



# Medicinal Plants:-Traditional Knowledge and Practices in Some Communities of Ethiopia

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**Abstract:** In Ethiopia, traditional knowledge associated with medicinal plants are being seriously depleted due to deforestation, environmental degradation and acculturation that have been taking place. The present study documented traditional knowledge associated with medicinal plants in Decha (Keffa) and Sheybench (BenchMaji) districts of Southern Nations, Nationalities and. The objective of the study was to identify and record traditional knowledge and practices associated with the medicinal plants with special emphasis on plants with potential for bio-prospecting. The study method was interviewing selected herbal practitioners and elderly people by means of a semi-structured questionnaire and focus group discussion. Out of 146 species of medicinal plants collected from the study area, herbs (41.4%) and shrubs (35.5%) constituted the highest proportion, followed by trees (16.2%) and climbers (6.9%). Out of the total of 146 medicinal plants collected 95(64.7%) were used against human disease, 32(21.9%) of medicinal plants were used against animal disease and the remaining 18% were used for the treatment of both human and animal diseases. The results showed relatively a higher proportions of plant species were found to be used for the treatments of respiratory diseases (32.8%), followed by for the treatment of miscellaneous disease conditions such as swellings/tumors, toothache, headache, etc. (20.9%), and gastrointestinal related complaints (18.4%). The most frequent methods (95.7%) of preparation of plant medicines in the studied communities were squashing/grinding of plant parts and extracting juicy ingredients. Although there is wealth of medicinal plants and traditional knowledge that has been applied in the treatment of human and lifestalk health problems, the sustainability of these heritages has been challenged increasingly by human and environmental factors. According to some respondents the traditional medicinal practices has been discouraged by modern health care system due to fear of inappropriate dosage and safety issue. Therefore in addition to documenting traditional medicinal plants and the associated knowledge, it is important to test the scientific validity of the herbal preparations to establish appropriate dosages and conduct clinical studies to ensure the safety of the traditional medicines if we are to benefit sustainably from these heritages.

**Keywords:** Traditional Knowledge, Medicinal Plants, Traditional Medicine, Associated Knowledge, Respondents, Herbal Practitioners

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## 1. Introduction

Traditional knowledge is vital for sustainability of natural resources including forests, water, and agro-ecosystems across landscape continuum spanning from households through farms, village, commons and wilderness [1]. Humanity faces exceptional challenge of eroding natural resources and declining ecosystems services due to a

multitude of threats created by unprecedented growth and misappropriation. Misappropriation of genetic resources and traditional knowledge through intellectual property claims has effected in loss of biological resources of countries rich in the biological diversity [1, 2]. The patent claims have been made without evidence of the prior informed consent of the

people from whom these resources and knowledge were taken, and without the existence of mutual agreement on sharing the benefits from use of the resources [1, 2, and 3].

The Convention on biological Diversity (CBD) recognized the close and traditional dependence of indigenous and local communities on biological resources and the need to ensure that these communities share the benefits arising from the use of their traditional knowledge and practices relating to the conservation and sustainable use of biodiversity [3, 4]. Member governments have agreed to respect, preserve and maintain such knowledge and practices, to promote their wider application with the approval and involvement of the communities concerned, and to encourage the equitable sharing of the benefits derived from their utilization [4, 5, 6]. The Nagoya protocol on access to genetic resources and fair and equitable sharing of benefit from the use of genetic resources is a recently developed international legal framework that has given legal status to genetic resources and associated traditional knowledge [7, 8].

In Ethiopia, traditional knowledge associated with medicinal plants are being seriously depleted due to deforestation, environmental degradation and acculturation that have been taking place in the country for quite a long time [10,11,12,13]. This could ultimately result in the weakening of primary health care services in the country, as most of the people are highly dependent on plant based traditional medical practices [11, 12, 13 ]. As more and more medicinal plants and the associated knowledge are lost, the potential for the future development of modern herbal drugs could also be compromised. Thus studies are needed to salvage the medicinal plants and the associated knowledge from further loss.

Therefore the present study aims at documenting traditional knowledge associated with medicinal plants in some zones and districts of Southern Nations, Nationalities and Peoples Regions.

The objective of the study was to identify and record traditional knowledge and practices associated with the medicinal plants with special emphasis on plants with potential for bio-prospecting.

## 2. Materials and Methods

### 2.1. Study Areas

Two districts (*Woreda*) (Decha and SheyBench) with diverse plants species and community knowledge and practices were selected from Southern Nations Nationalities and Peoples Region (SNNPRs) with the help Zonal administrative and Agricultural offices of the region. The Districts are located at about 528 km and 650 km from Addis Ababa respectively. According to 2007 census, the total population of Decha district was 128,853, whereas that of SheyBench was 208,339. The annual rain fall of Decha ranges from 1165-2200 mm with altitudes of 500-3200 above sea level, whereas SheyBench district receives an annual rain fall ranging from 2111 mm-2565mm [11]. Although the

proportion differs, there are three agro-ecological zones, *Dega (Cool)*, *Woina dega (medium)* and *Kola(hot)* in both of the studied districts.

