



Knowledge and use of medicinal plants by people around Debre Libanos monastery in Ethiopia

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Received 23 May 2006; received in revised form 26 September 2006; accepted 19 November 2006

Abstract

The study was conducted around Debre Libanos monastery from October 2005 to June 2006. A total of 250 villagers, 13 monks and 3 nuns were interviewed using semistructured questionnaire on the knowledge and use of medicinal plants. The informant consensus factor (ICF) and the fidelity level (FL) of the species were determined. Eighty medicinal plant species were reported. The average medicinal plant reported by a female is 1.67 ± 0.33 and a male is 5.77 ± 0.71 with significant difference between them ($\alpha=0.05$, $p=0.023$). The ICF values demonstrated that local people tend to agree more with each other in terms of the plants used to treat 'Mich' and headache (0.69) and intestinal illness and parasites (0.68) but a much more diverse group of plants are cited to treat problems related to rabies (0.14) and unidentified swelling and cancer (0.11). The FL values are also similar to ICF values. The knowledge of the villagers close to the monastery is found to be higher than those distant from the monastery and the correlation between Abichu and Telaye ($r=0.970$, $\alpha=0.05$, $p=0.001$), and Zegamel and Doreni ($r=0.745$, $\alpha=0.05$, $p=0.027$) is significant indicating the relationships between the number of plants reported by the informants and the distance from the monasteries to the villages. This study was not able to determine the knowledge difference between the villagers and the monastery dwellers because the monks and nuns were not willing to give information on the knowledge and use of medicinal plants. This may result in the long run in loss of local knowledge in the surrounding area and the country at large for preparation of pharmacologically effective remedies.

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Keywords: Ethnobotany; Medicinal plants; Monastery; Traditional knowledge; Ethiopia

1. Introduction

The Ethiopian Orthodox Church, an indigenous and integral Church of Africa is one of the oldest Churches in the world, if not the oldest one. According to Pankhurst (1990), the Ethiopian Orthodox Church encompasses some 15,000 churches and over 800 monasteries all over the country. Monasteries are refuges for old Gee'z manuscripts, which contain lists of traditional medicinal plants.

Debre Libanos is one of the monasteries founded in the 13th century by Saint Tekle Haymanot. There is a small cave near the church where he is said to have stood for 7 years on one leg,

until the other wasted away and dropped off. Tekle Haymanot's cave can still be seen and its holy water is a focus for pilgrims (Merahi, 2001).

In Ethiopia, knowledge of traditional medicines is based on oral tradition or medico-magical and/or medico-spiritual manuscripts (Pankhurst, 1990; Abebe and Ayehu, 1993; Abbink, 1995). The old Gee'z manuscripts that are found in monasteries are the first known traditional pharmacopoeia that dates back to the 15th century (Abate, 1989; Pankhurst, 1965, 1990). In most cases, the traditional herbalists in the northern part of the country are from the churches and monasteries. The knowledge from these herbalists is passed secretly from one generation to the next either through words of mouths or their descendants inherit the medico-spiritual manuscripts.

Ethiopia has about 800 species of plants that are used in the traditional health care system to treat nearly 300 mental and physical disorders. Traditional medicine still remains the main

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resource for a large majority (80%) of the people in Ethiopia for treating health problems (Abebe and Hagos, 1991; Debella et al., 1999; Addis et al., 2001) and a traditional medical consultancy has a much lower cost, including the consumption of the medicinal plants required than modern medical attention. Ethiopian traditional medical system is characterized by variation and is shaped by the ecological diversities of the country, socio-cultural background of the different ethnic groups as well as historical developments which are related to migration, introduction of foreign culture and religion. Previous studies showed the existence of traditional medical pluralism in the country (Pankhurst, 1965, 1990; Slikkerveer, 1990; Abebe and Ayehu, 1993; Vecchiato, 1993).

In recent years, folk medicine is no more an attraction to the younger generation and many young people migrate to urban areas for education and job opportunities. As a consequence, only the elder people possess the knowledge of herbs and it is estimated that only a handful of people are able to use the traditional remedy to treat illness. Thus, the traditional knowledge is rapidly eroding. In addition, there is a lack of ethnobotanical survey carried out in most parts of the country. For these reasons, the documentation of the traditional uses of indigenous plants is important to preserve the knowledge. The purpose of this study is to investigate the knowledge and traditional uses of medicinal plants by the people around the monastery, and the knowledge transferred from the monastery to the surrounding areas.

2. Materials and methods

2.1. Description of the study area

Debre Libanos monastery (9°72'N, 38°87'E) is located 105 km north of Addis Ababa on the road to Bahir Dar. It was established in the 15 Century A.D. and currently 650 monks and 230 nuns live in the monastery. The villages, around Debre Libanos monastery, visited during this survey were Abichu, Doreni, Debre Libanos, Telaye, and Zegamel. The main occupation of the villagers is mixed farming. There is only one rural clinic at Debre Libanos and the distance from the clinic to the villages varies from 30 min to 4 h on walking. Doreni and Zegamel are about 30 min, Telaye is 2–3 h and Abichu is 4 h walk from the monastery (Fig. 1).

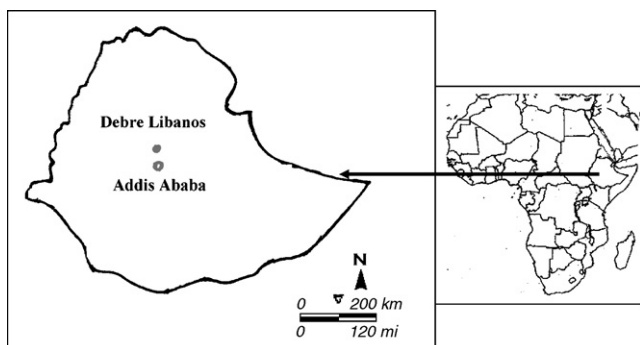


Fig. 1. Location of Debre Libanos in Ethiopia.

2.2. Knowledge and use of medicinal plants survey

Villagers, monks and nuns were interviewed using semistructured questionnaire (Martin, 1995) on the knowledge and use of medicinal plants. The consent of the informants was asked to give their knowledge about the plants they use against a disease, the plant parts, the method of preparation of the remedy, details of administration, the dosage and how knowledge is passed from elders to younger generation in the family or in the community. The field surveys in the study area were undertaken from October 2005 to June 2006. The informants were selected randomly and no appointment was made prior to the visits. Specimens of the reported medicinal plants were collected and voucher specimens were deposited at the herbarium of Aklilu Lemma Institute of Pathobiology, Addis Ababa University.

