

The Use and Management of Medicinal Plant by Shenasha People in Dibati District North West Ethiopia

Abesh Birhanu Morka^{1,*}, Tena Regassa Duressa²

¹Ethiopia Biodiversity Institution, Mettu Biodiversity Center, Forest and Range Land Plant Biodiversity Case Team, Mettu, Ethiopia

²Department of Biology, Faculty of Natural and Computational Sciences, Wollega University, Nekemete, Ethiopia

Email adders

birhanuabesh12@gmail.com (A. B. Morka), tenaregasa@gmail.com (T. R. Duressa)

*Corresponding author

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Abstract: Traditional medicinal plant species documentation is very crucial in Ethiopia for biodiversity conservation, bioactive chemical extractions and indigenous knowledge retention. An ethnobotanical study of the indigenes knowledge on medicinal plants by shinasha people in Dibati District, Northwest, Ethiopia, was conducted from October 2017 to Nember 2017. This study therefore, aimed at documenting indigenous knowledge on ethobotanical use of medicinal plants by herbalists to treat human and livestock ailments as well as assessing of the existing threats to these medicinal plants in Dibati district. Ethnobotanical data were obtained using semi structured interviews, field observations, focus group discussions with people and traditional medicine practitioners and various ranking and comparison methods were employed. Data were analyzed quantitatively and by Microsoft office excels informant's preference ranking, descriptive statistic Direct matrix ranking, paired comparisons, fidelity value index and Informant consensus factor (ICF) are computed to assess the degree of effectiveness of certain medicinal plants against human and animal. Information was collected from a sample of 99 informants (77 males and 22 Females) included 20 (male 16 female 4) key informants are selected to the help of kebele administration. Ethnomedicinal use of 65 plant species from in 62 genera and 39 families were documented. In terms of number of species, Febaceae appeared as the most dominate family that Contains 7 species in 7 genera, followed by Asteraceae. From the total medicinal plant species, 24 (2461.9.7%) were herbs, followed by 18(27.69%) species of trees. The most frequently used plant parts were leaves (28.06%) followed by roots (14.06%). The most widely used method of preparation was crashed (23.07%), Pounding (20). The common route medicine administration were oral (54.4%), followed by dermal (7.69%) and other. The most commonly used application of medicinal plant was drinking (35.38%) followed by smoking (18.64%). A total of 65 plant species 48 (73.84.%) species were mentioned for the treatment of 57 human ailments while 17 (26.15) species were used to treat 15 livestock health problems. In the study area possesses diverse natural vegetation and the environment under serious threatened by mainly agricultural expansion, firewood collection, population pressure, overgrazing, urbanization, household tool construction, charcoal production and medicinal purpose. Awareness rising on the use and management systems, sustainable utilization of medicinal plants and their in-situ and ex-situ conservation and establishment of forest protected areas should be recommended.

Keywords: Medicinal Plant, Dibati Woreda, Informant, Shinasha People, Ethnobotanical, Fidelity Level Index (FLI), Informant Consensus Factor (ICF)

1. Introduction

Traditional medicinal plant species documentation is very crucial in Ethiopia for biodiversity conservation, bioactive chemical extractions and indigenous knowledge retention. In all part of the world traditional medicinal plant practices

formed the basis of health cares for both human being and animal before the advent of modern medicine. In the Ethiopia people have been using traditional medicine to treat both human and animal disease for generations. Traditional medicine is still wildy practices in rural area where modern medicine and services available [29]. Traditional medicinal plants are also used for various purpose in additional their

medicinal values such as a forage, firewood, spices, construction, food, cosmetics, clothes, shelter for human habitats for wild animals and insects. Maintaining ecosystem stability export accommodation and fumigant [15]. Traditional herbal remedies can also be used as scientific resources to develop a new drug which are safes. It is also effectively cheapest and environmental sounds. Many of today's wonderful drugs were initially discovered through the study of traditional medicine [29]. (There are large number of moderate to high value of medicinal plants herbs and species existing in the world. However, of the existing medicinal herbs species only small percent are treaded. Availability of medicinal plant has been affected [10, 15]. by a dramatic decrease of native vegetation due to agricultural explanation, deforestation, fire, and overgrazing drought, tread of charcoal, firewood, introduction of alien invasive species and urban associated development. Globally the estimates of medicinal plant species range from 35,000-50,000 and out of this about 4,000-6,000 species have entered the world market of medicinal plants. The knowledge about the use of plants is largely oral; however, Plantations of medicinal plants can be made in degraded and degrading areas. There are many medicinal plants of Ethiopia that have good properties for land rehabilitation and erosion control which could be planted in different agro ecological settings. In-situ and ex-situ conservation strategies work well when they complement one another since what is not achievable by one method is backed by the other method. In addition to this scheme that would enable sustainable use of medicinal plants and the associated indigenous knowledge should be developed with the best practice of benefit sharing [10]. Maintain health through traditional medicine in general and utilization of medicinal plant in particular is almost as old as the history of man kinds. This is true in Ethiopia 80% of the population still

relies on the plant to prevent and cure various health problem [15].

The current plant use trend in Dibati district shows that the environment is facing problems of resource depletion and loss of indigenous knowledge like other areas of the country. Thus, intensive ethnobotanical research plays a vital role to draw information on plants and related indigenous knowledge for conservation and sustainable utilization. Like many other parts of the country, there is no such ethno medicinal research and documentation carried out in Dibati District, Metekele Zone, Northwest and Benshangul Gumuz Region. In this woreda there is no any research which is done on the use and management of medicinal plants in the Shinasha peoples.

2. Materials and Methods

2.1. Study Area

The research was conducted at Dibati district particularly which is found in Metekele zone, Benshangule Gumuze Regional State that is found at 586km northern west of Addis Ababa, the capital City of Ethiopia. The Benishangul Gumuz Regional State (BGRS) was established in 1994 as one of the nine regional states of Ethiopia. The BGRS borders the Republic of Sudan in the west, Amhara region in the North, Oromiya in the South east and Gambella region in the South. Administratively, it is divided in to 3 zones (Metekele, Assosa, and Kemashi) that are divided in to 19 Woreda, and one special Woreda. Metekel Zone is divided into 7 Woreda out of which Dibatie Woreda, the study area is located North 100 55'-110 90' latitude North and 300 12'-300 36' longitude East. (Source BGRS, 2008).

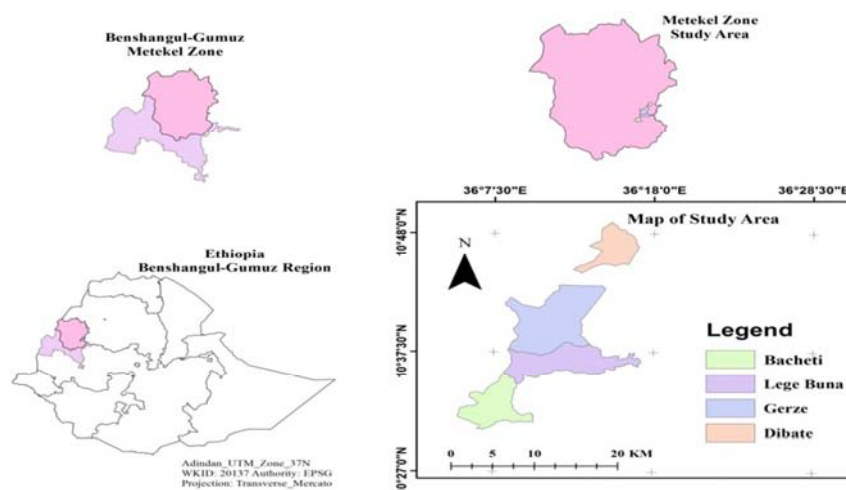


Figure 1. Maps of study area.

Based on the central statistics data (CSA, 2007), the total population for this Woreda of 66,654, of whom 33,452 were men and 33,202 were women; 7,399 or 11.1% of its population were urban dwellers of all 12,446 were children's. The vegetation of the study district is predominantly

composed of different woody and herbaceous species. The natural vegetation of Dibate is mainly composed of various lowland and midland species such as *Acacia sp.*, *Ficus spp.* (Such as *Ficusthonnigi*, *Ficussur*, *Ficus vasta*, *Ficusmochsttery*, *e.t.c.*, *Cordia africana*, *Albizia spp.* *Coroton*

macrostachyus, *Adonsoniadigitata*, *Dombeya spp.*, *Ekeverglacapensis*, *Carissa*, *Sizigum spp.*, and other trees, shrub and herbaceous species

2.2. Study Design

2.2.1. Reconnaissance Survey and Selection of Study Sites

Dibati Woreda has a total of 29 kebeles. Out of these, 5 kebeles were selected those are Modorem, Gerze, Zegehe, Legbuna, and Bechati due to the have high amount of shinasha peoples found in kebele. Additional to that they have larger vegetation cover and presence of key informants, different altitudinal ranges are selects for ethnobotanical data collection. The traditional healer, used as key informants, was identified by with the assistance of local authorities, elders and knowledgeable persons.

2.2.2. Informant Selection

Information regarding to each peasant association leaders the total household of Shenasha people in the study area of five kebele from the age of twenty and above is (N) is male 651 female 141 total 792. To obtain total sample size from the total targeted household, the researcher was use the usual known formula. (Yemane, 1967) that were calculated as follows:

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

Where n is sample size of the study area

N is targeted population size (total population of five kebele in study area.)

e: is the level of precision or sampling error= (0.05)

For the above formula,

$$n = \frac{792}{1 + 792 (0.05)^2} = 99$$

A total 99 informants five to seven individuals from each study kebele from the age of twenty and above were included. From the five studies kebele twenty key informants were purposively selected based on recommendations from local authorities (kebele administrators and local guides) peasant association leaders and other members of the local communities.

2.2.3. Plant Specimen Collection and Identification

At the end of the interview, the reported medicinal plants were collected from natural vegetation and home garden. Sample specimens of the plants cited for their medicinal use was collected, numbered, pressed and dried for identification. Plant identification was performed both in the field, and at the National Herbarium of AAU. Preliminary identification was done in the field and reconfirmed at the National Herbarium. The identification of other plant specimens using the Flora of Ethiopia and Eritrea also by comparison with authenticated specimens.

2.3. Ethnobotanical Data Collection

Ethnobotanical data was collected between Octobers to November, 2017 on three field trips. The data was collected based on prepared questionnaires, semi-structured

interviewees, observation, focus group discussion, and guided field walks with informants were employed to obtain indigenous knowledge of the local community of shinasha people. The study was carried out by interview in there habitants in different village. The informants include the various data sets such as local names, disease treated, parts of the plant used, and method of preparation dose and rote of application was obtained from local people through individual interviews. A list of question was prepared that covers the discussion with the informants in particular orders. All of the interviews will be held in Amharic and Shinasha language of the local people. The place and time for discussion were set based on the interest of the informants [5].

