacity of 130 MVA backed by a 108MW captive thermal power plant. IMFA, has the main furnaces located Therubali, Rayagada district, about 400 km away from Bhubaneswar, in Southern Odisha. Utkal Alumina International Limited, a 100% subsidiary of Aditya Birla group company Hindal Co, is engaged in Alumina refining. The Utkal Alumina refinery project in Rayagada district of Odisha comprises of 1.5 MTPA Alumina Refinery, bauxite mines (Baphlimali) with reserves lasting for over 25 years.

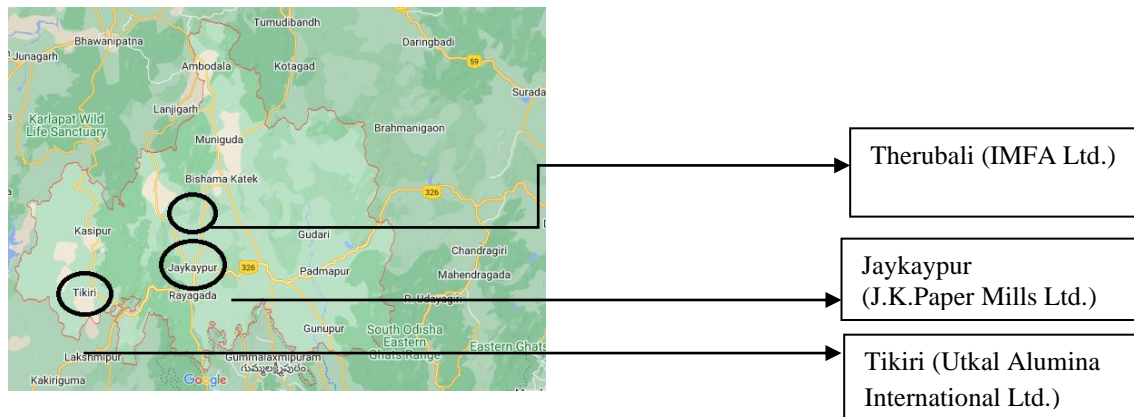


Figure No. 1: Google Map of the Study Area of Rayagada district.

(<https://rayagada.nic.in/map-of-district/>)

Data Collection Method:

From a total population of three main industrial area in and around Rayagada district, informations from 1535 people in the age group 21-75 and above was collected by different methods such as observation, census survey, sample survey, case study and interview. The sample survey method belongs to Ayurvedic medicine practioners, head of house people, chief of villages, local baidyas, priests and tribal medicine man etc. People were asked in their local language. All information obtained on different ethnomedicinal plants, their local name, used plant parts and value of medicinal plants were verified with the help of local baidya, local village people, medicine men (Disari) and some experienced old people of community. All nomenclature, identification, and classification of the ethnomedicinal plants was made with flora books on “Udvida Sangraha”¹⁴. The Disari (medicine man) about ethnomedicine were data through the survey and interview technique during 2019-2022.



(Figure No.2: Local tribal people and village people collects and their uses of ethno-medicinal plants in and around industrial area township, Rayagada district, Odisha.)

RESULTS AND DISCUSSION:

a) Socio-demographic data:

Rayagada is the main tribal district of Odisha. The population of Rayagada district has about 832019, out of which 473379 are tribals. The tribal people are dominantly in this district and contain 57.52% of tribal population. Rayagada gives its own identity for the tribal's ethno-cultural activity. This Rayagada district has been the mother land of many tribal communities namely kondhas, souras etc. Tribal economy does not standard an economic stage, but they practice different economics of their living. The status of tribal people, Rayagada is marginal, low, and subsistence-oriented etc. The base of technological idea is low and primitive. The tribal and village people in and around three industrial areas township, Rayagada district. Odisha possesses a mixed economy such as shifting cultivation, settled agriculture, food gathering including the collection of non-timber forest hunting, fishing, and service in private/public factors. The gift of tribal people is land, which is an economy commodity, focuses extra-economic, and ideological values.

b) Phyto-diversity of Ethnomedicinal plants used:

Information on the medicinal plants was gathered through survey, oral interview of tribal people old village people, ayurvedic medicine practitioners, baidya etc. Through survey and oral interviews. The scientific name, local name, family name, habit, plant parts used, medicinal importance were reloaded. All gathered information was cross checked with village people and other individuals practicing in and around three industrial localities of Rayagada district in which plant material was collected. According to Saxena (1996) reported that the plants were identified as per flora of Orissa¹⁵. Haines (1961) represented that plant specimens are identified and with help from IMMT (RRL), Bhubaneswar Herbarium Laboratory¹⁶. All studies on ethnobotany of Odisha was collected about ethnomedicinal plants¹⁷. Puspagandhan (1995) reported that more than 43% of total flowering plants are represented to be of importance of medicinal value¹⁸. Ethnomedicinal plant specimens were collected and indentified with local flora¹⁹. A literature survey was conducted on the study area before started of field work²⁰⁻²⁸. Marini-Bettolo, 1980 reported that the importance of this traditional medicine has spreader worldwide as some of them proved it to be very effective²⁹. Most of the ethno medicinal plant works were based on taxonomic survey. The present work is collecting from extensive survey of different villages of industrial township, Rayagada during 2019-2022. The medicinal value of

each plant was detailed in the following pattern:- a) Scientific name, b) Vernacular name, c) Family name, d) Plant Habit, e) Plant parts used and its medicinal value Table-1.

Table-1: List of ethnomedicinal plants and their uses present in and around J.K Paper Limited township area, Rayagada district, Odisha.

Sr. No.	Scientific Name	Vernacular Name	Family Name	Plant habit	Plant parts used and its medicinal value
1	Senegalia catechu	Khaira	Mimosaceae	Tree	Bark is used and it is used for mouth ulcers, reduce body pain, Cold and cough.
2	Acorus calamus	Ghorbacha	Araceae	Herb	Rhizome is used and it is used for liver disorder, appetite, kidney, neurological problems and respiratory etc.
3	Adhatoda vasica	Basango/Vrysha	Acanthaceae	Shurb	Flower, bark and leaves are used and it is used for cold, blood purification and Stomach pain.
4	Aegle marmelos	Bael	Rutaceae	Tree	Fruit ,leaf is used and it is used for inflammation, hepatitis, ulcer, digestive problems etc.
5	Aloe vera	Gheekunwari	Liliaceae	Herb	Leaf, pulp, root is used and it is used for Madness, stomach disorder, Indigestion, diarrhoea.
6	Argemone mexicana	Odoshomari	Papaveraceae	Herb	Bark, leaf, seed is used and it is used for wound and rat bites, skin disease, syphilis.
7	Argyreia nervosa	Munda nai	Convolvulaceae	Climber	Root is used and it is used for increasing intelligence and Sexual disorder in males and gonorrhoea.
8	Asparagus racemosus	Satamuli	Liliaceae	Climber	Whole Plant is used and is used for reducing body temperature in fever, Constipation, stomach

					ulcer.
9	Azadirachta indica	Limba/Nima	Meliaceae	Tree	Leaf is used and it is used for leprosy, skin disease and small pox
10	Bauhinia variegata	Raktakanchana	Caesalpiniaceae	Tree	Flower, bark is used and it is used for ulcer, leprosy and skin diseases.
11	Calotropis gigantea	Akondu	Asclepiadaceae	Shurb	Root is used and it is used for headache, toothache and cat bite
12	Cassia occidentalis	Kala chakunda	Caesalpiniaceae	Tree	Root, seed is used and it is used for filaria, asthmas and Eczema.
13	Catharanthus roseus	Nitimalli	Apocyanaceae	Herb	Root, Leaf is used and it is used for insect stings, diabetes, Skin diseases and cancer
14	Cinnamomum tamala	Tejapatra	Lauraceae	Tree	Leaf, bark is used and it is used for diarrhoea, stomach-ache and Vomiting.
15	Cissus quadrangularis	Hadasinkula	Vitaceae	Shurb	Whole plant is used and it is used for constipation and Bone fracture.
16	Clitoria ternatea	Aparajitaa	Fabaceae	Herb	Leaf is used and it is used for filaria, acne, indigestion, fever.
17	Cucumis sativus	Kakudi	Cucurbitaceae	Creepers	Fruit, Flower, seed is used and it is used for relief to tired eye, Heart burn, headache and insomnia.
18	Curcuma longa	Haridra	Zingiberaceae	Herb	Rhizome is used and it is used for chicken pox, allergies, eczema, kill worms, cough and anorexia
19	Cymbopogon citrates	Adi Gandhi	Poaceae	Herb	Leaf, whole plant is used and it is used for fever, constipation,

