Ethnobotanical study of medicinal plants in Kafficho people, southwestern Ethiopia

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Ethnobotanical study of medicinal plants used by Kafficho people was carried out in Kafa zone, Southern Nations, Nationalities and People’s Regional States in Southwestern Ethiopia. Kafficho are the dominant indigenous people living in the zone. Their language is Kaffinono, which belongs to Omotic language family. Inquiries were made regarding the local names of medicinal plants and the disease treated. Informants were asked to rank medicinal plants used to cure a specific ailments.

1. Introduction

Traditional medicine is used throughout the world as it is dependent on locally available plants, which are easily accessible, and capitalizes on traditional wisdom-repository of knowledge, simple to use and affordable. These medical systems are heavily dependent on various plant species and plant based products. The current account of medicinal plants of Ethiopia, as documented for National Biodiversity Strategy and Action Plan by Tesema Tanto et al. (2002), shows that about 887 plant species were reported to be utilized in the traditional medicine. Among these, about 26 species are endemic and they are becoming increasingly rare and are at the verge of extinction. Equally threatened is the knowledge base on which the traditional medicinal system is based, as the ethnobotanical information is not documented and remains in the memory of elderly practitioners. Therefore, detailed information on the medicinal plants of Ethiopia could only be obtained when studies are undertaken in the various parts of the country where little or no botanical and ethnobotanical explorations have been made.

Ethnobotany tries to find out how people have traditionally used plants, for whatever purposes, and how they are still doing so (den Eynden et al., 1992). Thus, ethnobotany tries to preserve valuable traditional knowledge for both future generations and other communities. Recently, the subject has adopted a much more scientific and quantitative methodology and has studied the ways in which people manage their environment (Phillips and Gentry, 1993a, b; Martin, 1995; Cotton, 1996; Höft et al., 1999). Quantitative methods and species use values enable comparisons of use between vegetation types or ecological zones, between people of different ages, gender or occupation within or between communities (Höft et al., 1999, Cunningham, 2001).

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Except for recording the medicinal plants constituting the agrobiodiversity of Kafficho homegardens by Feleke Woldeyes (2000) and medicinal use of *Ensete ventricosum* (Welw.) Cheesman (Musaceae) by Yemane Tsehaye and Fasil Kebebew (2006), no systematized study on the ethnobotany of Kafficho medicinal plants has been conducted before. The knowledge on medicinal plants is not easily accessible and this study was restricted to Chena and Decha districts where people are aware about the need to conserve plants. The awareness was created by the Institute of Biodiversity Conservation/Ethiopia while running a project supported by Global Environment Facility - “Dynamic Farmer Based Conservation of Ethiopia’s Plant Genetic Resources Project” (Tesfaye Awas, 2001). The project has established Community Gene Banks at Baha and Wacha villages, in Decha and Chena districts, respectively. Since the study may be regarded as one of the pioneer in its nature, the obtained result will hopefully contribute for implementing *in-situ* conservation, promotion and usage of the plants in a sustainable manner, and also open up the way for future research and development of new drugs from the medicinal plants. It also contributes in improving health care in the rural areas of Kafa.

2. Location of the study area

The study was carried out between August 2000 and October 2003 in Kafa zone, Southern Nations, Nationalities and People Regional State, Southwestern Ethiopia. The capital town of the zone, Bonga, is located 440 km southwest of Addis Ababa, capital city of Ethiopia. The name of the study area “Kafa” is well known and is every day on the minds of the many people throughout the globe who savor the juice extracted from the berry of a plant which originally grew in Kafa, coffee (Grühl, 1935). Kafa zone is bordered by Oromiya region on the north, Semen Omo zone on the east, Debub Omo zone in south east, Bench Maji zone on south and south west and Shaka zone on the west. The zone is subdivided into 10 districts, namely Bitta, Chena, Cheta, Decha, Gaweta, Gesha, Ginbo, Menjiwo, Silam and Telo. Chena and Decha are the two districts of the zone in which the present study was carried out. In each district, the villages near the Community Gene Banks (Baha in Decha and Wacha in Chena) were selected for detailed data collection (Figure 1).