### 2.2. Methods of Data Collection

Ethnobotanical data were collected from Decha and SheyBench districts from March up to April 2016. The study was conducted by interviewing selected herbal practitioners and elderly people from 3 urban and 3 rural Kebeles (lowest administrative structures) from each district by means of a semi-structured questionnaire and focus group discussion. The interview was conducted by local languages (Bench and Kaffa) with the help of translators. During the interview session each informant was asked to give information on the type of plants, parts of the plant used, ailments treated, route of administration, ways of remedy preparation, dosage, marketability of the plant, means of knowledge transfer and charge for the medication.

### 2.3. Plant Specimens Collection and Taxonomy

Voucher specimens were collected from each of the sampled Kebele, labeled and transported to Ethiopian Biodiversity Institute (EBI) Herbarium, Addis Ababa. The specimens were identified using paired key following Flora of Ethiopia and comparing Voucher specimens displayed at the EBI Herbarium.

### 2.4. Data Analysis

Information from questionnaires was entered into SPSS 21 and descriptive statistical analysis was used to summarize the data.

## 3. Results and Discussion

### 3.1. Socio-demographic

A total of 116 respondents were involved in the study from the two different districts. Although the plan was to interview 21 respondents from each Kebele, some informants were absent during the interview from Kuka and Kusha (SheyBench districts, BenchMaji) and one respondent was included in Uffa (Decha district, Kaffa) (Table1) because it was indicated by the facilitators of the Kebele that the same was known for his herbal practices. The gender of respondents was recorded during the interview and of the total 116 respondents, 102 were males and the remaining 14 were females (Table2). Although there was a prior notice to include a fair proportion of females in the study, the number of females involved in the study was by far lower than that of males, this may be due to engagement of females in multiple activities both at home and on the farm.

*Table 1. Kebeles studied and number of respondents in the study.*

Kebeles from Decha			Kebeles from SheyBench			Total
Uffa	Beha	Kutti	Kasheta	Kuka	Kusha	
22	21	21	21	17	14	116

**Table 2.** Gender of the respondents in study.

District of respondents	Sex of respondents		
	Male	Female	Total
SheyBench	46	6	52
Decha	56	8	64
Total	102	14	116

**Table 3.** Educational Levels of Respondents.

District of respondents	Educational Level				
	illiterate	Primary	Secondary	Diploma	Total
SheyBench	25	26	1	0	52
Decha	22	30	9	3	64
Total	47	56	10	3	116

The majority 56(48%) of respondents attended primary level of education, whereas, 47(41%) respondents cannot read and write (illiterates), only 10(9%) of the respondents have an educational level of secondary education and above (Table 3).

Similarly the ages of the study respondents is given in Table 4. The majority of respondents both from Shey-Bench and Decha districts fall in the age group 31-45 years. In spite of our expectation that the number of respondents in the age group 46-60 would be more frequent in the traditional knowledge study of this kind, only 21 respondents of that age group were involved in the study. This may be due to factors such as the distance of the interview site from their homes.

**Table 4.** Age of respondents

District of respondents	Age of respondents			Total
	18-30	31-45	46-60	
SheyBench	14	28	10	52
Decha	17	35	12	64
Total	31	63	22	116

### 3.2. Floristic Diversity of Medicinal Plants

A total of 146 medicinal plant species belonging to 57 families were recorded in the study area

The most frequently reported as medicinally used families in the community are given in Table 5.

**Table 5.** Medicinal Plant families that have highest frequency of the study area.

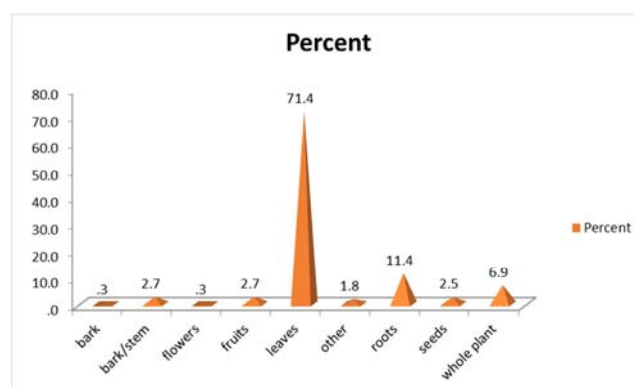
S.No	Family	Frequency	Percentage
1	Asteraceae	86	14.4
2	Lamiaceae	85	14.2
3	Ranunculaceae	40	6.7
4	Euphorbiaceae	35	5.9
5	Rutaceae	32	5.4
6	Fabaceae	25	4.2
7	Phytolaccaceae	22	3.7
8	Boraginaceae	16	2.7
9	Polygonaceae	16	2.7
10	Myrsinaceae	14	2.3
11	Solanaceae	12	2
12	Poaceae	10	1.7
13	Rosaceae	10	1.7
14	Asparagaceae	9	1.5
15	Dracaenaceae	9	1.5
16	Urticaceae	9	1.5
17	Amaranthaceae	8	1.3
18	Apiaceae	8	1.3
19	Vitaceae	8	1.3

