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Research Article

Ethnobotanical Study of Medicinal Plants Used to Treat Human Diseases in Nono-Sele District, Illubabor Zone, Oromia Regional State, Ethiopia

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Abstract

Plants are used by human societies for a variety of purposes, including food, clothing, and shelter, religious rituals, ornamental, and health care. The aim of this study was to investigate an ethnobotanical study of medicinal plants and related indigenous knowledge of the community of the study area. A crossectional study design was employed and Semi-structured questionnaire was used to collect ethnobotanical information from 325 informants. Informants were sampled by using Cochran sample size formula and Snowball technique was used to select informants. Moreover, semi-structured interview, group discussion, market survey, guided field walk and observation were methods of ethnobotanical data collection. SPSS version 25 and MS excel spreadsheet version 16 were used to analyze ethnobotanical data. Ninety three (93) plant species belonging to 77 genera and 39 families were documented. The most frequently reported plant species belong to family Asteraceae 12 (12.9%) followed by Fabaceae 10 (10.8%), Solonaceae 8 (8.6%) and Lamiaceae 7 (7.5%) family. Herbs accounted the highest proportion 42 (45.16%) followed by tree 25 (26.88%). Most of the herbal remedies were prepared from leaves 66 (50.4%) followed by fruits 16 (12.4%). Most of the herbal medicines were prepared from fresh 110 (84.3%) plants and mode of preparation was mostly by crushing 52 (39.69%). Among mode of administration of medicinal plants oral route 84 (64.1%) was the dominant route of administration. The study area is rich in medicinally important plant species and it is a good reservoir of medicinal plants.

Keywords

Ethnobotany, Folk Medicine, Herbal Remedy, Livestock Diseases, Medicinal Plants, Traditional Medicine

1. Introduction

Plants are used by human societies for a variety of purposes, including food, clothing, and shelter, as well as for religious rituals, ornamental, and health care [1]. The physical, spiritual, and social well-being of traditional civilizations around the world is largely dependent on the wealth of traditional knowledge that has been gathered through extensive interactions with the natural world [2].

Ethiopian population still depends on TMs for its health care services [3, 4]. To make it easier to find new sources of medicine and to encourage the sustainable use of natural

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resources, traditional medical knowledge must be documented [5]. That is why, [6], highlighted that in-depth knowledge about the medicinal plant could only be acquired when research is being conducted in the various regions where little to no botanical and ethnobotanical study has taken place.

Similar to other African nations, Ethiopia's medical plant species face continuity and sustainability issues, primarily as a result of the extinction of medicinal plant taxa and ecosystems [7]. Although traditional medicine holds a great value for Ethiopian civilizations, particularly in rural areas, it is losing plant species and associated knowledge as a result of factors including deforestation and the expansion of modern education [6].

Various sets of recommendations relating to the conservation of medicinal plants have been developed, such as providing both in situ and ex situ conservation [8, 9]. Natural reserves and wild nurseries are typical examples to retain the medical efficacy of plants in their natural habitats, while botanic gardens and seed banks are important paradigms for ex situ conservation and future replanting [10, 11]. According to the research of Sheikh K. et al., the goal of conservation should be to preserve the greatest amount of variation within each species in order to guarantee that its genetic potential will be preserved in the future [12].

Documenting this traditional medical knowledge is important to facilitate the discovery of new sources of drugs and promote sustainable use of natural resources [5]. The major limitation is that Africa has not been able to take advantage of its wealth of raw materials and traditional knowledge to invest in sustainable processing [13].

Similar to other places in Ethiopia, community in Nono-Sele district follow customs that have passed through generations to take care of health of their own health. The traditional healers who provide the local community with their services using their IK and traditions are said to use a variety of medicinal plants exist in the district. Despite the existence of these facts, a literature review on the ethnobotanical research reveals the absence of any prior documentation on the ethnobotanical study of MPs in any places in the district. Therefore, there is a clear need to conduct ethnobotanical study of MPs and fill the gap of documentation of TMPs used to treat human diseases. Thus, the study was initiated to conduct an ethnobotanical study of medicinal plants used to treat human diseases by the community of Nono-Sele district.

2. Methods

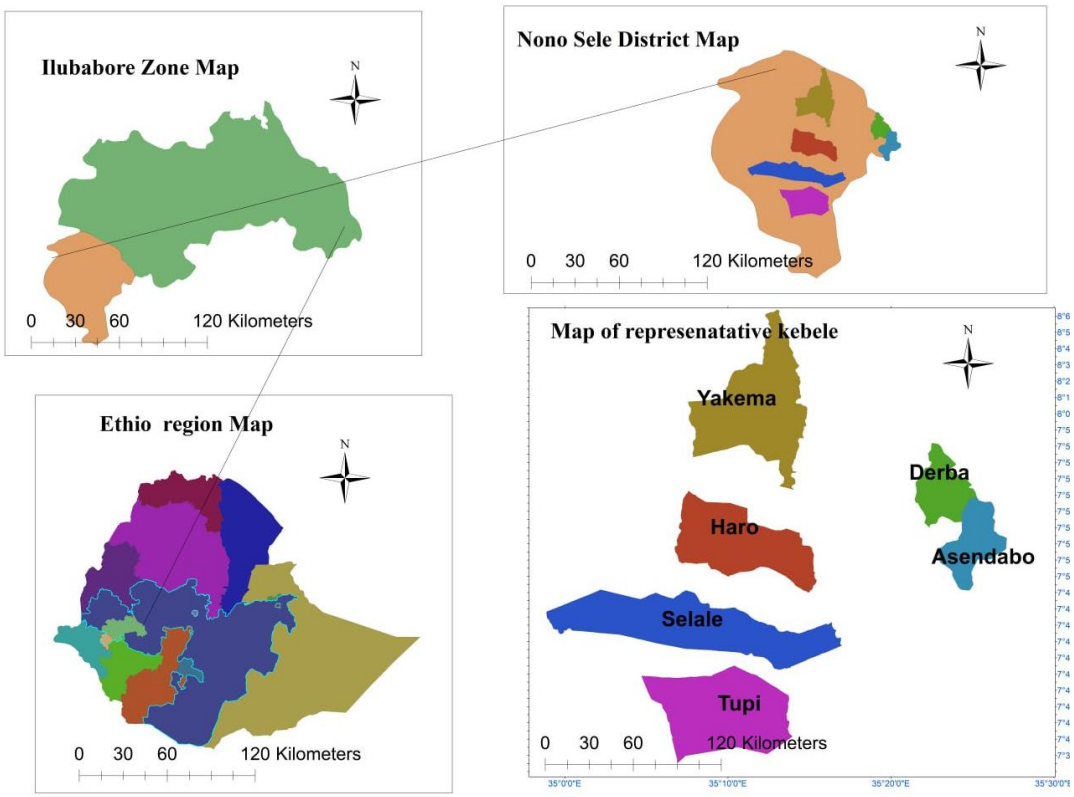

Figure 1. *Map of the study area.*

The study was conducted in Nono sele district, located in Illubabor administrative zone of Oromia National and Re-

gional State, Southwestern part of Ethiopia. It is one of the districts of Illubabor zone, located approximately 700 km away from Addis Ababa to the southwest direction. It is bordered on the Southwest by Gambela region, on the North by Bure, on the Northeast by Halu, and on the Southeast by the southwest Ethiopia region (SWER) (Figure 1). The district is divided into twenty-two administrative Kebeles, the smallest administrative units, namely Arbe, Asendabo, Birbirsa, Bontu Korma, Decha, Derba, Derbeta, Gemechesa, Haro, Kimo, Kombolcha, Kupi, Nono, Onose, Qoti, Selale, Sochoso, Tupi, Waka, Walketesa, Yakema and Yebache.

2.1. Topography

Data taken from Nono-sele agricultural office reveals, the area has rising and falling topography with a height range of 1300m above sea level to 2500 m above sea level. It lies between 7° 45′ 0″ N latitude and 35° 15′ 0″ E longitude.

2.2. Population

According to data taken from agricultural office of the study area, population data of the district is 39136 of which, 21032 were males and 18104 were females.

2.3. Socio-Economic Information

Data taken from Nono-Sele district agricultural office indicated that people inhabit only nine percent of the district's land area while the majority (91%) of the district's territory is covered by forest. The community in the area relies heavily on the forest and its products for their way of life. Wild coffee (*Coffee arabica*) and plants used as spices, such as *Afromomum corrorima* are naturally grow there.

2.4. Climate: Rainfall and Temperature of the Study Area

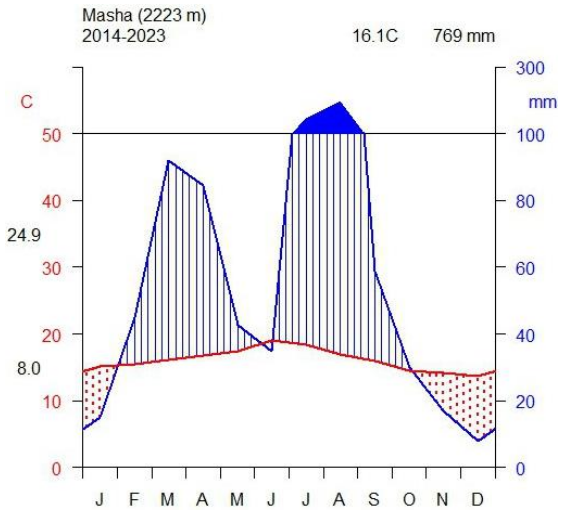

Figure 2. *Climadiagram (2014-2023).*

The area's average monthly high and low temperatures were 19.2 ℃ and 13.8 ℃, respectively. The average yearly temperature was 16.12 ℃ (Figure 1). Data taken from Nono sele agricultural office reveals that the ago-climatic zone of the district is classified in to three; Highland (32%), middle altitude (50%) and lowland (18%). It rains throughout the year. Since there have not been any weather stations in the area for a long time, accurate climate data is not available.

2.5. Vegetation Types of the Study Area

According to the most recent vegetation types in Ethiopia documented by [14], the vegetation of the area falls into the transitional rainforest and Afromontane rainforest types. Accordingly, three forest types are recognized in the Southwest forest of Ethiopia, which includes the Moist Afromontane Forest (MAF), Transitional Rainforest (TRF) and riverine forest. All these vegetation types were also noted in Nono-sele forest.