2.3. Data analysis

The reported remedies and ailments were grouped into 10 categories based on the information gathered from the interviewees. The categories were 'Mich' (febrile disease characterized by fever, headache, sweating, *Herpes labialis*, and muscle spasm), headache, intestinal illness and parasites, stomach illness and 'Megagna' (unidentified gastrointestinal disorder), skin infection and external injury, snake and viper bite, malaria, sensorial system, internal diseases and respiratory infection, evil eye and setan beshita (devil illness), rabies, and undefined swelling (non-infectious or infectious swelling) and cancer. The informant consensus factor (ICF) was calculated for each category to identify the agreements of the informants on the reported cures for the group of ailments. The ICF was calculated as follows: number of use citations in each category (n_{ur}) minus the number of species used (n_t), divided by the number of use citations in each category minus one (Heinrich et al., 1998).

$$ICF = \frac{n_{ur} - n_t}{n_{ur} - 1}$$

The fidelity level (FL), the percentage of informants claiming the use of a certain plant for the same major purpose, was calculated for the most frequently reported diseases or ailments as:

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

where N_p is the number of informants that claim a use of a plant species to treat a particular disease, and N is the number of informants that use the plants as a medicine to treat any given disease (Alexiades, 1996).

3. Result

3.1. Knowledge of informants

In this study, a total of 250 people from five villages ($N=50$) were interviewed. Out of these, 47 are women and it seems that they have less knowledge than men on traditional medicine. The average medicinal plant reported by a female is 1.67 ± 0.33

Table 1
Number of medicinal plants reported and percentages of informants in each study site (N=50)

No. of plants reported	Abichu (%)	Debre Libanos (%)	Doreni (%)	Telaye (%)	Zegamel (%)
0	64	79	27	48	29
1	12	0	0	9	24
2	0	5	5	0	12
3	0	5	23	9	0
4	12	0	5	13	12
5	8	11	0	9	6
>6	4	0	41	13	18

and male is 5.77 ± 0.71 , and there is a significant difference ($\alpha = 0.05$, $p = 0.023$) between female and male. The average age of the women is 64 and men 54 years. One hundred and twelve of the informants reported that they have no knowledge of medicinal plants. The majority is from Debre Libanos (79%) and the least is from Doreni (27%, Table 1). Although 13 monks and 3 nuns were interviewed, data were excluded from the analysis because it was felt that they were reticent to provide information.

The number of plants reported by the informants decreases as the distance from the monastery to the villages increases. There is a significant correlation between plant knowledge and distance from the monastery to the villages. The correlation between Abichu and Telaye ($r = 0.970$, $\alpha = 0.05$, $p = 0.001$), and Zegamel and Doreni ($r = 0.745$, $\alpha = 0.05$, $p = 0.027$) is significant indicating the relationships between the number of plants reported by the informants and the distance from the monasteries to the villages.

Seven men identified themselves as healers of which four are from Doreni, three from Zegamel and one from Telaye. The number of ailments reported by the healers ranged from 4 to 18. The maximum number of medicinal plants reported by a healer is 18 (Doreni). They also reported combination of multiple medicinal plants to treat an illness whereas most of the non-healers reported only single medicinal plant treatment (Table 1).

Only nine women reported medicinal plants related to 'Mich', stomach-ache, 'Megagna', 'Kosso' and 'Golloba'. The first three diseases are associated with children and the last one with cattle.

3.2. Medicinal plants and uses reported by the informants

A total of 80 medicinal plant species were reported that are distributed across 51 families and 74 genera (Tables 2 and 3). In terms of number of medicinal plant species, Lamiaceae are the dominant family (5 genera, 5 species) followed by Asteraceae (4 genera, 4 species), Solanaceae (3 genera, 4 species) and Polygalaceae (2 genera, 4 species). Forty are herbs, 19 shrubs, 13 trees and 6 climbers. The different parts of these plants are used as a medicine. The use of aboveground plant parts (69%) is higher than the belowground plant parts (31%). Of the aboveground plant parts, leaf is used in the majority of the cases (45 species) followed by seed (5 species). Underground parts are root (24 species) and bulb (2 species).

These 80 medicinal plant species are used as a cure to 54 types of ailments. The highest number of plant species (27 species) is

used for the treatment of gastrointestinal disorders, 'Megagna' and parasites followed by 'Mich' and headache (19 species). The rest are used to treat internal and external disease such as respiratory infections, external injuries, fungal or viral infections, unidentified cancerous growths, rabies and snakebites (Table 2).

Multiple plants treatments with different combinations of medicinal plants are used to treat 19 external and internal illnesses. Fourteen are used to treat 'Mich' and gastrointestinal illness. The highest number of medicinal plants in a multiple medicinal plants prescription is seven that is used to treat evil eye, followed by six medicinal plants for treatment of intestinal parasites, internal illness and severe dysentery (Table 3). Each ingredient in the poly-herbal medicines is dried, powdered and stored separately. The poly-herbal medicine is prepared by mixing the ingredients with different proportions.

3.3. Veterinary important traditional medicines

Thirteen families of medicinal plants have veterinary importances that are distributed into 14 genera and 19 species. The family with two genera is Cucurbitaceae and the rest are represented by one genus. The plant parts used are leaf (44%), root (39%) and latex of a species. These are used as remedy for 15 internal and external illnesses and as a contraceptive (Tables 4 and 5).

3.4. Dosage and route of administration

The dosage depends on the age and physical appearance of the individual. Children are given less than adults, such as, one-fourth of a coffee cup (2–5 ml) whereas, an adult is given up to one glass (approximately 250 ml) depending on the type of illness and treatment. It is measured by number of young leaf (7, *Calpurnia aurea*), number of seed (6, *Maesa lanceolata*) and length of root (about 2 cm, *Dorstenia barnimiana*). The frequency of treatment for many ailments is once per day for 1 day only but for some external skin infections ('Yeshererit Beshita') and internal illness ('Dem Bizat') it is three times per day for more than 1 day.

The administration routes are oral (59%), external (21%) and nasal (19%). The remedies are taken diluted by water, skimmed milk and honey or are taken with tef injera or boiled coffee. Those taken through nasal are either smoked or boiled in water and the patient inhales the smoke or the steam being covered with cloth.

3.5. Informants consensus and species use value

The category that has the highest ICF value is 'Mich' and headache (0.69) followed by intestinal illness and parasites (0.68). The lowest is unidentified swelling and cancer (0.11) and each informant reported a remedy. Nineteen informants cited *Ocimum lamifolium*, and 5 cited *Croton marcostachyus* as remedy for 'Mich' and Headache (Table 6).