Out of 146 species of medicinal plants collected from the study area, herbs (41.4%) and shrubs (35.5%) constituted the highest proportion, followed by trees (16.2%) and climbers (6.9%) (Fig2). Mirutse *et al* (11) documented a similar trend from Menit district in the same zone. Similarly, Maroyi(14) reported from Zimbabwe abundance of shrubs and herbs but he recorded greater number of shrubs.

### 3.3. Parts of Plants Used for the Treatment of Different Ailments

Informants of the study areas indicated that different parts of plants including leaves, roots, seeds, barks, fruits or combinations of these may be used for traditional treatment of diseases. According to the respondent's more species (71.7%) were harvested to use their leaves, followed by roots(11.4%) and whole plant (6.9%) in medicine preparation (Fig1). Previous studies from Ethiopia and elsewhere in the world (11,12, and 14) also showed similar findings.

From the total of 146 medicinal plants collected 95 (64.7%) of medicinal plants were used against human disease, 32(21.9%) of medicinal plants were used against animal disease and the remaining 18% were used for the treatment of both human and animal diseases. This result is similar to the one reported by Reta Regassa (15) and Mirtuse *et al* (11) whose reports indicated that most of the medicinal plants collected were used against human diseases.

**Figure 1.** Plant parts used for tradition medicine by studied community.

### 3.4. Type of Diseases Treated

The major health problems/disease conditions/treated by traditional medicine in the study areas are depicted in figure 2. In general, they were categorized as gastrointestinal (oral, Abdominal and intestinal), respiratory (nasal, nasopharyngeal, trachea, lung etc.), urinary/uro-genital, rabid animal bite, eye infection, skin infection, snake poison, wound and others (Fig. 2). The results showed relatively a higher proportions of plant species were found to be used for the treatments of respiratory diseases (32.8%), followed by for the treatment of miscellaneous disease conditions such as swellings/tumors, toothache, headache, etc. (20.9%), and gastrointestinal related complaints (18.4%) (Fig. 2). It could be noted from the respondents' information that one species of plant can be used to treat different ailments or different

species can be used in combination to treat a specific disease condition of human or animal diseases. Other studies from Africa and elsewhere (13, 15) recorded a similar trend of traditional medication. Mirutse (11) documented Meinit medicinal plants and found that 47% were used to treat gastro-intestinal complaints, 29% skin-related diseases and 16% respiratory system problems. Although the ailments in both Meinit and the present community were similar, the frequency of disease conditions and use of medicinal plant species in the present study areas are slightly different.

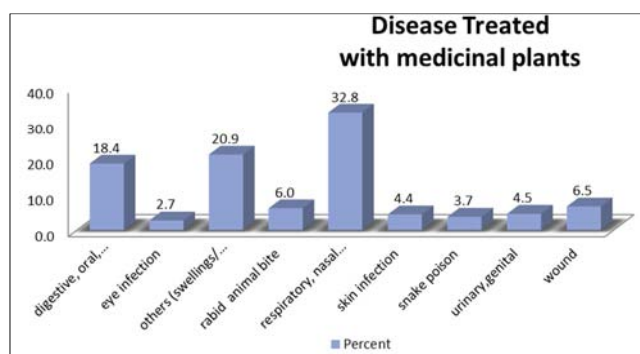


Figure 2. Diseases treated by plants.

### 3.5. Methods of Preparation of Traditional Medicines

According to the respondents the most frequent methods (95.7%) of preparation of plant medicines in the studied communities were squashing/grinding of plant parts and extracting juicy ingredients, followed by 1.6% drying and grinding to make powder for direct application on infected body parts, 1.2% direct application on infected site and 0.6% decoction and fumigating each.

### 3.6. Route of Administration

People of the studied area, mostly administer traditional medicine orally. This route of administration accounted for 69.1%, followed by dermal route of administration (12.7%), nasal route (6.5%) and the remaining administration routes such as smearing, infusion, vaginal and optical each accounted to less than 1% (Figure 3).