2.4. Ethnobotanical Data Analysis

The Ethnobotanical data collected was analyzed following survey and analytical tools for ethnobotanical methods which are Informant's preference ranking, descriptive statistic (Microsoft excel spreadsheets soft wore), Direct matrix ranking and paired comparisons conducted following [20, 5]. Were computed to assess the degree of effectiveness of certain medicinal plants against human and animal.

2.4.1. Medicinal Use Value

The use value (UV), a quantitative method that demonstrates the relative importance of species known locally [19]. Was calculated using the following formula. $UV = \sum U/n$ where: UV = use value of a species; U = number of citations per species; n = number of informants

2.4.2. Fidelity Level Index

Fidelity level index quantify the importance of a given species for a particular purpose in a given cultural group[8]. The relative healing potential of individual medicinal plants used against human or livestock ailments using an index called Fidelity Level Index (FLI) based on the proportion of informants who agreed on the use of a given medicinal plant against a given ailment category.

The formula for FL is given as $FL\% = Ip / Iu \times 100$, where Ip the number of informants who independently indicated the use of a species for the same major ailments and Iu the total number of informants who mentioned the plant for any major ailment (Friedman *et al.*, 1986).

2.4.3. 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 used by [19, 22]. ICF was calculated as follows: number of use citations for each ailment (nur) minus the number of species used (nt) for that ailment, divided by the number of use citations for each ailment minus one (Table 7).

$$ICF = \frac{nur_nt}{nur_1}$$

Where:

ICF: Informant consensus Factor,

Nur: number of use citation

Nt: number of species used

3. Results and Discussion

3.1. Ethnomedicinal Plant Species Used by Shinasha People in Study Area

In the study area a total of 65 medicinal plant species 62 genera and 39 families were gathered and documented that are used for the treatment of human and livestock ailments. From these, 48(73.8%) species were used as human medicine, 1 species only (1.54%) as livestock medicine and the remaining 16 species (24.62%) were used for treating both

human and livestock ailments (seen in figure 3). Of these 65 medicinal plants studied, 48 species were gathered from the wild and 17 species from home garden. This result indicates that the local communities mostly depend more on medicinal plants collected from the wild than those from home garden.

In my result family distribution, Fabaceae stood first dominant 7 (10.76%) followed by Asteraceae, Euphorbiaceae and Cucurbitaceae four (6.13%) species and next family, Combretaceae three species and other families consist of one representative species in each (appendix XI) This agrees with the finding of [16-18, 11, 12, 23, 24, 7, 4].

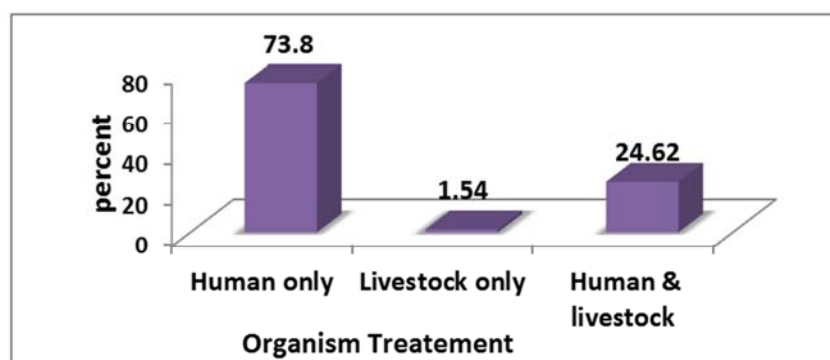


Figure 2. Proportion of medicinal plants used to treat human, livestock and both human and livestock ailment.

3.2. Medicinal Plant Habit, Habitat, Part(s) Used and Preparation Rout of Administration Both in Human and Livestock Ailments

3.2.1. Habit of Medicinal Plant in the Study Area

In the study area there are many habits of medicinal plant those are herb, shrub, tree and climber. The result shows that analysis of growth forms of medicinal plants revealed that herbs constitute the largest category 24 (36.9%) followed by tree 18 (27.69%), 16 (24.61%) shrub and 7 (10.76%)

Climbers were recorded. The record of the highest number of herbs medicinal plant species in the study could be dominated. This may be due to their relative better abundance, accessibility in nearby areas as compared to other life forms, there is presence bimodal rainfall and extended availability of moisture and herbs can grow everywhere compar toother plant habits. This Habit distribution of medicinal plants has also been reported by some researchers previously [5-7, 24, 22, 13, 27].

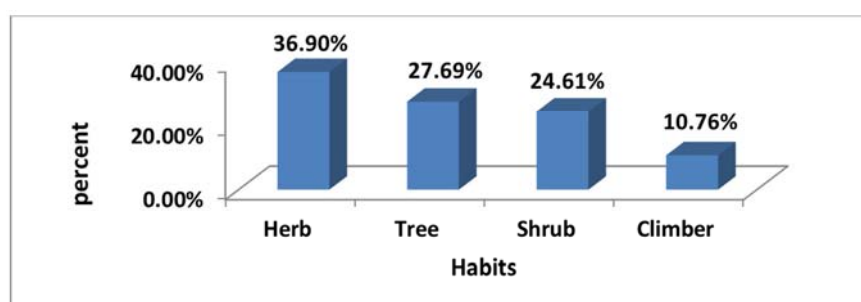


Figure 3. Habit of medicinal plants both human and livestock ailment in the Dibati woreda.

3.2.2. Habitats and Abundance of Medicinal Plants in the Study Area

In this study area medicinal plants were collected from various habitats including wild and home garden. As the result shows that most of the medicinal plants used by the communities were collected from wild 48(73.86%) and Home garden 17(26.15%). This finding is similar to the general pattern seen in most medicinal inventories for

example, [16, 11, 1, 28, 26, 36, 24, 21]. where wild medicinal plants dominate. The local people cultivate some popular medicinal plants in their home garden for the purpose of medicine such as *Allium sativum*, *Schinus molle*, *Ocimum lamiifolium*, *Rhamnus prinoides* and *Nicotiana tabacum*.

This and field observation during data collection clearly confirmed that some traditional healers do not have interest to grow in their home garden some plant species that are used

to treat specific ailments in order to keep the secret of their medicinal value. This means that most of the medicinal plants found in the home gardens are those also known to have other uses particularly as food.

3.3. Medicinal Plants Parts Used Treatment Both Human and Livestock in the Study Area

The most widely used plant part for the preparations of remedy were leaves, which accounted for 28.06% followed by roots (14.06%), seed (10.39%) break (9.39%) bulb (6.25) and others. In this study, leaves are the most frequently utilized part of plant organs. it was ease of accessibility to

leaves explains their frequent inclusion in most of the preparations. It was also observed that residents have been using leaves to identify. Additionally, leaves are the main photosynthetic organs in plants, and photosynthetic are translocate to other parts, such as the root, stem, fruit, and seed. These can act as toxins for protection of predators and some are of medicinal value to humans.

Within my finding, similar studies agreement to in other parts of Ethiopia reported and documented that leaf are the most commonly used medicinal plant parts followed by root [23, 5, 1, 13, 24, 14, 7, 26, 28].

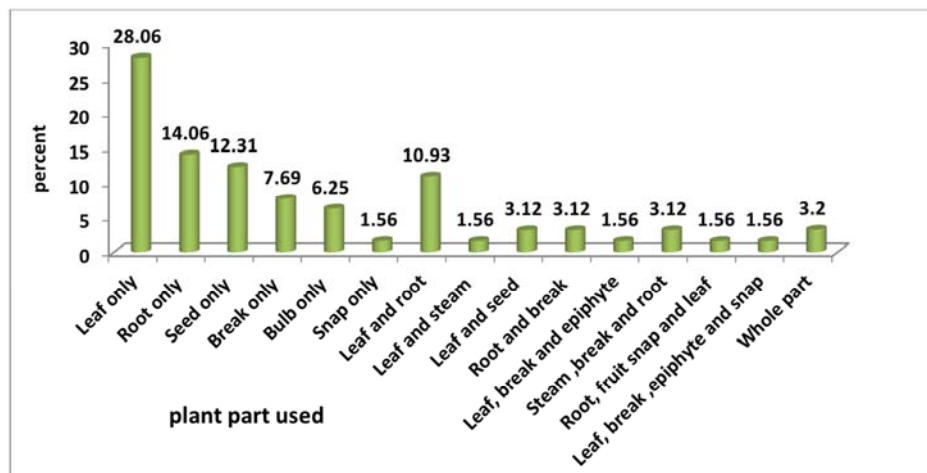


Figure 4. Plant Parts used in preparation of both human and livestock ailments in the study area.

3.4. Method of Preparation

The result that shows the preparation of medicinal plant for human and livestock of local community employs various methods of preparation of traditional medicines for different types of ailments. The preparations vary based on the type of disease treated and the actual site of the ailment. The principal methods of plant parts remedy preparation forms were reported to be through crushed, which accounts for

15(23.07%), followed by pounded 13(20%), squeezing 10(15.4%), chewing 7(10.71%), crashing and pounded 5(7.7%), cocking 4(6.15%), eating 3(4.61%), smoke/burning 3(4.61%) crushed squeezed 2(3.07%), pounded squeezed 2(3.07%) and pounding powder 1(1.5%) respectively. The most dominate method of preparation is crushed. In agreement with this study, similar researcher of medicinal plant species method of preparation are reported from different parts of the country by [14, 27, 7, 36].

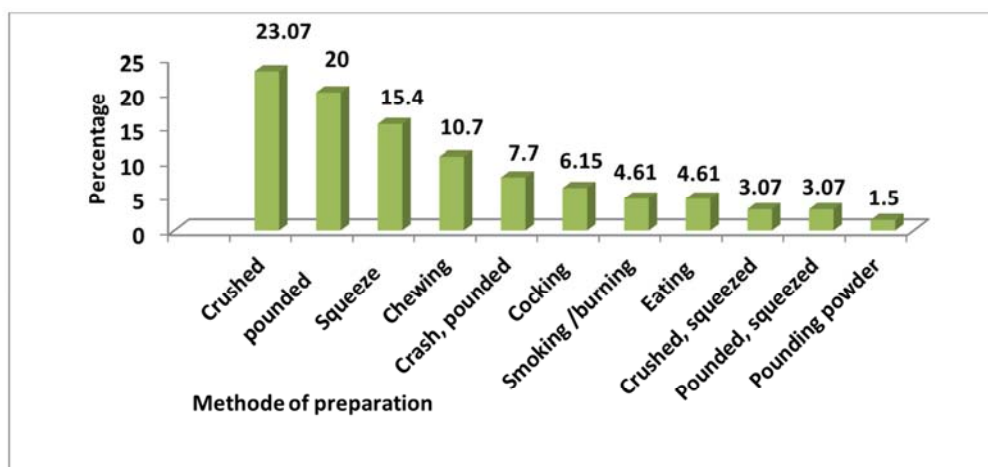


Figure 5. Preparation methods both in human and livestock ailments in the study area.

