ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS USED IN ERHUWAREN COMMUNITY IN UGHELLI SOUTH LOCAL GOVERNMENT AREA OF DELTA STATE

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ABSTRACT
An ethnobotanical survey was carried out to explore and document various plants and plant parts used for medicinal purposes in Erhuwaren Community, Ughelli-South Local Government Area of Delta State, Nigeria. Ethnobotanical data was collected from 40 respondents (16 males and 24 females) by means of Semi-structured questionnaires to obtain information on the Local names of the medicinal plants, their medical uses, the plant parts used, methods of preparation and method of administering treatments to people. The study exposed 65 medicinal plant species belonging to 36 families, used to prepare 120 recipes for different ailments. The major methods of herbal preparation were juice (28%) and decoction (26%). Family Asteraceae was the most commonly represented plant family having about 9.7% of all the medical plant species recorded in this study. The plant parts most frequently used were the leaves (53.8%). The disease categories with the highest ICF values were Gastrointestinal (0.80) and Antipyretic disorders (0.77). Solenosternon monostachyrus, Musa paradisiaca, Phyllantus amarus and Ocimum gratissimum were the most utilized medicinal plant species with the highest RFC value. Results revealed that residents in the study area find the use of traditional medicines cheaper and effective as compared to orthodox medicine.

Keywords: Ethnobotanical survey, Documentation, Conservation, Traditional medicine, Recipes

INTRODUCTION

The indigenous use of plants has been an effective source of both African traditional and modern medicine. Higher plants have been described as the sleeping giants of drugs development (Farnsworth and Morris, 1976) and this claim is especially true as medicinal plants are still been screened for their phytochemicals which are potent. Medicinal Plants are plants that contain properties or compounds that can be used for therapeutic purposes or those that synthesize metabolites to produce useful drugs (WHO, 2008). Medicinal plants have been shown to have genuine utility and about 80% of rural population depend on them for their primary health care needs (Akinyemi, 2000). About

25% of prescribed medicines in industrialized countries are derived directly or indirectly from higher plants (WHO, 2002a, 2002b, 2005)

Plants synthesize hundreds of chemical compounds that function in biological activities such as defense against insects, fungi, diseases and herbivorous animals (Wikipedia Encyclopedia), and these chemical compounds exhibit physiological and biochemical responses in the human body.

According to WHO, around 21,000 plant species have the potential for being used as medicinal plants. Also, Food and Agriculture Organization estimated in 2002, that over 50,000 medicinal plants are used across the world. It has been estimated that in developed countries such as United States, plant drugs constitute as much as 25% of the total drugs, while in fast developing countries such as China and India, the contribution is as much as 80% (Adb El-Ghani, 2016).

Botanically derived medicines have played a major role in human societies throughout history and prehistory and people have used plants as medicine since the beginning of civilization, as they were believed to have healing powers (Lewis and Elvin-lewis (2003). However, the medicinal uses of plants are rapidly declining among the present generation of local people as a consequence of modernalization and civilization (Cox, 2005). There are 7 billion people and about 250,000 plants co-existing in this planet (Mamedov, 2012), the knowledge about these plants, is passed from generation to generation without a proper documentation system and traditional healers keep little to no records, which are sometimes inadequate. This has subsequently contributed to the gradual loss of knowledge about plant uses. The World Health Organization has keen interest in documenting the use of medicinal plants by native people from different parts of the world (Buragohain, 2011) as numerous medicines have been derived from the knowledge of tropical forest people and clearly, there will be more in the future.
Most cultures possess a huge store of undocumented traditional knowledge of applying herbal remedies in the treatment of diseases (Offiah *et al*., 2011). It has become more important now than ever, to record and preserve the traditional knowledge of medicinal plants, in order to aid the discovery of new drugs and possibly to find improved application of traditional medicine,

Ethnobotanical studies have added significantly to the discovery of drugs from indigenous medicinal plant resources. All over the world, several ethnobotanical studies focusing on medicinal plants have been documented (Abd El-Ghani 2016; Tantengco *et al.*, 2018; Odoh *et al.*, 2018). This study explores the medicinal

plants used by the Ughievwen people for the treatment of various ailment, and the resulting records of these plants and their uses will provide baseline data for future phytochemical and pharmacological studies. Erhuwaren Community was chosen for this project because the people still adhere to their age-old traditional beliefs and custom and as such, they constitute an authentic source of data for the scientific documentation of medicinal plants still in everyday use.

Materials and methods

Study area

The study was conducted in Erhuwaren Community situated in Ughelli South Local Government Area, traditionally inhabited by the Ughievwen people.

Demographic data collection

The demographic data for this research were gathered from a total of 40 willing respondents (16 male and 24 female). Data collection was by means of semi-structured questionnaire. The questionnaire was designed to focus on the local names of plants, their various medicinal applications, the parts of the plants used and the methods of preparation and administering treatments to patients. The questionnaire was translated and interpreted to them orally in the local language and responses filled into the questionnaire after each interview.

Plant collection and Taxonomic identification

Plants specimens indicated in the recipes were collected, identified using their local names and standard texts, Pressed and mounted.

Data Analysis

Data was analyzed using different quantitative indices including Informant Consensus Factor (**ICF)** and Relative Frequency Citation (**RFC).**

Information Consensus Factor (ICF)

For the analysis of the general use of plants, Informant Consensus Factor (ICF) was used to highlight plants of particular cultural relevance and agreement in the use of plants. Informants Consensus within a Community and between Cultural groups indicates which plants are widely used and thus aids in the selection of plants for pharmacological and phytochemical studies (Giday *et al.,* 2007). In order to use this tool, illnesses were classified into categories as plants with high ICF are likely to be more pharmacologically efficient as compared to plants with low ICF (Trotter and Logan, 1986). ICF values lies between 0.00 and 1.00. ICF

values are always greater when single or few plants are documented to be used by large number of respondents to cure a specific disease while low ICF values give an indication that informant do not agree over which plant to use (Heinrich *et al.*, 1998, Canales *et al.*, 2005).
The ICF can be calculated using the formula as follows:

$$ICF = \frac{nur - nt}{nur - 1}$$

Where,
ICF = Informant Consensus Factor
nur = Number of use citation in each category
nt = Number of species used.

Relative Frequency of Citation (RFC)
Relative frequency of citation (RFC) signifies the local importance of each species in a study area (IIker *et al.*, 2009; Vitalini *et al.*, 2013; Iyamah and Idu, 2015).

