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Ethnobotanical study of traditional medicinal plant species of Arba Minch Zuriya Wereda, SNNPR, Ethiopia

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Abstract

An Ethnobotanical study of traditional medicinal plant species was carried out in Gamo zone, Arba Minch Zuriya Wereda, SNNPR between June 2016 to October, 2016. The aim of the study was to identify and document traditional medical plants and practices of using them to treat various ailments. Ethnobotanical data were collected using, semi-structured interview, group discussion, field observation and market survey. The data were analyzed by using descriptive statistics, preference ranking and paired comparison and direct matrix ranking method. A total of 52 medicinal plant species (43 genera, 35 families) were documented in the study area. Most (53%) were collected from wild followed by (41%) cultivated and 3(6%) from both wild and home garden. 36 medicinal plant species (31 families) were used to treat human ailments. Six medicinal plant species were used to treat livestock and nine were used both human and livestock. The most frequently used plant part was leaf (35.3%) followed by root, 11(21.6%), and the widely used method of preparation was crushing. Deforestation, agricultural activities, firewood and charcoal are major threats to medicinal plants in the study area.

Keywords: conservation, ethnobotany, medicinal plant species, deforestation

Introduction

Ethnobotany is defined as “local people's interaction with the natural environment: how they classify, manage and use plants available around them”. It involves an interdisciplinary approach surrounding the fields of botany, chemistry, pharmacology and anthropology [1]. It tries to find out how people have traditionally used and are still using plant resources. Ethnomedicine refers to the study of traditional medicine practice concerned with the cultural interpretation of health, diseases and illness [2].

Plants play a major role in treating both human and livestock ailments. For long periods of time directly and indirectly people used plants as a medicine. The history of plant used traditionally as a medicine were started early as 5000 to 4000 B.C in China. Much of an indigenous knowledge (IK) system, from the earliest times, is also found linked with the use of traditional medicine (TM) in different countries [3].

Many local communities prepare traditional medicine from different parts of plants. As stated by [4] many indigenous local communities have developed various traditional systems using locally available resources for the alleviation of health problems. Traditional healers use different mechanisms to prepare traditional medicine. The value of medicinal plants to human livelihoods is essentially infinite [5]. Medicinal plants have been source for the invention of novel drugs [6] and 25% of modern drugs contain one or more active principles of plant origin [7] and top 25 best selling medicines in the world originated from plant materials [8]. This study therefore, was aimed at the documentation of indigenous knowledge on use and conservation of medicinal plants by the people of Gamo in the study area and assessment of the existing threats to medicinal plants.

Materials and Methods

Description of the study area

The study was conducted in Arba Minch zuriya wereda, which is one of the weredas in Gamo zone Southern Nation, Nationalities and Peoples Regional State (SNNPRS). Arba Minch Zuriya wereda is bordered on the south by the Dirashe special woreda, on the west by Bonke, on the north by Dita and Chench, on the northeast by Mirab Abaya, on the east by the

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Oromia Region, and on the southeast by the Amaro special woreda. This woreda also includes portions of two lakes and their islands, Abaya and Chamo. Nechisar National Park is

located between these lakes. City of Arba Minch is surrounded by Arba Minch Zuria wereda. It is located in the dry land part of the southern Ethiopian Rift Valley system.

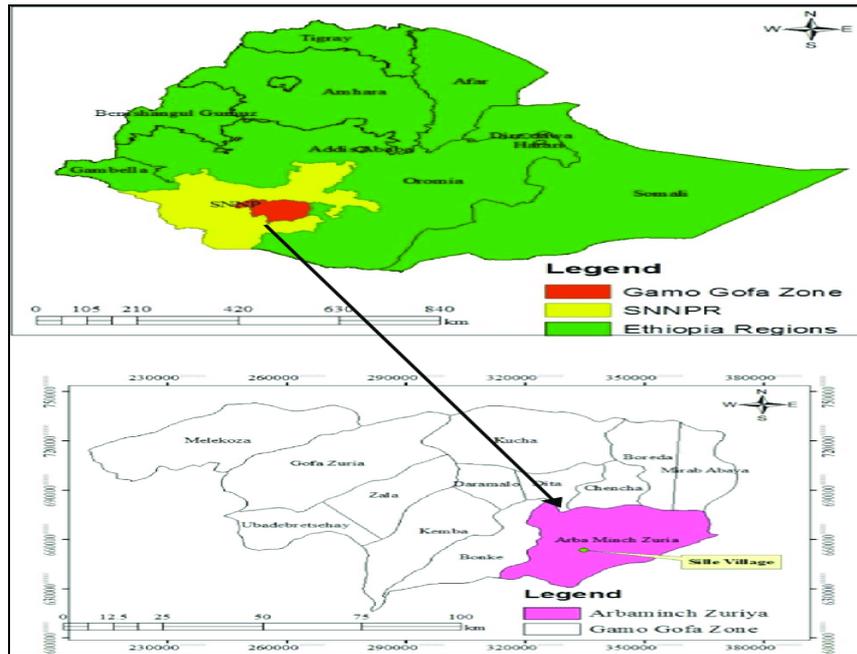


Fig 1: Map of study area (Source: <https://www.google.com/search>)