The medicinal plants that are commonly known by the informants have higher fidelity level than those that are only known

Table 2
Traditional medicine with single plant prescription

Species	Family	Local name	Habit	Part used	Use(s)	Preparation	Administration Route	Voucher Number
1. <i>Achyranthes aspera</i> L.	Amaranthaceae	Telenje	Herb	L	External injury 'Nessire' (epistaxis) Blood clotting (haemostasis)	Crushed Paste dressing Crushed pest and juice Paste dressing	External Nasal External	TD902
				R	Hepatitis	Infusion	Oral	
2. <i>Acokanthera schimperi</i> (A. DC.) Schweinf	Apocynaceae	Mirenze	Shrub	L	Hepatitis	Inhaling smoke	Nasal	TD945
3. <i>Allium sativum</i> L.	Alliaceae	Nech Shinkurt	Herb	Bu	Malaria Stomach-ache	Eating Eating	Oral Oral	TD924
4. <i>Brucea antidysenterica</i> J. F. Mill.	Simaroubaceae	Aballo	Tree	S	Kusil (wound)	Butter Paste dressing	External	TD905
5. <i>Calpurnia aurea</i> (Alt.) Benth.	Fabaceae	Digita	Shrub	S	'Tesbo Beshita' (epidemic disease)	Honey paste	Oral	TD917
6. <i>Carissa spinarum</i> L.	Apocynaceae	Agam	Shrub	R	Snake Bite	Chewing and juice	Oral	TD935
7. <i>Clematis hirsuta</i> Perr & Guill	Ranunculaceae	Azo Hareg	Climber	L and St	Leishmania 'Yeshererit Beshita' (Herpes zoster)	Water Paste dressing Water paste dressing	External External	TD949
				L	Haemorrhoids	Water Paste dressing	External	
8. <i>Clerodendrum myricoides</i> (Hochst.) Vatke	Verbenaceae	Misrich	Shrub	L	'Almaz Balechira' (viral infection)	Powder mixed with water	External	TD931
9. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	La	'Chiffa' (Eczema) 'Quaqucha' (Tinea versicolor)	Ointment Ointment	External External	TD906
				B	External Ulcer (Kusil)	Powder dressing	External	
10. <i>Cucurbita</i> sp	Cucurbitaceae	Gim Hareg /Dursht	Climber	R	Malaria	Inhaling odour and using as mattress	Nasal	TD948
11. <i>Cucumis dipsaceus</i> Ehemb. Ex. Spach	Curcurbitaceae	Yeamora Missa	Climber	R	Hepatitis	Infusion	Oral	TD903
12. <i>Cucumis ficifolius</i> A. Rich.	Curcurbitaceae	Yemidir Embuay	Herb	R	'Chiffa' (Eczema) Stomach-ache 'Mich' 'Yekusil Merze' (infected wound) 'Mogne Bagegne' (bacterial disease, anthrax) Snake Bite	Butter paste dressing Chewing and juice Chewing and juice Grounded paste dressing	External Oral Oral External	TD916
				R	'Mogne Bagegne' (bacterial disease, anthrax)	Eating	Oral	
				R	Snake Bite	Eating	Oral	
13. <i>Cyphostemma cyphopetalum</i> (Fresen.) Desc. Ex Wild & Drummond	Vitaceae	Gindosh	Climber	R	Rabies	Infusion	Oral	TD925
				St	Snake Bite	Chewing	Oral	
				L	Leishmania	Paste dressing	External Dressing	
				R	Snake Bite	Chewing	Oral	
14. <i>Datura stramonium</i> L.	Solanaceae	Astenagr	Herb	L	'Kusil' (External injury)	Powder Dressing	External	TD934

15. <i>Diplolophium africanum</i> (Turcz.)	Apiaceae	Yeferes Zeng	Shrub	L	Stomach-ache 'Mich' 'Yebird Beshita' (pneumonia)	Infusion Juice as lotion Infusion	Oral External Oral	TD915
16. <i>Dorstenia barnimiana</i> Schweinf.	Moraceae	Work Bemeda	Herb	R	Acute Coughing (TB) Leprosy Stomach illness	Infusion Butter paste dressing Infusion	Oral External Oral	TD954
17. <i>Echinops kebericho</i> Mesfin	Asteraceae	Kebercho	Herb	R	Coughing Head-ache	Infusion Inhaling smoke	Oral Nasal	TD900
18. <i>Eleusine floccifolia</i>	Poaceae	Akirma	Herb	Fl and S	'Efugnit Bite' (viper)	Crushing and dressing	External	TD937
19. <i>Epilobium hirustum</i> L.	Onagraceae	Wenze Admik	Herb	L	Babies Disease	Bathing	External	TD912
20. <i>Euphorbia abyssinica</i> J. F. Gmel.	Euphorbiaceae	Qulqwal	Tree	La	'Kusil' (External injury) 'Kintarot' (wart)	Ointment Rubbing and dressing	External External	TD908
21. <i>Glinus lotoides</i> L. var <i>lotoides</i>	Molluginaceae	Meterea	Herb	L S	'Kosso' (Tapeworm) 'Kosso' (Tapeworm)	Powder mixed with water Powder mixed with water	Oral Oral	TD930
22. <i>Gloriosa superba</i>	Liliaceae	Etse Libona	Herb	R	Stomach-ache	Chewing	Oral	TD963
23. <i>Jasminum abyssinicum</i> Hochst.	Oleaceae	Tembelel	Climber	L	Snake Bite 'Kosso' (Tapeworm)	Chewing Powder mixed with water	Oral Oral	TD961
24. <i>Kalanchoe petitiata</i> A. Rich.	Crassulaceae	Endehuahula	Shrub	L	'Ebach' (lymphadenopathy)	Mildly head L dressing	External	TD907
25. <i>Lens culinaris</i> Med.	Lamiaceae	Missire	Herb	S	'Yeshererit Beshita'	Chewing and applying paste	External	TD922
26. <i>Leonotis velutina</i>	Lamiaceae	Eras Kimir	Shrub	L	Head-ache Stomach-ache	Infusion Infusion	Oral Oral	TD976
27. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto	Herb	S	'Megagna' (unidentified gastrointestinal disorder) Stomach-ache 'Mich'	Powder mixed with water Powder mixed with water Powder mixed with water	Oral Oral Oral	TD928
28. <i>Maesa lanceolata</i>	Myrsinaceae	Kelawo	Tree	S	Intestinal Worms 'Kosso' (Tapeworm) 'Chiffa' (Eczema)	Powder mixed with water Powder mixed with water Water paste dressing	Oral Oral External	TD959
29. <i>Maytenus serrata</i> Schweinf.	Celastraceae	Atat	Shrub	L	Snake Bite Stomach-ache	Chewing Chewing	Oral Oral	TD962
30. <i>Ocimum lamiiifolium</i> Hochst.	Lamiaceae	Damakesse	Herb	L	'Mich' 'Mich' Evil Eye	Juice with water Juice with boiled coffee Inhaling smoke	Nasal Oral Nasal	TD904
31. <i>Olea europaea</i> L. ssp. <i>cuspidata</i> (Viv.) P. S. Green.	Oleaceae	Weyira	Tree	F (Oil)	Ear Pain	Decoction	Ear-Drop	TD901
32. <i>Otostegia integrifolia</i>	Lamiaceae	Tinjute	Shrub	L	Stomach-ache 'Megagna' 'Mich'	Juice with water Juice with water Inhaling steam boiled in water	Oral Oral Oral	TD929
				L and St	Evil Eye	Inhaling smoke	Nasal	