2.6. Study Design

Cross-sectional study was employed to collect ethnobotanical information from traditional healers in the area from 9/4/ 2016 E.C to 30/4/2016 E.C. This research design is used since the rainfall of the study area is unimodal.

2.6.1. Reconnaissance Survey and Site Selection

A reconnaissance survey was conducted from 10/2/2016 E.C to 20/2/2016 E.C following [15]. Six potential Kebeles such as Derba, Haro, Kombolcha, Tupi, Selale and Yakema were purposively selected from twenty-two kebeles in the study district based on recommendation of local elders, local authorities, and presence of traditional healers, vegetation cover and agro-climatic conditions.

2.6.2. Sample Size and Informant's Selection

The district agricultural office data indicated that, the number of household of the six selected kebeles such as Asandabo, Derba, Haro, Selale, Tupi and Yakema are 291, 281, 268, 346, 273 and 283 respectively. Based on this information, sample size was determined using Cochran's sample size formula [18].

$$n = \frac{N}{1+N(e)2},$$

Where, n is the research sample size,

N total number of households in all the six selected Kebeles,

e is the maximum variability or margin of error of 5% (0.05), whereas

1 is the probability of the event occurring.

$$n = \frac{N}{1+N(e)2} = n = \frac{1742}{1+1742(0.05)2} = 325$$

Based on the calculation of sample size formula, 325 informants were selected by snowball sampling from the six selected kebeles based on deep indigenous ethnobotanical knowledge of respondents in different age classes with an age range between 25- 80 years. Based on reconnaissance survey conducted, the recommendation from the local elders and kebele leaders indicted that, the inhabitants of the area whose age are twenty-five and greater than twenty-five have a good knowledge of medicinal plants. That is why informants whose age range between 25 to 80 were used for the interview. Similar study by [16, 17] had followed similar procedure.

Accordingly, sixty key informants were purposively selected from predetermined sample size (325). In similar manner, 265 informants were general informants and sixty (60) informants were key informants. Therefore, the sample size of each Kebele was determined purposively based on the availability of traditional healers, elder people and traditional medicinal plants use history of the kebeles. Accordingly, the representative sample size of Asandabo, Derba, Haro, Selale, Tupi and Yakama is 54, 52, 50, 65, 51, and 53 respectively. This technique is also used by [16, 17].

2.7. Ethnobotanical Data Collection

2.7.1. Semi Structured Interview

Semi-structured interview was prepared and used as guides following [15, 2]. It allows the investigator to provide supplementary question when needed. The questionnaire was first prepared in English and translated into the local language, Afan Oromo. Most of the questions were focused on the traditional knowledge, availability, distribution and threats of traditional medicinal plants in Nono – Sele district. Informants were interviewed individually to mention types of human and livestock ailments in the study area. Moreover, the informants for study listed the local names of the plants they use to treat diseases, diseases treated, part of plants used, methods of gathering, and methods of preparation of remedies. Furthermore, route of administration of remedies, application of the remedies, dosage, and the use of the medicinal plants other than medicine, types of threats and conservation status were listed.

2.7.2. Group Discussion

Group discussions was conducted at each of the selected kebeles forming eight to twelve informants and residents in seeking to understand the traditional medicinal system of the people and its management and to know how knowledge is maintained and transferred from one generation to other generations [15]. Discussion was conducted based on the checklist of questions prepared earlier in English and translated to Afan Oromo. Group discussion was conducted one time with key informants, who were suggested by respective kebeles elders and administrators about the status of the distribution, threats and conservation attempt of traditional medicinal plants. The respondents were interacted face to face and actively discussed on the distribution, threats and conservation in order to share information about a topic.

2.7.3. Demonstration

Some traditional healers, particularly the key informants, owning their own complicated traditional home pharmacies derived from plant remedies were observed. The way they show herbal remedies to the patients with great secrecy was documented [15].

2.7.4. Guided Field Walk

In this method, respondents guided the researcher through areas where the plants of interest expected to be found. Specimen collection and recording was done on the place while the interview is undergoing. Time was given to observe and discuss parts of plant used for medicine preparation, harvesting or patterns of plant distribution.

2.7.5. Participant Observation and Market Surveys

Market survey was done in markets exist in the selected kebeles to observe and collect data on the Marketability and trade of medicinal plants. Therefore, a market survey was conducted to gather the ethnobotanical data to distinguish and record the type of herbal medicine sold in the market, and the multipurpose role of some medicinal plants.

2.7.6. Ethnobotanical Data Collection

Data collection was done during one round field visit since the research design selected is cross-sectional. Data was collected from 9/4/2016 to 30/4/2016. The local names and habits MPs were collected. The collected specimens were taken to the Mizan-Tepi University Biology department laboratory for identification. The identification was done by Girma Gudesho (Doctor in plant ecology) and Abadir Abdu (MSc in botanical sciences) using various volumes of the Flora of Ethiopia and Eritrea, confirming actual photos on the field with photos on Google and using plant identifier software such as plant snap and the voucher specimens are deposited at botanical science laboratory of Biology department of Mizan-Tepi University. The deposition Number of voucher specimen is 102. Apart from these, two different data sources were used to collect relevant ethnobotanical data. Both primary data sources such as group discussion, semi-structured interview; guided field walk with informants and market survey were used and secondary data sources literature survey were applied to collect accurate and reliable ethnobotanical data.

2.8. Ethical Consideration Related to Data Collection

All methods of data collection were performed in accordance with the Mizan -Tepi university research data collection guidelines and regulations.

2.9. Data Analysis

2.9.1. Descriptive Statistics

A relevant ethnobotanical data was collected and entered into structured Microsoft Office Excel spreadsheet version 16 and exported to Statistical Software Packages for Social Science (SPSS), software version 25.0. Descriptive statistical method was applied. Information like route of administration, modes of preparation, source of medicinal plants, disease treated, habit, and parts of medicinal plants used were analyzed. frequency, average, percentage were used for analysis [2, 15, 20].

2.9.2. Informant Consensus Factor

Informant consensus factor (ICF) was calculated for categories of ailments to identify the agreements of the informants on the reported cures using the formula. ICF was calculated using the following formula (Martin, 1995).

$$\text{ICF} = \frac{\text{Nur} - \text{Nt}}{(\text{Nur} - 1)}$$

Where, Nur- is the number of individual plant use reports for a particular ailment category, and Nt- is the total number of species used by all informants for this ailment category. It was used to analyze the data collected through group discussion. In this case, informants were asked at least two times to check the reliability of information given by them, as recommended by [20].

2.9.3. Preference Ranking

Preference ranking was conducted by using ten key informants to rank ten medicinal plants reported curing a particular disease with different parts of medicinal plants used being presented to the informants. Then respondents asked to assign the highest value (10) for the most preferred species against the disease and the lowest value (1) for the least preferred plant and in accordance of their order for the remaining one. The value of each species was summed up and the rank for each species determined based on the total score.

2.9.4. Direct Matrix Ranking on Multipurpose Plant Species

Direct matrix ranking was used following [2] for multipurpose medicinal plants based on the relative benefits obtained from each plant. Five multipurpose plant species were selected out of the total medicinal plants based on the information collected from the informants and five key informants were chosen purposively to assign use value to each attribute (5=best, 4=very good, 3=good, 2 = less used, 1= least used and 0 = not used). These plant species values include medicinal, food spices, fencing, firewood, charcoal, construction and furniture making. Based on information gathered from informants, the average value of each use-diversity for species was taken and the values of each species was summed up and ranked.

2.9.5. Fidelity Level (FL)

The percentage of informants claiming the use of a certain plant for the same major purpose was calculated for the most frequently reported diseases or ailments using the following equation [2].

$$\text{FL}\ (\%) = \frac{\text{NP}}{\text{N}} \times 100$$

Where NP is the number of informants that claim the use of a plant species to treat a particular disease, and N is the number of informants that use the plants as a medicine to treat any given disease.

3. Results

3.1. Socio Demographic Characteristics of Study Participants

Three hundred twenty five participants were involved in this study. Among these participants included in this study, majority 225 (69.2%) of them were males and others were females 100 (30.8%). About 265 (81.5%) of them were general informants and 60 (18.5%) were key informants. Age range of most respondent's 224 (68.9%) were elder and 101 (30.1%) were younger informants. Moreover, most of them were illiterate (62.5%) and 68 (37.5%) were literate informants. (Table 1).

Table 1. *Socio-demographic characteristics of study participants.*

Characteristics		Frequency	Percentage
Sex	Male	225	69.2
	Female	100	30.8
Age	Elder (≥40 years)	224	68.9
	Younger (25-39 years)	101	31.1

Characteristics		Frequency	Percentage
Types of informants	Key informants	60	18.5
	General informants	265	81.5
Educational status	Illiterate	203	62.5
	Literate	68	37.5

3.1.1. Knowledge Difference According to Gender

The result of Z-test indicated that male (7.62 ± 3.95) informants reported more medicinal plants than female informants (6.2 ± 3.4). Moreover, p-value (0.0008) is less than confidence interval (0.025) (Table 2).

Table 2. Knowledge difference between genders.

Gender	Female	Male
Mean	6.2 ± 3.4	7.62 ± 3.95
Known Variance	11.2804	15.56754
Observations	100	225
Hypothesized Mean Difference	0	
Z	-3.37027	
P(Z<=z) one-tail	0.000375	
z Critical one-tail	1.644854	
P(Z<=z) two-tail	0.0008	
z Critical two-tail	1.959964	

3.1.2. Knowledge Difference Between key and General Informants

Table 3. Knowledge difference between key and general informants.

Groups of informants	Key informants	General informants
Mean	14.4 ± 1.9	5.54 ± 1.6
Known Variance	3.566102	2.635735
Observations	60	265
Hypothesized Mean Difference	0	
Z	33.63809	
P(Z<=z) one-tail	0.000	
z Critical one-tail	1.644854	
P(Z<=z) two-tail	0	
z Critical two-tail	1.959964	

The result of Z-test indicated that key informants (14.4 ± 1.9) reported more medicinal plants than general informants (5.54 ± 1.6). Moreover, p-value (0.000) is less than confidence interval (0.025) indicating that, the null hypothesis, which says there is no medicinal knowledge difference between key and general informants is rejected, and the alternative hypothesis which says there is medicinal knowledge difference between key and general informants is accepted (Table 3).

