Research

Ethnomedical survey of Berta ethnic group Assosa Zone, Benishangul-Gumuz regional state, mid-west Ethiopia
Teferi Flatie¹, Teferi Gedif¹, Kaleab Asres*² and Tsige Gebre-Mariam¹

Address: ¹Department of Pharmaceutics, School of Pharmacy, Addis Ababa University, PO Box 1176, Addis Ababa, Ethiopia and ²Department of Pharmacognosy, School of Pharmacy, Addis Ababa University, PO Box 1176, Addis Ababa, Ethiopia

Email: Teferi Flatie - teferif@yahoo.com; Teferi Gedif - teferig@phar.aau.edu.et; Kaleab Asres* - kasres@phar.aau.edu.et; Tsige Gebre-Mariam - tsigegmw@phar.aau.edu.et

* Corresponding author

Abstract

Traditional medicine (TM) has been a major source of health care in Ethiopia as in most developing countries around the world. This survey examined the extent and factors determining the use of TM and medicinal plants by Berta community. One thousand and two hundred households (HHs) and fourteen traditional healers were interviewed using semi-structured questionnaires and six focused group discussions (FGDs) were conducted. The prevalence of the use of TM in the two weeks recall period was 4.6%. The HH economic status was found to have a significant effect while the educational level and age of the patients have no effect either on the care seeking behavior or choice of care. Taking no action about a given health problem and using TM are common in females with low-income HHs. Forty plant species belonging to 23 families were reported, each with local names, methods of preparation and parts used. This study indicates that although the proportion of the population that uses TM may be small it is still an important component of the public health care in the study community as complementary and alternative medicine.

Background

Since time immemorial, human beings have found remedies within their habitat, and have adopted different therapeutic strategies depending upon the climatic, phytogeographic and faunal characteristics, as well as upon the peculiar cultural and socio-structural typologies[1].

Ethiopian traditional medicine (TM) comprises of the use of plants, animals and mineral products as well as beliefs in magic and superstition, although ethnobotany is the major one[2,3]. Studies reported that a significant proportion of the Ethiopian population still depends on TM for its health care services[4,5] and more than 95% of traditional medical preparations are of plant origin[6]. Documenting traditional medical knowledge is important to facilitate discovery of new sources of drugs and promote sustainable use of natural resources. On the other hand, the knowledge of the factors involved in the selection of treatment options at household (HH) level is important for health service planning and to incorporating herbal medicine in a country's health care delivery system.

Despite its significant contributions, TM in Ethiopia has attracted very little attention in modern medical research and development, and less effort has been made to upgrade the role of TM practice[7]. This study, therefore, attempts to identify and document factors determining the use of TM and medicinal plants used by Berta ethnic groups, Assosa Zone, mid-west Ethiopia.
Methods

Study area

Benishangul Gumuz Regional State (BGRS) is one of the nine Federal States of Ethiopia located in the mid-western part of the country and having a total area of about 50,382 Km². According to the 2001 Population and Housing Census of Ethiopia, the total population of Benishangul-Gumuz region was 460,459 which gives a population density of 9/Km². Assosa zone, one of the three zones and two special Woredas (second from lowest administrative units in government structure) in the region, has a total area of 1,519 Km² and a population of 28,970 (population density of 19.1/Km²).

The indigenous population of BGRS consists of five ethnic groups: Gumuz, Berta, Shinasha, Mao and Komo accounting for 23.4%, 26.7%, 7.0%, 0.6% and 0.2% of the total population, respectively. The Berta ethnic group resides mainly in the 7 Woredas of Assosa Zone (Figure 1) and more than 96.3% of the population of this ethnic group is Muslims[8].

The livelihood of nearly 95% of the population is subsistence farming. The enhancement of even this subsistence farming is precluded by the small number of livestock, which is commonly attacked by enzootic diseases, and frequently by paroxysms of epizootic episodes[9].

At the time of this survey, the region had 2 hospitals, 7 health centers, 75 health stations and 44 health posts of which 1 hospital, 3 health centers and 44 health posts are located in Assosa Zone[10,11]. In 2001, the top ten causes of morbidity in the region were; malaria (43.8%), helminths (13.6%), respiratory diseases (9.4%), dysentery (6.9%), gastritis and duodenitis (5.5%), rheumatism (5.3%), pyrexia of unknown origin (4.4%), skin diseases (4.1%), unspecified anemia (3.8%) and diseases of the digestive system (3.2%)[11].

Data collection and analysis

The Institutional Ethical Board Review of the School of Pharmacy has given permission to conduct the study prior to the commencement of the survey. Information on demographic characteristics, prevalence of perceived illnesses, factors associated with preference of health care seeking options, medicinal plants used and hoarded as well as some healers' socio-economic characteristics were collected using two sets of semi-structured questionnaires – one for HH heads and the other for traditional healers. Moreover, focused group discussions (FGDs) were conducted with six heterogeneous groups with respect to sex, age and income levels. Each FGD consists of 7–9 members.

