



ISSN 2320-3862

JMPS 2016; 4(2): 24-47

© 2016 JMPS

Received: 18-01-2016

Accepted: 20-02-2016

**Zewdie Kassa**

Mizan-Tepi University,  
Natural Sciences College,  
Department of Biology  
P.O. Box: 260 Tepi, Ethiopia

**Zemede Asfaw (Prof)**

Addis Ababa University,  
Department of Plant Biology  
and Biodiversity Management,  
the National Herbarium, P.O.  
Box: 3434  
Addis Ababa, Ethiopia

**Sebebe Demissew (Prof)**

Addis Ababa University,  
Department of Plant Biology  
and Biodiversity Management,  
The National Herbarium, P.O.  
Box: 3434 Addis Ababa,  
Ethiopia

**Correspondence**

**Zewdie Kassa**

Mizan-Tepi University,  
Natural Sciences College,  
Department of Biology P.O.  
Box: 260 Tepi, Ethiopia

## Ethnobotanical study of medicinal plants used by the local people in Tulu Korma and its Surrounding Areas of Ejere District, Western Shewa Zone of Oromia Regional State, Ethiopia

**Zewdie Kassa, Zemede Asfaw, Sebebe Demissew**

### Abstract

**Background:** An ethnobotanical study of medicinal plants was conducted between October 2013 and September 2014 in Tulu Korma and its surrounding areas of Ejere District, West Shewa Zone of Oromia Regional State, Ethiopia. The objective of the study was to document medicinal plant species of the area and associated ethnobotanical knowledge.

**Methods:** Common ethnobotanical methodologies and techniques were applied. About 156 informants were interviewed. The informants were selected from five visually established sites for sampling.

**Results:** About 138 medicinal plant species belonging to 107 genera and 56 families were recorded. About 76(55.07%) of the medicinal plants were used to treat human ailments, 9(6.52%) animal ailments and 53(38.44%) for both.

**Conclusion:** The study area is very rich in medicinal plant species and indigenous traditional ethnobotanical knowledge. There are also potential threats that need priority for conservation. Potentially significant plant species need screening, verifying and approval for setting conservation priorities.

**Keywords:** Ethnobotany, medicinal plants, Tulu Korma, Ejere, Indigenous species

### 1. Introduction

#### Background

Ethno botany is the scientific study of the relationships between plants and people [28, 6]. It was stated that Ethno botany appears to be a promising discipline that can play a key role as a mediator of dialogue between different academic disciplines and traditional knowledge, a union essential to enable contextualized and sustainable alternatives to explosive practices and biodiversity management [1]. Hence, ethnobotanical studies play significant roles in contributing techniques of community based resource management and conservation. This is because the science of ethnobotany is an endeavor which attracts people from various academic disciplines. Ethnobotanists and local people face the challenging task of not only recording knowledge of the plant world but also applying the results of their studies to biodiversity conservation, community development and primary healthcare services involving medicinal plants.

#### Ethno botany

It was noted that much of the controversy surrounding the definition of ethnobotany has begun from differences in the interests of workers involved in its study [6]. A good justification is that for several years, ethnobotany has included students from several disciplines. It is from this multidisciplinary approach involving various fields of botany, chemistry, pharmacology and anthropology that ethno-scientists can derive information for different applications.

Moreover, it was believed that the changing attitudes towards traditional peoples are the key reasons for the growing interests in ethnobotany. Hence, ethnobotany attained potential applications since the early ethnobotanical studies in aboriginal plant use. The scope of ethnobotany currently has expanded enormously, encompassing the botanical aspects of a number of ethno-scientific studies including ethnomedicine. The practical applications of ethnobotanical data in areas such as biodiversity prospecting and conservation biology are also seen as within the current scope of the subject [4, 6].

It is worth noting the concept of [27] who depicted ethnobotany as the renaissance of traditional herbal medicine when one envisages it from the medicinal plants point of view.

In that case, medicinal plants are botanical remedies derived from trees, shrubs or herbaceous plants that are useful for primary healthcare system and as a remedy for disease and injury including plants used traditionally for foods and drinks that are also believed good for health [12, 8]. Moreover, medicinal plants play multipurpose roles such as spices and condiments [24], apiculture [13], ecological services, source of wood and wood products as well as soil conservation [26, 3] in addition to their medicinal value.

### Plant-Human Relations

The history of plant use by humans for the treatment of various diseases is as old as the history of the human species. Hence, humans had been looking to nature to provide them with remedies for their health problems most of which are derived from plant products. It is due to the fact that the plants have been used as a source of medicine in both developed and developing countries in general and in Ethiopia in particular since the time immemorial [25, 18, 29, 30].

This research focused on documenting medicinal plants as well as the levels of ethnobotanically knowledge together with its contribution to primary healthcare system in Tulu Korma and its surrounding areas of Ejere District, Ethiopia.

## 2. Materials and Methods

### The Study Area Location

Tulu Korma and its surrounding, which is home to the Center for the Restoration of Ethiopia's Biodiversity and Key Natural Resources formerly known as the Center for Indigenous Trees Propagation and Biodiversity Development in Ethiopia, is located at 50-55 km West of Addis Ababa on the high way running from Addis Ababa to Ambo. Geographically, the center is located between 09°01.188' N and 038°21.570' E within altitude range of 2,163-2,267m [26].

Four neighboring kebeles bordering Tulu Korma are Chiri to the north, Kimoye to the west, Hora to the south and Endode to the east (Figure 1).

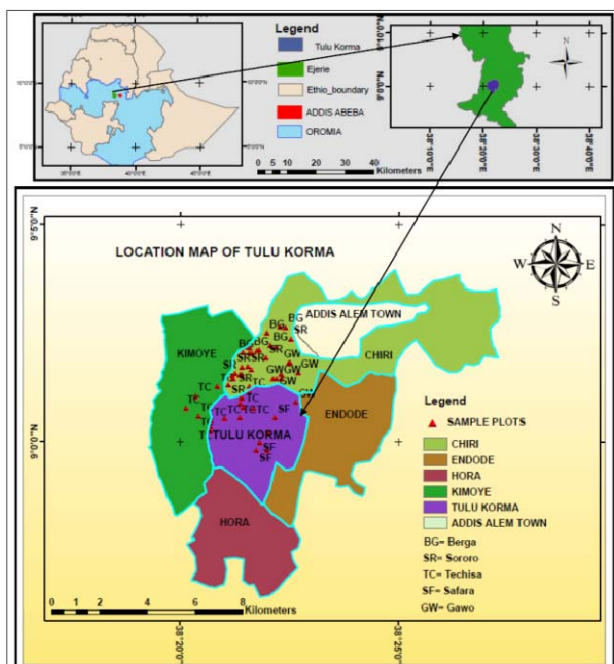


Fig 1: Location of the study area

### Climate

The climate of Tulu-Korma and its surrounding belongs to the woinadega agro-climate type of traditional classification. Based on data sources from the Ethiopian National

Meteorological Service Agency (ENMSA) during 1999 to 2014 the annual average minimum and average maximum temperature for 16 years data is 7.4 °C and 26.2 °C respectively. The annual average temperature and average rainfall for the same years' data are 16.9 °C and 1099mm respectively with uni-modal rainfall type (Figure 2).

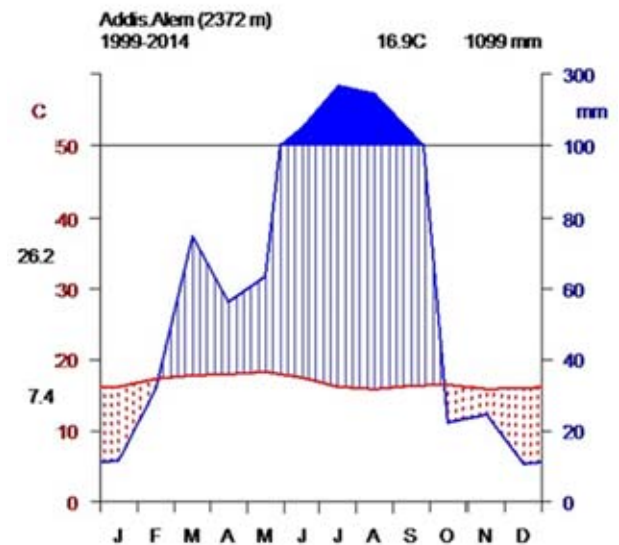


Fig 2: Climate diagram of the study area

### Vegetation Types

According to [16], areas between altitudes of 1800 and 3000 meters have been marked as the Dry evergreen Afromontane forest and grassland complex with the exception of high annual rainfall areas of 1700 millimeters and above. Hence, the vegetation type of the central highlands belongs to the Dry evergreen Afromontane forest and grassland complex type and the vegetation of Tulu-korma and its surrounding also belongs to such vegetation type. The authors were also noted that such vegetation type is characterized by a canopy dominated by *Juniperus procera* (Cupressaceae), *Podocarpus falcatus* (Podocarpaceae), *Olea europaea subsp. Cuspidata* (Oleaceae), *Croton macrostachyus* (Euphorbiaceae) and *Ficus species* (Moraceae). Shrubs and bush lands, woodlands and plantations are also available in Tulu-Korma and its surrounding.

### The people of the study area

According to Ethiopian Central Statistical Agency [7], Ejere District has a total population of 89,168 (45,352 males and 43,816 females) of which 78,795 are rural dwellers and the remaining 10,373 are urban dwellers. Although other ethnic groups are also found in the district, the major ones are the Oromo ethnic groups and Afaan Oromoo is widely spoken language. Since the study only focused on only Tulu-Korma and its surrounding areas, informant sampling was done by first identifying the number of households living in the vicinity and then determining the sample size (number of informants) following [5].

### Materials

The following materials were used in the course of data collection: Digital camera, field notebook, Garmin Global Position System, Meter, laptop computer, SILVA Compass, SILVA Ranger Clinometers and Plant press.

### Methods

Reconnaissance survey to get first hand preliminary information about the general floras, stakeholders, appropriate

data collection time and seasons as well as the levels of ethnobotanical knowledge in the study area, a survey was made after briefing the objectives and significance of carrying out the research in the area to the local officials as well as other concerned bodies. The survey was done by making sure of whether all concerned bodies are included to provide the required information during the course of the study. Demographic information was then retrieved from the nearby administration offices before setting sample size for ethnobotanical data collection using semi-structured interview. Both standard qualitative and quantitative ethnobotanical methods such as ranking and scoring were employed during data collection. About 260 households living in Tulu Korma and its surrounding areas were included in the study and informant sampling was based on only these households since the study is targeted to only Tulu Korma and its vicinity.

### Site and Informant Selection

Sample sites were identified and selected from the surrounding areas of Tulu-Korma and its surrounding within 2-10 kilometers radius. Five sites; Berga, Sororo, Techisa, Safara and Gawo were identified. Ethnobotanical data were preferentially sampled from the five villages found in the respective sites. Informants were also selected following even distribution for all the sample sites. Two types of informants were considered; those who were deliberately interviewed because of their detailed ethnobotanical knowledge, and those who were randomly interviewed to make the sampling frame representative of the whole population. Sample size for informants was determined following [5]. About 156 informants were selected from the 260 households and

interviewed randomly. Hence,  $n = \frac{n_0 \cdot (N + 1)}{N} = 156$  where  $n$  = corrected sample size,  $n_0$  = probable sample size without correction factor at 95% confidence interval determined with,  $N$  = population size, 260 households in our case. Plant Specimen Collection Locally used medicinal plants that were reported by each informant during each successive visit and interviews were collected. All the necessary information about the specimens collected was carefully recorded at the spot. Voucher specimens were pressed and dried, both those identified on the field and those not identified on the field, were taken to the Ethiopian National Herbarium for further confirmation and verification.

### Plant specimen identification

Specimen identification was made at the National Herbarium Addis Ababa University using taxonomic keys, characters and published volumes of the flora of Ethiopia and Eritrea [19, 20, 9, 10, 11, 21, 22, 15]. The entire medicinal plant specimens collected were identified and deposited in the National Herbarium of

Addis Ababa University, Ethiopia. Necessary photographic pictures taken along with specimens during field data collection were also properly managed, labeled and documented. Ethnobotanical Data Collection Following selections of informants, both qualitative and quantitative ethnobotanical data were collected through the application of standard ethnobotanical methods following [28, 2, 6]. Bennett's golden rules for ethnobotanical data collection were properly followed to retrieve the necessary information from the informants. Ethnobotanical data from and around homegardens were collected and recorded. The methods of field observation, guided field walk, market surveys, individual and group discussions, participant observations as well as demonstration were also used in the course of the study. Ranking and scoring, pair wise comparisons as well as direct matrix ranking techniques were used following [28] and the results were carefully recorded. Paired comparisons of selected useful plant species based on informants' responses were made to test for consistency and transitivity. Informants

were provided with pair of items determined as:  $N = \frac{n(n-1)}{2}$  for comparison, where  $N$  = number of pairs,  $n$  = number of items compared.