3.1.3. Knowledge Difference Between Age Group (Elder and Younger) Informants

The result of Z-test indicated that elder informants (8.50 ± 3.9) reported more medicinal plants than younger informants (4.3 ± 1.13). Moreover, p-value (0) is less than confidence interval (0.025) indicating that, the null hypothesis, which says there is no medicinal knowledge difference between elder and younger respondent is rejected, and the alternative hypothesis, which says there is medicinal knowledge difference between elder and younger informants is accepted (Table 4).

Table 4. Knowledge difference between elder and younger age group.

Age of informants	Elder (≥40)	Younger (<40)
Mean	8.50 ± 3.9	4.3 ± 1.13
Known Variance	15.08518	1.268119
Observations	224	101
Hypothesized Mean Difference	0	
Z	15.02836	
P(Z<=z) one-tail	0	
z Critical one-tail	1.644854	
P(Z<=z) two-tail	0.000	

Age of informants	Elder (≥40)	Younger (<40)
z Critical two-tail	1.959964	

Note: elders are those individuals whose age is forty and greater than forty whereas Youngers are those individuals whose age is below forty years.

3.1.4. Knowledge Difference Between Illiterate and Literate Informants

The result of knowledge difference between illiterate and literate informants by z-test indicated that illiterate informants (8±3.9) reported more medicinal plants than literate (5.72± 3.2) informants. This indicated that, illiterate informants reported significantly more medicinal plants than literate informants. Moreover, p-value ($6.45867E^{-09}$) is less than confidence interval (0.025). This indicates that, the null hypothesis, which says there is no medicinal knowledge difference between the level of education of informants (illiterate and literate) is rejected and the alternative hypothesis, which says there is medicinal knowledge difference between illiterate and literate is accepted (Table 5).

Table 5. *Knowledge difference between different level of education of informants.*

Level of education of informants	Literate	Illiterate
Mean	5.72±3.2	8±3.9
Known Variance	10.25372	15.3088
Observations	121	204
Hypothesized Mean Difference	0	
Z	-5.804426524	
P(Z<=z) one-tail	3.22933E-09	
z Critical one-tail	1.644853627	
P(Z<=z) two-tail	6.45867E-09	
z Critical two-tail	1.959963985	

3.2. Taxonomic Diversity and Medicinal Plants Identified

The result of Taxonomic distribution of medicinal plants used to treat human diseases in Nono-sele district revealed that each of ninety three medicinal plants recorded were distributed under thirty nine families and seventy seven genera. Among medicinal plants reported in the study area, Asteraceae 12 (12.9%) dominated the other plant family in the study area based on the number of species followed by Fabaceae 10 (10.8%), Solanaceae 8 (8.6%), Lamiaceae 7 (7.5%), Rutaceae 6 (6.5%), Cucurbitaceae 4 (4.3%), Euphorbiaceae 4 (4.3%), Moraceae 3 (3.2%), Zingebraceae 3 (3.2%), Anarcadiaceae 2 (2.2%), Acanthaceae 2 (2.2%), Boraginaceae 2 (2.2%), Musaceae 2 (2.2%), Myrtaceae 2 (2.2%), Brassicaceae 2 (2.2%), Polygonaceae 2 (2.2%), and others are the plant families exist in the study area based on the number of species abundance (Table 6). The lists of medicinal plants are given in Table A1.

Table 6. *Taxonomic distribution of medicinal plants used to treat human diseases in Nono-sele district.*

Family	Genera	Percent	Species	Percent
Asteraceae	9	11.688	12	12.9
Fabaceae	10	12.987	10	10.8
Solanaceae	5	6.4935	8	8.6
Lamiaceae	5	6.4935	7	7.5
Rutaceae	3	3.896	6	6.5
Cucurbitaceae	4	5.1948	4	4.3
Euphorbiaceae	3	3.896	4	4.3
Moraceae	1	1.2987	3	3.2
Zingebraceae	3	3.896	3	3.2
Anacardiaceae	2	2.5974	2	2.2
Boraginaceae	2	2.5974	2	2.2
Brassicaceae	1	1.2987	2	2.2
Musaceae	2	2.5974	2	2.2
Myrtaceae	2	2.5974	2	2.2
Polygonaceae	1	1.2987	2	2.2
Acanthaceae	1	1.2987	1	1.1
Alliaceae	1	1.2987	1	1.1
Aloaceae	1	1.2987	1	1.1
Amaranthaceae	1	1.2987	1	1.1
Apiaceae	1	1.2987	1	1.1
Apocynaceae	1	1.2987	1	1.1
Araceae	1	1.2987	1	1.1
Arecaceae	1	1.2987	1	1.1
Caricaceae	1	1.2987	1	1.1
Celastraceae	1	1.2987	1	1.1
Compositae	1	1.2987	1	1.1
Dioscoraceae	1	1.2987	1	1.1
Dracaenacae	1	1.2987	1	1.1
Lauraceae	1	1.2987	1	1.1
Linaceae	1	1.2987	1	1.1

Family	Genera	Percent	Species	Percent
Moringaceae	1	1.2987	1	1.1
Myrisinaceae	1	1.2987	1	1.1
Oleaceae	1	1.2987	1	1.1
Phytolacacace	1	1.2987	1	1.1
Poaceae	1	1.2987	1	1.1
Rosaceae	1	1.2987	1	1.1
Rubiaceae	1	1.2987	1	1.1
Tiliaceae	1	1.2987	1	1.1
Verbenaceae	1	1.2987	1	1.1
Total	77	100	93	100.0

3.3. Habits of Medicinal Plants

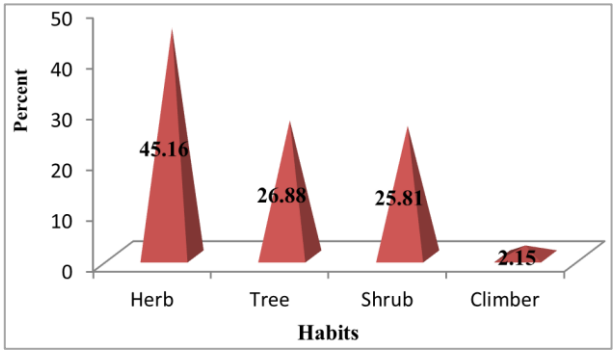

Figure 3. *Habit of medicinal plants.*

Of ninety three medicinal plants reported to cure human diseases in Nono-Sele district, the majority of the herbal remedies were reported to be prepared from herbs 42 (45.16%), followed by trees 25 (26.88%), shrubs 24 (25.81%) and climbers 2 (2.15%) (Figure 3).

3.4. Parts of Medicinal Plants

Out of 131 parts of medicinal plants used, leaves 66 (50.4%) were the most used medicinal plant part. Fruits 16 (12.4%), seeds 12 (9.2%), roots 11 (8.4%), bark 7 (5.3%), stem 7 (5.3%), bulbs 5 (3.9%), rhizomes 3 (2.3%), leaves and flowers 3 (2.3%) and flowers 1 (0.8%) ranked second, third, fourth, fifth, sixth, seventh, eighth, nineth and tenth respectively (Figure 4).

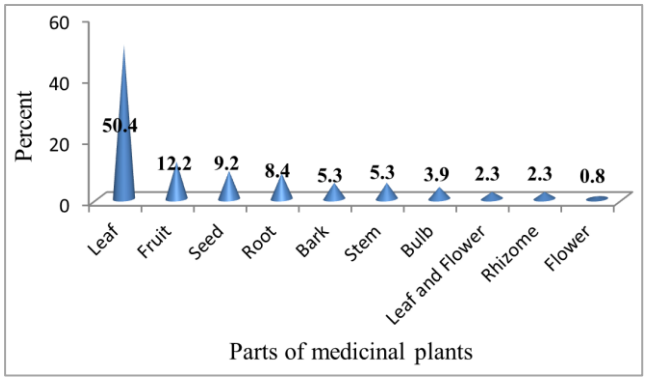

Figure 4. *Parts of medicinal plants used to prepare herbal remedies.*

3.5. Mode of Preparation of Medicinal Plants

The community in the study area reported 131 total mode of medicinal plant preparation. Among these, crushing 52 (39.69%) was the most widely used followed by eating raw medicines 14 (10.69%), grinding 14 (10.69%), squeezing 11 (8.4%), smashing 11 (8.4%), pounding 7 (5.34%), boiling 6 (4.58%), decoction 6 (4.58%), cooking 5 (3.82%), burning 3 (2.29%) and rubbing 2 (1.53%) (Figure 5).

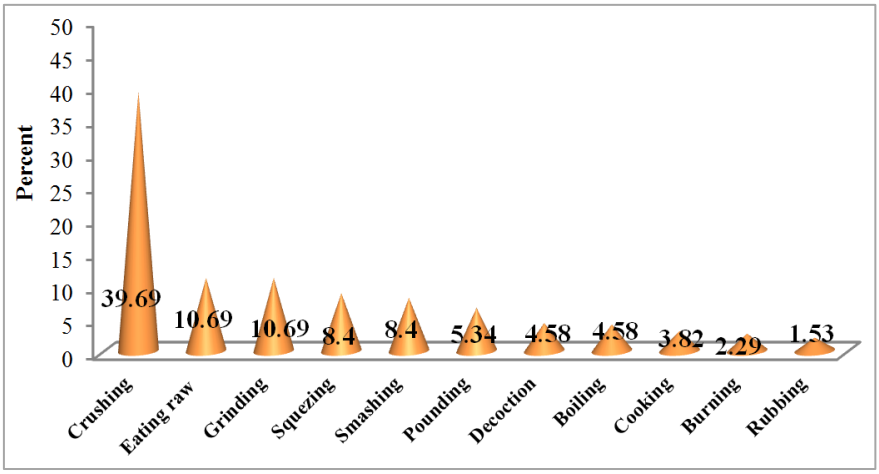

Figure 5. *Mode of preparation of medicinal plants.*

3.6. Condition of Preparation of Medicinal Plant Parts

Out of 131 Condition of preparation of medicinal plant parts reported in the study area, most of the medicinal plants were reported to be prepared from fresh plants 110 (84.3%) plants and followed by dry plants 21 (15.7%) (Figure 6).

