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An ethnomedicinal investigation of plants used by traditional healers of Gondar town, North-Western Ethiopia

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Abstract
Cross-sectional survey was conducted using semi-structured questionnaire and filled observation to document the indigenous medicinal plant knowledge of traditional healers in Gondar town and nearby rural kebeles from January to July 2012. Based on the information gathered, a list of diseases along with medicinal plants used for the treatment of these diseases was compiled. During the interview, demographic characteristics of the participants, local names, used parts, preparation methods of each medicinal plant; medicinal value (ailments treated), route and frequency of administration were recorded. This ethnomedicinal survey has documented a total of 30 medicinal plant species distributed in to 29 families. Despite the availability of modern health care institutions and modern pharmaceuticals, the study has disclosed the vital role of medicinal plants in maintaining the primary healthcare of the people of Gondar town and districts around therein. Documentation of the indigenous knowledge through ethnobotanical studies and promoting *in-situ* and *ex-situ* conservation of medicinal plants is of paramount importance for the conservation and utilization of biological resources to assure continual availability of these medicinal plant species in the study area. It is expected that the results of this study will lead to phytochemical and pharmacological investigations. In addition, it could also serve as a base to develop phytomedicine in combating emerging diseases.

Keywords: Medicinal plants, Traditional healers, Ethnomedicinal, Gondar town, Ethiopia.

1. Introduction
Medicinal plants have been used as a source of medicine to treat illness since time immemorial. For a long time, plants have provided a source of emerging modern medicines and drug compounds. As plant derived medicines have made large contributions to human health, their role is twofold in the development of new drugs. They may become the base for development of a medicine, a natural blue print for the development of the new drugs or a phytomedicine to be used for the treatment of diseases. Active compound present in the medicinal plants provide the bountiful resource of active compounds for the pharmaceutical, cosmetics and food industries, and more recently in agriculture for pest control. Plants are a rich source of many natural products most of which have been extensively used for human welfare, and treatment of various diseases Prasad DMR. *et al*. [1].

This is due to the fact that plants have the ability to synthesize a wide variety of chemical compounds grouped as that is used to perform important biological functions, and to defend against attack from predators such as insects, fungi and herbivorous mammals Ferreira MP. *et al.* [2].

It is estimated that more than 120 of the conventionally used pharmaceuticals are directly or indirectly derived from higher plants. Indeed, well in to the twentieth century, much of the pharmacopoeia of scientific medicine was derived from the herbal lore of native people Toma M. *et al*. Blumenthal M. [3, 4].

Today, traditional medicine is still the predominant means of health care in developing countries where about 80% of their total population depends on it for their wellbeing. Knowledge of medicinal plants is, however, rapidly dwindling due to the influence of western lifestyles, reduction in the number of traditional healers and lack of interest of the younger generations to carry on the tradition and associated knowledge Dyubeni L *et al* [5]. Ethiopia has high diversity of plant species (6500 to 7000 species of higher plants) making the country one of the most diverse floristic regions in the world.

Most of these plant species are used in traditional medicine and often quoted as one of the six countries in the world where about 60% of plants are said to be indigenous with their healing potential Edwards S. *et al* and Bekele E. [6, 7]. In Ethiopia, 90% of the population uses traditional medicine to meet their primary healthcare needs WHO [8]. The bulk of the plant matter used for medicinal purposes is collected from natural vegetation stocks that are shrinking with degraded environment and is faced to substantial reduction or dwindling of species of medicinal plants. The issue of medicinal plant conservation in Ethiopia today calls for aggressive studies and documentation before the accelerated ecological and cultural transformation distort the physical entities and the associated knowledge base. More over; habitat conservation threatens not only the loss of plant resources, but also traditional community life and cultural diversity, and the accompanying knowledge of medicinal and cultural value of several endemic species WHO and Iwu MM [8, 9]. The vast knowledge on traditional use of medicinal plants is not fully documented; most of the knowledge is conveyed from generation to generation through word of mouth. Like many other Ethiopians, people in Gondar town use plants for their healthcare. As is happening elsewhere in Ethiopia, the traditional knowledge as well as medicinal plants used by these people is under threat mainly due to deforestation, degradation and cultural shift Birhanu Z, Gedif T, Mesfin T, Debela H and Toma M *et al.* [10, 11, 12, 13 14]. With this background, the present study has documented ethnomedicinal knowledge of traditional healers in Gondar town focussing on the medicinal use of plants.