### Data Analysis

#### Ethnobotanical Data Analysis

Descriptive statistics was used to analyze ethnobotanical data using Microsoft Excel spreadsheet. Ranking and scoring, pair wise comparisons as well as direct matrix ranking techniques were done following [28, 6] to analyze ethnobotanical data quantitatively. To see the degree of effectiveness of a given medicinal plants species against certain diseases such as stomach problems, simple preference ranking and paired comparisons were computed. The agreement of the informants on the reported use of medicinal plants to cure a group of ailments was tested by calculating the informants' consensus

factor (ICF) values following [23] as:  $ICF = \frac{n_{ur} - n_t}{n_{ur} - 1}$ , where  $n_{ur}$  = number of use citations in each category of disease,  $n_t$  = total number of medicinal plants used.

### 3. Results

**General medicinal plant use categories** About 12 major use categories of plants were identified from the study area (Appendix 1). These use categories include medicinal, food/drink, fire wood, charcoal, shade, construction and tools, commercial, fodder, bee forage, culture and rituals, ornamental and others (Table 1).

**Table 1:** Taxonomic and use categories of medicinal plants recorded from the study area

Taxonomic Hierarchies	Medicinal	Food/drinks	Firewood	Charcoal	Shade	Construction /Tools	Commercial	Fodder	Bee forage	Culture and /Ritual	Ornamental	Others
Families	56	28	42	9	25	41	18	30	31	28	27	72
Genera	107	48	70	11	19	64	27	68	80	35	35	24
Species	138	51	87	14	23	79	31	92	115	44	45	29

**Medicinal Plants**

About 138 plant species belonging to 107 genera and 56 families were identified as medicinal plants used for treating major health problems of humans and animals. These medicinal plants were reported to be used for treating human, animals, both human and animal health problems (Table 2) in addition to other ethnobotanical significance they have (Appendix 1).

**Table 2:** Use categories of medicinal plants among human and animal health problems

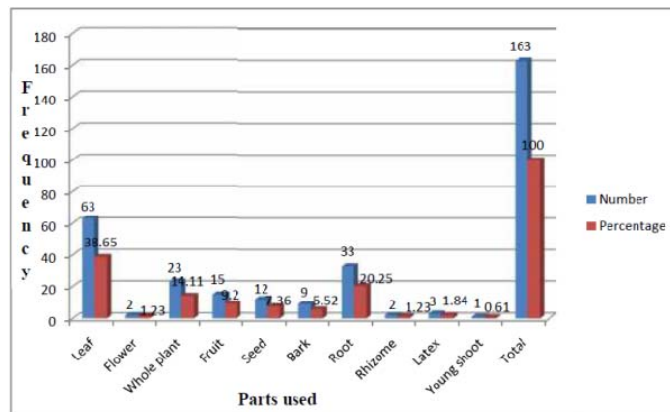
No of taxonomic hierarchies	Medicinal plants used to treat		
	Humans (H)	Animals (An)	Both (B)
138 species	76 (55.07%)	9 (6.52%)	53 (38.41%)
107 genera	58 (54.21%)	9 (8.41%)	48 (44.86%)
56 families	33 (58.93%)	9 (16.07%)	31 (55.36%)

**Plant parts used as medicines**

About 10 major plant parts were identified as to be used as medicines for treating various health problems of both humans and animals (Figure 3).

**Ranking and scoring**

Medicinal plants reported as the most common ones were compared by ranking and scoring ethnobotanical methods. Simple preference ranking was done to compare eight medicinal plants used against fever (MICH) (Table 3). Paired comparison was also used to rank four medicinal plants used against fever (Table 4). Similarly, six medicinal plant species were compared against seven major uses by direct matrix ranking (Table 5).



**Fig 3:** Frequencies of plant parts used as medicine

**Table 3:** Result of simple preference ranking for eight medicinal plants used against fever (MICH) where 8= most preferred and 1= least preferred.

Medicinal plant species	Respondents										Total	Rank
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10		
<i>Cynoglossum amplifolium</i>	6	1	2	1	7	3	2	5	6	1	34	6 <sup>th</sup>
<i>Cynoglossum coeruleum</i>	7	6	8	7	8	5	6	4	8	3	62	2 <sup>nd</sup>
<i>Plectranthus cylinderaceus</i>	5	4	5	4	3	1	5	6	4	2	39	5 <sup>th</sup>
<i>Leucas martinicensis</i>	4	2	1	3	2	4	1	2	3	5	26	7 <sup>th</sup>
<i>Ocimum lamifolium</i>	8	8	7	6	5	8	7	8	7	8	72	1 <sup>st</sup>
<i>Ocimum urticifolium</i>	1	3	3	2	1	2	4	1	2	4	23	8 <sup>th</sup>
<i>Salvia nilotica</i>	2	7	6	8	4	6	3	7	5	7	55	3 <sup>rd</sup>
<i>Satureja abyssinica</i>	3	5	4	3	6	7	8	3	1	6	46	4 <sup>th</sup>

Top four of the above medicinal plants were taken and randomized for the sequence of the pairs and the order within the pairs. Six possible pairs of medicinal plants were obtained as:  $N = n(n-1)/2 = 4(4-1)/2 = 6$  pairs were generated. Hence, the possible pairs are 1<sup>st</sup> pair = (1,2), 2<sup>nd</sup> pair = (1,3), 3<sup>rd</sup> pair = (1,4), 4<sup>th</sup> pair = (2,3), 5<sup>th</sup> pair = (2,4), 6<sup>th</sup> pair = (3,4). By

randomizing the order of presentation through drawing numbers 1-6 written on cards and by randomizing the order of each medicinal plant within each pair by flipping a coin such that head (H) indicates the original order is maintained and tail (T) indicates the original order is reversed, the following results were obtained (Figure 4).

<i>C. coeruleum</i>	<i>O. lamifolium</i>	<i>S. nilotica</i>	<i>S. abyssinica</i>		Scores	Rank
	<i>O. lamifolium</i>	<i>C. coeruleum</i>	<i>C. coeruleum</i>	<i>C. coeruleum</i>	2	2 <sup>nd</sup>
		<i>O. lamifolium</i>	<i>O. lamifolium</i>	<i>O. lamifolium</i>	3	1 <sup>st</sup>
			<i>S. nilotica</i>	<i>S. nilotica</i>	1	3 <sup>rd</sup>
				<i>S. abyssinica</i>	0	4 <sup>th</sup>

**Fig 4:** A pair wise ranking matrix of four medicinal plants against fever (single respondent)

**Table 4:** Paired comparison of four medicinal plants against fever (results of R1-R10).

Medicinal plant species	Respondents										Total	Rank
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10		
<i>Cynoglossum coeruleum</i>	2	3	2	1	0	2	1	2	0	3	16	2 <sup>nd</sup>
<i>Ocimum lamifolium</i>	3	2	1	3	3	3	3	2	2	2	24	1 <sup>st</sup>
<i>Salvia nilotica</i>	1	0	3	2	2	1	1	3	1	0	14	3 <sup>rd</sup>
<i>Satureja abyssinica</i>	0	1	1	1	1	0	2	1	3	1	11	4 <sup>th</sup>



**Table 5:** Direct matrix ranking of six plant species. Results of three informants (I1-I3) against 7 use values. UV = Use values, 0 = No use, 6 = Best, TM = Timber, FW = Firewood, CH = Charcoal, CT = Construction and Tools, FD = Food, SD = Shade, IT = Informants' Totalled, GT = Grand Totalled, R = Rank

UV	Multipurpose plant species in the study area																	
	Acacia abyssinica			Albizia schimperiana			Croton macrostachyus			Ficussur			Olea europaea			Podocarpus falcatus		
	Informants			Informants			Informants			Informants			Informants			Informants		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
MD	2	1	4	0	0	0	7	7	7	5	4	3	3	4	2	2	3	2
TM	3	2	1	3	2	1	0	0	0	3	2	1	2	3	1	6	6	6
FW	5	5	6	5	6	6	3	4	5	3	3	4	6	6	6	6	6	6
CH	6	6	6	1	1	0	1	0	0	1	0	0	5	2	1	4	1	2
CT	5	4	3	5	3	4	3	4	3	2	3	2	6	6	6	6	6	6
FD	1	2	1	0	0	0	0	0	0	5	6	5	0	0	0	0	0	0
SD	4	5	6	6	6	6	1	1	2	5	4	3	4	5	5	6	5	6
IT	28	25	27	20	18	17	15	16	17	24	22	18	26	26	21	30	27	28
GT	80			55			48			64			73			85		
R	2 <sup>nd</sup>			5 <sup>th</sup>			6 <sup>th</sup>			4 <sup>th</sup>			3 <sup>rd</sup>			1 <sup>st</sup>		

### Informants' consensus factor (ICF)

The values of informants' consensus (IC) and informants' consensus factor (ICF) are used to test the agreement of people on medicinal values of each medicinal plant species (Table 6, 7). The medicinal plant use reports obtained during the study

indicated that some medicinal plants are cited by more than 15 informants (Appendix 1). Based on the data, top 15 medicinal plants that have relatively higher percentages of informants' consensus were used selected for further analysis (Table 6).

**Table 6:** Informants' consensus for top 15 medicinal plants

SN	Medicinal plant species	Total No. citations by informants	Percentage of informants	Rank
1	<i>Allium sativum</i>	34	21.79	2 <sup>nd</sup>
2	<i>Brucea antidysentrica</i>	15	9.62	15 <sup>th</sup>
3	<i>Croton macrostachyus</i>	45	28.85	1 <sup>st</sup>
4	<i>Cucumis ficifolius</i>	30	19.23	3 <sup>rd</sup>
5	<i>Justicia schimperiana</i>	25	16.03	4 <sup>th</sup>
6	<i>Leucas martinicensis</i>	16	10.26	14 <sup>th</sup>
7	<i>Ocimum lamiifolium</i>	22	14.10	6 <sup>th</sup>
8	<i>Ocimum urticifolium</i>	17	10.90	12 <sup>th</sup>
9	<i>Phytolacca dodecandra</i>	24	15.38	5 <sup>th</sup>
10	<i>Ranunculus multifidus</i>	22	14.10	6 <sup>th</sup>
11	<i>Rumex nepalensis</i>	19	12.18	8 <sup>th</sup>
12	<i>Ruta chalepensis</i>	18	11.54	10 <sup>th</sup>
13	<i>Salvia nilotica</i>	19	12.18	8 <sup>th</sup>
14	<i>Stephania abyssinica</i>	17	10.90	12 <sup>th</sup>
15	<i>Zehneria scabra</i>	18	11.54	10 <sup>th</sup>

**Table 7:** Informants' consensus factor (ICF) values for 12 major plant use categories

SN	Use categories	No. species	%Species	No. use reports	%use reports	ICF	Rank
1	Medicinal	138	18.45	789	26.67	0.826	1 <sup>st</sup>
2	Food/drinks	51	6.82	174	5.88	0.711	10 <sup>th</sup>
3	Firewood	87	11.63	330	11.16	0.739	7 <sup>th</sup>
4	Charcoal	14	1.87	74	2.50	0.822	2 <sup>nd</sup>
5	Shade	23	3.07	114	3.85	0.805	3 <sup>rd</sup>
6	Const. and Tools	79	10.56	276	9.33	0.716	8 <sup>th</sup>
7	Commercial	31	4.14	122	4.12	0.752	6 <sup>th</sup>
8	Fodder	92	12.30	219	7.40	0.583	12 <sup>th</sup>
9	Bee forage	115	15.37	403	13.62	0.716	8 <sup>th</sup>
10	Culture and rituals	44	5.88	216	7.30	0.800	4 <sup>th</sup>
11	Ornamental	45	6.02	126	4.26	0.648	11 <sup>th</sup>
12	Others	29	3.88	115	3.89	0.754	5 <sup>th</sup>

Over all Informant consensus Factor (ICF) =  $(\text{nur-nt}) / (\text{nur}-1) = (2958-748) / (2958-1) = 0.747$

### Major threats to medicinal plants

This study identified six major threats to vegetation of the study area. Threats based on the intensity of destructiveness in

the area as reported by the informants. The result of priority ranking of threats to vegetation based on their destructiveness is given below (Table 8).

**Table 8:** Results of responses from ten respondents (R1-R10) on priority ranking of six factors that are perceived as threats to vegetation of Tulu Korma and its surrounding areas based on their degree of destructiveness (1 = least destructive, 6= most destructive).