This index is determined by dividing the number of informants citing a useful species (FC) by total number of informants in the survey (N). RFC is calculated by the formula as described.

$$RFC = \frac{FC}{N}$$

Results

Erhuwaren community
Figure 1 shows the map of Erhuwaren community. Erhuwaren is geographically located within Latitude 5.4382 North and 5.8783 East with an elevation of 9 metres (30 feet). Erhuwaren Community comprises four (4) distinctive quarters namely – Adjesaba, Ekrimegwe, Uduvedi, and Urhowhoro. Erhuwaren community is rural in nature.

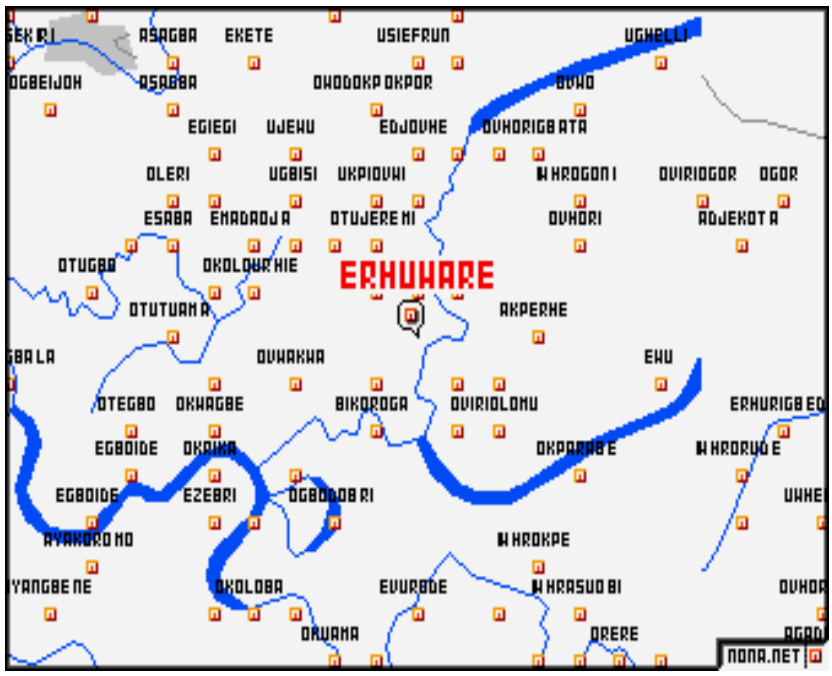

Figure 1: Map showing Erhuwaren community

Demographic structure of the respondents on Plant knowledge

Table 1 shows the demographic structure of respondents. There were 40 respondents interviewed through the use of semi-structured questionnaire. Among the 40 respondents, 16 (40%) were male while 24 (60%) were female. The highest number of respondents falls within the age group 40 - 49years (10, 26.32%), next to this is those in the age 50 - 59years (8, 21.05%) while those who would be regarded as youths, within age groups 20 - 39years have the lowest number of respondents (3, 7.89%). Two-third of the respondents interviewed were illiterate (87.5%), while those with an education, had primary education and represents one-third of the respondents (12.5%).

Table 1: Demographic structure of the respondents on the knowledge of plants used in the treatment of human ailment

	TOTAL	PERCENTAGE %
Gender		
Male	16	40
Female	24	60
Age group		
20-29	3	7.89
30-39	3	7.89
40-49	10	26.32
50-59	8	21.05
60-69	6	15.79
70-79	3	7.89
80-89	2	5.26
90-99	2	5.26
100-109	1	2.63
Educational attainment		
Illiterate	35	87.5
Literate	5	12.5
Practice specification /occupation		
House Wives	15	37.5
Farmers	8	20
Midwives	5	12.5
Traders	8	20
Herbalist	4	10
Source of Knowledge		
Parental	30	75
Training	5	12.5
Parental/Training	4	10
Divination	1	2.5

Medicinal plants used in Erhuwaren and their preparations

Table 2 shows the plants used for medicinal preparations in Erhuwaren. A total of 65 plants, belonging to 36 families were identified as plants used in Erhuwaren. Respondents gave local names of plants in recipes used in the treatment of different human ailments.

Table 2: Medicinal plants and their preparation

S/N	Common name	Botanical names	Local name	Family	Part used/habit	Specific function/ activity	Freq	Method of Preparation	Mode of administration
1	Cassava	*Manihot esculenta* Crantz	Imidaka/Eraka	Euphobiceae	Leaves/shrub	Measles, Hernia	8	Juice, paste	Orally, externally
2	False thistle	*Acantus montanus* Nees)T.Anderson	Isikpabo/gherame	Isikpabo/gherame	Leaves/shrub	Hunch back,foot poison	3	Paste	Externally
3	Prickly Amaranthus	*Amaranthus spinosus L*	Iseruen	Amarantaceae	Whole plant/Herb	Tooth worm, Abdominal pain, tooth and mouth ulcers	4	Paste/decoction	Externally
4	Sour sop	*Annona muricata*		Annonaceae	Leaves/tree	Typhoid	1	Decoction	Orally
5	Siam weed	*Chromolaena odorata (L) H.Rob*	Ishero	Asteraceae	Leaves/herb	External bleeding, tooth ache and loss of appetite	5	Juice, paste, Decoction	Orally, externally
6	Cinderalla weed Start wort	*Synedrella nodiflora (Linn.) Gaertn*	Ogboghu	Asteraceae	Whole plant/Herb	Fever	1	Decoction	Externally
7	Resurrection plant	*Bryophyllum pinnatum (Lam) Oken*	Ebe opkokpan	Crassulaceae	Leaves/Herb	Cough, footworm, hunch back, navel, sore	7	Strong heating	Orally
8	Mass cane, corn plant	*Drancaena manni Bak*	Orie erivwin	Agavaceae	Leaves/Herb	Swollen body, diarrhea, tuberculosis	3	Decoction, paste	Orally, externally
9	Physic nut Pignut	*Jatropha curcas L*	Eshakpa	Euphobiceae	Stem, sap/Shrub	Ulcer, chronic gonorrhea, headache for baby	6	Juice, tincture, paste	Orally

