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RESEARCH ARTICLE

ETHNO MEDICINAL STUDY IN NORTH WEST GANJAM, ODISHA

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ABSTRACT

The exploratory Ethno medicinal study was undertaken to document how different disease is conceptualized and Diagnosed by traditional healer of purushottampur block of North West Ganjam of Odisha and to record the medicinal plants used in the prevention and treatment of different diseases, their mode of preparation and administration. Out of 50 plants, 36 families and 48 genera identified as being used for treatment of approximately 70 ailments or therapeutic agents. The most cited family Caesalpiniaceae and Lamiaceae are the dominant family followed by Euphobiaceae, Mimosaceae, Solanaceae, Apocyanaceae, Combretaceae, Cucurbitaceae, Liliaceae, Myrtaceae and Rutaceae simultaneously each with two species. The other 18 Families contributed with one species. Out of 70 documented information the plants mostly used for skin diseases, cold and cough, Fever, diarrhea. In the study area the information about usages of medicinal plants ranges from 0.25 to 1.5 with an average value of 0.6. The fidelity levels of different plants were ranged from 7.69% to 100%. Plants (40%) were primary source of medicine, followed by herbs (34%). *C. citrates* (UV of 1.5) and *C. Roseus*, *L. aspera*, *R. serpentine* (UV of 1.33) at the most frequently and popularly used medicinal plant species in the study area.

Key words: Ethnomedicine, Traditional healers, North West Ganjam District, Odisha.

INTRODUCTION

India is one of the world's 12 biodiversity centre with the presence of over 45,000 different plant species. Traditional systems of medicine continue to be widely practiced on many accounts. Many of these plants are rare and endemic and found only in forest region. There is neither biological information nor adequate knowledge that led to their rarity in the habitat (Ragupathy *et al.,* 2008). And these medicinal plants are known to be in uses by mankind since time immemorial (Jain and Patole, 2001; Ignacimuthu *et al.,* 2006). Interest in medicinal plants is reemphasized during last decades and numerous medicinal plant species are being for pharmacological activities and advancement of novelties in drug discovery. Based on the astonishing proportion of 18.9% of total plant species around the world, FAO estimates the number of medicinal plant species to reach more than 50,000 (Sandhya *et al.,* 2006). Despite the ancient nature of the tradition, it is estimated that 70-80% of people worldwide rely on medicinal plants to meet their primary health care needs and that 25% of prescription drugs contain active components derived from higher plants (Ragupathy *et al.,* 2009; Ayyanar *et al.,* 2005). Documentation of traditional knowledge has gained eminence from the prospective of drug development (Rajan *et al.,* 2002). India has more than 427 tribal community rich diversity of indigenous tradition. However, traditional knowledge base and practices have been marginalized due to political and socio-economical reasons. Off late, interest in traditional medicine has been initiated to explore the knowledge base from various tribal groups across the country (Ganesan *et al.,* 2004; Hemadri *et al,* 1989). Several studies have related that tribal population in remote area not only depend on plant based resources for medicines, food, for age, and fuel, but also play a vital role in the management of natural resources (Phillips *et al.,* 1994; Sahu *et al.,* 2013). The main objective of this study was to assess the diversity of ethno medicinal plants used by North West of Ganjam, Odisha and document the traditional medicinal practices followed in healing ailments.

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MATERIALS AND METHODS

Study area: Ganjam district is situated in the coastal region of the state surrounded on the north by Khurda district, on the east by the Bay of Bengal, on the west by Kandhamal and Gajapati district and on the south by Andhra Pradesh. It lies between 19.00' and 20-17' of the Northern Latitude and 84-6' to 85.11' of eastern longitude (Fig 1). The district covers an area of 8206 sq.kms. Ganjam district is a mix of moist peninsular high and low level Sal forests; tropical moist and dry deciduous and tropical deciduous forest types provide a wide range of forest products and unique lifestyle to wild lives. The total Tribes are Khond (49.33 percent) Samutia (19.33 percent), Kandha (2.99 percent) and Saora (14.37 percent), Shabar (25.46). The Kandhas are found mainly in Kaithada, Bakshipalli and Benipur area of Purushottampur block. The Samutia live in high lands of hilly area in the district. The Saora or Odia Kandhas live in plain areas with the non tribal's.