Ethnobotanical data collection

The methods used for ethnobotanical data collection were semi-structured interviews, group discussion, field observation and market survey. The respondents background, health problems treated, treatment methods, local name of medicinal plants used, source of collection (wild or cultivated), used to treat (human or livestock ailments), plant part used as medicine, treats to medicinal plants and conservation practice of the respondents were recorded. Semi-structured interview sessions were employed with the help of local assistants 9 & 10. Group discussion was made in selected districts with the informants. Field observation was conducted throughout the whole process of the research in order to ensure the validity of the obtained information, in field observations, the type of medicinal plants, the source/location, the human activities that loss traditional medicinal plant, and conservations of medicinal plants were carefully observed. Market survey and observation was conducted to assess the products of traditional medicinal plants supplied from the surrounding with the objective of understanding the system in income generation to the household. In addition, the market survey was used as an occasion to hold discussions members of households that are not captured during the sampling.

Medicinal plant species specimen collection and Identification

The medicinal plants were collected from various sources. Local name and habit of the plant was recorded and each given a collection number, pressed, dried and voucher specimens brought to Addis Ababa University, National Herbarium (ETH) for identification and documentation of the

taxa using published volumes of flora of Ethiopia and Eritrea and to compare with authentic specimens.

Data Analysis

Ethnobotanical data were analysed using direct matrix ranking methods, preference ranking methods and paired comparison based on methods given by [9, 11]. Descriptive statistics (percentage and frequencies) were computed to describe the ethnobotanical information on the plant species used for medicinal, associated knowledge and conservation status. Qualitative data obtained from key informants was subjected for thematic analysis. Finally, all the results were presented in tables and figures.

Results and Discussions

Medicinal plant species of the study area

A total of 52 medicinal plant species distributed in 35 families were collected and identified in the study area. *Asteraceae* was widely used family in the area, followed by *Solanaceae* and *Fabaceae* respectively. The plants used for medicinal purposes in the study area are presented in Table 1 with the relevant information (Vernacular name, Scientific name, Part used, mode of preparation and plant family, etc). Out of 51 medicinal plant species of the study area, 36 species (70%) were noted to treat only human ailments while 6 species (12%) were used to treat livestock ailments. Nine species (18%) are used to treat both livestock and human ailments. Among plant families, *Asteraceae* family contributes more in treating human ailments in the study area. This finding is in line with the findings reported by [12] on the dominance of the family *Asteraceae* in human health treatment.

Table 1: Medicinal plant species of the study area

No	Scientific Name	Family	Local name	Source	Parts used
1	<i>Albizia schimperiana</i> Oliv	Fabaceae	Alga	Wild	root
2	<i>Allium cepa</i> L.	Alliaceae	Shunkkuruutuwa	cultivated	Leaf & root
3	<i>Allium sativum</i> L	Alliaceae	Tuummuwaa	cultivated	All parts
4	<i>Alysicarpus ferrugineus</i> A.Rich.	Fabaceae	Wareechiya	Wild	Root