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S/N	Common name	Botanical names	Local name	Family	Part used/habit	Specific function/ activity	Freq	Method of Preparation	Mode of administration
10	Stone breaker	*Phyllanthus amarus Schum & Thonn*	Iyeke	Phyllanthaceae	Whole plant/Herb	Constipation, stomach pain, back worm	9	Paste, Tincture	Orally
11	Lemon grass	*Cymbopogon citratus D.C Starf*	Iri	Poaeceae	Whole plant	Cattarrh, fever, Miscarriage	5	Decoction	Orally, externally
12	Scent leaf	*Occimum gratissimum L*	Erhan	Lamiaceae	Leaves /Herb	Catarrh, cough. Fever	3	Decoction	Orally, externally
13	Bitter leaf	*Vernonia amygdalyn*	Origbo	Asteraceae	Leaves/Shrub	Bleeding, stomachache,itching, ringworm	9	Juice, decoction	Orally,
14	Plantain	*Musa paradisiaca*	Orhe	Musaceae	Leaves , fruit, root,stem/ Shrub	Body pain, vomiting,sponge emaciating,swollen spleen, bleeding after child birth	10	Decoction, Juice, Paste	Orally, externally
15	Coconut palm	*Cocos nicifera*	Kokoria	Poaceae	Root/Grass	Rheumatism	1	Juice, poultice	Externally
16	Monkey Sugar cane	*Costus ofer* Ker *Gawl*	Eti	Costaceae	stem/shrub	Fever, measles, stomach pain	5	Juice	orally
17	Gauva	*Psidum guajava.* L	Igobe	Myrtaceae	Root. Leaf/ Tree	Fever, man power, sexual weakness	3	Tincture, Decoction	Orally, externally
18	Serpent wood	*Rauwolfia vomitoria Arfel*	Ogurukpe/Akpa	Apocenaceae	Leaf/Tree	Mental disorder, headache.	2	Infusion, tincture	Orally, externally

Table 2: Medicinal plants and their preparation

S/N	Common name	Botanical names	Local name	Family	Part used/habit	Specific function/ activity	Freq	Method of Preparation	Mode of administration
19	Fluted pumpkin	*Telferia Occidentalis Hook*	Umee	Curcubiceae	Leaf/Climber	Whitlow	1	Paste	Orally
20	Wild Sunflower plant	*Aspilia Africana C.D Adam*	Isahrasa	Asteraceae	Leaf/ Herb	External bleeding, Appendicitis, Measles	5	Juice, tincture, decoction	Orally, externally
21	Lime	*Citrus aurantifolia (Christm.) Swingle*	Okribeotete	Rutaceae	Fruit/Tree	Loss of appetite, Impotence in male.	1	Juice Tincture	Orally
22	Mango tree	*Mangifera indica L*	Imaigo	Anarcadeceae	Leaf, stem /Tree	High fever, hiccup, diarrheae, Diabetes, burns, throat disease	4	Decoction, smoke , ash, powder	Orally, externally
23	Pawpaw tree	*Carica papaya* L	Etooyibo	Caricaceae	Leaves/Tree	Fever	3	Decoction	Externally
24	Kola	*Garcinia kola Heckel*	Evhe	Clusiaceae	Bark/ Tree	Typhoid	1	Decoction	Orally, externally
25	Tomatoes	*Solanum lycopsersicum*	Ebetamatosi	Solanaceae	Leaves/Herb	Headache, fever, convulsion	5	Juice	Orally
26	Haemorrhage plant	*Allium sativum Christm.) Swingle*		Liliacaea	Bulb/ Underground stem	Pile, appendicitis, hernia	1	Tincture	Orally

Table 2: Medicinal plants and their preparation

S/N	Common name	Botanical names	Local name	Family	Part used/habit	Specific function/ activity	Freq	Method of Preparation	Mode of administration
	Christmas	*Alchonea cordifolia (Schumach & Thonna*	Osokpor/ usokpo	Euphorbiceae	Whole plant/ Shrub	Itiching, gain unconsciousness, Irregular menstruation, fever	2	Juice, decoction, touch	Externally
27	bush	*Newboldia Laevis (P Beauv.) Seem*	Igiriki	Bignoniceae	leaf, bark/Tree	Malaria, Typhoid, Barreness, headache, painful menstruation, kidney problem	4	Juice Paste	Orally, externally
28	Tree of life	*Colocasia esculenta* L	Ebedu	Araceae	Leaf/ Herb	Burn	5	Paste	Externally
29	Cocoyam	*Azadirachta indica* A. J Huss	Dongoyaro	Meliaceae	Seed/ Tree	Pile	1	Powder	Orally
30	Neem	*Bambusa vulgaris Schrad*	Okpo	Poaceae	Yound shoot/ Herb	Gonorrhea	1	Orally, tincture	Orally Orally,
31	Bamboo	*Allium cepa* L *Abelmoscus esculenta* L	Utita	Liliaceae	Bulb /Herb	delayed placenta, headache	2	Paste	externally
32	Onions	*Moench Elaeis guineensis*	Ebeshawo	Malvaceae	Leaf/ Herb	Ease child birth	1	Paste Paste,	Orally
33	Okro	*Jacquin*	Edi	Aracaceae	Fruit/Tree	Measles	1	decoction	Orally
34	Oil palm								

Table 2: Medicinal plants and their preparation

S/N	Common name	Botanical names	Local name	Family	Part used/habit	Specific function/ activity	Freq	Method of Preparation	Mode of administration
35	Ethiopian peper	Xylopia *aethiopica* (Dunal). A. Rich	Uririen/ Erieri	Annonaceae	Leaf, Fruit, stem/Tree	Eczema, cough, constipation	3	Powder, ash	Orally, externally
36	Prickly chaff	*Achyranthes aspera Linn*	Irhie	Amaranthaceae	Leaf/ Herb	Fracture, asthma, emaciating baby		Paste, decoction, poultice	Externally
37	Blck night shade	*Soalnum nigrum* L	Ebe akpe	Solanaceae	Leaf/Herb	Convulsion	1	Juice	Externally
38	Sweet potato	*Ipomea batatas* L *Lam*	Ebeneneghe	Convovulaceae	Leaves/Creeper	blood supplement	1	Juice	Orally
39	Alligapor pepper	*Afromomum meleguata Schumann*	Erhie	Zingiberaceae	Fruit/Herb	To fall baby umbilical cord, prevent air from entering navel	3	Paste	Externally
40	Black velvet tamarind	*Dialium guineensis Wild*	Ohiorama	Fabaceae	Leaf/Tree	Fever	1	Decoction	Orally, externally
41	Yellow tassle	*Emilia Sonchifolia* L *(DC)*	Orho-orua	Asteracea	Whole plant/Herb	Throat infections, clear the eyes and help children walk	2	Juice	Orally, externally
42	African Saandal wood	*Baphila nitida*	Orhua	Fabaceae	LeafTree	Miscarriage,abortion in women	2	Poultice, Crushed	Externally

