Journal of Medicinal Plants Studies
www.PlantsJournal.com

ISSN (E): 2320-3862
ISSN (P): 2394-0530
NAAS Rating: 3.53
JMPS 2018; 6(4): 11-19

Received: 05-05-2018
Accepted: 10-06-2018

Yemane Tilahun
Department of Biology, College of Natural and computational Science, Adigrat University, Adigrat, Ethiopia

Correspondence
Yemane Tilahun
Department of Biology, College of Natural and computational Science, Adigrat University, Adigrat, Ethiopia

Ethnobotanical study of traditional medicinal plants used in and around Adigrat town, eastern Tigray, Ethiopia

Yemane Tilahun

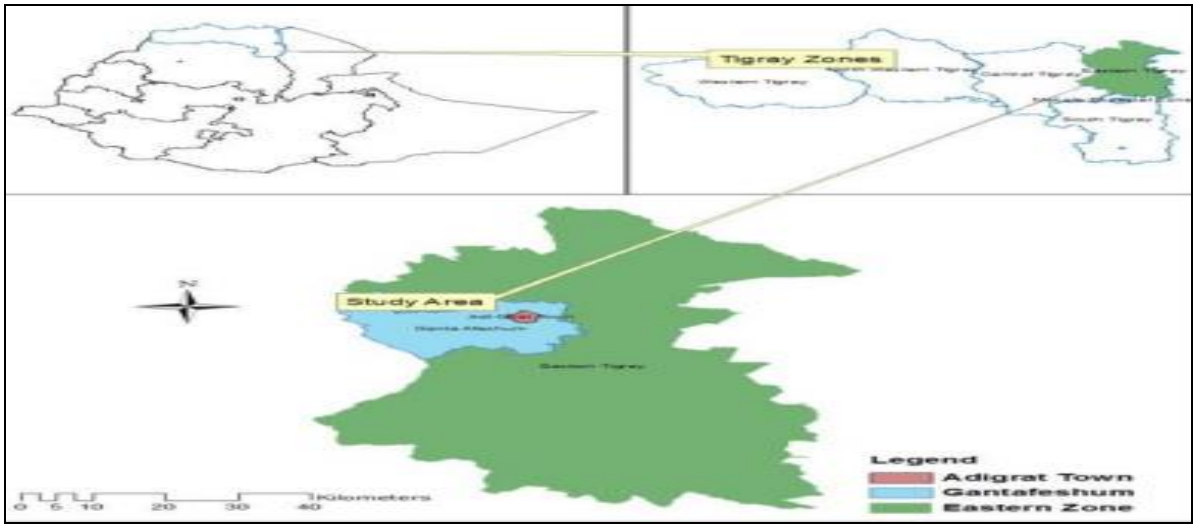
Abstract
Traditional medicine is a form of folk or cultural activity which has been practiced from the very beginning by indigenous people to treat a number of human and livestock aliments. Traditional medicinal plants are certain plant species utilized in the preparation of herbal medicine. In this study, an ethnobotanical study was conducted to investigate the use of medicinal plants around Adigrat Town, Eastern Tigray Ethiopia. Semi-structured interviews, field observations and guided field walks with informants were employed to obtain ethnobotanical data. A total of 62 key informants (26 males and 36 females) were selected purposefully with the help of local administers and local elderly people. A total of 55 species of medicinal plants which belong to 31 families were collected and identified for treating 26 human aliments. Solanaceae was the most dominant medicinal plant family followed by Asteraceae and Lamiaceae. Most (76.98%) of the traditional medicinal plants were wild and were mostly harvested for their leaves (57.50%). Oral application was the highest and most commonly used route of application followed by dermal whereas crushing was the most frequently applied mode of preparing herbal medicine. Awareness creation among the traditional healers and community at large is important to preserve the indigenous medicinal plant species and for conservation and sustainable use of medicinal plants in this study area.

Keywords: key informants, indigenous knowledge, local informants, traditional healers, traditional knowledge