![Figure 1. Map Ethiopia, stars showing the study sites.](image-url)
Based on figures from the CSA (2005), Kafa zone has an estimated population of 851,063 of which 417,605 were males and 433,458 were females. With an estimated area of 10,610.65 square kilometers, this zone has an estimated population density of 80.21 people per square kilometer. Kafficho are the dominant indigenous group of people living in Kafa zone. Their language is Kaffinono, which belongs to Omotic language. They are sedentary agriculturists and practice mixed farming, cultivating crops, raising livestock and bee keeping. They follow either or Christian or Muslim or Traditional Religion.

3. Materials and methods

The data collection was conducted in two phases. In the first phase informants were asked to locate medicinal plants. The plant local names and ailments treated by the plant were recorded on the spot when informants arrive at consensus. The plants were, then, collected, pressed, dried and made ready for taxonomic identification. The plant specimens were identified at the National Herbarium (ETH), Addis Ababa University/Ethiopia. The specimens were identified by comparing with already identified (authentic) specimens and using taxonomic literatures such as Hedberg and Edwards (1989), Phillips (1995), Edwards et al. (1995, 1997 and 2000), Hedberg et al. (2003), Mesfin Tadesse (2004), and unpublished manuscripts at ETH. Identified plant specimens have been deposited at ETH and Institute of Biodiversity Conservation/Ethiopia. After botanical identification of medicinal plants, structured questioner was prepared by listing local name of medicinal plants used treat particular ailment.

In the second phase, houses in each village were numbered starting from one corner and 30 of them were selected using random numbers. In each house one person was asked to rank medicinal plants used to treat a particular ailment according to personal preference. A total of 60 informants (22 men and 38 women) were interviewed independently to avoid others influence. Some social factors like age, gender and education were recorded during interview. The preparation methods of medicinal plants and dosage of application were considered as the intellectual property of the people and were not collected. The informants were compensated for their time.

Each rank was given an integer number with the most important or preferred item being assigned the highest number. The informant verse species matrix (with the rank in the cell) was used as a raw data for analysis (Höft et al., 1999). Information obtained from single informant was omitted as it has negligible scientific validity (Tippo, 1989). The data was analyzed using multivariate computer programs CANOCO version 4.5 (ter Braak and Smilauer, 2002), NTYSYS pc 2.0 (Rohlf, 1993) and PAST - PAleontological STatistics, ver. 1.56 (Ryan et al., 1995), to see consistency of information given by informants, variation among individuals and social groups in using certain medicinal plant species. The resulting ordination diagram (with people in plant space) obtained by running the three commuter programs were similar. The output obtained by latter was presented in our result.
4. Results and discussion

4.1. Diversity of medicinal plants

A total of 124 medicinal plants, which belong to 107 genera and 49 families of vascular plants (see Appendix) were recorded in Kafa zone. The Kafficho people use these plants to treat about 18 ailments of human and domestic animals (Table 1). Some families were represented by many species, like family Asteraceae (12 species), Fabaceae (10), Lamiaceae (nine), Solanaceae (six) and Poaceae (five). Four families were represented with four species each, eight families with three species, 10 families with two species and 22 families with one species. Herbs accounted highest proportion and followed by shrubs and trees (Table 2). A significant proportion of medicinal plants (74.19%) are collected from the wild and about 25.81% are cultivated in homegarden.

Table 1. Aliments treated and the number of medicinal plants used by Kafficho people.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Aliments</th>
<th>No of medicinal plants used</th>
<th>S. No.</th>
<th>Aliments</th>
<th>No of medicinal plants used</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Abdominal pain</td>
<td>23</td>
<td>10</td>
<td>Rabies</td>
<td>12</td>
</tr>
<tr>
<td>2</td>
<td>Back pain</td>
<td>8</td>
<td>11</td>
<td>Sexually Transmitted Diseases</td>
<td>10</td>
</tr>
<tr>
<td>3</td>
<td>Bone setting</td>
<td>6</td>
<td>12</td>
<td>Skin Diseases</td>
<td>14</td>
</tr>
<tr>
<td>4</td>
<td>Cough</td>
<td>14</td>
<td>13</td>
<td>Snake</td>
<td>14</td>
</tr>
<tr>
<td>5</td>
<td>Dysentery</td>
<td>7</td>
<td>14</td>
<td>Tooth Pain</td>
<td>14</td>
</tr>
<tr>
<td>6</td>
<td>Ear diseases</td>
<td>3</td>
<td>15</td>
<td>Wounds</td>
<td>15</td>
</tr>
<tr>
<td>7</td>
<td>Eye diseases</td>
<td>10</td>
<td>16</td>
<td>Internal diseases of domestic animals</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Headache</td>
<td>21</td>
<td>17</td>
<td>Fever of domestic animals</td>
<td>20</td>
</tr>
<tr>
<td>9</td>
<td>Intestinal parasites</td>
<td>13</td>
<td>18</td>
<td>Wounds of domestic animals</td>
<td>10</td>
</tr>
</tbody>
</table>

Table 2. Life form classes and proportion of cultivated and wild medicinal plants.