					cold, cough and headache.
20	Datura stramonium	Dudura	Solanaceae	Herb	Flower is used and it is used for insect bite, hair loss and skin disorders
21	Rauvolfia serpentine	Patalagaruda	Apocyanaceae	Shurb	Whole plant, leaf, rhizome Bark seed is used and it is used for irregular menstruation, gum bleeding, dysuria.
22	Saraca asoka	Asoka	Caesalpiniaceae	Tree	Flower is used and it is used for Fever, throat pain, dysentery.
23	Solanum viarum	Bheji baigna	Solanaceae	Shurb	Fruit, root is used and it is used for blood pressure, dysentery.
24	Syzygium cuminii	Jamukoli	Myrtaceae	Tree	Leaf, fruit is used and it is used for Constipation, round worm.
25	Tamarindus indica	Tentuli	Caesalpiniaceae	Tree	Fruit, seed is used and it is used for Pitta and cough fever, fruit oil.
26	Emblica officinalis	Dudura Anla	Euphorbiaceae	Tree	Fruit and leaf is used and it is used for Dysuria, urticaria, hair loss, and dandruff.
27	Eucalyptus globules	Sugandhapatra	Myrtaceae	Tree	Leaf is used and it is used for Bone joint pain, cold and cough
28	Euphorbia tirucalli	Lankasiju	Euphorbiaceae	Tree	Root is used and it is used for stomach-ache, ear-ache, tooth-ache, asthma and wrats.
29	Hibiscus rosasinensis	Japaa/Mandara	Malvaceae	Shurb	Leaf ,flower is used and it is used for growth of ,skin disease, gastric ulcer and inflammation
30	Lawsonia inermis	Manjuati/Benja	Lytheraceae	Tree	Leaf, root is used and it is used for hair loss, jaundice and skin diseases and fever.

Table-2: List of ethnomedicinal plants and their uses present in and around IMFA Limited township area, Rayagada district, Odisha.

Sr. No.	Scientific Name	Vernacular Name	Family Name	Plant habit	Plant parts used and its medicinal value
1	<i>Emblica officinalis</i>	Dudura Anla	Euphorbiaceae	Tree	Fruit and leaf are used and it is used for Dysuria, urticaria, hair loss, and dandruff.
2	<i>Eucalyptus globules</i>	Sugandhapatra	Myrtaceae	Tree	Leaf is used and it is used for Bone joint pain, cold and cough
3	<i>Euphorbia tirucalli</i>	Lankasiju	Euphorbiaceae	Tree	Root is used and it is used for stomach-ache, ear-ache, tooth-ache, asthma and warts.
4	<i>Hibiscus rosasinensis</i>	Japaa/Mandara	Malvaceae	Shurb	Leaf, flower is used and it is used for growth of, skin disease, gastric ulcer and inflammation.
5	<i>Lawsonia inermis</i>	Manjuati/Benja	Lytheraceae	Tree	Leaf, root is used and it is used for hair loss, jaundice and skin diseases and fever.
6	<i>Leucas aspera</i>	Bhutamari	Lamiaceae	Herb	Leaf, flower is used and it is used for cough, cold, inflammatory skin disorder, Headache, snake bite.
7	<i>Mentha spicata</i>	Podana	Lamiaceae	Herb	Leaf is used and it is used for skin diseases, Itching, hyperacidity, asthma, cold, feve, jaundice and obesity.
8	<i>Mimosa pudica</i>	Lajuli	Mimosaceae	Herb	Leaf, Root is used and it is used for piles, toothache and Eczema, dysentery and sinus.
9	<i>Mimuscops elengii</i>	Bakula	Sapotaceae	Tree	Seed, bark is used and it is used for headache, toothache, wound, chronic constipation, diarrhoea.
10	<i>Momordica charantia</i>	Tusikalara	Cucurbitaceae	Climber	Fruit, Leaf is used and it is used

					for Diabetes, Ear pain, leprosy, ulcer and wound.
11	Murraya koenigii	Bhrusrunga	Rutaceae	Small tree	Leaf is used and it is used for pile, inflammation, itching, hair loss.
12	Nyctanthes arbortristis	Sefali/Gotikhadka	Oleaceae	Shurb	Leaf is used and it is used for fever, fungal skin, high blood pressure, cough, joint pain,
13	Ocimum basilicum	Dhala tulasi	Lamiaceae	Herb	Leaf is used and it is used for constipation, wart, worms, dysuria, cough and cold
14	Ocimum sanctum	Kala tulasi	Lamiaceae	Herb	Leaf is used and it is used for kill warts, cough ,cold, Kidney stone, stomach disorder, heart diseases.
15	Paederia foetida	Gandha posarur	Rubiaceae	Herb	Leaf is used and it is used for piles, dirrahoea, inflammation, blood dysentery and headache.
16	Phyllanthus niruri	Bhumi anala	Euphorbiaceae	Herb	Whole plant is used and it is used for Jaundice, diabetes, swelling, itchness.
17	Piper nigrum	Kala golamaricha	Piperaceae	Climber	Fruit is used and it is used for cold, cough, stomachache, piles and worms.
18	Pongamia pinnata	Kanuga/Karanja	Fabaceae	Tree	Leaf is used and it is used for skin diseases, ulcer, prevention of malaria, and skin diseases.
19	Prosopis cineraria	Shami	Mimosaceae	Tree	Bark, leaves is used and it is used for Asthma, Leucoderma, leprosy, Headache, diarrhoea.
20	Pterocarpus santalinus	Lal chandan	Fabaceae	Tree	Bark, shoot is used and it is used for bleeding, inflammation, corneal capacity, high blood

