



Ethnobotanical Survey of Traditional Medicinal Practices in LaelayAdi-yabo District, Northern Ethiopia

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Abstract: A comprehensive assessment study with the aim of identifying and documenting traditional medicinal practices were carried out in Laelay Adi-yabo district, Northern Ethiopia in September 2016. Purposive sampling method was used to select traditional medicinal practitioners of the study area. Semi-structured questionnaire, interview and Focused Group Discussion were conducted to gather first hand ethnobotanical information on medicinal plants used for human and livestock ailments. A total of 28 knowledgeable informants were participated. Descriptive statistics and rankings were used to analyze data. A total of 37 medicinal plant species belonging to 37 genera and 24 families were reported. The habits of the plants were 29% each (shrubs, trees and herbs) and 10% climbers. Most frequently used plant part were leaves (34%) followed by roots (24%), seed (6%) and the remaining were other parts. Crushing was the most common way of remedy preparation. While, healing knowledge transfer varies within family. The result of the study revealed the existence of traditional healing knowledge had conserved the diversity of medicinal plants. Traditional Healers still play a great role in the primary health care systems in North Ethiopia. The sparsely distributed forests were important resources of healers and repositories of medicinal plants gene pools.

Keywords: Healing, Ethnobotany, Traditional Knowledge, Medicinal Plants, Laelay Adiyabo

1. Introduction

The wide range of climate and environmental conditions possessing vast diversity of flora and fauna, including huge number of potentially useful medicinal plants widely available than many other parts of the world are the distinguishable character of Ethiopia [1]. These characteristics are believed to be home for about 6,500 species of higher plants with approximately 12% endemism, and hence one of the six plant biodiversity prosperous countries of Africa [2]. However, deforestation, farm encroachment, overharvesting and alarming population growth with increasing demand and consumption are the principal problems. These problems aggravate the rate of extinction of medicinal plants from their habitat and the consequence loss of globally significant plant species and indigenous knowledge [3].

Even if, it is difficult to identify the birth of ethno medicine in Ethiopia, the beginning of an organized study on the plant resources can be traced to about 1850s when Achille Richard (1847–1851) described the first flora of the country [4]. *Tentamen Florae Abyssinicae* consists of descriptions of about 1,700 species of plants, particularly from northern parts of the country [4].

According to recently published reports there are an increasing number of studies in Tigray Region concerning the use and management of medicinal plants [5]. Thus, high MPs diversity and indigenous knowledge was assumed to be found. Furthermore, the purpose of this survey study was documenting the use and management of MPs and healing knowledge in Laelay Adi-yabo district, Tigray Regional State, Ethiopia.

2. Material and Methods

2.1. Study Area Description

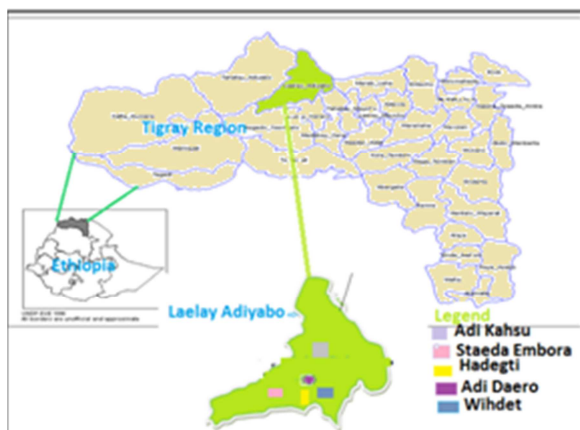


Figure 1. Map of the study district and study sites.

Laelay Adi-yabo wereda is found in the Northwestern zone of Tigray Regional State, Ethiopia (Figure 1).

Table 1. Sampled cites and their relative location from Google earth.

Sampled cites	approximate Relative location		Number of informants selected
	Northing	Easting	
Wihdet	14°13'35.46"N	38°17'38.11"E	5
Tsaeda-Embora	14°14'27.52"N	38°10'25.88"E	7
Hadegti	14°15'17.65"N	38°14'51.42"E	5
Adi Kahsu	14°25'07.05"N	38°11'22.49"E	6
Adi Daero	14°18'46.89"N	38°10'25.88"E	5

The selection of study cites was done based on the recommendation and information found from the wereda environmental protection officers. Five *kebele*/sub district/ was sampled for investigation to represent the whole cites. The size of the sample depends on the available budget, time and other reasons and not necessarily on the total population.

