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## RESEARCH ARTICLE

**Diversity and conservation status of some economically valued indigenous medicinal plants in Hawassa  
College of Teacher Education Campus, Southern Ethiopia**

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**Abstract**

The present study deals with diversity and conservation status of indigenous medicinal plants in Hawassa College of Teacher Education campus, southern Ethiopia using ethnobotanical inventory, semi-structured questionnaires, interview and group discussion. A total of 198 plant species which belongs to 158 genera and 74 families were recorded. Out of the total plant species documented 54 (27.27%) were trees, 52(26.26%) shrubs, 82(41.41%) herbs, 5 (2.53%) climbers and 5 (2.53%) ferns. Asteraceae was the most dominant and highest diversity with 17 species followed by Fabaceae and Euphorbiaceae with 14 and 13 species respectively. Ten multipurpose species were selected out of the total indigenous medicinal plants and five use categories were listed for five selected key informants to assign use value to each species. *Prunus africana* is found to be highly used by local community for multiple purposes, followed by *Juniperus procera*, *Hagenia abyssinica* and *Cordia africana*. Forty one commonly used indigenous medicinal plants were used to treat 32 human ailments. Leaves were the most frequently used plant parts used. Biodiversity conservation of indigenous medicinal plants is an important activity for preservation, sustainability, popularization, education and environmental conservation. It is therefore, recommended that people need to be encouraged to cultivate indigenous medicinal plants in and around their home garden through education.

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**Introduction**

Ethiopia is a tropical country with varied macro and micro-climatic conditions that have contributed to the formation of diverse ecosystems inhabited with a great diversity of life forms of both animals and plants. The flora of Ethiopia is diverse with about 6,500-7000 species of higher plants with about 12% endemic elements (Tewoldebrehan, 1991).

Among African countries, Ethiopia is often quoted as one of the six countries of the world where about 60% of the plants are said to be indigenous with their healing potential (Belachew, 1984). These plants vary in their distribution over the country due to the varied geographic and climatic conditions of the country (Amare, 1976). Only few studies were geared towards

indigenous medicine with an objective to improve their usage. Consequently, the overall use of these plants remained within the domain of local healers as they often resort to them for the treatment of different health problems.

Traditional medicine continues to be widely used in Ethiopia in spite of the growing importance of manufactured drugs. Little is known about the public health importance and potential pharmaceutical uses of plant medicines

The chemistry and economic importance of most of Ethiopian drug plants have never been studied in depth and little is known about the nearly 500 folk medicinal plants described by (Lemordant, 1972; Strelcyn, 1973; Akililu, 1974). Medicinal plants and traditional medicine play an important role in the health care system of most developing countries. In Ethiopia about 80% of human population and 90% of livestock rely on traditional medicine. The traditional

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health care practice is mainly dependent on medicinal plants collected from the wild. In spite of this, the medicinal plant biodiversity is being depleted due to man-made and natural calamities. Moreover, the indigenous knowledge associated with the conservation and use of medicinal plants is also disappearing at an alarming rate. Biodiversity Conservation of medicinal plants is an important activity not only for preservation, procurement and sustainability but also for popularization, education and environmental conservation. Because so many species of plants are medicinal, medicinal plant conservation is, in some ways, a microcosm of plant conservation as a whole. Globally the estimate of medicinal plant species range from 35,000 -50,000 species and out of this about 4000-6000 species have entered the world market of medicinal plants (Farnsworth and Soejarto,1991),however, only about one hundred species having been used as a source of modern drugs. The greater concentration of medicinal plants are found in the south and south western Ethiopian parts of the country following the concentration of biological and cultural diversity (Edwards, 2001).The objectives of the present study were to asses & identify diversity of indigenous medicinal plants in Hawassa College of Teacher Education campus in visually identified plant community types ; to gather, record and document the native medicinal plants and their uses in the study area and to evaluate the role of conservation of indigenous medicinal plants in education and biodiversity conservation.

## Material and Methods

### Study area

The study was conducted in Hawassa College of teacher education campus during period 2011 - 2012 with a view to study diversity and conservation status of indigenous medicinal plants of the campus and to record the ethnobotanical importance of native plant species. It is located 275 kms away from Addis Ababa, capital city of Ethiopia, in southern nations and nationalities & people's regional states (SNNPR), Hawassa city which is the capital city of the Government of the SNNPR State of the Federal republic region of Ethiopia and Sidama zone (Figure 1). The institute was established in 1969 E.C.in an area of 11.2 km<sup>2</sup>, but started training students in 1970/71 E.C. In 1988, the ministry of education transformed it to college level launching departments which provide 12+2 diploma courses. Since then the college has been increasing its training scope. It able to alleviate the prevailing problems among schools of

the region both at primary and junior secondary schools.

Geographically it lies between 07° 05' latitude North and 38° 29' longitude east. The altitude of the campus is 1697m above sea level. The rainfall pattern is characterized by bimodal distribution with spring/"belg" and summer (main) rainy seasons. However, the rainfall is continuously distributed with one dry season. The annual rainfall generally decreases on average from 1400 mm in the east and southeast to 1000 mm towards northwest. The mean annual temperature is 19.5<sup>0</sup>c with the minimum average ranging from 9.30<sup>0</sup>C during December to 14<sup>0</sup>c during July and maximum temperature varying from 24<sup>0</sup>c during July to 29.2<sup>0</sup>c during March. The land form is plain with reddish volcano soil which is ideal for construction.

### Data Collection methods

The study which is conducted between October, 2011 and May, 2012 involved the administration of semi-structured questionnaires, interviews with both individual herbalists and group of herbalists (Martin, 1995) and botanical inventory in the campus. The data was collected to supplement the information on plant names, plant parts used and conservation status of indigenous medicinal plants. To know the relative importance of some economically valued indigenous medicinal plants in the campus, all plant species encountered were enumerated regardless of their medicinal status. Identification of the plant species were carried out by herbalists, taxonomists and with reference to local as well as regional manuals and floras. Identification was confirmed at National herbarium of Addis Ababa University, where Voucher specimens were deposited. The collected plant specimens were identified with the help of different Floras and Manuscripts (Azene et al., 1993; Edwards et al., 1995; Hedberg et al., 2003; Hedberg et al., 2004). The plant specimens were pressed, dried and mounted on herbarium sheets and deposited in the lab. Information on plant parts used, purpose of use, methods of processing and dosage were collected through questioner survey with indigenous people in and around the campus. The most useful information gathered on medicinal plants reported by local people: medicinal value, application, methods of preparation, route of application, disease treated, part and habit used were analyzed through descriptive statistical analysis. Direct matrix ranking was done following Martin (1995) in order to compare multipurpose use of a given species and to relate this to the extent of its utilization versus its dominance.

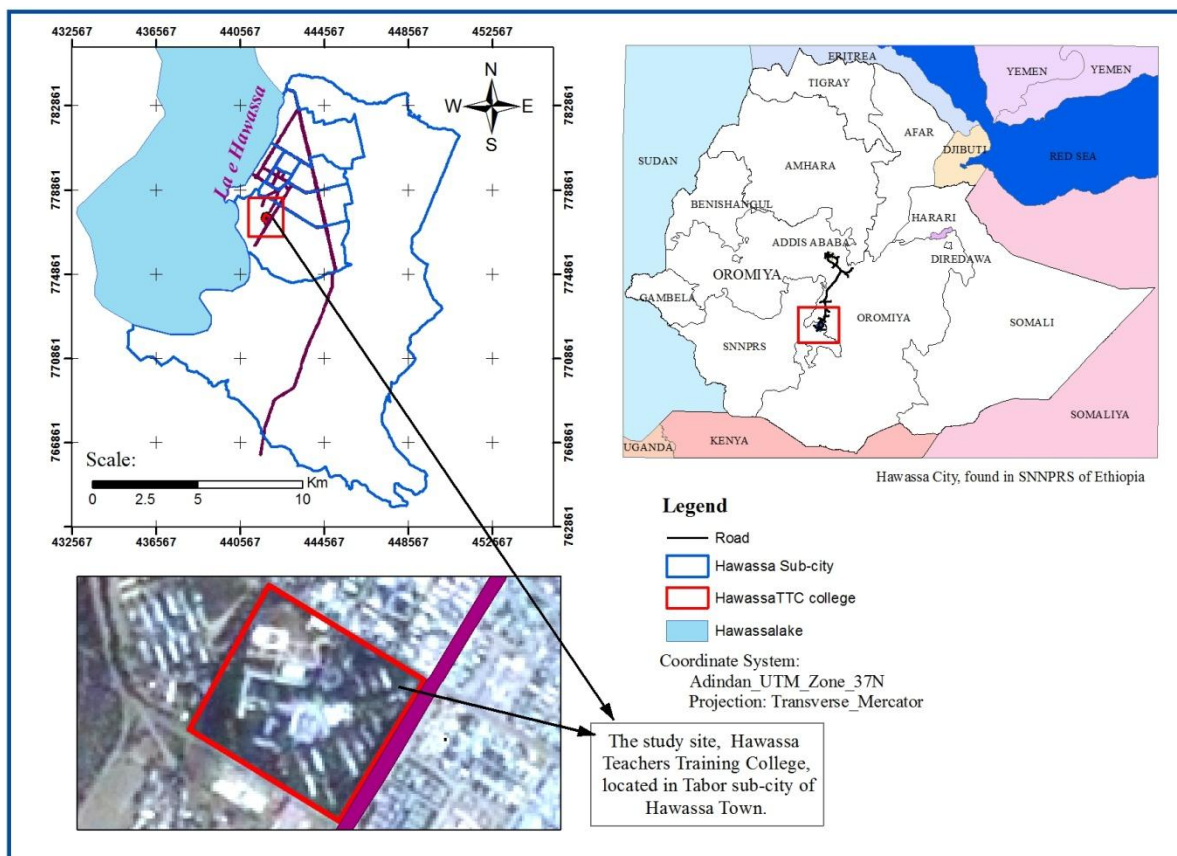


Figure1. Map of Hawassa College of Teacher Education campus (Inset: the map of Ethiopia showing Hawassa city).