Table 2 (Continued)

Species	Family	Local name	Habit	Part used	Use(s)	Preparation	Administration Route	Voucher Number
33. <i>Pentas schimperiana</i> (A. Rich.) Vatke	Rubiaceae	Etse Tsere	Shrub	R	Snake Bite	Chewing	Oral	TD972
34. <i>Phytolacca dodecandra</i> L'Herit	Phytolaceae	Endod (Male)	Shrub	R	Abortion/upto 3 months Rabies	Powder with water Powder with water	Oral Oral	TD973
35. <i>Plectranthus sp.</i>	Lamiaceae	Dachet	Herb	L	'Wesfat' (Ascaris)	Powder mixed with water	Oral	TD926
36. <i>Premna schimperi</i> Engl.	Verbenaceae	Checho	Herb	L	Eye Sickness	Juice	External	TD942
37. <i>Ranunculus multifidus</i> Forssk	Ranunculaceae	Etse Siol	Herb	L	'Nekersa' (Cancer)	Powder dressing	External	TD980
38. <i>Rubia cordifolia</i> L.	Rubiaceae	Enchibre	Herb	R	Coughing	Powder boiled with butter	Oral	TD921
39. <i>Rumex abyssinica</i> Jacq.	Polygonaceae	Mekmeko	Herb	R	'Quaqucha' 'Dem Bizat' (Hyper Tension)	Rubbing with fresh root Powder boiled with water	External Oral	TD913
40. <i>Rumex nervosus</i> Vahl	Polygonaceae	Embuacho	Herb	R	'Kintarot' (Wart) Stomach-ache Dysentery	Powder on cut edge Honey paste dressing Powder mixed with melted butter	External Oral Oral	TD990
41. <i>Rumex stuedelli</i> Hochst. Ex A. Rich.	Polygonaceae	Tult	Herb	R	Amoebic dysentery	Chewing	Oral	TD911
42. <i>Ruta chalepensis</i> L.	Rutaceae	Tena Adam	Herb	L and F	Stomach-ache 'Megagna'	Chewing Chewing	Oral Oral	TD977
43. <i>Securidaca longipedunculata</i> Fresen	Polygalaceae	Etse Menahea	Shrub	St	'Mich'	Inhaling smoke	Nasal	TD975
44. <i>Senecio myriocephalus</i> Sch. Bip. Ex. A. Rich.	Cunvulvulaceae	Weinagift	Herb	L	Eye Injury/Eye sickness	Chewing and applying paste	External	TD918
45. <i>Sida Schimperiana</i> Hochst. A. Rich.	Malvaceae	Chifrig	Shrub	R	'Shotelaye' (hydrops Fetalis)	Tying around waste of female	External	TD920
46. <i>Spilanthes uliginosa</i> Sw.	Asteraceae	Guticha	Herb	L	'Kusil' (External injury)	Crushed paste dressing	External	TD986
47. <i>Verbascum sinaiticum</i> Benth.	Scrophulariaceae	Ketetina/Yeahiya Joro	Herb	L	'Almaz Balechira' (Viral infection)	Water paste as lotion	External	TD965
48. <i>Verbena officinalis</i> L.	Verbenaceae	Atuch	Herb	R	Dysentery Stomach-ache	Powder mix with water Chewing	Oral Oral	TD952
49. <i>Vernonia amygdalina</i> Del.	Asteraceae	Girawa	Tree	L	Tapeworm Ascaris Stomach-ache	Crushed mixed with water Crushed mixed with water Crushed mixed with water	Oral Oral Oral	TD919
50. <i>Withania somenifera</i> L.	Solanaceae	Gizawa	Shrub	R	Babies Disease 'Satan Beshita' (devil disease)	Bathing Inhaling smoke	External Nasal	TD956
51. <i>Zehneria scabra</i> (Linn. f.) Sond	Asteraceae	Hareg Ressa	Climber	L	Unidentified Swelling	Crushed paste	External	TD909
52. <i>Zingiber officinale</i> Rosc.	Zingiberaceae	Zingibil	Herb	Rh	Stomach-ache	Eating	Oral	TD979

B, bark; F, fruit; Fl, flower; L, Leaf; La, latex; R, root; Bu, bulb, Rh, rhizome; S, seed; St, stem, WP, whole plant. All local names are in Amharic (official language of Ethiopia). 'Mich' is a febrile disease characterized by fever, headache, sweating, *Herpes labialis*, and muscle spasm