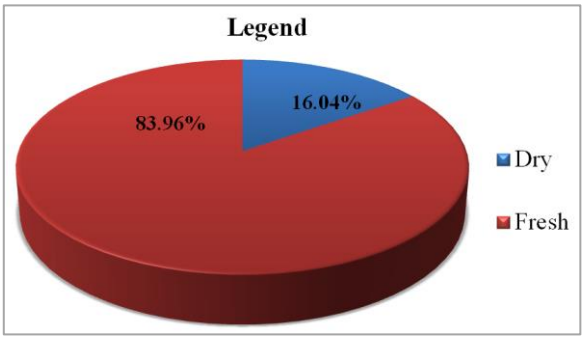

Figure 6. *Condition of preparation of medicinal plants.*

3.7. Routs of Administration of Medicinal Plants

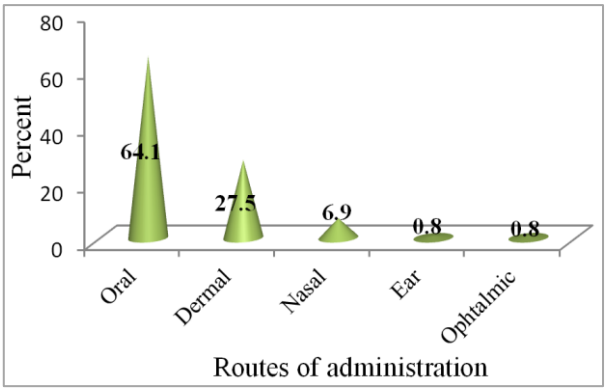

Figure 7. *Routs of administration of medicinal plants.*

In the study area, of the total 131 routs of administration of medicinal plants reported, oral rout 84 (64.1%) was ranked first, followed by dermal 36 (27.5%), nasal 9 (6.9%), ophthalmic 1 (0.8%) and through ear 1 (0.8%) (Figure 7).

3.8. Sources of Medicinal Plants

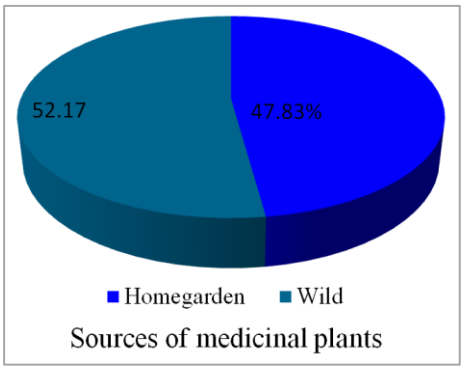

Figure 8. *Habitats of medicinal plants.*

In the study area, medicinal plants were reported mostly from wild 48 (52.17%) and followed by home garden 44 (47.83%) (Figure 8).

3.9. Result of Ranking and Scoring

3.9.1. Informant Consensus Factor

The result of informant consensus factor indicated that, informants in the study area have high agreement on the medicinal plants used treat stomachache (0.89) followed by medicinal plants used to treat toothache (0.85), evil eye (0.84), malaria (0.83), cough (0.81), headache (0.78), fire burn (0.67), tinia corporis (0.63), and menstrual pain (0.60) respectively (Table 8). Nt – total number of plant used to treat a particular disease, Nur- total number of informants who used these plants for the treatment of those diseases. ICF- informant consensus factor (Table 7).

Table 7. *Informant consensus factor values of top ten human health problem categories.*

Diseases	Nt	Nur	Nur-Nt	Nur-1	ICF
Toothache	10	60	50	59	0.85
Cough	9	44	35	43	0.81
Evil eye	8	44	36	43	0.84
Malaria	5	24	19	23	0.83
Dandruff	4	5	1	4	0.25
Headache	3	10	7	9	0.78
Stomachache	5	40	35	39	0.89

Diseases	Nt	Nur	Nur-Nt	Nur-1	ICF
Fire burn	3	7	4	6	0.67
Menstrual pain	3	6	3	5	0.60
Tinia corporis	3	8	5	7	0.63

3.9.2. Preference Ranking of Medicinal Plants Used to Treat Tooth Ache

The result of preference ranking of medicinal plants used to treat toothache indicated that, *Acmella caulirhiza* (94*)* ranked first. *Centella asiatica* (91), *Clerodendrum myricoides* (85), *Premna schimperi* (67), *Euphorbia abyssinica* (57), *Aloe kefaensis* (44), *Ficus vasta* (39), *Rosmarinus officinale* (31), *Ficus thonningii* (30), *Mangifera indica* (23) ranked second, third, fourth, fifth, sixth, seventh, eighth, nineth and tenth based on their score respectively (Table 8).

Table 8. *Preference ranking of medicinal plants used to treat toothache.*

Medicinal plants used	Respondents (R_1-R_{10})										Total	Rank
	R_1	R_2	R_3	R_4	R_5	R_6	R_7	R_8	R_9	R_{10}		
Aloe kefaensis	2	4	2	3	7	5	6	4	5	6	44	6th
Euphorbia abyssinica	6	7	5	4	6	7	7	5	6	4	57	5th
Centella asiatica	9	10	9	9	10	10	8	8	9	9	91	2nd
Rosmarinus officinales	3	2	1	5	1	6	4	2	2	5	31	8th
Clerodendrum myricoides	8	8	8	8	8	9	10	10	8	8	85	3rd
Ficus vasta	5	5	7	2	5	3	5	3	1	3	39	7th
Acmella caulirhiza	10	9	10	10	9	8	9	9	10	10	94	1st
Premna schimperi	7	6	6	7	4	4	2	7	7	7	67	4th
Ficus thonningii	4	3	4	1	2	1	3	6	5	1	30	9th
Mangifera indica	1	1	3	6	3	2	1	1	3	2	23	10th

3.9.3. Direct Matrix Ranking

The result of direct matrix ranking of multipurpose medicinal plants in the study area indicated that, *Cordia africana* (118) ranked first. *Vernonia amygdalina* (87), *Eucalyptus globulus* (70), *Justicia schimperiana* (59) *Calpurnia aurea* (57) ranked second, third, fourth and fifth based on their score respectively (Table 9).

Table 9. *Direct matrix ranking of multipurpose medicinal plants.*

use values	*Justicia schimperiana*					*Calpurnia aurea*					*Vernonia amygdalina*					*Cordia africana*					*Eucalyptus globulus*				
	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5	R1	R2	R3	R4	R5
Medicine	5	4	5	5	4	5	5	5	5	5	5	5	5	5	5	4	5	5	4	5	4	3	4	3	4
Charcoal	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	5	4	4	5	5	0	0	0	0	0
Construction	0	0	0	0	0	1	2	2	2	1	0	0	0	0	0	5	5	5	5	5	5	5	5	5	5
Fire wood	2	1	1	1	1	3	3	2	2	1	2	3	3	3	2	4	5	5	5	5	2	3	3	3	3
Fence	4	5	5	4	4	1	2	2	1	1	5	4	5	5	4	1	0	0	0	0	1	1	0	0	0

use values	*Justicia schimperiana*					*Calpurnia aurea*					*Vernonia amygdalina*					*Cordia africana*					*Eucalyptus globulus*				
	R1	**R2**	**R3**	**R4**	**R5**	**R1**	**R2**	**R3**	**R4**	**R5**	**R1**	**R2**	**R3**	**R4**	**R5**	**R1**	**R2**	**R3**	**R4**	**R5**	**R1**	**R2**	**R3**	**R4**	**R5**
Food	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0
Forage	1	2	1	2	1	1	1	1	1	2	4	5	5	5	5	4	5	4	3	3	1	2	3	3	2
Sum	13	12	12	12	10	11	13	12	11	10	16	17	18	19	17	24	24	23	23	24	13	14	15	14	14
Total	58					57					87					118					70				
Rank	4th					5th					2nd					1st					3rd				

3.9.4. Fidelity Level of Medicinal Plants Against Human Diseases

The result of fidelity level of medicinal plants used to treat human diseases indicated that, *Ruta chalepensis* (93.3%) *has high fidelity level to treat evil eye. Allium sativum* (90%), *Echinops kebericho (89.7%), Zingiber officinale* (88.3%), *Ocimum lamiifolium* (85%), *Vernonia amygdalina (83.3%) Acmella caulirhiza* (68.4%), *Clerodendrum myricoides* (60.5%), *Cordia africana* (54.5%), ranked second, third, fourth, fifth, sixth, seventh, eighth and nineth based on their score respectively (Table 10).

Table 10. *Fidelity level of medicinal plants against human diseases.*

Scientific names	Therapeutic category	NP	N	%FL
Allium sativum	Malaria	54	60	90
Acmella caulirhiza	Toothache	26	38	68.4
Clerodendrum myricoides	Toothache	26	43	60.5
Cordia africana	Ascaris	24	44	54.5
Echinops kebericho	Evil Eye	52	58	89.7
Ocimum lamiifolium	Allergic	51	60	85
Ruta chalepensis	Evil Eye	56	60	93.3
Vernonia amygdalina	Skin Infection	35	42	83.3
Zingiber officinale	Malaria	53	60	88.3

4. Discussions

Among all study participants included in this study, the majority of them were males, while only a few were females. A study conducted in Sheka zone serves as a parallel example, revealing the impossibility of conducting an equal number of interviews with men and women due to traditional norms governing many societies [19]. The reason of impossibility to get unequal number of male and female respondents in the study area could be due to social and cultural background of the society, which primarily assigns females to tasks performed in the home rather than activities conducted outside the home.

The results of Z-test indicated that male (7.62 ± 3.95) respondents reported more medicinal plants than female respondents (6.2 ± 3.4), indicating a statistically significant difference ($p = 0.0008$). This finding aligns with studies conducted elsewhere in Ethiopia and other parts of the world [19, 21]. However, studies conducted in the Adwa district in the Tigrai region, among the Guji semi-pastoralist people in Suro Barguda District, Ethiopia, and elsewhere in our country reported no significant knowledge difference between male and female respondents [16, 22-24]. The reason why males reported more medicinal plants than females respondents might be due to the fact that medicinal plant knowledge is often transferred to males rather than females. This is because the community of the study area believes those males are better at keeping the secrets of medicinal plants than females.

Similarly, key informants (14.4 ± 1.9) reported more medicinal plants than general informants (5.54 ± 1.6). This could be because key informants have the opportunity to repeatedly use medicinal plants to treat the local community. As a result,

the likelihood of forgetting medicinal plants is lower compared to general informants who do not use medicinal plants as frequently. Another reason might be that key informants inherit the knowledge of medicinal plants directly from their fathers, who might be traditional healers, while general informants acquire medicinal plant knowledge either from the local community or through trial and error. Moreover, p-value (0) is less than confidence interval (0.025), indicating that there is a significant difference in medicinal knowledge between key and general respondents. This finding aligns with previous studies [16, 23].