## RESULTS

### Diversity of indigenous medicinal plants

A total of 198 plant species were identified and documented in the Hawassa college of Teacher Education campus, which belongs to 158 genera and 74 families. Asteraceae was the most dominant and highest diversity (17 species) followed by Fabaceae (14 species), Solanaceae (9 species), Myrtaceae (8 species), Apocynaceae, Myrtaceae and Poaceae (6 species each), 10 families were represented with four species each, 4 families were represented with three species each, 8 families were represented with two species each and 37 families were represented with one species each (Table 1). Among 198 plants encountered in the campus 143 (72.2%) were locally named by indigenous people and 55 (27.78%) were not locally named. The total indigenous plant families and genera with corresponding numbers of species in the campus were shown in Table 1.

### Conservation status

The nativity of the plants shown that most of plants in the campus were originated from Ethiopia. Of the total 198 plant species in the campus 110 (55.56%) were

indigenous out of these 5 (2.53%) were endemic and 88 (44.44%) were exotic which comes from different regions of the world. (Figure 3). These were distributed in 5 growth forms such as trees 54 (27.27%), shrubs 52 (26.26%), herbs 82 (41.41%), climbers 5 (2.52%) and ferns 5 (2.52%) (Figure 2). About 85.27% of plant diversity in the college was conserved by ex-situ conservation and 14.73% were grow naturally in the campus by different mechanisms such as birds, wind and animals and conserved by in-situ conservation. Some indigenous plant species that need immediate attention for conservation in Ethiopia were *Prunus africana*, *Juniperus procera*, *podocarpus falcatus*, *Hagenia abyssinica*, *Ficus sur*, *Ficus vasta*, *Cordia africana*, *Albizia gummifera*, *Acacia abyssinica* and *Olea europea*. Among these *Prunus africana* and *Juniperus procera* were reported as highly endangered plant species (Table 2). These 11 indigenous tree species were currently identified and given conservation priority both nationally and internationally by using in-situ and ex-situ conservation in the country as well as in the Hawassa College of Teacher Education campus. The distribution of useful plants among taxonomic ranks and use

categories is summarized in Table 6. More than seventy-five percent of useful plants were recorded as medicinal plant species which accounts 72 families, 64 genera and 85 species followed by ornamental plant species which accounts 52 families, 56 genera and 64 species.

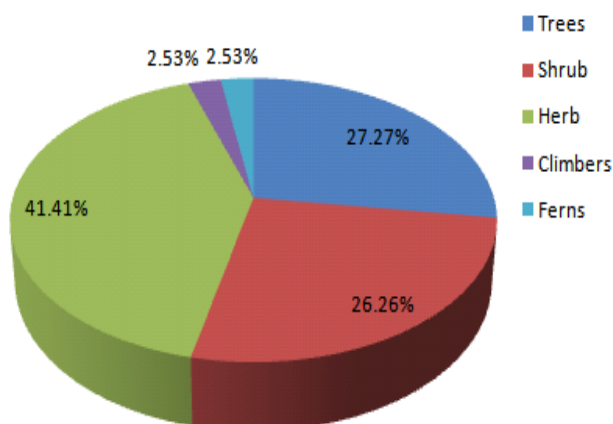


Figure 2. Growth form of plant species in the Hawassa College of Teacher Education Campus

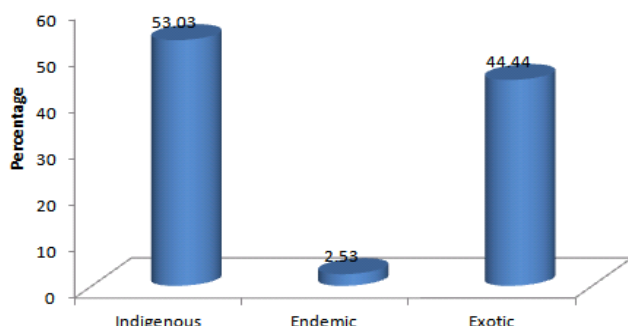


Figure3. Distribution of plant species in Hawassa College of Teacher Education campus

### Diversity of food crops

The study recorded forty (40) species of food crops in the campus which were distributed among 17 families and 22 genera. Of which, fruits 16 sps (8.1%), vegetables 9sps (4.55%), root and tubers 4sps (2.02%), oil crops 3 sps (1.52%), stimulants 3sps (1.52%) and spices 5 sps (2.53%) were recorded (Figure 4). Out of forty (40) species 14 (40%) shrubs, 12 (30%) trees and 10sps (25 %) herbs and 1sps (2.5%) were climbers. In the present study, 10 multipurpose species were selected out of the total indigenous medicinal plants and five use-categories were listed for 5 selected key informants to assign use values to each species. Accordingly, *Prunus africana* is found to be highly used by the local community for multiple purposes, followed by *Juniperus procera*, *Hagenia abyssinica* and *Cordia africana* (Table 3).The intensive utilization of these plant species for multiple uses renders the scarcity of

the species from the locality. As the direct matrix ranking below indicates, the scarcity of indigenous plants is occur not only due to medicinal uses, but also for other uses such as timber, fuel, charcoal and construction. For instance, *Acacia abyssinica* is ranked more for charcoal, *Cordia africana* and *Hagenia abyssinica* is more ranked for timber than medicinal value. *Juniperus procera* is ranked more for timber, fuel and construction, *Prunus africana* are ranked more for timber, medicine and construction.

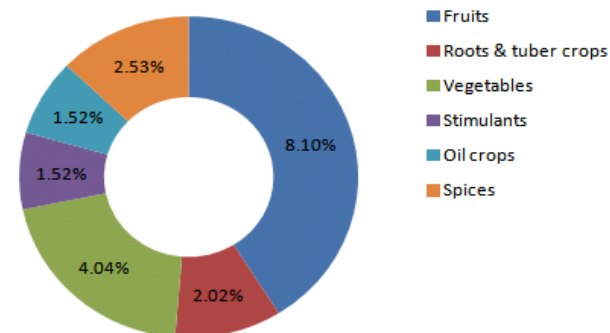
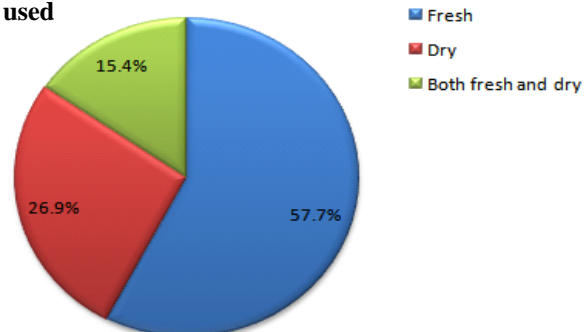


Figure 4. Diversity of food crops in the campus

### Indigenous medicinal plants part used to treat human ailments

Plants are the major resources for indigenous people for various purpose such as medicinal, firewood, charcoal, timber, fodder, bee forage, food, tools and tannin etc. From the total 110 indigenous medicinal plants recorded in the campus 40 species were commonly used by local people of the study area for treatment of various human and livestock ailments (Table 4). Most of the traditional medicinal plant preparations were used in fresh form 57.5%, 26.9% were dry and 15.4% were both fresh and dry (Figure 5). Plant parts used to treat different human ailments were seeds, stem, root, leaves, stem bark, root bark, flowers, shoot apex and latex. The most commonly used indigenous Plant parts were leaves 42.3% followed by seeds 19% and root 17.9 % ( Figure 6).The processed remedies were mainly through crushing 45.8%, powdering 18%, squeezed, 8.3%, chewing, 6.9 % ( Table 5).The indigenous medicinal plant remedies were mostly administered through oral 58.9% followed by dermal 34.6 % ( Figure 7).