Semi structured interview prepared and reliability pretested, field observation and group discussion was accomplished. The interviews and discussions were conducted in the local language, Tigrigna, and translated in to English for reporting. Information collected includes local name of the traditional medicinal plant, diseases treated, parts used, and method of preparation and route of administration. Based on ethnobotanical information provided by informants, specimens were collected and identification was done in the field.

3. Result

3.1. Diversity of Medicinal Plants in the District

A total of 37 plant species with their medicinal value were re-corded (Table 2). The Species were represented 37 genera and 24 families.

According to the districts Environmental Protection and Land Use Authority Office (LAWELUAO), the total population of the wereda accounts 129507(66798 males and 60709 females). The agro ecological zone of the wereda is most characterized by lowland (qola) ecosystem. There are 20 total *kebeles* (smallest administration below wereda). People in the study area lead their life by mixed farming system (crop production and animal husbandry).

2.2. Ethnobotanical Data Collection and Sampling Procedures

A preliminary survey of the area was conducted in September 2016, the flowering season of most plants in the study district. Informants were purposively selected for semi-structured questionnaire administration. Thus, twenty eight Key informants (experienced and willing healers) were purposively selected using information and recommendations of local officials, *kebele* administrators, knowledgeable elders and religious leaders as well as the local community as shown in table 1.

3.2. Preparation and Application of Medicinal Plants

Traditional healers in the study area reported that they follow various ways of remedy preparation and this depends, according to their explanations, on the type of ailment. Crushing, pounding and fumigation were the three frequently used methods of preparation of medicine in their decreasing order.

The majority of the preparations were made from mixture of different plant species with water and different additive substances like honey, sugar, butter, and salt and milk. These additive substances have different functions i.e. to lessen poisons, get better aroma and as remedies during adverse affects such as vomiting and diarrhea.

3.3. Back Ground Information

Knowledge distribution of medicinal plants was compared between age, marital status, gender and educational level of informants (Figure 2). Based on the data obtained from the informants in the study sites higher number of medicinal plants was cited by higher age group informants than lower age group informants The reason of elders were more knowledgeable was due to their personal experiences using these plants. The difference in the perception of the two age classes concerning the utilization of traditional medicinal plants will likely result in the loss of plant lore over time.

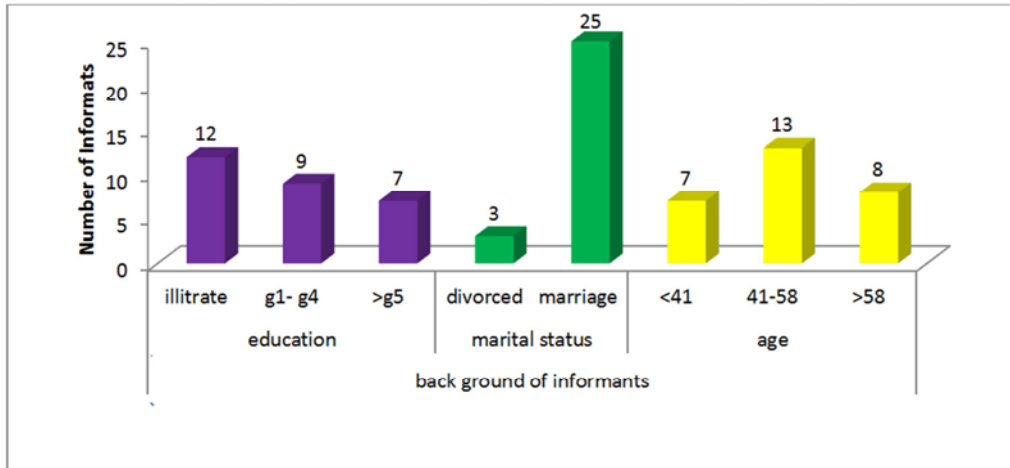


Figure 2. Back Ground Information of Informants.