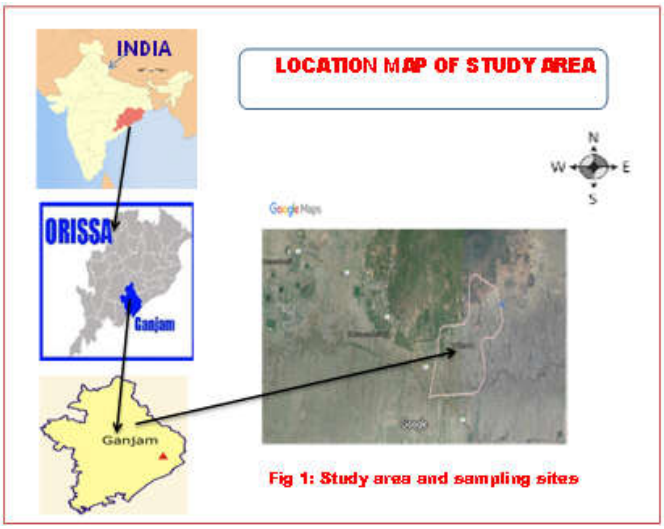

Fig. 1. Study area and Sampling sites

Data Collection

Ethno botanical surveys were carried out to obtain information on medicinal plants traditionally used to treat different diseases in the study area. During field survey approximately 2 months were spent with the local vaidyas. In order to document the utilization of medicinal plants, field trips were made during 2015-16. The collected specimens were identified and authenticated with help of valid references (Rout *et al.,* 2014). A literature survey was carried out on the study area before the field work started (Venkatasamy *et al.,* 2010; Sadangi and Sahu, 2004). The totals of 28 resource persons (traditional healers) were identified to get the ethno medicinal information through interviews oral. They have sound knowledge on the medicinal plants avail in their surroundings. Information gathered from the traditional healers on local name of the plants, plant parts used for curing, method of preparation, mode of administration and any other plants/agents used in ingredients. All information was recorded for each medicinal plant, and routs were documented. Plant specimens were prepared, identified and Descriptive statistics were used to analyze the ethno medicinal data collected. Then submitted to departmental herbarium section for future use.

Ailment categories

Based on the information of traditional healers in the study area, all the reported ailments were categorized into 13 categories (Table-1) viz. liver problems (LP), circulatory system (CS), poisonous bites (PB), endocrinal disorders (ED), fever (FVR), respiratory system disorders (RSD), skeleton muscular system disorders (SMSD), gastro intestinal ailments (GIA), eye infection (EI), genitor urinary ailments (GUA), dermatological infections/diseases (DID), hair diseases (HC) and cancer diseases (CD).

Data Analysis

Use Value

The relative importance of each plant species known locally to be used as herbal remedy is reported as the use value (UV) and it was calculated using the following formula (Silja *et al.,* 2008). The UV is helpful in determining the plants with high use.

$$UV = \Sigma U / n$$

Where UV = the use value of a species.
U = the number of use reports cited by each informant for a given plant species
n = the total number of informants interviewed for a given plant.

Fidelity Level: To determine the most frequently used plant species for treating a particular ailment category by the informants of the study area, we calculated the fidelity level (FL). The FL was calculated using the following formula [17]:

$$FL (\%) = Np/N \times 100$$

Where
Np = the number of use-reports cited for a given species for a particular ailment category.
N = the total number of use reports cited for any given species.

RESULTS AND DISCUSSION

Family Wise Classification of the Plants

During the present investigation it was noted that 50 ethno medicinal plant species used belongs to 30 families, 48 genera which are used for treatment of approximately 70 aliments. Caesalpiniaceae and Lamiaceae is the dominant family (each with 4 species) followed by Euphorbiaceae (3species), Fabaceae (3species), Mimosaceae (3species), Solanaceae (3species), Apocynaceae, Combretaceae, Cucurbitaceae, Liliaceae, Myrtaceae, Rutaceae each with two species. The other18 families contributed with one species. In our study area the information gathered that a single medicinal plant use for more than one affliction.

Plant Use Value

The most commonly used species are *Cymbopogon citrates* with 6 use reports by 4 informants, giving the highest use value of 1.50. *C. citrates* are attributed to its use in the treatment of various diseases and it is well recognized by all informants as the plant having the highest medicinal value (Table 1). Other important plants with a high use value were *Catharantus roseus, Leucas aspera, Rauvolfia serpentine* (4 use reports by 3 informants with a use value of 1.33), *Aloe vera, Curcuma lonnga, Syzygium cumini* (5 use reports by 4 informants with a UV value of 1.25) and *Nyctanthes arbortristis, Pterocarppus santalinus* (4 use reports by 4 informants with a UV value of 1.00). The medicinal plants with a very low UV were *Cassia occidentalis*, *Eucalyptus globules*, *Prosopis cineraria* ,which were reported by 12 informants with a UV of 0.25, but the informants regularly used these plants for the treatment of filarial, asthma, eczema, joint pain, toothache, diarrhea, dysentery etc.