### Figure 5. Condition of indigenous medicinal plants used



**Table 3. Direct matrix Ranking of 10 indigenous plant species on five use criteria (5 = the best, 4 = very good 3 = good 2 = less used 1 = the least 0 = not used)**

| Plant species                           | Timber | Fuel | Medicine | Charcoal | Construction | Total | Rank            |
|---|--------|------|----------|----------|--------------|-------|-----------------|
| <i>Acacia abyssinica</i>                | 0      | 4    | 2        | 5        | 3            | 14    | 6th             |
| <i>Albizia gummifera</i>                | 2      | 4    | 3        | 0        | 3            | 12    | 9th             |
| <i>Cordia africana</i>                  | 5      | 4    | 3        | 0        | 4            | 16    | 4 <sup>th</sup> |
| <i>Ficus sur</i>                        | 3      | 3    | 2        | 0        | 3            | 11    | 8th             |
| <i>Ficus vasta</i>                      | 3      | 3    | 1        | 0        | 2            | 9     | 10th            |
| <i>Hagenia abyssinica</i>               | 5      | 4    | 4        | 0        | 4            | 17    | 3 <sup>rd</sup> |
| <i>Juniperus procera</i>                | 5      | 5    | 3        | 0        | 5            | 18    | 2 <sup>nd</sup> |
| <i>Olea europea</i> L.ssp.<br>Cuspidata | 0      | 4    | 3        | 0        | 4            | 11    | 7th             |
| <i>Podocarpus falcatus</i>              | 4      | 4    | 3        | 0        | 4            | 15    | 5th             |
| <i>Prunus africana</i>                  | 5      | 4    | 5        | 0        | 5            | 19    | 1 <sup>st</sup> |

**Table 2. National and international conservation priority of some indigenous tree species with ethnobotanical uses in Hawassa College of Teacher Education campus**

| Scientific name            | Local name(Sidame nya) | Family        | Habit | Uses                               | Status                          |
|----------------------------|------------------------|---------------|-------|------------------------------------|---------------------------------|
| <i>Acacia abyssinica</i>   | Wacho                  | Fabaceae      | Tree  | Fw,Cha,Me,Fd,She,Bf,S<br>c,Nf,Po   | High national<br>priority,IBCR  |
| <i>Albizia gummifera</i>   | Matticho               | Mimosaceae    | Tree  | Fw,Tm,Me,Fd                        | High national<br>priority, IBCR |
| <i>Cordia africana</i>     | Wadicho                | Boraginaceae  | Tree  | Fw,Tm,Carv.,Me,Fd,Sh,<br>Bf, Or,Sc | High national<br>priority IBCR  |
| <i>Ficus sur</i>           | Odakko                 | Moraceae      | Tree  | Tm,Fr/Fo,Sh,T,Me                   | High national<br>priority IBCR  |
| <i>Ficus vasta</i>         | Qilto                  | Moraceae      | Tree  | Sh,Bf                              | High national<br>priority IBCR  |
| <i>Hagenia abyssinica</i>  | Dadako                 | Rosaceae      | Tree  | Fw, Tm, Carv., Me,<br>Or, Sc       | High national<br>priority IBCR  |
| <i>Juniperus procera</i>   | Honcho                 | Cupresaceae   | Tree  | Fw,Tm,Carv.,Me,Or,Sc               | IUCN Red list                   |
| <i>Olea europea</i>        | Ejersu                 | Oleaceae      | Tree  | Fw,Ch,Tm,Po,Flav.Me,B<br>f         | High national<br>priority IBCR  |
| <i>Podocarpus falcatus</i> | Dagucho                | Podocarpaceae | Tree  | Fw,Tm,Po,Me,Sh,Or                  | High national<br>priority IBCR  |
| <i>Prunus africana</i>     | Garbicho               | Rosaceae      | Tree  | Fw,Ch,Tm,Po                        | IUCN Red list                   |

**Keys:** Fw= fire wood Cha = charcoal Or = ornamental Tm = Timber Sh = shade Sc = soil conservation Fd = fodder  
Bf = beef forage Nf = Nitrogen fixation Tu = traditional use Po = poles  
IBCR = Institute of biodiversity conservation and research

**Table.1. Families and their species and genera percentage in Hawassa college campus**

| Family         | Species | % species | Genera | % Genera | Family         | Species | %    | genera | %    |
|----------------|---------|-----------|--------|----------|----------------|---------|------|--------|------|
| Asteraceae     | 17      | 8.59      | 14     | 8.86     | Fabaceae       | 14      | 7.07 | 6      | 3.79 |
| Acanthaceae    | 1       | 0.51      | 1      | 0.63     | Flacurtiaceae  | 1       | 0.51 | 1      | 0.63 |
| Agavaceae      | 1       | 0.51      | 1      | 0.63     | Geraniaceae    | 1       | 0.51 | 1      | 0.63 |
| Amaryllidaceae | 4       | 2.02      | 4      | 2.53     | Hymenophyll    | 1       | 0.51 | 1      | 0.63 |
| Apiaceae       | 4       | 2.02      | 4      | 2.53     | Iridaceae      | 1       | 0.5  | 1      | 0.63 |
| Aloaceae       | 1       | 0.51      | 1      | 0.63     | Lauraceae      | 1       | 0.51 | 1      | 0.63 |
| Anacardiaceae  | 2       | 1.01      | 2      | 1.01     | Malvaceae      | 4       | 2.02 | 3      | 1.89 |
| Annonaceae     | 1       | 0.51      | 1      | 0.63     | Marantaceae    | 1       | 0.51 | 1      | 0.63 |
| Apocynaceae    | 6       | 3.03      | 6      | 3.79     | Meliaceae      | 2       | 1.01 | 2      | 1.01 |
| Amarantaceae   | 4       | 2.02      | 3      | 1.89     | Melanthaceae   | 1       | 0.51 | 1      | 0.63 |
| Araceae        | 2       | 1.01      | 2      | 1.01     | Mimosoideae    | 2       | 1.01 | 1      | 0.63 |
| Areceaceae     | 2       | 1.01      | 2      | 1.01     | Moraceae       | 4       | 2.02 | 2      | 1.01 |
| Asparagaceae   | 2       | 1.01      | 2      | 1.01     | Moringaceae    | 1       | 0.51 | 1      | 0.63 |
| Aspleniaceae   | 2       | 1.01      | 1      | 0.63     | Musaceae       | 2       | 1.01 | 2      | 1.01 |
| Balanitaceae   | 1       | 0.51      | 1      | 0.63     | Myrsinaceae    | 1       | 0.51 | 1      | 0.63 |
| Balsaminaceae  | 1       | 0.51      | 1      | 0.63     | Myrtaceae      | 6       | 3.03 | 5      | 3.16 |
| Barassicaceae  | 4       | 2.02      | 1      | 0.63     | Nyctaginaceae  | 2       | 1.01 | 1      | 0.63 |
| Bignoniaceae   | 4       | 2.02      | 3      | 1.89     | Oleaceae       | 1       | 0.51 | 1      | 0.63 |
| Bombacaceae    | 1       | 0.51      | 1      | 0.63     | Poaceae        | 6       | 3.03 | 6      | 3.79 |
| Boraginaceae   | 1       | 0.51      | 1      | 0.63     | Papaveraceae   | 1       | 0.51 | 1      | 0.63 |
| Caesalbinoid   | 3       | 1.52      | 1      | 0.63     | Papilionaceae  | 1       | 0.51 | 1      | 0.63 |
| Cannaceae      | 1       | 0.51      | 1      | 0.63     | Phytolaccaceae | 1       | 0.51 | 1      | 0.63 |
| Casurinaceae   | 1       | 0.51      | 1      | 0.63     | Pinaceae       | 1       | 0.51 | 1      | 0.63 |
| Cariceaceae    | 1       | 0.51      | 1      | 0.63     | Plumbagnaceae  | 1       | 0.51 | 1      | 0.63 |
| Carassulaceae  | 2       | 1.01      | 1      | 0.63     | Podocarpaceae  | 1       | 0.51 | 1      | 0.63 |
| Cleastraceae   | 2       | 1.01      | 2      | 1.01     | Polygonaceae   | 2       | 1.01 | 1      | 0.63 |
| Combretaceae   | 3       | 1.52      | 3      | 1.89     | Polypodiaceae  | 1       | 0.51 | 1      | 0.63 |
| Commelinaceae  | 4       | 2.02      | 2      | 1.01     | Proteaceae     | 1       | 0.51 | 1      | 0.63 |
| Convolvulaceae | 2       | 1.01      | 2      | 1.01     | Rhamnaceae     | 1       | 0.51 | 1      | 0.63 |
| Cupresaceae    | 3       | 1.52      | 3      | 1.89     | Rosaceae       | 4       | 2.02 | 4      | 2.53 |
| Cyperaceae     | 1       | 0.51      | 1      | 0.63     | Rubiaceae      | 2       | 1.01 | 2      | 1.01 |
| Cucurbitaceae  | 3       | 1.52      | 3      | 1.89     | Rutaceae       | 4       | 2.02 | 4      | 2.53 |
| Capparidaceae  | 1       | 0.51      | 1      | 0.63     | Sapindaceae    | 1       | 0.51 | 1      | 0.63 |
| Dracaenaceae   | 1       | 0.51      | 1      | 0.63     | Simaroubaceae  | 1       | 0.51 | 1      | 0.63 |
| Euphorbiaceae  | 13      | 6.57      | 6      | 3.79     | Solanaceae     | 9       | 4.55 | 6      | 3.79 |
|                |         |           |        |          | Ulmaceae       | 1       | 0.51 | 1      | 0.63 |
|                |         |           |        |          | Verbenaceae    | 2       | 1.01 | 2      | 1.01 |

**Table 5. Methods of traditional medicinal plants preparation of remedies in the study area**

| Methods of preparation | Frequency | Percentage |
|------------------------|-----------|------------|
| Crushing               | 33        | 45.8       |
| Powdering              | 13        | 18.0       |
| Squeezing              | 6         | 8.3        |
| Chewing                | 5         | 6.9        |
| Oil extraction         | 4         | 5.6        |
| Heating                | 2         | 2.8        |
| Roasting               | 2         | 2.8        |
| Boiling                | 2         | 2.8        |
| Pounding               | 1         | 1.4        |
| Grinding               | 1         | 1.4        |
| Concocted              | 1         | 1.4        |
| Painting               | 1         | 1.4        |
| Rubbing                | 1         | 1.4        |

