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RESEARCH ARTICLE

IDENTIFICATION AND CONSERVATION STATUS OF TRADITIONAL MEDICINAL PLANTS IN GECHI AND CHEWAKA WOREDAS, ILU ABABOR ZONE, ETHIOPIA

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ABSTRACT

Traditional medicinal plants are highly decreasing due to different threatening factors in Ethiopia. The present study was conducted in Gechi and Chewaka, Southwest Ethiopia. The study was conducted with 120 informants randomly selected from 12 kebeles selected by random sampling techniques. Data were collected using structured questionnaire, interview and group discussion. Furthermore, field observation based on a checklist was used. A total of 61 species categorized under 34 families were recorded. Fabaceae family had the highest number of species (6) followed by Asteraceae with 5 species. Five medicinal plants were used selectively to treat headache and shown as Ocimum lamiifolium ranked first in both woredas. Majority of the respondents (57% in Gechi and 48% in Chewaka) revealed that traditional medicinal plants are highly decreasing by different threatening factors. Expansion of agricultural land was the first ranked threatening factors reported by 31.67 and 26.67% respondents followed by lack of awareness (each 23.33%) and drought (each 18.33%) in Gechi and Chewaka respectively. The habitat distribution of medicinal plant was ranked in order of home garden agro forestry (75.47 and 73.91%) followed by forest land (67.93 and 71.74%) in Gechi and Chewaka woreda respectively and varies among the study sites for the rest land uses. In the study areas, local communities are giving less attention to conserve medicinal plants. Therefore, conservation strategies are highly needed to conserve these plant species.

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INTRODUCTION

Plants provide food and other materials essential for human livelihoods and are involved in many ecological processes that benefit people (Hamilton and Hamilton, 2006). Specifically, forests contain a vast range of resources, many of which have been developed into important food, medicinal and commercial products (Stone *et al*., 1997). Over centuries ago, cultures around the world have learned how to use plants to fight illness and maintain health. These readily available and culturally important traditional medicines form the basis of an accessible and affordable health-care regime are an important source of livelihood for indigenous and rural populations (Roberson, 2008). Population throughout Africa, Asia and Latin America use traditional medicine to meet their primary health care needs. Ethiopians also heavily relied for centuries on a system of traditional or indigenous health care knowledge for various physical and mental disorders (Asfaw, 2014). Traditional medicine is serving as an integral part of the local culture and is a major public health system hence, what we call modern medicine currently is an offshoot of traditional medicine (Endashaw, 2007). As medicinal plants receive increased scientific and commercial attention, there is increasing pressure on the wild plant populations from which most medicinal plants are harvested (Roberson, 2008). Various human induced and natural threatening factors such as agricultural expansion, deforestation, firewood collection, construction materials, urbanization, over grazing, drought and lack of awareness creation are major threats to traditional medicinal plants in Ethiopia (Gidey, 2010; Eskedar, 2011; Kalayu *et al*., 2013). Sustainable use of medicinal plant has now grown to be a timely issue in Ethiopia because of resource degradation in the lowlands and highlands alike (Endashaw, 2007). However, traditional practitioners are collecting medicinal plants with less attention than would be preferred from viewpoint of conservation of plant resource in some regions (Gidey, 2010). The main objective of the present study was to identify and document current conservation status of traditional medicinal plants in the study woredas.

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MATERIALS AND METHODS

The Study Area

The study was conducted in Gechi and Chewaka woredas of Ilu Ababor Zone (Fig. 1). Gechi and Chewaka woredas were

selected from Ilu Ababor zone for this study based on their variation in ecological location (from high and lowland) respectively. Gechi and Chewaka woredas are located at a distance of 462 and 560 km, respectively from Addis Ababa and are situated at an altitude ranging from 1500 to 2100 and 900 to 1400 m.a.s.l, respectively, with area coverage of 48,632 and 54,220 ha, respectively. Gechi and Chewaka woredas receives an average annual rainfall ranging from 1825 mm and 1000 to 1200 mm and the minimum and maximum daily temperature of 13 and 18°C and 36 and 41°C respectively (LDMA, 2010; GDARDO, 2011).