5	<i>Artemisia absinthium L</i>	Asteraceae	Naturaa	Cultivated	All parts
6	<i>Artemisia afra (Jacq. Ex. Willd)</i>	Asteraceae	Aguppiyaa	cultivated	Leaf
7	<i>Brassica oleracea L.</i>	Brassicaceae	Danqqala Santtaa	cultivated	Leaf
8	<i>Brucea antidysenterica J.F.Mill.</i>	Solanaceae	Shurushuxxiyaa	wild	Leaf
9	<i>Carex steudneri</i>	Cyperaceae	Shoosha- maatta	wild	Fruit
10	<i>Carica papaya L.</i>	Caricaceae	Paappayaa	cultivated	Fruit
11	<i>Catha edulis (Vahl) Forssk.ex Endl.</i>	Celastraceae	Jimma	Both	Leaf
12	<i>Chamaecrista mimosoides (L.)</i>	Fabaceae	Deesha Halakkuwa	wild	All parts
13	<i>Citrus aurantifolia (Christm.)</i>	Rutaceae	Loomiya	cultivated	Fruit
14	<i>Clerodendrum myricoides (Hochst.)</i>	Lamiaceae		wild	Leaf
15	<i>Croton macrostadyus</i>	Euphorbiaceae	Ankkaa	Wild	leaf
16	<i>Cynodon spp.</i>	Poaceae	Suraa	wild	Shoot
17	<i>Cyperus articulatus L</i>	Cypraceae	Bidaariyaa	wild	Root
18	<i>Datura stramonium (LINN.)</i>	Solanaceae	Laflafuwaa	wild	Leaf
19	<i>Echinops kebricho</i>	Asteraceae	Boorisaa	wild	Root
20	<i>Ehretia cymosa Thonn.</i>	Boraginaceae	Itiriwanjjiyaa	Wild	Leaf
21	<i>Ensete ventricosum(Welw)</i>	Musaceae	Uttaa	Cultivated	Root
22	<i>Eucalyptus globulus Labill.</i>	Myrtaceae	Bootta zaafiya	both	Leaf & seed
23	<i>Euphorbia abyssinica var.</i>	Euphorbiaceae	Akirssaa	wild	Latex
24	<i>Euphorbia indica Lam.</i>	Euphorbiaceae	Shatto-maataa	wild	Leaf
25	<i>Foeniculum vulgare Mill.</i>	Apiaceae	Shillariyaa	cultivated	Leaf
26	<i>Hordeum vulgare L.</i>	Poaceae	Bangгаа	cultivated	Fruit
27	<i>Laggera pterodonta (DC.) Sch.</i>	Asteraceae	Geleshsho tambbuwa	Wild	leaf
28	<i>Lannea fruticosa (Hochst)</i>	Anacardiaceae	Dachchi-maracciya	wild	Root
29	<i>Lepidium sativum L.</i>	Brassicaceae	Sibbikka	Cultivated	Fruit
30	<i>Linn usitatissimum L.</i>	Linaceae	Talbbaa	wild	Fruit
31	<i>Lippia adoensis var.</i>	Verbenaceae	Kosorootiyaa	Semi-cultivated	Leaf
32	<i>Lycopersicon esculentum var.</i>	Solanaceae	Timattimmiyaa	cultivated	Fruit
33	<i>Moringa stenopetala (L.)</i>	Moringaceae	Halakkuwa	cultivated	Leaf
34	<i>Musa x paradisiacal L.</i>	Musaceae	Muuziya	cultivated	Fruit
35	<i>Nicotiana tabacum L.</i>	Solonaceae	Tambbuwa	cultivated	Leaf
36	<i>Persea americana Mill. var.</i>	Lauraceae	Abokkaduwaa	cultivated	Fruit
37	<i>Peunus persica(L).</i>	Rosaceae	kookkiya	wild	Fruit
38	<i>Phyllanthus machosolen</i>	Euphorbiaceae	Bawiyaa	wild	Root
39	<i>Pterolobium stellatum (Forssk.)</i>	Fabaceae	Aainna	Cultivated	Root
40	<i>Pycnostachys abyssinica (Fresen).</i>	Lamiaceae	Olomuwa	wild	Leaf
41	<i>Rhamnus prinoides L'Hérit.</i>	Rhamneaceae	Geeshuwaa	wild	Leaf
42	<i>Ruta chalepensis L.</i>	Rutaceae	Xaallottiyaa	cultivated	Fruit & leaf
43	<i>Satyrium aethiopicum Summerh</i>	Orchidaceae	Eceere hayyttaa	Wild	Root
44	<i>Sida rhombifolia L.</i>	Movaceae	Daandireetaa	wild	Both
45	<i>Sida schimperiana Hochst. ex A.Rich.</i>	Malraceae	kinndichuwaa	cultivated	Leaf
46	<i>Solanum dasyphyllum Schumach.</i>	Solanaceae	Bulo Santtaa	cultivated	Shoot
47	<i>Solanum incanumL.</i>	Solanaceae	Hare bulo	wild	Leaf
48	<i>Spilanthes mauritiana DC.</i>	Asteraceae	Aydamiia	wild	Fruit
49	<i>Syzygium ghineese</i>	Myrtaceae	Ochaa	wild	Fruit
50	<i>Terminalia schimperiana</i>	Combreateaceae	Ambbiya	wild	Bark
51	<i>Vernonia amygdalina Delile</i>	Asteraceae	Garaa	wild	Root
52	<i>Zingiber officinale Roscoe</i>	Zingiberaceae	Yeenjeeluwaa	cultevated	Root

Out of 52 medicinal plant species identified in the study area, 28(54%) were collected from wild, 21 (40%) were cultivated and the remaining 3(6%) were collected from both. So, most medicinal plants of the study area were collected from the wild sources followed by cultivation. This finding is in line with the findings of ¹³ where in various parts of the world, medicinal plants are mostly harvested from the wild sources either for local use or trade purposes.