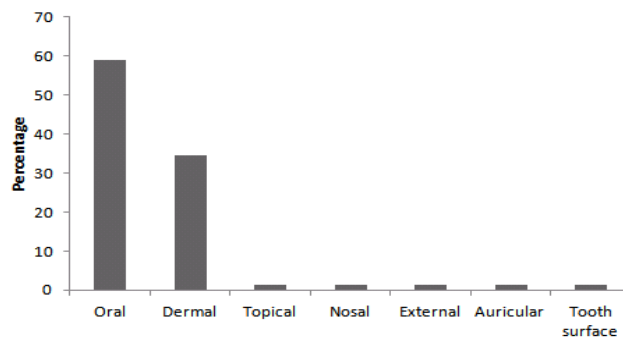
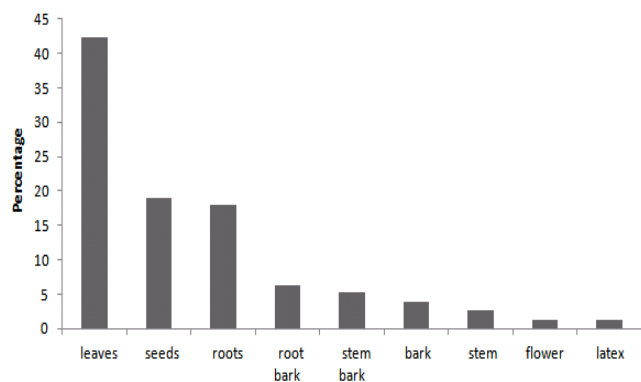


Figure 6. Parts of indigenous medicinal plants used for remedies preparation

Figure 7. Route of administration of indigenous traditional medicinal plants

Table 6. Summary of Taxonomic rank and multiple uses of plant species recorded in the Hawassa College of Teacher Education Campus

| Uses            | Firewood | Charcoal | Timber | Poles/posts | Tools/handle | Medicine | Fodder | Ornamental | Fiber | Resin/gum | Cosmetics | Tannin/dye | Bee forage | Tooth brush |
|-----------------|----------|----------|--------|-------------|--------------|----------|--------|------------|-------|-----------|-----------|------------|------------|-------------|
| <b>Families</b> | 39       | 17       | 24     | 17          | 17           | 72       | 16     | 52         | 7     | 2         | 4         | 5          | 20         | 4           |
| <b>Genera</b>   | 36       | 17       | 26     | 19          | 17           | 64       | 16     | 56         | 7     | 2         | 4         | 5          | 20         | 4           |
| <b>Species</b>  | 44       | 22       | 29     | 24          | 18           | 75       | 18     | 64         | 7     | 3         | 4         | 6          | 26         | 4           |

**Table 4. Some commonly used indigenous medicinal plant species in Hawassa College Campus**

| Scientific name  | Disease treated         | Parts used      | Condition of part used | Methods of preparation & application                                       | Route of administration | Status |
|--|-------------------------|-----------------|------------------------|--|-------------------------|--------|
| <i>Acacia etbaica</i>                                  | Unable to walk properly | root            | fresh/dry              | Crushed and drink  | oral                    | Common |
| <i>Acacia seyal</i>                                    | Swelling                | leaves          | fresh                  | Chewing the leaves & swallowing  | oral                    | Common |
| <i>Acacia tortilis</i>                                 | Skin wound              | bark            | fresh/dry              | Crushed, powdered apply to the wound                                       | dermal                  | Common |
| <i>Achyranthes aspera</i>                              | Stomach ache            | root            | fresh                  | Chewed & swallowed   | oral                    | Common |
| <i>Albizza gummifera</i>                               | Tuberculosis            | leaves          | fresh                  | Crushed, Powdered and drink  | oral                    | Rare   |
| <i>Balanites aegyptiaca</i>                            | Toothache               | stem bark       | fresh                  | Chewed & applied to the pain   | dermal                  | Common |
| <i>Brucea antidysentrica</i>                           | Evil spirit             | root            | fresh/dry              | Crushed and rubbing  | dermal                  | Common |
|  | Wound                   | root bark       | dry                    | Powdered, mixed with water & apply to the wound                            | dermal                  |        |
| <i>Carissa spinarum</i><br><i>Croton macrostachyus</i> | Rheumatic               | leaves          | fresh                  | Warmed on fire and applied to the affected area every night                | dermal                  | Common |
|  | Tonsilts                | shoot tip       | fresh                  | Holding in the mouth   | topical                 |        |
|  | Stomach ache            | leaves          | fresh                  | Crushed and drink by adding water  | oral                    |        |
|  | Skin cancer             | leaves          | fresh                  | Crushed & inserting to the wound   | dermal                  |        |
|  | Wound                   | leaves          | fresh                  | Grinding & apply to the wound  | dermal                  |        |
| <i>Cordia africana</i>                                 | Ring worm               | leaves          | Fresh                  | Liquid of the leaves apply to the wound                                    | dermal                  | rare   |
|  | Cough                   | Leaves          | fresh                  | Burning & selling  | dermal                  |        |
|  | Wound                   | leaves          | fresh                  | Heat on fire, powdered ,mixed with butter rush on the wound                | dermal                  |        |
|  | Stomach problem         | seed            | dry                    | Making tell by adding water, stay for one week for fermentation then drink | oral                    |        |
| <i>Calpurnea aurea</i>                                 | Tooth ache              | Stem bark       | fresh                  | Chewing & swallowing   | oral                    | Common |
|  | Stomach ache            | Root& stem bark | dry                    | Powdered & mixed with water & drink  | oral                    |        |
|  | skin rash               | leaves          | fresh                  | Dried, powdered, mixed with butter , painted & tied by clean cloth         | dermal                  |        |
|  | Hypertenson             | Seeds(3or4)     | dry                    | Crushed & swallow by touching nose   | dermal                  |        |
|  | Impotency(men)          | Seeds           | dry                    | Powdered, mixed with water stay over night then drink                      | oral                    |        |
|  | Tapeworm                | seeds           | dry                    | Powdered, mixed with water stay over night ,then drink                     | oral                    |        |
|  | Jaundice                | seeds           | dry                    | Crushed & swallow  | oral                    |        |
| malaria  | Seeds(3)                | dry             | Crushed & swallow      | oral   |                         |        |
| Ascariasis   | Seeds(3)                | dry             | Crushed & swallow      | oral   |                         |        |

|                        |                        |                  |                |  |                |        |
|------------------------|------------------------|------------------|----------------|--|----------------|--------|
| <i>Celtis africana</i> | Jaundice<br>Rheumatism | Leaves<br>leaves | fresh<br>fresh | Squeezed & drink<br>Squeezed with water & apply to the<br>area | oral<br>dermal | Common |
|------------------------|------------------------|------------------|----------------|--|----------------|--------|

Table 4. Cont'd

| Scientific name             | Disease treated               | Parts used | Condition of part used | Methods of preparation & application   | Route of administration | Status     |
|-----------------------------|-------------------------------|------------|------------------------|--|-------------------------|------------|
| <i>Combretum molle</i>      | Stomach problem for cow & man | leaves     | fresh                  | Powdered ,mixed with water & drink   | oral                    | common     |
| <i>Coffea arabica</i>       | Wound                         | seed       | dry                    | Roasted, powdered & apply to the wound   | dermal                  | common     |
|                             | Spider poison                 | seed       | dry                    | Roasted, powdered, mixed with butter & painted                                 | dermal                  |            |
| <i>Dovyalis abyssinica</i>  | Evil eye                      | root       | fresh/dry              | Concocted ,pounded & steam bath  |                         | common     |
|                             |                               |            |                        |  | dermal                  |            |
| <i>Dodonaea angusifolia</i> | Stomach pain                  | stem bark  | fresh/dry              | Crushed, mixed with water & drink  | oral                    | common     |
|                             | Stomach problem in cows       | leaves     | fresh                  | Powdered & drink   | oral                    |            |
| <i>Ekbergia capensis</i>    | Animal disease                | roots      | dry                    | Powdered, mixed with water & drink   | oral                    | common     |
| <i>Euphorbia tirucalli</i>  | warts                         | latex      | fresh                  | Painted on the area  |                         | common     |
|                             |                               |            |                        |  | dermal                  | common     |
| <i>Ficus sur</i>            | Urinary problem               | root       | fresh                  | Boiled & drink   | oral                    | rare       |
| <i>Justicia schimpeiana</i> | Gonorrhea                     | roots      | fresh                  | Powdered , mixed with water & drink  | oral                    | common     |
| <i>Juniperus procera</i>    | Flue                          | leaves     | fresh                  | Crushed & pounded, mixed with butter   | oral                    | endangered |
| <i>Hagenia abyssinica</i>   | Tapeworm                      | leaves     | fresh                  | Crushed, mixed with water & drink  | oral                    |            |
|                             | Wound                         | Leaves     | fresh/dry              | Powdered , apply to the wound  |                         |            |
|                             | Ascariasis                    | flower     | fresh                  | Powdered, mixed with water& honey ,boil then drink before breakfast for 4days  | dermal<br>oral          |            |
|                             | Tapeworm                      | seed       | dry                    | Powdered, mixed with water & fermented over night, taken orally in the morning | oral                    |            |
|                             | Thypoid                       | seed       | dry                    | Crushed, mixed with water stay over night ,drink before break fast             | oral                    |            |
| <i>Ocimum lamiifolium</i>   | Wound                         | roots      | fresh                  | Crushed apply to the wound   | dermal                  | common     |
|                             | Common cold                   | leaves     | fresh                  | Squeezed, mixed with coffee boil & drink                                       | oral                    |            |
|                             | Sun strike                    | leaves     | fresh                  | Squeezed and rub on the body   | dermal                  |            |
| <i>Lippia adoensis</i>      | Stomachache                   | leaves     | fresh/dry              | Crushed, Powdered ,Salted & taken  | oral                    | common     |
|                             | Ringworm                      | Leaves     | fresh                  | Leaf of <i>Lippia adoensis</i> is directly rubbed on affected skin             | dermal                  |            |
| <i>Maytenus arbutifolia</i> | Evelspirit                    | leaves     | dry                    | Pounded & taken  | nasal                   | common     |