					pressure and diabetes.
21	Senegalia catechu	Sandra/Khaira	Mimosaceae	Tree	Bark is used and it is used for mouth ulcers, reduce body pain, Cold and cough.
22	Acorus calamus	Ghorabacha	Araceae	Herb	Rhizome is used and it is used for liver disorder, Appetite, kidney, neurological problems and respiratory etc.
23	Adhatoda vasica	Basanga	Acanthaceae	Shurb	Flower, bark and leaves are used and it is used for cold, blood purification and Stomach pain.
24	Aegle marmelos	Lakshmiphala	Rutaceae	Tree	Fruit ,leaf is used and it is used for Inflammation, Hepatitis, Ulcer, Digestive problems etc.
25	Aloe vera	Gheekunwari	Liliaceae	Herb	Leaf, pulp, root is used and it is used for Madness, stomach disorder, Indigestion, diarrhoea.
26	Rauvolfia serpentine	Patalagaruda	Apocyanaceae	Shurb	Whole plant, leaf, rhizome Bark seed is used and it is used for Irregular menstruation, gum bleeding, dysuria.
27	Saraca asoka	Asoka	Caesalpiniaceae	Tree	flower is used and it is used for Fever, throat pain, dysentery.
28	Solanum viarum	Bheji baigna	Solanaceae	Shurb	Fruit, root is used and it is used for Blood pressure, dysentery.
29	Syzygium cuminii	Jamukoli	Myrtaceae	Tree	Leaf, fruit is used and it is used for Constipation, round worm.
30	Tamarindus indica	Tentuli	Caesalpiniaceae	Tree	Fruit, seed is used and it is used for abdominal pain, diarrhea, dysentery, wound healing, cough and fever.

Table-3: List of ethnomedicinal plants and their uses present in and around Utkal Alumina International Limited township area, Rayagada district, Odisha.

Sr. No.	Scientific Name	Vernacular Name	Family Name	Plant habit	Plant parts used and its medicinal value
1	Rauvolfia serpentine	Patalagaruda	Apocyanaceae	Shurb	Whole plant, leaf, rhizome Bark, seed is used and it is used for Irregular menstruation, gum bleeding dysuria.
2	Saraca asoka	Asoka	Caesalpiniaceae	Tree	Flower is used and it is used for Fever, throat pain, dysentery.
3	Solanum viarum	Bheji baigna	Solanaceae	Shurb	Fruit, root is used and it is used for Blood pressure, dysentery.
4	Syzygium cuminii	Jamukoli	Myrtaceae	Tree	Leaf, fruit is used and it is used for Constipation, Round worm.
5	Tamarindus indica	Tentuli	Caesalpiniaceae	Tree	Fruit, seed is used and it is used for abdominal pain, diarrhoea, dysentery, wound healing, cough and fever.
6	Terminalia bellerica	Bahada	Combretaceae	Tree	Bark, fruit is used and it is used for Asthma, cough, eye diseases, piles, diarrhoea, and hepatitis.
7	Terminalia arjuna	Arjuna	Combretaceae	Tree	Whole plant is used and it is used for heart diseases, Spermatorrhea and acne.
8	Tridax procumbens	Bishalya karani	Asteraceae	Herb	Leaf is used and it is used for dysentery, diarrhoea, liver diseases, cut and