Threats	Respondents										Total	Rank
	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10		
Agricultural intensification	6	4	5	3	6	5	4	4	5	6	48	2 <sup>nd</sup>
High population pressure	5	5	3	6	5	6	6	6	6	5	53	1 <sup>st</sup>
Charcoal making	2	3	1	2	4	1	2	1	2	3	21	5 <sup>th</sup>
Firewood collection	3	2	4	4	2	3	5	5	4	2	34	4 <sup>th</sup>
Construction and Tools	4	6	6	5	3	2	1	3	3	4	37	3 <sup>rd</sup>
Grazing	1	1	2	1	1	4	3	2	1	1	17	6 <sup>th</sup>

#### 4. Discussion

##### General use categories of plants

Almost all the 138 medicinal plant species recorded from the study area are useful and used by the local community in one or more ways both directly and indirectly. These use categories include medicines, food and drinks, firewood, charcoal making, shade, construction and tools, commercial, fodder, bee forage, culture and rituals, ornamental and others such as tanning hides and skins. Moreover, there are plants that have both positive and negative useful values in the environment but generally categorized as useful plants. For instance, plants such as *Oenanthe palustris* and *Rorippa nasturtium-aquatica* are known to be very poisonous to livestock if they are grazed since they immediately kill the animals unless immediate antidote is given to them. On the other hand, these two plant species especially *Oenanthe palustris* is a very good species used by farmer in tanning hides, skins and leathers.

According to [17], indigenous knowledge systems associated with various plant uses have become recognized worldwide for their contribution to science and conservation. The above concept is good implication for the need of knowledge integration from various angles in the course of better biodiversity management. [32] also added that indigenous knowledge play a key role in advancing reputes of sustainable natural resource management. For that matter, it would be worth noting here the role of ethnobotanical knowledge systems in retrieving valuable information from indigenous society. In the context of large-scale development and conservation projects, it was noted that ethnobotanical studies provide sound and valuable information to a wide range of stakeholders and the local peoples as well as to the scientific community interested in biodiversity conservation and management along with the associated traditional knowledge [31, 14]. This concept is hand-in-hand with the ongoing conservation activity at Tulu Korma.

##### Medicinal plants

All the 138 medicinal plant species recorded from the study area were found to have medicinal values in one or more ways both directly and indirectly. These plant species are used to treat humans (76, 55.07%) and animals (9, 6.52%) or both (53, 38.41%) health problems (Table 13). About ten major plant parts were identified as parts used to treat about 20 major health problems.

In most cases, the local people can be able to name the plants in their vicinity directly by its local name. However, in some cases, there are circumstances when one cannot get the exact mach or local name for a particular species in question despite the plant is still in use for certain purposes both directly or indirectly. In such cases, farmers associate the possible name of the plant with its use value or its ecological significance in the vicinity. For instance, all plants named by adding the prefix "QORICHA" to the name of the diseases or aliment for which it is used in the locality have certain medicinal value.

QORICHA means medicine for. Such naming systems include:

QORICHA MICHII: Plants used as medicine against fever and chilly.

QORICHA MADAA: Plants used as medicines against wound and bleeding.

QORICHA CINIINNA: Plants used as medicines against stomachache.

QORICHA SINBIRAA: Plants used as medicines against recurrent herpes zoster simplex around nose and the nasal cavity.

QORICHA MARZII/HADHAA: Plants used as medicines against poisoning and puss.

QORICHA BUDAA: Plants used as medicines against evil eye.

QORICHA BOFAA: Plants used as medicines against snake bite.

QORICHA XANNACHAA: Plants used as medicines against tumors.

QORICHA WAAN WAAQA IRRAA/BIDUU: Plants used as medicines against hepatitis virus.

QORICHA SAREE MARAATUU: Plants used as medicines against rabies virus.

QORICHA ILKAANII: Plants used as medicines against toothache.

QORICHA IJAA: Plants used as medicines against eye diseases.

QORICHA QUFAA: Plants used as medicines against common cold or cough.

QORICHA QOONQOO: Plants used as medicines against tonsillitis.

QORICHA MAAGAA: Plants used as medicines against *Ascariasis*.

QORICHA RAAMMOO MINNII: Plants used as medicines against tapeworm (*Taeniasis*).

QORICHA SHIFEE/SARARIITII: Plants used as medicines against herpes zoster simplex and skin diseases.

QORICHA BUUTII: Plants used as medicines against blotting due to snake poisoning. Similar finding was also reported by [33].

##### Ranking and scoring

Results of simple preferential ranking of eight medicinal plants used against fever (MICH) indicated that *Ocimum lamiifolium* ranked first followed by *Cynoglossum coeruleum* second and *Salvia nilotica* third (Table 2). Similarly, the results of paired comparison of four medicinal plants against fever (MICH) showed that *Ocimum lamiifolium* again ranked first followed by *Cynoglossum coeruleum* second and *Salvia nilotica* third confirming consistency and transitivity of the medicinal plants against a given health problem.

Direct matrix ranking of multipurpose plant species in the area was also done for six plant species against seven use values. The result revealed that *Podocarpus falcatus* ranked first followed by *Acacia abyssinica* second and *Olea europaea*

*subsp. cuspidata* third.

Informant consensus was also used to test the agreement of people on medicinal values of top 15 medicinal plants cited by more than 9.62 % of the informants. *Croton macrostachyus* was ranked first with informant consensus of 28.85% of the informants followed by *Allium sativum* second (21.795%) and *Cucumis ficifolius* third (19.23%) of the informants. Informant consensus factor (ICF) values for 12 major plant use categories indicated that medicinal values ranked first with ICF value of 0.826 followed by charcoal making second (ICF = 0.822) and shade third (ICF= 0.805) in the study area.

### Major threats to medicinal plants

Similar to elsewhere in Ethiopia, the vegetation of the study area is threatened by a range of factors. The major threats identified during the course of the study were agricultural intensification, high population pressure, charcoal making, firewood collection, grazing and demand of plant products for construction and tools. There are also warning signs of invasive alien species such as *Parthenium hysterophorus*, *Argemone mexicana* and *Lantana trifolia* encroachment observed in the area although their distribution is very limited. Eucalyptus plantations are also almost replacing the indigenous trees and other natural vegetation around the town margins of Addisalem Town. The result of priority ranking to threats revealed that high population pressure ranked first thereby agricultural intensification second and construction and tools ranked third position.

### Conclusions

The current study revealed that Tulu Korma and its surrounding environs are very rich in medicinal plant species and indigenous traditional ethnobotanical knowledge systems. It was stated that while traditions, customs, beliefs and cultural rights play crucial role in environmental conservation a comprehensive proactive policy framework is the best way to conserve indigenous knowledge that can help in the sustainable use, production and maintenance of plant biodiversity [14].

In case of Tulu Korma and its surrounding areas, despite the fact that there is better understanding of the local communities about vegetation conservation, there are also potential threats that need top priority for long-lasting and sustainable vegetation conservation of the area hence the medicinal plants as well. This will come to be true by integrating and implementing effective natural resource management policies in connection with community based conservation projects at its grass root level. This can be come to truth through understanding the need to build on the existing resources of indigenous medicinal plant communities by improving on their management sustaining the resources as well as further domestication of highly valuable medicinal plant taxa. The current study also revealed the need for screening, verifying and approval of potentially significant plant species of interest to treat specific health problems in the area thereby setting conservation priorities.

### Declaration of competing interests

The authors declare that they have no competing interests.

### Author' contributions

The authors have made substantive intellectual contributions to this study in data collection, organization of the data, analysis, interpretation of results, preparation of the manuscript and proof reading.

### 5. Acknowledgments

Zewdie Kassa gratefully acknowledges staff of the National Herbarium of Addis Ababa University and the main library circulation of Addis Ababa University (Keneddy Library), the library of the United Nations Economic Commission for Africa (UNECA) for collaboration during the write up of the manuscript. Addis Ababa University is greatly acknowledged for financial and material support. The local people of Tulu Korma and surrounding areas, Ejere District administration and agricultural offices, workers of Tulu Korma Centre for indigenous Trees Propagation and Biodiversity development in Ethiopia for unreserved assistances and collaborations during data collection.

### 6. References

1. Albuquerque UP, Cunha LVFC, Lucena RFP, Alues RRN (eds). *Methods and Techniques in ethnobiology and ethnoecology*. Springer science + business media, New York, USA. 2014.
2. Alexiades MN. Selected guidelines for ethnobotanical research: A field manual. The New York Botanic Garden, New York, USA. 1996.
3. Azene Bekele-Tessema. *Useful Trees and Shrubs for Ethiopia: Identification, Propagation and Management for 17 Agroclimatic Zones* (Bo Tengnas, Ensemu Kelbesa, Sebsebe Demissew and Ptrick Maundu, eds.). RELMA in ICRAF Project, World Agroforestry Centre, East African Region, Nairobi, Kenya. 2007.
4. Balick MJ, Cox PAR. *Plants, People and Clture*. The Science of Ethnobotany. Scientific American Library, New York, USA. 1996.
5. Cochran WG. *Sampling Techniques*, 3rd edn. Willey and Sons, New York. 1977.
6. Cotton CM. *Ethnobotany: Principles and Applications*. John Willey and Sons. Chichester, UK. 1996.
7. CSA. Summary and statistical Report of the 2007 population and Housing Cencus. Population size by age and sex. Federal Democratic Republic of Ethiopia Population Census Comission, United Nations Population Fund (UNFPA). 2008, 114.
8. Dawit Abebe, Asfaw Debela, Kelbessa Urga. *Medicinal and other useful plants of Ethiopia*. EHNRI, Addis Ababa, Ethiopia. 2003.
9. Edwards S, Mesfin Tadesse, Hedberg I (eds). *Flora of Ethiopia and Eritea, Caellaceae to Euphorbiaceae*. The National Herbarium Addis Ababa, Ethiopia and Upsala, Sewden. 1995, 2(2).
10. Edwards S. Sebsebe Demissew, Hedberg I. (eds) *Flora of Ethiopia and Eritrea. Hydrocharitaceae to Arecaceae*. The National Herbarium, Addis Ababa, Ethiopia and Upsala, Sewden. 1997, 6.
11. Edwards S, Sebsebe Demissew, Hedberg I. (eds). *Flora of Ethiopia and Eritrea. Magnoliaceae to Flacourtiaceae*. The National Herbarium Addis Ababa Ethiopia and Upsala Sewden. 2000, 2(1).
12. Fikadu Fulas. *Ethiopian Traditional Medicine: Common Medicinal Plants in Perspectiv*. Siox city, USA. 2001.
13. Fichtl R, Admsu Adi. *Honey Bee Flora of Ethiopia*. Margraf Verlag, Wikersheim, Germany. 1994.
14. Fongod AGN, Ngoh LM, Veranso MC. Ethnobotany, indigenous knowledge and unconscious preservation of the environments: An evaluation of indigenous knowledge in South and Southwest Regions of Cameroon. *International Journal of Biodiversity and conservation* 2014; 6(1):85-99.
15. Friis I. Floristic richness and endemism in the flora of

- Ethiopia and Eritrea. **In:** Flora of Ethiopia and Eritrea, General part and index to. Hedberg, I., Friis, I. and Presson, E. (eds), Addis Ababa, Ethiopia, Uppsala Sweden 2009; 8:1-7.
16. Friis I, Sebsebe Demissew, Breugel P. *Atlas of the Potential Vegetation of Ethiopia*, Addis Ababa University Press, Shama Books, Addis Ababa, Ethiopia. 2011.
  17. Gemedo Dalle, Maass BL, Isselstein J. Plant diversity and ethnobotany of Borena Pastoralists in Southern Oromia, Ethiopia. *Economic Botany* 2005; 59(1):43-65.
  18. Getachew Addis, Dawit Abebe, Kelbessa Urga. A Survey of Traditional Medicinal Plants in Shirka District, Arsi Zone, Ethiopia. *Ethiop. Pharmaceutical Journal*. 2001; 19:30-47.
  19. Hedberg I, Edwards S. (eds.). *Flora of Ethiopia and Eritrea, Pittosporaceae to Araliaceae*. The National Herbarium Addis Ababa, Ethiopia and Uppsala Sweden. 1989, 3.
  20. Hedberg I, Edwards S. (eds.). *Flora of Ethiopia and Eritrea, Poaceae (Graminae)*. The National Herbarium Addis Ababa, Ethiopia and Uppsala Sweden. 1995, 7.
  21. Hedberg I, Friis I, Edwards S. (eds.). *Flora of Ethiopia and Eritrea, Asteraceae (Compositae)*. The National Herbarium, Addis Ababa, Ethiopia and Uppsala, Sweden. 2004, 4(2).
  22. Hedberg I, Ensermu Kelbessa, Edwards S, Sebsebe Demissew, Persson E. (eds.). *Flora of Ethiopia and Eritrea, Gentianaceae to Cyclocheilaceae*. The National Herbarium, Addis Ababa, Ethiopia Uppsala Sweden. 2006, 5.
  23. Heinrich M. Ethnobotany and its role in drug development. *Phytother. Res.* 2000; 14:479-488.
  24. Jansen PCM. *Spices, Condiments and Medicinal Plants in Ethiopia*. Their taxonomy and Agricultural Significances. Centre for Agricultural Publishing and Domestication, Wageningen, Netherlands. 1981.
  25. Kokwaro JO. *Medicinal Plants of East Africa*. East African literature Bureau, Nairobi Kenya. 1976.
  26. Legesse Negash. *A selection of Ethiopia's Indigenous Trees Biology, uses and propagation techniques*. Addis Ababa University Press, Addis Ababa, Ethiopia. 2010.
  27. Mahishi P, Srinivasa BH, Shivann MB. Medicinal plant Wealth of local communities in some villages in Shimoga District of Karnataka, India. *Journal of Ethnopharmacology* 2005; 98:307-312.
  28. Martin GJ. *Ethnobotany*. Chapman & Hall, London. 1995.
  29. Mirutse Giday, Zemedede Asfaw, Thomas Equist, Zerihun Woldu. An Ethnobotanical Study of Medicinal Plants used by the Zay people in Ethiopia. *Journal of Ethnopharmacology*. 2003 85:43-52.
  30. Mirutse Giday, Zemedede Asfaw, Zerihun Woldu. The Role of Herbaria in Preserving Local Plant-use information: The case of the Ethiopian National Herbarium and Flora. *Journal of East African Natural History*. York, USA. 2005; 94(2):287-301.
  31. Uprety Y, Poudel RC, Asselin H, Boon E. Plant diversity and ethnobotany inside the projected impact area of the upper Seti Hydropower Project, Western Nepal. *Environ Dev Sustain*. 2011; 13:463-492.
  32. Zemedede Asfaw. Indigenous knowledge: Hope and Prospects for advancing reputes of Sustainable Natural Resource Management in East Africa. Paper presented to the workshop on Lessons Learnt on Dryland Biodiversity, University of Daresalam, Tanzania. 2005, 13-17.
  33. Zewdie Kassa. An ethnobotanical study of medicinal plants and biodiversity of trees and shrubs in Jeldu