|                             |                        |                     |                |   |                |        |
|-----------------------------|------------------------|---------------------|----------------|---|----------------|--------|
| <i>Millettia ferruginea</i> | Fish poison            | bark & matured seed | fresh          | Powdered & spread over the water  | external       | common |
| <i>Momordica foetida</i>    | Evileye<br>Stomachache | root<br>leaves      | fresh<br>fresh | Crushed, washed with it<br>Squeezed with leaves of <i>Ruta chalpensis</i> and drink | dermal<br>oral | common |

Table 4.Cont'd

| Scientific name            | Disease treated              | Parts used | Condition of part used | Methods of preparation & application  | Route of administration | Status     |
|----------------------------|------------------------------|------------|------------------------|---|-------------------------|------------|
| <i>Moringa stenopetala</i> | Pressure                     | leaves     | dry                    | Boiled and drink in the form of tea   | oral                    | common     |
| <i>Olea europaea</i>       | Earache                      | stem       | fresh                  | Oil extracted by boiling stem   | auricular               | rare       |
| <i>Premna schimperi</i>    | Chife                        | stem       | fresh                  | Oil extracted burning fresh stem, salted                                    | dermal                  | common     |
| <i>Podocarpus falcatus</i> | Toothache                    | leaves     | fresh                  | Crushed & hold on the pain  | teeth surface           | rare       |
|                            | Vomiting                     | leaves     | fresh                  | Crushed & Juice of leaves is taken  | oral                    |            |
|                            | Febrile illness              | root       | dry                    | Dried, powdered ,mixed with water drink for 3 days before break fast        | oral                    |            |
| <i>Prunus africana</i>     | Diuretic (unable to urinate) | shoot apex | fresh                  | Crushed, mixed with water & drink   | oral                    |            |
|                            | Ascariasis                   | Root bark  | fresh                  | Crushed, pounded & mixed with water ,drink                                  | oral                    |            |
| <i>Ricinus communis</i>    | Gonorrhoea                   | Root bark  | fresh                  | Powdered mixed with leaf of <i>parthenium</i>                               | oral                    | endangered |
|                            | Taenia versicolor            | leaves     | fresh                  | Crushed and powdered and apply to the area                                  | dermal                  |            |
|                            | Wound                        | seed       | dry                    | Crushed & the oil is painted  | dermal                  | common     |
|                            | Tonsillitis                  | seed       | dry                    | Tied on neck  | dermal                  |            |
|                            | Toothache                    | root       | fresh                  | Chewing fresh root  | oral                    |            |
|                            | Constipation                 | seed       | dry                    | Drinking the oil of seed  | oral                    |            |
|                            | Impotency                    | leaves     | dry                    | Crushed, pounded with coffee or milk drink 2 cups before sexual intercourse | oral                    |            |
| <i>Rumex abyssinicus</i>   | Tinea varsiclor              | root       | fresh/dry              | Crushed and rubbed on the infected area                                     | dermal                  | common     |
|                            | Ring worm                    | leaves     | fresh                  | Liquid of the leaves apply to the wound                                     | dermal                  |            |
| <i>Senna occidentalis</i>  | Gonorrhoea                   | root bark  | fresh/dry              | Crushed, boiled and drink   | oral                    | common     |
| <i>Senna didymobotrya</i>  | Snake bite                   | leaf       | fresh                  | Crushed, homogenized in water and drink immediately after infection.        | oral                    | common     |
| <i>Syzygium guineense</i>  | Stomachache                  | bark       | fresh                  | Crushed, squeezed and drink   | oral                    | common     |
|                            | Urination problem            | root bark  | fresh/dry              | Crushed, boiled and drink   | oral                    |            |
| <i>Vernonia amygdalina</i> | Malaria                      | Leaves     | fresh                  | Crushed & drink   | oral                    | common     |

|                                  |                         |        |           |                           |      |        |
|----------------------------------|-------------------------|--------|-----------|---------------------------|------|--------|
| <i>Vernonia<br/>auriculifera</i> | Stomach intestine       | leaves | fresh     | Crushed & drink           | oral | common |
|                                  | Diarrhoea               | leaves | fresh/dry | Crushed and drink         | oral |        |
| <i>Withania somnifera</i>        | Coughs, & Evil<br>sprit | leaves | fresh     | Squeezed & drink          | oral | common |
|                                  | Epilepsy                | root   | fresh/dry | Crushed, boiled and drink | oral |        |

## Discussion

High diversity of indigenous and exotic plant species were recorded and documented. The species diversity was grouped into fourteen categories of use with the most frequent being predominantly medicinal plant species followed by ornamental and firewood. Among 198 plant species recorded in the campus 110 species were native to the Ethiopian region out of these 5 species were endemic to Ethiopia and 88 species were from other regions of the world. This shows that the exotic species is highly diversified in the region not native to the area because of the absence of competence for resources and enemies. Out of 198 plant species recorded 40 were indigenously used as ethno medicine. Among ethno-medicinal plants, 20 species were trees, 15 species were shrubs, 2 species were herb and 1 species were climbers. Crushing was the most modes of preparations reported in the study area followed by powdering. Similar study was reported by Gidey (2010) in which crushing accounts 48% followed by squeezed 37% and Yinger et al. (2008) also reported that crushing accounts 35%. In line with (Dawit and Ahadu, 1993; Gidey, 2010; Fisseha et al., 2009) oral application was the highest and the most commonly used route of application followed by dermal. Leaves were the highest parts of indigenous medicinal plants part used for preparation of remedies followed by roots. Similar studies were reported from other parts of Ethiopia (Mirutse, 1999; Haile and Delenasaw, 2007; Mohammed and Berhanu, 2011).

Plant species recorded in the present study are also reported in other parts of Ethiopia, Africa and India. From the total of one hundred ninety eight plant species documented in the study area, 34 species are reported in Fisseha et al. (2009); 39 species in Mirutse (2001); 14 species in Gidey et al. (2011); 19 species in Gemedo et al. (2005); 16 species in Yinger et al. (2008); 21 in Tilahun and Mirutse (2007) and 24 species are new recorded plants in the present study compared to previous collections by different authors. 19 plant species are documented by Adhikari et al. (2010) in India; 3 species in Addo-Fordjour et al. (2008) in Ghana and 14 species in Ubom (2010) in Nigeria. Some indigenous medicinal plants for instance, *Momordica foetida*, *Ocimum lamiiifolium* and *Vernonia amygdalina* are reported to treat malaria and associated illness in Budiope country Uganda (Tabuti, 2008) and *Croton macrostachyus*, *Datura stramonium*, *Euphorbia candelabrum*, *Euphorbia tirucalli*, *Prunus africana* and *Ricinus communis* are reported for treatment of skin disorder in Central Kenya (Njoroge et al., 2007) and *Croton macrostachyus*, *Calpurnea aurea*, *Acacia tortilis* are used to treat skin disorder in Ethiopia.

The present study focus mainly on indigenous medicinal plant species which are economically and ecologically important. In Ethiopia little emphasis has been given to indigenous medicinal plants because of these some multi purpose indigenous plants are highly threatened. Natural forest stands near a restoration site can provide baseline data that can be utilized in the evaluation of the extent and rate of plant species recruitment and establishment in plantations (Eshetu, 2001). The presence of natural stands of indigenous species in a given area can thus give a clue to undertake possible plantation activities (Evans, 1992). Indigenous trees are adapted to the environment and are already integral part of an ecological niche. This state of condition may make them less susceptible to serious damage from diseases and pests since predators, viruses, climatic factors are already present there (Khun, 1987; Legesse, 1995). Indigenous species are ecologically more valuable than exotics for the conservation of native flora and fauna as well as for the conservation of water (Evans, 1992; Legesse, 2007). The timber of indigenous species is likely to be known to local wood using industries; it may also be preferred as a firewood source. The planting and establishment of trees on degraded land should be the first important step in soil rehabilitation and land reclamation (Evans, 1992). Legesse (1995, 2002) reported that *P. falcatus* in Ethiopia is not only degrading, but is also seriously threatened. It has been recommended that urgent actions be taken for propagating, cultivating and domesticating indigenous trees (Legesse, 1995, 2002). In selecting species for reforestation, it is often best to choose the ones that are already growing in the area, since these are adapted to the environment and are thus able to regenerate naturally. If the choice lies between two species of comparable growth and quality, one of which is native and the other exotic, the native species is to be preferred (Evans, 1992). In this regard it was reported that indigenous tree species of Ethiopia such as *Acacia abyssinica*, *Croton macrostachyus*, *Cordia africana* and *Millettia ferruginea* have fast growth performance, are culturally accepted and widely used and are adapted to local conditions (EFAP, 1994; Legesse, 1995; Tadesse et al., 2000). The indigenous plant species is highly treated through excessive or unsustainable harvesting practices for timber, construction and medicine. For instance, *Prunus africana*, *Juniperus procera* and *Hagenia abyssinica* are the most highly threatened species for construction and timber in the study area. IBCR (2003) report that *Acacia abyssinica*, *Acacia gummifera*, *Cordia africana*, *Ficus sur*, *Ficus vasta*, *Hagenia abyssinica*, *Olea europea* and *Podocarpus falcatus* were highly threatened indigenous plant species of Ethiopia. *Juniperus procera* and *Prunus africana* were reported as endangered plant species (IUCN, 1997). According to