From the 7 Woredas of Assosa Zone, two Woredas namely, Menge and Komehsa were selected by simple random sampling technique. Proportionate to the size of the population, 7 Kebeles (lowest administrative units) from Menge and 3 Kebeles from Komehsa were selected randomly. The number of HHs included from each selected Kebele was again determined based on the size and identified using systematic random sampling techniques where every nth HH was taken until the required size was met in each Kebele. A total of 1,200 HHs were selected.

Figure 1
Map of Assosa Zone (Finance and Economic Bureau, Benishangul-Gumuz Region).
Similarly, fourteen key informant healers were selected on the basis of their healing reputation with the help of Kebele administrators, health professionals in the area and community elders. Data collectors, who are high school students with knowledge of local language, were given training for two days on the data collection instrument.

Oral consent was obtained from each study participant before conducting the interview. Variables like socio-demographic characteristics of HH respondents, HH size, existence of illness during the past two weeks preceding interview date, choice of treatment options, names and parts of plants used, etc were entered in EPI info statistical software and analyzed.

Results
Summary of FGDs
Results of the six FGDs, conducted in six Kebeles of the two Woredas; Abora, Kudiyu and Belmeguha from Menge and Algela, Dareselam and Tselenkor Kebeles of Komesha Woreda are summarized below (the local names of illnesses written in italics and their major signs and symptoms or their closer meanings are shown in Appendix 1).

According to the respondents of the three groups, Menge Woreda, the major health problems identified by FGD participants were Birde, Kuralite, Malaria, Gunfan, Ikek, Azurite, Kurtemat, diarrhoea, Cheguara and Ashmem. In the other three discussions held in Komesha Woreda; malaria, Gunfan, Ikek, diarrhoea and Birde are listed as most prevalent illnesses in the localities. The common illnesses mentioned in both Woredas are similar, the only difference being the rare occurrence of some of these illnesses in Menge Woreda.

Most of the respondents of Menge agreed that modern medicine is the first choice during an episode of illness. They underlined that treatment recommended by modern medicine is strictly followed for the duration of the treatment and in case no improvement was observed from this treatment they would then resort to consulting traditional healers. Two respondents deviated from the opinions of their group in that for most of the illness episodes home made remedies were tried before going to health institutions and they even reported that for certain illnesses such as Ashmem, modern medicines are not believed to work at all.

Most of the respondents in all of the groups in Komehsa agreed that the choice of resorting to traditional healers depends on the specific illness episode to be addressed. For instance, modern treatment is the first choice for illnesses known to have been effectively cured by modern medicine. Malaria and pregnancy related problems are cited as best examples of illnesses with established signs and symptoms and which can be cured by modern medicine. On the other hand, Setan beshita, is believed to be an illness that can only be treated by traditional healers. Three respondents from two independent groups argued that for every illness episode, the use of home remedies is the first choice before consulting traditional healers. The patient only resorts to traditional healers only if the symptoms persist for two days or more following the administration of the home remedies. These deviants, however, agreed that modern medicine might be the first choice in case no one in the family or neighborhood claims to know TM for that specific illness.

Most of the medicinal plants, according to the respondents of Menge, are obtained from wild sources and there is no special protection or care given to these plants and they are treated just like any other plant that has no claims to medicinal values. Almost all of the respondents of Komesha also agreed that medicinal plants are obtained from wild sources except for some of the medicinal plants that are cultivated for added values. According to the respondents, the wild medicinal plants are treated just like other wild trees although some of these are even available only during the rainy season.

The members of all groups in Menge reported that the transfer of knowledge from generation to generation was by word of mouth, a practice that is being less commonly used these days. They admitted, however, that their forefathers collected and used medicinal plants for most of the illnesses that are treated today by modern medicine. The younger generation today has no or little interest in acquiring knowledge in TM and resort to it only after exhausting all treatment options by modern medicine.

All of the respondents in Komehsa agreed that knowledge of TM is given to mankind by God and transferred from generation to generation by word of mouth. However, they admit that this method for the transfer of knowledge is declining at a very fast rate from generation to generation. The respondents underlined that medicinal plants in use today are known to only a limited number of people in the communities and that the majority of users depend on either proxy knowledge or purchase herbs for illnesses they very well know to be effectively cured by herbs. This decline in the preservation of knowledge about TM is the result of lack of trust and confidence in the use of TM by the young generation on the one hand and, unwillingness on the part of traditional practitioners to share their traditional knowledge with the younger generation on the other.

The FGD participants reported that TM is an important alternative health care to the society for two reasons:
a) Some diseases are not treatable by modern medicines (for instance, Ashmem) for which TM is the only option and,

b) In some health facilities there is shortage of adequate diagnostic facilities and drugs, as a result of which appropriate treatment cannot be provided to the patients, who would then resort to TM.

As explained above, while the role of TM for the health care of the society is quite evident, traditional healers and members of the society believe that TM practice is not encouraged by the government which is in the opinion of the respondents tantamount to a criminal act.

**Perceived illnesses and patterns of resort**
Among the 7,130 people in the HHs studied, a total of 570 illness episodes were reported, which gives a prevalence rate of 8.0%, in the two weeks recall period preceding the interview date. Females (57.5%), had more morbidity than males (42.5%). In response to the perceived illnesses, 85.8% went to health institutions, 3.5% went to healers and 1.1% used home made remedies while 9.6% took no action (Table 1). TM was found to be a more frequent choice of care for females (5.2%) than males (3.7%) with perceived illnesses in the two weeks recall period.