The results of the Z-test indicated that elders (≥40 years) reported significantly more medicinal plants (8.50 ±3.9) than younger individuals aged 25–39 years (4.3 ±1.13). This might be due to the fact that the younger generation undervalues the use of traditional medicinal plants in the study area. Moreover, the p-value (0) is less than the confidence interval (0.025), indicating a significant difference in medicinal knowledge between elder and younger respondents. Similar results were reported in Ethiopia and elsewhere in the world [19, 21, 24].

Similarly, illiterate informants (8±3.9) reported more medicinal plants than literate informants (5.72 ±3.2). This might be due to the fact that educated people prefer to use modern medicine rather than traditional medicines in the study area compared to illiterate informants. Moreover, the p-value (6.45867E-09) is less than the confidence interval (0.025), indicating a significant difference in medicinal knowledge between illiterate and literate informants. This study is in line with previous research, affirming that illiterate individuals cite more medicinal plant species than literate informants [25-28].

The vegetation of Nono-sele district is rich in medicinal plants. Ninety-three medicinal plant species distributed under thirty-nine family and seventy-seven genera, were documented. These medicinal plants were used to treat forty-eight human diseases. Similarly, the studies conducted in different parts of Ethiopia reported various medicinal plants used for the treatment of different diseases. For example, [29] documented sixty-nine medicinal plant species used for the treatment of different diseases in and around Yayo forest, Oromia region, Ethiopia. Likewise, [30] documented 126 medicinal plant species used for the treatment of different diseases in Wayu Tuka Wereda, East Wollega Zone of Oromia Region, Ethiopia. The variation in the number of medicinal plants reported in different research areas could be due to differences in vegetation composition, socio-cultural use of medicinal plants, and the ethnobotanical knowledge of the respondents in different study areas.

Among medicinal plants reported, family Asteraceae dominated the other plant family in the study area followed by Fabaceae and Solonaceae family. This result is in line with the study conducted in different parts of Ethiopia [16, 26, 31, 32]. The reason why Asteraceae family dominated the other plant family in the study area could be due to high percentage distribution of the family in Ethiopia with relative to the other plant families. However, other studies reported different families as the most dominating family in their respective research area. For example, [33, 34] reported Solonaceae as the most dominant family of medicinal plant research conducted in hulet eju enese woreda, east gojjam zone of Amhara region, Ethiopia and Kelala District, South Wollo Zone of Amhara Region, Northeastern Ethiopia respectively. Furthermore, [35, 36] also reported Lamiaceae and Fabaceae as the most dominant medicinal plant family in Ada'a District, East Shewa Zone of Oromia Regional State, Ethiopia and Jimma zone, southwest Ethiopia respectively. This difference might be due to agro ecological difference among the research area.

The community in the study area used different habits of medicinal plants to prepare herbal remedies against human diseases. Among these, herbs were the most dominant habit of medicinal plants followed by shrubs and trees respectively. This could be due to high diversity of herbs, easy availability of herbs with compared to other plant habit and the presence of highly pharmacologically active chemicals in herbs with compared to trees and shrubs. However, the finding of study conducted in various parts of the country revealed shrubs as the primary growth form of medicinal plants. This result is in line with studies such as [37-40]. However, another studies reported trees and shrub as the most dominating medicinal plant habits in different areas [41, 42]. This difference might be due to agro ecological difference between research area and difference of traditional use of plants by different research area.

In this study, leaves were reported as the most dominant plant parts used by the community to prepare traditional medicines. The preference of leaf part could be due to easiness of preparation and the chemical constituents of leaf for the treatment of diseases. In the addition to these, collecting leaves could not harm plants with compared to collecting other plant parts such as bark and root which contributes for the destruction of the whole plant. This finding was in line with the study conducted in other parts of Ethiopia such as [16, 19, 33, 37, 38]. However, other studies [43, 56] reported roots as the most widely used medicinal plant part in the preparation of traditional remedies. This difference might be due to variation in knowledge of traditional healers and differences in diseases distribution in various areas.

The report of this study revealed that most of the medicinal plants were reported to be from wild habitats. This research result agrees with the findings of [42, 44, 45] which also reported medicinal plants from wild habitat. This could be related to low tendency of conservation of medicinal plants in the area. On the other hand, the current finding was not in agreement with study conducted at Alamata Town, Northern Ethiopia which reported highest number of medicinal plants collected from home garden [25]. This difference might be related to the variation of conservation technique used by the community of the two distinct study areas.

The community of the study area were using different mode

of administration to treat diseases by traditional medicine. Among these, oral route was the most widely used mode of administration of medicinal plants followed by dermal administration. In line with this, study conducted in other parts of Ethiopia such as [16, 19, 25, 33, 38, 46, 37] reported similar result. This could be due to the fact that medicines taken through the oral route can immediately form physiological reaction with diseases and the healing potential of the medicine will be high.

In the study area, most of the herbal remedies were prepared from fresh plants. This result aligns with other studies that reported the preparation of medicinal plants from fresh plant parts [19, 47, 48]. This could be because some medicinal plants lose their high healing ability if not used fresh, due to limited storage practices by the herbalists.

The community employed different modes of herbal remedy preparation, with crushing being the most commonly used method. This could be due to the ease of the method and the ease of forming juice from the plant parts [49-51, 48] also reported similar results. Informant consensus typically indicates the agreement among informants on the treatment of particular diseases. Informant consensus values range between zero and one [20]. In this study, ten disease categories were included for analysis, covering a range of common health issues, including toothache, cough, evil eye, malaria, dandruff, headache, stomachache, fire burn, menstrual pain, and Tinia corporis. Across the dataset, the values of the Informant Consensus Factor (ICF) range from 0.25 to 0.89, indicating the extent of consensus among practitioners for each ailment. A very high ICF value was reported among traditional medicine practitioners regarding the use of medicinal plants to treat stomachaches. This indicates a strong agreement on which plants are effective for treating stomachache. Conversely, conditions like dandruff exhibit lower levels of informant consensus. Other studies have also reported the highest informant consensus factor for medicinal plants used to treat dysentery [52].

The result of direct matrix ranking revealed that *Cordia africana* has the highest total score (118) and was ranked first. It appears to be highly valued across multiple use categories, including construction, firewood, timber and forage. *Cordia africana*, which have a high direct matrix ranking for a medicinal plant reflects its perceived effectiveness, cultural significance, accessibility, and community consensus, underlining its importance as a valued resource in traditional use of the plant for different purpose. Similar studies in in Ethiopia and elsewhere in the world reported *Cordia africana* with the highest direct matrix ranking [44, 53]. This might be due to the fact that the plant is culturally acceptable for different uses and the nature of the plant is suitable for using different things.

The provided data appears to represent the results of a paired comparison or ranking exercise for various medicinal plants, specifically in the context of addressing toothache. *Acmella caulirhiza* ranked first for toothache relief followed by *Centella asiatica*. Studies suggest that *Acmella species*, also known as "toothache plants," contain bioactive compounds like spilanthol, which exhibits painkilling properties and may help alleviate toothache [54]. Information taken from respondents revealed that *Mangifera indica* ranked lowest and there is limited evidence regarding its efficacy in treating toothache.

A high fidelity level is an indicator of the significant healing potential of certain plant species against particular ailments. In the current study, Ruta chalepensis demonstrated the highest fidelity level of 93.3% for treating the evil eye. The high fidelity levels observed for Ruta chalepensis reveal the plant's significant healing potential against the mentioned health problems. Plants with high fidelity levels can be targeted for efficacy investigations of their bioactive ingredients. In line with this study, study conducted in Dedo district of Jimma zone revealed that *Ruta chalepensis* had high fidelity level [55]. Moreover, another study reported high fidelity level for *Litsea glutinosa* to treat dysentery in Kalenga forest, Bangladesh [52].

5. Conclusions

Ninety-three medicinal plant species used for the treatment of forty-eight human diseases were documented in the current study area. This indicates that the study area is rich in medicinally important plant species and serves as a valuable reservoir of medicinal plants. Accordingly, Asteraceae family dominated the medicinal plants in the study area, followed by the Fabaceae and Solanaceae family. Most herbal remedies were prepared from leaves. Furthermore, the condition of preparation is mostly from fresh plants, and crushing was the most widely used method of preparation for medicinal plants in the current research area. Oral route was the most widely used method of administration, and there is no agreement among herbalists on the dosage and administration of medicinal plants. The presence of potentially important medicinal plants in the study area indicates the availability of bioactive compounds.

Abbreviations

E.C	Ethiopian Calendar
HH	House Hold
EBI	Ethiopian Biodiversity Institute
ICF	Informant Consensus Factor
IK	Indigenous Knowledge
JCS	Jaccard’s Coefficient of Similarity
KG	Knowledge
MAF	Moist Afromontane Forest
MPs	Medicinal Plants
NTFPs	Non Timber Forest Products
SD	Standard Deviation
SPSS	Statistical Software Packages for Social Science

SWER	South West Ethiopia Region
TMs	Traditional Medicines
TMPs	Traditional Medicinal Plants
TRF	Transitional Rain Forest
WHO	World Health Organization

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Author Contributions

Abadir Abdu (MSc) is the one who made intellectual contributions to this original research work in primary data collection, organization of the data, analysis, interpretation of results as well as preparation of the manuscript and identification of botanical name of plant specimen. Girma Gudesho (PhD) contributed a lot of things such as advising during data analysis and interpretation of the data even including advising on how to collect ethnobotanical data and identification of botanical name of plant specimen. Samuel Getachew (Ass. Prof.) has contributed in data interpretation and data analysis. Ashebir Awoke and Esubalew Tesfa has drawn the map of study area and assisted on each field work during data collection. Generally, all authors read and approved the final manuscript written.

Ethics Approval and Consent to Participate

This study was approved by Mizan-Tepi University ethical consideration committee. Data collection was performed after permission is obtained from Nono- Sele district administrative offices. The knowledge, patent and secret of the traditional healers was kept properly.

Informed Consent Statement

Informed consent was obtained from all subjects.