3.4. Threats to Medicinal Plants

Informants ranked agricultural expansion as the most serious threat to the medicinal plants followed by fire wood collection and drought. Being a wildness of the cited medicinal plants expose to various anthropogenic factors. From these factors, agricultural encroachment was ranked first by selected key informants followed by fire wood collection and drought respectively; the least one was fodder.

3.5. Source of Traditional Medicinal Plant Knowledge in the Study Area

The highest number of traditional medicinal plant knowledge of informants in the study area was gained from family, followed by religious books (Figure 4). Informants received the knowledge from their parents or grandparents orally.

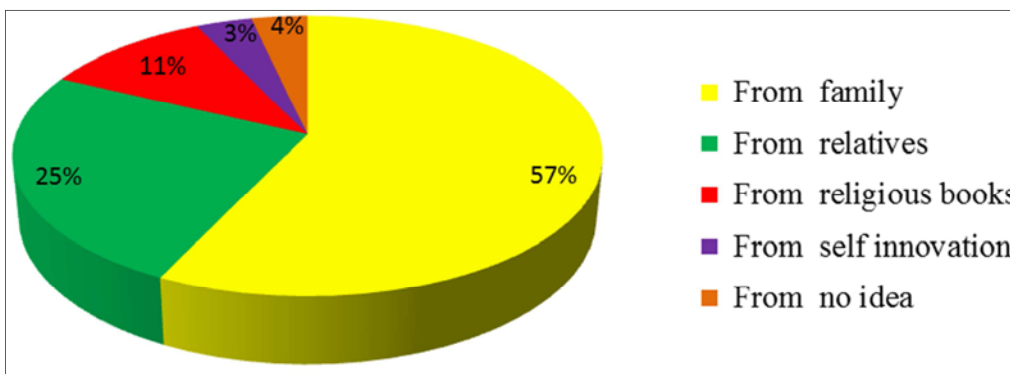


Figure 3. Source of traditional medicinal knowledge in the study district.

People in the study area use traditional medication practice because of their effectiveness in healing ailments followed by availability, sociocultural and economic reason respectively in their decreasing orders (Figure 4).



Figure 4. Reasons of the people to accept traditional remedy.

3.6. Transfer of Medicinal Plants Knowledge

According to the data from the study area, the major way of indigenous knowledge transfer on types of medicinal plants, traditional concepts of illness and methods of diagnosis among traditional healers was by word of mouth to

a family member, especially of an eldest son. More ever, 15 of the informant transfer their knowledge to their son, 8 to all family member, 2 informants to their daughter only and one respondent to his wife (figure 5).

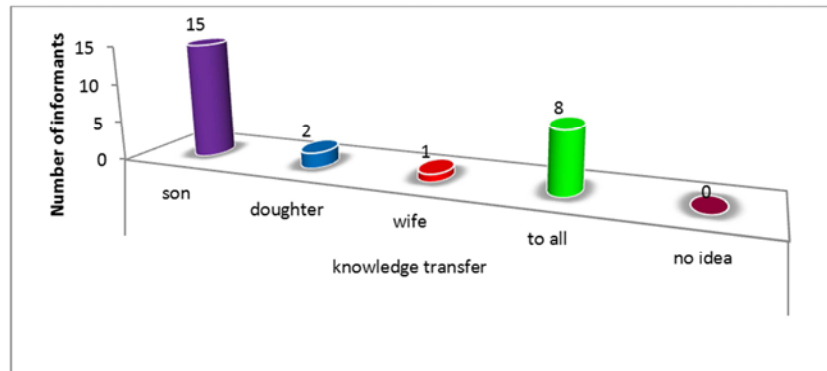


Figure 5. Transfer of medicinal plants knowledge.

Table 2. Plants scientific name, family name, local name, habit, type of disease treated, parts used and method of preparation.