Table 2: Medicinal plants and their preparation

S/N	Common name	Botanical names	Local name	Family	Part used/habit	Specific function/ activity	Freq	Method of Preparation	Mode of administration
43	Showy Combretum English	*Combretum grandiflorus F. Hoff*	Ikedike	Combretaceae	Leaf/Herb	Jaundice	1	Decoction	Orally
44	African greenheart	*Piptadeniastum africanum (Hoff F.)*	Owanga	Fabaceae	Bark, Root/ Tree	stimulant of nervous system, and snuff	1	Powder	Orally
45	Bottle gourd	*Lagenaria siceraria molina) Stand*	Awhore	Curcubitaceae	Leaf/Climber	Liver problems	1	Juice	Orally
46	Pseudo Colocynth	*Lagenaria breviflorus Benth*	Ibiukuemere	Curcubitaceae	Fruit/Creeper	Measles, chicken, pox, Navel pain	3	Juice	Externally
47	False mallow	*Malvastrumemere coromandelianum (L.) Garcke*	Usiokr	Malvaceae	Laef/Tree	Pile	1	Juice	Orally
48	Goat weed	*Ageratum conyzoides*	Oriogho	Asteraceae	Seed/Herb	Bleeding during, Pregnancy	1	Paste	Orally
49	Pasture weed	*Cyathula prostrata*	Orom-	Acanthaceae	Whole plant/ Herb	Swollen spleen, palpitation of the heart	1	Paste	Orally
50	Ballon vine	*Cardiospermum grandiflorum Radlk*	Arurogho	Sapindaceae	Leaf/Herb	Complications,in pregnancy, stomach,pain and stooling	2	Decoction	Orally

Table 2: Medicinal plants and their preparation

S/N	Common name	Botanical names	Local name	Family	Part used/habit	Specific function/ activity	Freq	Method of Preparation	Mode of administration
51	Common purslane	*Portulaca olearacea*	Erhoerawewen	Potulacaceae	Leaf/Herb	Swollen spleen	2	Juice	Decoction
52	Bird Gooseberry	*Hoslundia opposite Vahl*	Ebaugweri	Lamiaceae	Leaf/Herb	High fever	2	Juice, paste	Externally
53	Pepper	*Capsicum annum.* L	Sibotete	Solanaceae	Fruit, leaves/ Herb	Cholera/convulsion	5	Paste	Externally
54	Rice weed	*Hyptis lanceolata Poiret*	Origbe	Lamiaceae	Leaf/Herb	High blood pressure	1	Juice	Orally
55	Monkey potato	*Solenostemon monostachyus (P. Berk)*	Ebeame	Lamiaceae/Labiateae	Leaf/	Fever, high blood pressure,heart, failure, underdeveloped pregnancy, stomach ulcer	12	Decoction, juice	Orally
56	African Sandal wood	*Momordica charantia*	Ebeidiren/Udjiro	Curcubitaceae	Leaf/Creeper	Stomach pain in newborn baby Convulsion	3	Decoction, Juice	Orally
57	Diodias turtle shell	*Vernonia amygdalyn*	Ebeokrogbe	Rubiaceae	Leaf/Herb	Miscarriage, hernia,swollen stomach,undeveloped pregnancy	3	Paste, tincture decoction	Orally
58	Sugar cane	*Saccharum officanarium*	Akene	Poaceae	Stem/Grass	Measles	2	Juice	Externally
59	Lemon	*Citrus limon (L) Burn F*	Itien akpanfi	Rutaceae	Leaf/Tree	Fever	3	Decoction	Orally

Table 2: Medicinal plants and their preparation

S/N	Common name	Botanical names	Local name	Family	Part used/habit	Specific function/ activity	Freq	Method of Preparation	Mode of administration
60	Pepper fruit	*Denettia tripetala Bak F*	Imiko	Annonaceae	Leaf/Tree	Fever	1	Juice	Orally
61	Ackee/ Akee	*Blighia sapida konig*	Oghigihen	Sapindaceae	Root, bark/Tree	Stiooling, Fever	2	Juice	Orally
62	Bowstring hemp	*Sansevieria liberica* Gen and labr	Erewwen/Erewwen eban	Agavaceae	Leaf/ Shrub	To bath a newborn baby	1	Sponge	Externally
63	Ringworm plant	*Senna alata L.) Roxb*	Okikpobewweren/ Amoke	Caesalpinaceae	Leaf /Shrub	Constipation, ear pain	3	Decoction, juice	Orally
64	Rockrose plant	*Dissotis rotundifolia (Sm) Triana*	Ukuerowwo	Melastomataceae	Leaf/ Shrub	Stomach ache,and diarrhea, in children	2	Decocotion	Orally
65	Tobacco	*Nicotania tobacum L*	Utaba	Solanaceae	Leaves/Herb	Swollen spleen	1	Tincture	Orally

Plant parts used in medicinal preparations

Figure 2 shows the Percentage of plant parts used in medicinal preparations in Erhuwaren community. Leaves, stem, seeds, roots, flowers, young shoot, bulb, sap, and whole plant were named as plant parts used by respondents. Percentage Plant part used as given by respondents were leaves (53.8%), whole plant (9%), stem, root and seed (having 7.7% each), bulb and seed (2.6%), back (5.1), young shoot, flowers and sap (1.3% each). Leaves (53.8%) are the most collected plant part for medicinal purposes next to it are stems, root and seeds (7.7%) while young shoot, flowers and sap (1.3%) represent the least plant parts used.