Endashaw (2007) report environmental degradation, agricultural expansion, loss of forests and woodlands, over-harvesting, fire, cultivation of marginal lands, overgrazing and urbanization were appear to be the major threats to the medicinal plants of Ethiopia. Changing of cultures, habits and lifestyles further aggravate the situation. Business obtained from charcoal making and timber production severely accelerated the high rate exploitation of *Acacia abyssinica* and *Cordia africana* (Endalew, 2008). Balick and Cox (1996) argue that quite simply, mature seed producing trees that are the backbone of the population will die and are not replaced and ultimately the resource base on which cultural values are built will disappear because of over harvesting. Biodiversity Conservation of indigenous medicinal plants is an important activity for preservation, sustainability, education and environmental conservation. Because so many species of plants are medicinal, medicinal plant conservation is, in some ways, a microcosm of plant conservation as a whole. It is therefore, recommended that people need to be encouraged to cultivate indigenous medicinal plants in their home garden through training or education. Furthermore, the documented medicinal plants can be used as a basis for further studies on the indigenous medicinal plants knowledge and for future phytochemical and pharmacological studies. Awareness creation among the traditional practitioners and community at large is important in order to preserve the indigenous medicinal plant species.

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**Appendix1. Diversity of indigenous medicinal plant species encountered in Hawassa College of Teacher Education Campus**

| Scientific name                                      | Local name(Sidama) | Family           | Life form | Nativity |
|--|--------------------|------------------|-----------|----------|
| <i>Acacia abyssinica</i> Hochst.Ex Benth             | Wacho              | Fabaceae         | Tree      | I        |
| <i>Acacia etbaica</i> Schweinf.                      | Wacho              | Fabaceae         | Tree      | I        |
| <i>Acacia melanoxylon</i> R.Br.                      | Omedlla(Amh)       | Fabaceae         | Tree      | E        |
| <i>Acacia mearnsii</i> DeWild.                       | -                  | Fabaceae         | Tree      | E        |
| <i>Acacia seyal</i> Del.                             | Wacho              | Fabaceae         | Tree      | I        |
| <i>Acacia tortilis</i> (Forssk.)                     | Teddecha           | Fabaceae         | Tree      | I        |
| <i>Acalypha wilkesiana</i> Mull.Arg.                 | -                  | Euphorbiaceae    | Shrub     | E        |
| <i>Agave americana</i> L.                            | Qaca               | Agavaceae        | Shrub     | E        |
| <i>Ageratum conyzoides</i> L.                        | -                  | Asteraceae       | Herb      | I        |
| <i>Achyranthes aspera</i> L.                         | Ciikicho           | Amaranthaceae    | Herb      | I        |
| <i>Achillea millefolium</i> L.                       | -                  | Asteraceae       | Herb      | E        |
| <i>Acokanthera schimperi</i> (DC.) Oliv.             | Qaraaro            | Apocynaceae      | Shrub     | I        |
| <i>Albiza gummifera</i> (J.F.Gmel.                   | Matticho           | Fabaceae         | Tree      | I        |
| <i>Albizia</i> sp.                                   | -                  | Fabaceae         | Tree      | I        |
| <i>Albizia schimperiana</i> var. <i>schimperiana</i> | Mukarba(Or)        | Fabaceae         | Tree      | I        |
| <i>Alocasia macrorrhizos</i> (L.)G.Don               | -                  | Araceae          | Herb      | E        |
| <i>Aloe macrocarpa</i> Tod.                          | Ret/eret           | Aloaceae         | Herb      | I        |
| <i>Adiantum pedatum</i> L.                           | -                  | Hymenophyllaceae | Ferns     | E        |
| <i>Amaranthus caudatus</i> L.                        | Raafu              | Amaranthaceae    | Herb      | E        |
| <i>Amaranthus hybridus</i> L.                        | Raafu              | Amaranthaceae    | Herb      | E        |
| <i>Annona cherimola</i> Mill.                        | Gishta             | Annonaceae       | Tree      | E        |
| <i>Argemone ochroleuca</i> L.                        | Wajouta            | Papaveraceae     | Herb      | E        |
| <i>Artemisia absinthium</i> L.                       | Inaare             | Asteraceae       | Herb      | E        |
| <i>Artemisia afra</i> Jacq.exWilld.                  | Inaare             | Asteraceae       | Herb      | I        |
| <i>Asparagus setaceus</i> (Kunth) Jessop             | -                  | Asparagaceae     | Climber   | I        |
| <i>Asplenium rutifolium</i> (P.J.Bergius)Kunze       | -                  | Aspleniaceae     | Fern      | I        |
| <i>Asplenium anisophyllum</i> Kunze                  | -                  | Aspleniaceae     | Fern      | I        |
| <i>Balanites aegyptiaca</i> (L.) Del.                | Badana             | Balanitaceae     | Tree      | I        |
| <i>Becium filamentosum</i> (Forssk.)Cliob.           | Dikito             | Lamiaceae        | Herb      | I        |
| <i>Bersama abyssinica</i> Fresen.                    | Teberako           | Meliantaceae     | Shrub     | I        |
| <i>Bidens pilosa</i> L.                              | Danqarto           | Asteraceae       | Herb      | E        |
| <i>Brassica nigra</i> (L.) W. D. J. Koch             | Black mustard      | Brassicaceae     | Herb      | I        |
| <i>Brassica rapa</i> L.                              | Qosta              | Brassicaceae     | Herb      | E        |
| <i>Brassica carinata</i> A.Br.                       | Shana              | Brassicaceae     | Herb      | I        |
| <i>Brassica oleracea</i> L.                          | Raafu              | Brassicaceae     | Herb      | I        |
| <i>Brucea antidysenterica</i> J.F.Mill.              | Hatawicho          | Simaroubaceae    | Shrub     | I        |
| <i>Boscia mossambicensis</i> Klotzsch.               | Qalqalcha          | Capparidaceae    | Tree      | I        |
| <i>Bougainvillea glabra</i> Choisy                   | -                  | Nyctaginaceae    | Shrub     | E        |

|   |   |               |       |   |
|---|---|---------------|-------|---|
| <i>Bougainvillea spectabilis</i> Willd. | - | Nyctaginaceae | Shrub | E |
|---|---|---------------|-------|---|

**Appendix1. Cont'd**

| Scientific name  | Local name(Sidama) | Family         | Life form | Nativity |
|--|--------------------|----------------|-----------|----------|
| <i>Casimiroa edulis</i> LaLlave & I.ex                                       | Kasmire            | Rutaceae       | Tree      | I        |
| <i>Calathea zebrina</i> (Sims)Lindl  | -                  | Marantaceae    | Herb      | E        |
| <i>Callistemon Citrinus</i> (Curtis) Seekls                                  | -                  | Myrtaceae      | Tree      | E        |
| <i>Calpurnea aurea</i> (Alt.)Benth.  | Cekkatta           | Papilionaceae  | Shrub     | I        |
| <i>Canna indica</i> L.   | Siet-akuri         | Cannaceae      | Herb      | E        |
| <i>Capsicum frutescens</i> L.  | Berberae           | Solanaceae     | Herb      | I        |
| <i>Casuarina equisetifolia</i> L.  | Shewshewe          | Casuarinaceae  | Tree      | E        |
| <i>Carica papaya</i> L.  | Papaye             | Caricaceae     | Tree      | E        |
| <i>Carissa spinarum</i> L.   | Agamssa            | Apocynaceae    | Shrub     | I        |
| <i>Catha edulis</i> (Vahl)Forssk.ex Endl.                                    | Cati               | Celastraceae   | Shrub     | I        |
| <i>Catharanthus roseus</i> (L.)G.Don   | -                  | Apocynaceae    | Herb      | E        |
| <i>Celtis africana</i> Burm.f  | Xoqono(Shisho)     | Ulmaceae       | Tree      | I        |
| <i>Ceiba insignis</i> (Kunth)P.E.Gibbs and Semir                             | -                  | Bombacaceae    | Tree      | E        |
| <i>Centella asiatica</i> (L.) Urban  | Tussee(Or)         | Apiaceae       | Herb      | I        |
| <i>Cheilanthes viridis</i> (Forssk.)Sw.var.glavca (Sim.)Schelp & N.C.Anthony | -                  | Pteridaceae    | Fern      | I        |
| <i>Citrus aurantifolia</i> (L.) Burm.f                                       | Lomii              | Rutaceae       | Shrub     | E        |
| <i>Codiaeum variegatum</i> (L.)A.Juss.                                       | -                  | Euphorbiaceae  | Shrub     | E        |
| <i>Codiaeum</i> spp.   | -                  | Euphorbiaceae  | Shrub     | E        |
| <i>Combretum collinum</i> Fresen.  | Dabaqaa(Or)        | Combretaceae   | Tree      | E        |
| <i>Combretum molle</i> R.Br.exG.Don  | Rukkeesa(Tetele)   | Combretaceae   | Tree      | I        |
| <i>Commelina benghalensis</i> L.   | Laalunxe           | Commelinaceae  | Herb      | I        |
| <i>Convolvulus</i> sp.   | -                  | Convolvulaceae | Herb      | E        |
| <i>Conyza bonariensis</i> (L.) Cronquist                                     | -                  | Asteraceae     | Herb      | E        |
| <i>Cordia africana</i> Lam.  | Wadicho            | Boraginaceae   | Tree      | I        |
| <i>Coriandrum sativum</i> L.   | Dinbilal           | Apiaceae       | Herb      | I        |
| <i>Coffee arabica</i> L.   | Bunna              | Rubiaceae      | Shrub     | I        |
| <i>Colocasia esculenta</i> (L.) Schott.ex A.Rich.                            | Qolchoma           | Araceae        | Herb      | E        |
| <i>Crinum abyssinicum</i> Hochst.ex.A.Rich.                                  | Galadiweese        | Amaryllidaceae | Herb      | I        |
| <i>Croton macrostachyus</i> Del.   | Masincho           | Euphorbiaceae  | Tree      | I        |
| <i>Croton gratissimus</i> Burch.var <i>gratissimus</i>                       | Masincho           | Euphorbiaceae  | Shrub     | E        |
| <i>Cucumis ficifolius</i> A.Rich.  | Surupha            | Cucurbitaceae  | Herb      | I        |
| <i>Cucurbita pepo</i> L.   | Baqula             | Cucurbitaceae  | Cl        | I        |
| <i>Cupressus lusitanica</i> Mill.  | Homme              | Cupresaceae    | Tree      | E        |
| <i>Cyperus alternifolius</i> L.  | Ketma              | Cyperaceae     | Herb      | I        |
| <i>Cynodon dactylon</i> (L.)Pers.  | Qorciisha          | Poaceae        | Herb      | I        |