Author Contributions

Abadir Abdu Hareru: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing

Girma Gudesho: Formal Analysis, Methodology, Project administration, Supervision, Writing – review & editing

Samuel Getachew: Project administration, Supervision, Validation

Ashebir Awoke: Software

Esubalew Tesfa: Visualization

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Data Availability Statement

All data used for this study are included in the body of manuscript. So, there is no data available outside of the data available in this manuscript. The authors cannot provide the raw data due to ethical considerations related to the research.

Conflicts of Interest

The author declares no conflicts of interest.

Appendix

Table A1. *List of medicinal plants.*

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
AA1	*Carissa spinarium* L.	Apocynaceae	Agamsa	Oral	Shrub	Root	Grinding the fresh root of *Carissa spinarium* together with *Zingibil officinales* and giving three drops per day for three days for human against evil eye.	Wild	Evil eye
				Oral		Fruit	A raw fresh fruit of Carissa spinarium is eaten against abdominal cramp.		Abdomenal

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
									crump
AA2	*Maesa lanceolota* Forssk.	Myrsinaceae	Abbayyii	Dermal	Tree	Bark	Grinding the dried bark of *Maesa lanceolota* until it becomes powder and applying its powder on wound.	Wild	Wound
AA3	*Guizotia scabra* (Vis.) Chiov.	Asteraceae	Adaa	Dermal	Shrub	Leaf	Squeezing fresh new growing leaf of *Guizotia scabra* and applying its liquid drop on wound.	Wild	Wound
AA4	*Phytolocca dodecandra* L.	Phytolacacace	Andoodee	Nasal	Shrub	Leaf	Grinding the fresh leaf of *Phytolocca dodecandra* in the presence of water and applying its liquid on wound.	Wild	Wound
				Oral		Root	Fresh roots of *Phytolocca dodecandra* and fresh leaf of *Justicia schimperiana* are pounded in the presence of water and one coffee cup is added to milk and given to dog early at the morning for three days and finger strip of a little finger is given to human per day for three days and one cup per day of the preparation is given for three days for other animals		Rabies
				Oral		Root	Fresh roots of *Phytolocca dodecandra* are finely crushed together with fresh roots of *Justicia schimperiana* in the presence of water and the liquid part is filtered and finger strip of little finger is drunk against gonorrheae. Antidote: tela is drunk immediately following the medicine.		Gonohorrhea
AA5	*Albizia schimperiana* Oliv.	Fabaceae	Ambabbeessa	Dermal	Tree	Leaf	Crushing the fresh leaf of *Albizia schimperiana* boiling in water, filtering the liquid and washing the affected area by the filtered liquid when it cools until recovery.	Wild	Haemorrhoids
AA6	*Aloe kefaensis* M. G. Gilbert & Sebsebe	Aloaceae	Hargiisa	Dermal	Herb	Leaf	Grinding the fresh leaf of *Aloe kafaensis until the liquid juice release*, mixing the liquid juice with honey and applying to the affected area		Fire burn
				Oral		Leaf	The liquid juice from the squeezed fresh plant leaf is directly applied to the affected teeth.		Tooth ache
				Dermal		Leaf	Hairs are washed by squeezed liquid juice from the fresh plant to remove dandruff		Dandruff
AA7	*Datura stramonium* L.	Solanaceae	Asaangira	Dermal	Shrub	Leaf	The fresh leaf of *Datura stromonium* is crushed and the liquid part is applied on the affected body	Wild	Haemorrhoids
				Nasal		Leaf	Fresh leaf of *Datura stramonium* and roots of *Carissa edulis* are crushed together and strip of little finger of one tea cup is given only one day for the patient against evil eye. Antidote: chicken meat is eaten immediately after taking the medicine		Evil eye
AA8	*Euphorbia abyssinica* J. F. Gmel.	Euphorbiaceae	Adaamii	Oral	Tree	Stem	Cutting the fresh new growing stem of *Euphorbia abyssinica* and applying two to three drops of the liquid juice on a particular affected teeth taking care not to apply on the other body part	Homegarden	Tooth ache
AA9	*Croton*	Euphor-	Bak-	Der-	Tree	Leaf	The powder prepared from crushing the dried leaf	Wild	Wound

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
	macrostachyus Hochst. ex Delile	biaceae	kanniisa	mal			of *Croton macrostachyus* is applied on wound		
				Nasal		Leaf	Smoke from the dried leaf of *Croton macrostachyus* is used as a treatment against typhoid fever.		Typhoid fever
				Oral		Root	The fresh roots of *Croton macrostachyus* is pounded, soaked in water, decanted and then mixed with honey and finger strip size of the preparation is drunk.		Hypertension
				Oral		Leaf	Crushing the fresh leaf of *Croton macrostachyus* finely with water, filtering the liquid part and finger strip of little finger is drunk one time per day for three days before eating food to expel intestinal parasites.		Internal parasite
AA10	*Helianthus annuus* L.	Asteraceae	Suufii	Dermal	Herb	Leaf	Fresh leaves of *Helianthus annuus* are pounded after adding water and applied on affected body part	Homegarden	Skin infection
AA11	*Guizotia abyssinica* (L.f.) Cass.	Asteraceae	Nuugii	Oral	Herb	Seed	The powder prepared from grinding dried seed of *Guizotia abyssinica* is added to the powder of coffee arabica seeds and eaten against diarrhea	Homegarden	Diarrhea
AA12	*Coffee arabica* L.	Rubiaceae	Buna	Dermal	Shrub	Leaf	The fresh leaf of *Coffee arabica* is collected, dried, crushed, powdered, mixed with small power of *capsicum species*, boiled in water and the liquid part is filtered and drunk against cough	Homegarden	Cough
AA13	*Cucurbita pepo* L.	Cucurbitaceae	Buqqee	Oral	Herb	Fruit	The fresh fruit of *Cucurbita pepo* is cooked and eaten against anaemia	Homegarden	Anaemia
AA14	*Cassia arereh* Del.	Fabaceae	Botoroo	Oral	Tree	Seed	The dried seeds of *Cassia arereh* Del are pounded & its powder is mixed with water and filtered and finger strip size of small finger is drunk two times per day for three days for human and one glass of water per day for three days for livestock.	Wild	Snake poison
AA15	*Eucalyptus globulus* Labill.	Myrtaceae	Baargamoo Adii	Nasal	Tree	Leaf	Burning the dried leaves of *Eucalyptus globulus* and fumigating against headache	Homegarden	Head ache
AA16	*Foeniculum vulgare* Mill.	Asteraceae	Inshilaala	Oral	Herb	Leaf and Flower	Smashing the fresh flower and leaves of *Foeniculum vulgare* Mill. as spice and adding to sporage and eaten against cough.	Homegarden	Cough
AA17	*Calpurina aurea* (Ait.) Benth	Fabaceae	Ceekaa	Oral	Tree	Leaf	Fresh leaves of *Calpurnia aurea* (Ait.) Benth are crushed by adding water, filtered finger strip size of little finger is given to human and full of glass of water is given to livestock.	Homegarden	Snake poison
				Oral		Leaf	Fresh leaves of *Calpurnia aurea* and the leaf of *Datura stromium* are crushed together by adding little water and strip of little finger of the preparation is drunk one time per day for four days.		Evil eye
AA18	*Justicia schimperiana* (Hochst. ex	Acanthaceae	Dhummuugaa	Oral	Shrub	Leaf	The fresh root of Justicia schimperiana is finely crushed together with fresh root of Phtolacca dodecandra in the presence of water and the liquid part is filtered and finger strip of little finger is	Homegarden	Gonohorrhea

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
	Nees) T. Anders.						drunk against gonorrheae. Antidote: tela is drunk immediately following the medicine.		
AA19	*Ocimum lamiifolium* Hochst. ex Benth.	Lamiaceae	Damakasee	Nasal	Shrub	Leaf	The fresh leaf of *Ocimum lamiifolium* is crushed, filtered and half of tea cup is drunk two times a day early at the morning and at the night for three days	Wild	Allergic
				Nasal		Leaf	Putting dried Leaf of *Ocimum lamiifolium* on fire and fumigating under closed cloth		Head ache
				Dermal		Leaf	The fresh leaf of *Ocimum lamiifolium* is smashed and the liquid droplet is applied to the body		Fever
				Oral		Leaf	Fresh leaf of *Ocimum lamiifolium* is smashed and the liquid applied to the tongue		Tongue infection
				Ophthalmic		Leaf	Fresh leaf of *Ocimum lamiifolium* is smashed and the liquid applied to the eye		Eye problem
				Ear		Leaf	Fresh leaf of *Ocimum lamiifolium* is smashed with water and squeezed to ear		Ear problem
AA20	*Rumex abyssinicusJacq.*	Polygonaceae	Dhangaggoo	Dermal	Shrub	Bark	The fresh bark of *Rumex abyssinicus*Jacq. is pounded, mixed with water and its liquid is applied on the affected part.	Wild	Tinia corporis
AA21	*Catha edulis* (Vahl) Forssk ex Endl.	Celastraceae	Caatii	Oral	Tree	Leaf	Fresh leaf of *Catha edulis* (Vahl) Forssk ex Endl. is chewed against depression	Homegarden	Depression
				Oral		Leaf	Dried leaf of *Catha edulis* (Vahl) Forssk ex Endl. is heated on fire and fumigated against cough		Cough
AA22	*Aframomum corrorima* (Braun) Jansen	Zingebraceae	Ogiyoo	Oral	Herb	Seed	The dried seed of *Aframomum corrorima* (Braun) Jansen is pounded together with rhizome of *Zingiber officinale* and other spices such as *Capsicum species* and eaten against menstrual pain.	Wild	Stomach ache
AA23	*Olea europaea* L. subsp. cuspidata (Wall. ex G. Don) Cif.	Oleaceae	Ejersa	Oral	Tree	Bark	The fresh bark of *Olea europaea* L. subsp. cuspidata (Wall. ex G. Don) Cif. is crushed in the addition of small water, boiled, filtered and three spoon full of the tea spoon of the liquid is drunk two times per day for two days against menstrual pain	Homegarden	Menstrual pain
AA24	*Vernonia amygdalina* Del.	Asteraceae	Ebicha	Oral	Tree	Leaf	Decoction of the fresh leaf of *Vernonia amygdalina* Del. is used against menstrual pain	Homegarden	Menstrual pain
				Dermal		Leaf	Grinding the fresh leaf of *Vernonia amygdalina* and applying on the affected part		Skin infection
AA25	*Coccinia abyssinica* (Lam.) Cogn.	Cucurbitaceae	Ancootee	Oral	Herb	Root	Fresh roots of *Coccinia abyssinica* is cooked, dried, crushed until it becomes powder and its powder is used as soup against bone break	Homegarden	Bone break
AA26	*Colocasia esculenta* (L.) Schott	Araceae	Goodarree	Oral	Herb	Leaf	Fresh leaves are put on fire and rubbed on affected part	Homegarden	Athletis foot

