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An ethno-botanical study of medicinal plants in Jigjiga town, capital city of Somali regional state of Ethiopia

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Abstract

Ethiopia is a country characterized by a variety of cultures and diversity of medicinal plants. The objective of this study was to assess the indigenous knowledge system for medicinal plant use and cultural practices associated with the healing process of these plants by traditional healers in Jigjiga town, Somali region of Ethiopia. An ethnobotanical survey was employed to collect information from traditional healers during March and May 2016. Semi-structured interviewees, observation and guided field walks with informants were employed to obtain ethnobotanical data in the study area. Forty seven medicinal plant species belonging to 23 families were reported by the traditional healers for the treatment of various human ailments in the study area. Family Fabaceae and Solanaceae were represented by 8 and 6 species respectively. Among various medicinal plant preparation methods reported, chewing (26.5%), homogenizing in water (20.4%) and Crushing (16.3%) were most commonly used. The most frequently employed methods of applications were drinking (27.8%), chewing (25.9%) and smearing (20.4%) whereas mostly used routes of administrations were oral (55.6%) and dermal (27.8%). Leaves (32.7%) and roots (30.8%) were plant parts predominantly used for herbal preparations. Shrubs (18 species) were found to be the most used plants followed by trees (16 species). The majority (30.4 %) of the reported medicinal plant's habitat was semi-desert bush land followed by 13.0 % grass land. In the area, a total of 33 human ailments were recorded and treated with various plant species and preparations. Therein, wound is the most prevalent health problem and was treated with 7 plant species. *Euphorbia abyssinica* followed by *Opoilia campestris* were most preferred plants in this regard. Strict management and conservation of medicinal plants to exploit their medicinal value is pivotal in the area.

Keywords: Jigjiga, ethnobotany, medicinal plants, traditional healers

1. Introduction

It is estimated that more than 75% of the world's population relies on medicinal plants for treatment of various ailments. Africa is a continent greatly endowed with an abundance of medicinal plants, which indigenous people are familiar with and have used over time. As highlighted by Sofowora [1], Africa has as much as three hundred thousand medicinal plants. Wherein, around 80% of the population uses traditional medicinal plants for the treatment of various diseases, and ethno-botanical surveys have shown that traditional medicines have been deemed effective against those diseases, which are a great concern to most of the sub-Saharan African nations [2].

Due to the high cost of modern drugs, inaccessibility and paucity of modern health institutions as well as their cultural acceptability, about 80% of the population and 90% of livestock in Ethiopia still depend on traditional medicinal plants to combat a number of diseases [3, 4]. Most importantly, the majority of rural and/or urban slum inhabiting populations primarily rely on traditional medicines to treat malaria. Similarly, the indigenous people of different localities of the country have been shown to have developed their own specific knowledge of plant resource utilization, management and conservation [5].

In spite of the fact that Ethiopia is a country with great variety of cultures and diversity of medicinal plants, the alarming population growth with increasing demand and consumption is distracting medicinal plants resources from their natural habitat. Wherein, deforestation and agricultural encroachment aggravate the loss of medicinal plants from their habitat and consequent loss of globally significant plant species [6]. Furthermore, documentation of medicinal plants knowledge is incomplete as the result of limited inventory of medicinal plants traditionally used by local people [7].

The indigenous people of Somali region have been widely used medicinal plants for upholding their primary healthcare system. However, ethnobotanical study conducted to explore traditional medicinal plants and to document the indigenous knowledge of the people is virtually patchy. Therefore, the aim of this study is to fill the gap and enrich the limited inventory of medicinal plants thereby documenting and preserving traditional medicinal plants

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and the associated knowledge used for treatment of human ailments in Jigjiga town.

