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Studies on traditional medicinal plants in Ambagiorgis area of Wogera District, Amhara Regional State, Ethiopia

Zelalem Getnet, Subramanian Chandrodyam* and Getinet Masresha

Department of Biology, College of Natural and Computational Sciences, University of Gondar, Ethiopia

*Corresponding Author E-mail: wlbsasu@gmail.com

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ABSTRACT

The current study was conducted in Ambagiorgis area of Amhara Regional State of Ethiopia. Information gathered on qualitative and quantitative measurements through questionnaire, key informant interview, and observation by following Snowball Sampling Technique. A total of 32 medicinal plant species and their medicinal properties were recorded during this study. However, the conservation status of some of those medicinal plants such as Echinops keberch, Crinum abysinicus, Silene macrosolen were nearing extinction locally because of over exploitation, overgrazing, mainly due to over harvesting of their roots. In addition, the study showed that some of the plants such as Malva verticillata, Phytolaca dodecandra, Plantago lanceolata, Zehneria scabra were widely distributed in the study area. Appropriate intervention on awareness creation and parallel conservation works should be facilitated as far as the issue of medicinal plants sustainability is concerned.

Key words: *Ambagiorgis, Conservation, Medicinal plants, Traditional*

INTRODUCTION

Plants have been an essential source of preventive and curative medicinal preparations for human beings. The history of medicinal plants have been identified and used throughout human history[1]. The ancient Egyptians wrote, the information on over 850 plant medicines, include garlic, juniper, cannabis, aloe, mandrake, etc even before 15000 BC. The Greek and Roman medicinal practices, as preserved in the writings of Hippocrates provided the pattern for later western medicine. Similarly, Theophrastus, was wrote the historia plantarum written in 4th century which was the first systematization of the botanical world[2]. Now a day, the World Health Organization (WHO) estimates that 80% of the population of Asian and African counters uses herbal medicine for some aspects, primarily for health care[3].

People in Ethiopia use medicinal plants at one time or another as their primary source of healthcare. In the rural areas and among the urban poor, herbal medicine is the only form of health care, and a sick person consult regular physicians as a last resort.

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According to Dawit[4], the traditional medical system of Ethiopia is medico-religious systems due to close interaction the traditional medical system in the country. Ethiopian people have their own set of written and oral pharmacopoeias. However, the knowledge on medicinal plants is largely oral; however, Ethiopians ancient church practices have documented some of the knowledge inscribed in parchments which partly characterize the traditional medical system usually described as medico-religious written in Geez manuscripts of the 15th Century[5]. Other cultural groups in the country have their own written or oral traditions that could be associated with individual clans or groups as partly stated[6].

Ethiopian traditional medicine is vastly complex and diverse and varies greatly among different ethnic groups[4]. Under the rule of Menelik (1895-1913) western medicine became significantly more incorporated in to the Ethiopian medicinal system. Numerous medicinal envoys from abroad, starting with the Italians and Russians, were influential in building hospitals, providing medicinal training and participating in vaccination campaigns. However, most medicinal establishments primarily served the urban elites and foreign missionaries and were concentrated in the major cities[7].

About 1000 identified medicinal plant species are reported in the Ethiopian flora; however, many others are not yet identified. About 300 of these species are frequently mentioned in many sources. In various written records of medicinal plants from central north and north eastern parts of Ethiopia are having small fractions of medicinal plants present in the country. But very recent study on the Bale mountains motional park in there south east Ethiopia revealed that the area, as much as it is a biodiversity hotspot[8].

According to BGCI[9] report, 400 medicinal plants were found at risk of extinction from over-collection and deforestation, threatening the discovery of future cures for disease. Their report said that "five billion people still rely on traditional plant-based medicine as their primary form of health care.

The research made so far on Ethiopia medicinal plants has been mostly of producing inventories and check lists, some have been touched by modern research where their principal components has been analyzed and defined. In Ambagiorgis town, there are many traditional medicinal practitioners, use different types of medicinal plants to cure different aliments. But their knowledge is maintained as a secret for their lifespan and lost with their life.