## 7. Appendices (Additional files)

**Appendix1:** List of Medicinal Plants recorded from Tulu Korma and its surrounding areas and its description

**KEY:** H-Herb, HBT-HABIT, Sh-Shrub, Pu-Parts used, UT-Used to treat, RA-Route of administration, T-Tree, L-Leaf, Br-Bark, F-Fresh, D-Dry, Ex-External, O-Oral, Na-Nasal, Er-Ear, B-Both, An-Animal, Hu-Humans, Fl-Flower, Fr-Fruit, WP-Whole plant, Res-Resin, R-Root, Se-Seed, Cl-Climber, St-Stem. CP= Condition of Preparation, Ys=Young shoot, UT-Used to treat, RA-Route of administration, TMC=Total number of medicinal citations, COLL.NO-Collection number (Voucher number). **NB:** All the local Names are in Afaan Oromoo Language

SN	Scientific Names/Family/Local Names	HBT	PU	UT	CP	RA	TMC	Disease treated	Preparation and Application	Coll. No.
1	<i>Acacia abyssinica</i>	T	L/Ys	B	F	Ex	2	Snake blotting	Fresh leaf is pounded together with <i>Cynodon dactylon</i> and spited on the body.	ZK038
	<b>Fabaceae</b>					O/Ex		Anthrax	Concoction of young leaves together with <i>Cynodon dactylon</i> in water solution is taken orally as well as sprayed externally on the body of the patient.	
	<b>Laaftoo</b>									
2	<i>Achranthes aspera</i>	H	Wp	An	F/D	O/Na/Er	1	Anthrax	Leaf concoction together with <i>Teclea nobilis</i> , <i>Vernonia amygdalina</i> , <i>Croton macrostachyus</i> and <i>Justicia schimperiana</i> is given to cattle.	ZK039
	<b>Amaranthaceae</b>									
	<b>Darguu</b>									
3	<i>Acmella caulirhiza</i>	H	Wp	Hu	F	Ex	2	Poisoning	Leaf is pounded and applied to the body.	ZK047
	<b>Asteraceae</b>							Eye disease	Leaf is chewed and spited into the affected eye.	
	<b>Gutichaa</b>							Snake bite	Leaf is chewed and Swallowed.	
4	<i>Ageratum conyzoides</i>	H/Sh	Wp	Hu			1	Mitch/Fever	Aqueous extract of the plant is applied externally to the body	ZK089
	<b>Asteraceae</b>									
	<b>Qoricha michii</b>									
5	<i>Ajuga integrifolia</i>	H	Wp	Hu	F	O/Ex	2	BIDUU/RISAA	Leaf is crushed together with that of <i>J.schimperiana</i> , <i>C. macrostachyus</i> , and <i>S.abyssinica</i> . The water solution of the ingredient is used to wash the body of the patient repeatedly untill the pain relieves.	ZK002
	<b>Lamiaceae</b>							Stomach ache	Leaf extract together with that of <i>Vernonia amygdalina</i> is drunk.	
	<b>Armaguusaa</b>									
6	<i>Alchemilla pedata</i>	H	Wp	Hu		Ex	1	Wound	Leaf is smashed and put on the affected part of the body	ZK081
	<b>Rosaceae</b>									
	<b>Gurra hantuutaa</b>									
7	<i>Allium sativum</i>	H	Wp	Hu	F/D	O/Ex	34	Evil eye	Root bulb is added to that of <i>Caparis tomentosa</i> , <i>Carisa edulis</i> , and <i>Ruta chalepensis</i> , dried and pounded then smoked to the patient.	ZK003
	<b>Alliaceae</b>							QURUMBAA	Root bulb is chewed and swallowed.	
	<b>Qullubbii adii</b>							Blotting	Root bulb is crushed together with seeds of <i>Ricinus communis</i> in the presence of spices and given to cattle.	
								Stomach ache	concoction with other spices is eaten or drunk as a soup.	
								Asthma	Root bulb is pounded together <i>Ruta chalepensis</i> , and <i>Nigella sativa</i> , mixed with honey and eaten each morning.	
								Leeches	Root is pounded together with <i>Nicotiana tabacum</i> , <i>Ocimum lamiifolium</i> , and <i>Capsicum annum</i> and given to cattle.	
								Malaria	Bulb is pounded and drunk as soup.	
8	<i>Allophylus abyssinicus</i>	T	L	Hu	F	O	1	Snake bite	Leaf is pounded and drunk.	ZK004
	<b>Sapindaceae</b>									
	<b>Sarara</b>									
9	<i>Amaranthus caudatus</i>	H	Wp	B	F/D	O	2	Diarrhea	Leaf and flower are crushed together with leaf of <i>Leucas martinicensis</i> and given to cattle.	ZK007
	<b>Amarantaceae</b>									

	<b>Iyyaasuu</b>									
10	<i>Apodytes dimidiata</i>	T	L	B	F	O	1	cattle disease	Leaf is crushed together with root of <i>Thalictrum rhynchocarpum</i> and <i>Cucumis dipsaceus</i> and drunk.	ZK243
	<b>Icacinaceae</b>							Parasites		
	<b>Calalaqaa</b>									
11	<i>Artemisia abyssinica</i>	Sh	L/Fl	Hu	F/D	Ex	2	Evil eye	Leaf is added to root of <i>Clausena anisata</i> , <i>Allium sativum</i> , and <i>Ruta chalepensis</i> and smoked to the patient.	ZK254
	<b>Astraceae</b>									
	<b>Aritaa Jaldeessaa</b>									
12	<i>Artemisia afra</i>	Sh	Wp	Hu	F/D	O/Ex	3	Mitch/Fever	Decoction of the plant is drunk following severe headache and fever. The water solution is applied externally to the whole body.	ZK008
	<b>Asteraceae</b>									
	<b>Aritaa faranjii</b>									
13	<i>Asparagus africanus</i> ( <b>Asparagaceae</b> )	Sh	Wp	B	F/D	O/Ex	9	Rabies	Root is pounded together with that of <i>Phytolacca dodecandra</i> and drunk by humans. Porridge of red teff is an antidote.	ZK012
14	<i>Asparagus racemosus</i> ( <b>Asparagaceae</b> )	Sh	Wp	An			9	Diarrhea	Leaf is pounded together with <i>Clematis simensis</i> and <i>Osyris quadripartita</i> and given to cattle.	ZK114
15	<i>Asparagus setaces</i> ( <b>Asparagaceae</b> )	Sh	Wp	B			9	Snake bite	Root is pounded together with that of <i>J. schimperiana</i> , <i>R. communis</i> , <i>Calpurnia aurea</i> , <i>Senna obtusifolia</i> (L), and <i>Pterolobium stellatum</i> and drunk.	ZK135
	<b>Sariitii</b>							Eczema	Dried leaf powder is applied with butter.	
16	<i>Bersama abyssinica</i>	Sh/T	L	B	F/D	O	3	Pest control	Young leaf of <i>Bersama abyssinica</i> is put in the living hole of rodents so that over usage of the shoot kills particularly rats.	ZK021
	<b>Melanthaceae</b>							Ascariasis	Young leaf of <i>Bersama abyssinica</i> is crushed and given to humans to expell intestinal parasites.	
	<b>Lolchisa</b>							Jaundice	Fresh or dried powder of the leaf applied with butter.	
17	<i>Bidens pilosa</i>	H	L	Hu	F	Ex	2	Poisoning	Leaf is crushed and put on the affected part of the body.	ZK037
	<b>Asteraceae</b>									
	<b>Q/marzii</b>									
18	<i>Bothriocline schimper</i>	Sh	Wp	Hu	F	Ex/Na	1	Mitch/Fever	Aqueous extract of the plant is applied externally to the body and also internally through the nasal cavity.	ZK013
	<b>Asteraceae</b>									
	<b>Q/dhayichaa</b>									
19	<i>Brassica carinata</i>	H	Se	Hu	D	Ex	1	Fire burn	Roasted seeds pounded and applied to the affected part of the body	ZK014
	<b>Brassicaceae</b>									
	<b>Sagnii raafuu</b>									
20	<i>Brassica nigra</i>	H		Hu			1		Pounded seeds prepared into soup and used as anti nausea	ZK018
	<b>Brassicaceae</b>									
	<b>Macaafata</b>	H	Se			O/Na				
21	<i>Brucea antidysenterica</i>	Sh	L/Fr	B	F/D	O/Na/Ex	15	Anthrax	Concoction of leaf from <i>B. antidysenterica</i> , <i>Salix subserrata</i> together with the root of <i>Staphania abyssinica</i> is drunk.	ZK198
	<b>Simaroubaceae</b>							Body warts	Seed and leaf are crushed together homogenized in water and use as a washing agent.	
	<b>Qabanyoo</b>							Enczema	Dry seeds are pounded and applied with butter.	
								Stomach ache	Seeds and leaves are crushed together, mixed with water, decanted and drunk with honey.	
								Gonorrhea	Leaf and seeds are crushed together, mixed with water, decanted and drunk. Dossage varies accordingly.	
								Rabies	Leaf of <i>B. antidysenterica</i> and <i>Justicia schimperiana</i> are crushed together and the water solution is drunk. Dossage varies	

									according to age and sex.		
22	<i>Buddleja polystachya</i>	T	L/Fl	Hu	F	Ex/O	2	Biduu	Leaf of B.polystachya together with leaf of Discopodium penninervium and Rhmnus prinodes are crushed together and soaked in water then used as washing agent for the body of the patient.	ZK137	
	<b>Buddlejaceae</b>										
	<b>Qawwisa</b>										
23	<i>Callistemon citrinus</i>	T	L	Hu	F		1		Concoction from leaf infusion is used as a washing agent for the body of the patient.	ZK019	
	<b>Myrtaceae</b>										
	<b>Bottle brush(Eng)</b>							Mitch/Fever			
24	<i>Calpurnia aurea</i>	Sh	Wp/Fr	B	F	O/Ex	10	Poisoning	Concoction of young leaves from C.aurea, Glycine wightii, Rhmnus prinoides, Croton macrostachyus, Ethulia gracilis and Mattenus species is applied on the wound.	ZK009	
	<b>Fabaceae</b>							Evil eye	Root of C.aurea together with that of Caparis tomentosa and bark of Schiffera abyssinica are dried together , pounded then smoked to the patient as fumigant against evil eye.		
	<b>Ceekaa</b>							Diarrhea	Young shoot together with root of Plantago lanceolata are pounded together, homogenized in water, decanted then drunk with honey.		
								Snake bite	Leaf of C.aurea and Jasminum grandiflorum are crushed together and drunk.		
								Leeches	Young leaves of C.aurea, Croton macrostachyus, Vernonia amygdalina, Premna schimperiana and Nicotiana glauca are crushed together homogenized in water then administered through oral and nasal.		
								Horse disease	Leaf of C.aurea, J.schimperiana and Asparagus species are crushed together and the ingredient is administered through left ear and left nose.		
								Anthrax	The same as horse disease		
								Poisoning	Bark of Calpurnia aurea and Cucumis ficifolius are dried and pounded together then the powder is applied on the wound.		
25	<i>Caparis tomentosa</i>	Cl/Sh	Rb	Hu	D	Ex	8	Evil eye	Root bark of Caparis tomentosa, Carisa edulis, Allium sativum and Ruta chalepensis seed are dried and pounded together then smoked to the patient.	ZK133	
	<b>Capparidaceae</b>							Tooth ache	Bark of Caparis tomentosa together with leaf of Premna schimperiana and Croton macrostachyus are crushed together and put on the affected tooth.		
	<b>Arangama guracha</b>							DINGATAGNA	Root of Caparis tomentosa together with leaves of Croton macrostachyus, Ricinus communis and Justicia schimperiana are mixed together and the ingredient is decanted and drunk.		
26	<i>Capsicum species</i>	H	Fr	B	D/F	O/Ex	3	Anthrax	Powdered fruit of Capsicum species is added to concoction from Croton macrostachyus (L,Br), Brucea antidysenterica (L, Se), root of Rumex abyssinica, Cucumis ficifolius root then drunk for humans and it also administered through left ear and left nose in cattle.	ZK022	
	<b>Solanaceae</b>							Thicks	Powdered fruit is soaked in water and applied externally on the body of the affected animal.		
	<b>Barbaree</b>							Stomach ache	Concoction with spices such as Zingiber officinale and Nigella sativa is drunk as soup as anti nausea.		
27	<i>Carisa spinarium</i>	Sh	R	Hu	D	Ex	12	Evil eye	Root together with Caparis tomentosa in the presence of garlic are	ZK040	