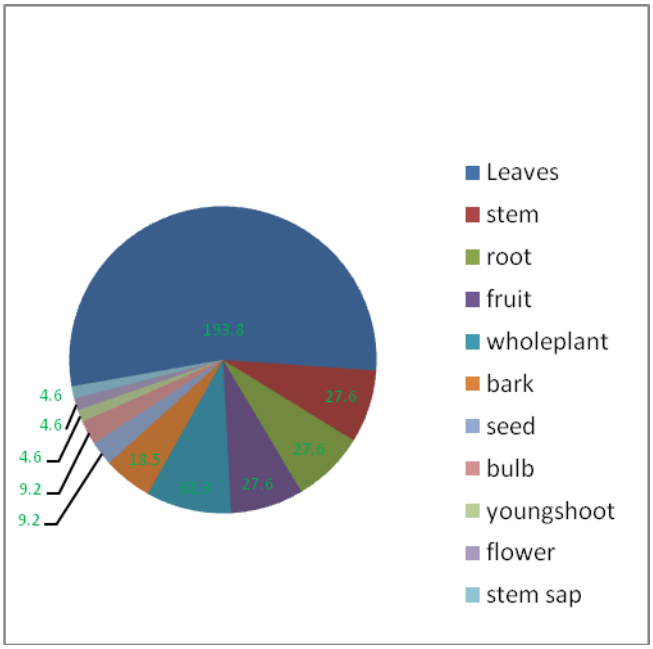

Figure 2: Plant parts used for Medicinal Preparations in Erhuwaren

Percentage Plant form used in medicinal Preparations

Figure 3 shows plant forms used in medicinal preparations. Plants forms mentioned by respondents include herbs, shrubs, trees, climbers, underground stem, creepers e.t.c. The most commonly used medicinal plant forms reported were herbs (31.8%), followed by trees (28.8%), shrub (25.8%), climbers and grasses (4.5% each), Creepers (3.0%) and underground stem (1.5%).

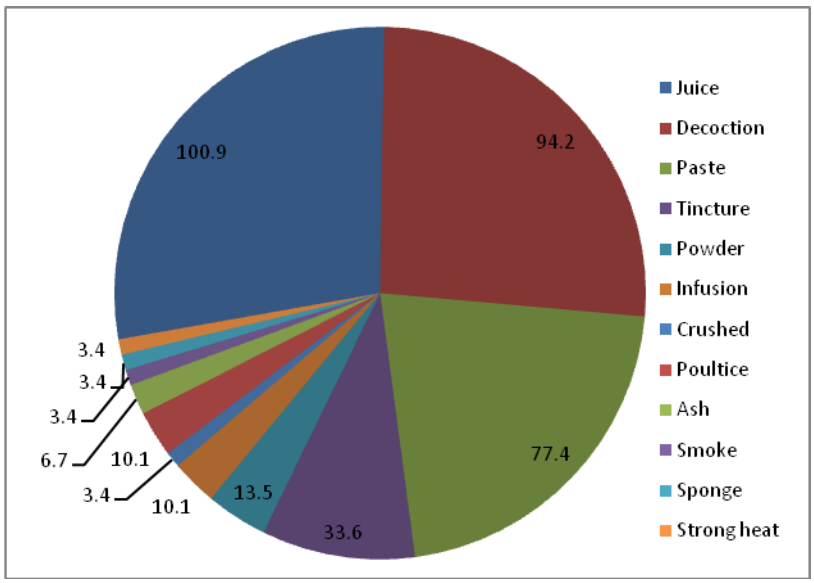

Figure 3: Mode of ethnomedicinal preparations in Erhuwaren (%)

Herbal formulation of medicinal plants for treating ailments

Table 3 shows herbal formulations used in treating ailments. A total of 120 herbal formulations were recorded for the 65 plants used in Erhuwaren community. Most of the plant remedies are taken orally and externally.

Table 3: Herbal formulation of traditional medicinal plants for treating human ailments in Erhuwaren Community.

S/N	Scientific Name	Herbal Formulation	Dosage
1.	*Manihot esculentum*	Juice is extracted from leaves for the treatment of measles. paste of leaves is applied externally for the treatment of hernia. Juice is mixed with native chalk for childbirth	Twice daily For a week As needed As needed
2.	*Acanthus mantanus*	A paste of the leaves is applied externally for treatment of hunch back and food poison	As needed
3.	*Amaranthus spinosus*	Whole plant is chewed for tooth worms and mouth ulcers. The decoction of plants with salt is taken for abdominal pain.	As needed Twice daily for three days
4.	*Chromolaena odorata*	Juice extracted from leaves is used for wounds. A paste of the leaves is used for toothache The decoction of the leaves is taken before breakfast for loss of appetite.	As needed As needed Once
5.	*Annona muricate*	The decoction of the leaf is taken for typhoid	Twice

6.	*Bryophyllum pinnatum*	Juices extracted from the leaves by heat is used for the treatment of cough, athlete foot, ear pain sore, hunch back, baby navel.	Twice daily
7.	*Synedrella nodiflora*	Decoction of leaves are applied of on the eyes for the treatment fever	One drop twice daily
8.	*Alchornea cordiflora*	Decoction of leaves is use for treatment of of swollen. A paste of the root along with alligator pepper, bitter kola and honey is taken for the treatment of tuberculosis A paste of the root is boiled along with native chalk is taken and paste of the roots is also applied on the forehead for the treatment of diarrhea.	As needed
9.	*Jathropha curcas*	Juice are extracted from the back for treatment treatment of ulcer. The sap from the stem is used as a mouthwash or paste for baby Leaves and roots alongside with local gin and native chalk is used for the treatment of chronic gonorrhea and headache	As needed As needed Twice daily
10.	*Phyllantus amarus*	Whole plant is chewed for the treatment of constipation Whole plant is added to local gin with three white capsules with leaves of *Solenosternon monostachyrus* for the treatment of stomach pain. Juice extracted from the whole plant with local gin is used for the treatment of blackworm	As needed Twice daily for three days As needed
11.	*Cymbopogon citratus*	The decoction of the whole plant is used for the treatment of catarrh and fever Whole plant with root decocted or added to local gin is Used for miscarriage**.**	Once daily .
12.	*Ocimum gratissimum*	Juice extract of leaves with kernel oil is used for treatment of catarrh and cough The decoction of leaves is used for fever	Twice daily for one
13.	*Vernonia amygdalina*	Juice extracted from leaves is used for wounds The leaf extract with a pinch of salt is used to treat of stomach ache The leaf extract is used to rub the body in itchingcondition and ringworm	As needed Once a day for three As needed
14.	.*Musa Paradisiaca*	Decoction of leaves is taken for body pain and fever A paste from roots is used for bleeding after child birth Decoction of dried fruits and leaves with salt is applied on incisions on a person for treatment of swollen spleen. Juice from rotten stem along with native salt is use to stop vomiting. Juice from stem is used as mouth wash or paste for babies Peels from fruit are used as sponge to bath emaciating baby.	Twice daily for one week Twice daily Once needed Twice daily for one As needed
15.	*Costus afer*	Stem is chewed for stomach pain. Juice extract from whole plant with lime juice for treatment of fever Juice extract from stem, mixed with lime juice and local gin is taken for the treatment of measles	As needed Twice a day Twice a day