MATERIALS AND METHODS

Study area

The study was conducted from March, 2015 to June, 2015 in Ambagiorgis area of Wogera District, Amhara Regional State, Northern Ethiopia. Reconnaissance survey was conducted from January 2015 to February 2015 in order to identify sampling site, to estimate the potential of our study site, and to determine sampling techniques. The Ambagiorgis town is located 740 km from the capital city Addis Ababa. The study area is surrounded by five neighboring Districts (North by Dabat, South by Gonder Zuria, West by Lay Armachiho and Sanja, and in the East by Belesa District).

According to Wogera District Office Report, the topography covers 52% of flat, 23% mountainous, 14% valleys and the rest of 11% is hills. It includes 56% of Dega (cold), 26% Woina Dega (moderate), 4% Wurch (frosty) and the rest 13% Kolla (hot) areas. The average elevation is 2812 masl and the mean temperature ranges between 14^0C in the highlands and 33^0C in the lowlands. Based on the Ethiopian statistical agency the total population of the District is 239,092 with more than half of them are females.

Sampling techniques

A total of 26 informants (20 men and 6 women) including 12 key informants were interviewed. All the informants were traditional medical practitioners. The key informants were selected based on the recommendation of Martin[10] and the general informants were selected using simple random sampling technique.

The primary data were collected through interview, field observation and group discussion with informants, while the secondary data were extracted from literatures. The ethical consideration and consensus was made with the informants before data collection based on Chunningham[11].

Some medicinal plants were also collected from the local market and home garden for identification following method of Martin[10] and Alexiades[12]. The identification of fresh specimens was done using Flora of Ethiopia and Eritrea under Botanical Science Laboratory of Biology department, University of Gondar, Gondar Ethiopia.

Data analysis

The questionnaire data was analyzed quantitatively, whereas the observation and interview data were analyzed qualitatively. Simple statistical tools were entertained for both quantitative and qualitative information.

RESULT AND DISCUSSION

Medicinal plant records

A total of 32 medicinal plant species belongs to 28 families were recorded in the study area shown in the table 1 with their aliments treated, parts used, methods of preparation and routes of administration etc. From these listed medicinal plants; 17 species (53.12%) were used to the treatment of human aliments, 15 species (46.88%) were used for the treatments of both human and Animals aliments.

Table 1: List of Medicinal Plant Species recorded during the study period in Ambagiorgis area

S#	Local Name	Scientific Name	Family	Habit	Aliment Treated	Parts Used	Methods of Preparation	Routs of Administration
1	Embacho	*Rumex nervosus*	Polygonaceae	Shrub	Rheumatism	Fresh leaf	Crushed and mixed with water and then left for some time	Washing the body parts
	„	„	„	„	Eye infection	Fresh leaf	Juice	Drop is applied in the infected eye
2	Lut /Adguar	*Malva verticillata*	Malvaceae	Tree	Stomach-ache	Fresh root	Grinded and mixed with one glass of beer	Oral
3	Gorteb	*Plantago lanceolata*	Plantaginaceae	Herb	Wound	Fresh leaf	Squeezing	Applied on the wound topically
4	Tinjut	*Otostegia integrifolia*	Lamiaceae	Shrub	Stomachache	Fresh leaf	Juice	Topical
	„	„	„	„	Malaria	Fresh leaf	Mixed with *Allium sativum*	Oral
5	Waginos/ Abalo	*Brucea antidysentrica*	Simaroubaceae	Shrub	Wound	Fresh leaf	Crushed fresh leaf	Applied on a wound mostly in child's head topically
	„	„	„	„	Eczema	Dried fruit	Powder mixed with butter	Topical
6	Endawula	*Kalanchoe petitiane*	Crassulaceae	Herb	Swelling	Fresh root or leaf	Use directly the root or hearten the fresh leaves	Fresh root is inserted into the swelling part by simple Surgical operation or covered the swelling part by heated fresh leaf topically.
7	Bisana	*Croton macrostachyus*	Euphorbiaceae	Tree	Alrgic /guagot	Fresh leaf or fresh root	Juice	Applied on the inflammation part topically
	„	„	„	„	Wound	Fresh leaf or fresh shoot	Juice	Topical
	„	„	„	„	Snake bite	Fresh leaf	One cup of juice	Topical
8	Digta	*Calpurnia aurea*	Fabaceae	Shrub	Liver	Fresh leaf	boiled with water	Inhaled the vapor
	„	„	„	„	Stomach-ache	Fresh root	1/3 of cup juice	Oral
	„	„	„	„	Ectoparasite	Fresh leaf	juice	Topical