Among the respondents who claimed to have used TM, most (54.8%) believed that TM is more effective, 24.2% claimed the use of TM only when modern medicine failed, while 19.1% preferred TM because of its low cost and the remaining 1.9% claimed that lack of access to modern medicine prompted them to resort to TM.

**Factors associated with patterns of actions taken**
As shown in Table 2, economic status of the HHs appears to influence the health seeking behavior and preference of treatment options. In this regard, there was a decrease in the percentages of no action respondents from 58.2% among low-income group to 30.9% and 10.9% among middle income and higher income groups, respectively. The economic status of the HHs was found to have a significant influence on whether to take actions or not during episodes of illnesses ($X^2 = 9.98, P < 0.05$) (Table 3).

The influence of education on treatment preference was analyzed and it was found that although non-literates tended to use TM more than literates, the relationship was not statistically significant (Table 3 and table 4).

In the study community there was a preferential care seeking behavior both by sex and age in which children below the age of 15 are given priority over adults and males over females. The stratified analysis (income as stratification variable) showed that actions taken against illness had significant association with sex in low-income respondents, and age did not show significant association with action taken against illness (Tables 3 and 5).

**Use of medicinal plants**
A total of 40 species of plants with claimed medicinal values were collected and botanically identified during the course of this study. HH respondents reported the use of 37 plant species (Table 6) while only 10 herbs were found to be utilized by healers (Table 7). Among these plants, 28 are fully identified by their scientific names while 12 are identified at the genus level only. The identified plants fall under twenty-three plant families with the largest number falling under Fabaceae followed by Euphorbiaceae and Asteraceae.

According to the HH respondents, root was the most widely used plant part (46.4%) followed by seed (14.3%), leaf (12.2%), fruit (11.2%), bark (7.7%), and stem (3.6%) while in the remaining (4.6%) combination of one or more plant parts were used. Healers also reported the use of roots in 63.3%, seeds in 17.1% and leaves in 14.6% of the plants.

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Table 1: Actions taken against perceived illnesses in two weeks recall period among members of Berta ethnic group Assosa Zone, June-July 2006

| Demographic characteristics | No Action taken | Went to healers | Used home made remedy | Went to health institutions | Total |
|----------------------------|----------------|----------------|----------------------|----------------------------|-------|
| Sex                        |                |                |                      |                            |       |
| Female                     | 39(11.9)       | 13(4.0)        | 4(1.2)               | 272(82.9)                  | 328(57.5) |
| Male                       | 16(6.6)        | 7(2.9)         | 2(0.8)               | 217(89.7)                  | 242(42.5) |
| Age                        |                |                |                      |                            |       |
| ≤ 5                        | 11(5.9)        | 5(2.7)         | 0(0.0)               | 169(91.4)                  | 185(32.5) |
| 5–15                       | 21(12.4)       | 3(1.8)         | 1(0.6)               | 144(85.2)                  | 169(29.7) |
| 15–65                      | 22(10.8)       | 9(4.4)         | 5(2.5)               | 167(82.3)                  | 203(35.6) |
| >65                        | 1(7.7)         | 3(23.1)        | 0(0.0)               | 9(69.2)                    | 13(0.2)  |
| Total                      | 55(9.6)        | 20(3.5)        | 6(1.1)               | 489(85.8)                  | 570(100.0) |
The major proportion of plants was collected from wild sources (77.0%) while 13.2% was cultivated and the remaining 9.8% was from both sources. Medicinal plants are stored by few HHs (11.7%) and of these plants, 30.8% are kept for unspecified period (long), 34.0% for one year and the remaining between one day and one year.

Diarrhea is frequently reported to be the disease which responds best to TM followed by malaria, evil eye, \textit{Lib himem}/\textit{Lib dikam}, headache, \textit{Gunfan} and \textit{Yehistanat beshtita}. However, doses were not well established for most of the claimed treatments (71.6%) i.e. quantities were unknown or approximate in 58.6% of the plants and duration of treatment is undetermined in 13.0% of the cases.

**Discussion**

A number of surveys indicated that some illnesses are believed not to be cured by modern health care. For instance, demon possession and infertility are typical health problems for which people visit traditional healers in Kalabo District, Zambia\cite{12}. Similarly, in this study society, \textit{Ashmem}, \textit{Setan} and \textit{Ebdet} are believed to be cured only by TM. Therefore, TM remains important component of public health care in the study community.

Even though low prevalence of herbal drug use was reported in this study, the reasons for preferring herbal drugs were perceived to be due to efficacy of TM, and perhaps also due to economic and geographic inaccessibility of modern medicine. These reasons of preference and the fact that more females (7.2%) prefer visiting traditional healers than males (5.6%) are consistent with finding of other studies conducted in different communities in Ethiopia\cite{5,14,15}.

This study showed an increase in the rate of “no actions taken” against illness episodes with a decrease in economic status (negative relationship) and this association is found to be statistically significant (\(P < 0.05\)). Other studies also came up with a statistically significant association between socio-economic status and choice of health care provider, and health care is less likely to be sought when the individual or HH is poor\cite{16,17}.