2. Material and Methods

2.1. Study Area

The study was conducted in Jigjiga, a city in eastern Ethiopia and the capital of the Somali Region of the country. It is located at about 626 km from Addis Ababa. The city is situated at 9.35° North latitude, 42.8° East longitude with 1609 meters elevation above the sea level. The average annual

rainfall is about 712 mm and the mean maximum temperature ranges between 20 and 26 ° C. Based on figures from the Central Statistical Agency in 2005, Jigjiga has an estimated total population of 98,076 of whom 50,355 are men and 47,721 are women [8]. The city is the largest settlement in Jigjiga woreda. The climate of Jigjiga is a subtropical highland climate with the influence of mountain climate, the seasonal difference is minor. This is attributed to the fact that Jigjiga is located on a plain surrounded by mountains and to its distance to the sea and its effects.

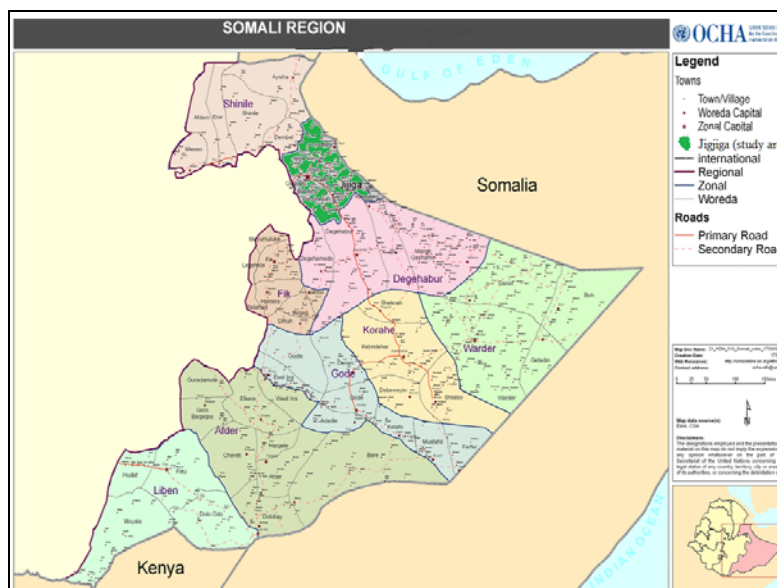


Fig 1: Map of Somali Region showing Jigjiga Town. Taken from EMA, CSA, 2008 with slight modification

2.2. Selection of study kebeles and informants

Ethnobotanical data were collected between March and May 2016. Information was gathered from elders and local peoples of the town regarding the better availability of traditional healers. Therein, 15 traditional healers (8 female and 7 male) between the age of 55 and 80 were systematically selected. Prior to the administration of the questionnaire, conversation with the informants was held with the assistance of local development agent living in the study area to elaborate the objectives of the study and to build on trust with the common goal to document and preserve the knowledge on medicinal plants. Twelve kebeles were selected based on availability of traditional healers, and on the recommendations of elders and local authority.

2.3. Ethno-botanical data collection and plant specimen's identification

Ethnobotanical data were collected through semi structured interviews and observations by following standard methods [9, 10]. Series of individual interviews were carried out to gather information regarding local names of plants and its part(s) used, preparations methods, routes of remedy administration, diseases which have been treated and side effects of remedies. The same method is also used to collect data on habit, habitat, and market ability and status of the reported medicinal plants and associated indigenous knowledge. Interviews were conducted using “Somaligna”, language that is spoken by the people in the study area. Specimens of reported medicinal plants were identified by specialists in Biology Department of Jigjiga University, Jigjiga agriculture research institute and using the published volume of the flora of Ethiopia and Eritrea.

2.4. Data analysis

A descriptive statistical methods, percentage and frequency were used to analyze the ethnobotanical data on reported medicinal plants and associated indigenous knowledge. Preference ranking was also computed to assess the degree of effectiveness of certain medicinal plants against most prevalent diseases in the area [9, 10].

2.5. Preference ranking

Preference ranking was used to rank the selected medicinal plants treating the most prevalent diseases reported by the informants. Each plants treating the selected disease was ranked by 7 informants. All informants are oriented on each variable and asked to mark the highest value (7) for most preferred and the lowest value (1) for the least preferred plant treating the disease. Finally, the values were summed up; ranked and illustrated using tables.