S#	Local Name	Scientific Name	Family	Habit	Aliment Treated	Parts Used	Methods of Preparation	Routs of Administration
9	Yeayit hareg	*Stephania abyssinica*	Menispermaceae	Climber	Swelling	Fresh leaf	Boiled the fresh leaf in water	Oral
	,,	,,	,,	,,	Almaz balchira	Fresh leaf	Squeezing the fresh leaves	Topical
10	Kok	*Prunus persica*	Rosaceae	Tree	Stomach-ache	Fresh leaf	Juice	Oral
	,,	,,	,,	,,	Infertile women	Epiphyte	Squeezing the entire part	Fresh epiphytes juice is given topically
11	Asteanagir	*Datura stramonium*	Solanaceae	Herb	Dandruff	Fresh leaf	Squeezing the fresh leaves	Fresh leaf juice is applied topically
12	Endod	*Phytolaca dodecandra*	Phytolaceae	Shrub	Rabies	All parts	Juice	Fresh root or leaf juice is mixed with milk and given orally.
	,,	,,	,,	,,	Swelling	Leaf	Juice	Fresh leaf juice is applied topically
	,,	,,	,,	,,	Liver	Fresh root	Juice	Oral
	,,	,,	,,	,,	Stomach-ache	Fresh root	Juice	Oral
13	Chocho	*Premna schimperi*	Lamiaceae	Shrub	Injured eye	Fresh leaf	Juice	Fresh leaf juice is applied topically
	,,	,,	,,	,,	Dandruff	Fresh leaf	Juice	Applied with fresh leaf juice topically
14	Simiza	*Adhatoda schimperiana*	Acanthaceae	Shrub	Liver	Fresh leaf	boiled in water	Fresh leaf is boiled in water and given orally
	,,	,,	,,	,,	Rabies	Fresh leaf	Juice	Oral
	,,	,,	,,	,,	Stomachache	Fresh leaf	Juice	Oral
	,,	,,	,,	,,	Foot fungi	Fresh leaf	Juice	Fresh leaf juice is applied topically
15	Yejib Shinkurt	*Crinum ornatum*	Amaryllidaceae	Bulb	Rheumatism	Fresh bulb	Squeezing	Fresh bulb juice is mixed with lemon juice and Applied topically
	,,	,,	,,	,,	Earache	Fresh root	Juice	Fresh root juice is applied topically
16	Atuch	*Verbena officinalis*	Verbenaceae	Herb	Tonsillitis	Fresh root	Juice	Fresh root Juice is dropped in to the mouth, topically
	,,	,,	,,	,,	Liver	Fresh root	Juice	Half cup of fresh root juice is given orally
17	Nech Shinkurt	*Allium sativum*	Alliaceae	Bulb	Astma	Fresh bulb	Crushed and mixed with honey	Oral
	,,	,,	,,	,,	Rabies	Fresh bulb	Whole bulb directly	Chewing continuously until cured, topically
	,,	,,	,,	,,	Common cold	Fresh bulb	Whole bulb directly	Chewing bulb or smelling
	,,	,,	,,	,,	Stomach- ache	Fresh bulb	Whole bulb directly	Chewing bulb and adding in the diet
	,,	,,	,,	,,	Malaria	Dried bulb or fresh bulb	powder or grind, mixed with Honey	Oral
18	Fiyele feji	*Clutia lanceolata*	Euphorbiaceae	Shrub	Dandruff	Fresh leaf or fresh bulb	Juice	Applied on the head topically
19	Mekimeko	*Rumex abysinicus*	Polygonaceae	Herb	Malaria	Dried root	boiled with butter	Oral
	,,	,,	,,	,,	Stomach –ache	Fresh root or	Fresh grind root or dried	Oral