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
AA27	*Centella asiatica L.*	Apiaceae	Qoricha ilkaanii	Oral	Herb	Leaf	Fresh leaf is chewed against tooth ache	Wild	Tooth ache
AA28	*Rosmarinus officinalis* L.	Lamiaceae	Urgeessaa Foonii	Oral	Herb	Leaf	Fresh leaf is chewed against toothache	Homegarden	Tooth ache
AA29	*Rumex crispus* L.	Polygonaceae	Dhanggaggoo Gabaabduu	Dermal	Herb	Leaf	Fresh leaves of *Rumex crispus* L. is crushed and applied on skin	Wild	Skin infection
AA30	*Indigofera arrecta* Hochst. ex A. Rich.	Fabaceae	Heennaa	Oral	Shrub	Leaf	Grinding the fresh leaf of *Indigofera arrecta* with *Allium sativum* and *Zingibil officinales* in the presence of water and filtering the liquid part and drinking finger strip of little finger of the preparation twice a day morning and night for three days	Wild	Malaria
AA31	*Zingiber officinale* Roscoe	Zingebraceae	Zinjibila	Oral	Herb	Rhizome	The fresh rhizome is eaten	Homegarden	Abdomenal crump
				Oral		Rhizome	The fresh rhizome is chopped together with *Allium sativum* and other spices such as *Capsicum annuum, Capsicum frutescens* and eaten against malaria.		Malaria
AA32	*Grewia ferruginea Hochst. ex A. Rich.*	Tiliaceae	Loqonuu	Dermal	Shrub	Bark	Hair is washed by crushed fresh bark of *Grewia ferruginea*	Wild	Dandruff
AA33	*Withania somnifera* L.	Solanaceae	Xossaa	Oral	Shrub	Leaf	The fresh leaf of *Withania somnifera* is crushed with the leaf of *Ruta chalepins* by adding small amount of water, the liquid part is filtered and five drops per day drunk at the morning before food for three days.	Wild	Evil eye
AA34	*Citrus limon* L.	Rutaceae	Loomii	Dermal	Shrub	Fruit	Juice from the fresh fruit is squeezed and applied on the affected part	Homegarden	Skin infection
				Oral		Fruit	Juice from the fresh fruit is drunk		Abdomenal crump
AA35	*Bidens Pilosa* L.	Compositae	Maxxannee Gurraacha	Oral	Herb	Leaf	The liquid drop prepared from the fresh leaf of *Biden pilosa* by squeezing between palm of hand and drunk against menstrual pain.	Wild	Menstrual pain
AA36	*Clerodendrum myricoides* (Hochst.) R. Br. ex Vatke	Lamiaceae	Maraasisaa	Oral	Shrub	Leaf	Fresh new growing leaf is chewed against toothache	Wild	Tooth ache
				Dermal		Stem	Butter paste of fresh stem is heated on fire and put on the tumor.		Tumor
AA37	*Carica papaya* L.	Caricaceae	Paappayyaa	Oral	Tree	Seed	The fresh seeds of *Carica papaya* is eaten against internal parasite	Homegarden	Internal parasite
AA38	*Galinsoga*	Aster-	Kaasee	Der-	Herb	Leaf	The fresh leaf of *Galinsoga quadriradiata* Ruiz &	Wild	Bleeding

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
	quadriradiata Ruiz & Pavon	aceae		mal			Pavon is smashed and the liquid juice is applied to the bleeding area		of skin
AA39	*Ficus vasta* Forssk.	Moraceae	Qilxuu	Oral	Tree	Bark	The fluid of the fresh bark is directly applied on teeth	Wild	Tooth ache
AA40	*Echinops kebericho Mesfin*	Asteraceae	Qarabichoo	Oral	Herb	Root	The dried roots of *Echinops kebericho* is placed on fire and its smoke is fumigated	Wild	Evil eye
AA41	*Ricinus communis* L.	Euphorbiaceae	Qobboo	Oral	Shrub	Root	The fresh roots of *Ricinus communis* and the fresh leaf of *Datura metel* are crushed together and one cup of the liquid juice is given to livestock only one time and finger strip of a little finger of the liquid juice is given to human against snake bite. Antidote: tela is drunk immediately after taking the medicine for human.	Wild	Snake poison
AA42	*Vernonia myriantha* Hook.f.	Asteraceae	Reejjii	Oral	Shrub	Root	The dried roots of *Vernonia myriantha* Hook.f. is finely crushed and one tea spoon of its powder is added to tela and drunk early at the morning for three days. The shade of human shouldn't pass over the person and he/she should sleep along in isolated house	Wild	Liver ailment
				Dermal		Leaf	The fresh leaves of *Vernonia myriantha* Hook.f. is smashed and the extract dropped on the cut skin		Bleeding of skin
AA43	Ficus sycomorus L.	Moraceae	Odaa	Dermal	Tree	Stem	The fresh milky liquid from stem cut of *Ficus sycomorus* L. is dropped on the affected body part.	Wild	Herpes zoster
AA44	*Bidens macroptera* (Sch. Bip. ex Chiov.) Mesfin	Asteraceae	Keelloo	Dermal	Herb	Stem	Fresh stem of *Bidens macroptera* (Sch. Bip. ex Chiov.) Mesfin is rubbed on fire and the liquid release is applied on affected part	Wild	Athletis foot Foot
AA45	*Brassica nigra* L.	Brassicaceae	Shinfaa	Oral	Herb	Seed	Dried seeds of *Brassica nigra* L. is smashed & its preparation is eaten.	Homegarden	Bloat
AA46	*Acmella caulirhiza* Del.	Asteraceae	Gutichaa	Oral	Herb	Flower	Fresh flower chewed and swallowed	Wild	Tonsilitis
				Oral		Leaf	Fresh Leaf of *Acmella caulirhiza* is crushed without adding water and putting on affected teeth.		Tooth ache
AA47	*Acacia abyssinica Hochst. ex Benth.*	Fabaceae	Sondii	Dermal	Tree	Leaf	New growing fresh leaves crushed and creamed on affected part	Wild	Candidiasis
AA48	*Trigonella foenum-graecum* L.	Fabaceae	Sunqoo	Oral	Herb	Seed	Grinding the dried seeds of Trigonella foenum & its powder mixed with honey and two tea spoon is eaten every morning per day for seven days against asthma.	Homegarden	Asthma
				Oral		Seed	Grinding the dried seeds of *Trigonella foenum-graecum* L. and soaking powder in water and drinking one glass of water per day until body condition im-		Stomach ache

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
							proved		
AA49	*Physalis peruviana* L.	Solanaceae	xossaa	Oral	Herb	Fruit	Fresh fruits are eaten against stomach ache	Wild	Stomach ache
AA50	*Linum ustitatissimum* L.	Linaceae	Talbaa	Oral	Herb	Seed	Grinding the dried seeds of *Linum ustitatissimum* L. and its powder is mixed with water and drunk	Homegarden	Gastritis
				Dermal		Seed	The hair is washed by the water filtered from dried seeds of *Linum ustitatissimum* L soaked in water.		Dandruff
AA51	*Premna schimperi* L.	Lamiaceae	Urgeessaa	Oral	Tree	Leaf	Fresh leaf of *Premna schimperi* is crushed and directly applied on teeth	Wild	Tooth ache
AA52	*Cordia africana* L.	Boraginaceae	Waddeessa	Dermal	Tree	Bark	The dried bark of *Cordia africana* is pounded, its powder mixed with butter and creamed on tumor	Wild	Tumor
				Oral		Bark	The dried bark of *Cordia africana* is crushed, powdered, homogenized with the powder prepared from the dried bark of *Grewia bicolar* dissolved in water and its filtrate is drunk.		Diarrhea
				Oral		Fruit	Fresh fruit is eaten to expel ascaris in children.		Ascaris
				Oral		Leaf	Fresh leaf of *Cordia africana*, *Rumex nepalensis*, *Ruta chalepensis*, *Allium sativum* are crushed together homogenized in water solution of salt and half tea cup is drunk before eating food		Stomach ache
AA53	*Ocimum urticifolium Roth*	Fabaceae	Hancabbii	Nasal	Shrub	Leaf	Fresh leaf of *Ocimum urticifolium* Roth is squeezed and taken through nose	Wild	Head ache
AA54	*Euphorbia hirta* L.	Euphorbiaceae	Qoricha qufaa	Nasal	Herb	Leaf	Dried leaves of *Euphorbia hirta* L. is burn and fumigated against cough	Wild	Cough
AA55	*Rhus ruspolii* Engl.	Anacardaceae	Xaaxessaa	Dermal	Shrub	Leaf	Fresh leaves of *Rhus ruspolii* Engl. is crushed, mixed with butter and creamed on affected part until cure.	Wild	Herpes zoster
				Dermal		Leaf	Fresh leaves of *Rhus ruspolii* Engl. is crushed and rubbed on affected part		Ring worm
AA56	*Ruta chalepensis* L.	Rutaceae	Ceredaama	Oral	Herb	Leaf	Fresh leaf of *Ruta chalepensis* is crushed together with *Echinops kebericho* in the presence of water, the liquid part is filtered and drunk	Homegarden	Evil eye
				Oral		Leaf	Fresh leaf of *Ruta chalepensis* immersed in hot readymade tea or coffee and drunk against cough		Cough
AA57	*Mentha spicata* L.	Lamiaceae	Yaatuu	Oral	Herb	Leaf	Fresh plant leaf is put in tea and drunk against cough	Homegarden	Cough
AA58	*Vicia faba* L.	Fabaceae	Baaqilaa	Oral	Herb	Seed	Dried seed chewed against stomach ulcer	Homegarden	Stomach ache
AA59	*Amaranthus* L.	Amaranthaceae	Liimmaa	Dermal	Herb	Leaf	Fresh leaf is cooked, crushed and applied to affected part	Wild	Haemorrhoids
AA60	*Vigna unguiculata*	Fabaceae	Otongora	Oral	Herb	Seed	Dried seeds are cooked and eaten against skin itching	Homegarden	Rheumatism