3.5. Route of Administration

The major routes of administration in the study area are oral, dermal, nasal, anal, tide; ear and fumigated. People of the study area mostly administer traditional medicine orally. Oral accounts 38(58.46%) followed by dermal 5(7.69%), oral and dermal 6(9.23%) and others (Figure 8). Due to they may indicated the higher prevalence of internal ailments in the study area.

However, the dose should be given in great care in the oral system than in the dermal since it might cause other severe internal problems. Similarly, various research findings mentioned oral application as the primary route of administration in traditional plant medicines. This fact that has been documented by different authors in the other part of Ethiopia. [2, 5, 12-14, 4, 7, 36, 25].

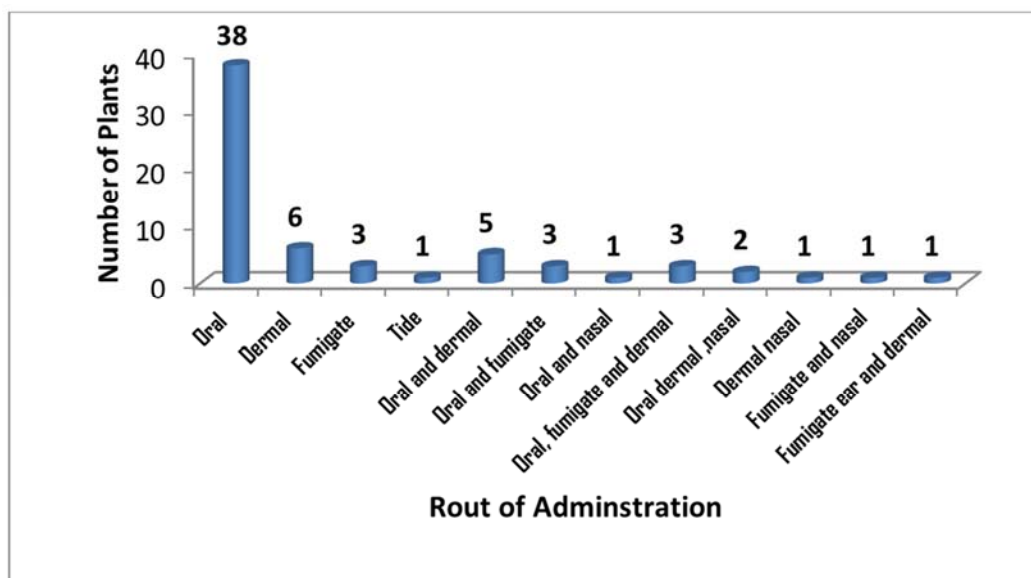


Figure 6. Route of administration both in human and livestock ailments in the study area.

3.6. Application

The prepared traditional medicines are applied in a number of methods, drinking accounted for the largest 23(35.38%), followed smoking 11(16.76%) creamed and snaffid 7(10.76%) and others (Figure 6). Internal ailments were commonly treated by making the patient drink herbal preparations; tooth infection were treated by crushing and put on the remedial plant part on the tooth surface; skin infections such as

ringworm were treated by painting herbal preparations on an infected skin. Some plants do have different applications for different disease types. This preparation is used for different diseases by diverse application techniques. For instance, putting the leaves on tooth surface is used to cure toothache, and to tie on swollen body part is used to cure swelling. Similar results were reported elsewhere in Ethiopia by [6, 18, 9, 11, 23].

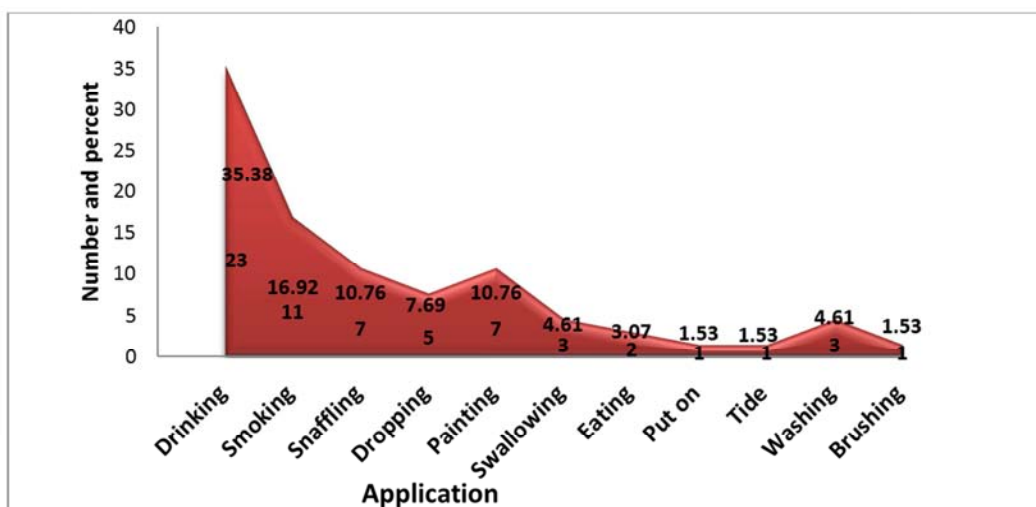


Figure 7. Graph showing ways of application of plant remedies in both human and livestock ailment treatment.

3.7. Conditions of Preparation of Herbal Remedies

The results showed that herbal remedies are prepared using fresh material 45(69%), while 8(12%) were used in the case of dried plant material and 21(18.46%) in both condition. (Figure 7). The informants in the study area prefer fresh plant materials (69%) to prepare effective and efficient remedies due to the fact that, most of the bioactive phytochemicals are retained in fresh plant materials as compared to dry ones. Although frequent collection of fresh plant materials in dry seasons has a devastating influence on the conservation statuses of medicinal plants, it is common to use fresh plant materials for the preparation of remedy. In addition to that they believe that using fresh materials increases efficacy compared with the dry one. This is because of the fact that

the content or ingredients may be lost or reduced when the plants became dry. Similarly, various studies in Ethiopia has reported by [33, 22, 17, 12, 30, 32, 15, 13, 1, 24, 36, 7, 26].

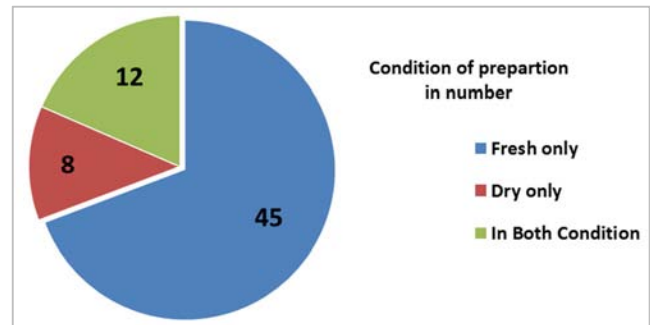


Figure 8. Conditions of Preparation both in human and livestock ailments.

Table 1. Solvents and additives used in medicinal preparation.

Solvents and additives	No- of informants who cited the species	Percent (%)
Water	85	85.8
Honey	73	75.76
Better	61	61.6
Milk	59	59.5
Sugar(tea)	42	42.4
Tefee powder	31	31.3
Hen wote	29	29.2
hyena liver	18	18.1
Coffee powder	15	15.1
Bordee	14	14.1
Meat	13	13.1

3.8. Solvents and Additives

Some of the remedies are taken with different additive and solvents, the solvent used is water. The additives include butter, honey, milk, sugar, 'teff' flour, boiled coffee or tea, hen wote, hyena liver, bordee and meat (Table 1). These additives have importance in reduction of pain, to get better taste and reduce adverse effects such as vomiting and diarrhea and enhance the efficacy and healing conditions as explained by informants.

For example, the seed of *Coffea arabica* is roasted crushed powdered boil and the filter one cup of tea, mixed with a few drop of oil then drink for treatment of diarrhea. The roots *Justicia schimperiana* is crashed pouded and mixed with the honey and drink one glass for 3-5 days for treatment of stabbing pain. The who part *Clematis hirsuta* is pounded

powder and mixed with butter and creamed affected part until recover for 5 days to treat wound.

3.9. Sources and Transferring of Indigenous Knowledge

3.9.1. Sources of Traditional Knowledge Practices

The highest number of traditional medicinal plant knowledge gain from to be 45 (45.4%) Father followed by 20(20.2%) from Mother and 15(15.1%) from Uncle 10(10.1%) from Brother, 8(8.08%) from Sister 6(6.06%) from Neighborhood and 5(5.05%) from Friend. The great majority of respondents (90%) reported that most of their knowledge was received from their family members and friends secretly by oral. The secret practices of traditional medicines came from their ancestors. Within my finding similar studies are agreed by [31, 28, 36, 14, 27].

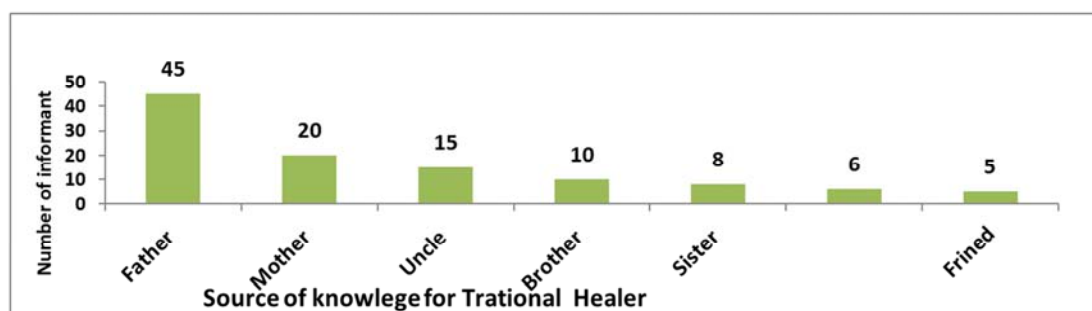


Figure 9. Sources of knowledge on the practice of traditional medicine.

3.9.2. Transferring Knowledge of Traditional Medicinal Plants

According to the survey, knowledge transfer of medicinal plants follows vertical transfer to the most selected family member orally with great secrecy. The findings of the study showed that as people become older and older their knowledge of traditional medicine becomes better and better. Most of the informants were elders that indicated the trend of transferring knowledge is usually at old age. The highest number for the

ways of transferring knowledge on traditional medicinal plants by elder son who received 56(56.5%) votes followed by the elder daughter 12(12.1%), for the brother 10(10.1%) for the sister 7(7.07%) for the not to all 5(5.05%) for all went to known 4 (4.04%) to all the member of my family 3(3.03%) and other to fried 2(2.02%) (Figure 10). Therefore most way of indigenous knowledge transfer in the study District was by word of mouth to a family member (especially to an elder son). Similar findings were reported for other communities in Ethiopia [28, 27, 36].