	Plant Scientific name	Family name	Local name	habit	source	Disease treated	Parts used	Method of preparation and application	Route of administration
1	<i>Sennasingueana</i> (Delile) Lock	Fabaceae	Hambahambo	S	Wild	Abdominal pain	Bark	Grind & Swallow the liquid	Oral
2	<i>Acacia lehay</i>	Fabaceae	Lehay	T	Wild	Evil sprit	Stem	Cut 3mm long & tie in the neck covering by piece of clothes	Dermal
3	<i>Zehneriascabra</i> (L. f.) Sond.	Cucurbitaceae	Leminbayta	Cl	Wild	Abdominal pain	Root	Crush & squeeze, & Drink the liquid	Oral
4	<i>Citrus aurantifolia</i> (Christm.) Swingle	Rutaceae	Lemin	T	Cultivated	Abdominal pain	Fruit	Crush, squeeze, add salt & water then drink the liquid	Oral
5	<i>Clerodendronmyricoides</i>	Lamiaceae	Sur betri	S	Wild	Eye disease	Stem	Crush, mix with butter & Fumigate	Dermal
6	<i>Solanumincanum</i> L.	Solanaceae	Engule	H	Wild	Abdominal pain	Root	Grind & Swallow the liquid	Oral
7	<i>Plumbagozeylanica</i> L.	Plumbaginaceae	Aftuh	H	Wild	Anthrax	Root	Crush, squeeze & paste the liquid on the affected part	Dermal
8	<i>Phytolaccadodecandra</i> L'Herit.	Phytolaccaceae	Shibti	Cl	Wild	Rabbis	Root and Leaf	Crush, squeeze, add to decanted tella (local drink) and drink the mixture	Oral
9	<i>Anogeissusleiocarpa</i> (DC.) Guill. & Perr.	Combretaceae	Hanse	T	Wild	Abdominal pain	Bark	Grind and Swallow the liquid	Oral
10	<i>Adansoniadidgitata</i>	Bombacaceae	Dima	T	Wild	Impotence	Root	Crush, mix with honey and eat the mixture before break fast	Oral
11	<i>Crotalaria spinose</i> Hochst. ex Benth	Fabaceae	Chifrg	H	Wild	Impotence	Root	Crushing, mixing and eat	Oral
12	<i>Euclea racemosa</i> Murr. subsp. <i>schimperii</i> (A. DC.) F. White	Ebenaceae	Kulio	S	Wild	Impotence	Root	Crush, add to chicken stew and eat with injera (local meal) for 7 days before the meal	Oral
13	<i>Croton macrostachyus</i> Hochst. ex Delile	Euphorbiaceae	Tambok	T	Wild	Yellow fever	Bark	Crush and drink the liquid	Oral
14	<i>Euphorbia tirucali</i> L.	Euphorbiaceae	Kinchib	S	Cultivate	Yellow fever	Bark	Crush, add decanted tella & drink for 3 days in morning	Oral
15	<i>Rumex nervosus</i> Vahl.	Polygonaceae	Machicheo	S	Wild	Halafen	Leaf	Crush, squeeze and drink the liquid	Oral