Fidelity level

The analyzed categories with major agreements to high light the most important plant species in each category are listed in Table 2. Out of the reported plants, 50 species had the highest fidelity level of 100% most of which were used in the single ailment category with multiple informants. The plants with the highest FL of 100% were *Lawsonia rosasinensis, Rauwolfia serpentine* and *Cucumis sativus.*

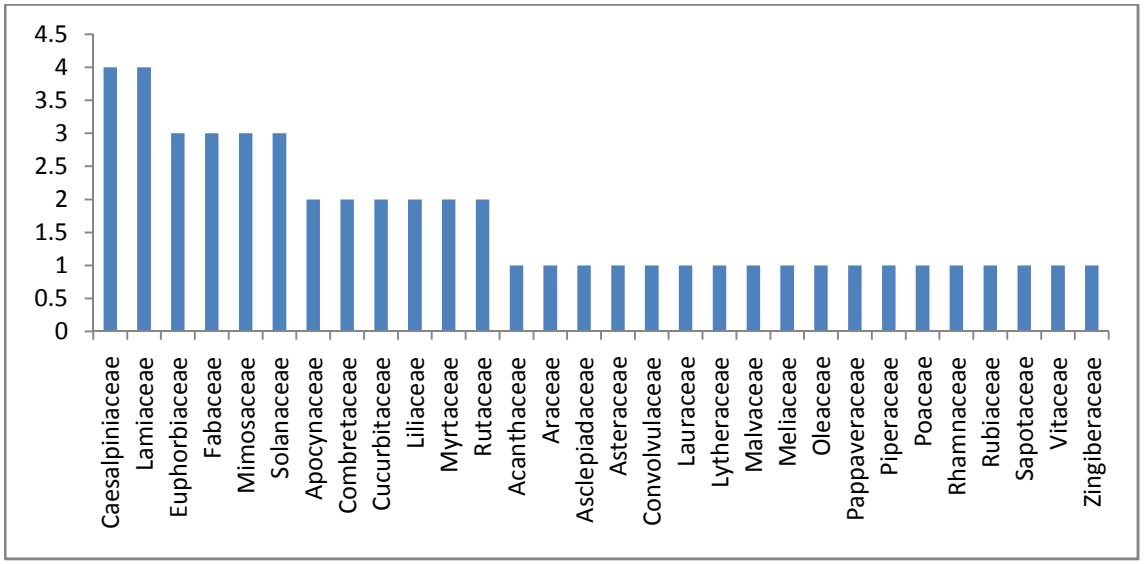

Fig. 2. Distribution and number of Plants among Families

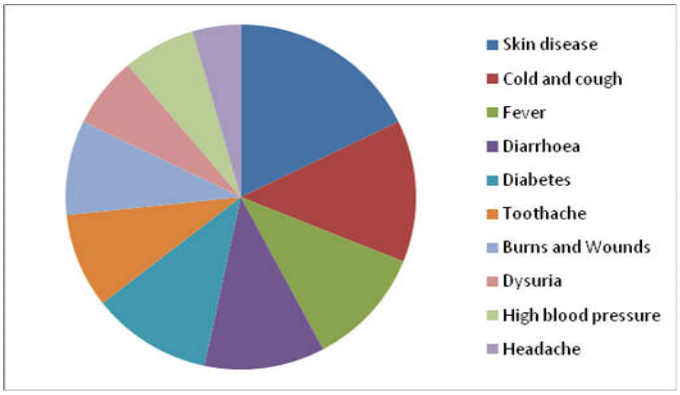

Figure 3. Plant wise diseases distribution

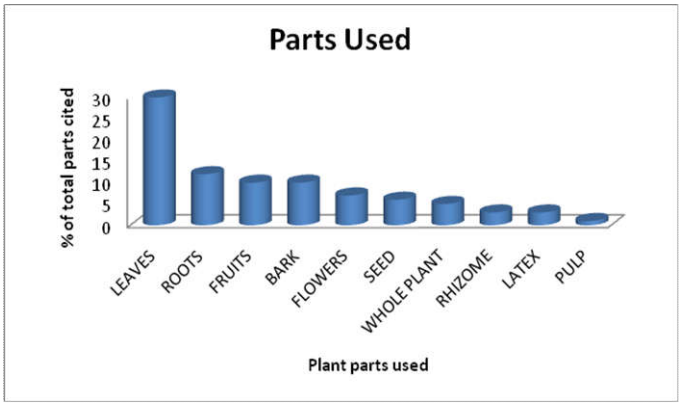

Figure 5. Percentage of plant parts uses

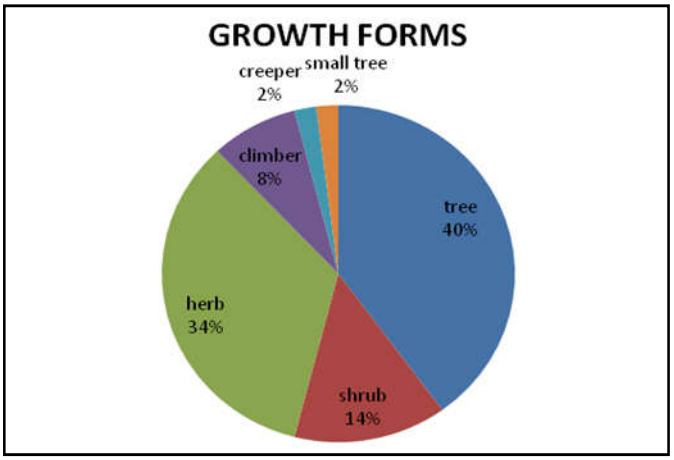

Figure 4. The percentage of traditional medicinal plant species in each growth habit

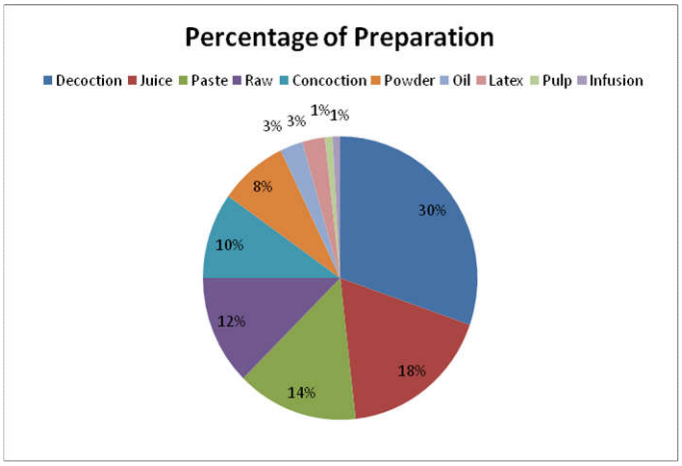

Figure 6. Method of Preparation

Major Diseases Wise Plant Distributions: A total of 50 plants have been found to be used for medicinal basis by the traditional healers of North West Ganjam District, Odisha. Maximum plants are used by the tribal healer for the curing of major diseases like Skin disease (08 Plants), cold and cough (06 Plants), Fever (05 Plants), Diarrhoea (05 plants), Diabetes (05 plants), Toothache (04 plants), Burns and Wounds (04 plants), Dysuria (03 plants), High blood pressure (03 plants), Headache (02 plants). But these plants are used by other neighboring euthenics community for the treatment of other diseases *(*References are given in Table 5).

As the sources of the medicinal plant knowledge is the main factor for difference in utilization and treatment of different ailment. The literature says ethnobotanical knowledge and practice within any culture vary by geographical origin, residence, ethnicity, religion, age and gender (Pfeiffer and Butz, 2005).

Statistics of plant growth forms: During the present investigation, it was noted that 50 plant species are used as herbal remedy for the treatment of several ailments. Among them, (Fig.4) 40% tree,34% herbs, 14% shrubs, 8% climber species,2% creeper and 2% small tree.

