

Full Length Research Paper

Assessment of traditional medicinal plants in Endrta District, South-eastern Tigray, Northern Ethiopia

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Ethnobotanical data was collected between September and December, 2009 on six field trips to investigate medicinal knowledge and application of medicinal plants in Endrta Wereda (the lowest administrative unit in Ethiopia) of Southeastern Tigray, Northern Ethiopia. Semi-structured interviewees, observation and guided field walks with informants were employed to obtain ethnobotanical data. A total of 35 informants (24 males and 11 females) were selected purposefully with the help of local administrators and local elderly people. A total of 27 species of medicinal plants were collected and identified for treating 24 human ailments. Most (62.96%) of the traditional medicinal plants were wild and were mostly harvested for their leaves. Oral application was the highest and most commonly used route of application followed by dermal. Awareness creation among the traditional healers and community at large is important in order to preserve the indigenous medicinal plant species and for conservation and sustainable use of medicinal plants in the area.

Key words: Documentation, ethnobotany, traditional medicinal plants, Tigray.

INTRODUCTION

Since ancient times, plants have been indispensable sources of both preventive and curative traditional medicine preparations for human beings and livestock. Historical accounts of traditionally used medicinal plants depict that different medicinal plants were in use as early as 5000 to 4000 BC in China and 1600 BC by Syrians, Babylonians, Hebrews and Egyptians (Dery et al., 1999). Beside their use in fighting various ailments at local level, different medicinal plants are used as export commodities, which generate considerable income (Rai et al., 2000). These plants are normally traded in dried or freshly preserved form as whole or comminuted (Lange, 1998); and their global markets are found in China, India, Germany, France, Italy, Japan, England and USA (Laird, 1999). Trends in the use of traditional and complementary medicine are on the increase in many developed and developing countries. In the USA, it was estimated that 42.5 million visits were made to herbalists in 1990, contrasting the 388 million actual visits to primary health care physicians (Gebre-Mariam and Asres, 1996).

The introduction of modern medicine to Ethiopia dates back to the 16th century during the regime of Emperor Libne Dingel (1508 - 1540). The first government run modern health care was established in 1906 with the opening of Menelik II Hospital in Addis Ababa, the capital

city of Ethiopia. Since then the government has taken the formal responsibility of delivering health care to the population and health institutions were established in the different regions of the country. However, the growth and development of modern health care in Ethiopia as a whole has been very stunted and to date, its coverage is less than 50% of the population. The vast majority of the rural populations, therefore, still depend on traditional medicines and its practitioners (Messeret, 1996). Ethiopia is the home of many nationalities and remarkably diverse flora, including numerous endemic species that are utilized in the different traditional medical practices (Desta et al., 1996).

In many developing countries, medicinal plants have not been well studied, tested or documented. Most of the information is still in the hands of traditional healers and knowledge of healers is either lost or passed to generation by the word of mouth. Thus, ethnobotanical research attempts to document the knowledge of the healers in the community in order to reserve it for future use (Tesfaye, 2004). In Ethiopia, the long history of using traditional medicinal plants for combating various ailments can be confirmed by referring to the medico-religious manuscripts in the country (Kibebew, 2001).

Plant remedies are still the most important and

sometimes the only source of therapeutics for nearly 80% of the population in Ethiopia (Dawit, 2001). The current loss of medicinal plants in the country due to natural and anthropogenic factors links with the missing of valuable indigenous knowledge associated with the plants.

Most times, it is impossible to document all the knowledge of traditional healers. Hence critical observations of traditional medicine practices of the community should make for the selection of plants that are worth documenting. Medicinal plants have not been well studied and documented in Tigray region, Northern Ethiopia. Most of the information is still in the hands of the traditional healers. The correct identification of the species used can be very difficult due to lack of or poor quality sample specimens.