2. Description of the study area and ethnographic back ground of the people of Gondar town

The area under investigation for ethnomedicinal studies falls under Amhara regional state of Ethiopia and it is the town of North Gondar administrative zone. Based on the 2007 national census conducted by the Central Statistical Agency of Ethiopia (CSA), Gondar has a total population of 207,044, of whom 98,120 are men and 108,924 women. The majority of the inhabitants practiced Ethiopian Orthodox Christianity, with 84.2% reporting that as their religion, while 11.8% of the population said they were Muslims and 1.1% was Protestant. Gondar town is about 740 km North West of Addis Ababa, the capital city of Ethiopia. Gondar town is located at 12, 6000 (1235'60.000"N) latitude and 37, 4667 (3728'0.120"E) longitude. The area receives a mean annual rainfall of 1172 mm. The mean annual maximum and minimum temperature ranges from 22-30.7 ^{0}C and 12.3-17.7 ^{0}C respectively, with an annual average temperature of 19.7^0 Martin, GJ [15, 16].

3. Methodology

3.1 Survey on the use of medicinal plants

Cross-sectional survey was conducted using semi-structured questionnaire[17] and field observation to document information regarding medicinal plants in Gondar town and nearby rural kebeles from January to July 2012. The questionnaires were administered only to those traditional healers who were licensed and professionally certified by the ministry of health to practice their profession to give care for the community during the study period. Information concerning licence of traditional healers was obtained from the chairman of traditional healers association. Identification was performed by using flora books of Ethiopia and Eritrea, people who have experience in such work, and by comparing with the authentic specimens of the herbarium. Before filling the questionnaire, the local people were convinced about the importance of their knowledge and the need for its documentation for future generations, and the nation at large. Based on the information gathered, a list of diseases along with medicinal plants used for the treatment of these diseases was compiled following the methods of Yinger H *et al* [17].

During the interview, demographic characteristics of the participants, local names, used parts, preparation methods of each medicinal plant; medicinal value (ailments treated), route and frequency of administration were recorded. In addition, the participants were asked to show the researcher these medicinal plants and specimen of these plants were pressed in the field and prepared for identification. During the course of the study, each informant was visited three times in order to verify the reliability of data obtained. If what was said during the first visit concerning the use of a particular medicinal plant by an informant did not agree with what was said during the second or third visit, the information was considered unreliable and was rejected. The interview and discussions were conducted in Amharic, for it is the language spoken by the community. Likewise, a vernacular name for each medicinal plant is given in Amharic language. The voucher specimens of all the medicinal plants were deposited in the department of Pharmacognosy, School of Pharmacy, University of Gondar.

4. Result

The data on ethnomedicinal survey of Gondar town is presented in Table 1.

Demographic profile

A total of 14 licensed traditional healers with the age of 21 and above were participating in the study. From the group interviewed, the majority of the respondents, 11 (78.6%) were males and only 3 (21.4%) were females. The proportion of healers aged under 30 was 1 (7.1%) while the proportion of healers aged above 40 years was 7 (50%) and the majority of healers (78.6%) had an experience of more than 10 years in this profession. A large proportion of the traditional healers were practicing Ethiopian Orthodox Christianity 13 (92.9%) and only 1 (7.1%) represented Muslims. Concerning level of education, all of the traditional healers were able to read and write and the majority of them 8 (57.1%) had attended church education and only 1 (7.1%) had completed grade 12. All of the informants were from Amhara nationality.

Source of healing knowledge and way of knowledge transfer: The most frequently cited sources of knowledge acquiring was from family 8 (57.1%) fallowed by religion institutions 3 (21.4%), friends 2 (14.3%) and only 1 (7.1%) had acquired the knowledge from other sources at which he was unwilling to explain clearly from which he had acquired. The majority of the healers kept the healing wisdom secret, and the only way of knowledge transfer concerning medicinal plants was found to be verbal, without documentation in written form, to selected son or daughter. The result has also revealed that majority, 12 (57.8%) were married and unmarried and widowed represented only 1 (7.1%) each.