|                             |        |            |      |   |
|-----------------------------|--------|------------|------|---|
| <i>Daucus carot</i> L.      | Karote | Apiaceae   | Herb | E |
| <i>Datura metel</i> L.Engl. | Banje  | Solanaceae | Herb | I |
| <i>Datura stramonium</i> L. | Banje  | Solanaceae | Herb | I |

**Appendix1. Cont'd**

| Scientific name  | Local name(Sidama)  | Family         | Life form | Nativity |
|--|---------------------|----------------|-----------|----------|
| <i>Delonix regia</i> (Boj.ex Hook.)Ref.  | Yedirezaf           | Fabaceae       | Tree      | E        |
| <i>Dodonaea angustifolia</i> L.  | Etancha             | Sapindaceae    | Shrub     | I        |
| <i>Dracaena steudneri</i> Engl.  | Lanticho            | Dracaenaceae   | Tree      | I        |
| <i>Dovyalis caffra</i> (Hook.f.&Harv.) Hook.f.   | Shisho              | Flacurtiaceae  | Shrub     | I        |
| * <i>Echinops kerebicho</i> Mesfin   | Bursa               | Asteraceae     | Herb      | I        |
| <i>Embelia schimperii</i> Vatke  | Qaanqo              | Myrsinaceae    | Shrub     | I        |
| * <i>Enset ventricosum</i> (Welw.) Cheesman  | Weese               | Musaceae       | Shrub     | I        |
| * <i>Erythrina brucei</i> Schweinf.  | Walako              | Fabaceae       | Tree      | I        |
| <i>Euphorbia cotinifolia</i> L.  | -                   | Euphorbiaceae  | Shrub     | E        |
| <i>Euphorbia pulcherrima</i> (R.Grah.)Wild.  | Duumo daraaro       | Euphorbiaceae  | Shrub     | E        |
| <i>Euphorbia tirucalli</i> L.  | Hanannatto          | Euphorbiaceae  | Shrub     | I        |
| <i>Euphorbia species</i>   | Anano               | Euphorbiaceae  | Shrub     | E        |
| <i>Euphorbia milii</i> (Bojerex Hook.)Ursch & Leandri                                    | Ye'aklil eshoh(Amh) | Euphorbiaceae  | Shrub     | I        |
| <i>Euphorbia candelabrum</i> Trem. & Kotschy.  | Carricho            | Euphorbiaceae  | Shrub     | I        |
| <i>Eucalyptus camaldulensis</i> Dehn.  | Duumo Bahirzafe     | Myrtaceae      | Tree      | E        |
| <i>Eucalyptus saligna</i> Smith.   | Duumo Bahirzafe     | Myrtaceae      | Tree      | E        |
| <i>Ekebergia capensis</i> Sparrm.  | Oloncho             | Meliaceae      | Tree      | I        |
| <i>Ficus elastica</i> Roxb.  | Yegoma zaf(Amh)     | Moraceae       | Tree      | E        |
| <i>Ficus sur</i> Forssk.   | Odakko              | Moraceae       | Tree      | I        |
| <i>Ficus vasta</i> Forssk.   | Qilto               | Moraceae       | Tree      | I        |
| <i>Foeniculum vulgare</i> Mill.  | Malkata             | Apiaceae       | Herb      | I        |
| <i>Galinsoga quadriradiata</i> Ruiz & Thonn.   | Bexissa             | Asteraceae     | Herb      | E        |
| <i>Gardenia ternifolia</i> Schumach &Thonn.  | Amessa              | Rubiaceae      |           |          |
| <i>Gazania rigens</i> var. <i>rigens</i> (L)Gaertn. var. <i>uniflora</i> (L.f.) Roessler | -                   | Asteraceae     | Herb      | E        |
| <i>Grevillea robusta</i> R.Br.   | Grevilla            | Proteaceae     | Tree      | E        |
| <i>Guizotia scabra</i> (Vis.) Chiov.   | Bole                | Asteraceae     | Herb      | I        |
| <i>Hagenia abyssinica</i> (Bruce)J.F.Gmel.   | Dadako              | Rosaceae       | Tree      | I        |
| <i>Helianthus annuus</i> L.  | Suufi               | Asteraceae     | Herb      | E        |
| <i>Heteropogon contortus</i> (L.)Roem.   | Hixicho             | Poaceae        | Herb      | I        |
| <i>Hibiscus rosa-sinensis</i> L.   | -                   | Malvaceae      | Shrub     | E        |
| <i>Hibiscus sp.</i>  | -                   | Malvaceae      | Shrub     | E        |
| <i>Hippeastrum puniceum</i> (Lam.) Kuntze  | -                   | Amaryllidaceae | Herb      | E        |
| <i>Hyparrhenia rufa</i> (Neefs)Stapf   |                     | Poaceae        | Herb      | I        |

|  |             |                |       |   |
|--|-------------|----------------|-------|---|
| <i>Hypericum revolutum</i> Vahl                | Garaanbicho | Hypericaceae   | Shrub | I |
| <i>Impatiens tinctoria</i> A.Rich.             | Hanshuluule | Balsaminaceae  | Herb  |   |
| <i>Indigofera spicata</i> Forssk. Var. spicata | -           | Fabaceae       | Herb  | E |
| <i>Ipomoea purpurea</i> (L.) Roth              | -           | Convolvulaceae | Cl    | I |