However, data on the part used, method of preparation of remedies and methods of application are also necessary since they all affect the nature and amount of any biologically active compounds. This phenomenon suggests a need to conduct ethnobotanical research and to document the medicinal plants and the associated indigenous knowledge. Hence, an intensive documentation of medicinal plants is of paramount importance to mitigate the erosion of indigenous knowledge of traditional medicine. The present research was initiated to assess the medicinal plant species, parts used, route of application and diseases treated in Endrta, Wereda (the lowest administrative zone in Ethiopia), Southeastern Tigray, Northern Ethiopia.

Study area

The study was conducted in Endrta Wereda which is found in Tigray Regional State, Ethiopia. The Wereda is situated 730 km north of Addis Ababa, capital city of Ethiopia. The study area lies between 12° 13' and 14° 54' North and 56° 27' and 40° 18' East with total area of approximately 10,200 km² with an altitude of 2070 m.a.b.s.l. The mean minimum and maximum annual rain fall is 280 and 910 mm, respectively. The temperature ranges between 12°C (November and December) and 27°C (January and March). It has three urban centers: Quiha, Aynalem and Adigudum. Mixed crop and livestock farming system is the mode of agriculture in the Wereda. In the Wereda, there is only one health center and nine clinics. The health center covers for about 58% of the population. The total agricultural human and livestock population is about 115,000 and 56,000, respectively. Malaria, TB, diarrhea, asthma and tonsillitis have been reported as the five most common diseases in 2009 by the Wereda health office and are prevalent in the rural areas of the Wereda.

METHODS

Ethnobotanical data was collected between September and

December, 2009 on six field trips made to the site based on methods given by Hedberg (1993), Martin (1995) and Cotton (1996). Accordingly, semi-structured interviewees, observation and guided field walks with informants were employed to obtain ethnobotanical data. A total of 35 informants (24 males and 11 females) were selected purposefully with the help of local administrators and local elderly people from six subdistricts of the Endrta Wereda (Qiha, Felege-Selam, My-Tsedo, Aynalem, Shibta and Debri). Recommended traditional medicine practitioners were identified as potential informants and subsequently participated in personal interviews.

Interviews were based on a checklist of questions prepared before hand in English and translated to the local language (Tigrghna). Information regarding local names of medicinal plants, methods and conditions of gathering and preparation, part(s) used, diseases treated, dosage used, route of application, adverse effect, uses other than medicinal uses and management methods was recorded at the spot. Observations were made on the morphological features and habitats of each medicinal plant species in the field. Based on ethnobotanical information provided by informants, specimens were collected, numbered, pressed and dried for identification and plates of each traditional medicinal plant were collected. Identification was done in the field as well as in Mekelle University with the help of experts, by comparison with authentic specimens, illustrations and taxonomic keys.

RESULTS

A total of 27 species of medicinal plants were collected and identified for treating 24 human ailments (Table 1). Most (62.96%) of the traditional medicinal plants were wild while 5 species (18.52%) were gotten from cultivation and the remaining 5 species (18.52%) were obtained both from cultivation and the wild (Figure 1). Most of the traditional medicinal plant preparations were used in fresh form (22, 75.86%) while some were in dried form (5, 17.24%) and dry or fresh form (2, 6.9%). It was found that 62.96% of medicinal plants have values other than their medicinal role (Table 1).

The medicinal plant preparations were applied through different routes of administration like oral, dermal, nasal and oral or dermal routes. However, oral application (15 preparations, 51.72%) was the highest and most commonly used route of application followed by dermal application (11 preparations, 37.93%) (Figure 2).

The plant parts used widely to treat human include roots, stems, leaves, fruits and seeds (Figure 3). The most commonly used plant parts for herbal preparations in the area were leaves (55.56%), stems (14.81%) and roots (11.11%).