Field visits were carried out with the traditional healers to observe the traditional medicinal plant species reported. Sample specimens of unclear medicinal plant species were collected during the field visits identified using flora of Ethiopia and Eritrea (Edwards *et al*., 1995; Hedberg *et al*., 2004; Hedberg *et al*., 2006), useful trees and shrubs for Ethiopia (Azene *et al*., 1993) and researcher experience. The collected data were coded, entered to computer, interpreted, analyzed and synthesized using Microsoft excel and simple descriptive statistical analysis methods.

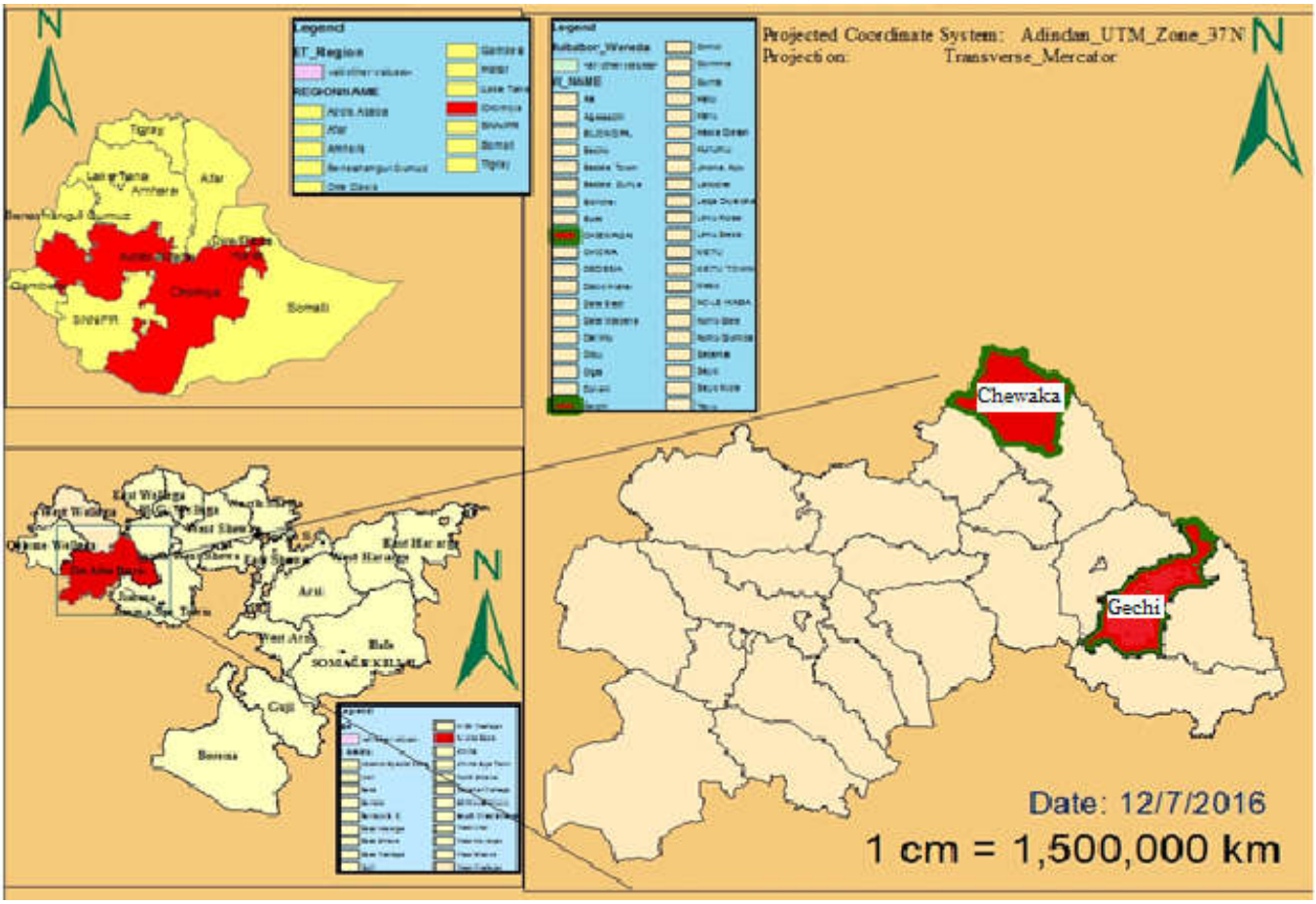

Figure 1. Study areas (Chewaka and Gechi woredas)