Introduction
Traditional medicine is a sum total of knowledge, skills, and practices based on theories, beliefs, and experiences of indigenous people. This is used to maintain health as well as to prevent, diagnose, improve or treat the physical and mental illness (WHO, 2008) [16].
Traditional medicine is the part of cultural and religious life of the developing people (Lange, 1998) [10]. In many developing countries of Africa, people depend on traditional knowledge and medicinal plants to meet their primary health care needs. For instance, in Africa about 70% of the population use traditional medicines for primary health care because is easily accessible, more effective, safe, not expensive, and culturally acceptable (Mohammed and Birhanu, 2011; Tesfaye, *et al*., 2006) [11, 13]. In Ethiopia traditional medicinal plays a significant role in curing different types of diseases in all part of the country (Kibebew, 2001) [9]. About 80% of human population and 19% of livestock rely on traditional medicine (Hunde, 2001) [7]. Plant remedies are still the most important and sometimes, the only source of therapeutics for nearly 80% of aliments for the population of Ethiopia (Dawit, 2001) [3]. But currently medicinal plants are loss due to different human activities (Tesfa`ye, *et al.*, 2006) [13]. In addition to this the indigenous knowledge associated with conservation and use of medicinal plants is also disappeared at an alarming rate. Furthermore, documentation of medicinal plants knowledge is incomplete as results of limited inventory (Kebu, *et al*, 2004; Hunde, 2001) [18, 7].
In this study area traditional medicinal plant along with indigenous Knowledge of the people is not documented still wow. Therefore, this study focuses on identification and documentation of traditional medicinal plants utilized by indigenous people around Adigrat town along with the indigenous Knowledge of the people on preparing and utilizing tradition medicinal plants around this study area.

Methodology
This study was conducted around Adigrat Town, Tigray National Regional State,

located 898km from Addis Ababa. The GPS coordinate oscillated latitude at 14º16'41"Northing and the longitude at 39º27'38"E with 2457m elevation a.s.l (Adigrat Town Administration Office Plan, 2010). It receives mean annual rainfall of 500 to 600 mm where most of it occurs from mid-June to August and the annual temperature of the town ranges from 18 to 20^{0}C. The town is within the Woina-Dega (Alemshet Birhanemeskel, 2014) [2].



Primary data on traditional medicinal plants was collected through beforehand prepared semi-structured interview, field observation, and guided field walk. A total of 62 informants (26 males and 36 Females) who have more knowledge on traditional medicinal plants were incorporated in to interview purposively from all parts of the study area. Questionnaires for interview were prepared in local official language "Tigrigna" Questionnaires were prepared targeted on identifying basic information regarding traditional medicinal plants, methods of preparing herbal medicine, part of the plant used as medicine, ingredients added while preparing plant remedies, disease treated, routes of administration, amount of utilised herbal medicine in the treatment, source of medicinal plant used and other basic information. Finally collected data was organized and summarized by descriptive statistics packages such as frequency, percentage, and were analysed via Excel and word processor. Then, it was interpreted using tables, pie charts, graphs.

Results

Table 1: Ages of selected informants

No	Ages of informants	Frequency of respondents	percent
1	< 25	0	0.00
2	26-35	5	8.06
3	36-45	11	17.74
4	46-55	34	54.84
5	56-65	8	12.9
6	66-80	4	6.46
Total		62	

As it is indicated in table 1, the ages of interviewed informants were in all age class, but the majority of informants' age ranged 46 to 55.

A total of 55 traditional medicinal plant species distributed in 31 botanical families were collected and documented across the study areas, of which 16 (29.09%) were trees, 14 (25.41%) were shrubs, 23 (41.82%) were herbs and the rest 2 (3.64%) were climbers and hoot (Table 2above). Solanaceae is the most dominant medicinal plant family reported (with 6 species), followed by Asteraceae (4 species), Lamiaceae, Liguminoceae, Malvaceae, Polygonaceae (3species), Myrtaceae, Rutaceae, Rubaceae, Euphorbiaceae, Boraginaceae and Cucurbitaceae with (2species). The rest families (19) were represented by single species (Table 2). A total of 26 diseases are mentioned to be treated in which most of these diseases uses more than one species. Abdominal pain is the disease which uses many species (12) flowed by Michi (10 species), Evil eye and eye infection with 8 and 5 species respectively.

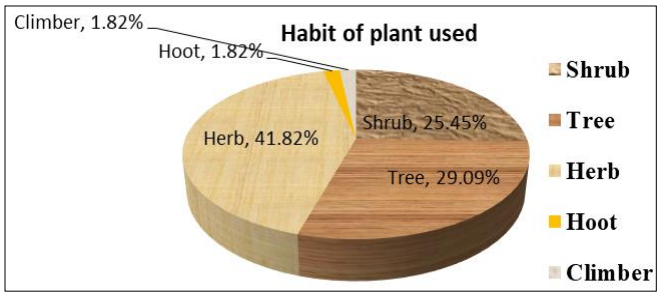


Fig 1: Growth habits of traditional medicinal plants in the study area

Most of the traditional practitioners of the study area reported that herbs were the most utilized plants to prepare medicine (41.82%) followed by trees (29.09 %), shrub (25.45%), and climber and hoot with (1.82%) respectively (Figure1).