<table>
<thead>
<tr>
<th>Habit</th>
<th>Cultivated</th>
<th>Wild</th>
<th>Grand Total</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Climber</td>
<td>1</td>
<td>5</td>
<td>6</td>
<td>4.84</td>
</tr>
<tr>
<td>Grass</td>
<td>3</td>
<td>1</td>
<td>4</td>
<td>3.23</td>
</tr>
<tr>
<td>Herb</td>
<td>22</td>
<td>56</td>
<td>78</td>
<td>62.90</td>
</tr>
<tr>
<td>Sedge</td>
<td>-</td>
<td>2</td>
<td>2</td>
<td>1.61</td>
</tr>
<tr>
<td>Shrub</td>
<td>5</td>
<td>12</td>
<td>17</td>
<td>13.71</td>
</tr>
<tr>
<td>Succulent</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td>0.81</td>
</tr>
<tr>
<td>Tree</td>
<td>-</td>
<td>16</td>
<td>16</td>
<td>12.90</td>
</tr>
<tr>
<td>Grand Total</td>
<td>32</td>
<td>92</td>
<td>124</td>
<td>25.81</td>
</tr>
<tr>
<td>%</td>
<td></td>
<td></td>
<td>74.19</td>
<td></td>
</tr>
</tbody>
</table>

The medicinal plants are always cultivated on the upper slope of the homegarden, specifically behind the house (Figure 2). The zone of medicinal plant cultivation and collection is always kept clean. Animal wastes or any other garbage are not damped in this zone. Weedy medicinal plants are also collected from this site, even when they occur throughout the garden. Kafficho people give four reasons for this: to prevent
contamination by discharge of animal waste in the lower slope of their house, protect from livestock, make out of human sight and ensure continuous supply of medicine for the household. The third reason is related to traditional belief. The fourth reason is related to plant nutrition and the consequent plant performance. If medicinal plants are grown in homegarden quarters with high soil nutrient, they grow faster, complete their life cycle within a relatively shorter period and then die – a situation not appreciated by farmers. Instead, the farmers want the medicinal plants to remain longer in their gardens so as to ensure a prolonged harvest, and they achieve this by maintaining the plants under stressed conditions that subdue plant growth.

The people use various parts of medicinal plants (Figure 3). Leaves contribute about 50% of part used and followed by seeds (15%) and roots (10%). There are instances where different parts of the same plant being used for different purposes. There are also cases where more than one plant is used to treat a particular ailment. Headache is, for example, treated with a combination of either six or nine or 12 medicinal plants. There also cases where a particular plant is used to treat many ailments. For example, both Clerodenderum myricoides (Hochst.) R.Br. ex Vatke (Verbenaceae) and Croton macrostachyus Del. (Euphorbiaceae) are used to treat seven aliments.

Figure 2. The zone of medicinal plant cultivation in the homegarden of Kafficho people

Figure 3. Proportion of parts of medicinal plants used in the treatment of various ailments.
4.2. Naming of medicinal plants - folk taxonomy

Kafficho people name medicinal plants by using the disease treated followed by ‘ato’. For example two medicinal plants, *Vernonia auriculifera* Hiern (Asteraceae) and *Datura metel* L. (Solanaceae) are both used to treat snake poison and are collectively named as ‘Dingerato’, where ‘Dinger’ is snake and ‘ato’ means medicine. Some names are attributed to wild animals or domestic animals, like ‘Shetti Offio’ - Monkey’s Kororima (‘Shetti’ means Monkey while ‘Offio’ is Kororima) for *Aframomum zambesiacum* (Baker) K. Schum. (Zingiberaceae) to distinguish it from *Aframomum corrorima* (Braun) Jansen. The latter is mainly used as a spice. An example of plant names attached to domestic animal is ‘Bege Gicho’ – ‘Sheep’s Spine’ for *Achyranthes aspera* L. (Amaranthaceae). The relationship or similarities among plants are also expressed in plant naming like – ‘Damo Gebo’, where ‘Gebo’ means brother and *Ocimum urticifolium* Roth (Lamiaceae) is a bother of ‘Damo’ - *Ocimum lamifolium* Hochst. (Lamiaceae). The people also name plants using colors like- ‘Chele Dukusho’ and ‘Neche Dukisho’ to distinguish *Allium cepa* L. (Alliaceae) and *Allium sativum* L. (Alliaceae), respectively. In this case ‘Chele’ means red, ‘Neche’ means white and ‘Dukisho’ means onion.