Table 1. Use value for commonly used medicinal plants

Sl No	Botanical Name	Use Value
1	*Acacia catechu*	0.57
2	*Acorus calamus*	0.33
3	*Adhatoda vasica*	0.37
4	*Aegle marmelos*	0.42
5	*Aloe vera*	1.25
6	*Argemone Mexicana*	0.50
7	*Argyreia nervosa*	0.5
8	*Asparagus racemosus*	0.66
9	*Azadirachta indica*	0.57
10	*Bauhinia variegate*	0.37
11	*Calotropis gigantia*	0.27
12	*Cassia occidentalis*	0.25
13	*Catharanthus roseus*	1.33
14	*Cinnamomum tamala*	0.33
15	*Cissus quadrangularis*	0.33
16	*Clitoria ternatea*	0.37
17	*Cucumis sativus*	0.75
18	*Curcuma longa*	1.25
19	*Cymbopogon citrates*	1.5
20	*Datura stramonium*	0.4
21	*Emblica officinalis*	0.83
22	*Eucalyptus globules*	0.25
23	*Euphorbia tirucalli*	0.28
24	*Hibiscus rosasinensis*	0.67
25	*Lawsonia inermis*	0.67
26	*Leucas aspera*	1.33
27	*Mentha spicata*	O.75
28	*Mimosa pudica*	0.42
29	*Mimuscops elengii*	0.33
30	*Momordica charantia*	0.67
31	*Murraya koenigii*	0.4
32	*Nyctanthes arbortristis*	1.0
33	*Ocimum basilicum*	0.6
34	*Ocimum sanctum*	0.57
35	*Paederia foetida*	0.33
36	*Phyllanthus niruri*	0.67
37	*Piper nigrum*	0.38
38	*Pongamia pinnata*	0.67
39	*Prosopis cineraria*	0.25
40	*Pterocarppus santalinus*	1.0
41	*Rauvolfia serpentine*	1.33
42	*Saraca asoka*	0.42
43	*Solanum viarum*	0.37
44	*Syzygium cuminii*	1.25
45	*Tamarindus indica*	0.4
46	*Terminalia bellerica*	0.42
47	*Terminalia arjuna*	0.4
48	*Tridax procumbens*	0.4
49	*Withania somnifera*	0.57
50	*Ziziphus Mauritiana*	0.5

Table 2: Fidelity (FL) values for common medicinal plants used by traditional healers of North West Ganjam, Odisha by ailment categories

Sl No	Ailment categories	Biomedical term	Fidelity level
1.	Liver problem (LP)	*Lawsonia rosasinensis*	100%
2.	Circulatory problem (CS)	*Adhatoda vasicanees*	25%
3.	Poisonous bites (PB)	*Aegle marmelos, Calotropis gigantean, Datura stramonium, Leucas aspera,*	25%
4.	Endocrinal disorders(ED)	*Rauwolfia serpentine*	100%
5.	Fever(FVR)	*Asparagus racemosus, Cymbopogan citrates, Salanum viarum, Terminalia belferica*	16.6%
6.	Respiratory system disorder (RSD)	*Senegalia catechu, Ocimum basilium, Piper nigrum*	16.6%
7.	Skeleto muscular system disorders (SMSD)	*Eucalyptus globules, Momordica charantia, Paederia foetida*	12.5%
8.	Gastrointestinal ailments(GIA)	*Cissus quadrangularis, Mimuscops elengii, Tamarindus indica*	7.69%
9.	Eye infection (EI)	*Cucumis sativus*	100%
10.	Genito urinary ailments (GUA)	*Saroca asoka, Argyreia nervosa, Emblica officinalis*	20%
11.	Dermatological infection/diseases (DID)	*Acorus calamus, aloe vera, Argemone Mexicana, Azadirachta indica, Bauhinia variegate, Catatharanthes roseus, Hibiscus rosasinenensisMentha spicata, Mimosa pudica, Pongamia pinnata*	9.09%
12.	Hair diseases (HD)	*Datura srtamonium, Hibiscus rosasinenensis, Lawsonia inermis, Muraya koenigii, Zizipus mauritiana*	20%