S#	Local Name	Scientific Name	Family	Habit	Aliment Treated	Parts Used	Methods of Preparation	Routs of Administration
						dried root	powder boiled with honey or sugar	
20	Kebricho	*Echinops kebeircho*	Assteraceae	Herb	Evil eye	Dried root	Smoking	Smelling and inhaling
	,,	,,	,,	,,	Mitat	Dried root	Smoking	Smelling and inhaling
21	Wogert	*Silene macrosolen*	Caryophyllaceae	Herb	Snake away	Dried root	Smoking	Smelling
					Evil eye	Dried root	Smoking	Smelling and inhaling
22	Tosgn	*Thymus schimperi*	Phytolaccaceae	Herb	Asthma	Fresh or dried leaf	Boiled in water	Oral
	,,	,,	,,	,,	Blood Pressure	Fresh or dried leaf	boiled with water	Oral
23	Kosso	*Hagenia abyssinica*	Rosaceae	Tree	Tapeworm	Dried fruit	Half cup of dried fruit powder	Oral
	,,	,,	,,	,,	Bone fracture	Fresh leaf	Grinding the leaf	Pasted by the fresh leaf, topically.
24	Aregresa	*Zehneria scabra*	Cucurbitaceae	Climber	Mitat	Fresh leaf	boiled in water	Inhaling the vapor, or after boiled the liquid with sugar is applied orally.
25	Tenadam	*Ruta chalepensis*	Rutaceae	Herb	Evil eye	Fresh leaf	Crushing with *Allium sativum* and *Artemisia abyssinica*	Smelling or inhaling
26	Kitkita	*Dodonaea angusifolia*	Sapindaceae	Shrub	Stomach – ache	Fresh leaf	Juice	Oral
	,,	,,	,,	,,	Bone fracture	Fresh leaf	Grinding	Pasted the body part topically.
27	Gesho	*Rhamnus prinoides*	Rhamnaceae	Shrub	Liver	Fresh root	Grinding and mixed with water and left for a few minuets	Oral
	,,	,,	,,	,,	Stomach- ache	Fresh leaf	Juice	Oral
28	Yemidir Embuay	*Cucumis ficifolius*	Cucurbitaceae	Climber	Stomach- ache	Fresh root	Juice with water (1/3 Cup)	Oral
	,,	,,	,,	,,	Infertility in women	Fresh root	Juice	Oral
	,,	,,	,,	,,	Retained placenta	Fresh root	Mix with water	Oral
29	Feto	*Lepidium sativum*	Brassicaceae	Herb	Wart	Dried root or fresh root	grinding with milky latex of *Opuntia vulgaris*	Topical
30	Kulkual	*Opuntia vulgaris*	Cactaceae	Herb	Mental worries	Epiphytes (All parts)	Squeezing	Pasted on the hand topically
	,,	,,	,,	,,	Wart	Dried root and milky latex	Grinding the root mixed with its milky latex	Pasted on the infected part topically
					Mitat	Dried stem	Smoking	Inhaling
31	Telenji	*Achyranthes aspera*	Amaranthaceae	Herb	Wound	Leaf	Dried leaf powder mixed with butter	Pasted topically
	,,	,,	,,	,,	Ear ache	Fresh leaf	Juice	Applied on ear
	,,	,,	,,	,,	Retained placenta	Fresh stem	Juice with water	Oral
32	Ensillal	*Feoniculum vulgare*	Apiaceae	Herb	Cough	Fresh leaf	Fresh leaf soaked in milk	Oral
	,,	,,	,,	,,	Stomach-ache	Fresh fruit	Grinding and mixed with food	Oral

From the above 32 listed medicinal plants, about 20 plants were reported by Getaneh *et al.*[13] at different places as medicinal plants. Some of those plants are *Echinops kebericho*, *Phytolaca dodecandra*, *Otostegia integrifolia*, *Hagenia abyssinica*, *Allium stivum*, *Croton macrostachyus*, *Kalanchoe petian*, *Lepidium sativum*, *Prunus persica*, *Rumex nervosus* etc. The remaining 12 medicinal plants were practiced on the local community however not common in other study areas of the country.

Plant parts used for the preparation of remedies

The results reveal that most remedies were prepared from the leaves (49.28%) and root (30.43%) parts of the medicinal plants to treat the aliments than the stem, fruit, shoot, and epiphytes. (Fig.1).