**Table 2: Effect of economic status on the action taken against illness, Berta ethnic members Assosa Zone, June-July 2006**

| Action taken | Economic status |
|--------------|-----------------|
|              | Low | Middle | High | Total |
| No action taken | 32 (58.2) | 17 (30.9) | 6 (10.9) | 55 (100.0) |
| Went to healers | 17 (85.0) | 2 (10.0) | 1 (5.0) | 20 (100.0) |
| Used home made remedies | 3 (50.0) | 1 (16.7) | 2 (33.3) | 6 (100.0) |
| Went to health institutions | 239 (48.9) | 188 (38.4) | 62 (12.7) | 489 (100.0) |
| Total | 291 (51.1) | 208 (36.5) | 71 (12.5) | 570 (100.0) |

**Table 3: Factors affecting patterns of resort among Berta ethnic members, Assosa Zone June-July 2006**

| Associated Factor | Chi-Square | Yates corrected | Degree of freedom | P-Value |
|-------------------|------------|-----------------|-------------------|---------|
| Economic Status   | 9.9795     | 2               | <0.00408          |         |
| Educational status (non-stratified) | 2.0019 | 1 | <0.1571 | |
| Educational status (low income stratum) | 0.3952 | 1 | <0.5296 | |
| Educational status (middle and high income stratum) | 1.2496 | 1 | <0.2636 | |
| Age of the ill (non-stratified) | 9.4660 | 2 | <0.0088 | |
| Age of the ill (low income stratum) | 0.5248 | 1 | <0.4688 | |
| Age of the ill (middle and high income) | 0.0584 | 1 | <0.8090 | |
| Sex (non-stratified) | 5.1409 | 2 | <0.0765 | |
| Sex (low income stratum) | 4.0720 | 1 | <0.0436 | |
| Sex (middle and high income stratum) | 0.7509 | 1 | <0.3862 | |
This study, consistent with a study conducted in Zambia[12], showed that educational level has no significant effect on the choice of health care, while other studies reported the existence of a statistically significant association between educational level and choice of health care provider[5,17].

In this study, a significant association existed between female and no-action taking during illness in the low-income HHs (P < 0.05). A study conducted in Nepal also indicated that illness reporting, choosing an external care, choosing a specific health care provider, and spending money to treat the sick child are all associated with sex of the patient[18]. Moreover, being a woman is more highly associated with visiting traditional healers than modern health facilities[5,19]. Even though a priority in resource allocation for children (<15 years) in preference to adults was reported by participants of group discussion, the association of the age of the patient with health care seeking pattern was not statistically significant in all income groups (P > 0.05).

Similar to other studies carried out in northwestern Ethiopia among the people of Shinasha, Agew-awi and Amhara, the family Fabaceae was reported to have the largest number of plant species used for medicinal purposes among the Bertha ethnic group[20]. Awas et al. [21] also reported that the Fabaceae is the most widely used plant family among the Bertha and Gumez people.

In agreement with other ethnomedical studies conducted in different parts of Ethiopia, the present study has also documented the roots as the most commonly sought-after plant parts[22-24]. Moreover, the results of the present study are consistent with reports in previous studies done in south-western Ethiopia where a large proportion of medicinal plants are collected from wild sources[25-27]. It is well recognized by conservationists that medicinal plants primarily valued for their root parts and those which are intensively harvested for their bark often tend to be the most threatened by over-exploitation[28]. Thus, it is recommended that an urgent and concerted action be taken to conserve widely used medicinal plants in general and those plants for which the roots constitute the primarily valued part in particular before they are lost irretrievably.

**Conclusion**

In conclusion, Assosa zone harbors high diversity of medicinal plants most of which are rare species and seasonal plants. Despite the reported low prevalence of TM use, herbal medicine remains important component of public health care in the study community as it is the only option for some illnesses and also the next alternative when modern medicine fails. Since roots are the most widely used plant parts and plants are mostly collected from wild sources, the risk of loss of biodiversity in the Zone is high. Doses are not established or are approximate for most treatments and most herbs are stored for unspecified period. Thus there is a risk of treatment failure due to loss of potency, if any, during storage with possible formation of poisonous products. The risk of loss of indigenous knowledge appears to be high in connection with lack of transfer of knowledge among family members and

**Table 4: Preference of care of household respondents by their level of literacy of Berta ethnic members Assosa Zone, June 2006**

| Literacy                         | Preference | Modern health institutions | Total |
|----------------------------------|------------|---------------------------|-------|
|                                  | Traditional practitioners |                         |       |
| Respondents without formal education | 51         | 663                       | 714   |
| Respondents with formal education | 23         | 444                       | 467   |
| Total                            | 74         | 1107                      | 1181  |