Table 3. Medicinal plants used for treating human diseases in Ganjam District

Sl no.	Botanical name	Local name	Family	Habit of the plant	Habitat / source	Parts used	Medicinal use in ganjam district	Method of preapara-tion	Administr-ation of route	Medicinal use in other districts.	Reference
1	*Senegalia catechu var. Sundra(L.F)*	Khaira	Mimosaceae	Tree	Wild	Bark	Cold and cough, milk secretion in pregnancy, mouth ulcers,redu_ce body pain .	Decoction	Oral and External application	Diarrhoea, piles	Rout *et al.,* 2014
2	*Acorus calamus L.*	Bacha	Araceae	Herb	Wild	Rhizome	Promotion of memory power,epil_epsy and worm infection.	decoction and paste	Oral	cataract	Rajan *et al.,* 2012
3	*Adhatoda vasica Nees*	Basanga	Acanthaceae	Shurb	Wild	Leaf, flower, bark	Stomach pain, cold, blood purification.	Juice and powder	Oral	Cough	Mohanty *et al.,* 2015
4	*Aegle marmelos (L.)corr.*	Bela	Rutaceae	Tree	Wild	Leaf, fruit, root	Seminal weakness, indigestion, diarrhoea.	juice , infusion and raw	Oral	Dysentery	Carlini *et al.,* 1986
5	*Aloe vera (L.)burm.f.*	Gheekunwari	Liliaceae	Herb	Wild	Leaf pulp,root	Madness, stomach disorder, mastitis, burnt skin and wound	paste, decoction and pulp	Oral and external application	Asthma	Kalita *et al.,* 2015
6	*Argemone mexicana (L.)*	Odoshomari	Papaveraceae	Herb	Wild	Seed, bark, leaf	Skin disease, syphilis, wound and rat bites.	Powder, paste and decoction	Oral and external application	Cancer and viral fever	Pattnaik *et al.,* 2007
7	*Argyreia nervosa (burm.f.)Boj.*	Brudhataraka	Convolvulaceae	Climber	Wild	Root	Sexual disorder in males	decoction and latex	Oral	Fids	
8	*Asparagus racemosus Wild.*	Satabari	Liliaceae	Climber	Wild	Whole plant	Protects pregnancy, reduce body temperatur-e in sunstroke and fever	decoction and powder	Oral	Rheumatism	Mohanty *et al.,* 2015
9	*Azadirachta indica A.J.uss*	Nimba	Meliaceae	Tree	Wild	Leaf	Boils, small pox, leprosy, skin disease	decoction ,raw and juice	Oral and external application	Mouth diseases and wounds	Pareek and Trivedi, 2011
10	*Bauhinia variegate (L.)*	Kanchana	Caesalpiniaceae	Tree	Wild	Bark, flower	Skin diseases, ulcer, leprosy	Paste and decoction	Oral and external application	Dysuria	Kaur, 2015
11	*Calotropis gigantia (L.)R.Br.*	Arakha	Asclepiadaceae	Shurb	Wild	Root, latex	Cat bite, headache and toothache	decoction and latex	Oral	Induce abortion and migraine	Mishra, 2000
12	*Cassia occidentalis L.*	Ghoda chakunda	Caesalpiniaceae	Tree	Wild	Seed, root	Eczema, filaria and asthema	Juice and paste and decoction	Oral	Cough	Mishra, 2000
13	*Catharanthus roseus Don.*	Sadabihari	Apocyanaceae	Herb	Wild	Leaf, root	Skin diseases, insect stings, diabetes and cancer	Raw and juice	Oral and external aplication	Tumours	Sadangi and Sahu, 2004
14	*Cinnamomum tamala (F.hamilt)Ness &Eberm*	Tejapatra	Lauraceae	Tree	Wild	Bark, leaves	Vomiting, diarrhoea, stomachache	decoction and juice	Oral	Gonorrhea	Sadangi and Sahu, 2004
15	*Cissus quadrangularis L.*	Hadabhanga	Vitaceae	Shurb	wild	Whole plant	Bone fracture and constipation	decoction and paste	Oral	Appetizer	Hemadri, 1989
16	*Clitoria ternatea L.*	Aparajita	Fabaceae	Herb	wild	Leaf, flower	Acne, boils, and filarial	decoction and paste	Oral	poison affected area	Venkatasamy *et al.,* 2010
17	*Cucumis sativus L.*	Kakudi/kantiali	Cucurbitaceae	Creeper	Wild	Fruit, seed	Heart burn, relief to tired eyes	Juice and raw	Oral	Urinary infection	Rout *et al.,* 2014
18	*Curcuma lonnga L.*	Haladi	Zingiberaceae	Herb	wild	Rhizome	Boils, eczema, chicken pox, allergies and kill worms	Paste and juice	Oral and external application	Ecchymosis	Mishra, 2000