	Plant Scientific name	Family name	Local name	habit	source	Disease treated	Parts used	Method of preparation and application	Route of administration
16	<i>Withaniasomnifera</i> (L.) Dunal	Solanaceae	Agol	H	Wild	Swelling Tonsil	Leaf	Crush, squeeze and drink	Dermal
17	<i>Sidaovata</i> Forssk.	Malvaceae	Dekidaero	H	wild	Swelling	Leaf	Crush and paste the liquid to the affected part	Dermal
18	<i>Daturastramonium</i> L.	Solanaceae	Mezerbae	H	Farm land	Leech	Leaf	Crush and add the liquid through nose	Nasal
19	<i>Rutachalepensis</i> L.	Rutaceae	Chena adam	H	cultivate	Evil eye	Leaf	Crush and drink the liquid or tie on the neck	Dermal
20	<i>Lepidium sativum</i> L.	Brassicaceae	shinfae	H	cultivate	Evil sprit Fibril illness	seed	Crush, squeeze, smell and cover with piece of clothes	Oral Nasal Dermal
21	<i>Buddlejapobystachya</i> Fresen.	Budlejaceae	Metere	S	Wild	Evil sprit Leeches	Stem Leaf	-Cut the stem and tie on the neck -Crush, add water and apply through the nose	Dermal Nasal
22	<i>Cucumis dipsaceus</i> Ehrenb.	Cucurbitaceae	Hafaflo	Cl	Wild	Fibril illness	whole	Boil mixing with eucalyptus leaf and wash the body through the boiled water	Dermal
23	<i>Boscia angustifolia</i> A. Rich.	Capparaceae	Kermed	S	Wild	Head ache, Evil sprit	Stem	Cut the stem part and tie in the neck	Dermal
24	<i>Schinus molle</i> L.	Anacardiaceae	Tikurberbere	T	Cultivate	Evil eye bloating	Leaf	Crush and squeeze apply on the affected part	Dermal
25	<i>Albizaanthelmintica</i> (A. Rich.) Brongn	Fabaceae	Bsana	T	Wild	Tape worm	bark	Dried, crush and prepare by mixing with food	Oral
26	<i>Tragiacinerea</i>	Euphorbiaceae	amae	Cl	Wild	Anti bleeding	Leaf	Crush, squeeze and drink the liquid	Oral
27	<i>Maytenus senegalensis</i> (Lam.) Excell.	Celastraceae	Argudi	T	Wild	Stomach pain	Stem bark	Crush, mix with water, filter and drink the fluid	Oral
28	<i>Gomphocarpus purpurascens</i> A. Rich.	Asclepiadaceae	Tsebadimu	S	Wild	Hemorrhoids	Latex	Smear the infecting site by the milky latex until cure	Dermal
29	<i>Dodonia angustifolia</i> L. f.	Sapindaceae	Tahses	H	Wild	Ring worm	Latex	Smear the infected part by latex until treated	Dermal
30	<i>Ziziphusspina</i> (L.) Desf.	Rhamnaceae	Geba	T	Wild	Scabies	Leaf	Roasted, pound and mix with butter, cream the infected part	Dermal
31	<i>Rumex abyssinicus</i> Jacq	Polygonaceae	Mequemeqo	T	Farm land	Head wound infection Dandruff	Leaf	-Dry, grind, mix it with butter and rub it on the affected part -Crush and rub it on the affected part	Dermal
32	<i>Grewia ferruginea</i> Hochst	malvaceae	tsinquayt	H	Farmland	Tooth ache	-Root	Crush and drink it with boiled coffee or tea	Oral
33	<i>Melia Azadrachta</i> L.	Meliaceae	Nim	S	Wild	-Leech,	Bark	Squeeze, filter and drink the fluid or apply the fluid through the nose	Oral Nasal
34	<i>Terminalia brownie</i> Fresen	Combretaceae	weyba	T	Farmland	External wound	Leaf	Crush and apply it on the affected part.	Dermal
35	<i>Ficus palmata</i> Forssk.	Moraceae	Beles	S	Wild	Hemorrhoids	Latex	Smear the infecting site by the milky latex until cure	Dermal
36	<i>Capparis tomentosa</i> Lam.	Capparaceae	Andel	S	Wild	Evil sprit	Steam	Crush, squeeze and drink the liquid	Oral
37	<i>Achyranthes aspera</i> L.	Amaranthaceae	Telenji	H	Wild	Sprain -Anti-abortion	Root	Tie piece of root in the damaged body or in the shoulder by making circle and attached it by string	Dermal

Where H =herb, T=Tree, Cl= Climber, S= shrub

4. Discussion

In terms of species composition, Fabaceae and Euphorbiaceae consists of 4 species each (16%) followed by Solanaceae with 3 (13%) species were the dominant family in the study district. Euphorbiaceae (07 genera and 07 species) and Solanaceae (06 genera and 06 species) were the dominant family in Dega Damot, Ethiopia [6]. Euphorbiaceae and Fabaceae (six species each), and Cucurbitaceae and Solanaceae (three species each) were the most represented plant families in Asgedetsimbla district, Ethiopia [7]. The family Fabaceae was also reported the dominant family elsew herein Ethiopia [15, 16, 17, 18].