**Table 5: Actions taken by household respondents by socio-demographic characteristics of those with reported illness in two weeks recall period, Berta ethnic members Assosa Zone, June-July 2006**

| Variables                         | No Action | Used traditional medicine | Went to health institutions | Total |
|-----------------------------------|-----------|---------------------------|-----------------------------|-------|
| Sex                               |           |                           |                             |       |
| F                                 | 39        | 17                        | 272                         | 328   |
| M                                 | 16        | 9                         | 217                         | 242   |
| Age                               |           |                           |                             |       |
| ≤ 15                              | 32        | 9                         | 313                         | 354   |
| > 15                              | 23        | 17                        | 176                         | 216   |
| Total                             | 55        | 26                        | 489                         | 570   |
Table 6: Medicinal plants reported by household respondents of Berta ethnic group, Assosa Zone, Benishangul-Gumuz Regional State, June-July 2006

| Scientific name                      | Family               | Vernacular name | Collection No. | Indication(Citation)          | Part used | Preparation                                                      |
|--------------------------------------|----------------------|-----------------|----------------|------------------------------|-----------|------------------------------------------------------------------|
| *Acacia* sp.                         | Fabaceae             | Mezel           | TF-145         | * Gunfan (4), Headache       | Fruit     | Ground, boiled with water and drunk                              |
| *Achyranthus aspera* L.              | Amaranthaceae        | Dumugelo        | TF-031         | Fever                        | Leaf      | Boiled with water and drunk                                     |
| *Acmella caulirhiza* Del.            | Asteraceae           | Esetgne andewu  | TF-171         | * Tse Himem (4)              | Root      | Ground and put in-between teeth                                 |
| *Aristolochia bracteolata* Lam.      | Aristolochiaceae     | Abujenajil      | TF-186         | Diarrhoea (2), * Lib Himem (3) | Seed      | Ground, dispersed in water and drunk; also applied on the body  |
| *Breonadia salicina* (Vahl) Hepper & Wood | Rubiaceae         | Digel           | TF-203         | * Yehitsan beshita           | Stem      | Ground, dispersed in water and drunk                            |
|                                      |                      |                 |                | * Kurtemat                   | Seed      | Put into fire and exposed to its smoke                           |
|                                      |                      |                 |                | * Setan (2)                  | Stem Root |                                                                 |
| Bridelia sp.                         | Euphorbiaceae        | Sheketful       | TF-200         | Headache (4), * Gunfan       | Root      | Ground and applied on the head and drunk with water for * Gunfan |
| Calotropis procera (Ait.) Ait.f.     | Asclepiadaceae       | Aberdade        | TF-188         | Antidot for scorpion bite (2) | Latex     | Fresh leaves are cut and the exuding latex applied to affected area |
| *Calpurnia aurea* (Ait.) Benth.      | Fabaceae             | Esetgne eru     | TF-194         | * Yehitsan beshita (9)       | Root      | Ground and drunk with water                                     |
| *Carissa spinarum* L.               | Apocynaceae          | Esetgne gundew  | TF-042         | * Yewgeb medhanit            | Root      | Ground, dispersed in water and drunk                            |
| *Cassampeas pareira* L.              | Menispermaceae       | Abujelaji       | TF-190         | Diarrhoea (6), Abdominal cramp (1), * Lib Himem (3) | Root      | Ground and drunk with water                                     |
|                                      |                      |                 |                | * Etseye Egne                 | Seed      |                                                                 |
| *Clematis* sp.                       | Ranunculaceae        | Esetgn egne     | TF-202         | Headache                     | Root      | Ground and drunk with water                                     |
|                                      |                      |                 |                | * Yetut medhanit              | Seed      | Ground, dispersed in water and drunk; also applied on the affected area |
|                                      |                      | Shekedful       |                | Snake repellant (2), * Gunfan | Seed      | Ground, dispersed in water and sprayed in areas around house; also smoked like cigarette for * Gunfan |
| *Clerodendrum myricoides* (Hochst.) R. Br. ex Vakke | Verbenaceae          | Bishchereh      |                | * Cheguara                   | Root      | Ground, dispersed in water and drunk                            |
|                                      |                      | Esetgne shaleha | TF-184         | * Birde(2)                   | Fruit     | Ground, dispersed in water and drunk; also applied on the affected area |
|                                      |                      | Esetya shalaw   |                | * Birde (2)                  | Root      | Boiled with water and drunk like soup                            |