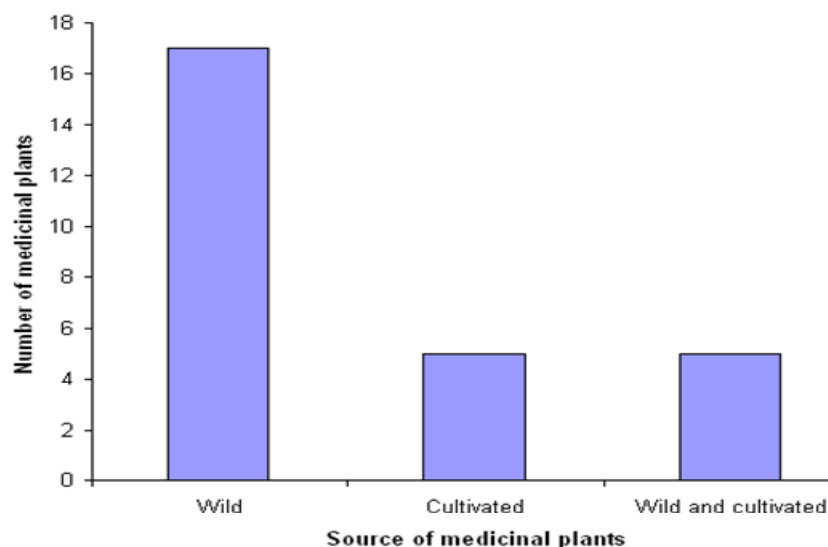
The medicinal plants have various methods of preparation and application for different types of ailments and they have various preparation forms like crushing, squeezing, chewing, crushing and cooking. Crushing and squeezing (31.03%) constituted the highest type of preparation form, followed by crushing (24.14%) (Table 2).

DISCUSSION

In Tigray, medicinal plants have been used as traditional

Table 1. List of medicinal plants, diseases treated, ingredients added and condition of the medicinal plant used.

Medicinal plants	Condition of the medicinal plant	Diseases treated	Ingredients added	Other uses of the plant
<i>Achyranthes aspera</i>	Fresh	Tonsillitis	None	None
<i>Allium sativum</i>	Fresh	Malaria	None	Splice
<i>Aloe barbadensis</i>	Fresh	Ascariasis	None	Food
<i>Carica papaya</i> L.	Fresh	Hepatitis	Tella (local beverage)	None
<i>Citrus aurantifolia</i>	Fresh	Diarrhea	Sugar and salt	Food
<i>Citrus aurantifolia</i>	Dry	Hepatitis	None	Food
<i>Citrus aurantifolia</i>	Fresh	Hyper tension	Water	Food
<i>Cordia africana</i>	Fresh	Acute febrile illness(AFI)	Coffee	Fire wood
<i>Cyphostema acaulata</i>	Fresh	Snake bites	Oil and water	None
<i>Datura innoxia</i>	Dry	Leishmaniasis	Sheep blood	None
<i>Datura stramonium</i>	Fresh	Tenea versicolor	None	None
<i>Datura stramonium</i> L.	Fresh	Wound	None	None
<i>Dodonaea viscosa</i>	Dry/fresh	Vitiligo	Butter	Food
<i>Entada abyssinica</i>	Fresh	Herpefoster	Honey	Fire wood
<i>Eucalyptus globulus</i>	Fresh	Acute febrile illness(AFI)	Coffee	Construction
<i>Euclea natalensis</i>	Fresh	Rabies	Cheese	Fire wood
<i>Euphorbia tirucali</i>	Dry	Tuberculosis(TB)	None	Binding
<i>Linum ustatissimum</i>	Dry	Swelling around neck(Megegha)	None	Food
<i>Ocimum lamiifolium</i>	Fresh	Acute febrile illness(AFI)	Coffee	None
<i>Phytolacca dodecandra</i>	Fresh	Abortion	Water and coffee	Washing
<i>Rumex abyssinicus</i>	Dry/fresh	Hypertension	Water	None
<i>Schinus molle</i>	Fresh	Asthma	None	Fire wood
<i>Sida schimperiana</i>	Fresh	Tuberculosis(TB)	None	None
<i>Solanum dulcamara</i>	Fresh	Goiter	None	None
<i>Solanum insanum</i>	Fresh	Anthrax	Honey	None
<i>Trigonella foenum -graecum</i>	Dry	Spider poison	Water	Splice
<i>Whithania somnifera</i>	Fresh	Common cold	None	None
<i>Zingiber officinale</i>	Fresh	Abdominal cramp	None	Splice
<i>Ziziphus spina christi</i>	Fresh	Dandruff	None	Food