Table 3
Traditional medicine with multiple plants prescription

Species	Family	Local name	Habit	Part used	Use(s)	Preparation	Administration route	Voucher number
1. <i>Catha edulis</i> (Vahl.) Forssk. Ex Endl.	Celastereaceae	Chat	Tree	L	Asthma/Coughing	Powder mixed with melted butter	Oral	TD939
2. <i>Rubia cordifolia</i> L.	Rubiaceae	Enchibre	Herb	R				TD921
1. <i>Dorstenia barnimiana</i> Schweinf.	Moraceae	Work Bemeda	Herb	R	Coughing (TB)	Boiled in water	Oral	TD954
2. <i>Thea sinensis</i> L.	Threaceae	Tea	Herb	L				TD950
1. <i>Calpurnia aurea</i> (Alt.) Benth.	Fabaceae	Digita	Shrub	L	Internal diseases, Intestinal Worms, Unidentified swellings/ Cancer Neck, Severe Dysentery with Blood	Powder mixed with water	Oral	TD917
2. <i>Cucumis ficifolius</i> A. Rich.	Cucurbitaceae	Yemidir Embuay	Herb	R				TD916
3. <i>Dodonaea angustifolia</i> L. F.	Sapindaceae	Kitkita	Shrub	L				TD941
4. <i>Euphorbia abyssinica</i> J. F. Gmel.	Euphorbiaceae	Qulqwal	Tree	La				TD908
5. <i>Euphorbia tirucalli</i> L.	Euphorbiaceae	Kinchib	Tree	La				TD966
6. <i>Malva verticillata</i> L.	Malvaceae	Lut	Herb	R				TD958
1. <i>Brucea antidysenterica</i> J. F. Mill.	Simaroubaceae	Aballo	Tree	L	'Eeke'	Powder butter paste	External	TD905
2. <i>Myrica salicifolia</i> A. Rich.	Myricaceae	Shinet	Shrub	L				TD960
3. <i>Rhamnus prinoides</i> L.	Rhamnaceae	Gesho	Shrub	S				TD957
1. <i>Brucea antidysenterica</i> J. F. Mill.	Simaroubaceae	Aballo	Tree	L	Evil Eye	Inhaling of Smoke of mixed powder	Nasal	TD905
2. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	L				TD906
3. <i>Cucumis ficifolius</i> A. Rich.	Cucurbitaceae	Yemidir Embuay	Herb	R				TD916
4. <i>Kalanchoe petitiiana</i> A. Rich.	Crassulaceae	Endehuahula	Shrub	L				TD907
1. <i>Carissa spinarum</i> L.	Apocynaceae	Agam	Shrub	R	Evil Eye	Inhaling of Smoke of mixed powder	Nasal	TD935
2. <i>Echinops kebericho</i> Mesfin	Asteraceae	Kebercho	Herb	R				TD900
3. <i>Ferrula communis</i> L.	Apiaceae	Dog	Herb	R				TD988
4. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto	Herb	S				TD928
5. <i>Ocimum lamiifolium</i> Hochst.	Lamiaceae	Damakesse	Herb	L and St				TD904
6. <i>Otostegia integrifolia</i>	Lamiaceae	Tinjute	Shrub	WP				TD929
7. <i>Withania somenifera</i> L.	Solanaceae	Gizawa	Shrub	R				TD956
1. <i>Allium sativum</i> L.	Alliaceae	Nech Shinkurt	Herb	B	Evil Eye	Inhaling of Smoke of mixed powder	Nasal	TD924
2. <i>Capparis tomentosa</i> Lam.	Capparidaceae	Gumero	Shrub	R				TD944
3. <i>Carissa spinarum</i> L.	Apocynaceae	Agam	Shrub	R				TD935
4. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	R				TD906
5. <i>Withania somenifera</i> L.	Solanaceae	Gizawa	Shrub	R				TD956
1. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	L	Wound dressing	Mixed Powder paste	External	TD906
2. <i>Cynoglossum lanceolatum</i> Forssk.	Boraginaceae	Chegogit	Herb	L				TD967
3. <i>Dodonaea angustifolia</i> L. F.	Sapindaceae	Kitkita	Shrub	L				TD941
1. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	B	Tape Worm	Powder Mixed with water	Oral	TD906
2. <i>Glinus lotoides</i> L. var <i>lotoides</i>	Molluginaceae	Meterea	Herb	S				TD930
1. <i>Glinus lotoides</i> L. var <i>lotoides</i>	Molluginaceae	Meterea	Herb	S	Tape Worm	Powder paste	Oral	TD930
2. <i>Guizotia abyssinica</i> Cass	Asteraceae	Noug	Herb	S				TD968
1. <i>Allium sativum</i> L.	Alliaceae	Nech Shinkurt	Herb	B	Leishmania	Mildly heated Powder paste	External	TD924
2. <i>Clematis hirsuta</i> Perr & Guill	Ranunculaceae	Azo Hareg	Climber	L				TD949
3. <i>Guizotia abyssinica</i> Cass	Astraceae	Noug	Herb	S				TD968

Table 3 (Continued)

Species	Family	Local name	Habit	Part used	Use(s)	Preparation	Administration route	Voucher number
1. <i>Plectranthus</i> sp.	Lamiaceae	Dachet	Herb	L	Leishmania	Crushed paste	External	TD926
2. <i>Apiaceae</i>	Bussa	Herb	L				TD969	
1. <i>Capparis tomentosa</i> Lam.	Capparidaceae	Gumero	Shrub	R	Malaria	Inhaling of Smoke of mixed powder	Nasal	TD944
2. <i>Carissa spinarum</i> L.	Apocynaceae	Agam	Shrub	R				TD935
3. <i>Cucurbita</i> sp.	Cucurbitaceae	Gim Hareg /Dursht	Climber	L and St				TD948
4. <i>Securidaca longipedunculata</i> Fresen	Polygalaceae	Etse Menahea	Shrub	R				TD975
5. <i>Withania somenifera</i> L.	Solanaceae	Gizawa	Shrub	R				TD956
1. <i>Citrus aurantifolia</i> (Christm.) Swingle	Rutaceae	Lomi	Tree	Juice	'Megagna'	Powder mixed with juice	Oral	TD970
2. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto	Herb	S				TD928
1. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	L	'Mich'	Inhaling of Smoke	Nasal	TD906
2. <i>Echinops kebericho</i> Mesfin	Asteraceae	Kebercho	Herb	R	'Mich'			TD900
1. <i>Cordia africana</i> Lam.	Boraginaceae	Wanza	Tree	L	'Mich'	Inhaling steam of mixture boiled in water	Nasal and Oral	TD933
2. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	L				TD906
3. <i>Eucalyptus globulus</i> Labill	Myrtaceae	Nech Bahir Zaf	Tree	L				TD971
4. <i>Ocimum lamiifolium</i> Hochst.	Lamiaceae	Damakesse	Herb	L and St				TD904
1. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	L	'Mich'	Inhaling steam of mixture boiled in water	Nasal and Oral	TD906
2. <i>Eucalyptus globulus</i> Labill	Myrtaceae	Nech Bahir Zaf	Tree	L				TD971
3. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto		S				TD928
4. <i>Ocimum lamiifolium</i> Hochst.	Lamiaceae	Damakesse	Herb	L and St				TD904
5. <i>Otostegia integrifolia</i>	Lamiaceae	Tinjute	Shrub	L and St				TD929
1. <i>Becium grandiflorum</i> (Lam.) Richi-Serm.	Lamiaceae	Matosh	Shrub	L	'Mich'	Inhaling steam of mixture boiled in water	Nasal and Oral	TD947
2. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	L				TD906
3. <i>Ocimum lamiifolium</i> Hochst.	Lamiaceae	Damakesse	Herb	L and St				TD904
4. <i>Zehmeria scabra</i> (Linn. f.) Sond.	Asteraceae	Hareg Ressa	Climber	L and St				TD909
1. <i>Ocimum lamiifolium</i> Hochst.	Lamiaceae	Damakesse	Herb	L and St	'Mich'	Inhaling of Smoke	Nasal	TD904
2. <i>Otostegia integrifolia</i>	Lamiaceae	Tinjute	Shrub	L and St				TD929
1. <i>Capparis tomentosa</i> Lam.	Capparidaceae	Gumero	Shrub	R	'Mich'	Inhaling of Smoke	Nasal	TD944
2. <i>Securidaca longipedunculata</i> Fresen	Polygalaceae	Etse Menahea	Shrub	R				TD975
3. <i>Withania somenifera</i> L.	Solanaceae	Gizawa	Shrub	R				TD956
1. <i>Securidaca longipedunculata</i> Fresen	Polygalaceae	Etse Menahea	Shrub	R	'Mich'	Inhaling of Smoke	Nasal	TD975
2. <i>Silen macrosolen</i> A. Rich.	Caryophyllaceae	Wegert	Herb	St				TD946
1. <i>Cyphostemma junceum</i> (Webb) Decoings ex Wild & Drummond	Vitaceae	Etse Zewe	Herb	R	'Mushro'/Thinning with severe dysentery	Powder Mixed with water and Fermented for 7 days	Oral	TD964
2. <i>Dorstenia barnimiana</i> Schweinf.	Moraceae	Work Bemeda	Herb	R				TD954
3. <i>Gloriosa superba</i> L.	Liliaceae	Etse Libona	Herb	R				TD963
1. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	B	Rabies	Baked Mixed powder in water	Oral	TD906
2. <i>Cyphostemma cyphopetalum</i> (Fresen.) Desc. Ex Wild & Drummond	Vitaceae	Gindosh	Climber	R				TD925
3. <i>Juniperus procera</i> Endl.	Cupressaceae	Tsede	Tree	L				TD914
4. <i>Solanum indicum</i> L.	Solanaceae	Geber Embuay	Herb	R				TD932
5. <i>Solanum marginatum</i> L.	Solanaceae	Embuay	Herb	R				TD953

