

Full Length Research Paper

Use of traditional medicinal plants by indigenous people in Mekele town, capital city of Tigray regional state of Ethiopia

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An ethno-botanical study of traditional medicinal plants used by indigenous people in Mekele city, Northern Ethiopia was carried out from July - September 2009. Thirteen informants between the ages of 18 and 56 were randomly selected for the study. Ethno-botanical data were collected using semi-structured interview and field observations. The routes of administration were oral and dermal with equal proportions. The local people utilized 16 medicinal plant species to treat 16 human ailments. Most of these plants (62.5%) were collected from wild habitats. Local people depend on both dry and fresh remedies. In this case, 10 preparations (62.5%) were in fresh form and 6 (37.5%) dried. The majority (75%) of remedy preparations did not have additive substances while the remaining has different additive substances like honey, sugar, oil and hair of female old sheep for the treatment of single ailment. Most (84.6%) of the traditional healers were found to have poor knowledge on the dosage and antidote while prescribing remedies to their patients. Majority (84.6%) of traditional healers indicated the absence of any adverse effects of traditional medicines after administrations. But some (15.4%) of the preparations were reported to have some adverse effects like vomiting and fever on patients. Agricultural expansion, over grazing and lack of awareness are major threats to medicinal plants in the study area. It was found that, there is little practice of bringing medicinal plants under cultivation. It is therefore, recommended that people need to be encouraged to cultivate medicinal plants in their home garden. The participation of the local people and awareness creation through training or education on sustainable utilization and management of plant resources should be encouraged.

Key words: Ethno-botany, medicinal plants, Mekele, traditional healers.

INTRODUCTION

It is reported that more than 3.5 billion people rely on plants for the treatment of both human and livestock diseases (FAO, 1997). As elsewhere in Africa, indigenous people in Ethiopia, by large employed plant based traditional medicine to get cured from diseases arising from worms, fungi, virus and protozoa (Dawit, 2001).

The majority of the developing countries depend on traditional medicinal plants for their healthcare (Balick and Cox, 1996). This global utilization of medicinal plants has considerably increased in the last two decades

(Dawit, 2001). Maintaining health through traditional medicine in general and utilization of medicinal plants in particular is almost as old as the history of humankind. This is true in Ethiopia where nearly 80% of the population still relies on plants to prevent and cure various health problems (Dawit and Ahadu, 1993). In developing countries leaning to and favoring traditional medicinal plants is mainly due to inaccessibility of modern medical system, economic and cultural factors (Abbiw, 1996). According to Konno (2004), easy accessibility, efficacy on treatment and affordable cost in getting health services are main reasons in preferring traditional medicine to modern medication.

Ethiopia has a flora that is extremely rich in its diversity. It is therefore not surprising that some of these plants

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have chemical compounds of therapeutic value that may be used in the treatment of major diseases such as HIV/AIDS, malaria, cancer, etc (Urga et al., 2004). It is also reported by Abbiw (1996) that traditional medicines are safe and with little or no side effects.

The use of traditional medicine is still wide spread in Ethiopia, and its acceptability, availability and popularity is no doubt as about 90% of the populations use it for health care needs (WHO, 2002). In Ethiopia using traditional medicinal plants is common and forms the backbone of traditional medicine. However, research and documentation on medicinal plants have been started only very recently (Mesfin and Sebsebe, 1992) as this was neglected and considered irrelevant in the past (Dawit and Ahadu, 1993). Only very little effort has so far been made to record and document the medicinal plants used and the associated knowledge.

The extent of the knowledge of traditional medicine practice based on medicinal plants should be documented through botanical surveys. Botanical collection and documentation of the associated ethno-botanical knowledge should be carried out before such rich heritages are lost due to various anthropogenic and other natural causes. In addition, the conservation of ethno-botanical knowledge as part of living cultural knowledge and practice between communities and the environment is essential for biodiversity conservation (Martin, 1995).

The loss of valuable medicinal plants due to population pressure, agricultural expansion, and deforestation is widely reported by different researchers in Ethiopia for example, Abebe (2001); Getachew and Shiferaw (2002). Consequently, the need to perform ethno-botanical researches and to document the medicinal plants and the associated indigenous knowledge must be an urgent task (Pankhurst, 2001; Hamilton, 2003).

As would be the case elsewhere, traditional medication is believed to be an important healthcare system in Tigray, northern Ethiopia which mainly involve the use of locally available medicinal plants. However, such knowledge and practices are not documented. The present study was then initiated with an intention to document the knowledge and practices on use of medicinal plants by people of Mekele City, northern Ethiopia.