3. Results and Discussion

3.1. Medicinal plants and associated indigenous knowledge

A total of 46 medicinal plants were reported by the informants from the study area as being used for treatment of various human ailments in the area. These plant species are distributed in 23 families. Family Fabaceae was represented by 8 species followed by Solanaceae which was represented by 6 species. Burseraceae and Laminaceae represented by 4 species each, Asteraceae by 3 species whereas Anacardiaceae, Aloaceae and Cucurbitaceae represented by 2 species each. The remaining families had 1 species each (Table 1).

Table 1: Medicinal plants, with family, scientific and local name, for selected ailments of human, with parts used preparations and administration routes, as claimed by informants of Jigjiga Town, Somali Regional State of Ethiopia

Scientific name	Family	Vernacular Name (Somaligna)	Ref.	Habit	Disease treat	Part used	Method of preparation	Application routes
<i>Abutilon fruticosum</i> Guill. & Perr.	Malvaceae	Balanbal	[11]	Sh	Wound	L	Crushed and tied	Dermal
<i>Euphorbia abyssinica</i> Gmel.	Euphorbiaceae	Dhankayr	[12]	T	Wound	Fl	Boiled	Dermal
<i>Zingiber officinale</i> Roscoe	Zingiberaceae	*Zingibil	[13]	H	Abdominal pain, Respiratory problem	R	Chewed or masticated	Oral
<i>Azadirachta indica</i> A. Juss.	Meliaceae	Talaal	[14]	T	Toothache	L	Chewed	Oral
<i>Boswellia rivae</i> Engl.	Burseraceae	Hadi	[15]	T	Abdominal pain	Fl	Crushed and mixed with water	Oral
<i>Acacia senegal</i> (L.) Willd.	Fabaceae	Cadaad (Xabag)	[16]	T	Abdominal pain	Fl	Dry the fluid and chewed	Oral
<i>Commiphora hodai</i> Sprague	Burseraceae	Hodai	[17]	H	Toothache, Headache Gastric	R S	Drying the root and smoke Fluid from the stem extract with cold water	Oral
<i>Senna italica</i> Mill.	Fabaceae	Salamaki	[14]	Sh	Waste discharging	L	Boiling with water	Oral
<i>Parthenium hysterophorus</i> L.	Asteraceae	Kaliginoze	[18]	H	Anti-bleeding (blood clotting)	L	Crushed and tied	Dermal
<i>Commiphora myrrha</i> (Nees)	Burseraceae	Malmal	[19]	T	Inflammation	Fl	Crushed, powdered and boiled	Dermal
<i>Opoilia campestris</i> Engler	Opiliaceae	Tire	[19]	T	Wound	R	Extracted with cold water	Dermal
<i>Lepidium sativum</i> L.	Brassicaceae	Qacamo	[20]	H	Tape worm	F	Chopping	Oral
<i>Mangiferaindica</i> L.	Anacardiaceae	*Mango	[13]	T	Control pregnancy	Se	Crushed	Urogenital
<i>Ocimumlamiifolium</i> Hochst. ex. Benth.	Lamiaceae	*Damakesie	[13]	S	Cough and common cold, Headache	L	Fresh leaves are squeezed and sniffed	Nasal
<i>Acacia bussei</i> Harms ex Sjostedt.	Fabaceae	Gosol	[16]	T	Urogenital infection Influenza	L	Crushed and latex extracted by syringe then mixed with malma/ barzaf(<i>Eucalyptus globulus</i>)	Urogenital
<i>Aloe pirottae</i> Berger	Aloaceae	Dacar	[21]	Sh	Eye pain, Malaria, Stomachache	L	Crushed and squeezed	Optical Oral
<i>Moringa borziana</i> Mattei	Moringaceae	Mawe	[22]	T	Chest pain, Common cold	R	Chewing	Oral
<i>Cadaba glandulosa</i> Forssk	Capparidaceae	Qalaanqal	[22]	T	Skin infection (itching)	L	Crushed and smear	Dermal
<i>Aloe vera</i> (L.) Burm. f.	Aloaceae	Daar	[23]	H	Abdominal pain	S	Crushed and mixed with water	Oral
<i>Cucumis ficifolius</i> Naud. ex Hook.f.	Cucurbitaceae	*Yemdirembuay	[12]	H	Abdominal pain	R	Chewed the root for several minutes and swallow it	Oral
<i>Acacia tortilis</i> (Frossk.) Hayne	Fabaceae	Qudhac	[16]	T	Eye itching	Fl	Extract the latex	Optical
<i>Ficus somalensis</i> (Pamp.) Chiov.	Moraceae	Baarcade	[22]	T	Expel thorn from injured foot	L	Crushed	Dermal
<i>Commiphora kua</i> (R. Br. ex Royle) Vollesen	Burseraceae	Xabaghadi	[17]	T	Gastric	Fl	Extract with cold water	Oral
<i>Myrsine africana</i> L.	Myrsinaceae	Qurjeen	[24]	T	Headache	L	Crushed and mix with water	oral
<i>Indigofera costata</i> Guill. & Perr.	Fabaceae	Geed mas	[19]	Sh	Snake bites	R	Chewed the root	Oral
<i>Iphionopsis rotundifolia</i> (Oliv. & Hiern) A. Anderb.	Asteraceae	Gogobo	[18]	Sh	Gastric problem	R	Chewed	Oral
<i>Kleinia</i> sp. Ellis	Asteraceae	Wissil	[18]	H	Headache	S	Chewed the stem	Oral
<i>Solanum incanum</i> L.	Solanaceae	Xanbaax	[20]	Sh	Kidneys problems, Hemorrhoids Toothache	R F	Chewed the root Chewed	Oral Oral
<i>Solanum jubae</i> Bitter	Solanaceae	Dhigadhigood	[25]	Sh	Wound	R	Crushed the root and tied the powder on wounds	Dermal
<i>Solanum</i> spp.	Solanaceae	Micigaloole	[25]	Sh	Snake bite	R	Chewed the root	Oral
<i>Solanum dubium</i> Forssk.	Solanaceae	Urundhi	[26]	H	Wounds Eye problem	F	Fruit dried, crushed and squeezed	Dermal Optical
<i>Solanum elastomoides</i> C.H. Wright	Solanaceae	Canduuroshugux	[25]	Sh	wound	F & R	Extract the fruit juice or dry the root	Dermal