Different parts of various plant species are used in traditional medication by traditional healers and medicinal plant users in healing different diseases. However, the most widely used plant part was leaf, 19(36%), followed by roots, 11(21%) in the study area as indicated in Fig.2 below. The finding of the roots as the contributor of higher number of plant species used for medicinal purpose than other plants parts is in line with similar study conducted by ^[14] in which leaves (31.5%) were reported as the most widely used plant part followed by roots 28.3% in Ejaji Area (Chelya Woreda), West Shoa, Ethiopia.

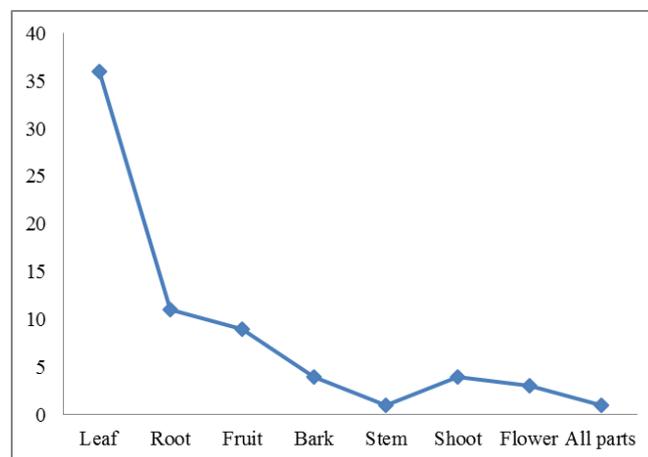


Fig 2: Plant parts used as medicine

The growth form analysis of medicinal plants revealed that herbs constitute the highest proportion being represented by

19 species (36%), shrubs represented by 17 species (31.5%), trees represented by 13 species (25.5%), and climbers represented by 2 species (3.9%), while there was one species (1.9%) of epiphyte (Fig. 3). This finding shows that the most represented life forms of medicinal plants in the study area were herbs followed by shrubs. Similar findings were also reported in the earlier works in Ethiopia [15, 16].

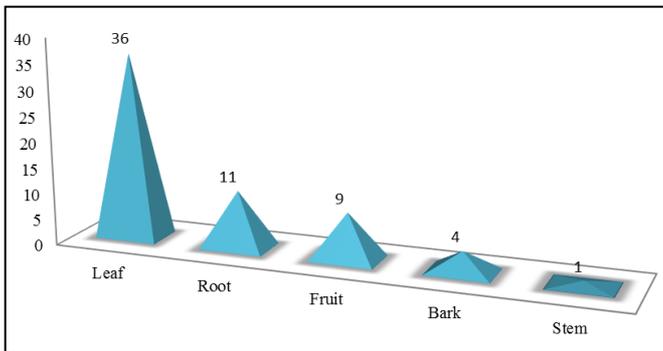


Fig 3: Growth form of Medicinal plants of the study area

The major methods of remedy preparation in the study area, as reported by informants, include, crushing (60%), chewing (23%), squeezing and others (17%). Crushing as the most common mode of preparation is in agreement with the findings of [17] who noted that the principal method of remedy preparation was through crushing.

Threats to medicinal plants

Information collected during the study indicated that anthropogenic factors affect the medicinal plants in the area. These factors include deforestation, agricultural expansion, over grazing, fire wood collection, charcoal production, urbanization. This result agrees with the findings of [2].

Conclusions

The ethnobotanical study on medicinal plant species in area showed that the communities commonly use medicinal plants for treating various human and animal health problems. For this reason, the local people of the study area used medicinal plants and have developed wide knowledge on plant based traditional medicinal practice. However, the traditional knowledge on medicinal plants is being eroded through acculturation and the loss of plant biodiversity along with indigenous people and their cultural background. The risk of the rapid disappearance of the knowledge on traditional medicine calls for an urgent multidisciplinary approach towards conserving the information before it is lost forever. Therefore, it is vital to take timely measures that will help in conservation of both the medicinal plants and knowledge on local medicine before the threat causes an irreversible loss.

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