6. <i>Eragrostis tef</i> (Zucc.) Trotter	Poaceae	Tikur Teff		S					TD940
1. <i>Carissa spinarum</i> L.	Apocynaceae	Agam	Shrub	R	Snake Bite	Chewing Fresh mixture	Oral		TD935
2. <i>Catha edulis</i> (Vahl.) Forssk. Ex Endl.	Celastraceae	Chat	Tree	L					TD939
3. <i>Rhamnus prinoides</i> L.	Rhamnaceae	Gesho	Shrub	R					TD957
1. <i>Allium sativum</i> L.	Alliaceae	Nech Shinkurt	Herb	B	Stomach-ache	Eating fresh mixture	Oral		TD924
2. <i>Cymbopogon citratus</i> (DC) Stapf	Poaceae	Tej Sar	Herb	R					TD910
3. <i>Maytenus serrata</i> Schweinf.	Celastraceae	Atat	Shrub	L					TD962
4. <i>Ruta chalepensis</i> L.	Rutaceae	Tena Adam	Herb	F and L					TD977
1. <i>Allium sativum</i> L.	Alliaceae	Nech Shinkurt	Herb	B	Stomach-ache	Eating fresh mixture	Oral		TD924
2. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto	Herb	S					TD928
1. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto	Herb	S	Stomach-ache	Eating fresh mixture	Oral		TD928
2. <i>Ruta chalepensis</i> L.	Rutaceae	Tena Adam	Herb	F and L					TD977
1. <i>Citrus aurantifolia</i> (Christm.) Swingle	Rutaceae	Lomi	Tree	Juice	Stomach-ache	Powder mixed with juice	Oral		TD970
2. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto	Herb	S					TD928
1. <i>Cymbopogon citratus</i> (DC) Stapf	Poaceae	Tej Sar	Herb	R	Stomach-ache	Eating fresh mixture	Oral		TD910
2. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto	Herb	S					TD928
3. <i>Ruta chalepensis</i> L.	Rutaceae	Tena Adam	Herb	F and L					TD977
1. <i>Calpurnia aurea</i> (Alt.) Benth.	Leguminosae	Digita	Shrub	S	Tesbo Beshita	Honey paste	Oral		TD917
2. <i>Dodonaea angustifolia</i> L. F.	Sapindaceae	Kitkita	Shrub	S					TD941
1. <i>Brucea antidysenterica</i> J. F. Mill.	Simaroubaceae	Aballo	Tree	S	Veneral Diseases	Water paste beaked	Oral		TD905
2. <i>Eragrostis tef</i> (Zucc.) Trotter	Poaceae	Tikur Teff	Herb	S					TD940

Table 4

Medicinal plants with veterinary importance and with single plant prescription

Species	Family	Local name	Habit	Part used	Use(s)	Preparation	Administration route	Voucher number
1. <i>Achyranthes aspera</i> L.	Amaranthaceae	Telenje	Herb	L	Blood clotting	Water Paste	External	TD902
2. <i>Acokanthera schimperi</i> (A. DC.) Schweinf	Apocynaceae	Mirenze	Tree	L	'Wef Beshita' (Jaundice)	Grounded mixed with water	Oral	TD945
3. <i>Aloe pulcherima</i>	Aloaceae	Yesete Ret	Herb	L	'Abagorba' (Black leg)	Grounded mixed with water	Oral	TD923
4. <i>Aloe pulcherima</i>	Aloaceae	Yesete Ret	Herb	L	Bloat	Grounded mixed with water	Oral	TD923
5. <i>Brucea antidysenterica</i> J. F. Mill.	Simaroubaceae	Aballo	Tree	L	Thinning (Helimethiasis)	Crushed with water	Oral	TD905
6. <i>Clematis hirsuta</i> Perr & Guill	Ranunculaceae	Azo Hareg	Tree	L	'Yeferes Ekeke' (Lymphangitis)	Water paste	External	TD949
7. <i>Cucumis dipsaceus</i> Ehernb. Ex. Spach	Curcurbitaceae	Yeamura Missa	Climber	R	'Wef Beshita' (jaundice)	Grounded mixed with water	Oral	TD903
8. <i>Cucumis ficifolius</i> A. Rich.	Curcurbitaceae	Yemidir Embuay	Herb	R	Gastrointestinal sickness	Grounded mixed with water	Oral	TD916
9. <i>Cucumis ficifolius</i> A. Rich.	Curcurbitaceae	Yemidir Embuay	Herb	R	Unable to urinate	Grounded mixed with water	Oral	TD916
10. <i>Echinops kebericho</i> Mesfin	Asteraceae	Kebercho	Herb	R	Coughing	Grounded mixed with water	Oral	TD900
11. <i>Euphorbia abyssinica</i> J. F. Gmel.	Euphorbiaceae	Qulqwal	Tree	La	External injury (Kusil)	Ointment	External	TD908
12. <i>Euphorbia abyssinica</i> J. F. Gmel.	Euphorbiaceae	Qulqwal	Tree	La	'Kintarot' (Papilloma/ Wart)	Ointment	External	TD908
13. <i>Phytolacca dodecandra</i> L'Herit	Phytolacceae	Endod (Male)	Shrub	R	Contraceptive	Powder mixed with water	Oral	TD973
14. <i>Premna schimperi</i> Engl.	Verbenaceae	Checho	Herb	L	Eye Sickness	Juice	External	TD942
15. <i>Rumex nervosus</i> Vahl	Polygonaceae	Embuacho	Herb	R	'Kintarot'	Mildly heated leaf dressing	External	TD990
16. <i>Senecio myriocephalus</i> Sch. Bip. Ex. A. Rich.	Asteraceae	Weinagift	Herb	L	Eye injury	Chewed paste	External	TD918
17. <i>Sida Schimperiana</i> Hochst. A. Rich.	Malvaceae	Chifrig	Shrub	R	'Shotelaye' (prenatal abortion)	Tie around forehead	External	TD920

Table 5
Traditional medicine of veterinary importance and with multiple plants prescription