							and/or fruit, crushed & apply	
<i>Ochradenus somalensis</i> Bak. f.	Resedaceae	Mirow	[22]	Sh	Constipation Neck gland problems	R R & L	Dried the root, crushed and drink with tea Dried the root and leaves, then crushed	Oral Dermal
<i>Acacia nubica</i> (Forssk.) Schweinf.	Fabaceae	Gumar	[16]	Sh	Stomach upset	S	gum extracted from the stem and masticated	Oral
<i>Heliotropium longiflorum</i> (A.DC. in DC.) Jaub. & Spach	Boraginaceae	Dabagorayaale	[27]	H	Constipation	L	Crush, squeezed and liquid placed on anus	Anal
<i>Cucumis pustulatus</i> Naud. ex Hook. f.	Cucurbitaceae	Qalfoon	[19]	H	Swelling Wound	F S	Slip fruit on swollen part put the seeds on wounds	Dermal Dermal
<i>Pistacia aethiopica</i> Kokwaro	Anacardiaceae	Hamar	[19]	T	To decrease loss of appetite	S	Mixed with water	Oral
<i>Cordeauxia edulis</i> Hemsl.	Fabaceae	Yicib/yicib	[28]	T	To combat malnutrition	Se	Chewed	Oral
<i>Otostegia modesta</i> S. Moore	Lamiaceae	Waylo wad	[29]	Sh	To treat menstruation problem	R	Mixed with water	Oral
<i>Dodonaea angustifolia</i> L. f.	Sapindaceae	Xayramad	[30]	Sh	To treat tetanus	L	Crushed and mixed with water	Dermal
<i>Solanum somalense</i> Franchet.	Solanaceae	KiriiriQodxaale	[25]	Sh	Insecticide	Se	Crushed mixed with water	Dermal
<i>Asepalum eriantherum</i> (Vatke) Marais	Cyclocheilaceae	JaJaboot/gagabot	[31]	Sh	Stomachache Gonorrhoea	L R	Crushed and mixed with water Decoct the root and drink	Oral Oral
<i>Clerodendrum myricoides</i> (Hochst.) Vatke	Lamiaceae	Tiirro	[32]	Sh	Diarrhea	L	Crushed and mixed with water	Oral
<i>Lippa carvioidora</i> Meikle	Verbinaceae	Dhigri	[31]	Sh	Diarrhea	L	Crushed and mixed with water	Oral
<i>Leucas jamesii</i> Bak.	Lamiaceae	Dahaayanuur	[29]	H	Eye pain, Gastritis	L	Crushed leaves	Optical, Oral
<i>Crotalaria jijigensis</i> Thulin	Fabaceae	Gabaldaye	[19]	H	Diarrhoea	R	Root boiled with water	Oral