**Figure 1.** Source of medicinal plants.

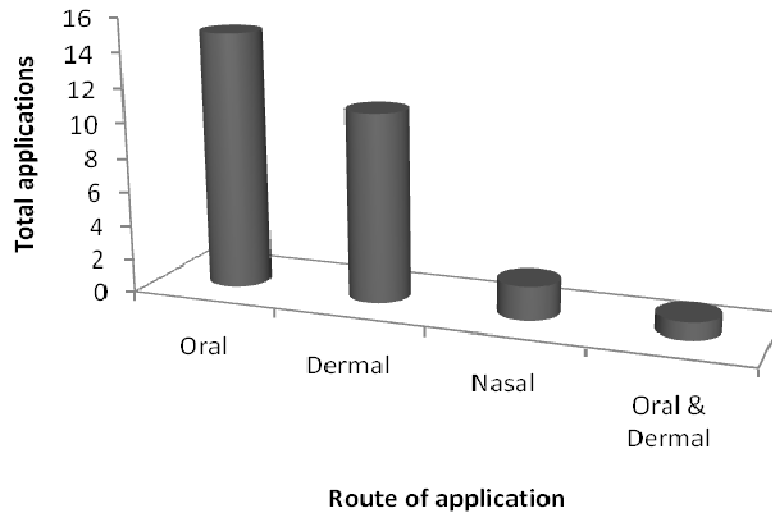


Figure 2. Route of administration of remedies used for human ailments.

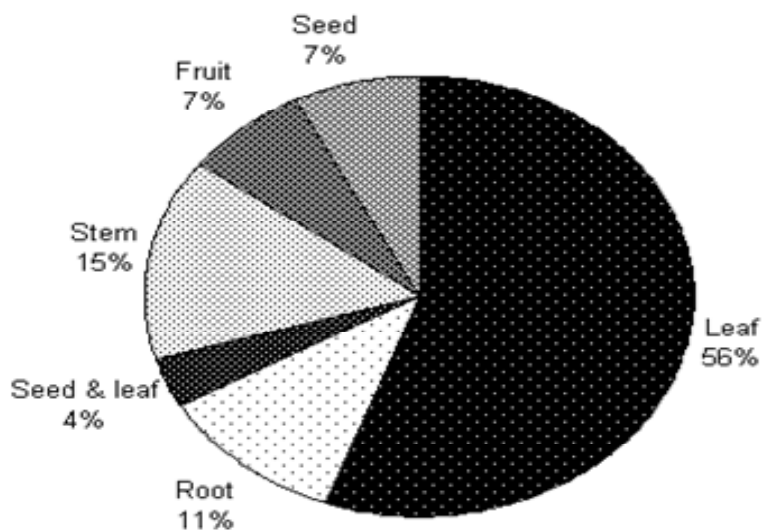


Figure 3. Parts of the medicinal plants used in the preparation of remedies.

Table 2. Methods of preparation of traditional medicinal plant remedies.