|                                      |                      | Etseye hoho     |                | * Gunfan                     | Root      | Ground, dispersed in water and drunk                            |
| *Combretum* sp.                      | Combretaceae         | Keye            | TF-206         | Diarrhoea, * Lib Himem       | Bark      | Eaten as it is or ground, dispersed in water and drunk           |
| *Croton macrostachyus* Del.          | Euphorbiaceae        | Abnga           | TF-067         | Anti-dot for snake and corpion venom (3) | Bark      | Ground into powder and applied to affected area                  |
| *Doyolis* sp.                        | Flacourtiaceae       | Etseya bishu    | TF-207         | * Lib Himem (2)              | Root      | Ground and drunk with water                                     |
| *Echinops* sp.                       | Asteraceae           | Esetgne setan   | TF-185         | * Setan (3)                  | Root      | Dried, put in fire and patient is exposed to the smoke          |
| *Flicoutria indica* (Burm.f.) merr.  | Flacourtiaceae       | Agnaneshewe     | TF-204         | * Cheguara (1), Malaria (1)  | Fruit     | Eaten as it is                                                  |
| *Grewia mollis* Juss                 | Tiliaceae            | Hurinotse       | TF-010         | * Dem mefses lemakone (2)    | Stem      | Cut into pieces and put on the bleeding part together with the leaf |
| *Grewia trichocarpa* Hochst ex A. Rich. | Tiliaceae          | Horgnatse       | TF-195         | * Dem mefses lemakom         | Bark      | Tied on the part to cover the cut and stop bleeding              |
| *Indigofera spinata* Forssk          | Fabaceae             | Atahuna         | TF-192         | Nausea                       | Seed      | Ground to fine powder and drunk                                 |
|                                      |                      | Esetgne Murkewu |                | Chronic patient              | Root      | Ground, dispersed in water and drunk                            |
| Plant Name | Family          | Part Used | Preparation                                      | Therapy                                                                                     |
|------------|----------------|-----------|--------------------------------------------------|---------------------------------------------------------------------------------------------|
| Lennea sp. | Anacardiaceae   | Root      | Ground, dispersed in water and drunk             | Ground, mixed with hot water and drunk; or tied around broken area for Sibera.               |
| Melia azedarach L. | Meliaceae | Bark | Leaf boiled with water and drunk                  | Leaf boiled with water and drunk                                                             |
| Ocimum canum Sims. | Lamiaceae | Leaf | To get dirt out of eyes (3), Trachoma (1)         | Powdered seeds are sprinkled into the eye                                                      |
| Phyllanthus linnuensis Cufod. | Euphorbiaceae | Leaf | Ground leaf is drunk with water                   | Ground leaf is drunk with water                                                              |
| Piliostigma thonningii (Schumach.) Milne-Redh | Fabaceae | Root | Ground, dispersed in water and drunk              | Ground and drunk with water                                                                   |
| Plectranthus sp. | Lamiaceae | Root | Dried, put in fire and patient is exposed to the smoke | Dried, put in fire and patient is exposed to the smoke                                        |
| Pseudocedrela kotschyi (Schweinf.) Harms | Meliaceae | Root | Eaten as it is                                     | Eaten as it is                                                                               |
| Pterolobium stellatum (Forsk) Brenan | Fabaceae | Root | Diarrhoea                                         | Root (after removing the cover) boiled together with Acacia sp. in water and drunk            |
| Ricinus communis L. | Euphorbiaceae | Leaf | Immersed in warm water and used to massage the area | Immersed in warm water and used to massage the area                                           |
| Securidaca longipesedunculata Fresen. | Polygonaceae | Root | Ground and applied to the head                    | Ground and applied to the head                                                                 |
| Senna sp. | Fabaceae        | Stem      | Ground and drunk with water for diarrhea; powder tied on fractured bone | Ground and drunk with water for diarrhea; powder tied on fractured bone                      |
| Syzygium guineense (Willd.) DC. | Myrtaceae | Stem | Root is ground, dispersed in water and drunk      | Root is ground, dispersed in water and drunk                                                 |
| Tamarindus indica L. | Fabaceae | Root | Root is ground, dispersed in water and drunk      | Root is ground, dispersed in water and drunk                                                   |
| Vernonia sp. | Asteraceae      | Stem      | Root is ground, dispersed in water and drunk      | Root is ground, dispersed in water and drunk                                                   |
| Vigna sp. | Fabaceae        | Root | Root is ground, dispersed in water and drunk      | Root is ground, dispersed in water and drunk                                                   |
| Ximnea sp. | Olacaceae       | Leaf     | Boiled with water and sugar is added before it is drunk | Boiled with water and sugar is added before it is drunk                                        |
| Ziziphus mauritiana Lam. | Rhamnaceae | Seed    | Leaves are ground, dispersed in water and applied on the wound | Leaves are ground, dispersed in water and applied on the wound                                |