* Amharic name

H- Herb; T- Tree; Sh-Shrub; L- Leaf; F- Fruit; R- Root; S- Stem; Fl- Fluid; Se-Seed

3.2. Preparation, dosage and route of administration of medicinal plants

Plant parts were prepared as medicine using fresh materials that accounted 86%, and dried plant materials accounted 14 %. The dependency of the inhabitants on fresh materials in the study area including the removal of fresh leaves and roots 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 i.e. not stored for later use. However, during this survey local healers were argued that fresh materials are effective in treatment as the contents are not lost before use compared to the dried forms.

The present study revealed that different forms of preparations were investigated. These include: homogenizing in water, crushing, decoction, squeezed, chewing, smoking, extract with cold water, chopping and concoction. Wherein, chewing (26.5%), homogenizing in water (20.4%) and Crushing (16.3%), were among the most frequently used methods of traditional medicine preparation in the study area. One herbal preparation was taken by mixing with *Acacia bussei* and *Eucalyptus globulus* (Table 1). A similar study showed that different preparations and application methods of medicinal plants were mentioned for internal and external use [33] in which water is mostly used to dilute plant preparations while some remedies are prepared from dry and fresh plant parts [34].

Table 2: Preparation methods of the reported traditional medicinal plants

Methods of preparation	Total preparation (%)
Homogenizing in water	10(20.4)
Crushing	8(16.3)
Decoction	5(10.2)
Squeezing	5(10.2)
Chewing	13(26.5)
Smoking	2(4.1)
Chopping	1(2.0)
Extract with cold water	3(6.1)
Concoction	2(4.1)

In the study area, the recommended dosage differs based on the types of preparation and health problems encountered. During the interview and discussion with the informants they indicated that the doses for liquid preparations were prescribed through estimation, in terms of a full, half or one fourth of a coffee cup or spoon, depending on the age and sex of the patient being treated. In Some health problems such as wound, the doses were depending on its size. Regarding some herbal preparations that were considered harmless, the dosage depends on the interest and/or the capacity of the patient to chew a particular plant for a given health problem. The quantity of plant part used was measured by number of leaves and fruits and length of root. There were variations in the unit of measurement, duration and time at which remedies were taken and prescribed by healers for the same kind of health problems. In agreement with the present study, lack of precision and standardization are also discussed as one drawback for the recognition of the traditional health care system [35, 36].

With regards to methods of application, most medicinal plant preparations were taken internally that accounts for about 70.4%, and 27.8 % were taken externally while the remaining 1.9 % were taken both internally and externally. Among internal application methods', drinking was most commonly employed that accounted for 27.8 %, whereas smearing was

the most predominantly used methods of external application that accounts 20.4%.

Table 3: Methods of traditional medicinal plant application

Method of application	Total application (%)
Drinking	15(27.8)
Smearing	11(20.4)
Fumigating	1(1.9)
Sniffing	1(1.9)
Dropping	4(7.4)
Chewing	14(25.9)
Tying	8(14.8)

There were various routes of administration of traditional medicinal plants prepared products by the inhabitants. The major routes of administration in the study area include: oral, dermal, optical, urogenital, nasal, anal and sometimes mixed. Oral administration was predominantly used that accounts 55.6%, followed by dermal route (27.8%) (Figure 2). This is in agreement with the result of various ethnobotanical researchers elsewhere in Ethiopia [7, 37, 38, 39]. Both oral and dermal routes permit rapid physiological reaction of the prepared medicines with the pathogens and increase its curative power [38].