Medicinal plants and their applications as practiced by traditional healers in the study area

This ethnomedicinal survey has documented a total of 30 medicinal plant species distributed in to 29 families. The complete data is presented in (Table 1) in which the plants are arranged in alphabetical synopsis. For each species the botanical name, plant family, local name, part(s) used, method of preparation or administration, condition of plant used, the ailment (s) treated by the given medicinal plant and duration of

therapy is provided. Local names are given in Amharic language for it is the language commonly spoken by the community in the study area. All of these plants were discovered to be used by local people of Gondar town and the adjoining districts in North Gondar administrative zone, north-western Ethiopia in treating different types of human ailments ranging from infection, cardiovascular problems, cancer, haemorrhoid, arthritis, malaria, asthma and intestinal parasites (Table 1).

The family Euphorbiaceae represented three (10.34%), and each two (6.7%) species of Cucurbitaceae, Lamiaceae, Solanaceae, and Verbenaceae. The rest 19 families, however, had one medicinal plant species each. All of the reported medicinal plants were used to treat human ailments in the study area (Table 1).

Source of medicinal plants, plant parts used and methods of preparation

Most of the study subjects 12 (86%) responded that they harvest their medicinal plants exclusively from the wild and only 2 (14.3%) grow some of their medicinal plants around their home. Lack of land ownership was the most frequently cited reasons for not growing medicinal plants. According to the study, the majority of the remedy preparations 12 (40%) utilized the leaf part fallowed by roots 9 (30%), leaf & root 4 (13.3%), bark and root 2 (6.7%), and the rest seeds, flowers, aerial parts, exudates and shoots represented 1(3.3%) each.

Units of measurement, Condition of plant use, route of administration, solvents and extraction methods

The traditional healers of the study area were assessed regarding the units of measurement for their remedy preparation and all of them used index finger for preparations made of root part, number for seeds and leaves, a teaspoon for powdered drugs and coffee cup for liquid preparations. Respondents were also assessed for conditions of their medicinal preparations and the majority of the preparations were made from fresh plants (73.3%), dried 16.7% and either fresh or dried accounted 10% (figure 1).

Concerning their route of administration, medicinal plant preparations taken orally represented 27 (64.3%), topically 11 (26.2%), inhalational 3 (7.1%) and tying at affected part only 1(2.4%) (Figure 2). In most of the preparations taken orally, water was the most widely used solvent and widely used extraction techniques were maceration and decoction. Honey was commonly used for preparations with unpleasant taste. Butter was found to be an important vehicle in the formulation of herbal drugs in the form of paste intended for topical application.

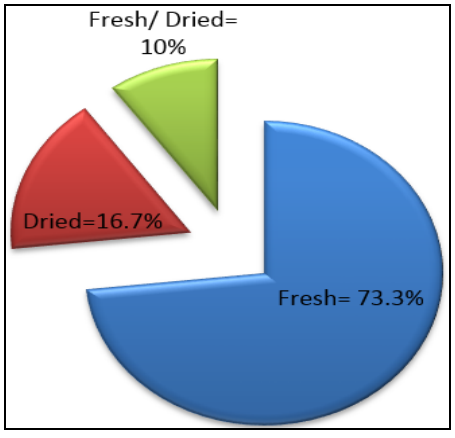

Fig 1: Condition of plant (plant parts) used as practiced by traditional healers in Gondar town

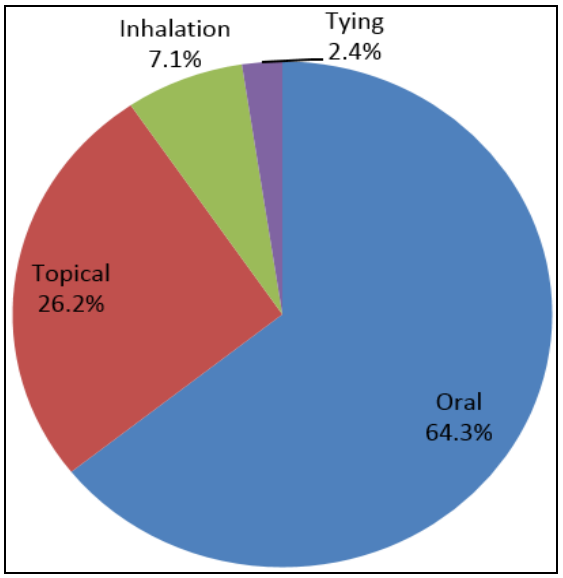

Fig 2: Routes of drug administration as practiced by traditional healers in Gondar town.