16.	*Cocus nucifera*	Paste obtained from roots is boiled and taken for rheumatism	Twice a day
17.	*Psidium guajava*	Decocted leaves is used for the treatment of fever.	Twice daily for one week
		Decocted roots and leaves along with pawpaw leaf added to local gin for sexual weakness	Once daily
18.	*Rauwolfia vomitoria*	Infused leaves is applied externally on the head for treatment of headache.	As needed
		The tincture of the roots is used for the treatment of mental disorder	Twice daily
19.	*Telferia occidentalis*	A paste of the leaves along with native chalk is use for chalk is use for the treatment of whitlow	As needed
20.	*Aspilia Africana*	Tinctured leaves is taken for the treatment of appendicitis	Twice daily
		Decocted leaves is applied externally on the eyes for treatment of measles	A drop twice daily
		Juice extract from leaves is use for wounds.	As needed
21.	*Citrus aurantifolia*	Juice extracts from fruit is used boost appetite	As needed
		Ten to twelve fruits are sliced and put inside a bottle local local gin is added and is taken for the treatment of impotence in men.	One drop twice daily
22.	*Mangifera indica*	Decocted leaves with native soup (owho) is used for the treatment of fever.	Twice daily for a week
		Powdered young leaves is used for diarrhea and diabetes	Thrice daily 3-4 days
		Smoke from the burning leaves is inhaled for hiccups and throat diseases.	As needed
		Ash from the leaf is used to treat burns	As needed
23.	*Carica papaya*	Decocted leaves is used for treatment of fever	Twice daily for one week
24.	*Garcinia kola*	Decocted leaves is taken and also used to bath on top of a dustbin for the treatment of typhoid	As needed
25.	*Solanum lycopersicum*	Juice extract from leaves with kernel oil is used for treatment of headache and fever	Twice daily for one week
		Juice extract from the leaves with kernel oil is applied on the eyes for convulsion.	A drop twice daily
26.	*Allium sativum*	Six to seven bulbs of garlic are Sliced inside a bottle with dry gin and allowed for three days before use for pile.	Twice daily for 3-4 days
		Bulb is dug very early in the morning and cut into small sizes and dry gin is added, and taken for the treatment. of hernia and appendicitis.	Twice daily for 3-4 days
27.	*Alchornea cordifolia*	Decoction of the whole plant s used for itching.	As needed
		Juice extract from the leaves along with native chalk Is used for irregular menstruation.	As needed
		The whole plant is used to touch an unconscious person to reawaken them.	As needed
		Decoction of whole plant is use for the treatment of fever	Twice daily for one week
28.	*Newbuoldia laevis*	Juice extract from leaves along with lime fruit extract is bathed with for treatment of malaria, headache and typhoid	Twice daily for one week
		The bark of the tree with Ethiopian pepper is ground and taken for barrenness, painful menstruation and kidney problem.	Twice daily
29.	*Colocasia esculenta*	A paste of the leaves is applied externally on burn	As needed
30.	*Azadirachta indica*	Seeds are roasted, powdered mixed with sugar for pile	Twice daily
31.	*Bambusa vulgaris*	The young shoot is sliced and cooked with local gin tobacco leaf/ native salt taken for gonorrhea	Twice daily for 3 - 4 days

32. *Allium cepa*	Chew onion to bring out placenta after child birth Sliced onions are applied on the head for headache	As needed
33. Abelmoschus esculentum.	Chew apex of leaves for fast delivery	As needed
34. *Elaeis guineensis*	Make paste from unripe palm kernel bunch add Ethiopian pepper, boil and drink for treatment of measles.	As needed
35. *Xylopia aethiopica*	Leaf and stem bark are dried and pulverized, palm oil is added, mixed and applied on eczema. The opened dried fruit without seed is burnt powdered and mixed with palm oil for cough. Dried fruit is placed into the anus for constipation	As needed Twice a daily As needed
36. *Achyranthus aspera*	A paste of leave is boiled with pepper, oil and three camphor balls is applied externally for treatment of fracture.. Chew seven flowers of the plant with kernel seed,, spit the paste in a basin add oil to it, apply the paste externally on the person's chest, then use bamboo stick to hit the chest for treatment of Asthma A paste of the leave along with kernel oil, is applied externally for emaciating baby	As needed Twice daily Twice daily
37. Solanum nigrum	Juice extracted from the leaves along with kernel oil is Applied on the eyes for convulsion	A drop twice daily
38. Ipomea batatas	Juice extracted from leaves along with milk is used as blood supplements	As needed
39. Afromomum meleguata	A paste of fruit is applied externally to drop the umbilical cord of a baby and to prevent air from entering the navel	As needed
40. *Lagenaria breviflora*	Slice fruit, add salt and apply externally on navel with fowl feather for treatment of a newborn babies navel. Fruit is placed in the house for the treatment of measles of measles/ chickenpox.	As needed As needed
41. *alvastrum coromandelianum*	Leaves are washed with cold water and hot stone is added and taken for treatment of pile	Twice daily
42. *Ageratum* conyzoides	Chew seeds with one alligator pepper or chew leaves with native chalk apply if the first formulation doesn't work for the treatment of bleeding during pregnancy.	As needed
43. Cyathula prostrata	A paste of the whole plant along with one fruit of pepper is taken before breakfast for swollen spleen and palpitation of the heart	As needed
44. *Cardiospermum grandiflora*	A paste of the leaves is applied externally on pregnancy Chew leaves for stomach pain and stooling	Once daily As needed
45. Portulaca olaracae	Decoction of the whole plant along with native chalk is used to prepare owho soup and used for the treatment of swolllen swollen spleen.	Twice daily 3-4 days
46. *Hoslundia opposita* high fever.	Juice extracted from leaves is applied on the eyes daily for	One drop twice
47. *Capsicun annum*	A paste of fruit is applied externally on the navel for the treatment of cholera. Juice extracted from leaves along with kernel oil is applied applied on the eyes for treatment of convulsion.	Once One drop daily