Species	Family	Local name	Habit	Part used	Use(s)	Preparation	Administration route	Voucher number
1. <i>Brucea antidysenterica</i> J. F. Mill.	Simaroubaceae	Aballo	Tree	L	'Aba Senga' (Anthrax)	Fresh crushed with water	Oral	TD905
2. <i>Cucumis ficifolius</i> A. Rich.	Curcurbitaceae	Yemidir Embuay	Herb	R				TD916
3. <i>Stephania abyssinica</i> (Dill. & Rich.) Walp	Menispermaceae	Kolela/Esteyesus	Climber	L				TD974
1. <i>Chenopodium Anthelminticum</i> (L.) A. Gray	Chenopodaceae	Gim Kitel	Herb	L	'Abagorba'	Fresh crushed or filtrate in water	Oral/ear/nose	TD948
2. <i>Clerodendrum myricoides</i> (Hochst.) Vatke	Verbenaceae	Misrich	Shrub	R				TD931
1. <i>Dorstenia barnimiana</i> Schweinf.	Moraceae	Work Bemeda	Herb	R	Coughing (Acute)	Boiled in water	Oral	TD954
2. <i>Thea sinensis</i> L.	Threaceae	Tea	Herb	L				TD950
1. <i>Allium sativum</i> L.	Alliaceae	Nech Shinkurt	Herb	Bu	'Golloba' (Trips)	Fresh crushed in water	Oral	TD924
2. <i>Anethum foeniculum</i> L.	Umbelliferae	Insilal	Herb	R				TD936
3. <i>Cucumis ficifolius</i> A. Rich.	Curcurbitaceae	Yemidir Embuay	Herb	R				TD916
4. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto	Herb	Seed				TD928
1. <i>Cucumis ficifolius</i> A. Rich.	Curcurbitaceae	Yemidir Embuay	Herb	R	'Golloba'	Fresh crushed in water	Oral	TD916
2. <i>Cucurbita</i> sp	Cucurbitaceae	Gim Hareg /Dursht	Climber	L, St				TD948
1. <i>Cymbopogon citratus</i> (DC) Stapf	Poaceae	Tej Sar	Herb	R	'Golloba'	Fresh crushed in water	Oral	TD910
2. <i>Lepidium sativum</i> L.	Brassicaceae	Fetto	Herb	S				TD928
3. <i>Ruta chalepensis</i> L.	Rutaceae	Tena Adam	Herb	L				TD977
1. <i>Croton marcostachyus</i> Del.	Euphorbiaceae	Bissana	Tree	B	Rabies	Water paste eaten with small teff bread	Oral	TD906
2. <i>Cyphostemma cyphopetalum</i> (Fresen.) Desc. Ex Wild & Drummond	Vitaceae	Gindosh	Climber	R				TD925
3. <i>Juniperus procera</i> Endl.	Cupressaceae	Tsede	Tree	L				TD914
4. <i>Solanum indicum</i> L.	Solanaceae	Geber Embuay	Herb	R				TD932
5. <i>Solanum marginatum</i> L.	Solanaceae	Embuay	Herb	R				TD953
6. <i>Eragrostis tef</i> (Zucc.) Trotter	Poaceae	Tikur Teff	Herb	S				TD940

Table 6
Informant consensus factor by categories of diseases

Category	Species	All species (%)	Use citations	All use citations (%)	ICF
'Mich' and headache	17	33	52	17	0.69
Intestinal illness and parasites	12	23	35	12	0.68
Stomach illness and 'Megagna'	17	33	46	15	0.64
Skin infection and external injury	20	38	36	12	0.46
Snake and viper Bite	10	19	16	5	0.40
Malaria	5	10	7	2	0.33
Sensorial system	5	10	7	2	0.33
Internal diseases and respiratory infection	30	58	42	14	0.29
Evil Eye and 'setan beshita'	12	23	16	5	0.27
Rabies	7	13	8	3	0.14
Unidentified swelling and cancer	9	17	10	3	0.11

Table 7
Most commonly used medicinal plants and their major uses with their fidelity Level (0 = the least, 100 = the highest efficiency)

Species and family	Local name	Uses	Fidelity level (FL)
<i>Cordia africana</i> Lam. Boraginaceae	Wanza	'Mich'	100%
<i>Glinus lotoides</i> L. var <i>lotoides</i> Molluginaceae	Meterea	'Kosso'	100%
<i>Ocimum lamifolium</i> Hochst. Lamiaceae	Damakesse	'Mich', Evil Eye	95%
<i>Achyranthes aspera</i> L. Amaranthaceae	Telenje	External injury (Kusil), Blood clotting, 'Nessire', 'Wef Beshita'	83%
<i>Ruta chalepensis</i> L. Rutaceae	Tena Adam	Stomach-ache/ 'Megagna',	80%
<i>Calpurnia aurea</i> (Alt.) Benth. Leguminosae	Digita	'Tesbo Beshita', Internal diseases, Intestinal worms	75%
<i>Lepidium sativum</i> L. Brassicaceae	Fetto	Stomach-ache, 'Megagna', Evil Eye, 'Mich'	67%
<i>Carissa spinarum</i> L. (Forssk.) Vahl Apocynaceae	Agam	Snake Bite, Evil Eye, Malaria	57%
<i>Croton marcostachyus</i> Del. Euphorbiaceae	Bissana	'Mich', 'Chiffa', Evil Eye, External Injury (Kusil), 'Quaquacha', Rabies	53%
<i>Otostegia integrifolia</i> Lamiaceae	Tinjute	'Mich', Evil Eye, 'Megagna'	50%
<i>Euphorbia tirucalli</i> L. Euphorbiaceae	Kinchib	Intestinal worms, Dysentery, Internal diseases, unidentified swellings/ Neck Cancer	50%
<i>Malva verticillata</i> L. Malvaceae	Lut	Intestinal Worms, Dysentery, Internal diseases, unidentified swellings/ Neck Cancer	50%
<i>Allium sativum</i> L. Alliaceae	Nech Shinkurt	Stomach-ache, Evil Eye, 'Mich', Malaria	43%
<i>Clematis hirsuta</i> Perr & Guill Ranunculaceae	Azo Hareg	Leishmania, Hemorrhoid, 'Yeferes Ekeke', 'Yeshererit Beshita'	43%
<i>Cucumis ficifolius</i> A. Rich. Cucurbitaceae	Yemidir Embuay	Stomach-ache. 'Chiffa', Dysentery, Evil Eye, Internal Disease, 'Kosso', 'Mich', Snake bite, 'Mogne Bagegne', unidentified swellings/Neck Cancer, Intestinal Worms, External Injury	41%
<i>Dorstenia barnimiana</i> Schweinf. Moraceae	Work Bemeda	Leprosy, Coughing (Acute), 'Mushro'/Thinning, Stomach illness	40%
<i>Dodonaea angustifolia</i> L. F. Sapindaceae	Kitkita	Intestinal Worms, Dysentery, External Injury (Kusil), Internal Diseases, unidentified swellings/ Neck Cancer, 'Tesbo Beshita'	38%
<i>Euphorbia abyssinica</i> J. F. Gmel. Euphorbiaceae	Qulqwal	Intestinal Worms, Dysentery, External Injury (Kusil), Internal Diseases, 'Kintarot', unidentified swellings/ Neck Cancer	38%

by the healers. *Cordia africana* (100%) has the highest FL and *Euphorbia abyssinica* (38%) has the lowest (Table 7).