5. Discussion

The study showed that the predominance of men on having better medicinal plant knowledge that could probably be ascribed from the fact that boys are usually more preferred than girls in the study area in the transfer of medicinal plant knowledge. All of the traditional healers participated in this study were from a town where allopathic medical services and modern drugs are abundant, nevertheless, they were providing healthcare services to a number of people. This probably may be due to cultural acceptability, cheapness of traditional remedies compared to the cost of modern medicine. On the other hand, this might be due to the fact that some diseases are chronic in their nature like cancer, cardiovascular problems, asthma, diabetes mellitus, haemorrhoid, and arthritis. These disease conditions were being treated by traditional healers of the study area. Rabies was also one of the disease condition people frequently visit the traditional healers clinic in seeking treatment. The result depicted that the majority of the respondents had attended church education indicating the importance of religious institutions in preserving Ethiopian traditional medicine in general and the herbal wisdom of Gondar town in particular.

Traditional healers were also asked the modality of medicinal plant knowledge transfer and a large proportion of the healers said that they kept the healing wisdom secret, that may be due to the fear of competition and the only way of knowledge transfer concerning medicinal plants was found to be verbal, without documentation in written form, to selected son or daughter. Collection and processing of medicinal plants were restricted to traditional medicine practitioners and their trainees at family level only to elder son or daughter. This way of knowledge transfer may probably end up in distortion or total loss of the indigenous medicinal plant knowledge; necessitating urgent inventory of medicinal plants in the country.

According to this finding, leaves were the most widely used plant parts fallowed by roots for the preparation of remedies. This is in line with the previous reports in Ethiopia Giday M and Giday M *et al* [18, 19]. Despite the fact that high frequency was given to the leaf, in the study area, treats to medicinal plants was found to be maximal. This is due to the fact that high treats to the mother plant comes when collection of medicinal plant involve not only roots but also barks and stems as well. A large proportion of medicinal plants were being

harvested leaving the mother plant in danger. Medicinal plant harvest, that involves the aforementioned plant parts, has serious effect on survival of the mother plant and this is also true in the study area.

Setting conservation priorities for threatened medicinal plants and promoting *in-situ* and *ex-situ* conservation of medicinal plants by providing cultivating land would help to preserve and assure continual availability of these medicinal plant species in the study area.

In the survey, Euphorbiaceae provided the highest number of species employed in the treatment of diseases fallowed by Cucurbitaceae, Lamiaceae, Solanaceae and Verbenaceae underscoring the significance of these species in the ethnomedicine of Gondar town.

A number of these medicinal plants were also reported in other parts of Ethiopia for their medicinal values Birhanu Z and Giday M *et al*. [10, 18, 19].

Among the medicinal plants used for herbal preparations to treat human health problems, most of the remedy was taken by the oral route fallowed by topical application. Similar results reported in other parts of Ethiopia Lulekal E *et al*. [20, 21] and in some of the preparations taken orally; honey was the commonly used sweetening agent. This indicates that the traditional healers of the study area were knowledgeable enough in increasing their patient's compliance by improving disagreeable and offensive taste of some plant constituents by using sweetening agents like honey.

Traditional healers in the study area, mostly for roots and leaves, use similar measurements such as the tip part of the index finger for roots and numbers for leaves. Informants had awareness of the toxicities of some of their medicinal plants/plant parts and if toxicity arises as a result of administering large doses of their herbal preparation, they administer antidotes such as coffee. This indicates that healers of the study area are aware of the toxicity of some herbal components.

Further analysis of the data revealed that the majority of the remedy preparations makes use of fresh plant (plant parts) fallowed by fresh and/dried. It was also observed that only few of the remedy preparations utilized dried plant materials. This result is consistent with ethnobotanical studies conducted elsewhere in the country Lulekal E *et al*. [20].