Our result shows that 88.7% of medicinal plants have one to one matching of the local name to the botanical name. The plant naming system is mainly at species level. There are a few cases where one local name is used for two species (6.5%), one species with two local names (3.2%) and plants with infraspecific names (1.6%).

4.3 Variation in ethnobotanical knowledge among social groups

Our result showed that medicinal plant use among Kafficho is site specific and there is variation in plant use between the two districts (Figure 4). People in Decha district use...
many medicinal plants from the near by forest. They collect medicinal plants such as *Teclea nobilis* Del. (Rutaceae) and *Trilepisium madagascariense* DC. (Moraceae) from forest. Within each district there is difference in medicinal plant knowledge between women and men (Figure 4). The former ranked best those medicinal plants that are available in homegardens or close to homestead. This is related to the role of women in the management of homegardens (Feleke Woldeyes, 2000) and cultivation of medicinal plants. The men ranked best plants that grow in the wild where they expend most of their time.

Our result also shows that there is a positive relationship \((r = 0.1801)\) between the age of informants and their ethnobotanic knowledge. The older person knows more medicinal plants than youngsters (Figure 5). Like any other traditional societies in Africa (Fekadu Fullas, 2001), ethnobotanical knowledge of medicinal plants of Kafficaho is transferred from the older people to younger generations at household level. This knowledge is not existent in written form, their losses or distortion at every transfer is inevitable. Our result further shows that, there is a negative relationship \((r = -0.0954)\) between the educational level of informants and their ethnobotanic knowledge (Figure 6). This show the occurrence of rapid disappearance of ethnobotanical knowledge when new generation gets the opportunities that were not available to their elders, such as attending school and living in urban areas (Tesfaye Awas et al., 1997). Access to modern clinics also contributes to loss of indigenous medical systems (Abbink, 1995). It is obvious that those people who went to school consider traditional use of medicinal plants as harmful and backward and prefer to go to modern clinics.

![Figure 5. The relationship of age of informant and number of medicinal plants recognized.](image-url)
Figure 6. The relationship of educational level of informant and number of medicinal plants recognized.

5. Conclusion and recommendations

Medicinal plants have an immense contribution to the health care of Kafficho people. As practiced in other societies, traditional medicine is practiced; one at the household level and the other is through traditional healers. In the later case, there is specialization, where people go to different specialists. Our study is limited to the former case and focused on the ethnobotanical knowledge of Kafficho which is available at the public domain. The ailments are also presented as they are mentioned by the informants and were not described as they are used by health sectors.

Medicinal plant use among Kafficho is localized and dependent on plants that are found around them. The ethnobotanical knowledge on medicinal plants also varies among various social groups. A significant proportion of medicinal plants used by Kafficho people are collected from wild. Although the reasons for the loss of medicinal plants and associated traditional knowledge systems are many, deforestation is the most visible one in Kafa zone. With high rate of population growth, expansion of farmlands by clearing vast area of forest annually, the loss or scarcity of many medicinal plants at least locally is inevitable. Under such circumstances the use of plants for medicinal purposes will also decline and consequently the once effective traditional health care system will also be lost. This will affect the health service provided by the traditional sector in the area.