The local people cultivate some popular medicinal plants in their home garden and farmlands for the purpose of medicine such as *Rutachalepensis* and *Lepidium sativum*. It was found from the present study area that some traditional healers do not have interest to grow some of plant species that are used to treat specific ailments in their home garden in order to keep the secret of their medicinal knowledge. This means that most of the medicinal plants found in the home gardens were those also known to have other ornamental uses or serve particularly as food or spice. The fact that most of the medicinal plants were found in the wild also poses a threat to their existence if habitats are destroyed. The healers in the district use trees, herbs, shrubs and climbers in their decreasing order to treat ailments. This is similar with the study done in Kenya that states trees were the most widely used plant parts 41(37%) followed by herbs 32(28%) and shrubs 29(26%) [8]. According to the interview result leaves were the most commonly used plant part, followed by root and bark. This practice helps to reduce the rate of threat on plant species or helps for sustainable harvesting of plants. Therefore, the existence of the plant will be ensured. However, given the highest frequency of roots and barks used for medicinal purpose next to leaves in the study area threat to the destruction of medicinal plants especially to shrub and tree. High treat to the mother plant comes with root, bark and leafy – stem harvest. With regard to plant parts used medicinally, leaves (48.5%) followed by roots (32.4%) were the most commonly used [7]. Besides, leaves were the dominant plant part used by healers in study conducted in [15, 16, 19, 20, 21, 22, 27].

The greater proportion of application of medicinal plant preparation was internal, and external application was slightly lower. This result was similar with the finding of [15, 16, 19, 20, 20, 23, 24]. There were several Administration routes of traditional medicinal plants in the study area by the local community. The major routs of administration by the peoples under study area were; oral, dermal, nasal, and oracular. There was lack of agreement among the informant on doses of certain remedies prescribed in the study area. This indicates lack of precision and standardization as one of the drawbacks for the recognition of traditional health care system. According to

the data documented from the study area most of the informants was illiterate and irregularly educated, those with the skill of writing and reading only. Because of cultural and anthropological reason, the involvements of Males were more than females in traditional medication practice. The distribution of knowledge and services of medicinal plants were hierarchically placed. Most of the traditional healers were males and married [9]. A significantly higher number of medicinal plants were reported by informants above 40 years of age among the Bench ethnic group. However, [10] reported a statistically insignificant correlation between age and the number of medicinal plants by the local people in Jimma zone, south western Ethiopia. The local people in the study area harvest plants with medicinal values for a variety of other uses; mostly for firewood and charcoal, construction, fodder and fences. The utilization of medicinal plants for variety of added values may result in additional pressures to these resources. This calls for practical solutions like domestication, *in-situ* conservation, and introduction of other tree species for non-medicinal uses to reduce pressures on the medicinal plants. Especially the collection of fire wood not only for their own consumption but also for selling and to earn money was observed the most treating effect in the district. Pressures from agricultural expansion, wide spread cutting for fuel wood combined with seasonal drought had been reported by [11, 12, 13, 19, 20, and 25] as main factors for environmental degradation as well as the depletion of medicinal plants. It was also found from the informants that there was maximum mystery in passing the knowledge within the family circle. The highest transfer of medicinal plant knowledge to eldest son limits the involvement of female in the study area. The study done in [14], shows that deprecating attitude towards traditional medicine practitioners had strained healers to keep their knowledge and practices to themselves. People in the study area use traditional medication practice because of their effectiveness in healing ailments. However, a study conducted in other part of Ethiopia indicated that pregnant women preferred herbal medicines because of accessibility and less affordability of conventional medicines [26].

5. Conclusion

The result of the study illustrates that there is high multiplicity of medicinal plants knowledge along with local people of Laelay Adi-yabo. The use of more trees than other habits for medicinal purpose is considerable to threat on plant diversity. People in the study area mostly prepare remedy from leaves and these might not put plants under pressure. However, the use of large root and bark next to leaves in the district put medicinal plant in pressure. Large numbers of medicinal plants were collected from wild. This shows, as there is lack of cultivation of medicinal plants in home gardens by local people. Knowledge of medicinal plants in the study area varies among age and sex. Much of knowledge of medicinal plants

was handled by elders who were the ages of 41 and above and males were able to mention more medicinal plants than females. The result also revealed that many wild medicinal plants species were under strain from various human persuade factors. In addition, disinterest of young generation on traditional medicine put the continuity of traditional medicinal knowledge under question. Moreover, creation of awareness on young generation is very important.

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