Table 2: List of Traditional medicinal plants used around Adigrat Town, Tigray, Ethiopia

No	Scientific name/ Family	Local name	No of informants cited it/Disease treated	Plant habit	Part used	Additive (ingredients) added	Preparation	Source	Administration routes
1	Cordia Africana/ Boraginaceae	Awhi	4(Michi) 1(Fire burn) 1(Diarrhoea)	Tree	Leaf	Boiling water Coffee Butter Cold water	• Fresh leaves are boiled and the vapour is fumigated or crush, filter, mix it with boiling coffee and drink • Grind, mix it with butter and apply on affected part • Crush leaves with cold water and drink the fluid	wild	Nasal/oral Dermal Oral
2	Ocimium lamifolium/ Lamiaceae	Damakasie	7 (Michi)	Herb	Leaf	Water	• Boil the leaves in water and inhale the gas or Crush leaves, add little water and apply it on the affected part	Wild	Nasal/dermal
3	Citrus limon/ Rutaceae	Lemin	1 (Tinea Capitis 1 (mouth swelling & skin dryness)	Tree	Fruit	____	• Rub the fruit juice on the part of infection	Cultivated	Dermal
4	RhamnusPrenodes/ Ramnaceae	Gesho	2 (Tonsillitis) 1 (Tinea capitis)	Shrub	Leaf	Water	• Crush the fresh leaves with water and then drink the fluid • .Rub the leaf on the site of infection	Cultivated	1.Oral 2.Derma
5	Eucalyptus globules/ Myrtaceae	Tseadakelemtos	4(Cough) 2(Michi) 1(Eye infection)	Tree	Leaf	Water Leaves of Carica papaya	• Add leaves to boiling water and inhale the gas • Boil leaves in water with the leaves of carica papayaand inspire the vapour • .Boil its leaves with the leaves of carica papaya and smoke the vapour	Wild	Nasal
6	Medicago polymorpha/ Liguminoceae	Teneg	3(Abdominal pain) 1(Michi)	Herb	Root Leaf	_ Water	• Chew the root and swallow the fluid • Crush the fresh leaves with water and drink the juice	Wild	Oral
7	Withanias omnifera/ Solanaceae	Agol	1(Eye infection) 1(Michi) 1(Evil eye)	Shrub	Leaf Whole Whole	1Water 2.Justicia schimperiana Roots of Carissa spinarum	• Crush fresh leaves with water and apply it to infected eye. • Boil it by mixing with Justiciaschimperianaand wash the body with it. • Crush it with the root of Carissa spinarumand fire it for fumigation.	Wild	1.Optical 2.Dermal 3.Nasal
8	Gossypium hirsutum/ Malvaceae	Tut	1(Cattle eye infection)	Shrub	Seed	salt	• Chew the seed with salt and drop the fluid in to the eye of cattle.	Cultivated	Optical
9	Allium sativum/	Tseadashingurt	2(Toothache)	Herb	1.Bulb	1_	• Masticate it by affected tooth.	Cultivated	1&2. Oral