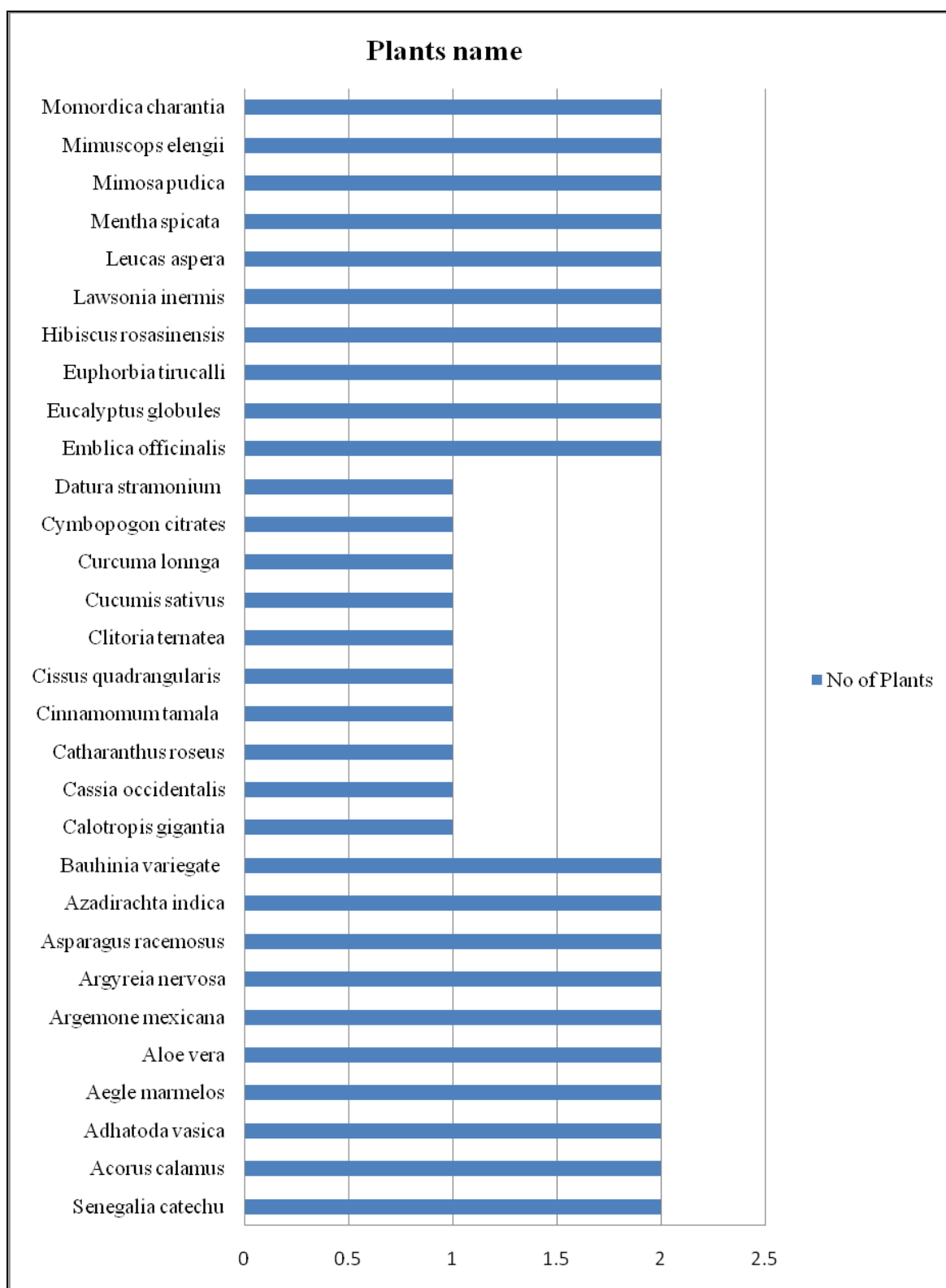
					wounds.
9	Withania somnifera	Askanda	Solanaceae	Herb	Root, leaf is used and it is used for Burns and wounds, carbuncles, microbial infections, cancer, anxiety.
10	Ziziphus Mauritiana	Barakoli	Rhamnaceae	Tree	Leaf, fruit, root is used and it is used for liver diseases, ulcers, hair loss, Headache, diarrhoea, burns and wounds.
11	Shorea robusta	Sal	Dipterocarpaceae	Tree	Bark, leaves is used and it is used for ulcer, leprosy, cough, headache, earache, gonorrhoea, wounds.
12	Mesua ferrae	Nageswara	Guttifera	Tree	Flower is used and it is used for Asthma, inflammation, fever, bleeding piles, fever.
13	Madhuca indica	Mahula	Sapotaceae	Tree	Flower, root is used and it is used for Rheumatism, diabetes, skin diseases, Impotency and snake bite.
14	Hemidesmus indicus	Sugandhi	Apocyanaceae	Herb	Root is used and it is used for leprosy, skin infection, urinary tract, Syphilis and piles.
15	Ficus benghalensis	Bara	Moraceae	Tree	Bark, leaf is used and it is used for dysentery, diarrhoea, nervous disorder, Mouth infection, skin diseases.
16	Cymbopogon martini	Dhanwantari	Poaceae	Herb	Leaf is used and it is used for respiratory diseases, joint pain, fever, constipation,