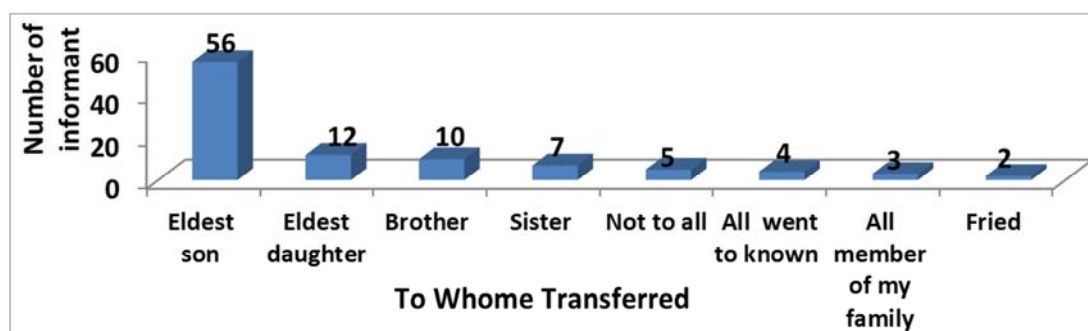


Figure 10. Transferring of knowledge of traditional medicinal plants.

3.10. Ranking of Most Important Medicinal Plants

3.10.1. Preference Ranking

Preference ranking for eleven medicinal plants to treat snake biting (Table 2) made by ten informants showed that *Bersema abyssinica* ranked first and hence is the most effective medicinal plant to cure snake biting. *Myrsine melanophloeos*, *Nicotiana tabacum*, *Justicia schimperiana* and *Allium sativum*. Are the 2nd, 3rd, 4th and 5th respectively.

Table 2. Preference ranking of eleven Selected Medicinal Plants based on the Degree of their Curative Power of snake bit as Perceived by Informants.

Name of plants species	Respondents(R1-R10)										Total	Rank
	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	R ₈	R ₉	R ₁₀		
<i>Allium sativum</i> L.	4	3	5	3	4	5	1	5	5	3	38	5 th
<i>Carduus englerianus</i> Sch. Bip. Ex A. Rich.	2	3	1	1	2	3	4	3	3	5	27	9 th
<i>Carissa spinarum</i> L.	2	5	5	4	5	5	2	5	3	1	37	6 th
<i>Justicia schimperiana</i> (Hochst. ex Nees) T. Anders.	4	5	5	2	5	4	5	4	2	3	39	4 th
<i>Lagenaria siceraria</i> (Mol.) Standl.	4	4	0	1	4	3	2	2	1	3	24	11 th
<i>Nicotiana tabacum</i> L.	3	5	2	4	4	5	5	3	5	5	41	3 rd
<i>Paeonia urens</i> Cav.	5	2	5	3	2	4	5	4	1	5	36	6 th
<i>Stereospermum kunthianum</i>	4	2	2	4	5	2	2	5	5	4	30	9 th
<i>Bersema abyssinica</i>	5	5	5	4	5	5	4	4	5	5	47	1 st
<i>Dicrocephale latifolia</i>	5	4	2	2	3	2	3	3	3	4	31	8 th
<i>Myrsine melanophloeos</i>	5	4	4	5	5	5	4	5	5	4	46	2 nd

3.10.2. Direct Matrix Ranking

Direct matrix ranking was performed to assess the relative importance each of the plant. The result of the direct matrix ranking showed that *Cordia africana* stood first in being the most

multipurpose medicinal plant followed by *Gardenia ternifolia*, *Eucalyptus globulus*, *Myrsine melanophloeos* *Croton macrostachyus* Del. *Acacia abyssinica*, *Ximenia caffra*. *sond*, *Bersema abyssinica* and *Jatropha curcas* was the least (Table 3).

Table 3. Direct matrix ranking for seven specie and main use in study area.

NamePlant species	Use categories							Total	Rank
	Charcoal	Construction	Medicine	Food	Firewood	Fencing	Furniture		
<i>Jatropha curcas</i>	0	0	4	0	3	5	1	13	9 th
<i>Ximenia caffra</i> . <i>sond</i>	0	2	5	5	5	3	2	22	7 th
<i>Cordia africana</i> Lam.	5	5	5	4	5	3	5	32	1 st
<i>Croton macrostachyus</i> Del.	5	5	5	0	4	4	2	24	5 th
<i>Acacia abyssinica</i>	5	5	3	0	4	3	3	23	6 th
<i>Eucalyptus globulus</i>	5	5	3	0	5	5	5	28	3 rd

NamePlant species	Use categories							Total	Rank
	Charcoal	Construction	Medicine	Food	Firewood	Fencing	Furniture		
Myrsine melanophloeos	5	5	5	0	5	2	3	25	4 th
Bersema abyssinaca	1	2	5	0	3	3	1	15	8 th
Gardenia ternifolia	2	3	5	3	4	3	5	30	2 nd
Total	33	30	40	12	47	31	23		
Rank	3 rd	5 th	2 nd	7 th	1 st	4 th	6 th		

3.10.3. Paired Comparison

A paired comparison made to determine the most preferred medicinal plants among the 9 species that were used to treat eye vile in the study area, the responses of ten key informants, showed that Ranked *Withania somnifera* first followed by

Gardenia ternifoli is the second (Table 4). Therefore, this result indicated that *Withania somnifera* is the most preferred while. *Clausena anisata* is the least favored over the other plant species cited in treating eye vile.

Table 4. Paired comparisons of five medicinal plant species used to treat fibril illness.

Name of plants species	Respondents(R1-R10)										Total	Rank
	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	R ₈	R ₉	R ₁₀		
Gardenia ternifolia	1	4	3	0	1	1	2	4	5	4	35	2 nd
Acacia abyssinica	4	1	2	2	4	5	5	4	2	1	30	4 th
Allium sativum L.	2	2	1	4	3	2	4	3	2	5	28	5 th
Croton macrostachyus Del	5	5	1	4	2	2	1	0	1	4	25	8 th
Vernonia amygdalina Del.	1	0	2	4	3	1	4	1	5	1	27	6 th
Secuidaca longepedunculata	4	1	0	4	1	2	1	4	5	4	26	7 th
Clausena anisata	4	4	1	0	4	1	4	3	1	0	22	9 th
Capparis tomentosa	1	2	4	2	4	2	4	4	3	5	31	3 rd
Withania somnifera	4	2	4	4	5	1	5	4	4	5	38	1 st

4. Threatened and Factor Threatening Medicinal Plants in Dibati Woreda

4.1. Threatened Medicinal Plant in the Study Area

The ranking of 9 medicinal plants based on the degree of threats was conducted using 10 key informants. (Table 5) The results indicated that is *Asparagus africanus* and *Myrsine melanophloeos* the most threatened followed by *Withania somnifera* (L.) and *Bersema abyssinaca* and the least threatened one is *Glinus lotoides* L.

Table 5. Ranking of threatened plants.

Name of plants species	Respondents(R1-R10)										Total	Rank
	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	R ₈	R ₉	R ₁₀		
Myrsine melanophloeos	1	4	3	0	1	1	2	4	5	4	35	2 nd
Bersema abyssinaca	4	1	2	2	4	5	5	4	2	1	30	4 th
Paveonia urens cav	2	2	1	4	3	2	4	3	2	5	28	5 th
Oncoba spinosa Forssk.	5	5	1	4	2	2	1	0	1	4	25	8 th
Momordica foetida. schum	1	0	2	4	3	1	4	1	5	1	27	6 th
Kalanchoe petitiata A.Rich,	4	1	0	4	1	2	1	4	5	4	26	7 th
Glinus lotoides L.	4	4	1	0	4	1	4	3	1	0	22	9 th
Withania somnifera (L.)	1	2	4	2	4	2	4	4	3	5	31	3 rd
Asparagus africanus	4	2	4	4	5	1	5	4	4	5	38	1 st

4.2. Factors Threatening Medicinal Plants in the Study Area

The cause of threats to medicinal plants can be generally grouped into natural and human induced factors. However, as reported in this study most of the causes for the threats to medicinal plants and the associated indigenous knowledge are the anthropogenic factors such as deforestation due to over exploitation of plants for different uses including

charcoal making, population pressure, fire wood collection, house hold construction, overgrazing, cutting and burning of plants to create new agricultural expansion lands and urbanization. Informants ranked agricultural expansion, fire wood and population pressure as the most serious threat to the medicinal plants followed by medicinal purpose and charcoal collection is lower levels of threats by the other factors (Table 6). Similar study b [18, 12, 3, 28, 36]. This showed that, there are different threats in medicinal plants such as agricultural expansion fire wood collection and

others. Furthermore, the negative impact of deforestation on medicinal plants was also reported [15].

In this study, the information gathered from the key informants was indicated that the treats of medicinal plants increase from time to time in study area. The agricultural expansion and deforestation was the major medicinal plant treats. The finding was in line with other findings [15]. This

might be due to continuous agricultural expansions, deforestation and draught in addition to lack attention towards the medicinal plants. The plants are disappeared because of rapid socioeconomic, environmental and technological changes and as a result of the loss of cultural heritage under the guise of civilization [11].

Table 6. Ranking of threats to medicinal plants.

Name of plants species	Respondents(R1-R10)										Total	Rank
	R ₁	R ₂	R ₃	R ₄	R ₅	R ₆	R ₇	R ₈	R ₉	R ₁₀		
Fire wood	4	5	5	4	3	4	3	5	2	5	40	2 nd
Medicinal purpose	2	1	2	1	2	2	1	2	2	1	16	8 th
Charcoal Making	4	2	3	2	3	1	3	4	1	3	23	7 th
Household tool construction	4	5	5	3	1	2	4	4	2	3	33	6 th
Over grazing	3	4	4	2	5	5	4	3	2	3	35	4 th
Agriculture expansion	5	4	5	5	5	4	4	5	5	5	47	1 st
Urbanization	3	2	4	5	4	3	2	2	5	4	34	5 th
population pressure	5	2	3	4	5	5	3	3	4	5	39	3 rd

4.3. Management and Conservation of Medicinal Plants

At this moment natural habitats of medicinal plants in the study area are highly affected by factors mentioned above. The local people in the study area have brought only about 48 and 17 species of the total collected medicinal plants under wild and home garden. As a result many medicinal plants are under serious threats. So the local people should be conserve medicinal plant in-suit and ex- suit management style.

Those manes that forty-eight medicinal plants that are collected in the wild by conserve in-suit conservation method and the reaming seventeen medicinal plants that conserve by ex-suit conservation method. According to the informant information generally, there are some conservation measures that have been under taken around the world aimed at protecting threatened medicinal plant species from further destruction by create awareness for the user local people for the use and management of medicinal plant in study area.

Some authors clarify that home gardens can be refuge for wild species that are threatened in the wild by deforestation and environmental changes Concerning this [37] Reported that home gardens are being used as informal experimentation plots for new varieties and exotic species.

Medicinal plants are also left as remnants of trees, shrubs and herbs in and around agricultural fields due to their uses as forage, fuel wood, timber, and construction, spiritual and ritual needs. Protecting such multi-purpose plant species by agro-pastoralists in their localities is evidence for the existence of traditional conservation practices in the area. But this has to be strengthened to safeguard these natural resources. Of the species purposely maintained in home gardens in the country, about 6% are primarily cultivated for their medicinal values [37].