Gechi and Chewaka were selected by the purposive sampling techniques based on their knowledge of utilization of traditional medicinal plants and ecological location. Twelve kebeles (sites), each six from the proposed woredas were selected by random sampling techniques. Following to kebele selection, key informants (traditional healers) were selected by the snowball method. Key informant (KI) is a person who is knowledgeable about the previous and current conservation status of traditional medicinal plants of the area and lived there at least for 20 years in this context. Two KIs at each kebele and a total of 24 KIs were selected. The selected KIs were randomly selected 8 informants as a representative at each kebele and 96 informants as a total. Finally, 120 informants (including KIs) were selected for the present study.Structured questionnaire interview and group discussion were used to collect data by the investigators and field assistances on identification of traditional medicinal plants, current conservation status, local name of medicinal plants and factors affect conservation status of medicinal plant species.

RESULTS AND DISCUSSION

Traditional Medicinal Plants

In the present study, a total of 61 medicinal plant species categorized under 34 families were identified. Fabaceae family had the highest number of species (6) followed by Asteraceae with 5 species and Lamiaceae, Myrtaceae, Poaceae and Solanaceae with each having 3 species while the rest 10 and 18 families were contained two and one species respectively (Appendix 1). The result was in line with the study by Belayneh *et al*. (2012) in Erer Valley of Babile Wereda, Eastern Ethiopia, which reported a total of 51 plant species distributed among 39 genera and 28 families as traditional medicines against human ailments. In the finding Fabaceae also had the highest number of species (13), followed by Capparidaceae, Euphorbiaceae and Tiliaceae each with 3 species; Acanthaceae, Balanitaceae, Lamiaceae, Malvaceae and Meliaceae each with 2 species and the rest 19 families had 1 species each.

Preference Ranking

In traditional medicinal plants utilization, when there are different species prescribed for the same health problem, people show preference of one over the other (Endale, 2007). Preference ranking of five selected traditional medicinal plants were used to treat headache and shown that *Ocimum lamiifolium* ranked first in both woredas hence it is the most effective medicinal plant to cure headache (Table 1). The study conducted in different parts of Ethiopia compared the degree of selected traditional medicinal plants to treat the same disease (Endale, 2007; Getaneh, 2011; Seyoum and Zerihun, 2014; Misganaw *et al.* 2016). The study in line the study conducted by Misganaw *et al.* (2016) in Delanta, Northern Ethiopia indicated the preference ranking of five traditional medicinal plants reported as effective for treating febrile illness in which *Ocimum lamiifolium* was ranked first. The second, third, fourth and fifth ranked most preferred medicinal plants against this disease were *Croton macrostachyus, Echinops kebericho, Ruta chalepensis and Nigella sativa* in Gechi and *Nigella sativa, Azadirachta indica, Zingiber offjicinale* and *Carissa edulis* in Chewaka respectively (Table 1).

Habitat of the Medicinal Plants

Local community of the study sites were collected traditional medicinal plants from different land uses notably agricultural land, forest site, home-garden, road side and grazing land. The availabilities as well as quantities of medicinal plant species were varying from one land use to the other land uses.

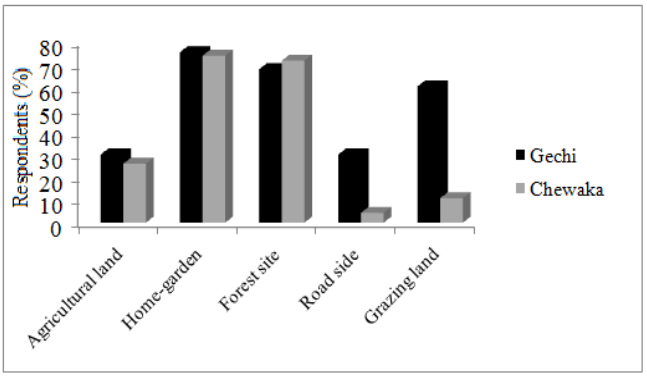

Figure 2. Habitats of traditional medicinal plants of the study sites

Table 1. Preference ranking of five selected traditional medicinal plants based on their degree of treating headache at the study sites (n=10)