									dried together and smoked to the patient.	
	<b>Apocynaceae</b>							Evil sprit	Root of Carisa edulis and Caparis tomentosa are dried and pounded together and smoked to the patient.	
	<b>Agamsa</b>									
28	<i>Caylusea abyssinica</i>	H	Wp	Hu	F	O	2	Gastritis	Leaf is boiled and eaten with roasted powdered barley seeds	ZK024
	<b>Resedaceae</b>									
29	<i>Centella asiatica</i>	Hb	L	Hu	F	Ex	10	Poisonig and wound	Fresh leaf is crushed and tied on the wound.	ZK245
	<b>Umbelliferae/Apiaceae</b>									
	<b>Q/marzii</b>									
30	<i>Citrus limon</i>	Sh	Fr	B	F	EX/O	3	Hen disease	Juice from the fruit is squeezed into the mouth of the hen.	ZK025
	<b>Rutaceae</b>							Diarrhea	Juice is drunk with pounded young leaf of Cordia africana	
	<b>Loomii</b>							Ring worm	The affected part of the body is wipped with lemon juice.	
31	<i>Clausena anisata</i>	Sh	Wp	Hu	F	Ex	1	Tumor	Butterpaste of fresh stem is heated on fire and put on the swollen part of the tumor.	ZK010
	<b>Rutaceae</b>							Evil eye	Root is mixed with Allium sativum, Artemisia abyssinica and Ruta chalepensis leaves then dried then smoked to the patiet.	
	<b>Ulumaa</b>									
32	<i>Clematis simensis</i>	Li	L	B	F/D	Ex/O	10	Diarrhea	Leaves of C.simensis, Osyris quadripartita and Asparagus species are mixed and dried together and the water solution is given to cattle.	ZK023
	<b>Ranunculaceae</b>							Jaundice	Dried powder of the above concoction for diarrhea is mixed with butter and pasted on the wound around nasal and face of the patient in humans.	
	<b>Hida Fiitii</b>							Evil eye	Root bark is mixed with Carisa edulis and Caparis tomentosa then the dried mixture is smoked to the patient.	
								Rabies	Crushed leaf of C.simensis is mixed with latex of Tacazzea conferta and Euphorbia abyssinica and given to the affected animal with milk taking care of the dossage.	
								Tooth ache	Bark of Schefflera abyssinica and leaf of Clematis simensis are crushed together and put on the affected tooth.	
33	<i>Clerodendrum myricoides</i>	Sh	Rt	B	F/D	Ex/O	6	Rabies	Root together that of Justicia schimperiana are crushed together and its water solution is poured into left ear and left noistrill of cattle	ZK094
	<b>Lamiaceae</b>							Tumor	Butter paste of fresh stem is heated on fire and put on the tumor.	
	<b>Marasisaa</b>							Snake bite	Leaf together with that of Medicago polymorpha are crushed together and the water solution is drunk.	
								Poisoning	Leaf together with that of Indigofera arrecta are crushed together and tied on the wound.	
34	<i>Coffea arabica</i>	Sh	Se	Hu	D	O	3	Head ache	Roasted seed is crushed and drunk following cough and fever.	ZK027
	<b>Rubiaceae</b>							Bleeding	Powdered seed is sprinkled on the bleeding part of the body following mechanical injury.	
	<b>Buna</b>									
35	<i>Cordia africana</i>	T	Fr/Br	Hu	F	O	5	Parasites	Fruitis eaten to expell internal parasites in children.	ZK028
	<b>Boragnaceae</b>							Diarrhea	Bark is crushed, homogenized in water and drunk.	
	<b>Wadeessa</b>							Stomach ache	Leaf of C.africana, Rumex nepalensis, Reuta chalepensis in the presence of garlic are crushed together homogenized in watersolution of salt and drunk.	
36	<i>Crepis achyrophoroides</i>	H	R	Hu	F	O	3	Stomach ache	Root is chewed with salt and swallowed.	ZK029

	<i>Asteraceae</i>									
	<b>Q/ciniinnaa</b>									
37	<i>Croton macrostachyus</i>	T	WP	B	F/D	O/Ex	45	Anthrax	The same as description given to Brucea antidysentrica	ZK011
	<i>Euphorbiaceae</i>							Poisoning	The same as C alpurmia aurea.	
	<b>Bakaniisa</b>							Jaundice	Dry bark is poudered mixed with latex from its young twings and applied to the wound.	
								Biduu	Leaves of Croton macrostachyus, Justicia shimperiana, Ajuga integrifolia and Staphania abyssinica are pounded together homogenized in water and used to bath the body of the patient.	
								QURUMBAA	Leaf together with the leaf of Teclea nobilis in the presence of garlic are crushed together and given to cattle.	
								Stomachache	Bark is crushed into powder, homogenized in water solution of salt and drunk.	
								STI in males	Dry bark is powdered and mixed with Guizotia abyssinica and drunk with salt.	
								Mitch/Fever	Leaf infusion is used to wipe the affected part of the body.	
								Wound	Dry leaf is powdered and sprinkled on the wound.	
								Leeches	Leaves of together with leaves of Buddlejia polystachya and Verbascum sinaiticum are pounded together homogenized in water and given to cattle to expell leeches.	
38	<i>Cucumis dispacous</i>	Li	Fr	Hu	F	Ex.	2	Ringworm	Fresh fruit is roasted in fire and the jelly internal part is applied to the affected body.	ZK030
	<i>Cucurbitaceae</i>									
	<b>Buqee seexanaa</b>									
39	<i>Cucumis ficifolius</i>	Li	R	Hu	F/D	O/Ex	30	Stomachache	Root is pounded, homogenized in water, decanted then drunk with butter.	ZK031
	<i>Cucurbitaceae</i>							Anthrax	The same as Brucea antidysentrica.	
	<b>Hidii hooloo</b>							Biduu	Root of C.ficifolius together with bark of Osyris quadripartita and Pittosporum viridiflorum are crushed together, homogenized in water and drunk.	
								QURUMBAA	Root is chewed and swallowed.	
								Rabies	Root together with that of Euphorbia dumalis are crushed together, homogenized in water decanted then drunk with honey.	
								Worm infestation	Concoction of the root with leaves of Teclea nobilis and Brucea antidysentrica is used as a washing agent for the affected body of animals.	
								Toothache	Root of Cucumis ficifolius is chewed and kept between tooth for few minutes.	
								Poisoning of foot(Xafaa)	Root of Cucumis ficifolius is chewed and kept between toes for few minutes.	
40	<i>Cucurbita pepo</i>	Li	Fr/Se	Hu		Or	2	Stomachache	Seeds eaten with empty stomach	ZK032
	<i>Cucurbitaceae</i>									
	<b>Buqee</b>									
41	<i>Cupressus lusitanica</i>	T	L	Hu	F	EX/O	3		Young shoots together with that of Croton macrostachyus, Justicia schimperiana Asparagus species, Rumex nepalensis and Rhmnus prinoides are prepared through concoction by crushing and homogenized in water then used as washing agent for the body of the patient. Small dossage is also taken orally.	ZK035
	<i>Cupressaceae</i>							BIduu		
	<b>Gaatira faranjii</b>									
42	<i>Cyathula cylindrica(Amaranthaceae)</i>	H	L	B	F	Ex/O	3	Anthrax	Concoction of C.cylindrica, Teclea nobilis, Vernonia amygdalina,	ZK041



									Croton macrostachyus and Justicia shimperiana leaves by crushing and soaking in water is orally taken by humans in small dosage but administered through left ear and left nose for horses.	
43	<i>Cyathula unculata (Amaranthaceae)</i>	H		An			3	BIDUU	Leaf infusion together from Oteostegia integrifolia and Rhmnus prinoides is used as washing agent for the body of the patient then small dosage is drunk orally.	ZK042
	<b>Darguu</b>							Poisoning	Leaf is crushed between hands and the liquid exudate is applied to the wound.	
44	<i>Cymbopogon caesius</i>	H	WP	Hu	F/D	Ex/O	1	Stomachache	Leaf infusion together with Ruta chalepensis is mixed with garlic and drunk.	ZK048
	<b>Poaceae</b>							Malaria	Water soaked mixture of C.citracus, Ruta chalepensis and Croton macrostachyus in the presence of garlic is consumed.	
	<b>Xajisaara</b>							Thyphoide fever	The same as malaria.	
45	<i>Cynodon dactylon</i>	H	WP	B	F	Ex/O	1	Snake poison	Fresh leaf is pounded together with that of Acacia abyssinica in water solution is taken orally as well as sprayed on the body of the patient.	ZK054
	<b>Poaceae</b>							Anthrax	Fresh leaf is pounded together with that of Acacia abyssinica in water solution is taken orally as well as sprayed on the body of the patient.	
	<b>Coqorsa</b>									
46	<i>Cynoglossum amplifolium</i>	H	L	Hu	F	Ex/Na	2	Mitch/Fever	Leaf is smashed and the liquid applied to the body	ZK057
	<b>Boraginaceae</b>								Leaf extract is taken through the nasal cavity	
	<b>Q/michii</b>									
47	<i>Cynoglossum coeruleum</i>	H	L	Hu	F	Ex/Na	3	Mitch/Fever	Leaf is smashed and the liquid applied to the body	ZK195
	<b>Boraginaceae</b>								Leaf extract is taken through the nasal cavity	
	<b>Q/michii</b>									
48	<i>Cyphostema adenocaula</i>	Li	WP	An	F	O	1	Horse disease	Pounded soaked in water and given to horse with NAQATTO	ZK063
	<b>Vitaceae</b>									
	<b>Hidda dololaa</b>									
49	<i>Datura stramonium</i>	H	R/Se	B	F/D	Ex/o	2	Toothache	Butter paste of the seed is soaked in boiling water and the steam is released to the affected teeth through a pipe.	ZK058
	<b>Solanaceae</b>							Poisoning	Leaf together with leaf of Carisa edulis, Calpurnia aurea, Guizotia scabra and Brucea antidysentrica are crushed together and tied on the wound.	
	<b>Manjii/Asangira</b>							Evil eye	Root of Datura stramonium together with that of Carisa edulis are dried together crushed into fine then smoked to the patient.	
50	<i>Dicrocephala integrifolia</i>	H	L	Hu	F	Ex	4	Poisoning	Fresh leaf is crushed and tied on the wound.	ZK082
	<b>Asteraceae</b>									
	<b>Q/marzii</b>									
51	<i>Discopodium penninervium</i>	Sh	L/Fr	Hu	F	O/Ex	4	BIDUU	Leaves together with leaves of Buddlejia polystacha and Rhmnus prinoides are crushed and soaked in water then used as a washing agent for the body of the patient.	ZK059
	<b>Solanaceae</b>							Gonorrhoea	Leaf together with leaves of Brucea antidysentrica, Oteostegia integrifolia and root of Staphania abyssinica are crushed together, soaked in water, decanted and drunk with honey.	
	<b>Coongii</b>							QURUMBAA	The same as for Gonorrhoea.	
52	<i>Dodonea angustifolia</i>	Sh	L	Hu/An	F	Ex	2	Bone fracture	Fresh leaf togetherwith splited stem of Arundo donax or Arundinaria alpiina is used to tie and assemble the broken bone to be kept at its original position until it revived.	ZK244
	<b>Sapindaceae</b>									
	<b>Ittacha</b>									