6. Conclusion

Despite the availability of modern health care institutions and modern pharmaceuticals, the study has disclosed the vital role of medicinal plants in maintaining the primary healthcare of the people of Gondar town and districts around therein. Documentation of the indigenous knowledge through ethnobotanical studies and promoting *in-situ* and *ex-situ* conservation of medicinal plants is of paramount importance for the conservation and utilization of biological resources to assure continual availability of these medicinal plant species in the study area. Based on the observations, it is expected that the results of this study will lead to phytochemical and pharmacological investigations. The result could also serve as a base to develop phytomedicine in combating diseases.

7. Acknowledgement

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Table 1: Medicinal plant species, Plant parts used, route of administration, methods of remedy preparation and ailments treated by Traditional Healers of Gondar town, Ethiopia.

Species, family	Vernacular Name	Part used	Uses (Ailments treated)	Remedy preparation	Mode of administration	Frequency/ duration of treatment	Condition of plant part(s) use
***Achyranthes aspera* L. (Amaranthaceae)**	**Telenj**	L	Tonsillitis	The crushed leaf mixed with water and the filtrate is taken	Oral	1/3 of the size of small finger using coffee cup once (stat)	Fresh
***Adhatoda schimperiana* Hochst.ex. (Acanthaceae) Leaves of the plant are boiled with milk, filtered, cooled Diarrhoea**	**Simiza (Sensel)**	L	Liver disease	3 leaves crushed and juice taken with cow milk in empty stomach	Oral	Three consecutive days	Fresh
***Aloe species* (Aloaceae)**	**Riet**	L R R	Abdominal pain & Cancer Chronic cough & Pulmonary tuberculosis. Eye infection	3 leaves crushed and mixed with 1 kg of honey Root buried for 6 months, dried and powdered then mixed with 1kg of honey and taken orally Powder mixed with honey & applied on the eye	Oral Oral Topical	1 teaspoonful a day for 30 consecutive days One teaspoonful per day for 30 consecutive days Once	Fresh Dried Dried
***Arisaema schimperianum* (Araceae)**	**Amoch**	R	Chronic sinusitis	Powder made in to paste with butter	Per nasal (topical)	Once using cotton (held in the nostrils)	Dried
***Asparagus africanus* Lam. (Asparagaceae)**	**Yesiet qest**	R	Tinea versicolor	Filtrate applied on the affected part locally	Topical	Until complete cure (symptomless)	Fresh
***Bersama abyssinica* Fresen. (Melianthaceae)**	**Azamr**	L L & R	Ascariasis Hypertension	Boiled with water and filtrate mixed with teff powder and eaten with aguat. Crushed and mixed with honey	Oral Oral	Once Once daily for 3 consecutive days	Fresh Fresh
***Beta vulgaris* L. (Chenopodiaceae)**	**'Qeysr**	L	Throat pain	Crushed and mixed with honey	Oral	Once daily for 3 consecutive days	Fresh
***Carissa spinarum* L. (Apocynaceae)**	**Agam**	L	Conjunctivitis	Squeezed and juice applied locally on the affected eye	Topical	Once a day small amount of drope for 3 days	Fresh
***Clerodendrum alatum* (Lamiaceae)**	**Misirich**	B	Tonsillitis	Bark, obtained at sunrise direction, is dried, powdered and macerated with water	Oral	Half a Coffee cup of the filtrate per day for 1-3 days	Dried