Respondents	Gechi					Chewaka				
	Echinops kebericho	Ocimum lamiifolium	Ruta chalepensis	Nigella sativa	Croton macrostachyus	Ocimum lamiifolium	Carissa edulis	Azadiracht a indica	Nigella sativa	Zingiber ofjicinale
R_1	3	5	2	1	4	4	1	3	4	2
R_2	2	4	1	0	3	5	1	3	4	2
R_3	2	4	1	0	3	4	1	2	3	0
R_4	1	3	0	0	2	3	0	0	0	0
R_5	3	5	2	1	4	3	0	1	4	2
R_6	4	5	2	1	3	5	1	4	2	3
R_7	1	3	0	0	2	3	0	2	3	1
R_8	4	5	1	2	3	4	0	0	3	0
R_9	3	5	1	2	4	3	0	2	1	0
R_{10}	3	4	0	1	2	4	0	2	3	1
Total	26	43	10	8	30	38	4	19	27	11
Rank	3rd	1st	4th	5th	2nd	1st	5th	3rd	2nd	4th

Current Conservation Status of Medicinal Plants

The information obtained from the respondents revealed that traditional medicinal plants are highly decreasing in Gechi (57%) and Chewaka woreda (48%) due to man-made and natural causing factors (Table 3). Previous studies also indicated that different threatening factors influence the conservation of medicinal plants in Ethiopia (Kalayu *et al*., 2013; *Agize et al.,* 2015). Whereas, 23 and 18% of the total respondents in Gechi and Chewaka woreda respectively approved that there is no fluctuation (i.e. neither increasing nor decreasing) between the previous and present status of medicinal plants. The rest respondents did not gave their idea on the three mentioned criterion (increasing, decreasing and stable) on the status of traditional medicinal plants in their duration (Table 2).

Table 2. Current conservation status of traditional medicinal plants in the study sites

Nº	Conservation Status	Respondents (N=120)			
		Gechi		Chewaka	
		Nº	%	Nº	%
1	Decreasing	34	57	29	48
2	Increasing	2	3	7	12
3	Stable	14	23	11	18
4	No response	10	17	13	22
	Total	60	100	60	100

Majority of the respondents responded that the traditional medicinal plant species were collected from the home-garden agro forestry practice (75.47 and 73.91%) followed by forest land (67.93 and 71.74%) in Gechi and Chewaka woreda respectively. The respondents also revealed out that little amount of the species were collected from road side (4.35%) and grazing land (10.83%) in Chewaka (Figure 2). The study conducted by Misganaw *et al.* (2016) in Delanta, Northern Ethiopia indicated that traditional medicinal plants were collected from different habitats though their availability varies from place to place among species.

Table 3. List of respondent's response on factors that negatively affect medicinal plant species in the study sites

Nº	Threatening factors	Respondents (N=120)					
		Gechi			Chewaka		
		Nº	%	Rank	Nº	%	Rank
1	Agricultural Expansion	19	31.67	1st	16	26.67	1st
2	Drought	11	18.33	3rd	11	18.33	3rd
3	Exploitation	4	6.67	5th	8	13.33	4th
4	Firewood Collection	1	1.67	7th	2	3.33	7th
5	Habitat Destruction	2	3.33	8th	5	8.33	5th
6	Lack of Awareness	14	23.33	2nd	14	23.33	2nd
7	Over-grazing	9	15	4th	4	6.67	6th
Total		60	100		60	100	

Threaten Factors of Medicinal Plants

As the below table indicated, a total of seven threatening factors of traditional medicinal plants were identified in the study sites. The table showed that list of the threaten factors, response of the respondents in terms of number and percentage and rank of the threaten factors. About 31.67 and 26.67 % of the respondents in Gechi and Chewaka woredas respectively responded that agricultural expansion was the most common threatening factors that reduce the diversity and abundance of traditional medicinal plants (Table 3).