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
	(L.) Walp.								
AA61	*Musa paradisiaca* L.	Musaceae	Muuzii	Dermal	Herb	Leaf	Juice from the fresh leaf holding part is squeezed and applied on fire burn	Homegarden	Fire burn
AA62	*Mangifera indica* L.	Anacardaceae	Maangoo	Oral	Tree	Stem	Juice from the fresh new growing stem is squeezed and dropped on teeth	Homegarden	Tooth ache
AA63	*Citrus sinensis* (L.) Osb.	Rutaceae	Burtukaana	Dermal	Tree	Fruit	Juice from the fruit is squeezed is applied on skin	Homegarden	Skin infection
AA64	*Brassica carinata* A. Br.	Brassicaceae	Raafuu	Oral	Herb	Leaf	Fresh leaf is rubbed on fire and eaten against gastritis	Homegarden	Gastritis
AA65	*Citrus aurantium* L.	Rutaceae	Qomxaaxxee	Dermal	Tree	Fruit	Juice from the fruit is squeezed and applied on the affected part	Homegarden	Skin infection
AA66	*Lippia adoensis* Hochst. ex walp	Verbenaceae	Kusaayee	Dermal	Herb	Leaf	Fresh leaf is smashed between palm and applied to the affected part of the body.	Wild	Ring worm
AA67	*Lagenaria siceraria* (Molina) Standl.	Cucurbitaceae	Hadhoftuu (Qabee)	Dermal	Herb	Leaf	Fresh leaf of *Lagenaria siceraria* and Leaf and roots of *Cynodon dactylon* are crushed together and applied to the affected area	Homegarden	Tinia corporis
AA68	*Cynodon dactylon (L.) Pers.*	Poaceae	Coqorsa	Dermal	Herb	Leaf	Fresh leaf and roots of *Cynodon dactylon* and leaf of *Lagenaria siceraria* are crushed together and applied to the affected area	Wild	Tinia corporis
AA69	*Cynoglossum lanceolatum* Forssk.	Boraginaceae	Maxxannee Daalacha	Oral	Herb	Root	Fresh roots of *Cynoglossum lanceolatum* and butter is boiled together and given for children against evil eye	Wild	Evil eye
AA70	*Clausena anisata* (Willd.) Hook. f. ex Benth.	Rutaceae	Ulmaayyaa	Oral	Shrub	Leaf	Dried Leaves of *Clausena anisata is* crushed, powdered, mixed with water and a finger strip of little finger is given to human only one time immediately and one can of the preparation to livestock poisoned	Wild	Snake poison
AA71	*Datura metel* var.	Solanaceae	Qoricha Bofaa	Oral	Shrub	Leaf	Fresh leaf of *Datura metel* var. is crushed in the presence of water, filtered and little finger strip of the preparation is given to human and one can is given for cattle and other livestock against snake poison only one time. Antidote: tela or alcohol areke must be taken for the immediate dispersal of the medicine in the body.	Homegarden	Snake poison
AA72	*Allium sativum* L.	Alliaceae	Qulluubbii Adii	Oral	Herb	Bulb	Fresh bulb of *Allium sativum* is eaten against malaria	Homegarden	Malaria
				Oral		Bulb	Fresh bulb of *Allium sativum* is eaten against cough		Cough
				Dermal		Bulb	Fresh bulb of *Allium sativum* is heated and immediately applied on wound		Wound
				Oral		Bulb	Fresh bulb of *Allium sativum* is eaten against Bloat		Bloat
				Oral		Bulb	Fresh bulb of *Allium sativum* and *Zingibil offici-*		Ab-

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
							nales is crushed together and eaten against abdominal crump		domenal crump
AA73	*Momordica foetida* Schumach.	Cucurbitaceae	Saaranbaawoo	Oral	Climber	Leaf	Fresh leaf is collected, cooked, and three spoon of the preparation is given to patient early at the morning for three days against liver problem and alcohol areke or tela is taken immediately after taking the medicine. The shade of human shouldn't pass over the patient and he/she should sleep alone by closing the door of house.	Wild	Liver ailment
AA74	*Ficus thonningii* Blume.	Moraceae	Dambii	Oral	Tree	Stem	The white liquid release from stem cut of the fresh plant is applied on teeth	Wild	Tooth ache
AA75	*Capsicum annuum* L.	Solanaceae	Waaqila alee	Oral	Herb	Fruit	Fresh fruit of *Capsicum annuum* is smashed with water and salt and eaten against bloat	Homegarden	Bloat
				Oral		Fruit	The fresh fruit of *Capsicum annuum, Zingibil officinale* and *Allium cepa* are smashed together and eaten against abdomenal crump		Abdomenal crump
				Oral		Fruit	Fresh fruit of *Capsicum annuum, Zingibil officinale* and *Allium cepa* are crushed together in the presence of water and eaten		Diarrhea
				Oral		Fruit	Fresh fruit of *Capsicum annuum, Zingibil officinale* and *Allium cepa* are crushed together and eaten		Malaria
AA76	*Capsicum frutescens* L.	Solanaceae	Barbaree	Oral	Herb	Fruit	Fresh fruit of *Capsicum frutescens* is smashed and eaten against bloat	Homegarden	Bloat
AA77	*Citrus medica* L.	Rutaceae	Turungoo	Oral	Shrub	Fruit	Fresh fruit is eaten to expel ascaris.	Homegarden	Ascaris
AA78	*Crotalaria rosenii* (Pax) Milne-Redh. ex Polhill	Fabaceae	Baaqilaa Jaldeessaa	Oral	Shrub	Leaf	Fresh leaf of *Crotalaria rosenii* is crushed by adding water and its liquid part is filtered and a strip of little finger is given morning and afternoon for two days for human and one water cup of the preparation per day for two days is given for livestock against snake poison.	Wild	Snake poison
AA80	*Curcuma domestica*Valeton	Zingebraceae	Irdii	Oral	Herb	Rhizome	Dried *Curcuma domestica*Valeton is crushed, powdered and its powder is applied on wound	Homegarden	Wound
AA81	*Dioscorea alata* L.	Dioscoraceae	Burii	Oral	Climber	Leaf	Young shoots of the fresh leaf of *Dioscorea alata* together with the leaf of *Ricinas communis* are pounded together and three drops of the liquid is drunk two times per day morning and night against Tonsilitis.	Homegarden	Tonsilitis
AA82	*Dracaena steudneri* Engl.	Dracaenacae	Sarxee	Dermal	Tree	Leaf	Fresh leaf of *Dracaena steudneri* is crushed and applied on affected area.	Wild	Fire burn
AA83	*Artemisia abyssinica* Sch. Bip. ex	Asteraceae	Koddoo Gurraacha	Oral	Herb	Leaf	Crushing the fresh leaf of *Artemisia abyssinica* with *Allium sativum* and *Zingibil officinalis* by adding water and drinking its filtered liquid part half of tea cup per day for three days against malaria.	Homegarden	Malaria

Collection number	Scientific name	Family name	Local name	Routs	Growth habit	Parts used	Method of preparation	Habitat	Human disease treated
AA84	*Psidium guajava* L.	Myrtaceae	Zeetuunii	Oral	Shrub	Fruit	The fresh fruit is eaten against amoebic dysentery	Wild	Stomach ache
AA85	*Moringa stenopetala* (Baker f.) Cufod.	Moringaceae	Moriingaa	Oral	Tree	Leaf	Fresh leaf is boiled in water and the liquid part is filtered and half of tea cup is drunk against diabetes	Homegarden	Diabetes
				Oral		Leaf	Fresh leaf is crushed by adding water and the liquid part is filtered and half of tea cup is drunk morning and afternoon for three days against hypertension		Hypertension
AA86	*Ocimum americanum* L.	Lamiaceae	Kefoo gurraacha	Oral	Herb	Leaf and Flower	Preparation from the fresh plant in the form of spice is added to sporage and eaten against cough.	Homegarden	Cough
AA87	*Ocimum basilicum* L.	Lamiaceae	Kefoo diimaa	Oral	Herb	Leaf and Flower	Preparation from the fresh plant in the form of spice is added to sporage and eaten against cough.	Homegarden	Cough
AA88	*Phoenix reclinata*Jacq.	Arecaceae	Meexxii	Dermal	Tree	Leaf	Burning the dried leaf and fumigating against headache	Wild	Head ache
				Oral		Seed	Fresh seeds are eaten against stomach ache		Stomach ache
AA89	*Solanum incanum* L.	Solanaceae	iddii	Oral	Shrub	Root	Grinding the fresh roots of *Solanum incanum* properly with the seeds of *Trigonella foenum-graecum*, and fresh roots of *Cynoglossum lanceolatum* Forssk., boiling by adding butter and giving one tea spoon of the preparation to new born children for three days against abdomenal problem.	Wild	Abdomenal crump
AA90	*Solanum marginatum* L.f.	Solanaceae	iddii waraabessa	Oral	Shrub	Root	Grinding the fresh roots of *Solanum marginatum properly* with the seeds of *Trigonella foenum-graecum*, and fresh roots of *Cynoglossum lanceolatum* Forssk., boiling by adding butter and small amount of water and giving one tea spoon of the preparation to new born children for three days against abdomenal problem.	Wild	Abdomenal crump
AA91	*Hagenia abyssinica* J. F. Gmel.	Rosaceae	Heexoo	Oral	Tree	Leaf	The fresh leaf of *Hagenia abyssinica* is crushed by adding water, squeezed and one glass of water is drunk against tapeworm and tela or alcohol areke is immediately drunk in order to speed up vomiting. Antidote: chicken meat and injera prepared from red teff is eaten six hours after medication.	Wild	Tapeworm
AA92	*Ensete ventricosum* (Welw.) Cheesman	Musaceae	Qoccoo	Oral	Herb	Stem	Juice from the fresh stem part is squeezed, mixed with honey and applied on wound	Homegarden	Wound
AA93	*Artemisia afra* Jacq. ex Willd.	Asteraceae	Koddoo adii	Nasal	Herb	Leaf	Fresh leaf is smashed and sniffed against evil eye	Wild	Evil eye

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