MATERIALS AND METHODS

Study area

The study was conducted in Mekele, capital city of Tigray Regional State located in Northern Ethiopia. Its approximate geographic location is 39° 33' East and 13° 32' North. It has an average altitude of 2200 m.a.s.l. with a mean minimum, mean maximum and mean average monthly temperatures of 8.7, 26.8 and 17.6°C respectively (Kibrom, 2005). Amount of rainfall of the study area is variable on average about 600mm and more than 70% of the rainfall arrives in the months of July and August followed by long dry season (Kibrom, 2005).

Methods

Descriptive and quantitative survey method was used in this study to reveal the medicinal plants and how are people using them in the town of Mekele. Ethno-botanical data were collected from 3 traditional healers using semi-structured interview and followed by participant observations. Sample informants were selected based on recommendation from elders and local authorities of the town. The traditional healers involved were 12 males and 1 female and their ages ranged from 18 up to 56. Most of the healer's were illiterate (7) and at most only able to read and write (1) while few (2) attended up to standard eight and the rest had completed grade 10. Interviews were made with each traditional healer about the knowledge and use of medicinal plant species used to treat human disease in the study area. The healers were not professional practitioners who treat the local people by using ethno-medicinal plants and their products. Data on human ailments treated, local name of plants used, growth form, degree of management (wild/cultivated), parts used, methods of preparation, route of administration and application, added values of medicinal plants, existing threats to medicinal species and indigenous knowledge transfer were recorded. We accompanied the traditional healers and made field visits to observe and collect medicinal plant species reported to treat ailments. Sample specimens of each medicinal plant species were collected during the field visits and allotted collection numbers. The collected specimens were then dried, identified through flora of Ethiopia and Eritrea, useful trees and shrubs for Ethiopia and by asking other experts.

RESULTS

There are various routes of administration of traditional medicinal plants prepared products by the local community. The routes of administration were oral and dermal with equal proportions. As described in Table 2, the local people utilize 16 medicinal plant species to treat 16 human ailments. Most of these plants (10 species, 62.5%) were collected from wild habitats indicating the existence of pressure on wild plants. Local people depend on both dry and fresh remedies. In this case, 10 preparations (62.5%) were in fresh form and 6 (37.5%) dried.

The majority (75%) of remedy preparations did not have additive substances while the remaining had different additive substances like honey, sugar, oil and hair of female old sheep for the treatment of single ailment. These additive substances have double function that is, to improve flavor and reduce adverse effects such as vomiting and diarrhea, and enhance the efficacy and healing conditions.

Both pounding and powdering were used to preserve the plant materials that are not available both in dry and rainy seasons. Moreover, these are effective for the complete extraction of the potential content of the plant and increase the curative power of the medicine or its efficiency, as both increases the healing power of the remedy through faster physiological reaction. After preparation, the remedies are either used soon or preserved for latter use. Traditional practitioners often use any dry clean containers to preserve traditional medicines. Some (15.4%) of them hang dried medicines

Table 1. Methods of traditional medicinal plant preparation.

Methods of preparation	Total preparations	Percentage
Squeezing	3	18.75
Powdering	2	12.25
Crushing	5	31.25
Chewing	1	6.25
Rinsing	1	6.25
Cooking	1	6.25
Pounding	1	6.25
Tied	1	6.25
Total	16	100

Table 2. Medicinal plant species, vernacular name, diseases treated and rout of administration.

Species	Diseases treated	Rout of administration	Condition of plant used
<i>Trigonella foenum-graecum</i>	Urticaria	Dermal	Dried
<i>Phytolacca dodecandra</i>	Abortion	Oral	Fresh
<i>Aloe Barbadensis</i>	Strain	Dermal	Fresh
<i>Olea europaea</i>	Ascariasis	Oral	Fresh
<i>Solanum insanum</i>	Abdominal cramp/colic	Oral	Fresh
<i>Ziziphus spina christi</i>	Dandruff	Dermal	Fresh
<i>Entada abyssinica</i>	Herpes-zoster	Dermal	Fresh
<i>Schinus molle</i>	Diarrhoea	Oral	Fresh
<i>Vernonia amygdalina</i>	Goiter	Oral	Dried
<i>Cucurbita pepo</i>	Tape worm	Oral	Dried
<i>Croton macrostachyus</i>	Urinary retention	Oral	Fresh
<i>Verbascum sinaiticum</i>	vomiting	Oral	Dried
<i>Citrus aurantifolia</i>	leprosy	Dermal	Fresh
<i>Cordia africana</i>	Evil eye	Dermal	Fresh
<i>Rhus glutinosa</i>	Hemorrhoid	Dermal	Dried
<i>Datura innoxia</i>	Leshimaniasis	Dermal	Dried

on roofs and walls, while majority (84.6%) use plastic bags, ceramics and other containers.