The result was agreed with previous study by Getaneh, (2011) in Mecha wereda, Ethiopia who revealed that the main threats to ethno-medicinal plants were agricultural expansion (24.5%) ranked first followed by firewood collection (22.9%). Other finding by Seyoum and Zerihun, (2014) in Debre Libanos woreda, Central Ethiopia also indicated that expansion of agricultural land and firewood collection are the major threats that threaten the survival of medicinal plants. Lack of awareness and drought have an equal values (23.33%) and (18.33%) respectively in both woredas having the second and third rank in order. Previous study by Kalayu *et al*. (2013) in Samre district, northern Ethiopia indicted that 17.39% of the respondents responded that lack of awareness of the indigenous people about the type, use and management strategies of medicinal plant was the main threatening factors for the loss of traditional medicinal plants.

Conclusion and Recommendations

Medicinal plant species are commonly utilized in Gechi and Chewaka woredas in order to treats human and cattle diseases. Community's uses 61 medicinal plant species categorized under 34 families for this purposes. Preference ranking of five selected traditional medicinal plants were used to treat headache and shown that *Ocimum lamiifolium* ranked first in both woredas. The current conservation statuses of the traditional medicinal plants were recorded as increasing, decreasing and/or stable in the study sites due to different man-made and natural factors. Seven major threatening factors were affecting the conservation status of traditional medicinal plant species. Of which, expansion of agriculture was the most common threatening factors responded by 31.67 and 26.67 % of the respondents in Gechi and Chewaka woredas respectively. Lack of awareness, drought, over-exploitation, firewood collection, habitat destruction and over-grazing are the other threatening factors hinder the sustainable utilization of medicinal plants in the sites. Majority of the threatening factors of medicinal plants in the study sites are caused through human activities. Therefore, awareness creation by Governmental and NGOs should be made in communities to reduce factors negatively affect the conservation status of dominant medicinal plants. Indigenous knowledge is very important in identification and conservation of traditional medicinal plants. Thus encourage the indigenous knowledge of transferring of medicinal plants from generation to generation. Further study should be conducted to investigate the overall use (part used, method of preparation, route administered, dosage used and major drawbacks) of medicinal plants documented in the study sites and give feedback for the whole local communities to effectively manage traditional medicinal plants of the study sites.

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APPENDIX

Appendix 1: Scientific, Local and family names of the identified traditional medicinal plants