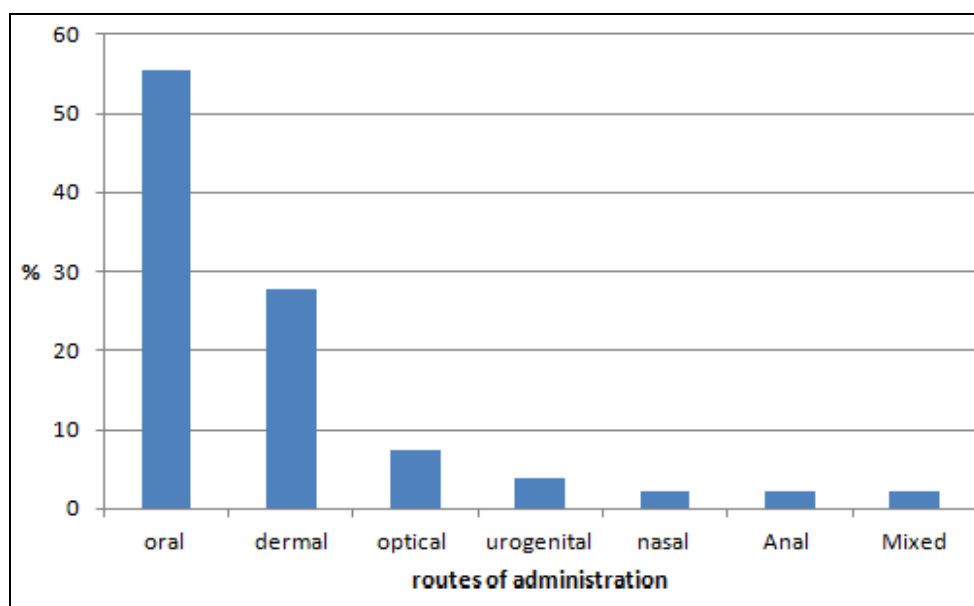


Fig 2: Routs of administration of traditional medicines in the study area

3.3. Plant parts used for medicine and diversity of growth forms

Plant parts used for medicinal purposes indicated that the inhabitant were mostly used leaves (32.7%), followed by roots and fluids/latex accounted 30.8% and 11.5% respectively. Other plant parts used to prepare traditional medicine include: seed accounted 9.6 % whereas stem and fruit accounted 7.7% each (Figure 3). Analysis of the data showed that leaves were the most part used in preparation of remedies. In agreement with findings of the present study,

previous reports in Ethiopia have shown that leaves were the most commonly used and followed by roots to treat various health problems [40, 41, 42, 43]. Due to the highest frequency of roots used for medicinal purposes in the study area, threat to the destruction of medicinal plants was relatively found to be significant as high threat to the mother plant comes with root, bark and stem harvest. According to Dawit Abebe and Ahadu Ayehu [44] medicinal plant harvest that involves roots, rhizomes, bulbs, barks and stems have serious effect on the survival of mother plants.