Method of preparation	Total preparations	Percentage
Crushing and squeezing	9	31.03
Grinding and drying	2	6.89
Cooking	2	6.89
Squeezing	3	10.34
Crushing	7	24.14
Chewing	2	6.89
Squeezing and boiling	1	3.45
Crushing and drying	1	3.45
Crushing and homogenizing in water	1	3.45
Roasting and crushing	1	3.45
Total	29	100

medicine to treat different human ailments by the local people from time immemorial. However, it is not widely used as it could be, because the skills are fragile and easily forgettable as most of the medicinal plants are in the hands of a handful and kept as a secret. In the present study, a total of 27 species of medicinal plants were collected and identified for treating 24 human ailments (Table 1). Most (62.96%) of the traditional medicinal plants were wild. This finding agrees with studies elsewhere in Ethiopia. For instance, Awas and Asfaw (1999) reported that 71% of the medicinal plants of the 'Berta' people in Western Ethiopia are obtained from the wild vegetation. Mesfin (2007) reported that (69.1%) of the medicinal plants in Wonago Wereda, Southern Ethiopia was from the wild. Most (68.75%) of the medicinal plants in central Tigray, Northern Ethiopia were collected from the wild (Yirga, 2010). The most commonly used plant parts for herbal preparations in the area were leaves (55.56%), stems (14.81%) and roots (11.11%). Most commonly used plant parts for herbal preparations in central Tigray were leaves (Yirga, 2010). Collecting leaves alone could not pose a lasting danger to the continuity of an individual plant compared with the collection of roots, bark, stem or whole plant and hence does not affect sustainable utilization of the plants. The dependence on roots of plants gave consequences from both ecological point of view and from the survival of the medicinal species (Abebe and Ayehu, 1993).

The most popular mode of preparation was in the form of crushing and squeezing which accounts to 31.03% followed by 24.14% of crushing only. Oral application (51.72%) was the highest and most commonly used route of application followed by dermal application (37.93%). This is concurrent with the finding of Abebe and Ayehu (1993) who reported that the leading route of application used in northern Ethiopia is oral, which accounted for 42%. This is also in agreement with the result of various ethnobotanical researchers elsewhere in Ethiopia (Gidey, 1999; Hunde, 2001; Addis et al., 2001; Balemie et al., 2004; Lulekal, 2005; Mesfin, 2007; Yirga, 2010) that indicates oral as the predominant route of application. Practitioners know the importance of conserving medicinal plants, but limited conservation effort is done in the area. The current loss of medicinal plants in Ethiopia due to natural and anthropogenic factors links with the missing of valuable indigenous knowledge associated with the plants.

To document the medicinal plants and the associated indigenous knowledge of the country, aggressive study on ethnobotany is needed. As most of the medicinal plants are wild and harvested for their roots to prepare remedies, the healers in consultation with government officials should take care not to eradicate the medicinal plant species altogether. It is advisable to replace these plants to ensure sustainability by establishing nurseries for the common medicinal plants so as to curb deforestation as its associated consequences such as erosion and loss in soil fertility (Yirga, 2010).

People of the study area used various units of measurement and the duration of administration to determine the dosage. Local units such cup, spoon and number were used to estimate and fix the amount of medicine. However, majority of the traditional healers had a poor knowledge of dosage. Balemie et al. (2004) found that there are variations in amount and unit of measurement of medicinal plants used by healers for the same kind of health problems.

Lack of precision and standardization is a drawback for the recognition of the traditional health-care system (Getahun, 1976; Sofowora, 1982; Abebe, 1986). Traditional healers had no accurate value of the medicines prescribed to patients. They administered the same amount of medicine to people who have the same disease regardless of age, body weight or sex (Yirga, 2010). Local healers did not have enough awareness about cleanness of the equipments which are used to prepare the medicines.

Conclusion

Traditional medicinal plants are harvested mostly from wild stands and were harvested mainly for their leaves. Twenty seven species of medicinal plants were collected and identified for treating 24 human ailments. The mode of administration is mainly through oral and dermal. Training the traditional healers on resource use value, management and conservation of plants, sterilization of materials used and various communicable diseases by agricultural experts or health professionals is of paramount important. Recognitions and intellectual property rights should be given to traditional healers, either through certification or through organizing them at community or Wereda level. Awareness among the traditional healers and community at large is important in order to preserve the indigenous medicinal plant species.

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