53	<i>Dovyalis abyssinica</i>	Sh	Fr	Hu	F	O	3	Parasites	Fruit is eaten to expel intestinal parasites.	ZK132		
	<b>Flacourtiaceae</b>											
	<b>Koshomii</b>											
54	<i>Dovyalis verrucosa</i>	Sh		Hu			2		Fruit is eaten to expel intestinal parasites.	ZK168		
	<b>Flacourtiaceae</b>											
	<b>Mixmixaa</b>											
55	<i>Dregea schimperi</i>	Li	Br	B	F	O/Ex	1	Rabies	Bark is crushed homogenized in water and given to the affected animal.	ZK111		
	<b>Asclepiadaceae</b>											
	<b>Hidda goor'isaa</b>											
56	<i>Echinops kebericho</i>	Sh	R	B	F/D	O/Ex	3	Evil eye Headache	The same as <i>Carisa edulis</i> and <i>Caparis tomentosa</i> .	ZK060		
	<b>Asteraceae</b>								Dry root is smoked to the patient.			
	<b>Qabarichoo</b>							Parasites	Root is pounded together with leaf of <i>Vernonia amygdalina</i> and given to cattle as feed.			
57	<i>Echnops papii</i>	Sh	R	B	D	Ex	1	Erythroblastosis Stomachache	The same as <i>Eleusine floccifolia</i> below	ZK036		
	<b>Asteraceae</b>								Root is crushed, soaked in water, decanted then drunk with salt or honey.			
	<b>Kosoruu daalattii/Qoree Shokolee</b>											
58	<i>Eleusine floccifolia</i>	H	R	B	D	Ex	1	Erythroblastosis	Root is mixed together with root of <i>Staphania abyssinica</i> , <i>Solanum anguivi</i> , <i>Kalanchoe petitiiana</i> , and <i>Echinops spinosus</i> and tied on the body.	ZK026		
	<b>Poaceae</b>											
	<b>Cangeedara</b>											
59	<i>Embelia schimperi</i>	Sh	Fr	Hu	F	O	2	Intestinal parasites	Fruit is pounded, soaked in water, decanted and drunk empty stomach.	ZK061		
	<b>Myrsinaceae</b>											
	<b>Haanquu</b>											
60	<i>Enset ventricosum</i>	H	L/Rh	An	F	O	3	Retained placenta Syphilis/Gonorrhoea	Leaf and rhizome are pounded together and given to cattle. It also pumped into the reproductive organ of the female animal.	ZK062		
	<b>Musaceae</b>											
	<b>Warqee</b>											
61	<i>Erythrina brucei</i>	T	R	B	F/D	O/Na/Er	1	Horse disease	Root together with root of <i>Staphania abyssinica</i> , <i>Juniperus procera</i> and <i>Verbascum sinaiticum</i> are pounded together, soaked in water and administered taking care of dosage.	ZK139		
	<b>Fabaceae</b>											
	<b>Waleensuu</b>											
62	<i>Ethulia gracilis</i>	Sh	L	Hu	F	Ex	3	Poisoning	Concoction of young leaves from <i>C.aurea</i> , <i>Glycine wightii</i> , <i>Rhmnus prinoides</i> , <i>Croton macrostachyus</i> , <i>Ethulia gracilis</i> and <i>Mattenus</i> species is applied on the wound.	ZK064		
	<b>Asteraceae</b>											
	<b>Tamsaasa</b>											
63	<i>Eucalyptus globulus</i>	T	L	Hu	F	Ex/O	2	Mitch/Fever	Leaf infusion together with that of <i>Oenanthe palutris</i> is boiled and the steam is smoked to the patient under highly sealed clothes so that no air circulates under the cloth during steam treatment.	ZK052		
	<b>Myrtaceae</b>							Mitch/Fever	Concoction from leaf infusion of <i>E.globulus</i> , <i>Phycnostachyus abyssinica</i> , <i>Salvia nilotica</i> , <i>Leonotis raineriana</i> , <i>Leucas martinicensis</i> , <i>Ocimum lamiifolium</i> and <i>Oenanthe parustris</i> mixture is used as a washing agent for the body of the patient.			
	<b>Baargamoo</b>											
64	<i>Euclea divinorum</i>	Sh	R	B	F	Ex	1	Eye disease	Root is chewed and spited into the eye of cattle or on the affected part of the body.	ZK045		
	<b>Ebenaceae</b>											
	<b>Mi'eessaa</b>											
65	<i>Euphorbia abyssinica</i>	T	Lt	B	F/D	O/Ex	3	Jaundice	Latex is mixed with powdered leaf of <i>Clematis simensis</i> and applied to the wound/affected part of the body/.	ZK065		
	<b>Euphorbiaceae</b>							BIDUU	Latex is mixed with flour of red <i>Erogratis teff</i> , baked then eaten with butter.			
	<b>Adaamii</b>							Stomachache	The same as BIDUU.			
								Intestinal parasites	The same as BIDUU.			

66	<i>Ficus sur</i>	T	Lt	Hu	F	Ex	1	Ring worm	The milky exudate is directly applied to the affected part of the body particularly head in children.	ZK104
	<b>Moraceae</b>							Control of fertility	Plant ectoparasite on <i>Ficus sur</i> is pounded soaked in water, decanted and drunk in small dosage by females. However, it is not recommended specially for individuals who have not yet predicted their family size since it totally leads to sterility.	
	<b>Haarbuu</b>									
67	<i>Foeniculum vulgare</i>	H	WP	B	F	O/Ex	2	Stomachache	Concoction from <i>F. vulgare</i> , <i>Nigella sativa</i> , <i>Zingiber officinale</i> , <i>Ruta chalepensis</i> in the presence of garlic is used as a good remedy when eaten or drunk as soup.	ZK142
	<b>Apiaceae</b>									
	<b>Insilaalee</b>									
68	<i>Galineria saxifraga</i>	Sh	L	Hu	F/D	Ex	3	Jaundice	Dry or fresh leaf together with that of <i>Clematis simensis</i> , <i>Justicia schimperiana</i> , <i>Asparagus species</i> , <i>Osyris quadripartita</i> and <i>Ranunculus multifidus</i> are powdered, mixed with butter and applied to the wound or affected part of the body.	ZK066
	<b>Rubiaceae</b>									
	<b>Buniitii</b>									
69	<i>Girardinia bulbosa</i>	H	R	B	F	O/Ex	5	Retained placenta	Root is pounded, homogenized in water and drunk with salt for animals and with honey for humans.	ZK067
	<b>Urticaceae</b>							Horse disease	Root together with root of <i>Justicia schimperiana</i> are crushed together and given to horses.	
	<b>Doobii</b>							Tumor	Root is finely pounded then the solid part is tied on the tumorous body and the liquid part is drunk with salt.	
70	<i>Glycine wightii</i>	Li	L/Fr	Hu	F/D	O/Ex	3	Poisoning	Concoction from the leaves of <i>G. wightii</i> , <i>Calpurnia aurea</i> , <i>Rhmnus prinoides</i> young shoot, <i>Croton macrostachyus</i> young shoot, <i>Ethulia gracilis</i> young shoot, and <i>Matenus species</i> is applied on the affected part of the body.	ZK216
	<b>Fabaceae</b>							Enczema	Flower of <i>G. wightii</i> , <i>Linum usitatissimum</i> and <i>Medicago polymorpha</i> are dried and powdered together and spoon full of the powder is homogenized in water and drunk. The powder is also sprinkled on the affected part of the body.	
	<b>Hidda hantuutaa</b>									
71	<i>Grewia ferruginea</i>	Sh	L/Br	An	F	O	3	Retained placenta	Leaf and bark are crushed together and given to cattle.	ZK235
	<b>Tiliaceae</b>									
	<b>Dhohonuu</b>									
72	<i>Guizotia scabra</i>	H	R	Hu	D	Ex	8	Poisoning	Root together with root and leaf of <i>Carisa edulis</i> and <i>Calpurnia aurea</i> are dried, crushed and made into powder then applied to the affected part of the body.	ZK151
	<b>Asteraceae</b>									
	<b>Adaa/Tuufoo</b>									
73	<i>Guizotia abyssinica</i>	H	Se	Hu	D	O	8	Stomachache	Fried seeds are finely pounded and added as an ingredient to any concoction from medicinal plants to treat stomachache, diarrhea and gonorrhea.	ZK055
	<b>Asteraceae</b>							Diarrhea	Fried seeds are finely pounded and added as an ingredient to any concoction from medicinal plants to treat stomachache, diarrhea and gonorrhea.	
	<b>Nuugii</b>							Gonorrhea	Fried seeds are finely pounded and added as an ingredient to any concoction from medicinal plants to treat stomachache, diarrhea and gonorrhea.	
								Cough	Fried seeds are finely pounded, boiled and drunk with honey, salt or sugar as soup.	
74	<i>Heracleum abyssinicum</i>	H	R	B	F	O	3	Stomachache	Root is chewed and swallowed with salt.	ZK117
	<b>Apiaceae</b>							QURUMBAA	Root is pounded and given to cattle. Leaf is smashed fresh into fine powder mixed with butter and put on head for humans	
	<b>Ululee</b>							Diarrhea	Root is pounded together with root of <i>Thalictrum rhyncocarpum</i>	

									and given to cattle.	
75	<i>Hygrophila shulli</i>	H	L	Hu	F	Ex	5	Poisoning	Leaf is crushed and tied on the affected part of the body.	ZK046
	<b>Acanthaceae</b>							Wound		
	<b>Kachoo</b>								The same as poisoning.	
76	<i>Hypericum quartinianum</i>	Sh	L	B	F	O	1	Anthrax	Leaf together with leaf and seed of Croton macrostachyus and Brucea antidysenterica are crushed together homogenized in water and given to humans and cattle taking note of dosage.	ZK150
	<b>Hypericaceae</b>									
	<b>Ulee foonii</b>									
77	<i>Impatiens rothii</i>	H	R	An	F	O	5	Retained Urine	Root is pounded and given to cattle with salt.	ZK068
	<b>Balsamiaceae</b>							Tonsil	Young leaf is chewed and swallowed	
	<b>Burii</b>							QURUMBAA	The same as for retained urine.	
								Stomach problems	The same as for QURUMBAA.	
								Diarrhea	Root together with root of Asparagus species and Loranthes species from Croton macrostachyus are pounded together and given to animals.	
78	<i>Indigofera arrecta</i>	Sh	L	Hu	F/D	Ex	3	Poisoning	Leaf of I.arrecta and Clerodendrum myricoides are crushed together and applied to the affected part of the body either fresh or in the form of dry powder with butter.	ZK069
	<b>Fabaceae</b>									
	<b>Q/marzii</b>									
79	<i>Jasminum grandiflorum</i>	Sh	L	B	F	Ex/O	2	Snake bite	Leaf of J.grandiflorum and Calpurnia aurea are pounded together homogenized in water and drunk immediately following snake bite.	ZK051
	<b>Oleaceae</b>							Eye disease	Leaf is chewed and spited into the eye of cattle.	
	<b>Qamaxee</b>							Poisoning	Fresh leaf is smashed between hands and tied on the affected part of the body.	
80	<i>Juniperus procera</i>	T	L/R	Hu	F	Ex/O	3	BIDUU	Young shoots together with that of Croton macrostachyus, Justicia schimperiana Asparagus species, Rumex nepalensis and Rhmnus prinoides are prepared through concoction by crushing and homogenized in water then used as washing agent for the body of the patient. Small dosage is also taken orally.	ZK125
	<b>Cupressaceae</b>									
	<b>Gaatiraa habashaa</b>									
81	<i>Justicia shimperiana</i>	Sh	R/L/	B	F/D	Ex/O/Na	25	Rabies	Root together with roots of Clerodondrum myricoides, Staphania abyssinica and Tacazzea conferta are prepared by concoction and drunk with milk.	ZK043
	<b>Acanthaceae</b>								<b>Animals:</b> The above concoction is administered through left ear and left nostril.	
	<b>Dhumuugaa</b>								<b>Dogs:</b> Powder from the concoction is mixed with red teff baked and given to them with milk.	
									<b>Humans:</b> The concoction is homogenized with milky exudate from T.conferta and cow milk and drunk.	
								Cattle disease	The same as Croton macrostachyus.	
								Bloating in cattle	Leaf of J.schiperiana and Vernonia amygdalina are pounded together and given to cattle with salt.	
								Snake bite	Roots of J.shimperiana and Racinus comunis together with leaves from Ximenia americana, Pterolobium stellatum, Senna obtusifolia and Calpurnia aurea are crushed together, homogenized in water and drunk.	
								Horse Disease	Leaf of J.schimperiana together with that of Calpurnia aurea and Asparagus species are pounded together and the water solution is administered through oral, left nostril and left ear.	
								Evil sprit	Leaf infusion together withleaves of Eucalptus globulus, Tagetes	