The knowledge and practices of traditional medication are kept with them for the sake of secrecy. Services are obtained only from family. Majority (69%) traditional healers transfer their indigenous knowledge to their selected family verbally, some (23%) through showing the medicinal plant in the field and the remaining (8%) through demonstration including remedy preparation methods. Most (84.6%) of the traditional healers were found to have poor knowledge on the dosage and antidote while prescribing remedies to their patients.

Majority (84.6%) of traditional healers indicated the absence of any adverse effects of traditional medicines after administrations. But some (15.4%) of the preparations were reported to have some adverse effects like vomiting and hyperthermia on patients. Majority (61.5%) administer the medicine regardless of age and sex for the patients. Some (38.5%) indicated dose differences

among different age groups.

In the study area, various human induced and natural factors threaten the survival of many medicinal plant species which include agricultural expansion, overgrazing and lack of awareness. Field observation and semi-structured interview clearly showed little concern with conservation of medicinal plants by local people. Conservation and sustainable utilization of medicinal plants is poor in the study area.

DISCUSSION

There are various methods of traditional medicinal plant preparation in the area. The most popular mode of preparation was in the form of crushed which accounts to 31.25% followed by 18.75% of squeezed and 12.75% Powdering (Table 1). This result is different with the finding of Fisseha Mesfin (2007), in which 32 (36.4%)

Table 3. Units of measurements used by local healers to determine dosage of medicine in the study area

Prepared remedies	Unit of measurement
Root	Finger length
Seed	Number
Leaf	Number
Powder	Tea spoon
Liquid	Cup

preparations were made in the form of powder, 29 (32.9%) followed by crushed and pounded, and 12 (11.3%) in the form of chewing of plant parts used for treatment of human health problems.

The routes of administration in the study area were oral and dermal with equal proportions. This is concurrent with the finding of Dawit and Ahadu (1993), main route of application used in northern Ethiopia is oral, which accounted for 42%. Moreover, this is in agreement with the result of various ethno botanical researchers elsewhere in Ethiopia (Mirtuse Giday, 1999; Debela Hunde, 2001; Getachew Addis et al., 2001; Kebu Balemie et al., 2004; Ermias Lulekal, 2005; Fisseha, 2007) and indicates oral as the predominant route of application. Both oral and dermal routes permit rapid physiological reaction of the prepared medicines with the pathogens and increase its curative power (Fisseha Mesfin, 2007). Previous reports such as Dawit Abebe (1986), Bayafers Tamene (2000) and Kebu Balemie et al. (2004) agree with this current finding.

The local people utilize 16 medicinal plant species to treat 16 human ailments. Most of these plants (62.5%) were collected from wild habitats indicating the existence of pressure on wild plants. These findings are in agreement with the findings of Zemedede (1997); Tesfay and Zemedede (1999); Fisseha (2007) and Gidey (2010) in which majority of the plant species were obtained from the wild vegetation. The local people depend on both dry and fresh remedies.

In this study, 10 preparations were in fresh form and 6 dried. The dependency of local people on fresh materials put the plants under serious threat than the dried form, as fresh materials are harvested directly and used soon with its extra deterioration with no chance of preservation that is not stored for latter use (Fisseha, 2007). Debela (2001) and Kebu et al. (2004) indicated that the use of fresh medicinal plants is more threatened than dry forms. However, healers argue that fresh materials are effective in treatment as the contents are not lost before use compared to the dried forms. Traditional practitioners are collecting medicinal plants with less attention than would be preferred from viewpoint of conservation of plant resource.

The majority (75%) of these preparations did not have different additive substances while the remaining pre-

parations are drawn from mixtures of different plant species with different additive substances like honey, sugar, oil and hair of female old sheep for the treatment of single ailment. Similar result was also reported elsewhere (Mirtuse, 1999; Bayafers, 2000; Fisseha, 2007). Dawit Abebe (1986) has also identified the additive substances in herbal remedy preparations with their possible benefits.

Majority (84.6%) of traditional healers indicated the absence of any adverse effects of traditional medicines after administrations. But some (15.4%) of the preparations were reported to have some adverse effects like vomiting and fever on patients. There were variations in the unit of measurement (Table 3), duration and time at which remedies are taken and prescribed by healers for the same kind of health problems. Lack of precision and standardization is main drawback for the recognition of the traditional health care system (Amare, 1976; Sofowora, 1982; Dawit, 1986; Fisseha, 2007). Most (84.6%) of the traditional healers were found to have poor knowledge on the dosage and antidote while prescribing remedies to their patients.