Informants also reported that the healers know time and processes of gathering, and storing medicinal plants. It is once a year that some medicinal plants are collected and preserved. *Lepidium sativum*, *Cucuribita pepo*, *Jatropha*

curcas and *Ocimum basilicum* seed, leaf, fruit or root are harvested, dried and preserved in roof corners or outside house, and dried parts are powdered and stored in different containers like pots, bottles or tied with clothes and used when needed.

The study indicated that many of the informants who have knowledge on traditional medicine usage give priority to the immediate use of the medicinal plants than to its sustainable future uses, as a result their harvesting style is destructive. However, some plants has protected for their spiritual and cultural purposes. Thus, these places are good sites for the protection of the medicinal plants since cutting and harvesting are not allowed in such particular areas. This was indicated that a good practice for the conservation of medicinal plants through cultivation. [28].

4.4. Informant Consensus Factor (ICF)

All cited human and livestock diseases were categorized into 7 categories: namely, Sense organs related diseases, Animal and insect biting related disease, digestive system related disease, Reproductive system related diseases, Cultural related disease, Respiratory disease related diseases, intestinal and parasitic infection related diseases, and derma related disease, These diseases are categorized based on nature of disease, conditions that cause, place of attack, symptoms and sign of disease (Table 7). Disease categories with relatively higher ICF values were: intestinal and parasitic infection related diseases (0.89), derma related diseases (0.87) Sense organs related diseases (0.83), and Cultural related diseases (0.73). This may indicate the common occurrence of these diseases so that more number of people exchanging information and agree on plant species that can be used to treat these diseases than the rest. The medicinal plants that are presumed to be effective in treating a certain disease have higher ICF values. On the other hand, the rest of disease categories had ICF value of lower suggesting that these diseases are either rare in the study area

or are treated only by the healers with little information passed to other general public [22].

Table 7. Informant consensus factor (ICF).

Categories	Ailments/diseases	Number of Species used (nt)	Use citation (nur)	ICF Value
Sense organs	Eye problem, ear problem, trachoma,	5	25	0.83
Animal and insect biting	snake bite, rabies, malaria, spider poison, scorpion poisons	23	69	0.64
digestive system	Stomach ache,, bloat, diarrhea, toothache, gastritis abdominal pain	25	81	0.70
Reproductive system	gonorrhea, sexual weakens diseases, retained placenta, infertility RH factor	11	33	0.68
Respiratory diseases	Nasal bleeding,, tonsillitis, cough and asthma, common cold, leech	16	28	0.44
intestinal and parasitic infection	Tap worm, ascarisis	6	49	0.89
dermal	Dandruff, wound, skin rash, body swell, bone broken	8	58	0.87
	Leprosy goiter, ring worm mouth rash Athletes foot			
Cultural related	Eye vile, feberal ilnes, headache, preventing snake	18	64	0.73

4.5. Fidelity Level Index (FLI)

Fidelity level (FL) quantifies the importance of a species for a given purpose. Hence, fidelity level values were calculated for commonly used individual medicinal plants against the following ailments: *Justicia schimperiana*(against snake biting and Rabbis) *Nicotiana tabacum* L.(against leech) *Asparagus africanus* (against retained of placenta) *Croton macrostachyus* (against eye vile), *Stereospermum*

kunthianum (Tonsil, scorpion biting), *Momordica foetida*. *schum* (against Bleeding during delivery) *Myrsine melanophloeos* (against blackleg) *Euphorbia abyssinica* (against Hemorrhoid, gonorrhea) *Paveonia urens* (against Rheumatic, tooth ache) and *Protulaca sp.*(against Gastritis). The fact that these medicinal plants had the highest FL values which could be an indication of their good healing potential (Table 8).

Table 8. The relative healing potential of individual medicinal plants used against human or livestock ailments.

No	Medicinal plants species	Aliments treated	IP	IU	FLI (%)	Rank
1	<i>Croton macrostachyus</i>	Evile eye	52	58	89.6	4 th
2	<i>Justicia schimperiana</i> (Hochst. ex Nees) T. Anders.	Snake biting, rabbis	47	47	100	1 st
3	<i>Nicotiana tabacum</i> L.	Leech,	45	48	93.75	2 nd
4	<i>Asparagus africanus</i> (kunth) Baker	Retained placenta	38	41	92.6	3 rd
5	<i>Myrsine melanophloeos</i>	Black leg	37	45	82.22	7 th
6	<i>Stereospermum kunthianum</i> Cham.	Tonsil, scorpion biting	31	35	88.57	5 th
7	<i>Euphorbia abyssinica</i> J.F Gmel	Hemorrhoid, gonorrhea	29	37	78.38	8 th
8	<i>Momordica foetida</i> .schum	Bleeding during delivery	26	31	83.8	6 th
9	<i>Protulaca sp.</i>	Gastritis	21	29	72.4	10 th
10	<i>Paveonia urens</i> scav	Rheumatic, tooth ache	19	25	76.0	9 th

4.6. Medicinal Use Value

While some plant species are known to treat a single ailment, some others may be used for multiple of health problems. Medicinal use value is a quantitative method that demonstrates the relative importance of species known locally [19].

Some species that were cited for more than one ailment were selected and their use value was calculated. Results of use value computation for these species showed that *Croton macrostachyus* and had the *Carissa spinarum* highest use value (Table 9). The informant consensus values also indicated that the people share the knowledge of the most important medicinal plant species to treat the most frequently encountered diseases in the community. Moreover, most medicinal plant species have least use values in the study

area, which could not mean that they are less effective to treat ailments. This is because the few effective medicinal plant species are reported by one or two healers. In this case, the knowledge is very secret. This suggests that these species are used to treat many ailments. For example, *Croton macrostachyus* was reported to treat ailments such amoeba, evil eye, febrile illness, wound, prevent snake, skin infection and malaria. On the other hand was *Carissa spinarum* L. reported to treat snake biting, ascarises, malaria, gonorrhea, Amoeba, febrile illness and diarrhea. *Justicia schimperiana* was reported to treat ailments such as snake biting, anti-toxic stabbing malaria, rabbis and typhoid's. *Stereospermum kunthianum* was reported to treat ailments such as scorpion biting, retained plasta, gasterite, tosile, snake biting and stomachache.

Table 9. Use Value of Certain Medicinal Plants in Study Area.

Plant species	Use citation(U)	Number of informants(n)	Use value (Uv)
<i>Croton macrostachyus</i>	7	23	0.35
<i>Carissa spinarum</i> L.	7	19	0.37
<i>Stereospermum kunthianum</i> Cham.	6	12	0.50
<i>Justicia schimperiana</i> (Hochst. ex Nees) T. Anders	6	14	0.43

Plant species	Use citation(U)	Number of informants(n)	Use value (Uv)
Vernonia amygdalina Del.	5	12	0.42
Combretum collinum	5	13	0.38
Paveonia urens cav	5	15	0.33
Cordia africana Lam.	5	23	0.22
Solanu nigrum	4	11	0.36
Kalanchoe petitiiana A.Rich	4	9	0.44
Gardenia lutea Fresen.	4	12	0.33
Allium sativum L.	3	7	0.43
Clusia abyssinica Jaub. and Spach	3	5	0.60
Coffea arabica L.	3	25	0.12
Ximenia caffra.sond	3	8	0.38
Nicotiana tabacum L.	3	7	0.43
Ruta chalepensis L.	3	19	0.16
Eucalyptus globulus.Labil.	3	20	0.15
Zingiber officinale Roscoe,	3	15	0.20
Clematis hirsuta perr and Guill	3	12	0.25
Euphorbia abyssinica J.F Gmel	3	4	0.75
Linum usitatissimum L.	3	11	0.27
Oncoba spinosa Forssk.	3	9	0.33

5. Conclusion

Dibati woreda is one the most rich medicinal plant species and the associated indigenous knowledge. In this study area 39 family, 62 genera and 65 medicinal plant species were recorded. Of these, 48(47.6%) and 17(21.9%) of the species were reported as seeing used to treat human ailments and livestock respectively, while 30.5% of them were reported to treat both livestock and human ailments. The majorities of these medicinal plant species were obtained and collected 48 from wild, 17 from home garden. Analysis of growth forms of these medicinal plants that herbs constitute the largest category 24(36.9%) followed by tree 18(27.69%) shrub 16(24.61) and climber 7(10.76%) plant species. Herbal remedies are prepared from fresh materials 45(62.23%) and dried plant materials 8(12.30%) and in both condation 18(18.46%). In the study area, 72 ailments were reported (57 for human and 15 for livestock) which are being treated by traditional medicinal plants of the area.

Leaves were the most frequently used plant parts followed by roots for preparation of human and livestock remedies.

Most of the medicinal plants are administered orally (54.4%) and followed dermal (7.69). The most widely used method of preparation was crashed (23.07%), Pounding (20%), squeezed (15.4%), chewing (10.7%) crushed pounded, cocking, smoking eating of the different medicinal plant parts.

The shinasha people of Dibati Woreda are rich with indigenous knowledge in using, conserving and managing plant resources in general and medicinal plants in particular. They have a wide knowledge in using plants for various purposes such as for medicine, food, household utensils, fodder, fuel, construction, etc. This knowledge is transferred from elders to youngsters entirely through oral traditions and personal experiences. But this way of knowledge transmission will lead to distortion of the original knowledge or total disappearance of the practice. The major threats to medicinal plants and the associated knowledge in the study area are mainly agricultural expansion, firewood collection, population pressure, over gaze ring, urbanization, household tool construction, charcoal production and medicinal purpose. Therefore, use and management system awareness rising should be made among the healers so as to avoid erosion of the indigenous knowledge and to ensure its sustainable use.

Appendix

Table 10. Lists of medicinal plants used to treat human in the Dibati woreda by shinasha people.

Scientific Name	Family	Local Name	Parts used	Disease Treated	Mode of Preparation and dose
Acacia abyssinica hochst.ex. Benth.	Fabaceae	Sipa/ Grara	Leaf	Nose bleeding	Squeeze flashy leaf and drop to nostrils for 3-5 days
			Root	Eye vile	Root is crushed and fumigated during the night time for 3 day.
				Abdominal pain	Crash the bulb and mixed with honey take a tea of spoon in each morning for 2 days
Allium sativum L.	Alliaceae	Nas' shink'urt'a	Bulb	Common cold	Crashing the bulb and swallow it. Additional insert the bulb in nostrils
				Snake bit	Crashing the bulb and put it on the site of bites and tide it
				Wound	The leaf is crashed then drink one glass for 3-5 days
Carduus schimperii Sch. Bip. ex A. Rich	Asteraceae	Gali koshoshela	Leaf		
			Root	Snake bit	Root is crushed, pounded then mix with water and drink one cup during the biting time
Carissa spinarum L.	Apocynaceae	Awawa/Agam	Root	Snake biting	The root is pounded, squeezed and drink one cup during biting time
			Root	Ascaries	The root is crushed then drink one cup for 3 day.