## Appendix1. Cont'd

| Scientific name  | Local name(Sidama) | Family        | Life form | Nativity |
|--|--------------------|---------------|-----------|----------|
| <i>Iresine herbstii</i> Hook. ex Lindl.                              | -                  | Amaranthaceae | Herb      | E        |
| <i>Jacaranda mimosifolia</i> D. Don.                                 | Temenjazaf         | Bignoniaceae  | Tree      | E        |
| <i>Jatropha curcas</i> L.  | Jatropha           | Euphorbiaceae | Shrub     | E        |
| <i>Juniperus procera</i> Hochst. ex Engl.                            | Honcho             | Cupresaceae   | Tree      | I        |
| <i>Justicia schimperiana</i> (Hochst. ex Nees)                       | Cikkicho           | Acanthaceae   | Shrub     | I        |
| <i>Kalanchoe lanceolata</i> (Forssk.) Perr.                          | Hanculuulle        | Crassulaceae  | Herb      | I        |
| <i>Kalanchoe petitiiana</i> A. Rich.                                 | Hanculuulle        | Crassulaceae  | Herb      | I        |
| <i>Lantana camara</i> L.   | Ceate xoxxo        | Verbenaceae   | Shrub     | E        |
| <i>Launaea cornuta</i> (Oliv. & Hiern) C. Jeffrey                    | -                  | Asteraceae    | Herb      | E        |
| <i>Leucas martinicensis</i> (Jacq.) R. Br.                           | Raaskimir          | Lamiaceae     | Herb      | I        |
| * <i>Lippia adoensis</i> Hochst. Ex Walp.                            | Ha'nashsho         | Verbenaceae   | Shrub     | I        |
| <i>Loxogramme abyssinica</i> (Baker) M. G. Price                     | Kaarroolee         | Polypodiaceae | Fern      | I        |
| <i>Lycopersicon esculanta</i> L.                                     | Timatim            | Solanaceae    | Herb      | E        |
| <i>Maesa lanceolata</i> Forssk.                                      | Gowancho           | Myrtaceae     | Shrub     | I        |
| <i>Maytenus arbutifolia</i> (A. Rich.) Wilczek                       | Cucco              | Celastraceae  | Tree      | I        |
| <i>Mangifera indica</i> L.   | Mango              | Anacardiaceae | Tree      | E        |
| <i>Malva neglecta</i> Waller.  | Malacho            | Malvaceae     | Herb      | I        |
| <i>Melia azedarach</i> L.  | Neem, kiniin       | Meliaceae     | Tree      | E        |
| <i>Menta spicata</i> L.  | Nana               | Lamiaceae     | Herb      | I        |
| * <i>Milletia ferruginea</i> (Hochst.) Bak.                          | Hengedicho         | Fabaceae      | Tree      | I        |
| <i>Momordica foetida</i> Schumach.                                   | Kire               | Cucurbitaceae | Climber   | I        |
| <i>Morus alba</i> L.   | Enjori/Gora        | Moraceae      | Shrub     | E        |
| <i>Moringa stenopetala</i> (Bak.) Cuf.                               | Shiferaw           | Moringaceae   | Tree      | I        |
| <i>Musa paradisiaca</i> L.   | Muzi               | Musaceae      | Herb      | E        |
| <i>Nerium oleander</i> L.  | -                  | Apocynaceae   | Shrub     | E        |
| <i>Nicotiana tobaccum</i> L.   | Araddo             | solanaceae    | Herb      | I        |
| <i>Ocimum lamiifolium</i> Hochst. ex Benth.                          | Machete xagicho    | Lamiaceae     | Shrub     | I        |
| <i>Olea europaea</i> L. ssp. <i>Cuspidata</i> (Wall. ex G. Don) Cif. | Ejersu             | Oleaceae      | Tree      | I        |
| <i>Phoenix reclinata</i> Jacq.                                       | Saticho            | Arecaceae     | Tree      | I        |
| <i>Parthenium hysterophorus</i> L.                                   | -                  | Asteraceae    | Herb      | E        |
| <i>Pavonia urens</i> Cav.  | -                  | Malvaceae     | Herb      | E        |
| <i>Pelargonium x hortorum</i> L. H. Bail.                            | -                  | Geraniaceae   | Herb      | E        |

|   |            |                |       |   |
|---|------------|----------------|-------|---|
| <i>Pennisetum thunbergii</i> Kunth.       | -          | Poaceae        | Herb  | I |
| <i>Persea americana</i> Mill.             | Abukato    | Lauraceae      | Tree  | E |
| <i>Phalaris arundinaceae</i> L.           | -          | Poaceae        | Herb  | E |
| <i>Phytolacca dodecandra</i> L'Herit.     | Haranjicho | Phytolaccaceae | Shrub | I |
| <i>Premna schimperi</i> Engl.             | Tulanji    | Lamiaceae      | Tree  | I |
| <i>Pinus patula</i> L.                    | -          | Pinaceae       | Tree  | E |
| <i>Plumbago auriculata</i> Lam.           | -          | Plumbagnaceae  | Shrub | E |
| <i>Podocarpus falcatus</i> (Thunb.) Mirb. | Dagucho    | Podocarpaceae  | Tree  | I |
| <i>Psidium guajava</i> L.                 | Zeyituna   | Myrtaceae      | Shrub | E |

## Appendix1. Cont'd

| Scientific name                                       | Local name(Sidama) | Family           | Life form | Nativity |
|---|--------------------|------------------|-----------|----------|
| <i>Prunus africana</i> (Hook.f.)Kalkm                 | Garbicho           | Rosaceae         | Tree      | I        |
| <i>Rhamnus prinoides</i> L'Herit                      | Xaddo              | Rhamnaceae       | Shrub     | I        |
| <i>Ricinus communis</i> L.                            | Qenbo'o            | Euphorbiaceae    | Shrub     | I        |
| <i>Rosa richardii</i> Hart.                           | Tsgereda           | Rosaceae         | Shrub     | E        |
| <i>Rosmarinus officinalis</i> L.                      | Maalaasincho       | Lamiaceae        | Shrub     | E        |
| <i>Rubus steudneri</i> Sehweinf.                      | Gora               | Rosaceae         | Shrub     | I        |
| <i>Rumex abyssinicus</i> Jacq.                        | Shishone           | Polygonaceae     | Shrub     | I        |
| <i>Rumex nepalensis</i> Spreng.                       | Bexxo              | Polygonaceae     | Herb      | I        |
| <i>Ruta chalepensis</i> L.                            | Sunkurta           | Rutaceae         | Herb      | I        |
| <i>Salvia leucantha</i> Cav.                          | -                  | Lamiaceae        | Herb      | E        |
| <i>Salvia splendens</i> Sellow exRoem.& Schult.       | -                  | Lamiaceae        | Herb      | E        |
| <i>Scadoxus multiflorus</i> (Martyn)Raf.              | Arfaasa            | Amaryllidaceae   | Herb      | I        |
| <i>Sansevieria trifasciata</i> Prain.                 | -                  | Asparagaceae     | Herb      | E        |
| <i>Schinus molle</i> L.                               | -                  | Anacardiaceae    | Tree      | E        |
| <i>Senna alexandrina</i> Mill.                        | -                  | Caesalpinioideae | Shrub     | I        |
| <i>Senna spectabilis</i> (DC.)H.S.Irwinand R.C.Bameby | -                  | Caesalpinioideae | Tree      | E        |
| <i>Senna didymobotrya</i> (Fresen.) Irwin &Barneby    | Hamashaqa          | Caesalpinioideae | Shrub     | I        |
| <i>Senna occidentalis</i> (L.)Link                    | Hamashaqa          | Caesalpinioideae | Shrub     | I        |
| <i>Sesbania sesban</i> (L.) Merr.                     | Arbeti             | Fabaceae         | Shrub     | I        |
| <i>Sida ovata</i> Forssk.                             | Qirqixxe           | Malvaceae        | Shrub     | I        |
| <i>Sisyrinchium californicum</i> KerGawler)Dryander   | -                  | Iridaceae        | Herb      | E        |
| <i>Solanum anguivii</i> Lam.                          | Borbordhi'cho      | Solanaceae       | Herb      | I        |
| <i>Solanum nigrum</i> L.                              | Xunaaye            | Solanaceae       | Herb      | I        |
| <i>Solanum tuberosum</i> L.                           | Dinicha            | Solanaceae       | Herb      | I        |
| <i>Spathodea campanulata</i> P.Beauv. ssp. nilotica.  | Spathoda           | Bignoniaceae     | Tree      | E        |
| <i>Sporobolus pellucidus</i> Hochst.                  | Miciica            | Poaceae          | Herb      | I        |
| <i>Syzygium guineense</i> (Wild.)DC.                  | Duwancho           | Myrtaceae        | Tree      | I        |
| <i>Tagetes minuta</i> L.                              | -                  | Asteraceae       | Herb      | E        |

|   |                   |               |                |   |
|---|-------------------|---------------|----------------|---|
| <i>Tagetes patula</i> L.                    | Yeresa-abeba(Amh) | Asteraceae    | Herb           | E |
| <i>Teclea nobilis</i> Del.                  | Ha'dhessa         | Rutaceae      | Shrub          | I |
| <i>Tecoma capensis</i> (Thunb.) Spach       | -                 | Bignoniaceae  | Shrub          | E |
| <i>Tecoma stans</i> (L.) Juss ex kunth      | -                 | Bignoniaceae  | Shrub          | E |
| <i>Terminalia stuhlmanni</i> Engl.          | -                 | Combretaceae  | Tree           | E |
| <i>Thuja orientalis</i> L.                  | -                 | Cupresaceae   | Tree           | E |
| <i>Thevetia peruviana</i> Luckey Nut(Eng.)  | -                 | Apocynaceae   | Shrub          | E |
| <i>Tradescantia pallida</i> (Rose)D.R.Hunt. | -                 | Commelinaceae | Herb           | E |
| <i>Tradescantia zebrina</i> Bosse           | -                 | Commelinaceae | Herb/succulent | E |

**Appendix1. Cont'd**

| <b>Scientific name</b>                       | <b>Local name(Sidama)</b> | <b>Family</b>  | <b>Life form</b> | <b>Nativity</b> |
|--|---------------------------|----------------|------------------|-----------------|
| <i>Tradescantia spathacea</i> Sw.            | -                         | Commelinaceae  | Herb             | E               |
| <i>Vinca minor</i> L.                        | -                         | Apocynaceae    | Herb             | E               |
| <i>Vernonia amygdalina</i> Del.              | Hecho                     | Asteraceae     | Shrub            | I               |
| <i>Vernonia auriculifera</i> Hiern.          | Rejicho                   | Asteraceae     | Shrub            | I               |
| <i>Washigtonia robusta</i> (Lindl.) H.Wendl. | Saticho                   | Arecaceae      | Tree             | E               |
| <i>Withania somnifera</i> (L.) Dunal in Dc.  | Gizawa, Bula              | Solanaceae     | Herb             | I               |
| <i>Zephyranthes candida</i> (Lindi.)Herb.    | -                         | Amaryllidaceae | Herb             | E               |

Keys: I = Indigenous (native) plant, E = Exotic \_ = No local name, Amh = Amharic name, Or = Oromo name