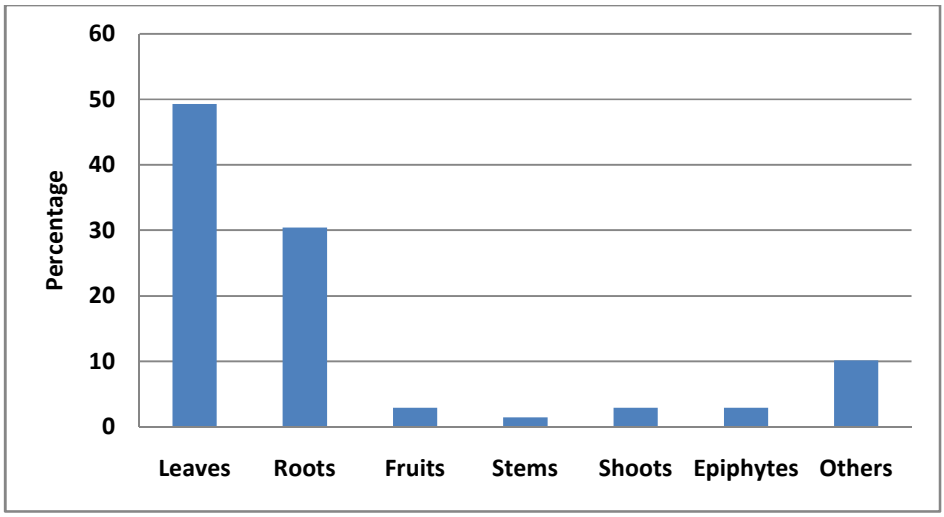

Fig. 1: Plant parts used for preparation of remedies

The main reason of many traditional medicine practitioners used the leaf part for remedial preparation is due to its accessibility and to prevent the plant from extinction. According to Abiyu *et al.*[14], the leaf is easily renewable part of the plant and using plants for medicinal purpose may not affect the survival of a plant and is not causes a serious challenge or stress factor for plants.

Other researchers also proved that leaf is the major source of traditional medicine in Ethiopia[15].

Remedial preparation methods include squeezing (39.73%), grinding (16.44%), chewing (4.11%), powdering (8.22%), and boiling (9.59%) (Fig. 2).

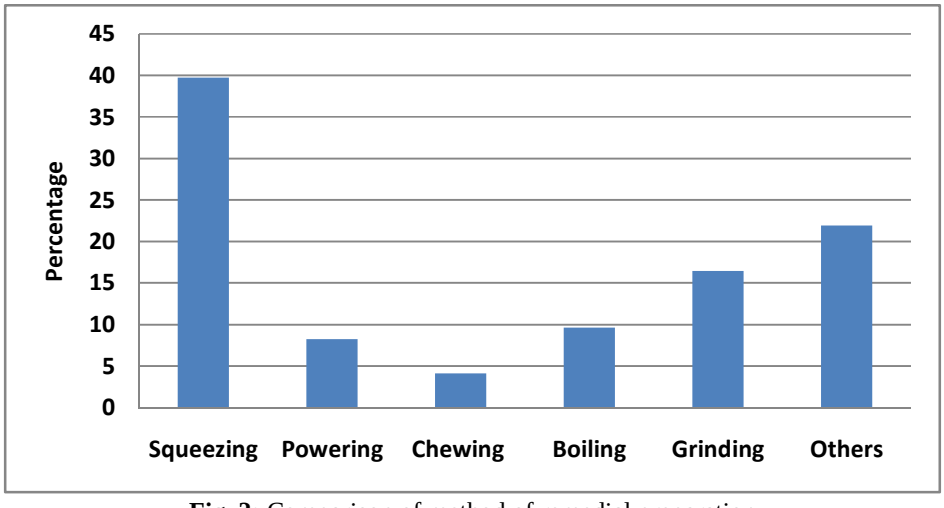

Fig. 2: Comparison of method of remedial preparation

Getaneh *et al.*[13] also found similar result at different study areas. The Authors showed that, squeezing is the most common remedies preparation method followed by crushing. However, unlike the present study, Ermiyas *et al.*[8] prove that, powdering and crushing methods are the most common remedies preparation than squeezing. These all indicates that methods of remedial preparation for the traditional medicinal plants are not common throughout the country.