Scientific Name	Family	Local Name	Parts used	Disease Treated	Mode of Preparation and dose
Clutia abyssinica Jaub. and Spach	Euphorbiaceae	Batska/feyele feg	Root	Malaria	The root is pounded squeezed and drink one cup of coffee for 3 days before eating any food.
			Root	Gonorrhea	Root is crushed and mixed with water then drink one cup for 5 day.
			Root	Fibril illness	Crashed the root then burned for continuous every night time for 3 day.
			Root	Amoeba	Crashed the root and smashed then drink one cup for 3-5 days
			Leaf	Diarrhea	Crashed the leaf and smashed then drink one cup for 3-5 days
			Leaf	Prevent snake	The leaf is pounded then burn in the house.
			Leaf	Ear disease	The leaf is pounded, squeezed and then its drop through ear.
			Leaf	Dandruff	The leaf is pounded, squeezed and creamed affected part until recovery for 3-5 day.
Coffea arabica L.	Rubiaceae	Buna	Leaf	Asthma	The leaf is crashed then drink one cup for 3 days before eating food.
			Seed	Fire burn	The seed is roasted, crushed, powdered and applied on wounded
			Seed	Diarrhea	The seed of Coffea arabica is roasted, crushed, powdered, boiled and the filtrate one cup of tea, mixed with few drop of oil then drunk.
Cordia africana Lam.	Boraginaceae	Baaja/Wanze	Root break	Diarrhea with blood	The root and the break crashed then drink two galas for 2 day.
			Break	Stomach Pain	Crashing the break then pounding and extract the liquid drink one glas for 3-5 day.
			Break	Liver diseases	The break is crushed, pounded then mix with water and squeezed then drink one cup for 3 day.
			Root	Tonsils	The root chewing before eating food for 3 day.
			Break	Bleeding during delivering	The break crashed pounding then extract the liquid drink it one cup for once
			Leaf	Skin diseases	The leave of shoot is squeezed and the content is dropped on infected sited
				Prevent snake	The epiphyte is burn in the area of snake
			Epiphyte	Eye vile	The epiphyte is fumigate in the people is attack with it during starting time.
Croton macrostachyus Del.	Euphorbiaceae	Baroha/Bisana	Leaf	Fibril illness	The collect epiphyte then fumigate every night for 3 day.
			Leaf	Malaria	The leaf cocking then one cup drinks the liquid for 3 day.
				Amoeba	Crushed the break and mix with water and squeezed then drink one cup for 2 day.
			Break	Eye disease (trachoma)	The beak is crashed; pounding then washed the face morning for 3 day.
			Snap	Wound	The fresh latex is applied on the Infected part
			Fruit of snap	Hemorrhoids.	The fruit snap added on Hemorrhoids area.
Solanu nigrum L.	Solanaceae	Ump'ap'a/ embay	Root	Stomach ache	The root of is chewing and swallowing during the feeling of ache for 3 day
			Root	Scorpion biting	The root is chewing and swallowing during biting time.
			Leaf	Cough	The leaf is pounded, powdered and mixed with honey and then drunk for 3 days.
Datura stramonium L.	Solanaceae	Eelefila/Astenager	Leaf	Dandruff	The fresh leaf is squeezed and creamed affected part until recovery for 3 day.
				Wound	The leave crashed and applied to affected area for 5 day.
			Root	Common cold	Crashed the root and mixed with sugar then extract drink one gales for 3 day.
Eucalyptus globulus Labill,	Myrtaceae	Nas' Baahirzaafiya	Leaf	Fibril illness	The leaf is crashed then burn on fire in fumigate every night for the 3 day.
			Root	Dry Cough	The root crushed and pounded then mixed with water and squeezed then drink one glass for 3 day.
				Snake bit	The crushed the leaf then pounding drinks one glass during biting time.
			Leaf	Antitoxic	The crushed the leaf then pounding drinks one glass during taking any chemical time.
			Root	Wugat/ Stabbing pain	The root is crashed and mixed with honey and drink one gales for 3-5 day
Justicia schimperiana (Hochst. ex Nees) T. Anders.	Acanthaceae	Simiza	Leaf	Malaria	The leaf is crashed and mixed with water then extract the drink one gales for 3 day.
			Root	Rabbis	The root crashed pounding then drink one cup for 3 dyes
			Root	Snake bit	Crashed the root and pounding the drink one cup during biting time.
			Root	Typhoid	Root is crushed then mixes with water and squeezed one cup

Scientific Name	Family	Local Name	Parts used	Disease Treated	Mode of Preparation and dose
<i>Ficus sur</i> Forssk.,	Moraceae	Eetsa/Shola	Break	Rh factor	drink for 5 day. The break is pounded and smashes then drink one glass for 7 day during 6 month pregnant mother.
<i>Lagenaria siceraria</i> (Mol.) Standl	Cucurbitaceae	S'oola/Qel	Leaf	Snake bit	Crashed the leaf part then drink during biting time.
<i>Ximenia caffra</i> . Sond.,	Olaceaceaea	Kula /Enkoye	Steam	Herpes zoster	Dried steam baker powder mixed with butter is applied it.
<i>Melia azedarach</i> L.	Meliaceae	Mimiya	Break	Amoeba	Cashed the break then drink one glass for 3-5 days.
			Root	Gonorrhea	Crashed the root and filter then drink one cup for 3-5 days
			Leaf	hypertension	The leaf are eaten during starting hypertension
			Leaf & steam	Snake bit	The whole part is powdering then drink one galas during biting time
<i>Nicotiana tabacum</i> L.	Solanaceae	Tumbaka / Timbaho	Leaf	Toothache	The leaf of is chewed and hold by the infected teeth during the feeling of ache
				Malaria	The leaves are crushed and mix with water then squeezed one cup and drink one cup for 3 day.
<i>Catha edulis</i> (Vahal.Forssk.ex.Endl.	Celastraceae	C'atiya	Leaf	Diarrhea	Chewing the leaf mixed with honey coffee or sugar 50g for 3 day.
				Common cold	Chewing the leaf mixed with honey coffee or sugar 50g for 3 day.
			Seed	Eye vile	The seed of Ruta chalepensis with Allium sativum and mixed with hyena liver are finely crushed together and sniffed at the sickness time.
<i>Ruta chalepensis</i> L.	Rutaceae	C'ilatama/ Teneadam	Seed and leaf	Stomach ache	The seed and leaf Squeezed and drunk the juice during stomach ache.
			Leaf & Seed	Nasal bleeding	The seed and leaf. is crushed and sniffed
<i>Sida schimperi</i> Hochst. ex. A. Rich	Malvaceae	Jinigita /Chifreg	Leaf and Root	Wound and Tumors (nekersa)	The leaf and root is pounded, powdered and then applied on it.
			Root	Scorpion biting	Chewing the root and swallowing during Scorpion biting.
			Leaf	Allergic Herpes/	The leaf is pounded, powdered and applied on affected area.
				Eye vile	The leaf is crashed then mixed with water boil that person is fumigate
<i>Vernonia amygdalina</i> Del	Asteraceae	Ga'a /Grawa	Leaf	Toothache	Chewing the leaves and hold it close to the infected during the pain.
				Abdominal Paine	Crashed leaves in the powder and mix with water then drink it for 3 day.
			Leaf	Athletes foot	The leaf is crushed, squeezed and creamed on affected part for continuous days.
			Leaf	Wound	The leaf is crashed and pounding then dropped on wound area for 5 days
			Leaf	Amoeba	The leaf is crashed and pounding then drink one cup for 5 days
<i>Combretum collinum</i>	Combretaceae	Shondoh a/ abalo	Epiphyte	Fibril illness	The epiphyte is collected then fumigated by fire for 3 day every night
			Epiphyte	Tumor	The epiphyte is burn on the tumor area and necklace on the neck on Friday and Wednesday.
			Bark	Stabbing pain	The bark is crushed and pounded then mix with water, squeezed one cup drink for 3 day before food eating.
<i>Kalancheo petitiiana</i> A.Rich,	Crassulaceae	Andahula	Root	Ear disease	The root is squeezed and added few drops through ear
			Leaf	Body swelling	The leaf is first heated put on affected part for 3 day.
			Root	Toothache	The fresh root is giving for chewing
			Root	Tonsillitis	Crushed the root and mixed with water then drink oral for 3 day.
<i>Rehamnus prinoides</i> L. Herit	Rhamnaceae	Geshiya	Leaf	Liver disease	The leaf is pounded, powdered, mixed with honey and then eaten for 3 days before food
				Common cold	The bulb is mixed with honey they can drink one cup for 3 days.
<i>Zingiber officinale</i> Roscoe,	Zingiberaceae	Zaanijibila /Ginger	Bulb	Abdominal pain	Direct eating or crushed and mixed with tea and drink for 3 day.
				Weakness of sex	The bulb is crushed and mixes with (borde) then drink one cup before starting sex.
			Whole part	Wound	The root and leaf is pounded, powdered and mixed with butter and creamed affected part until recovery for 5 day.
<i>Clematis hirsuta</i> perr and Guill	Ranunculaceae	Fitiya/Yeazo Areg	Steam	Toothache	The stem is brush the teeth or hold by the affected teeth during feeling.
			Leaf	Headache	The leaf is crushed and sniffed at the sickness time
			Break	Evil eye	The dried root steam break allium sativum power mixed with water is given oral.
<i>Gardenia ternifolia</i> Schumach.&Thonn.,	Rubibaceaea	Gaaba /Gambilo	Root	Malaria	Crashed the root, pounding then drink one cup for once day in morning.
			Steam	Toothache	Chewing the leaves and hold it close to the infected during the