	Alliaceae		2(Abdominal pain) 2(Cough)		2.Stem 3.Bulb/Root	2_ 3.Honey for bulb or none for root	• Chew the stem and swallow it. • Digest bulb with honey and swallow it or remove outer cover and inter it in to the nose.		3.Oral/Nasal
10	Citrus senensis/ Rutaceae	Aranshi	2(Cough)	Tree	Fruit	Water/salt and sugar	• Cooking the fresh fruit and the eating or press the fresh fruit and boil the juice with salt and sugar for drinking.	Cultivated	Oral
11	Aloe adigratina Aloaceae	Ere	1(Snake bite) 1(wound) 1(Abdominal pain) 1(Urine retention)	Shrub	1.Whole 2.Latex 3.Leaf 4.Root	–	• Crush its parts and then drink the juice. • Cut a leaf and spread latex on wound until it healed. • Crush fresh leaves, filter and then drink the liquid. • Tie the root around the sex organ.	Wild	1.Oral 2.Dermal 3. oral 4.Dermal
12	Euclearacemosa/ Ebenaceae	Keleaw	1(Snake bite) 1(Evil eye) 1(Toothache)	Shrub	1.Root& bark 2.Whole 3.Root	1. Water 2. ____ 3._____	• Crush and add water, then drink the fluid • Grind and tie the powder around the neck. • Masticating the root with the affected tooth.	Wild	1.Oral 2. Dermal 3.Oral
13	Galiumboreo-aethiopicum/ Rubaceae.	Mendefdgi	1.(Toothache) 1(Evil eye)	Herb	Root	_	• Chew root with the infected tooth. • Burn it and fumigate.	Wild	1.Oral 2.Nasal
14	Calpurnia aurea/ Fabaceae.	Hitswatis	1(Diarrhoea) 1(Abdominal pain)	Tree	1.Seed 2Leaf	1.milk 2.None	• Crush the seed with milk and then drink • Crush the leaves, filter and drink the fluid.	Wild	Oral
15	Lepidium sativum/ Brassicaceae	Shimfa	1(Abdominal pain) 1(swellings)	Herb	Seed	Water	• Crush and mix with water to drink • Grind and apply it on the affected part.	Wild	1.oral 2. Dermal
16	Anethumgra veolens/ Apiaceae.	Shilan	1(Urine retention)	Herb	Whole	Water	• Boil it with water and drink the fluid	Cultivated	Oral
17	Echinops kebericho/ Asteraceae	Dander	1(Dislocated bone(Livestock))	Herb	Root	_	• Tie it on the damaged bone of livestock.	Wild	Dermal
18	Dodonaea angustifolia Sapindaceae	Tahses	1(Eye infection)	Tree	Leaf	_	• Crush and apply the juice droplets in to the infected eye	Wild	Optical
19	Commicarpuspedunculosus Nyctaginaceae	Eznianchiwa	1(Dislocated bone)	Herb	Root	_	• Tie the root on the damaged part	Wild	Dermal
20	Premnaoligotricha/ Verbenaceae	Sasa	2(Toothache)	Shrub	Leaf	--	• Chewing it by affected tooth	Wild	Oral
21	Rumexnepalensis/ Polygonaceae.	SHembobata	1(Fire burn)	Herb	Root	Urine	• Crush the root by mixing with urine and apply it on the burned part.	Wild	Dermal

22	Schinus molle/ Anacardiaceae	Tikurbarbare	3(Michi) 1(diarrhoea) 1(Tonsillitis)	Tree	Leaf	Water None Coffee	• Grind with water and then drink the juice. • Crush, filter, and then, drink the fluid. • Crush leaves and mix with coffee to drink.	Wild	Oral
23	Rutachale pensis/ Rutaceae.	Chena-adam	2(Evil eye) 1(Cough)	Hoot	leaf	1.Coffee 2.Food	• Crush and drink with boiled coffee • 2. Mix with food and eat.	Cultivated	Oral
24	Rumex nervosus/ Polygonaceae	Hihot	3(Evil eye)	Shrub	Leaf	Water, Leaves of Rumexabyssinicus	• Soak it in water with leaves of Rumexabyssinicusand wash the body by the mixture.	Wild	Dermal
25	Cynoglossum lanceolatum/ Boraginaceae	Dikikteneg	2(Michi)	Herb	leaf	__	• Fire the leaf and fumigate the vapour	Wild	Nasal
26	Artemisia abyssinica/ Asteraceae	Chenabaria	1(Evil eye)	herb	Whole	Bulb of Allium sativum	• Mix with the bulb of Allium sativumand smell it.	Cultivated	Nasal
27	Argemonem exicana/ Papaveraceae	Esholektilian	2(Wound)	Herb	Latex	None	• Apply it on the affected part until cured	Wild	Dermal
28	Solanum incanum/ Solanaceae	Nieshtonengule	1(Abdominal pain)	Shrub	Root	None	• Chew the root and swallow the fliud.	Wild	Oral
29	Ricinus communis Euphorbiaceae	Gulie	2(Wound)	Herb	Leaf	None	• Crush and place it on the wound	Wild	Dermal
30	Bidens comporum/ Asteceae	Tselimeteneg	3(Eye infection)	Herb	Leaf	None	• Squeeze and apply the juice onto the affected eye.	Wild	Optical
31	Ficus vasta/ Moraceae	Daero	1(Ascariasis)	Tree	Bark	Honey	• Crush the bark with honey and swallow it.	Wild	Oral
32	Nicotinia tabacum/ Solanaceae	Timbako	1(Leeches infection)	Herb	Leaf	None	• Fresh leaf is crushed the fluid is added through the nose of livestocks.	Wild/Cultivated	Nasal
33	Solanum hastifollium/ Solanaceae	Alalimokelbi	2(Ear infection) 1(Evil eye)	Shrub	1.Fruit 2.Root	1. Butter of goat 2.None	• Squeeze and produce the juice, then apply the juice via nose • Place the on the fire for fumigation	Wild	Nasal
34	Zehnerias cabra/ Cucurbitaceae.	Hafaflo	2(Wound)	Climber	Leaf	_	• Crush and tie on the affected part	Wild	Dermal
35	Carica papaya/ Caricaceae	Papaya	1(Michi)	Tree	Leaf	Water Leaves of Eucalyptus globulus	• Boil it with the leaves of Eucalyptus globulus and intake the vapour	Cultivated	Nasal
36	Ajuga integrifolia Laminaceae	Endifdif	1(Tape worm) 1(Abdominal pain)	Herb	Leaf	None	• Crush it, filter and drink the liquor	Wild	Oral
37	Ziziphus spinachristis/ Rhamnaceae	Geba	3(Head wound infection) 1(Dandruff)	Tree	Leaf	1.None 2.Butter	• Crush it and rub on the affected part • Dry, grind, mix with butter and spread on the place of infection.	Wild	Dermal
38	Zingiber officinale/ Zingiberaceae	Zingible	2(Vomiting) 2(Diarrhoea)	Herb	Bulb	__	• Chew and swallow the juice	Cultivated	Oral
39	Zehneria sacabra/	Aregresa	1(Michi)	Herb	Leaf	Water	• Boil fresh with water and smoke	Wild	Nasal