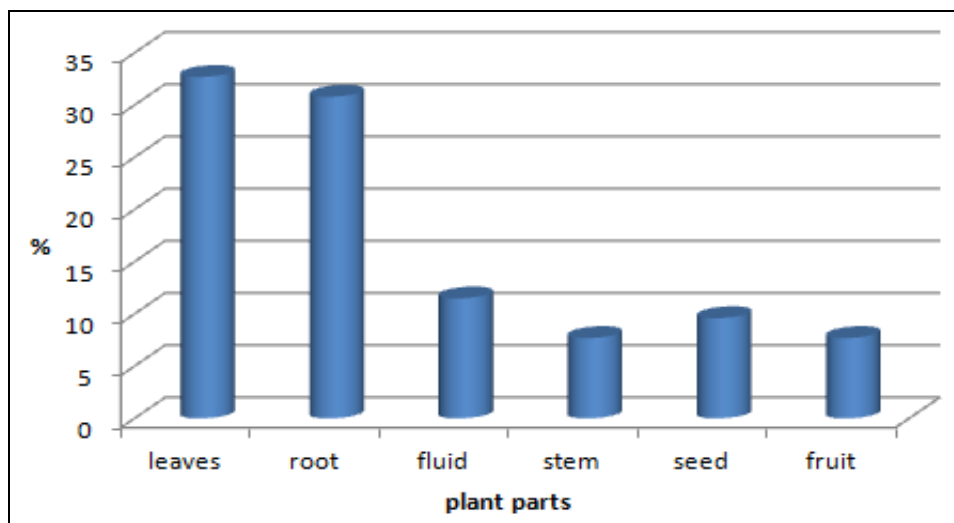


Fig 3: Plant parts used for medicine in the study area

Analysis of growth forms of medicinal plants (Figure 4) revealed that Shrubs were constituted the largest category with 18 species (39.1%) followed by trees with 16 species (34.8%). Herbs were accounted for 12 species (26.1%). About 70% of the reported medicinal plants constitute shrubs and trees. Herein, the possible reasons could be: First; it could be related with the floristic composition of vegetation in the area. Second; high usage of shrubs could be due to their high level of abundance and easy to obtain them, or the area fosters the flourishing of these plants. Third, the tendency to use shrubs as predominant traditional medicinal plant could be due to the presence of strong bioactive compounds. Various studies in the world have shown that shrubs comprise phytochemicals like alkaloids and flavonoids which are known to have substantial anti-microbial and anti-fungal properties [45].

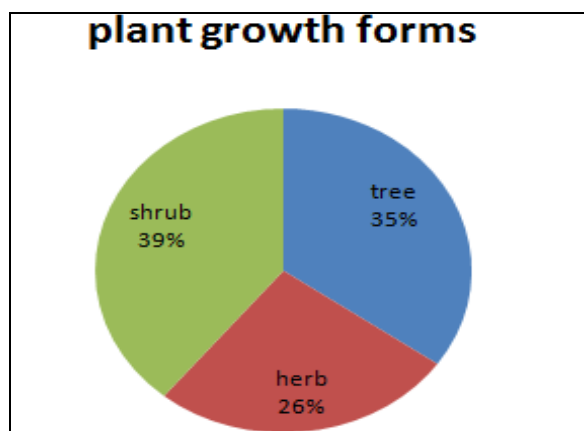


Fig 4: Growth forms of the reported medicinal plants in the study area

3.4 Habitats of medicinal plants in the area

Informants in the study area confirmed that, medicinal plants are grown in different habitats. The majority, 30.4 % are grown in semi-desert bush land followed by 13.0 % grass land. Wherein forest, home garden and both wood and bush land represented 10.9 % each (Table 4). As the climate of Somali region is arid and semi-arid, the area dominated by acacia wood, bush and grasses. As a result, most of the medicinal plants used by the healers were belong to these plant types. Moreover, plant species such as *Zngiber officinale*, *Azadirachta indica*, *Ocimum lamiifolium*, *Lepidium*

sativum and *Mangifera indica* were cultivated in the home garden.

Table 4: major habitats of the reported medicinal plants in the study area

Habitats	Total numbers (%)
Rocky area	4(8.7)
Bush land	14(30.4)
Home garden	5(10.9)
Wood land	3(6.5)
Grass land	6(13.0)
Wood and bush land	5(10.9)
Forest	5(10.9)
Wet land	1(2.2)
Along road side	1(2.2)
Everywhere	2(4.3)