Scientific Name	Family	Local Name	Parts used	Disease Treated	Mode of Preparation and dose
Ocimum utisinamum L.	Lamiaceae	Damakessi	Leaf and root Steam Leaf Snap	Amoeba Tooth ache Fibril illness Hemorrhoid	pain. Crashed the root and leaf then pounding drink one cup of coffee drink for 3 day. The steam boil with fire then put on the teeth and catch for 5 mint The fresh leaf is squeezed and added in tea or coffee and drunk. The snap that drop on the hemorrhoid. area for 2-3 day
Euphorbia abisanic J.F.Gmel.	Euphorbiaceae	Eebreera /Qulquale	Snap	Gonorrhea Rabbis	The snap that mixed with powder of teffe dried then mixed in small amount of bored drink it. The snap that mixed with powder of <teffe> dried then mixed in small amount of bored drink it.
Jatropha curcas.L.	Euphorbia ceae	Arawi k'e'ha	Seed	Rabbis	Eaten the seed one for 3 day.
Dichrostachys cinerea.l	Fabaceae	Uunga (ader)	Root	Biting of spider Helment (parasiticworam)	Crashing the root then drink one glass for 3-5 days. Crashing the root then mix with water drink one cup 1-2 daye
Paveonia uren. scav	Malraceae	Shukura (abelalit)	Root	Amoeba Rheumatism	Crashed the root then pounded and drink one cup for two days. Crushed the root and mixed with, 'hen wete'/doro wet" then drink one glass for 3 day.
Secuidaca longe pedunculta	Polygalceae	Sik'ida /temenay	Root	Toothache	Chewing the leaves and hold it close to the infected during the pain.
Ficus vasta Forssk	Moraceae	Dogna (warka)	Small bud	Snake bit	The root is crushed and mixes with water then drinks one glass during biting time.
Cucurbita pepo L.	Cucurbitaceae	Maat'i aawa/ Duba ferre	Seed	Eye vile	Digging and cutting the root then smoking in the home
Stereospermum kunthianum Cham.	Bignoniaceae	Shoola/ washeti	Break	Tonsil	Cutting and chewing the small buds before eating any food for 1-2 days.
Protulaca sp.	Portulacaeae	Kaa'wa /kema/	Steam and leaf	Tap worm	One of the coffee cup Eating the seed before eating any food for 3 day
Lablab purpureus	Febaceaea	Eep'a	Seed	Scorpion bit Retained placenta Gastritis Ton ensile Snake biting Stomachache	Chewing the break during the scorpion biting Crashed the break and mixed with bored drink one galas it Crashing the break before food eating for 3 dayes Chewing the break during the starting the disease for 3 day. Crushed the break and mix with water and squeeze the drink one cup during biting time Crushed the break and mix with water and squeeze the drink one cup for 3 day.
Trignoellfoenum graecum	Fabaceaea	Gira/ abish	Seed	Gastritiss	Crashed the whole part and mixed with water squeezed then drink before food for 3 day.
Combretum molle.	Combretaceae	Bogoha/ bagore /	Break	Malaria	Cooking the seed and drink water for two day
Momordica foetida. Scum.	Cucurbitaceae	Beda	Bulb	Bone break	Cooking the seed crashed and add ox or cow leg then drink one glass for 3 day.
Linum usitatissimum L.	Linaceae	Keet'a Telba	Seed	Abdominal Paine Kurtmat /Rheumatism Fiber illness Bleeding during birth	Crashed the seed juice by mixed it with water then add hone to drink one glass for 3 day. Pounding the break drink one cup of coffee for 3 days Crashed the bulb and burn with fire fumigate it Crashing the bulb then pounding extract and drink one cup during bleeding.
Clausena anisata (Willd.) J. Hk. ex Cyathula polycephala Bak.	Rutaceae	Lemeche	Root	Amoeba	Crashing the bulb then pounding extract and drink one cup for 3 day.
Jasminum abyssinicum Hochst. ex DC.	Oleaceae	Tenbelel	Leaf	Gastric	The seed is crushed, powdered, mixed water and sugar and then drunk during feeling pain for 3 day.
Ocimum basilicum L.var.	Lamiaceae	Joma/Zqaqeb	Leaf	Retained Placenta Intestinal wound	The seed is mixed water and boiled and then drunk the solution is cooled that time Crushed the seed in to powder and mix with water the drink a glass of juces before food each morning until recovery
				Evil eye	The fresh root is crushed and mixed With water and drunk.
				Skin rash ("chiffiee)	The leaf is crushed, squeezed and the pure solution is applied on affected body part until recovery
				Infertility	The leaf is pounded, squeezed and drunk the pure liquid for 5 days
				Tap worm	The leave is crushed, mixed with water and then patient will drink a glass for 3 day every morning.
				Sudden sickness	The fresh leaf of is chewing and swallowing during feeling pain

Scientific Name	Family	Local Name	Parts used	Disease Treated	Mode of Preparation and dose
Tamarindus indica L.	Fabaceae	Aabay guutsa /Mserech	Leaf	Wound	The leaf with Croton macrostachyus is pounded, powdered and applied on the wounded parts for 3 day.
Rumex abyssinicus	Polygonaceae	Ambat'a /mokemoko	Root	Ring worm	The root of Rumex abyssinicus is pounded, powdered, mixed with solution of Citrus limon and creamed on affected part
Asparagus africanus Lam	Asparagaceae	Eliya Yeset keset	Root	hypertension	Crushed the root in to powder mix with the bulb of allium staivum add the mixture into the boiled water and dink the hot decoction into a cup for 3 day.
Anogeissus leiocarpa Guill. And Perr.	Combretaceae	Anususa/ Kerkera	Root	Retain of placenta	Crashed the root and pounding then extract and drink one galas during this time
Allium cepa L.	Alliaceae	Birshnk'urat'a/Key shenkrt	Break	Stomachache	The root is chewing and swallowing
Capparis tomentosa.Lam.	Fabaceae	Bac'up'aGumero	Bulb	Retain of placenta	Crashed the break and pounding then extract and drink one galas during this time
lepidium sativum L.	Alliaceae			Hypertension	The blub is crushed and immersed in little water for 1 day and then filtrated by clean cloth and drunk before food
Pterolobium stellatum	Fabaceae	Kentefa	Root	Eye vile	Crushed the root and put on the fire and smoke the bed room of the patient during night time for 3 day.
Withania somnifera	Brassicaceae	Siimbila/feto	Seed	Abdominal pain	Crushed the seed and mix with injera and eating for 3 dayes
Syzygium guineense (Wild.)Benth	Fabaceae	Gizawa	Leaf	Ascariasi	Crushed the seed then drink one cup for one day.
Oncoba spinosa Forssk.	Somniferaceae	Daak'uwa/Doqema	Leaf	Goiter	Crushed the leave mixed with butter then the paste and tide it and cover it for 5 day.
Vernonia theophrastifolia Schweinf ex.Oliv&Hiern	Bignoniaceae	Aas'i	Blub	Eye vile	Smoke the enter body of the patient with dried leaf.
Dicrocephale latifolia Breonadia salicina (Vahl.Heppehr&wood	Flacourtiaceae	Eegidima	Leaf	Diarrhea	Crashed the leaf and squeezed drink one cup for 3 day.
Premna schimperi Engl.	Asteraceae	Koshamiya	Leaf	leprosy	Dried leaf powder mixed with honey I applied 3 day.
Myrsine melanophloeos	Asteraceae	Dijiha	Break	Wound	Crush the bulb the added to the wound for 3 day.
Bersemia abyssinica. Fresen.	Rubiaceae	Chocho	Leaf	Abortion	Crashed the bulb mixed with water and drink one glass for once.
Celosia trigyna L.	Verbenaceae	Aluwangisha	Root	Retain of placenta	Crashed the bulb mixed with water and drink one glass for once during the birth.
	Myrsinaceae		Root	Fiber illness	Crushed the leaf then fumigate for 3 day every night.
	Asteraceae		Leaf	Snake biting	Crashed the leaf then drink one cup oral during biting snake.
	Rubiaceae		Break	Trachoma	Crashed the break and pounding and washed the face ever morning for 3 day.
	Verbenaceae		Leaf	Common cold	The leaf is pounded and sniffed
			Root	Eye disease	Squeeze the leaf and drop of the extract on affected eye for 3 day
			Root	Caught	The root is pounded, mixed with sour milk or ergo" and boiled and then drink for 3 day.
			Root	Cancer	Crashed the root and mixed with 'bordi' the drink one galas for 3 day.
			Break	Snake bit	Crashed the root pounded and drink one galas during biting time
			Seed	Snake bit	Crashed the break pounded and drink one glas during biting time.
			Seed	Tap worm	Crashed the seed and make ball size then mixed Lablab purpureus swallowing 3 for one day.

Table 10. Continued.

Scientific Name	Route of application	Habit	Condition of preparation	Season of availability	Source	Distribution	Collation No.
Acacia abyssinica hochst.ex. Benth.	Nostril	Tree	Fresh	Both	Wild	Com	Ab/022
Allium sativum L.	Fumig ated	Herb	Fresh	Both	Home	Co	AB/060
Carduus schimperi Sch. Bip. ex A. Rich	Oral	Herb	Fresh	Both	Wild	Co	AB/021
Carissa spinarum L.	Oral nostril	Shrub	Both	Both	Wild	Medim	AB/002
	Derma						
	Dermal						
	Oral						
	Oral						
	Oral						
	Oral						
	Fumigate						
	Oral						
	Oral						

Scientific Name	Route of application	Habit	Condition of preparation	Season of availability	Source	Distribution	Collation No.
Clusia abyssinica Jaub. and Spach	Fumigate Ear Dermal Oral	Shrub	Both	Both	Wild	Med im	AB/034
Coffea arabica L.	Dermal Oral Oral Oral	Shrub	Both	Both	Home garden	Rare	AB/023
Cordia africana Lam.	Oral Oral Oral Dermal Fumigate fumigate	Tree	Both	Both	Wild	Com	AB/010
Croton macrostachyus Del.	Fumigate Oral Oral Dermal Dermal Dermal	Tree	Both	Both	Wild	Com	AB/028
Solanum nigrum L.	Oral Oral Oral Dermal Dermal	Herb	Fresh	Both	Wild	Rare	AB/030
Datura stramonium L.	Oral Dermal Dermal Oral	Herb	Wild	Fresh	Rare	Rare	AB/003
Eucalyptus globulus Labill.	fumigate Oral Oral Oral	Tree	Home	Fresh	Both	Com	AB/056
Justicia schimperiana (Hochst. ex Nees) T. Anders.	Oral and derma Oral Oral Oral Oral	Shrub	Wild	Fresh	Both	Med	AB/031
Ficus sur Forssk.,	Oral	Tree	Wild	Fresh	Both	Rare	AB/054
Lagenaria siceraria (Mol.) Standl	Oral	Climber	Home garden	Fresh	Wet	Medium	AB/057
Ximenia caffra. Sond.,	Dermal Oral Oral	Shrub	Forest	Wild	Both	Rear	AB/055
Melia azedarach L.	Oral Oral Oral	Tree	Home	Fresh	Both	Com	AB/007
Nicotiana tabacum L.	Oral Oral Oral	Herb	Home	Both	Both	Rear	AB/058
Catha edulis (Vahl. Forssk. ex. Endl.)	Oral Oral Nasal	Shrub	Home garden	Fresh And dry	Both	Medium	AB/053
Ruta chalepensis L.	Oral Nasal	Herb	Home	Fresh	Wet	Med	AB/004
Sida schimperi Hochst. ex. A. Rich	Dermal Oral Dermal Fumigant	Herb	Wild	Fresh	Both	Rare	AB/006
Vernonia amygdalina Del	Oral Oral Dermal Dermal Oral	Shrub	Wild	Fresh	Both	Medium	AB/018
Combretum collinum	Fumigate Burn Oral Ear	Tree	Wild	Fresh	Both	Rare	AB/008
Kalanchoe pinnatifida A. Rich.	Dermal Oral Oral	Herb	Wild	Fresh	Wet	Rear	AB/