					cold, cough and headache.
17	Curcuma aromatic	Bana haladi	Zingiberaceae	Herb	Rhizome is used and it is used for cold, bronchitis, indigestion, stomach disorder, indigestion, kill intestinal worms.
18	Centella asiatica	Thalakudi	Apiaceae	Herb	Leaf is used and it is used for skin problems, leprosy, eczema, ulcers, memory, I.Q and immunity.
19	Curculigo orchioides	Talamuli	Hypoxidaceae	Herb	Root is used and it is used for watery diarrhoea, joint pain, sexual strength, Dysuria, and leucorrhoea.
20	Cissampelos pareira	Akanbindhi	Menispermaceae	Herb	Root, Stem bark is used and it is used for fever, asthma, cholera, migraine, haemorrhoids, and dysentery.
21	Argemone mexicana	Odoshomari	Papaveraceae	Herb	Seed, bark, leaf is used and it is used for Rheumatism, leprosy, jaundice, malaria, inflammations.
22	Argyreia nervosa	Bataraj	Convolvulaceae	Climber	Root is used and it is used for inflammation, ulcer, Sexual disorder in males.
23	Asparagus racemosus	Satabari	Liliaceae	Climber	Whole Plant is used and is used for reducing body temperature in fever, Constipation, stomach ulcer
24	Azadirachta indica	Nima	Meliaceae	Tree	Leaf is used and it is used for leprosy, skin disease and small pox.

25	Bauhinia variegata	Kulera	Caesalpinaceae	Tree	Flower, bark is used and it is used for ulcer, leprosy and skin diseases.
26	Leucas aspera	Bhutamari	Lamiaceae	Herb	Leaf, flower is used and it is used for cough, cold, inflammatory skin disorder, Headache, snake bite.
27	Mentha spicata	Podana	Lamiaceae	Herb	Leaf is used and it is used for skin diseases, Itching, Hyperacidity, asthma, cold, fever, jaundice and obesity.
28	Mimosa pudica	Lajuli	Mimosaceae	Herb	Leaf , Root is used and it is used for piles, toothache and Eczema, dysentery and sinus
29	Mimusops elengii	Bakula	Sapotaceae	Tree	Seed, bark is used and it is used for headache, toothache, wound, chronic constipation, diarrhoea.
30	Momordica charantia	Tusikalara	Cucurbitaceae	Climber	Fruit, Leaf is used and it is used for Diabetes, Ear pain, leprosy, ulcer and wound.

The investigation divulged ethnomedicinal 90 plants belonging 60 genus and 60 families.

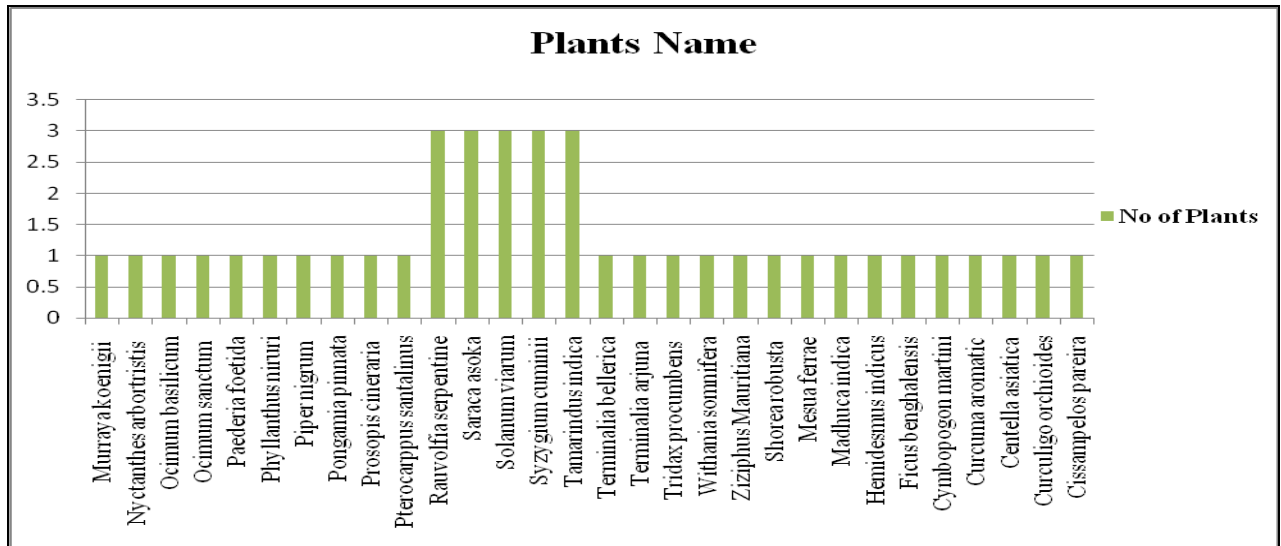
Figure no. 2(30 families) and Figure no. 3(30 families) are given below.