One way of preserving such important traditional knowledge in the new generation is through integrating to school curricula or at least introducing the idea as an extra curricular school activity. The lessens learned in creating awareness about the need for conservation of crop farmer varieties are also important in preserving in situ both the medicinal plants and associated ethnobotanical knowledge among farmers. Strengthening the gardens in community gene banks, which have been serving as source for the exchange of medicinal plants among farmers is also important. Conducting further collection of medicinal plants identified and their ex situ conservation in cold rooms and field gene banks is also recommended.
Acknowledgment
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References
den Eynden, V.V., Vernemmen, P. and Damme, V.P., 1992. The Ethnobotany of the Topnaar, University of Gent, Gent.
Appendix. List of medicinal plants used by Kafficho people: Botanical names, family names, Kafficho names in Kaffinono, part used and ailments treated. The average preference rank of each medicinal plant was given in parenthesis following the aliment. Lowest number indicates the best one. The collector name and collection number of voucher herbarium specimens were given at the end. All herbarium specimens are deposited at the National Herbarium (ETH) of Addis Ababa University and Institute of Biodiversity Conservation.

1. *Acanthus eminens* C.B. Clarke, ACANTHACEAE, ‘Phecho’, Stem, Fever of domestic animals (19), Wounds (13), Wounds of domestic animals (8), Tesfaye A. 973.


30. *Centella asiatica* (L.) Urb., APIACEAE, ‘Tepheleshe (1)’, Leaves, Eye diseases (8), Tesfaye A. 1062A.


33. *Clerodendrum myricoides* (Hochst.) R.Br. ex Vatke, VERBENACEAE, ‘Agiwo’, Leaves & Sap, Abdominal pain (20), Dysentery (4), Eye diseases (5), Headache (8), Fever of domestic animals (15), Skin diseases (8), Wounds (9), Tesfaye A. 725, 980.


42. Cyathea manniana Hk., CYATHEACEAE, ‘Shishino’, Leaves, Sexually transmitted diseases (9).
43. Cymbopogon martini (Roxb.) J.Watson, POACEAE, ‘Tocho’, Roots, Abdominal pain (22), Fever of domestic animals (10), Tesfaye A. 1050.
49. Datura metel L., SOLANACEAE, ‘Dingerato (1)’, Whole plant, Snake poison/repellant (11), Tesfaye A. 753.
51. Dicliptera laxata C.B.Clarke, ACANTHACEAE, Togo, Leaves, Eye diseases (6), Headache (2), Tesfaye A. 807.
57. Ensete ventricosum (Welw.) Cheesman, MUSACEAE, ‘Wutto’, Sap, Back pain (6), Bone setting (6), Cough (12).
59. Erythrina abyssinica Lam., FABACEAE, ‘Bero’, Bark, Abdominal pain (17), Fever of domestic animals (14), Snake poison/repellant (8), Tooth pain (6).
68. Hydrocotyle mannii Hook.f., APIACEAE, ‘Tepheleshe (2)’, Leaves, Eye diseases (7), Tesfaye A. 1062B.
70. Isodon ramosissimus (Hook.f.) Codd, LAMIACEAE, ‘Dingermiko (1)’, Leaves & Stem, Tooth pain (13), Tesfaye A. 1074.
81. Maesa lanceolata Forssk., MYRSINACEAE, ‘Chego’, Sap, Fever of domestic animals (17), Skin diseases (13), Tesfaye A. 805.
86. Nicotiana tabacum L., SOLANACEAE, Tumbao, Leaves, Internal diseases of domestic animals (5), Fever of domestic animals (5), Snake poison/repellant (2), Wounds of domestic animals (2), Tesfaye A. 839.
89. Ocimun sp., LAMIACEAE, ‘Kudo’, Leaves, Ear diseases (2), Headache (3), Sexually transmitted diseases (6), Tesfaye A. 975, 1066.

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95. Pavonia urens Cav., MALVACEAE, ‘Shurnoko’, Leaves, Abdominal pain (19), Wounds of domestic animals (9), Tesfaye A. 1109.
100. Pittosporum abyssinicum Del., PITTOSPORACEAE, ‘Shollo’, Bark, Abdominal pain (14), Cough (11), Tesfaye A. 1002.
101. Prunus africana (Hook.f.) Kalkm., ROSACEAE, ‘Omo’, Bark & Leaves, Abdominal pain (21), Intestinal worms (11), Sexually transmitted diseases (3), Wounds (7), Tesfaye A. 1056.
111. Stellaria mannii Hook.f., CARYOPHYLLACEAE, ‘Dingermiko (2)’, Leaves & Stem, Skin diseases (12), Tesfaye A. 1048.


120. *Vernonia amygdalina* Del., ASTERACEAE, ‘Grawo’, Bark, Fever of domestic animals (11), Skin diseases (3).