	Cucurbitaceae						the gas and then finally wash it.		
40	Melia azadrachta/ Meliaceae	Nim	1(Wound)	Tree	Leaf	—	• Crush the fresh leaf and use it on the wounded part	Wild	Dermal
41	Clerodendrum myricoides/ Lamiaceae	Shiwha	1(Urine retention)	shrub	Root	Water	• Crush the roots and add water, filter and drink it	Wild	Oral
42	Hypoestesforskaolii/ Acanthaceae	Gerbia	1(Abdominal pain)	herb	Root	--	• Chew and swallow the fluid.	Wild	Oral
43	Gorphocarpuspurpur Apocynaceae	Tsebadimu	1(Abdominal pain)	Herb	Root	—	• Chew the root and swallow the liquid	Wild	Oral
44	Euphorbai abyssinica/ Euphorbiaceae	Kolqual	1(Wound) 1(Swelling)	Tree	1.Flower 2.Latex	1.Honey 2.None	• Crush, mix with honey and apply on the wound. • Smear the latex the affected part.	Wild	Dermal
45	Datura stramonium Solanaceae	Mestenager	1(Wound)	Herb	Leaf	None	• Crush fresh leaf and apply it on the affected part.	Wild	Dermal
46	Olea europaea/ Oleaceae	Awlie	2(toothache) 1(Abdominal pain)	Tree	Leaf	None	• 1.Masticate by diseased tooth • 2.Chew it and swallow the liquid	Wild	1Oral
47	Acacia etbaica/ Leguminosae Mimosoideae	Seraw	1(Itching)	Tree	Leaf	None	• Crush fresh leaf and rub it on the affected part	Wild	Dermal
48	Rumex abyssinicus/ Polygonaceae	Mequmeqo	1(Headache)	Herb	Leaf and root	Tea	• Mix together with tea and then drink	Wild	Oral
49	Verbascumsinaiticum/ Scrophulariaceae	Tirnake	1(Tonsillitis)	Herb	Root	None	• Crush, filter and drink by a cup	Wild	Oral
50	Solanum marginatum/ Solanaceae	Abyungule	1(Abdominal pain)	Shrub	Root	None	• Masticate and swallow the fluid	Wild	Oral
51	Sidaschimperiana/ Malvaceae.	Tefraria	1(Paralysis)	Shrub	Root	None	• Tie the around the affected part.	Wild	Dermal
52	Abutilon bidentatum Malvaceae	Negarnegarito	1(Michi) 1(Abdominal pain)	Shrub	Leaf	1.None 2.Milk	• Crush fresh leaf, filter it and drink the fluid. • 2. Crush, filter, mix with milk and then drink.	Wild	Oral
53	Eucalyptus camaldulensi Myrtaceae	Keyikelamos	1(Eye infection)	Tree	Leaf	Water	• Boil leaves with water and inhale the vapour	Wild	Nasal
54	Vernomia bipontini/ Asteraceae	Endigendig	1(Snake bite)	Shrub	Root	None	• Crush, filter and drink the liquid	Wild	Oral
55	Acacia abyssinica/ Leguminosae	Memona	1(Evil eye)	Tree	Root	None	• Crush the root and fire it for fumigation	Wild	Nasal