(Figure No. 3: Family Name VS Number of plants)

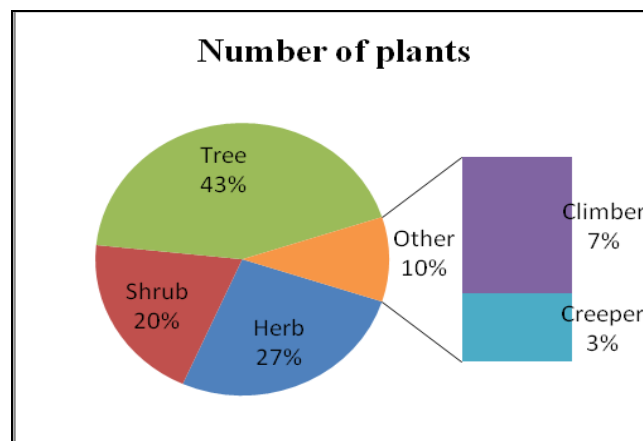
In Figure No.3, Momordica charantia, Mimuscops elengii, Mimosa pudica, Menthe spicata, Leucas aspera, Lawsonia inermis, Hibiscus rasasinesis, Euphorphia tirucalli, Eucalyptus globules, Emblica officinalis, Bauhinia variegata, Azadirachta indica, Asparagus racemosus,

Argyreia nervosa, Argemone Mexicana, Aloe vera, Aegle marmelos, Adhato vasica, Acorus calamus, Senegalia catechu is dominant family (2 numbers each) and other plants, each with one number.

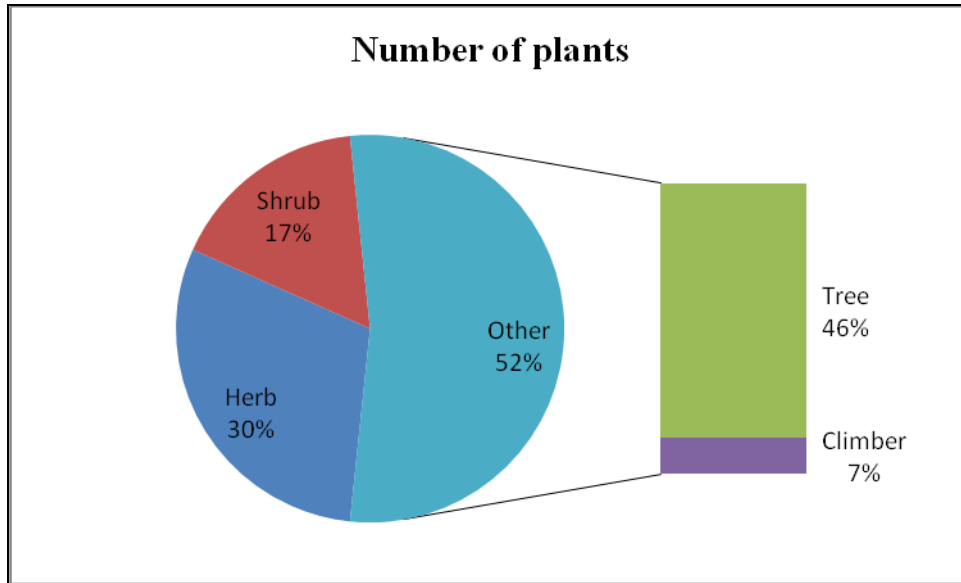


(Figure No. 4: Family Name VS Number of plants)

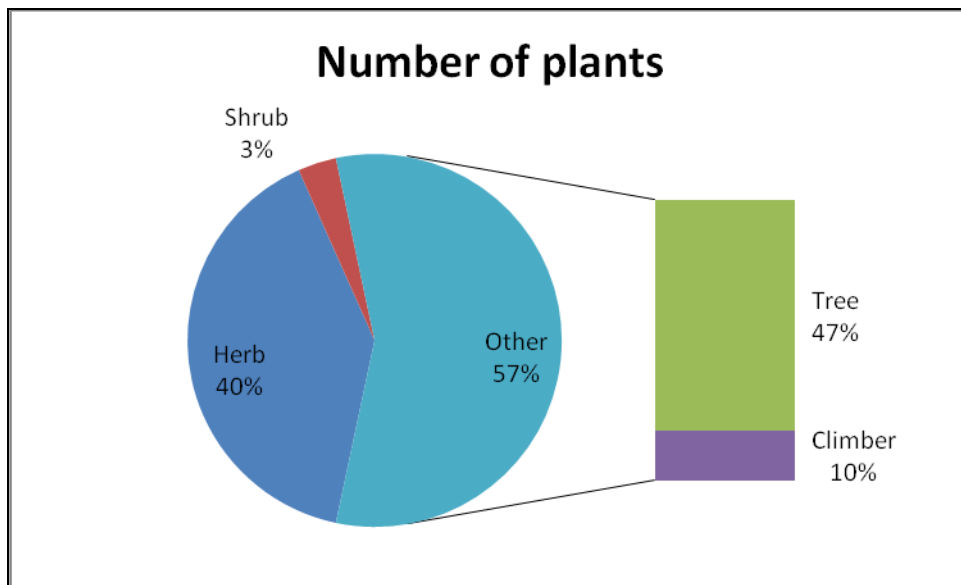
In Figure No.4, Rauwolfia serpentine, Saraca asoka, Solanum viarum, Syzygium cuminii, Tamarindus indica is the dominant plants(3 Numbers each). The other plants each with one number.