***Clutia Abyssinica* Jaub. & Spach (Euphorbiacea)**	**Fyele fej**	R	Fracture	Root powder with zagol, medab and gracha eshoh	Tying at the affected area	Till complete cure	Dried
***Croton macrostachyus* Hochst. (Euphorbiaceae)**	**Bisana**	L	Eczema, Chirt, & Haemorrhoid	Powder made in to paste with water	Topical	Small amount applied daily for 3 consecutive days	Dried
***Cucumis ficifolius* A.Rich (Cucurbitaceae)**	**Yemdr embuay**	R	Abdominal pain	Root boiled with milk for 12 hours and filtrate taken orally	Oral	a cupful daily for 2 consecutive days	Fresh
***Cyphostemma adenocaula* (A.Rich.) (Vitaceae)**	**Asserkush**	R	Rabies	Root boiled with milk, filtered and filtrate taken in empty stomach	Oral	Full of a coffee cup daily for 3 consecutive days	Fresh
***Dorstenia barnimiana* Schweinf. (Moraceae)**	**Werk bemieda**	A R	-Hemorroid -Cancer Ejeseb, Malaria, & Evil sprit	Powder made in to paste with butter Root powder is mixed with aguat and filtrate taken in empty stomach	Topical Oral	Every other day till complete cure Once every other day for 3 days	Fresh Fresh
***Euphorbia ampliphylla* Pax. (Euphorabiaceae)**	**Qulqwal**	Ex	Hemorrhoid	exudates mixed with butter to make paste	Topical	Once daily till it cures	Fresh
***Eucalyptus globules* Labill. (Myrtaceae)**	**Nech Bahrzaf**	L	Common cold	leaf boiled with water and steam inhaled	Inhalation	Once	Fresh
***Ferula communis* L. (Apiaceae)**	**'Ienselal**	Sh	Gonorrhea	Pulverized, mixed with water and filtrate taken	Oral	Full of a coffee cup every 3 to 4 days till complete cure	Fresh
***Gallium aparine L.* (Rubiaceae)**	**Ashrt**	L	Mumps	Squeeze the leaf and juice taken	Oral	½ tea spoonful once	Fresh
***Gladiolus abyssinicus* (Brongn. ex Lem.) B.D.Jacks. (Iridaceae)**	**Ezerzay**	R	Meningitis	Sniffing of the chewed fresh root	Inhalation	Once	Fresh
***Hagenia Abyssinica* Willd. (Rosaceae)**	**Kosso**	F	Tapeworm	Crushed and taken orally	Oral	Once	Fresh
***Lippia adoensis* (Hochst. ex Walp.) (Verbenaceae)**	**Koseret**	L	Mich	Squeezed/crushed & mixed with water and juice/ filtrate applied locally	Topical	Once daily at bed time for 7 consecutive days	Fresh & dried
***Ocimum lamiifolium* Hochst. (Lamiaceae)**	**Damakessie**	L	Mich	Leaf juice with coffee or tea	Oral	Once one coffee cup	Fresh
***Phytolacca dodecandra* L'Herit. (Phytolaccaceae)**	**Endod**	R	Kurba	Root without bark is crushed in to pieces, mixed with water and filtrate taken	Oral	Full of a coffe cup once	Fresh

***Plumbago zeylanica* Linn. (Plumbaginaceae)**	**Amira**	R	Gonorrhoea, Abdominal pain & Arthritis	Mixed with honey and kept for 7 days finally, filtered and filtrate is taken	Oral	Full of a coffee cup for 3- 4 consecutive days	Fresh
		L	Neck pain	Mixed with goat bile to make paste and locally applied	Topical	Massage once daily till it cure	Fresh
		L	Toothache	Root and bark mixed together and chewed One fist of leaf mixed with refined butter, boiled with water and filtrate taken	Oral	Once	Fresh
		R & B	Chronic cough & Asthma		Oral	One tea spoonful per day for 3 days	Dried
***Rumex nepalensis* Spreng. (Polygonaceae)**	**Tult**	R	-Tonsillitis -Arthritis -Abortion -To induce labor	Crushed root mixed with butter to make paste 1/3 of small finger fresh root Chewed & the juice swallowed	Topical Oral	Locally applied on the head / joints (once) Once	Fresh Fresh
***Solanum incanum* L. (Solanacea)**	**Tilik embuway**	S	Asthma	Powder mixed with water and filtrate taken	Oral	One coffee cup daily for 3 days	Dried
***Stephania abyssinica* Dillon. & A. Rich.) Walp. (Menispermaceae)**	**Ye ait hareg (Etse- eyesus)**	L	-Kuriba -Abdominal crump	Three leaves infused with water	Oral Oral	One teaspoonful once Once using a coffee cup	Fresh Fresh
***Verbena officinalis* L. (Verbenaceae)**	**Atuch (Achuch)**	R	Diarrhoea	Powder extracted with water and filtrate taken in empty stomach	Oral	½ coffee cup for 3 consecutive days	Fresh
***Vernonia amygdalina* Del. (Asteraceae)**	**Grawa**	L	Abdominal pain	Leaf infused with water and filtrate taken	Oral	One half of tea spoonful daily for 3 days	Fresh
***Withania somnifera* (L.) Dunal. (Solanaceae)**	**Gizawa**	L	-Fever -Diarrhea	Infusion Powder of 3 leaves mixed with water	Topical Oral	Once Once per day for 1-3 days	Fresh Dried or fresh
***Zehneria scabra* [L.f.] Sond. (Cucurbitaceae)**	**Aregresa (Haregresa)**	A	-Internal mitch	Boiled with water and steam inhaled	Inhalation	Once	Fresh
		L	-To induce labor	Leaf with awazie	Oral	Half filled teaspoonful once	Fresh