Scientific Name	Route of application	Habit	Condition of preparation	Season of availability	Source	Distribution	Collation No.
Rehamnus prinoides L. Herit	Oral	Shrub	Home	Both	Both	Rare	AB/025
Zingiber officinale Roscoe,	Oral	Herb	Home	Both	Both	Rare	AB/048
Clematis hirsuta perr and Guill	Oral Dermal Tooth surfac Nasal	Climber	Wild	Fresh	Wet	Rare	AB/013
Gardenia ternifolia Schumach.&Thonn.,	Oral Nasally	Shrub	Wild	Fresh	Both	Rare	AB/012
Ocimum utisinamum L.	Oral Oral & fumigate	Shru	Home	Fresh	Both	Me	AB/061
Euphorbia abisanic J.F.Gmel.	Oral Oral	Shrub	Home	Fresh	Both	Rear	Photo
Jatropha curcas.L.	Oral	Shrub	Home	Dry fresh	Both	Mediu	AB/051
Dichrostachys cinerea.l	Oral	Shrub	Wild	Fresh	Both	Rear	AB/014
Paveonia uren. scav	Oral Oral Oral	Climber	Wild	Fresh	Wet	Rare	AB/040
Secuidaca longe pedunculta	Fumigate	Tree	Wild	Fresh dry	Both	Rare	AB/032
Ficus vasta Forssk	Oral	Tree	Wild	Fresh	Both	Rear	AB/020
Cucurbita pepo L.	Oral	Climber	Home	Both	Both	medium	AB/049
Stereospermum kunthianum Cham.	Oral Oral Oral	Tree	Wild	Fresh	Both	Medium	AB/047
Protulaca sp.	Oral	Herb	Home garden	Fresh	Both	Med ium	AB/027
Lablab purpureus	Oral	Climber	Home garden	Fresh	Wet	Mediu	AB/026
Trignoellfoenum graecum	Oral	Herb	Home garden	Dry	Both	Medium	
Combretum molle.	Oral	Tree	Wild	Fresh	Both	Medium	AB/038
Momoridica foetida.Scum.	Fumig ate Oral Oral	Herb	Wild	Fresh	Wet	Rear	AB/059
Linum usitatissimum L.	Oral Oral	Herb	Home garden	Both	Both	Rare	AB/042
Clausena anisata (Willd.) J. Hk. ex	Oral	Tree	Wild	Fresh	Both	Rare	
Cyathula polycephala Bak.	Dermal	Herb b	Wild	Fresh	Wet	Common	AB/035
Jasminum abyssinicum Hochst. ex DC.	Oral	Climber	Wild	Fresh	Both	Rare	AB/001
Ocimum basilicum L.var.	Oral	Herb	Home garden	Fresh	Wet	Rare	AB/050
Tamarindus indica L.	Dermal	Shrub	Wild	Fresh	Both	Medium a	AB/041
Rumex abyssinicus	Oral	Herb	Home garden	Dry	Wet	Rear	
Asparagus africanus Lam	Oral	Herb	Wild	Fresh	Wet	Rear	AB/033
Anogeissus leiocarpa Guill. And Perr.	Oral	Tree	Wild	Fresh	Both	Rare	AB/009
Allium cepa L.	Oral	Herb	Home garden	Fresh	Both	Medium	AB/005
Capparis tomentosa.Lam.	Fumigated	Shrub	Wild	Fresh	Both	Rear	AB/019
lepidium sativum L.	Oral Oral	Herb	Home garden	Dry	Both	Rare	
Pterolobium stellatum	Tide	shrub	Wild	Fresh	Both	Medium	AB/029
Withania somnifera	Fumigated Oral	shrub	Wild	Both	Both	Rare	AB/046
Syzygium guineense	Dermal	Tree	Wild	Both	Dry	Common	AB/036

Scientific Name	Route of application	Habit	Condition of preparation	Season of availability	Source	Distribution	Collation No.
(Wild.)Benth							
Oncoba spinosa Forssk.	Dermal Oral	Herb	Wild t	Fresh	Wet	Rear	AB/048
Vernonia theophrastifolia Schweinf ex.Oliv&Hiern	fumigate	Shrub	Wild	Fresh	both	common	AB/048
Dicrocephale latifolia	Oral	Herb	Fresh	Wild	Wet	Co	AB/052
Breonadia salicina (Vahl.Heppehr&wood	Dermal	Tree	Fresh	Wild	Both	Rare	AB/024
Premna schimper Engl.	Nasal Dermal Oral	Shrub	Fresh	Wild	Both	Rare	AB/044
Myrsine melanophloeos	Oral Oral	Tree	Fresh	Wild	Both	Rare	AB/017
Bersema abyssinica. Fresen.	Oral	Shrub	Fresh	Wild	Both	Rare	AB/044
Celosia trigyna L.	Oral	Herb	Fresh	Wild	Both	Rare	

Key: (Hb=Habit, Pu=Parts used, Ut=Used to treat, Cp=Condition of preparation, Ra= Route of application, T=Tree, H=Herb, Sh=Shrub, Cl=Climber, F=Fresh, D=Dried, F/D=Fresh/Dried, O=Oral, Dm=Dermal, Na=Nasal, Er=Ear, L=Leaf, Rt=Root, St=Stem, Ba=Bark, Fr=Fruit, S=Seed, Bu=Bulb, La=Latex, Ds=Distribution, C=Common, M=Medium R=Rare, Sa Season of ability, W=Wet=D=Dry=B=Both season.

Table 11. Lists of medicinal plants used to treat livestock ailments in the Dibati woreda by shinasha people.

Scientific Name	Family	Local Name	Part of used	Disease treated	Mode of preparation and dose
Rhamnus Prinoides	Rhamnaceae	Gesho	Leaf	Leech	The fresh leaf of Rhamnus Prinoides is pounded, squeezed and added few in the mouth for one day in morning.
Ficus vasta Forssk	Moraceae	Doogina/warka	leaf	Wound	The fresh leaf of Ficus vasta is pounded, squeezed and creamed the affected part.
Anarrhinum forskorlii	Scrophlariaceae	Shukura	Whole parts	Coccidiosis	The whole parts Anarrhinum forskorlii expect roots with Allium sativum is pounded and immersed for 1 days and drunk
Grewia ferruginea Juss.	Tilaceae	K'oriya	Leaf	Retained placenta Bloating	The fresh leaf of Grewia ferruginea is pounded, squeezed and drunk Crashed leaf mixed with water and salt drink it
Nicotiana tabacum.L	Solanaceae	Tumbaka Timbaho	Leaf	Leech	Crush dry leaves mix with water and give it to cattle as drink one galas morning
Justicia schimperiana T.Anders.	Acanthaceae	Simiza	Root	Rabbis Coccidiosis	Crushed the root then drink one cup for 2-3 day. The root crushed then mixed with water and drinking morning for 3 day.
Melia azedarach	Meliaceae	Mimiya	Leaf	White cholera New castle	The leaf crushed then mixed with water drink during morning time for 3 day. The leaf is crushed then mixed with water and drink oral
Cucurbita pepo.L	Cucurbitaceae	Maat'i aawa Duba fere	Leaf and climber	Bloating	The leaf and climber is burn then mixed with water and extract drinking before eating any grass for 2-3 day.
Myrsine melanophloeos	Myrsinaceae	Aalwangisha	Leaf	Black leg	The fresh leaf is fumigated in dry place for 3-5 day.
Asparagus africanus Lam.	Asparagaceae	Eliyia Yeset keset	Root	Retain of placenta Diarrhea	Crashed the bulb mixed with water and drink one glass for once during the birth time. Crushed the break then mixed with salt then drink one glas for 3 day.
Cordia africana Lam.	Boraginaceae	Banja/ Waza	Break	Eye disease	Crushed the break and mixed with duba fere pounded and washed the eye for 3 day.
			Root	cough	Crushed the root and mixed with water egg then drink one galas for 3 day.
Carduus schimper Sch.	Asteraceae	Kooshoshila	Leaf	Mouth rash	The leaf burn then ash can mix with butter washed that mouth rash for 3 day.
Euphorbia ampliphylla J.F.Gmel	Euphorbiaceae	Eebreer a/Qulquale	Snap	Rabbis	The snap is mixed with teffe bread and salt then pounded and eaten for 3 day morning before eating any grass.
Clutia abyssinica Jaub. and Spach	Euphorbiaceae	Batska/feyele feg	Leaf	Diarrhea with blood	The leaf is crushed and mixed with salt and drink one glass for 3 day
lepidium sativum L.	Brassicaceae	Siimbila/feto	Seed	Bloating	The seed crushed and mixed with water then drink one glass for 3 day.
Clausena anisata (Willd) Beth.	Rutaceae	Lemich	Leaf	Coccidiosis	The leaf is crushed then mixed with water and given oral for the hen
Gardenia ternifolia Fresen.	Rubibaceaea	Gaaba /Gambilo	Root	Eye of cow	Crushed the root and mixed with duba fere pounded and washed the eye for 3 day.

Table 11. Continued.

Scientific Name	Route of application	Habit	Condition of preparation	Season of availability	Habitat	Distribution	Collection No.
Rhamnus Prinoidea	Oral	Shrub	Fresh	Both	Wild	Medi	AB/025
Ficus vasta Forssk	Dermal	Tree	Fresh	Both	Wild	Rare	AB/020
Anarrhinum forskorlii	Oral	Herb	Fresh	Wet	Wild	Rare	AB/040
Grewia ferruginea Juss.	Oral	Tree	Fresh	Both	Wild	Rare	
Nicotiana tabacum L.	Oral	Herb	Both	Both	Home	Medium	AB/058
Justicia schimperiana T. Anders.	Oral	Shrub	Fresh	Both	Wild	Medium	AB/031
Melia azedarach	Oral	Tree	Fresh	Both	Wild	Medium	AB/007
Cucurbita pepo L.	Oral	Climber	Fresh	Both	Home	Medium	AB/049
Myrsine melanophloeos	Fumigated	Tree	Fresh	Both	Wild	Rare	AB/017
Asparagus africanus Lam.	Oral	Herb	Fresh	Wet	Wild	Rare	AB/033
Cordia africana Lam.	Dermal	Tree	Fresh	Both	Wild	Medium	AB/010
Carduus schimperi Sch.	Dermal	Herb	Fresh	Wet	wild	Rare	AB/021
Euphorbia ampliphylla J.F. Gmel	Oral	Shrub	Fresh	Both	Home	Rare	PHOTO
Clusia abyssinica Jaub. and Spach	Oral	shrub	Fresh	Both	Home	Medium	AB/034
lepidium sativum L.	Oral	Herb	Dry	Wet	Hom	Rare	AB/61
Clausena anisata (Willd) Beth.	Oral	Tree	Fresh	Both	Wild	Rare	AB/65
Gardenia ternifolia Fresen.	Dermal	Shrub	Fresh	Both	Wild	Medium	AB/012

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