(Figure No. 5: Plants Habit Vs. Percentage of Plant Species, present in and around JK Paper Limited township area, Rayagada)

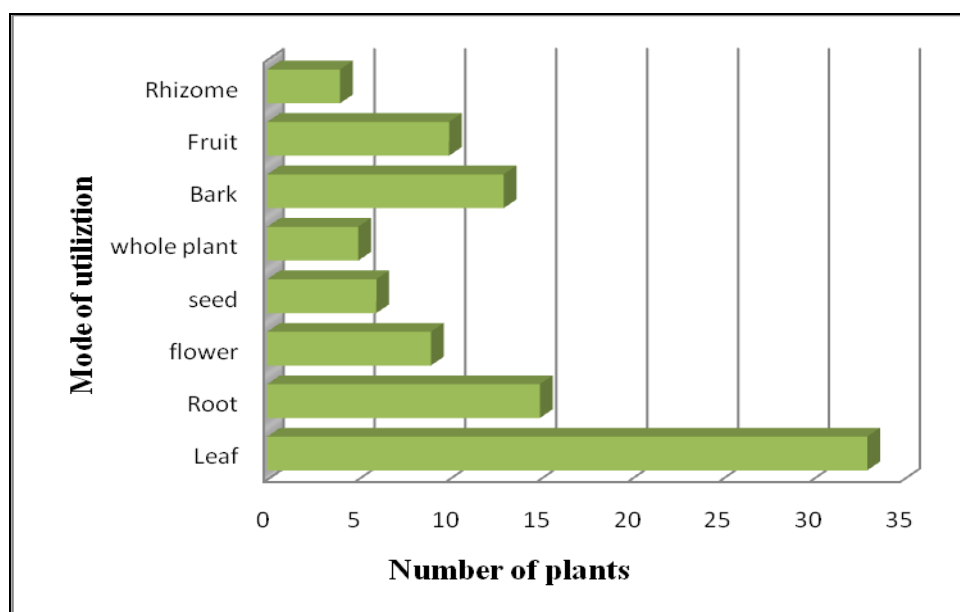


(Figure No. 6: Plants Habit Vs. Percentage of Plant Species, present in and around IMFA Limited township area, Rayagada)



(Figure No. 7: Plants Habit Vs. Percentage of Plant Species, present in and around Utkal Alumina International Limited township area, Rayagada)

In figure No.5, Among all the species, trees are found to be more(13) followed by Herb(8), Shrub(6), Climber(2) and Creeper(1). In figure No.6, Among all the species, trees are found to be more (14) followed by herb(9), shrub(5), climber(2). In figure No.7, Among all the species, trees are found to be more(14) followed by herb(12), climber(5), and shrub(1).



(Figure No. 8: Number of plant parts in ethno-medicine preparation and their mode of utilization)

In figure No.8, According number of plant parts in ethnomedicine preparation and their mode of unitization, leaves are found to be more used and followed by root(15), Bark(13), fruit(10), flower(9), seed(6), whole plant(5) and Rhizome(4).

CONCLUSION:

Improved awareness of conservation issues is essential for tribal village people with a well documentation of collective knowledge about the ethno medicinal plants could be supportive in achievement of objectives. The collective efforts of pharmacologists, phytochemists, botanist, ethno-botanist, taxonomist etc. are needed to document and safety of claims. Drugs or herbal preparation, clinical studies are more need be conducted. The above three industrial areas are losing its natural vegetation cover with the medicinally valuable species. Tree species are more facing threats in their natural habitats from many human activities. In view of plentiful occurrence of number of ethnomedicinal plant species and its surroundings, it is suggested that national medicinal plant board, India may be convinced to prepare briefly report for establishment of small-scale processing units for the valued drugs. On field survey, it was found that pollution reduce trees namely Peepal, Saptaparni, Jamun, Devdaru and Champa etc. must conserved and should be high listed to more planting in three industrial areas. Further research works and clinical trials need to be done to establish the above ethnomedicinal plants effects in human beings.

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