S/N	Scientific Name	Local Name	Family Name
1	*Aframomum korarima (Braun) Jansen*	*Hogio*	*Zingiberaceae*
2	*Ajuga integrifolia Buch-Ham, ex D. Don*	*Arma guusaa*	*Lamiaceae*
3	*Albizia gummifera (J.F.Gmel.) CA. Smith*	*Ambabeessa*	*Fabaceae*
4	*Allium cepa L.*	*Shunkurti diimaa*	*Alliaceae*
5	*Allium sativum*	*Qullubbii*	*Alliaceae*
6	*Allophylus macrobotrys Gilg*	*Gur-sade*	*Sapindaceae*
7	*Aloe spp.*	*Hargessa*	*Liliaceae*
8	*Azadirachta indica*	*Neam tree*	*Meliaceae*
9	*Bersama abyssinica Fres.*	*Lolchisa*	*Melianthaceae*
10	*Brassica nigra(L.) Koch*	*Senafica*	*Brassicaceae*
11	*Brucea antidysenterica J.F. Miller*	*Qomonyo*	*Simaroubaceae*
12	*Calpurnia aurea (Lam.) benth.*	*Ceekaa*	*Fabaceae*
13	*Capsicum annum*	*Barbare*	*Solanaceae*
14	*Carica papaya L.*	*Papaya*	*Caricaceae*
15	*Carissa edulis (Forssk.) Vahl*	*Agamsa*	*Apocynaceae*
16	*Citrus auranntifolia (Christm.) Swingle*	*Lomii/xuuxoo*	*Rutaceae*
17	*Clematis simensis Fres.*	*Xilloo*	*Ranunculaceae*
18	*Coffea arabica L*	*Buna*	*Rubiaceae*
19	*Combretum paniculatum Vent.*	*Baggee*	*Combretaceae*
20	*Cordia africana Lam.*	*Waddeessa*	*Boraginaceae*
21	*Croton macrostachyus Hochst. ex Del.*	*Bakkanniisa*	*Euphorbiaceae*
22	*Cucurbita maxima*	*Hadhoftuu/Qillee*	*Cucurbitaceae*
23	*Datura stramonium*	*Asaangira*	*Solanaceae*
24	*Echinops kebericho*	*Qarabicho*	*Asteraceae*
25	*Echlnops longisetus A. Rich.*	*Qoree adii*	*Asteraceae*
26	*Ekebergia capensis Sparrm.*	*Onoonuu*	*Meliaceae*
27	*Eragrostis tef (Zucc.) Trotter*	*Xaafii*	*Poaceae*
28	*Erythrina abyssinica Lam. ex DC.*	*Beroo*	*Fabaceae*
29	*Eucalyptus globules*	*Baargamo Adii*	*Myrtaceae*
30	*Gossypium hirsutum L.*	*Jirbii (Hidda)*	*Malvaceae*
31	*Guizotia seabra*	*Hadaa*	*Asteraceae*
32	*Hoedeum vulgare L.*	*Garbuu*	*Poaceae*
33	*Ipomoea oenotherae (Vatke) Hall.f.*	*Godarree*	*Convolvulaceae*
34	*Justicia schimperiana (Hochst. ex Nees) T. Anders.*	*Dhummuugaa*	*Acanthaceae*
35	*Lepidium sativum L.*	*Feexoo*	*Brassicaceae*
36	*Moringa oleifera L.*	*Moringaa*	*Moringaceae*
37	*Musa paradisiacal*	*Muuzii*	*Musaceae*
38	*Myrtus communis L.*	*Qoddoo*	*Myrtaceae*
39	*Nicotiana tabacum*	*Tamboo*	*Solanaceae*
40	*Nigella sativa L.*	*Tiqur azmudii /Abasuda*	*Ranunculaceae*
41	*Ocimum basilicum*	*Bassobilaa*	*Lamiaceae*
42	*Ocimum lamiifolium Hochst. ex Benth.*	*Damakasee*	*Lamiaceae*
43	*Phytolacca dodecandra L'Herit*	*Andoodee*	*Phytolacaceae*
44	*Polygalas phenoptera*	*Harmal*	*Polygalaceae*
45	*Prunus africanus* (Hook.f.) Kalkm	*Hoomii*	*Rosaceae*
46	*Pstdium guajava L.*	*Zetunaa*	*Myrtaceae*
47	*Pterolobium stellatum (Forssk.) Brenan*	*Qajima*	*Fabaceae*
48	*Punica granatum L.*	*Rumaana*	*Puniaceae*
49	*Ricinus communis L.*	*Qobboo*	*Euphorbiaceae*
50	*Rosa abyssinica L.*	*Tsegerada*	*Rosaceae*
51	*Rubia cordifolia*	*Maxxanne*	*Rubiaceae*
52	*Rumex nervosus Vahl*	*Dhangaggoo*	*Polygonaceae*
53	*Ruta chalepensis L.*	*Xalaasam/xena adam*	*Rutaceae*
54	*Sideroxylon oxyacanthum Baill.*	*Kombolcha*	*Sapotacea*
55	*Sorghum btcotor L.*	*Bisinga diimaa*	*Poaceae*
56	*Tamarindus indica L.*	*Roqaa*	*Fabaceae*
57	*Trigonella foenum-graecum L.*	*Ulbata/Abishii*	*Fabaceae*
58	*Vernonia amygdalina Del.*	*Eebicha*	*Asteraceae*
59	*Vernonia auriculifera Hiern.*	*Reejjii*	*Asteraceae*
60	*Whitfieldia elongata (P. De Beauv.)*	*Soyyama gurraacha*	*Acanthaceae*
61	*Zingiber officinale L.*	*Zinjibila*	*Zingiberaceae*

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