In the study area, various human induced and natural factors threaten the survival of many medicinal plant species which include agricultural expansion, overgrazing and lack of awareness. Pressure from agricultural expansion and cutting for fuel wood combined with seasonal drought are main factors for medicinal plants degradation in Ethiopia (Zerihun and Mesfin, 1990; Ensermu et al., 1992; Kebu et al., 2004.).

Figure 1 reveals that leaf is the most part used in preparation of remedies. Most commonly used plant parts for herbal preparations in central Tigray, Ethiopia were harvested mainly for their leaves (Gidey, 2010). Previous reports in Ethiopia have shown that leaves were the most commonly used and followed by roots to treat various health problems (Bayafers, 2000; Mirtuse, 1999). Given the highest frequency of leaves used for medicinal purposes in the study area, threat to the destruction of medicinal plants was found to be minimal, as high threat to the mother plant comes with root, bark and stem harvest. Medicinal plant harvest that involves roots, rhizomes, bulbs, barks and stems have serious effect on the survival of mother plants (Dawit and Ahadu, 1993).

The knowledge and practices of traditional medication are kept with them for the sake of secrecy. Services are obtained only from family. A Majority (69%) of traditional healers transfer their indigenous knowledge to their selected family verbally, some (23%) through showing the medicinal plant in the field and the remaining (8%) through demonstration including remedy preparation methods. The indigenous knowledge transfer is poor which may causes erosion of the practice and knowledge. Traditional healers should cultivate scarce and more valuable medicinal plants around their homes instead of going long distances to fetch medicinal plants. Promoting the organizational structure at Zone and

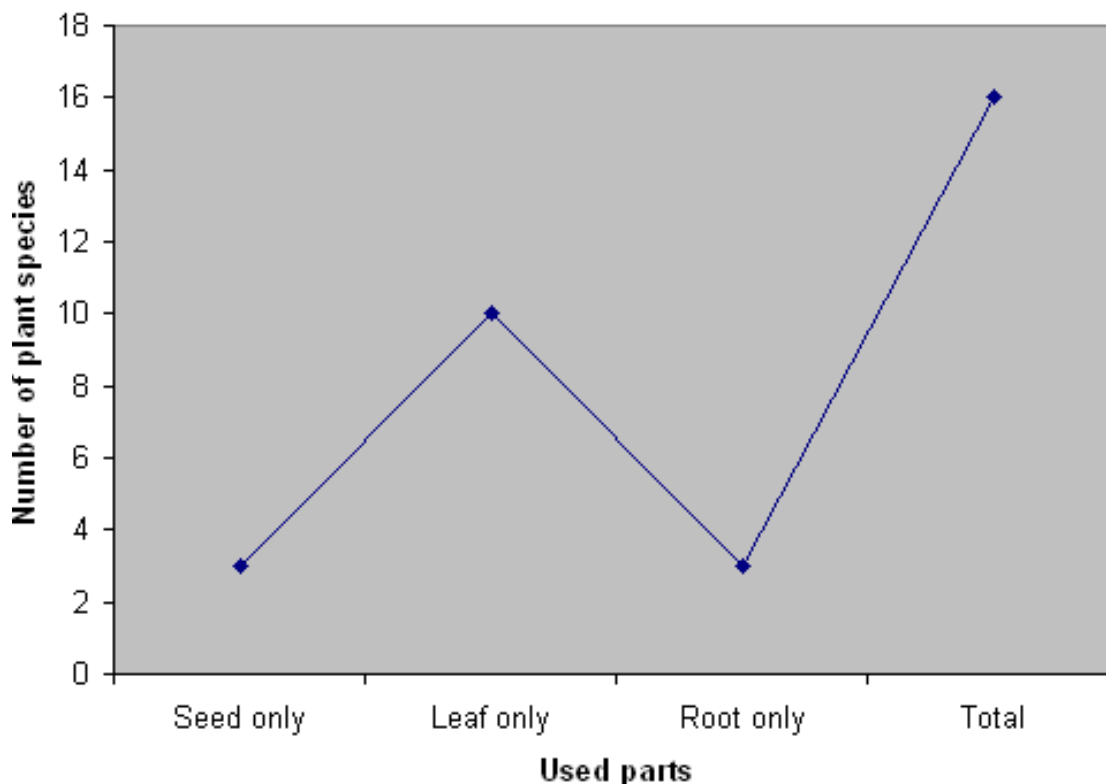


Figure 1. Plant parts used in preparation of remedies in the study area.

Woreda Agricultural offices to identify and encourage the local herbal medicinal practitioners to enhance the use of traditional medicine and licensing the work of the practitioners is per amount important.

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