(Illnesses with asterisks are in local terms and the major signs and symptoms or closer meanings are presented in Appendix 1.)
friends. Therefore, it is important that the government create awareness among community members about the significance of preserving traditional knowledge and conserving medicinal plants before they disappear, and thereby ensure the rights of people to use their traditional practices which are known for their proven safety and effectiveness.

Competing interests
The authors declare that they have no competing interests.

Authors' contributions
TF coordinated data collection; performed data entry and analysis; wrote the draft manuscript.

TG, KA and TGM initiated the idea; involved in the design of the study; developed data collection instruments and corrected the manuscript.

Appendix 1: Glossary of meanings of local terms for illnesses

- **Anget ebtete** or **Tibi**: Swelling of the lymph nodes of the neck area
- **Ashmem**: Illness characterized by swelling of finger tips followed by painful sore and leading to loss of finger if untreated. This illness is believed to be caused by accidental contact with a certain worm.
  - **Atintseberat**: Fracture of bone of any part of the body from any cause
  - **Ayene himem**: Eye disorder characterized by severe irritation and redness
  - **Birde**: Coughing and chest pain with or without fever and believed to result from being predisposed to a draft of air.
  - **Buda**: Evil eye
  - **Kanser**: Swelling and fluid accumulation around the neck or breast in ladies
  - **Cheguara**: Burning sensation in the upper alimentary tract (possibly esophagus or stomach)
  - **Dem meses lemakom**: To stop bleeding from cuts
  - **Ye dem manes** or **Azurit**: Illness characterized by dizziness and loss of balance usually while trying to stand-up from a seated position or long exposure to strong sun (similar to symptoms of anemia)

**Table 7: Plants reported by healers of Berta ethnic group, Assosa Zone Benishangul-Gumuz Region, June-July 2006**

| Scientific name                        | Family                | Vernacular name(s) | Collection no. | Indication/s | Part used | Preparation                                      |
|----------------------------------------|-----------------------|--------------------|----------------|--------------|----------|--------------------------------------------------|
| *Achyranthus aspera* L.                | Amaranthaceae         | Dalecha            | TF-031*        | *Shererit    | Leaf     | Rubbed between palms and applied to the affected area |
| *Acmeila caulisata* Del.               | Asteraceae            | Gutecha            | TF-171*        | *Shererit    | Leaf     | Ground, mixed with sesame oil, and also applied to the affected area |
| *Aristolochia bracteolata* Lam.        | Aristolochiaceae      | Abujelalen         | TF-186*        | *Setan (2)   | Root     | Ground, dispersed in water and drank, and applied to body |
| *Colpurnia aurea* (Ait.) Benth.        | Fabaceae              | Estegne eru        | TF-194*        | *Yehitsan beshita | Root     | Ground, dispersed in water then drunk, and also applied on body |
| *Clematis sp.*                         | Ranunculaceae         | Shekedful          | TF-202*        | *Ebdet       | Seed     | Powdered and put in fire with gum Arabic & patient is exposed to the smoke |
|                                        |                       | Shekelful          |                |              |          | Ground and applied on the head                   |
| *Ocimium urticifolium* Roth.           | Lamiaceae             | Anchebu            | TF-101*        | *Mich       | Leaf     | Rubbed between palms and the fluid is applied on the affected area |
| *Pilostigma thonningii* (Schumach.) Milne-Redh Cham. | Fabaceae              | Mekel              | TF-036*        | Bloody diarrhoea | Root     | Ground, dispersed in water and drank             |
| *Sterospermum kunthianum* DC.*         | Bignoniaceae          | Estegne eyo        | TF-111         | Diarrhoea    | Root     | Ground, dispersed in water and drunk             |
| *Syzygium guineense* (Willd.) DC.      | Myrtaceae             | Bul-meste          | TF-008*        | *Hod himem  | Seed     | Ground and applied on the painful area           |
| *Waltheria indica* L.                  | Sterculiaceae         | Albe               | TF-121*        | *Ebdet       | Root     | Ground and dispersed in water then drunk, and also applied on the head |

(In illnesses with asterisks are in local terms and the major signs and symptoms or closer meanings are presented in Appendix 1).
Ebtet: Swelling of body part especially of the abdomen, face and legs.

Ibek: Skin disorder characterized by severe itching sensation (similar to scabies)

Gubet beshita: Disorder characterized by yellow coloring of eyes and urine (jaundice)

Gunfan: Common cold

Hod himem: Abdominal disorder with unknown cause and signs and symptoms that cannot be well stated by the patient

Hod nefat: Stomach distension

Hullum beshita: Acute illnesses of unknown etiology

Kebad tekmat: Diarrhoea that is of high frequency leading to severe loss of fluid

Korekore: Illness characterized by circular swollen spots on the head with mild itching sensation and dry and shading skin and hair around the affected area

Kuakucha: Skin disorder characterized by discoloring spots with mild and intermittent itching sensation (A kind of fungal infection)

Kufigne: Illness characterized by fever, headache, throat pain and skin rash (measles like symptoms)

Kurtemat: Joint pain (symptoms like arthralgia)

Lib himem or Lib dikam: Symptoms characterized by total body weakness and intermittent shock

Majerat beshita: Initial pain at the back of the neck area with subsequent difficulty of neck movement

Megetatemiya himem: Pain and swelling in joint areas of bones (symptoms are similar to symptoms of arthritis)

Mich: Febrile illness characterized by fever, headache, skin rash and muscle spasm

Nifase: Draft and associated muscle pain

Setan beshita: Illness believed to be caused by demon possession and characterized by intermittent convulsion (similar to symptoms of epilepsy)

Shererit: Skin disorder characterized by skin rash (symptoms of herpes)

Shinte lembiatelew or Chebbi: Illness characterized by symptoms of burning sensation and pain during urination (A kind of gonorrhea)

Tirs himem: Dental pain with or without swelling of face area (might be due to tooth decay)

Trachoma: Infectious eye problem characterized by irritant eyes, itching and mucus secretion

Wegeb himem or Jerba himem: Severe back pain especially at the lower end of the spinal chord

Wugat: Acute pain of the abdominal and thoracic area

Yehitsane beshita or Wetete beshita: Diarrhoea and vomiting in children on breast feeding, believed to result from some abnormality in the mother's milk.