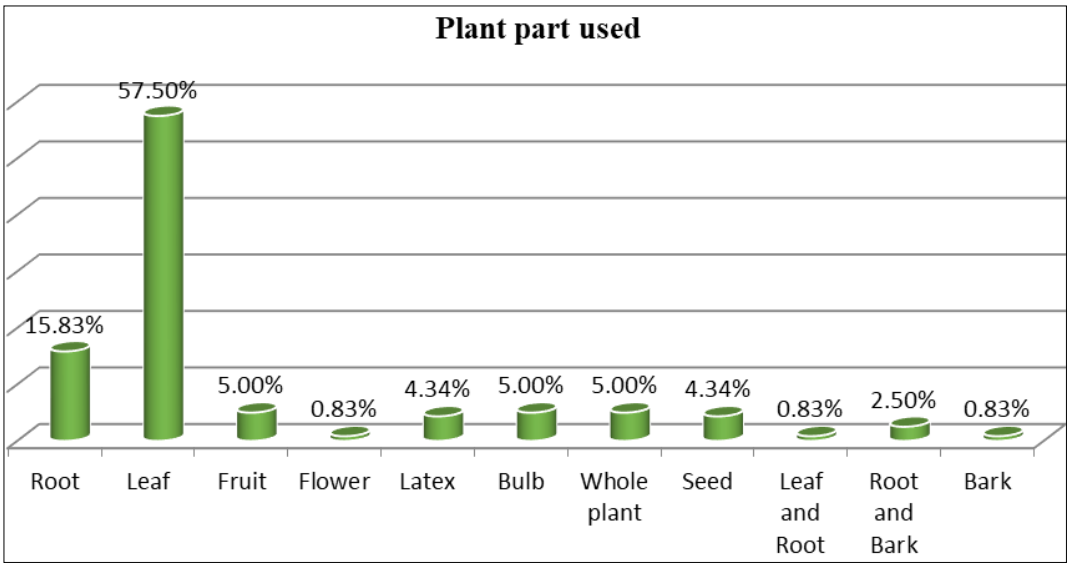


Fig 2: Parts of plant used in the preparation of herbal medicine

Traditional medicinal plant practitioners of the study areareported that leaves were the dominant plant part used to prepare remedies (57.50%), followed by root (15.83%) fruit (5%), bulb and whole plan (5% each), Seed and latex (4.34% each) and the rest 4.99% is from flower, leaf wit root, bark and root mixed with bark.

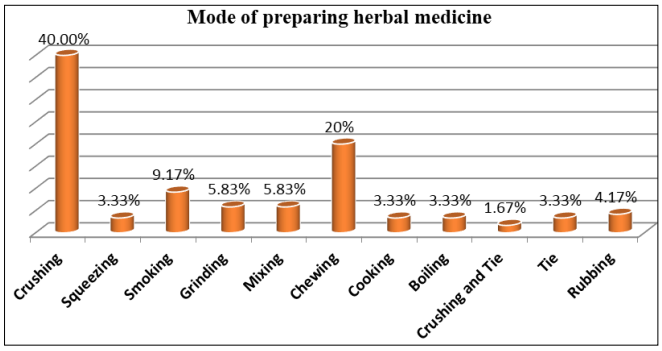


Fig 3: Mode of preparing herbal medicine

As indicated in figure 3 above, most respondent reported that crushing was the dominant mode of preparing to their herbal medicine with (40%) Followed by chewing (20%), smoking (9.17%), grinding (5.83), ting, cooking, squeezing and boiling (3.33% each) but crushing followed by ting is the least mode of preparation.

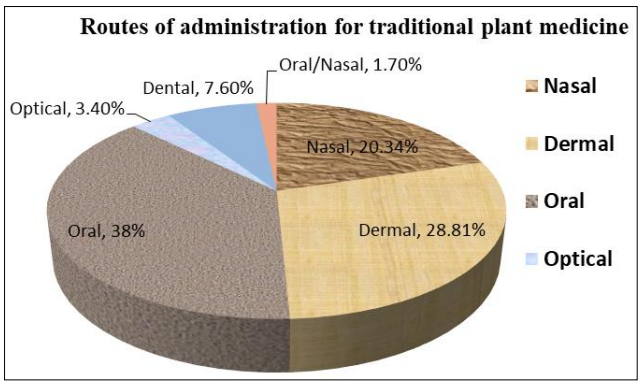


Fig 4: Routes of administration for traditional plant medicine

As it was indicated in the above figure, most of the traditional medicine in the study area are applied or administrated by oral (38%) followed by dermal (28.81%), nasal (20.34%), dental (7.60%), optical (3.40%), nasal and oral (1.70%) together.