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19	*Cymbopogon citrates Stapf.*	Dhanwantari	Poaceae	Herb	wild	Leaf, plant oil	Mosquito repellent, fever, constipation, cold, cough and headache.	Oil, Decoction	Oral and external application	Digestive disorder, diabetes	Mahalik *et al.,* 2015
20	*Datura stramonium L.*	Dhala dudura	Solanaceae	Herb	wild	Flower and leaves	Hair loss, insect bite	Juice and raw	Oral nd external application	Asthma	Phillips *et al.,* 1994
21	*Emblica officinalis Gaertn.*	Anla	Euphorbiaceae	Tree	wild	Fruit	Gout, Dysuria, urticaria,hair loss and dandruff.	decoction, juice and powder	Oral	Dysentery	Silja *et al.,* 2018
22	*Eucalyptus globules Labill.*	Nilagiri	Myrtaceae	Tree	Wild	Leaf	Bone joint pain, toothache.	Latex and decoction	Oral and external application	Constipation, bird lice	Phillips *et al.,* 1994
23	*Euphorbia tirucalli L.*	Khadisiju	Euphorbiaceae	Tree	Wild	Latex, root	Toothache and stomachache	Powder and decoction	Oral	ear pain	Kalita *et al.,* 2015
24	*Hibiscus rosasinensis L.*	Mandara	Malvaceae	Shurb	Wild	Flower, leaf	Growth of air and skin diseases	Powder and decoction	Oral and external aaplication	Leucorrhoea and indigestion	Venkatasamy *et al.,* 2010
25	*Lawsonia inermis L.*	Manjuati	Lytheraceae	Tree	Wild	Root, leaf	Jaundice and hair loss	decoction and paste	Oral	Leprosy and skin diseases	Venkatasamy *et al.,* 2010
26	*Leucas aspera Spreng.*	Gaisa	Lamiaceae	Herb	Wild	Leaf, flower	Headache, snake bite, intestinal worm in children.	Juice, decoction, oil and raw	Oral	Nose bleeding, scorpion string	Carlini *et al.,* 1986
27	*Mentha spicata L.*	Podina	Lamiaceae	Herb	Wild	Leaf	Hyperacidity, skin diseases, itching	Raw, decoction, oil	Oral and external application	Nasal bleeding, skin problem	Sadangi and Sahu, 2004
28	*Mimosa pudica L.*	Lajakuli	Mimosaceae	Herb	Wild	Leaf, root	Eczema, piles and toothache	Paste and decoction	Oral	Psoriasis, wound, and asthma	Venkatasamy *et al.,* 2010
29	*Mimuscops elengii L.*	Baula	Sapotaceae	Tree	Wild	Seed, bark	Diarrhoea, wound, chronic constipation	Juice, paste and raw	Oral	Mouth disease	Kalita *et al.,* 2015
30	*Momordica charantia L.*	Kalara	Cucurbitaceae	Climber	Wild	Leaf, fruit	Diabetes, ear pain	Paste and juice	Oral	Skin disease	Rout *et al.,* 2014
31	*Murraya koenigii (L.)Spreng.*	Mersinga	Rutaceae	Small tree	Wild	Leaf	Bleeching and hair loss	Juice	Oral	Dysentery	Pattnaik *et al.,* 2007
32	*Nyctanthes arbortristis L.*	Gangasiuli	Oleaceae	Shurb	Wild	Leaves	High blood pressure, cough, joint pain, skin disease	decoction, paste and juice	Oral and external application	Malarial fever	Carlini *et al.,* 1986
33	*Ocimum basilicum L.*	Durlava tulasi	Lamiaceae	Herb	Wild	Leaf,	Dysuria, cough and cold	Powder, decoction	Oral	Cold, cough and fever	Mohanty *et al.,* 2015
34	*Ocimum sanctum L.*	Tulasi	Lamiaceae	Herb	Wild	Leaf	Diabetes, kill warts, cough and cold	Juice, decoction	Oral	Diabetes	Mohanty *et al.,* 2015
35	*Paederia foetida L.*	Posaruni	Rubiaceae	Herb	Wild	Leaf	Waist pain, blood dysentery and headache	Raw, decoction	Oral	mucostool	Kalita *et al.,* 2015
36	*Phyllanthus niruri Webster.*	Badi anal	Euphorbiaceae	Herb	Wild	Whole plant	Leucorrhoea and alati	decoction	Oral	Leucorrhoea	Sahu *et al.,* 2013
37	*Piper nigrum L.*	Gol maricha	Piperaceae	Climber	Wild	Fruit	Nyctalopia, stomach pain during menstrual cycle, cough and cold	decoction	Oral	Indigestion	Venkatasamy *et al.,* 2010
38	*Pongamia pinnata (L.)Pierre.*	Karanja	Fabaceae	Tree	Wild	Leaves	Diabetes, prevention of malaria and skin diseases	decoction	Oral and exetrnal application	Mosquito bite and cold	Phillips *et al.,* 1994
39	*Prosopis cineraria (L.)Druce.*	Sami	Mimosaceae	Tree	Wild	Bark, leaves	Diarrhoea, dysentery, ulcers	Raw and decoction and powder	Oral	Asthma, bronchitis	Sahu *et al.,* 2013