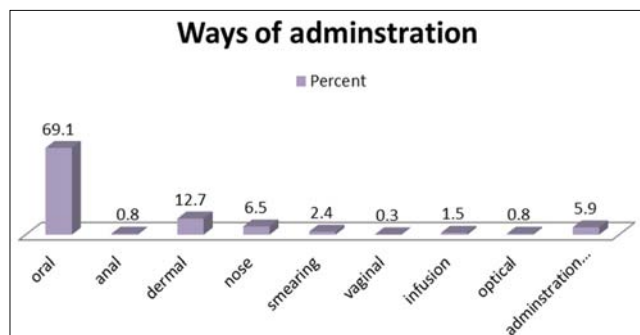


Figure 3. Ways of administration of traditional medicine.

### 3.7. Most Preferred Medicinal Plants

Of the total 146 (127 identified to the family and species

level and 19 unidentified) in the study area *Ocimum lamifolium* 52 (9.45%), *Croton macrostachyus* 26 (4.72%) and *Phytolacca dodecandra* 22(4%) were the most frequently preferred medicinal plants (Table 6).

Table 6. Preference ranking of medicinal plant in the study area.

Medicinal plant name	Frequency	Percentage	Rank
<i>Ocimum lamifolium</i> Hochst. ex. Benth	52	9.45	1
<i>Croton macrostachyus</i> Del.	26	4.72	2
<i>Phytolacca dodecandra</i> L' Herit	22	4	3
<i>Ranunculus multifidus</i> Forssk.	20	3.63	4
<i>Ruta chalpensis</i> L.	19	3.45	5
<i>Vernonia spp</i>	13	2.36	6
<i>Clematis longicauda</i> Steud. Ex A. Rich	12	2.18	7
<i>Cynoglossum lanceolatum</i> Forssk.	12	2.18	8
<i>Sature japaradoxa</i> (Vatke)Engl.	12	2.18	8
<i>Maesa lanceolata</i> Forssk.	11	2	9
<i>Rumex nepalensis</i> Spreng.	11	2	9

The respondents have indicated the different ways and means they determine the dosage of medicinal preparations used in the treatment of both human and animal diseases. Out of the total 136 medicinal plant preparations, 50.8% of them were taken by either as one fourth or half a cup, 15.7% are taken in one fourth or half a spoonful, 6% are taken in one fourth or half a glassful and in 0.3% dosage is undefined (Table 7). This result is also in line with the findings of Reta Regassa (15) which explain as local units for instance, half a cup, a full cup, were widely used to estimate and fix the amount of dosage.

Table 7. Dosages of medicinal preparations used.

Measurement	Frequency	Percent
spoon, one fourth, half etc	94	15.7
drop,	14	2.3
In cups, one fourth, half	304	50.8
In glass, half, one fourth etc	36	6.0
Other units	26	4.3
No definite quantity	101	16.9
Total	598	100.0

## 4. Conclusion

Documentation and digitization of traditional medicine knowledge is the surest means of preservation. One of the major problems with traditional medicine knowledge is the oral nature of the knowledge. Hence documentation ensures preservation of this delicate knowledge and ensures wider dissemination. It will also result in codification of best practices which can be transmitted across communities in developing countries. Documentation and digitization of traditional medicine knowledge is an effective tool for defensive protection from biopiracy as well as expropriation without compensation by multi-national pharmaceutical companies. Documentation provides evidence that a particular medicinal knowledge has developed in a particular local community thus vesting the community with claim over such knowledge as well as right to share in any profit

resulting from the commercialization of the knowledge (16). Documenting traditional knowledge associated with medicinal plants is also significant in the implementation of the third objective of CBD as well as in scientific research and development.

The large area covered by 2 districts, Decha, and Sheybench (Kaffa and BenchMaji respectively) was found to contain diverse medicinal plants and the associated traditional knowledge and practices. This is due to wide range of climatic and ecological variation as well as the presence of different ethnic community in the area. The altitude range varies from 1500-1900 m. a. s. There is also relatively low interference by human activities. Although there is wealth of medicinal plants and traditional knowledge that has been applied in the treatment of human and animal health problems, the sustainability of these heritages has been challenged increasingly by human and environmental factors. According to the respondents the traditional medicinal practices has been discouraged by modern health care system due to fear of inappropriate dosage and safety issue. More over there has been spiritual cult that confuses medicinal property of the plants, so documentation of traditional medicinal practices is crucial to refine the traditional knowledge associated with medicinal plants.

Therefore in addition to documenting traditional medicinal plants and the associated knowledge, it is important to test the scientific validity of the herbal preparations to establish appropriate dosages and conduct clinical studies to ensure the safety of the traditional medicines if we are to benefit sustainably from these heritages.

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