									minuta and Ocimum lamiifolium are used to wash the body of the patient and small dosage is taken through oral and nasal.	
								QURUMBAA	The same as cucumis ficifolius.	
								Dingatagya	The same as cucumis ficifolius.	
								Poisoning(xafaa)	The same as Croton macrostachyus and Cucumis ficifolius.	
								Stomachache	Root together with roots of Rumex nepalensis are chewed and swallowed with salt.	
								Jaundice	Leaves together with leaves of Clematis simensis, Asparagus species, Osyris quadripartita, Galinaria saxifraga and Rununculus multifidus are pounded together and applied to the affected part of the body with butter.	
								Anthrax	Leaves together with that of Vernonia amygdalina, Racinus communis and root of Phytolacca dodecandra are pounded together, dried then the mixture homogenized in water and drunk taking care of dosage for humans and animals.	
82	<i>Kalanchoe species</i>	H	R	Hu	F/D	Ex/O	5	Erythroblastosis	The root is mixed together with root of Stephania abyssinica Solanum anguivi, Kalanchoe petitiiana, and Echinops spinosus and tied on the body.	ZK177
	<b>Crassulaceae</b>							Stomachache	Root is chewed and swallowed with salt.	
	<b>Bosoqee</b>							Eye disease	Root together with roots of Urera hypselodendron are pounded together and applied to the eye of animals.	
								Wound	Root together with that of Plantago lanceolata are crushed together and applied to the wound.	
83	<i>Leucas martinicensis</i>	Sh	L	Hu	F	Ex/O/Na	16	Mitch/Fever	Fresh leaf is smashed between pulms and applied to the body. The liquid part is taken both orally and through nasal in small dosage.	ZK050
	<b>Lamiaceae</b>									
	<b>Bokkolu Adii</b>									
84	<i>Linum usitatissimum</i>	H	Se	Hu	D	O/Ex	6	Constipation	Fried seeds are pounded homogenized in water and drunk.	ZK217
	<b>Linaceae</b>							Stomach problems	Fried seeds are pounded homogenized in water and drunk.	
	<b>Talbaa</b>							Eczema	Concoction of seed and flower of Linum usitatissimum, Glycine wightii and Medicago polymorpha is used as a good remedy. The concoction is prepared in powder form and stored in dry container then spoonful is homogenized in in water and drunk. Externally, is also applied to the affected skin.	
85	<i>Lippia adoensis</i>	Sh	L	Hu	F	Ex/O	4	Ring worm	Leaf is smashed between pulm and applied to the affected part of the body.	ZK006
	<b>Verbanaceae</b>							Cough	Concoction from the Lippia adoensis and other spices is boiled and drunk as soup.	
	<b>Kusaayee</b>							Stomachache	The same as for cough.	
86	<i>Medicago polymorpha</i>	H	L	Hu	F/D	O/Ex	3	Eczema	The same as Linum usitatissimum.	ZK020
	<b>Fabaceae</b>							Snake bite	The whole plant is pounded and the water solution is drunk taking care of the dosage.	
	<b>Gosa siddisaa</b>							DINGATAGNYA	The same as snake bite.	
87	<i>Millittia ferruginea</i>	T	Se	B	F/D	Ex/O	9	Jaundice	Seeds together with seeds of Croton macrostachyus are dried and pounded together and applied to the affected part of the body with butter.	ZK070
	<b>Fabaceae</b>							Leeches	Seeds are sprinkled into water as water purification.	
	<b>Birbirraa</b>							Fish poisoning	Seeds are added to still water where there are abundant fishes for fishing.	



								Control of Jigger flea	Pounded seeds are applied in powdered form.	
88	<i>Myrsine african</i>	Sh	L	Hu	F/D	Ex	1	Poisoning	Leaf is crushed either fresh or dry and applied to the affected part of the body.	ZK098
	<b>Myrsinaceae</b>									
	<b>Qacama</b>									
89	<i>Nicotiana tabacum</i>	H	L/Se	B	F/D	Ex/O	2	Snake bite	Leaf is added to concoction from <i>Calpurnia aurea</i> , <i>Xemenia americana</i> and <i>Jasminum grandiflorum</i> as an ingredient to treat snake bite.	ZK053
	<b>Solanaceae</b>							Leeches	Leaf together with garlic is pounded and given to cattle through oral and nasal to expel leech from the nasal cavity after which the dropped leech under the throat is mechanically removed.	
	<b>Tambo</b>									
90	<i>Nigella sativa</i>	H	Se	B	D	O	3	Asthma	Seeds together with <i>Ruta chalepensis</i> and garlic are pounded together, mixed with honey and stored in sealed container for few days. The mixture is eaten each morning.	ZK071
	<b>Ranunculaceae</b>							Stomachache	Seeds together with <i>Zingiber officinalis</i> and other spices are pounded together and eaten following pain.	
	<b>Abasuuda guraacha</b>									
91	<i>Ocimum lamiifolium</i>	Sh	L	Hu	F	Ex/N/O	22	Mitch/Fever	Fresh leaf is crushed between hands and the liquid part is taken as a sip through nostrills.	ZK115
	<b>Lamiaceae</b>							Fever	Leaf infusion is from mixed <i>O.lamiifolium</i> , <i>Eucalyptus globulus</i> , and <i>Oenthe palustris</i> is used to wash the body of the patient following steam treatment from the same plant material. Small dosage of the infusion is also drunk orally.	
	<b>Ancabbii</b>									
92	<i>Ocimum urticifolium</i>			Hu			17		Leaf infusion is from mixed <i>O.urticifolium</i> , <i>Eucalyptus globulus</i> , and <i>Oenthe palustris</i> is used to wash the body of the patient following steam treatment from the same plant material. Small dosage of the infusion is also drunk orally.	ZK033
	<b>Lamiaceae</b>									
	<b>Ancabbii</b>									
93	<i>Oenanthe palustris</i>	H	L	Hu	F	Ex	1	Fever/Mitch	The same as <i>O.lamiifolium</i> .	ZK124
	<b>Apiaceae</b>									
	<b>Q/lagaa</b>									
94	<i>Olea europaea subspecies caspidata</i>	T/Sh	L/Br/Wp/R	Hu	F	O/Ex	3	Gonorrhea	Bark is pounded soaked in water and used as washing agent for the femal genital immediately before infant delivery.	ZK127
	<b>Oleaceae</b>							Wound	Fresh stem is roasted in fire and the foamy exudate is applied to the wound.	
	<b>Ejersa</b>							Tonsil	Bark and leaf is crushed into fine powder, mixed with juice from fruit of <i>Solanum marginatum</i> and applied into the pharynx.	
95	<i>Oreobanche minor</i>	H	R	Hu	F	Ex	3	Tumor	Root is heated on fire and put on the tumor.	ZK056
	<b>Orobanchaceae</b>									
	<b>Q/xannachaa</b>									
96	<i>Osyris quadripartita</i>	Sh	L	B	F/D	O/Na/Er	4	Horse disease	The same as <i>Clematis simensis</i> and <i>Asparagus</i> species.	ZK096
	<b>Santalaceae</b>							BIDUU	The same as <i>Cucumis ficifolius</i> .	
	<b>Waatoo</b>									
97	<i>Persicaria senegalensis</i>	H	L	An	F	O/Na	3	Heart failur	Leaf is crushed and its water solution is given to cattle both through oral and nasal.	ZK072
	<b>Polygonaceae</b>									
	<b>Q/honnee buutee, Q/arma loonii</b>							Breast wound	Fresh lef is smashed and applied to wounded breast of cow	
98	<i>Phragmanthera macrosolen</i>	Sh	L	An	F	O	3	Horse disease	The same as <i>Lorantes</i> species	ZK073
	<b>Loranthaceae</b>									

	<b>Digalu</b>				F	Ex		BIDUU/RISAA	The same as Loranthes species.	
99	<i>Phytolacca dodecandra</i>	Sh	R/Fr	B	F	O/Ex	24	Rabies	Root together with root of Asparagus species are pounded together and the water solution is drunk with milk according to age and sex. Porridge from red teff is the best antidote.	ZK074
	<b>Phytolacaceae</b>							Anthrax	The same as Cucumis ficifolius.	
	<b>Handoodee</b>							STI/Gonorrhea	Root is pounded and its homogenous mixture in water is drunk with salt.	
								Ring worm	Fruit is pounded and used as a washing powder to the affected body.	
100	<i>Pittosporum viridiflorum</i>	T/Sh	Br/R	Hu	F	O	3	Snake bite	Bark is crushed together with bark of Osyris quadripartita and root of Cucumis ficifolius and drunk taking care of dosage.	ZK205
	<b>Pittosporaceae</b>							BIDUU	Root together with roots of Osyris quadripartita and Cucumis ficifolius are pounded together and drunk with honey.	
	<b>Soolee/Qarxammee</b>							Eczema	Leaf is dried, powdered and applied with butter.	
101	<i>Plantago lanceolata</i>	H	L/R	Hu	F	Ex/O	8	Diarrhea	Root is pounded with leaf of Calpurnia aurea and drunk with honey.	ZK015
	<b>Plantaginaceae</b>							Wound	Fresh leaf is smashed between hands and tied on the wound.	
	<b>Qorxobbii</b>									
102	<i>Plectranthus cylindraceus</i>	H	WP	Hu	F	Ex/O	5	Mitch/Fever	Fresh leaf is crushed between hands and the liquid part is taken as a sip through nostrills.	ZK274
	<b>Lamiaceae</b>									
	<b>Dabasee</b>									
103	<i>Premina shimperi</i>	Sh	L	B	F	Ex	4	Toothache	Leaf is chewed and kept between teeth.	ZK017
	<b>Lamiaceae</b>							Hyena bite	Leaf is crushed and tied on the wound.	
	<b>Urgeessaa</b>							Mitch/Fever	Fresh leaf is crushed between hands and the liquid part is taken as a sip through nostrills.	
104	<i>Prunus africana</i>	T	Br	B	D	Ex/O	5	Wound	Bark is dried, pounded and the powder is applied to the wound with butter.	ZK075
	<b>Rosaceae</b>							Worm infestation	Powdered bark is sprinkled on the affected part of the body of animals.	
	<b>Gurraa/Gura'ee</b>							Horse disease	Bark is pounded homogenized in water and administered through left ear and left nostril of horses.	
105	<i>Pterolobium stellatum</i>	Sh	L	Hu	F	O	1	Snake bite	Roots of J.shimperiana and Racinus comunis together with leaves from Ximenia americana, Pterolobium stellatum, Senna obtusifolia and Calpurnia aurea are crushed together, homogenized in water and drunk.	ZK153
	<b>Fabaceae</b>									
	<b>Arangama diimaa</b>									
106	<i>Pycnostachyus abyssinica</i>	Sh	L	Hu	F	Ex/N	2	Evil sprit	Leaf infusion from P.abysinnica, Ocimum lamiifolium, Leonotis raineriana and Oenthe palutris is used as a washing agent for the body of the patient.	ZK076
	<b>Lamiaceae</b>							Mitch/Fever	Leaf is smashed between pulms and taken through the noistril as a sip.	
	<b>Q/dhayichaa</b>									
107	<i>Ranunculus multifidus</i>	H	L	Hu	F/D	Ex	22	Jaundice	Fresh leaf is crushed and tied on the affected part of the body.	ZK106
	<b>Ranunculaceae</b>								Dried powedr of the leaf is applied with butter to the wound.	
	<b>Q/sinbiraa</b>									
108	<i>Rhamnus prinoides</i>	Sh/T	L	Hu	F/D	Ex/O	10	Poisoning	The same as Croton macrostachyus.	ZK077
	<b>Rhmnaceae</b>							BIDUU/RISAA	Leaf infusion from R.prinoides, Salix subserrata, Acacia species, Cucumis dispasaceus is used to wash the body of the patient.	
	<b>Geeshoo</b>							Tonsil	Young leaf together with that of Maytenus species is chewed and swallowed.	