Yematwolde set endetewolde: Fertility promoter in ladies with total infertility

Yemtitil beshita: Symptoms of seizure (epilepsy)

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References

1. Nichter M: Anthropological Approaches to the Study of Ethnomedicine. Amsterdam: Gordon & Breach; 1992.
2. Pankrust R: Historical reflections on the Traditional Ethiopian Pharmacopoeia. J Ethn Pharm Assoc 1976, 2:29-33.
3. Vecchiato NL: Traditional medicine. In The Ecology of Health and Disease in Ethiopia Edited by: Helmut K, Zain Ahmed Z. West View Press, Boulder; 1993:157-178.
4. Abebe D, Ayehu A: Medicinal Plants and Enigmatic Health Practices of Northern Ethiopia. Addis Ababa: BSPP; 1993.
5. Gedif T, Hahn HJ: The use of medicinal plants in self-care in rural central Ethiopia. J Ethnopharmacol 2003, 87(2–3):155-161.
6. Abebe D: Traditional medicine in Ethiopia: the attempts being made to promote it for effective and better utilization. SINET 1986, 9:61-69.
7. Abebe D: Preface. In Proceedings of the Workshop on Development Utilization of Herbal Remedies in Ethiopia Edited by: Abebe D. Addis Ababa: University Academic Press; 1996.
8. Ethiopia Central Statistical Authority: Ethiopian Population Census. Addis Ababa: E.C; 1994.
9. Benishangul Rehabilitation and Development Association: Nutritional Survey in Assosa Zone. Assosa 2000.
10. Ministry of Health: Health and Health Related Indicators. Addis Ababa, Ethiopia; 2003.
11. Benishangul Gumuz Regional Health Bureau: Annual Report on Regional Health Profile. Assosa, Ethiopia; 2003.
12. Stekelenburg J, Jager BE, Kolk PR, Westen EH, Kwaak A van der, Wolffers IN: Health care seeking behavior and utilization of traditional healers in Kalabo, Zambia. Health Policy 2005, 71(1):67-81.
13. Gedif T, Hahn HJ: Epidemiology of herbal drugs use in Addis Ababa, Ethiopia. Pharmacoeplidemio Drug Saf. 2002, 11(7):587-591.
14. Gujji T: Ethnopharmacy of Medicinal Plants in Wombera District, Metekel Zone, Western Ethiopia MSc. Thesis, School of Pharmacy, Addis Ababa University; 2005.
15. Wolde B, Gebre-Mariam T: Household herbal remedies for self-care in Addis Ababa: a preliminary assessment. J Ethiop Pharm Assoc 2002, 20:59-70.
16. Masatu MC, Lugoe WL, Kvale G, Klepp KI: Health services utilization among secondary school students in Arusha region, Tanzania. East Afr Med J 2001, 78(6):300-307.
17. Habtem G, Ruys P: The choice of a health care provider in Eritrea. Health Policy 2007, 80(1):202-217.
18. Pokhrel S, Snow R, Dong H, Hidayat B, Flessa S, Sauerborn R: Gender role and child health care utilization in Nepal. Health Policy 2005, 74(1):100-109.
19. Slikkerveer L: Rural health development in Ethiopia. Problems of utilization of traditional healers. Soc Sci Med 1982, 16(21):1859-1872.
20. Gidey M, Teklehaimanot T, Animut A, Mekonnen Y: Medicinal plants of Shinasha, Agew-awi and Amhara peoples in north-west Ethiopia. J Ethnopharmacol 2007, 110:516-525.
21. Awas T, Asfaw Z, Nordal I, Demissew S: Ethnobotany of Berta and Gumuz people in western Ethiopia. In Plant Diversity in Western Ethiopia: Ecology, Ethnobotany and Conservation PhD Dissertation: University of Oslo, Norway; 2007.
22. Yineger H, Kelbessa E, Bekele T, Lulekal E: Ethnoveterinary Medicinal plants at Bale Mountains National park, Ethiopia. J Ethnopharmacol 2007, 112:55-70.
23. Teklehaimanot T, Gidey M: Ethnobotanical study of medicinal plants used by people in Zegie Peninsula, Northwestern Ethiopia. J Ethnopharmacol 2007, 112:55-70.
24. Lulekal E, Kelbessa E, Bekele T, Yineger H: An Ethnobotanical study of medicinal plants in Mana Angetu District, South-eastern Ethiopia. J Ethnobiol Ethnomed 2008, 4:10.
25. Gidey M, Asfaw Z, Elmqvist T, Woldu Z: An ethnobotanical study of medicinal plants used by the Zay People in Ethiopia. J Ethnobiol Ethnomed 2003, 85:43-52.
26. Wondimu T, Asfaw Z, Kelbessa E: Ethnobotanical study of medicinal plants around "Dheeraa" town, Arsi zone Ethiopia. J Ethnobiol Ethnomed 2007, 112:152-161.
27. Yineger H, Yewhalaw D: Traditional medicinal plant knowledge and use by local healers in Serkoru District, Jimma Zone, South-western Ethiopia. J Ethnobiol Ethnomed 2007, 3:24.
28. Sheldon JW, Balick MJ, Laird SA: Advances in Economic Botany Series. In Medicinal Plants: Can Utilization and Conservation Co-Exist? Volume 12. New York: New York Botanical Garden; 1997.