Discussion

The result that was obtained from the table 1 above had shown the relative range of age of informants or local experts. According to this result, the relevant experience and indigenous knowledge regarding traditional herbal medicine were found among the respondents whose ages lie above 26 years majority in the age of 46-55 years old which accounts 54.84%. This result has correspondence with that of Gidey and Samuel (2012) [5], which was said 71.7% of informants were older than 46 years. Similarly, Reta (2013) [12] had expressed as the majority of herbal medicine practitioners were aged from 40 to 75 years. So, the longevity and sustainability of these traditional healing systems have been restricted to the elders with short life span as a result it was poorly understood by new young generations. From the ethno botanical data collection had taken place in the study area, a total 55 traditional medicinal plant species collected were distributed in 31 botanical families. Solanaceae was the most dominant medicinal plant family reported by the respondents of study area (having 6 species), followed by Asteraceae (4 species), Lamiaceae, Liguminoceae, Malvaceae, and polygonaceae (3 species), Myrtaceae, Rutaceae, Rubaceae, Euphorbiaceae, Borginaceae, and Cucurbitaceae (2 species), whereas most of the families (19) were represented one species (table 3 above).Contingency table and binomial analysis of medicinal plants showed that Solanaceae was significantly overused traditional medicinal plant in the preparation of herbal medicine (Thomas, *et al.*, 2008) [14]. *Abreha et al* (2013) [1] had also mentioned that Solanaceae was the second largest proportion of medicinal plant family next to Fabaceae. According to the report from traditional healers of the study area, one disease could be treated by more than one plant species alternatively. In this sense, abdominal pain was the disease which treated by several plant species (12 species), followed by michi (10 species), evil eye and eye infection 8 and 5 species respectively (table 2 above). Most of the traditional practitioners of the study area reported that herbs were the most utilized plants to prepare medicine (41.82%) followed by trees (29.09 %), shrub (25.45%), and climber and hoot with (1.82%) respectively (Figure1). This result had correlated with that of Reta (2013) [12], herbs were the most commonly used traditional medicinal plants reported by herbal medicine practitioners (42.2%), followed by trees

(30.1%). In contrast, Haile and Delenasaw (2007) [6] mentioned in their study that shrubs were the most dominant plant species used in herbal medicine (37.04%), followed by tree (25.93%), which forwarded that the variation of traditional medicinal plants in abundance and diversity was based on agro ecological zone of the study area. Furthermore, different parts of plant such as leaf, shoot, fruit, flower, latex, bulb, whole plant, seed, the mix of leaf and root, root and bark are mentioned by informants of the study area as they utilize them during preparation of herbal medicine to treat a variety humans and animals of aliments. Based on this out puts, leaf was become the most usable plant part (53.6%), whereas flower (1%), bark (1%), and the mix of bark and root (1%) were the least plant parts used in the herbal medicine preparation process (Figure 2 above). This has relation with what Haile and Delenasaw (2007) [6] and Reta (2013) [12]. had reported that leaves were the mostly utilized plant part in preparation of herbal medicine (64.52%).However, in contrast to this result, Ermias, *et al*. (2008) [4], had reported in their study that root was the most frequently used part of medicinal plants (33.91%) followed by leaves (25.65%). This variation occurred in result might be due to variability in knowledge of traditional practitioners from one study area to another and types disease encountered in the area. While preparing herbal medicine, several mode of preparation including crushing (40%), squeezing (3.33%), smoking (9.17), grinding (5.83%), mixing (5.83%), chewing (20%), cooking (3.33%), rubbing (4.17%), boiling (3.33%), crushing and ting (1.67%), and ting (3.33%) could be applied based nature plant species and their part used. Among these procedures, crushing was the most frequently performed method for preparation of herbal medicine (40%), followed by chewing (20%), whereas crushing and ting together (1.67%) was the least method mentioned by the informants of the study area (Figure3). This was similar with result found by Reta (2013) [12] that traditional medicine practitioners informed crushing was the main mode preparing herbal medicine (28.2%), followed by chewing (12%). Not only modes of preparation, but also, routes of administration for herbal medicine had varied with the position of application as it was used for a number of diseases. These include nasal (20.34%), dermal (28.81%), oral (38%), optical (3.4%), dental (7.9%), and (1.7%). According to this result, most of the traditional medicines produced from the plant in the study area were applied through oral, followed by dermal, nasal, dental optical and oral/nasal (Figure5). The result had argued according to Ermias, *et al*. (2007) [4], which was accounts 50% of oral routes of administration for herbal medicine followed by dermal (23.48%). Tilahun and Mirutse (2007) [15] had come with the same result on the dominance of oral route of administration (51.4%), and followed by dermal (38.6%) what was strengthened again by Gidey and Samuel (2012) [5] as oral application was the highest and the most commonly used route of administering herbal medicine (67.3%), followed by dermal (30.6%). It was mentioned that most of the plant used as input for the production of herbal medicine have been gathered from wild source or not cultivated (76.98%), very few were cultivated (19.84%), whereas the least are those both cultivated and the wild (3.17%). The result was concurrent with the study of Ermias, *et al.*, (2007) [4]. Wild (90.43%), whereas 5.65% were cultivated, Haile and Delenasaw (2007) [6], wild (85.71%) and cultivated (3.75) and Reta (2013) [12] reported that the majority of plants species used in production of herbal medicine were harvested from the wild (80.41%) and 14.5% from the home garden. This had revealed the condition of traditional medicinal plants used around Adigrat Town which would lead them to different anthropogenic and natural factors. So far, the indication of this result had shown the dependency of traditional practitioners on the wild source rather than home garden to obtain medicinal plants and cultivation activity is very poor, which leads to overexploitation of these wild plants from their natural habitats.