48.	*Solenostemon monostachyrus*	Juice extracted from leaves with milk and 14 white capsules is taken for stomach ulcer.	As needed
		Juice extracted from leaves with kernel oil and one camphor is taken for convulsion.	As needed
		Juice extracted from leaves is applied on eyes for fever	One drop twice daily
		Use leaf to prepare owho for under development of pregnancy	As needed
		A paste of leaf with native chalk is applied externally on chest for treatment	As needed
49.	*Momodica charantia*	Decocted leaf is taken for convulsion	As needed
		Wash leaves with palm wine, apply juice externally on a child's the child's navel for stomach pain	Once daily
50.	*Diodia samentosa*	A paste of leaf is mixed with Ethiopian pepper, local gin and taken for hernia.	As needed
		Decocted leaves is taken for swollen stomach	Twice daily 3 - 4 days
		A paste of leaf mixed with alligator pepper is applied applied externally for miscarriage.	As needed
		A paste of leaf is applied externally for under development of pregnancy	Once daily
51.	*Sansevieria liberica*	Pound leaves, boil and use for bathing a new born baby	Twice daily
52.	*Senna alata*	Decocted leaves is taken for constipation	Twice daily for three days
		Juice extracted from leaf, mixed with kernel oil is used ear pain.	One drop twice daily
53.	*Nicotianan tobaccum*	Leaves mixed with local gin is taken for swollen spleen	Twice daily
54.	*Hyptis lanceolate*	Juice extracted from leaves is applied on the eyes for high blood pressure and fever	One drop twice daily
55.	*Emilia sonchifolia*	Juice from the fresh leaves is used to clear the eyes	One drop twice daily
		The leaf with guinea corn and lime juice is sed to treat sore throat.	As needed
		Leaf extract is rubbed on limb of children to make them walk	As needed
56.	*Combretum Grandiflora*	Decocted leaf is used for jaundice.	Twice daily three days
57.	*Lagenaria sansevieria*	The leaf juice is extracted for liver problem	Twice daily
58.	*Baphia nitida*	The leaf is crushed and applied to the lower part of the abdomen to prevent miscarriage/ abortion in women	Twice daily for two days
59.	*Dailum guineensis*	Fresh leaves is boiled and decoction is used for fever	Twice daily for three day
60.	*Citrus limon*	Leaves are boiled together with mango and guava leaves or the steam from the decoction is inhaled to treat malaria	Three times daily 3-4 days
61.	*Dissotis rotundifolia*	Leaf is cooked with alligator pepper for stomach ache and diarrhea in children	Once daily for 2 days, Half glass is given to children
62.	*Bilghia sapida*	Decoction of leaves for fever	A cup full is taken
		Juice extraction with native chalk for choking	Twice daily for three days
63.	*Saccharum officinarium*	Juice extract together with scent leaf juice and palm oil applied externally for measles	Twice daily for one week
64.	*Piptadeniastum africanum*	Powdered stem and roots are used as snuff and stimulant of nervous system	As needed
65.	*Denettia tripetata*	Fresh leaves are boiled along with the leaves of mango plants for fever	Twice daily for 3 days

ICF values of medicinal plants

Table 4 shows the disease categories treated with medicinal plants in Erhuwaren. 17 major disease categories were recorded from the study. Respondents use a total of 25 plant species for Gastrointestinal disorder, followed by 24 plant species for Antipyretic disorders. Respondents mentioned 25 plant species for the highest ICF value (0.8) which is Gastrointestinal. *Phyllantus amarus* is the commonly used plant for this disease category, while *Solenosternon monostachyrus* was commonly used for the treatment of Antipyretic disorder which is the second highest ICF value (0.77) while Otalgia, Renal & urinoogenital, Aphrodisiac, Hemorrhoids and Haematological diseases recorded the lowest ICF value (0).

Table 4: ICF values of traditional medicinal plants for treating human ailments in Erhuwaren Community

S/N	Diseases Category	NUR	NT	ICF
1.	Gastrointestinial	108	25	0.8
2.	Antipyretic	103	24	0.77
3.	Wounds	13	4	0.75
4.	Cardiovascular	5	2	0.75
5.	Respiratory tract infection	7	6	0.74
6.	Dental	20	5	0.56
7.	Dermatological	31	15	0.53
8.	Gynecological/ obstetrics	31	16	0.5
9.	Deficiency	3	2	0.5
10.	Musculoskeletal	2	0.2	
11.	Otalgia	2	3	0
12.	Renal and Urinogenital	3	3	0
13.	Aphrodisiac	2	2	0
14.	Hemorrhoids	3	3	0
15.	Haematological	3	3	0

RFC value of medicinal plants reported for ailments

Table 5 shows the RFC values of medicinal plants used for treating ailments. The highest RFC value (0.3) was recorded for *Solenosternon monostachyrus* followed by (0.25) for *Musa paradisiaca* and (0.23) for *Phyllantus amarus* and *Ocimun gratissimum.* The lowest RFC (0.003) was recorded for 26 plant species with only one or two informants citing their medicinal uses.

Table 5: RFC value of medicinal plants commonly reported against given ailments

S/N	Medicinal Plants	FC	N	RCN
1.	*Solenosternon Monostachyrus*	12	40	0.3
2.	*Musa paradisiacl*	10	40	0.25
3.	*Phyllantus amarus*	9	40	0.23
4.	*Vernonia amygdalina*	9	40	0.23
5.	Mangifera indica	9	40	0.23
6.	*Manihot esculenta*	8	40	0.2
7.	*Ocimum gratissiumum*	8	40	0.2
8.	*Psidum guajava*	8	40	0.2
9.	*Momordica charantia*	8	40	0.2
10.	*Bryophyllum pinnatum*	7	40	0.18
11.	*Jatropha curcas*	6	40	0.15
12.	*Chromolaena odorata*	1	40	0.13
13.	*Cymbopogon citratus*	5	40	0.13
14.	*Costus afer*	5	40	0.13
15.	*Solanum lycopersicum*	5	40	0.13
16.	*Colocasia esculenta*	5	40	0.13
17.	*Capsicum annum*	5	40	0.13
18.	*Diodia sarmentosa*	5	40	0.13
19.	*Amaranthus spinosus*	4	40	0.1
20.	*Newboudia laevis*	4	40	0.1
21.	*Dissotis rotundifolia*	4	40	0.1
22.	*Acanthus montanus*	3	40	0.08
23.	*Dracaena mannii*	3	40	0.08