3.5. Major human diseases and plant species used by indigenous people

In the area a total of 33 diseases of humans (Table 1), recorded are treated with a total of 46 plant species and 9 preparations, where one species can treat a single disease or a number of diseases. Similarly, one ailment can be treated with combination of plant species or single plant. For example, wound is treated with 7 species of plants, abdominal pain with 5 species, head ache with 4 species, eye pain, gastritis, and toothache with 3 species each. In spite of the fact that the above ranked diseases being treated by a number of species is coupled with the frequent occurrence of the diseases and ease of accessibility of plant species for treatment. In turn, these factors widen the popularity of these species among the informants and indigenous knowledge for treating these diseases

3.6. Preference ranking

When there are different species prescribed for the same health problem, people show preference of one over the other. Preference ranking for seven medicinal plants used to treat wound (Table 5) shown that *Euphorbia abyssinica* was ranked first and hence is the most effective medicinal plant to cure wound. The second, third and fourth most preferred medicinal plants against this disease are *Opoilia campestris*, *Abutilon fruticosum* and *Solanum jubae*. Both *Cucumis pustulatus* and *Solanum melastomoides* are ranked as fifth while the least preferred species compared to the other species is *Solanumdubium*, according to informants.

Table 5: Preference ranking of seven selected medicinal plants based on their degree of treating wound as perceived by informants

List of medicinal plants	Key informants (coded A to E) with the ranks they gave					Total score	Rank
	A	B	C	D	E		
<i>Abutilon fruticosum</i>	2	3	4	2	4	15	3
<i>Euphorbia abyssinica</i>	1	2	5	5	5	18	1
<i>Opoilia campestris</i>	3	4	2	4	3	17	2
<i>Solanum jubae</i>	5	5	1	3	1	14	4
<i>Cucumis pustulatus</i>	4	1	3	4	2	13	5
<i>Solanum melastomoides</i>	4	4	1	3	1	13	5
<i>Solanum dubium</i>	3	4	1	3	1	12	7

3.7. Medicinal plants and trade

In the study area, medicinal plants are marketable. During the interview, informants mentioned that many plants are sold in the local market wherein *Sennaitalicaa*, *Acacia tortilis*, *Pistacia aethiopia*, *Crotalaria jijigensis*, *Commiphora myrrha*, *Lippia carviadora*, *Clerodendrum myricoides* and *Dodonaea angustifolia* are among commonly available plants in this matter. Some other medicinal plants are also marketed for other use-values these include *Zingier officinale* spices and *Mangifera indica* for food.

3.8. Threats to medicinal plants and indigenous knowledge in the area

Nowadays, the world is losing many plants in relation with the alarming population growth with increasing demand and consumption, and subsequent deforestation for agriculture, firewood, timber, construction materials [46]. These common anthropogenic factors together with some natural factors resulted in loss of plant genetic diversity and threatening the very survival of human kind with erosion of some lifesaving medicinal plants of wild genes [47]. Therein, the loss of medicinal plants associates with the missing advantages gained from them and indigenous knowledge associated with plants [1]. Likewise, medicinal plants conservation and management habits of the population in the present study area are found to be minimal.

In the present study area, most of the informants said that knowledge of traditional medicine passed to the young generation by telling orally. Consequently, the knowledge on medicinal plants depth and width become dramatically decreased. Furthermore, factors including secrecy the knowledge (restricted only to the family member), reluctance of young generation to gain the knowledge together with death of elderly knowledgeable members of the society, influence of modern education and religious related factors contribute for the gradual decline of indigenous knowledge on medicinal plants. In agreement with findings of the present study, such trends are also observed in many studies which are conducted in different parts of the country [48, 49].

4. Conclusions

Herbal medicines are very important in the study area which is an integral part of their culture. Therein, the inhabitants maintain and widely use indigenous knowledge on traditional medicinal plants. However, the knowledge on medicinal plants depth and width therein become declining due to its secrecy, unwillingness of young generation to gain the knowledge, influence of modern education, religious impacts, and lack of awareness, which all contributed for this matter. On the other hand, anthropogenic factors such as deforestation for construction materials, and over grazing are beside some natural factors threaten medicinal plants in the study area. Thus, strict management and conservation of plants to use their medicinal value is pivotal. Moreover, nurturing the indigenous healers and accrediting their work as

well as integrating them with researchers to work in collaboration will bring the health care system one step forward.

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