Conclusions

- Huge number of plant is the study areas are utilized to treat different types of disease.
- most traditional healers in this study area are found to be older and uneducated in which indigenous Knowledge transfers verbal without scientific documentation
- Majority of plant species used are collected from wild without replacement.

Recommendations

- The regional government and the local leading organs should have to do cooperatively to organize local healers and provide them critical training on how to update and transfer their secretive indigenous knowledge on traditional medicine through generations.
- Sustainable utilization on these plants used in extraction of herbal medicine should be taken in to consideration in order to save them from extinction.
- Local healers should be given awareness about how to practice on cultivation of traditional medicinal plants for realizing their continuity and survival in the future.
- Conservation practices such as in-situ and ex-situ conservation should be practiced in the study area to safeguard the safety and availability of the medicinal plant species from different adverse human activities.

References

1. Abraha T, Belcha A, Miruts G. An ethnobotanical study of medicinal plants used in KilteAwulaelo District, Tigray Region of Ethiopia. J Ethnobiology and Ethno medicine. 2013; 9:65.
2. Alemshet B. Evaluation of the reproductive performance of crossbred (HF X Zebu) Dairy cows and artificial insemination service efficiency in And around Adigrat, norther Ethiopia. 2016; 3:1.
3. Dawit K. Biodiversity conservation of medicinal plants problems and prospects. IBCR, Adis Abeba. 2001, 56-69.
4. Ermias L, Ensarmu K, Tamrat B, Haile Y. An ethnobotanical study of medicinal plants in Mana Angatu Destrict, Southern Ethiopia. Journal of Ethnobiology and Ethnomedicine. 2008; 4:10.
5. Gidey Y, Samuel Z. Ethnobotanical study of traditional plants in Gindeberet District Western Ehtiopia. IJRESS. 2012; 1(1)4:8.
6. Haile Y, Delenasaw Y. Traditional medicinal knowledge and use by local healers in Sokoru District Jimmazone, South Western Ethiopia. Jouranal of Ethnobiology and Ethnomedicine. 2007; 3:4.
7. Hunde D. Use and management of traditional medicinal plants by indigenous people of Boosat Woreda, Wolechiti Area, an Ethno botanical approach, MSc Thesis, Addis Ababa University, Ethiopia, 2001.
8. Kebu B, Ensarmu K, Zemede. Indigenous medicinal plants utilization, Managements and threats in Fentalle area, Eastern Shewa, Ethiopia. J Bioscience. 2004; 3(1):37-58.

9. Kibebew F. The stutus and availability of oral and written knowledge of traditional health care in Ethiopia.
10. Lange D. Europ's medicinaln and aromatic plants ther use, Trade and conservation. Cambridge; Traffic Europ, 1998.
11. Mohamed A. and Birhanu A. Ethobotanical survey of traditional medicinal medicin in Tehulederd District South Wollo, Ethiopia. Journal of medicinal plant research. 2011; 5(6)6233-6242.
12. Reta R. Assessment of indigenous Knowledge of medicinal plant practice and mode of delivery in Hawssa city Southern Ethiopia. Journal of medicinal plants research. 2013; 7(9): 517-535.
13. Tesfaye S, Kaleab A, Tsige G. Ethnobotanical and ethono pharmaceutical studies on medicinal plnats of Chifra Destrict Afar Region, North Eastern Ethiopia. Paharma. J. 2006; 24:41-58.
14. Thomas E, Sabino SI, Damme P. Cultural significance of plan families and species among Quechua farmers. Journal of ethno pharm. 2008; 122(2):60-67.
15. Tilahun T, Muruts G. Ethnobotanical study of medicinal plants used by People of Ziege peninsula, North Ethiopia. J Ethnobotany and aethnomedicine. 2007; 3:12.
16. WHO. General Guide line for methodology on research and evaluation medicine. WHO, Geneva, Switzerland.