Routs of administration

The result indicates that the oral (54.69%) and dermal (20.31%) were frequent while Eye (1.56%) and Ear (3.13%) were less frequent in administration methods (Fig. 3).

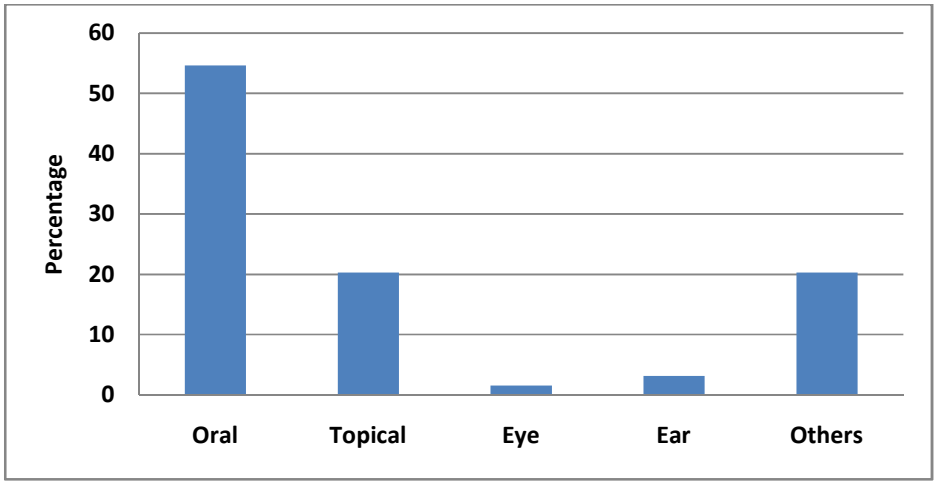

Fig. 3: Routes comparison of remedies administration

Similar to the present study, Getaneh *et al.*[13] also found that, oral is the most common remedies administration method. The authors also pointed out that, based on the nature of the disease and to improve the quality of ethno medicine and acceptability by patients the remedies were mixed with water, tea, milk or honey and administered in the form of a drink.

Conservation status and challenges of medicinal plants

According to this study, the availability and accessibility of most medicinal plants in the study area is very hard. For instance, from the listed medicinal plants 28.13 percent were widely distributed and easily available but the rest of 71.88 percent of plants were rare in distribution.

Traditional practitioners were collecting 25 percent of medicinal plants from home gardens and remaining 75 percent from the natural habitats. In addition some medicinal plants like *Echinops kebericho*, *Silene macrosolen*, *Feoniculum vulgare*, *Ruta chalepensis*, *Rhamnus prinoides*, *Allium stivum* and *Otostegia integrifolia* were available in the local market.

Among the recorded medicinal plants, 13 species (40.62%) were herbs followed by 10 species (31.25%) shrubs, 4 species (12.50%) trees, 3 species (9.38%) climbers and 2 bulb plants (6.25%). The plants like *Silene macrosolen*, *Echinops kebeircho* and *Crinum abysinicum* were approaching extinction in the study area due to over harvesting of its root. On the other hand, traditional medicinal practitioners were started to cultivate some plants in home gardens such as *Calpurnia aurea*, *Croton macrostachyus*, *Kalanchoe petian*, *Hagenia abyssinica*, *Rhamnus prinoides* and *Prunus persica*.

Various factors hindered the sustainability of traditional medicinal plants on the study area. According to the respondents, over harvesting stands a maximum of 53.85 percent, followed by over grazing (38.46%) and urbanization (7.69%). The results of Getaneh *et al.*[13] also match with the results of current study.

CONCLUSION

The study area has diverse medicinal plants used for the treatment of human and domestic animal aliments by the local community. The wild areas are the major source of medicinal plants than home gardens. This study disclosed the

existence of about 32 medicinal plants in the area and their conservation status of some medicinal plants such as *Echinops kebeircho*, *Silene macrosolen*, *Crinum abysinicum* etc. These medicinal plants are under severe pressure nearing to extinction because of over exploitation, overgrazing and urbanization. Hence a further detailed study is recommended to explore the knowledge and conservation of the medicinal plants in this area.

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