A=Arial part, B=Bark, EX=Exudate, F= Flower, L=Leaf, R=Root, S=Seed, Sh=Shoot

8. References

1. Prasad DMR, Izam A, Khan MMR. *Jatropha curcas*: Plant of medical benefits JMPR 2012; 6:2691-2699.
2. Ferreira MP, Gendron F, McClure KC, Kindscher K. "North American bioactive plants for human health and performance. *GJRMPIM* 2012; 1:568-582. (Available at http://digitalcommons.wayne.edu/nfsfrp/1/).
3. Toma M, Grcioso JS, Hiruma-Lima CA, Andrade FD, Vilegas L, Brito AS. Evaluations of analgesic and antiedematogenic activities of Quassia amara bark extract. J Ethnopharmacol 2003; 85:19-23.
4. Blumenthal M (Ed). The ABC Clinical Guide to Herbs. American Botanical Council. New York, 2003.
5. Dyubeni L, Buwa Lv. An ethnobotanical study of plants used for the treatment of ear, nose and throat (ENT) infections in Nkonkobe Municipality, South Africa. JMPR 2012; 6:2721-2726.
6. Edwards S, Asfaw Z. Plants used in African traditional medicine as practiced in Ethiopia and Uganda. East and Central Africa Monograph Series. Published by NAPRECA, Addis Ababa University, Addis Ababa, 1992, 5.
7. Bekele E. Actual Situation of Medicinal Plants in Ethiopia. Prepared for JAICFA, 2007.
8. WHO Traditional Medicine Strategy: World Health Organization; Geneva, 2005.
9. Iwu MM. Handbook of African Medicinal Plants, Tokyo: CRS press, 1993.
10. Birhanu Z Ethno-botanical survey on medicinal plants used by ethnic groups of Denbia District, north-western Ethiopia. Jnr. 2011; 11:119-123.
11. Gedif T. Herbalist in Addis Ababa, mode of service delivery and traditional pharmaceutical practice Ethiop Med J. 2000; 5:32-33.
12. Mesfin T. Survey of medicinal plants used to treat human diseases in Seka chekorsa, EJHS 2005; 15:89-106.
13. Debela H. Use of traditional medicinal plants by people of Bosa sub district, JHS 2006; 16141-154.
14. Toma M, Grcioso JS, Hiruma-Lima CA, Andrade FD, Vilegas L, Brito AS. Evaluation of analgesic and antiedematogenic activities of *Quassia amara* bark extract. J Ethnopharmacol 2003; 85:19-23.
15. ^ Census Tables: Amhara Region, Tables 2.1, 2.4, 2.5, 3.1, 3.2 and 3.4. (Accessed on February18, 2013), 2007. ^ http://www.tiptopglobe.com/ethiopia
16. Martin, GJ. Ethno-botany: *A Methods Manual*. Royal botanic Garden. Kew, UK, 1995.
17. Yinger H, Kelbessa E, Bekele T, Lulekal E. Plants used in traditional management of human ailments at Bale Mountains National Park, Southeastern Ethiopia. *JMPR.* 2008; 2:132-153.
18. Giday M, Asfaw Z, Elmiquist T, Woldu Z. An ethnobotanical study of medicinal plants used by the zay people in Ethiopia. J Ethnopharmacol 2003; 85:43-52.
19. Giday M, Teklehimanot T, Animut A, Mekonnen Y. Medicinal plants of the Shinasha, Agew-Awi and Amhara peoples in northwest Ethiopia. J Ethnopharmacol 2007; 110:516-525.
20. Lulekal E, Kelbessa E, Bekele T, Yinger H. An ethnobotanical study of medicinal plants in Mana Angetu district, southeastern Ethiopia. J Ethnobiol Ethnomed, 2008, 4:10.