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40	*Pterocarppus santalinus L..f.*	Rakta chandan	Fabaceae	Tree	Wild	Bark, shoot	Headache, diarrhoea, burns and wounds	Paste and decoction	Oral and external application	genitor - urinary tract infection and polyuria.	Rout *et al.,* 2014
41	*Rauvolfia serpentine (L.)*	Patalagaruda	Apocyanaceae	Shurb	Wild	Whole plant, leaf, rhizome	Fever, corneal capacity, high blood pressure and diabetes	decoction and juice	Oral	Gonorrheal diseases	Sahu *et al.,* 2013
42	*Saraca asoka (Roxb.)deWild*	Asoka	Caesalpiniaceae	Tree	Wild	Bark, seed, flower	Irregular menstruation, gum bleeding, dysuria	Decoction and raw	Oral	For bleeding	Venkatasamy *et al.,* 2010
43	*Solanum viarum Dunal*	Bheji baigana	Solanaceae	Shurb	Wild	Fruit,root	Fever, throat pain, dysentery	decoction, juice	Oral	Toothache	Phillips *et al.,* 1994
44	*Syzygium cuminii (L.)Skeels.*	Jamukoli	Myrtaceae	Tree	Wild	Leaf, fruit	Blood pressure, dysentery and diarrhea, bleeding piles	Juice, powder, decoction and raw	Oral	Diabetes	Carlini *et al.,* 1986
45	*Tamarindus indica L.*	Tentuli	Caesalpiniaceae	Tree	Wild	Fruit, seed	Constipation, round worm	Decoction and paste	Oral and external application	Digestion, dysentery	Rout *et al.,* 2014
46	*Terminalia bellerica (Gaertn.)Roxb.*	Bahada	Combretaceae	Tree	Wild	Bark, fruit	Pitta and cough fever, fruit oil for headache	decoction and oil	Oral	Anaemia and leucoderma	Rout *et al.,* 2014
47	*Terminalia arjuna (Roxb.ex C.)*	Arjuna	Combretaceae	Tree	Wild	Whole plant	Spermatorrhea and acne	decoction	Oral	Heart disease	Mishra, 2000
48	*Tridax procumbens L.*	Bisalya karani	Asteraceae	Herb	Wild	Leaf	Cuts and wounds	Juice	Oral	Cuts and wounds	Silja *et al.,* 2008
49	*Withania somnifera (L.)Dunal.*	Aswagandha	Solanaceae	Herb	Wild	Root, leaf	Burns and wounds,carbuncles and ulcers	Raw, decoction and paste	Oral	Dysuria	Rout *et al.,* 2014
50	*Ziziphus Mauritiana Lam.*	Barakoli	Rhamnaceae	Tree	wild	Leaf, fruit, root	Indigestion, hair loss	Raw, decoction	Oral	boils, dysentery, diarrhoea	Rout *et al.,* 2014

Plants parts used: Most of the remedies are reported for the first time. The tribal population used herbal remedies for the treatment of common minor ailments and even for some major diseases like jaundice, malarial fever, blood clotting etc. These people have a long history of traditional use of plants. Traditional medicine is still widely practiced throughout the region; it is now fast disappearing due to modernization. Most of the time drugs are utilized in the fresh or dried state. It is found that leafy crude drug preparations are mostly recommended as Ethnomedicine followed by leaves, roots, seeds and fruits, stem or bark, flower, rhizome and bulb (Fig.5)

Method of preparation of plants for administration: The method of preparation and administration of plant parts were grouped into 9 categories (Fig.-6). Of which, the most commonly used method of preparation was decoction (30%) followed by juice (18%), paste (14%), raw (12%), concoction (10%), powder (8%), oil (3%), latex (3%), pulp (1%), infusion(1%).Preparation of decoction, juice and paste for the treatment of ailments is a common practice of tribal people of North West Ganjam.

Mode of Administration: Most of the plant parts used for treatment of different diseases and used to take orally or apply externally. Remedies based on mixture of different plants are common as well as mixture of same plant parts. The amount of prepared medicine used to make the concentration are describes in terms of a full, half or quarter of a teaspoon or table spoon, full, half and quarter of glass.

The prepared medicines were usually prescribed to be taken twice or thrice per a day until the patient healed. All healers were very clear about their recipes and dosages.

Conclusion

During this present investigation about 50 plants species have been collected from the North West region of Ganjam district, Odisha and their therapeutic information gathered. It is evident that still a large number of villages of North west Ganjam district rich in their old customs and culture and adopt herbal therapy for the majority of disease because of strong belief on local practitioners. Their uses have been documented exclusively either on medicinal properties, their preparation, storage or dose administration and efficiency against ailment. It is evident from the above mentioned discussion that the herbal therapy and other details are almost in conformity with other the previous workers with a little difference. The efficacy and safety of all the reported ethno medicinal plants needs to be evaluated for phytochemical and pharmacological studies, especially the plants with high use value, should be given priority to carry out bioassay and toxicity studies. As a result of the study on *Cymbopogon citrates* which is a rare and vulnerable herb, are suggesting the plants like *Catharantus roseus, Leucas aspera, Rauvolfia serpentine, Aloe vera,Curcuma longa, Syzygium cumini, Nyctanthes arbortristis, Pterocarppus santalinus* ,since these plants have high UV values.

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