24.	*Carica papaya*	3	40	0.08
25.	*Xylopia aethiopica*	3	40	0.08
26.	*Achryanthus aspera*	3	40	0.08
27.	*Aframomum melegueta*	3	40	0.08
28.	*Senna alata*	3	40	0.08
29.	*Citrus limus*	3	40	0.08
30.	*Saccharum officinalis*	3	40	0.05
31.	*Rauvolfia vomitoria*	2	40	0.05
32.	*Alchornea cordifolia*	2	40	0.05
33.	*Allium cepa*	2	40	0.05
34.	*Hoslandia opposite*	2	40	0.05
35.	*Emilia sonchifolia*	2	40	0.05
36.	*Baphia nitida*	2	40	0.05
37.	*Bilghia sapida*	2	40	0.05
38.	*Piptadeniastum africanum*	2	40	0.05
39.	*Cardiospermum garndiflorum*	2	40	0.05
40.	*Annona muricata*	1	40	0.03
41.	*Synedrella nodiflora*	1	40	0.03
42.	*Cocus nucifera*	1	40	0.03
43.	*Telferia occidentalis*	1	40	0.03
44.	*Aspilia Africana*	1	40	0.03
45.	*Citrus Aurantifolia*	1	40	0.03
46.	*Kola nitida*	1	40	0.03
47.	*Allium sativum*	1	40	0.03
48.	*Azardiracta indica*	1	40	0.03
49.	Bambusa vulgaris	1	40	0.03
50.	*Abelmoschus esculentus*	1	40	0.03
51.	*Elaeis guineensis*	1	40	0.03
52.	*Solanum nigrum*	1	40	0.03
53.	*Ipomea batatas*	1	40	0.03

54.	*Lagenaria breviflora*	1	40	0.03
55.	*Malvastrum coromandelianum*	1	40	0.03
56.	*Ageratum conyzoides*	1	40	0.03
57.	*Cyathula prostrata*	1	40	0.03
58.	*Sansevieria liberica*	1	40	0.03
59.	*Nicontiana tabacum*	1	40	0.03
60.	*Hyptis lanceolate*	1	40	0.03
61.	*Combretum grandifloras*	1	40	0.03
62.	*Dialium guineeese*	1	40	0.03
63.	*Dennita tripetata*	1	40	0.03
64.	*Lagenaria siceraria*	1	40	0.03
65.	*Portulaca oleracea*	1	40	0.03

Discussion

The study aimed at exploring and documenting medicinal plants and plant parts used for treating ailments in Erhuwaren community. Forty willing respondents who participated in the study using a well-structured questionnaire listed the plants species, parts used, forms in which plants are used for medicinal preparations and ailments the plants are used to for in Erhuwaren.

More female than male participated in the study, this implies that females take responsibility for the health care needs of their families in Erhuwaren. The high number of respondents within the age group 40 – 49years and the low number among the youngsters indicates that youths in Erhuwaren, as a result of modernization, are more interested in other captivating activity than having the knowledge of ethnomedicine passed to them. The more illiterate people in the study area found to have more knowledge of medicinal plants as compared to literate ones, imply that exposure to modern ways of life brought by education may be responsible, this has been reported by other studies (Khan *et al.*, 2014, Adnan *et al.*, 2014, Gedif and Hahn, 2003). Also, source of knowledge of the use of plant for medicine is parental however, this knowledge is under threat of being transferred to the younger generation, shown by the low percentage of youth who respondent. The decreased rate of tare of youth participation may be due to the lack of interest among the younger generation to learn and practice it, which might be attributed to the increasing influence of modernization (Adan *et al.*, 2014).

Local names of plants in recipes given by respondents used in the treatment of different human ailments is in consonance with Singh (2008) who reported that plants are generally known by their local names in every part of the world. Although local names of plants are not recommended directly for scientific accounts as they lack uniformity and consistency, yet they are considered as a useful tool for search of useful plants or new uses of known plants (Erinoso and Aworinde, 2012).

The high usage of herbs in the study area could be an indication of their abundance, accessibility and their effectiveness in the treatment of ailments in comparison to other growth forms. These findings are consistent with previous reports (Akhtar *et al.,* 2013, Kadir *et al.,* 2014). The highest number of medicinal plants found in Asteraceae family used for medicinal purposes may be because they contain a wide range of biologically active compounds (Gazzaneo *et al.,* 2005) and also because being one of the largest families in the plant kingdom, a large number of plants belong in it (Simbo, 2010). Several research Simbo (2010); Bibi *et al.,* (2014); Ahmed *et al.,* (2014) reported similar result.

The frequent use of leaves for treatment of ailments indicated by the respondents may be as a result of their availability and the fact that they contain high amount of chemicals which could be easily extracted and used in different forms. Khan *et al.,* (2014) and Focho *et al.,* (2009) reported similar result in their studies.

Gastrointestinal and Antipyretic disorders are common in the community and may be the reason majority of the plants are being used orally and externally. Ethnomedicines are taken along different types of additives generally called vectors like salt, sugar, milk, local gin (ogogoro), palm oil and kernel oil for the purpose of increasing flavor and reduction the astringent taste of the remedies. Since traditional medicines have sour or bitter taste in most cases, the additives reduce such tastes and may even improve the efficacy of the medicine. The measurements used to determine dosages are not standardized and depend on the age, physical appearance of the patient, sociocultural explanation of the illness, diagnosis and experience of individual herbalist. Some herbal preparations were used for bathing, dropped in the ear and sniffed. The medicinal plant species used as sniffs are burnt to inhale fumes while some plants parts were crushed and inhaled. Similar modes of applications were reported in Gujaranwala in Pakistian (Mahmood *et al.,* 2013). The leaf and back of some plant species are boiled and decoction is used to take bath against body pain and fevers

The high modes of ethnomedicinal preparation reported for Juice (28%) and Decoction (26 %) in the study was reported Cechinel-Filho (2012) who implied that it was due to their high effectiveness for the curing ailments. their high effectiveness for the curing ailments.

The highest ICF value (0.8) for *Phyllantus amarus* as the commonly used plant for this disease category suggests that *Phyllantus amarus* deserve further researching because according to Henrich *et al.* (1998), high ICF values are very useful in the selection of specific plants for further search of bioactive compounds. The highest RFC was calculated for *Solenosternon monostachyrus* indicated that *Solenosternon monostachyrus* is used for the treatment of various human ailments.

Conclusion

There is a clear need to document traditional knowledge on medicinal plants usage before it becomes lost to future generation. Instead of relying on trial and error occasioned by random screening procedures, properly documented traditional knowledge about plant use could help scientists to target those plants whose medicinal properties may find new application or source of a new drug for the benefit of mankind.

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