109	<i>Ricinus communis</i>	Sh	R/Se	B	F	O	7	Anthrax	Root is pounded and the liquid decant is drunk with honey.	ZK121
	<b>Euphorbiaceae</b>							Bloating in cattle	Seed together with seeds of <i>Nigella sativa</i> and garlic are pounded together and given to cattle.	
	<b>Qobboo</b>							Snake bite	Roots of <i>J. shimperiana</i> and <i>Racinus comunis</i> together with leaves from <i>Ximenia americana</i> , <i>Pterolobium stellatum</i> , <i>Senna obtusifolia</i> and <i>Calpurnia aurea</i> are crushed together, homogenized in water and drunk.	
								QURUMBAA	The same as <i>Cucumis ficifolius</i> .	
110	<i>Rosa xrichardii</i>	Sh	R	Hu	F	O	2	Stomachache	Root is chewed and swallowed.	ZK078
	<b>Rosaceae</b>									
	<b>Tsigeredaa/Ililiy/Abaaboo</b>									
111	<i>Rumex abyssinicus</i>	H	R	B	F/D	Ex/O	4	Anthrax	The same as <i>Croton macrostachyus</i> .	ZK101
	<b>Polygonaceae</b>							Ring worm	Root is dried, powdered and applied with butter.	
	<b>Maqmaqoo</b>							BIDUU	Root together with that of <i>Cucumis ficifolius</i> are pounded together and the liquid decant is drunk with honey and butter.	
112	<i>Rumex nepalensis</i>	H	R	Hu	F	O/Ex	19	Stomachache	Root is chewed and swallowed with salt.	ZK001
	<b>Polygonaceae</b>							Abortion	Root is pounded, soaked in water and the homogenous solution is decanted and stored in bottle and drunk.	
	<b>Shuultii</b>							BIDUU	The same as <i>Croton macrostachyus</i> and <i>Justicia shimperiana</i> .	
								Sanke bite	Root is pounded and drunk with salt.	
113	<i>Rumex nervosus</i>	Sh	L/Fr	B	F/D	O/Ex	3	Jaundice	The same as <i>Croton macrostachyus</i> .	ZK079
	<b>Polygonaceae</b>							BIDUU	Leaf of <i>R. nervosus</i> , <i>Loranthus</i> species and <i>Rhmnus prinoides</i> are pounded together with roots of <i>Phytolacca dodecandra</i> and <i>Enset ventricosum</i> then used as a washing agent for the body of the patient.	
	<b>Dhangagoo</b>							Hemorrhoid	Dry powdered leaf is applied with butter. Fresh leaf is smashed between hands and tied on the affected body.	
114	<i>Ruta chalepensis</i>	H	WP	B	F/D	O/Ex	18	Evil eye	The same as <i>Carisa edulis</i> and <i>Caparis tomentosa</i> .	ZK080
	<b>Rutaceae</b>							Stomachache	Concoction from <i>R. chalepensis</i> , <i>Nigella sativa</i> , <i>Zingiber officinalis</i> , <i>Foeniculum vulgare</i> in the presence of garlics consumed as a remedy against stomach problems.	
	<b>Xenaadama</b>							Anthrax	Root is pounded and the liquid decant is drunk with honey	
								Rectal/Vaginal cramp	Leaf infusion is used for washing the affected organ or body parts.	
								Malaria	The same as <i>Allium sativum</i> .	
115	<i>Salvia nilotica</i>	H	L	Hu	F	Ex/O	19	Mitch/Fever	Fresh leaf is crushed between hands and the liquid part is taken as a sip through nostrills.	ZK016
	<b>Lamiaceae</b>									
	<b>Q/michii</b>									
116	<i>Salix subserrata</i>	Sh/T	L	B	F	O	5	Anthrax	Leaf/root together with leaf of <i>Brucea antidysentrica</i> and root of <i>Staphania abyssinica</i> are pounded together and drunk taking care of dosage between humans and animals.	ZK005
	<b>Salicaceae</b>							Rabies	Root of <i>Ssuberrata</i> together with root of <i>Phytolacca dodecandra</i> are pounded together and the liquid decant is drunk with milk.	
	<b>Alaltuu</b>							BIDUU/RISAA	The same as <i>Rhmnus prinoides</i> .	
117	<i>Saturaja paradoxa</i>	H	L	Hu	F	Ex/O	2	Mitch/Fever	Fresh leaf is crushed between hands and the liquid part is taken as a sip through nostrills.	ZK103
	<b>Lamiaceae</b>									
	<b>Duufaa loonii</b>									

118	<i>Saturaja abyssinica</i>	H	WP	Hu	F	Ex/O	10	Mitch/Fever	Fresh leaf is crushed between hands and the liquid part is taken as a sip through nostrills.	ZK083	
	<b>Lamiaceae</b>										
	<b>Q/michii</b>										
119	<i>Scadoxus multiflorus</i>	H	R	Hu	F	Ex	1	Tumor	Bulb is heated on fire and put on the affected body	ZK084	
	<b>Amaryllidaceae</b>										
	<b>Arfaasee</b>										
120	<i>Schefflera abyssinica</i>	T	R/Br	Hu	D	Ex	2	Evel eye	The same as <i>Caparis tomentosa</i> .	ZK085	
	<b>Araliaceae</b>							Anthrax	The same as <i>Justicia schimperiana</i> and <i>phytolacca dodecandra</i> .		
	<b>Harfattuu</b>							Toothache	Bark is chewed and kept between teeth.		
								Snake bite	Leaf together with leaf of <i>Carisa edulis</i> are pounded together and the liquid decant is drunk with honey.		
121	<i>Solanacio gigas</i>	Sh/T	L/Fr	B	F	Ex/O	3	BIDUU	Leaf together with leaf of <i>Brucea antidysentrica</i> , <i>Justicia schimperiana</i> , <i>Staphania abyssinica</i> and <i>Rhmnus prinoides</i> are pounded together and the liquid extract is used to wash the body of the patient.	ZK086	
	<b>Asteraceae</b>							Diarrhea	Leaf and flower are pounded together and given to cattle as fodder.		
	<b>Diluu Arbaa</b>										
122	<i>Solanum incanum</i>	Sh	R/Fr/L	Hu	F	O/Ex	4	Erythroblastosis	Root is mixed together with root of <i>Staphania abyssinica</i> , <i>Solanum anguivi</i> , <i>Kalanchoe petitiiana</i> , and <i>Echinops spinosus</i> and tied on the body	ZK162	
	<b>Solanaceae</b>							Stomachache	Root is chewed and swallowed with salt or the liquid decant is drunk with honey.		
	<b>Hiddii</b>							Rabies	Leaf is pounded and homogenized in water then drunk with milk taking care of the dosage.		
								Toothache	Root is chewed and kept between teeth.		
								Tonsil	Pounded leaf of <i>Solanum denekense</i> and <i>Ocimum lamiifolium</i> is mixed with juice from fruit of <i>solanum</i> species and put on the frontal part (forehead) for 6 to 7 minutes.		
								Hemorrhoid	Fruit juice is applied to the affected body with honey.		
123	<i>Sphaeraranthus sauveolens</i>	H	L	Hu	F	Ex	6	Poisoning	Leaf is smashed between hands and and tied on the affected part of the body.	ZK107	
	<b>Asteraceae</b>							Wound	The same as for poisoning.		
	<b>Q/marzii</b>										
124	<i>Staphania abyssinica</i>	Li	R/L	B	F	Ex/O	17	Anthrax	The same as <i>Brucea antidysentrica</i> and <i>Salix subserrata</i> .	ZK044	
	<b>Menispermaceae</b>							Rabies	Root is pounded together with root of <i>Justicia schimperiana</i> and drunk with honey.		
	<b>Kalaala</b>							BIDUU	The same as <i>Croton macrostachyus</i> .		
								DINGATAGNAA	Root is chewed and swaloowed with salt.		
125	<i>Tacazzea conferta</i>	Li	Lt	B	F	Ex/O	3	Jaundice	Latex is directly applied to the affected body.	ZK141	
	<b>Asclepiadaceae</b>							BIDUU	The same as <i>Clematis simensis</i> and <i>Bersama abyssinica</i> .		
	<b>Aanannoo</b>							Rabies	The latex is mixed with powder of red teff, baked and given to dogs.		
126	<i>Tagetes minuta</i>	Sh	L	Hu	F	Ex/O	4	Insect repellent	Fresh leaves together with leaves of <i>Eucalyptus globulus</i> are used to keep away insects particularly trailing ants to attack beehive or living rooms.	ZK049	
	<b>Asteraceae</b>							Mitch/Fever	The same as <i>Eucalyptus globulus</i> .		
	<b>Barifidee</b>										

127	<i>Teclea nobilis</i>	Sh/T	L	B	F/D	O/Na	7	Horse disease	Concoction from dry leaves of <i>T.nobilis</i> , <i>Juniperus procera</i> , <i>Withania somnifera</i> , <i>Osteostegia integrifolia</i> , <i>Verbascum sinaiticum</i> <i>Senna obtusifolia</i> , <i>Loranthus species</i> is administered through left ear and left nostril.	ZK250
	<b>Rutaceae</b>							Cattle disease	Concoction from dry leaves of <i>T.nobilis</i> <i>Justicia schimperiana</i> , <i>Croton macrostachyus</i> , <i>Ruta chalepensis</i> , <i>Calpurnia aurea</i> , <i>Thalictrum rhynchocarpum</i> in the presence of garlic is mixed with ash and given to cattle each morning for three consecutive days.	
	<b>Hadheesa</b>							Anthrax	Leaf concoction , either dry od fresh, from <i>Teclea nobilis</i> , <i>Vernonia amygdalina</i> , <i>Croton macrostachyus</i> , <i>Justicia schimperiana</i> and <i>Achyranthes aspera</i> is homogenized in water and administered.	
128	<i>Thalictrum rhynchocarpum</i>	H	R	B	F/D	O	11	Diarrhea	Root is pounded and given to cattle.	ZK200
	<b>Ranunculaceae</b>							Stomach problems	Root is pounded homogenized in water and drunk.	
	<b>Siraabizuu</b>							BIDUU	Root is pounded, soaked in water, decanted and drunk with honey and butter.	
129	<i>Thymus schimperi</i>	Sh	WP	Hu	F/D	O	3	Cough	Whole plant is washed soaked in water and boiled then drunk with sugar.	ZK183
	<b>Lamiaceae</b>									
	<b>Xoosanyii</b>									
130	<i>Trigonella foenum-graenum</i>	H	Se	Hu	D	O	3	Eye disease	powdered seed is used to treat eaye disease.	ZK087
	<b>Fabaceae</b>							HAIII (swelling in child's belly)	Cooked seeds are used in weeping the belly of the infant gently.	
	<b>Abishii</b>									
131	<i>Urera hypselodendron</i>	CL	R/L	B	F	O/Ex	3	Retained urine	Root is pounded and the jelly extract is given to cattle.	ZK088
	<b>Urticaceae</b>							Eye disease	Root together with root of <i>Kalanchoe</i> species are pounded together and applied to eye of animals.	
	<b>Laanqisaa</b>							Retained placenta	The same as retained urine.	
132	<i>Urtica simensis</i>	H	L	Hu	F	O	5	Gastritis	Cooked leaf is mixed with powder from fried seeds of barley and eaten.	ZK090
	<b>Urticaceae</b>									
	<b>Saamaa</b>									
133	<i>Verbascum sinaiticum</i>	H	L	B	F/D	O/Ex	6	Horse disease	Dry concoction of leaves together with leaves of <i>J.procera</i> , <i>Withania somnifera</i> , <i>Verbascum sinaiticum</i> and <i>Loranthus regularis</i> is homogenized in water and given to horse.	ZK034
	<b>Scrophulariaceae</b>							Rabies	Leaf of <i>V.sinaiticum</i> , <i>Phytolacca dodecandra</i> and <i>Stapgania abyssinica</i> are pounded together and the decant is drunk with milk.	
	<b>Gurra harree</b>							Cattle disease	Root together with that of <i>Staphania abyssinica</i> and leaf of <i>Hypericum revvolutum</i> are pounded together and given to cattle.	
								Poisoning	Root together with leaf of <i>Indigofera arrecta</i> are pounded together and applied to the affected part of the body.	
134	<i>Verbena officinalis</i>	H	R	B	F	O	6	Diarrhea	Decant from pounded root is drunk.	ZK091
	<b>Verbanaceae</b>							Tonsil	Root is chewed and swallowed.	
	<b>Q/albaatii</b>									
135	<i>Vernonia amygdalina</i>	T	L	B	F/D	O/Ex	8	Anthrax	Leaf together with leaf of <i>Teclea nobilis</i> , <i>Croton macrostachyus</i> , <i>Justicia schimperiana</i> and <i>Achyranthes aspera</i> are pounded together and administered through left ear and left nostril.	ZK152
	<b>Asteraceae</b>							Bloating in cattle	The same as <i>Justicia schimperiana</i> .	
	<b>Ebicha</b>							Jaundice	Fresh or dry leaf is pounded and applied with butter.	
								Leeches	Leaf together with leaves of <i>Premna schimperi</i> , <i>Nicotiana</i>	



									tabacum, Calpurnia aurea and Croton macrostachyus are pounded together and given to cattle to expel leech.	
								Stomachache	Leaves together with leaves of Ajuga integrifolia are pounded together, soaked in water, decanted and drunk with honey.	
136	<i>Ximenia americana</i>	Sh	Br	B	D/F	O/Na/Er	1	Anthrax	Bark togetherwith Cucumis ficifolius, Acacia abyssinica and Cynodon dactylon are pounded together and applied.	ZK092
	<b>Olacaceae</b>							Evil eye	Roo bark togetherwith Carisa edulis, Allium sativum and Ruta chalepensis seed are dried and pounded together then smoked to the patient.	
	<b>Hudhaa</b>							Snake bite	Leaf together with leaf of Carisa edulis are pounded together and the liquid decant is drunk wtith honey.	
137	<i>Zehneria scabra</i>	Li	L	B	F	Ex	18	Poisoning	Leaf is crushed and applied.	ZK160
	<b>Cucurbitaceae</b>							Anthrax	The same as poisoning.	
	<b>Hidda adii/Daaymii</b>									
138	<i>Zingiber officinale</i>	H	Rh	B	F/D	O	5	Stomachache	Rhizome is chewed and swallowed.	ZK093
	<b>Zingiberaceae</b>							Cough	Pounded rhizome is boiled and drunk as soup.	
	<b>Gijinbila</b>							Bloattng in cattle	Rhizome is pounded together with garlic and given to cattle.	