4. Discussion and conclusions

In the present study, it was found that most people (55%) continue to use traditional systems of health care including medicinal plants alone or in combination with modern pharmaceuticals although modern medicines are gradually expanding into the villages, either through private rural pharmacies or through governmental health care scheme.

4.1. Use and knowledge of medicinal plants

Our assumption that villagers acquired the knowledge and use of medicinal plants from the clergymen in the monastery is supported by our result (Abebe and Ayehu, 1993; Van der Gest, 1997). In Doreni, 73% of informants reported one or more medicinal plants followed by Zegamel (71%) than the other villages. Doreni is located only 30 min walk from Debre Libanos monastery and Zegamel is 4 h walk but there is an Abune Habtemariam monastery in Zegamel where only monks reside and nuns are forbidden. The number of informants that reported

one or more medicinal plants decreases as the distance from the monastery increases such that Telaye (52%) is 2–3 h walk and Abichu (36%) is 4 h walk.

The females have less knowledge than the males and medicinal plants reported by the females are either cultivated or weeds that are found in their backyards, and they mainly treat their own children. This is because the traditional knowledge in the family or community is passed from male parent to his first-born son (Bishaw, 1990; Berhe Tesfu et al., 1995).

The multiple prescriptions reported by the healers usually contain a range of pharmacologically active compounds; in some cases, it is not known which ingredients are important for the therapeutic effect (Schulz et al., 2001). Many herbalists believe that the poly-herbal treatment healing power increases than that of single medicinal plant although each medicinal plant is used as a remedy. Healers, on the other hand, may deliberately use poly-herbal treatment to disguise the plant that is used as a remedy for a given ailment. For example, a poly-herbal medicine for evil eye reported in this study consists of seven medicinal plants: *Carissa spinarum*, *Echinops kebericho*, *Ferrula communis*, *Lepidium sativum*, *Ocimum lamiifolium*, *Otostegia integrifolia*, and *Withania somenifera* and when compared with the other two treatments for evil eye reported in this study, only *Croton marcostachyus*, *Carissa spinarum* and *Withania somenifera* are common. Hence, these three medicinal plants may be the remedy for evil eye and the rest are for masking and keeping the knowledge secret (Addis et al., 2001).

4.2. Plant part, dosage and route of administration

In studies conducted in Ethiopia, root is one of the most extensively used plant part in preparation of traditional herbal medicine (Abebe and Ayehu, 1993; Kloos, 1976) but in Giday et al. (2003) and our study, the leaf (44%) is more favoured in preparation of herbal medicines. The leaves are used as fresh preparations against ‘Mich’, Stomach-ache, ‘Megagna’ and external injuries and the preference for the leaves may not be related as much to their ready availability, the vegetation is always green and leaves are abundant (Di Stasi et al., 2002). Actually, the upper part of some plant dries in the dry season such as of the *Clematis hirsuta*, *Clerodendrum myricoides*, *Achyranthes aspera*, *Diplolophium africanum* and *Echinops kebericho*. The root and stem are more favoured in herbal medicines that are dried, powdered and stored.

The quantity of the parts used determines the dosage and it is one of the drawbacks of herbal medicine, which causes severe side effects. For example, *Phytolacca dodecandra* is used for abortion but it causes death if it is taken over dosage and not administered by a healer. The measurements used are not standardized and depends on the experience of individual herbalist. In preparation of poly-herbal medicines, each medicinal plant is dried, powdered and stored separately, and the amount taken from each varies and is mixed secretly.

The other factor that determines dosage and route of administration is the sociocultural explanation and diagnosis of the

illness and hence, some types of illness have more than one description and remedy. For example, ‘Mich’, stomach-ache and evil eye are described by variety of symptoms (Tables 2 and 3) and the type of remedy prescribed is in accordance with the information given by the patient and the experience of the healer. Furthermore, different healers can interpret the symptoms as different type of illness, such as coughing is associated with pneumonia, asthma or TB, and accordingly, the remedy, dosage and route of administration vary (Abebe and Ayehu, 1993; Addis et al., 2001).

4.3. Informant consensus factor and fidelity level

The local people tend to agree on the type of remedy and ailments reported. If the data are examined from the standpoint of the consistency of the reason that the plant is effective in treating a certain disease, there is extensive agreement for some categories of diseases. Table 6 shows higher ICF values for some of the categories of diseases that are common: ‘Mich’ and headache (0.69), intestinal illness and parasites (0.68), and Stomach illness and ‘Megagna’ (0.64), which are related to the poor hygiene of the society. The type of disease with lower ICF values such as Rabies (0.14) and unidentified swelling and cancer (0.11) whose occurrence is rare, are administered by healers, and mostly treated with poly-herbal medicines, therefore, a variety of medicinal plants are reported.

The fidelity level calculated for each medicinal plant agrees with ICF value. Obviously, the remedies for frequently reported ailments have the highest FL value and those with low number of reports have lowest FL values. The remedies such as *Dodonaea angustifolia* (38%) and *Euphorbia abyssinica* (38%) have low FL value because the majority of the informants do not know the dosage and the methods of preparation of the remedies even though *Euphorbia abyssinica* is used as fence in their compounds and its latex is considered as poison by the majority of the informants (personal communication).

This study was not able to determine the knowledge difference between the villagers and the monastery dwellers because the monks and nuns were not willing to give information on medicinal plant despite the attempts made to convince them about the importance of their knowledge and its documentation for the coming generations and the country at large for preparation of pharmacologically effective remedies. Nevertheless, it is assumed that they know better than the villagers and one knowledgeable member of the monks told us that he had learnt herbal medicine working as servant to the Debeta (clergy man that teaches the boys to be ordained as Deacon) for 2 years. He was the member of National Traditional Medicine Practitioner Association of Ethiopia but he is not willing to work as an informant. Furthermore, most of the people in Debre Libanos (79%) consider using herbal medicines as sin, which may exacerbate the loss of traditional medicinal knowledge in the surrounding and the country at large. Also, considering the number of monasteries and churches in the country at large, this negative attitude to traditional medicine increase the bias and puts its future use in dilemma.

Acknowledgements

We are very much grateful to all the local informants and healers who shared their knowledge on the use of medicinal plants with us. Without their contribution, this study would have been impossible. We would like to thank Associate Vice President Office for Research and Publication, Addis Ababa University for the grant to conduct this study.

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