

**FOLKLORE MEDICINAL USES OF *HAGENIA ABYSSINICA*
(BRUCE) J.F. GMEL TO TREAT HUMAN AILMENTS BY GUJI
OROMO TRIBES IN ABAYA DISTRICT, BORANA ZONE,
OROMIA REGIONAL STATE ETHIOPIA**

Genene Bekele*

Dr. P. Ramachandra Reddy*

Abstract

Study of folklore uses of medicinal plants were carried out to collect information on the medicinal uses of *Hagenia abyssinica* (Bruce) J.F. Gmel. of family Rosaceae. The study was conducted among the communities of Abaya district of Borana zone, Oromia, Ethiopia. This study provides insight into the medicinal importance of *H. abyssinica* as well as the degree of threat on its population. The study was conducted using group discussions, interviews, observation, questionnaire and a local market survey. A total of 48 people were interviewed among whom elderly and traditional healers were the key informants. Communities in the study sites still depend on *H. abyssinica* for medicine. All plant parts are used to treat different ailments. Informants in all sites knew *H. abyssinica*, and identified under the local name 'Hexxo'. About 42 (87.5%) (34 male and 8 female) of the respondents are able to differentiate between male and female trees. 38 (79.2%) of respondents explained that parts of *H. abyssinica* collected in the morning time could have strong and effective medicinal properties. Informants stated that October to February as the 'best time' for plant parts collection. This particular study confirms that parts of *H. abyssinica* are used against 14 human ailments among the communities of Abaya district. In spite of its significance, interest in utilizing flowers of *H. abyssinica* as an anthelmintic seems to be diminishing, notably among young people. This is partly because the

* Plant anatomy and taxonomy laboratory, Department of Botany, Osmania University, Hyderabad-500007, India.

medicine can be harmful when it is taken in large quantities. Nowadays, this medicinal tree species is endangered primarily due to various anthropogenic impacts. This in turn may become a threat for the associated knowledge. It is recommended to assist communities in documenting their traditional knowledge. Measures for conserving species are urgently needed.

Key Words: Abaya district, *H. abyssinica*, Medicinal use, traditional knowledge

Introduction

Plants have been used as traditional medicines for several thousands of years. People in different parts of the world depend on plant resources for their basic needs and are aware of many useful species occurring in their ecosystem. They have continuously developed their knowledge of traditional plant uses and plant resource management. Traditional knowledge is described as 'a cumulative body of knowledge, practice and belief, evolving by adaptive processes and handed down through generations by cultural transmission, about the relationship of living beings (including humans) with one another and with their environment' (Yineger, 2008). In many countries of Africa, Asia and Latin America people depend on traditional knowledge and medicinal plants to meet some of their primary health care needs. For instance in Africa up to 80% of the population use traditional medicine for primary health care (Abebe, 1986). Likewise, many Ethiopian communities are dependent on local plant resources for medicine. Ethiopia is endowed with diverse biological resources due to significant geographical diversity, which favored the formation of different habitat and vegetation zones. Ethiopia is also home to a diverse mix of ethnic, cultural and linguistic groups. This diverse combination of social and cultural backgrounds contributed much to the existence of rich indigenous knowledge, including managing and using medicinal plants against human ailments. Plants have been used as a source of medicine in Ethiopia for a long time. More than 80% of the Ethiopian people are dependent on plants for their health service. More than 95% of traditional medical preparations in the country are of plant origin. Medicinal plants and knowledge of their uses provide a vital contribution to human health care needs. The importance of medicinal plants to treat human ailments in most parts of Ethiopia is stated by various authors (Abebe and Ayehu, 1993; Gedif and Hahn, 2003; Gidey *et al.*, 2007; Teklehaymanot and Giday, 2007; Lulukal *et al.*, 2008.)

H. abyssinica is an important medicinal tree species that societies relied on for generations for combating various ailments. It is a multipurpose dioecious tree in the plant family of Rosaceae. It is a tree growing up to 20 m (Figure 1). The species also occurs in Kenya, Tanzania, Uganda, Sudan, Congo, Malawi, Burundi and Rwanda (Jansen, 1981). *H. abyssinica* has been used as a remedy for intestinal parasites, especially against cestodes. It has served as an anthelmintic in ruminants and also against tapeworms in humans. Besides being a source of medicine, it has been utilized for various other purposes such as construction, furniture, fuelwood, and soil fertility management. As a result of its enormous significance, *H. abyssinica* is one of the endangered tree species in the country due to overexploitation. Accordingly, the Forestry Law (FDRE, 1994) prohibits the utilization/harvesting of this tree species. The proclamation was enacted with a view of providing and enhancing better conservation, development and utilization of forests. However, in practice, there is a lack of law enforcement. Consequently the population of this tree species is increasingly endangered.



Figure1. *H. abyssinica* and its flowers

Habitat destruction reduces the existence of such important tree species, and thus negatively affects several aspects of human well-being, such as food security, medicine as well as the associated traditional knowledge. In spite of its significance, information on the traditional use of *H. abyssinica* has experienced little consideration. Studies have been conducted on medicinally important Ethiopian plant species among which *H. abyssinica* is also listed. However, former studies do not provide sufficiently detailed information on the utilization of this

medicinally important tree; hence further research is necessary. This study aims to examine in detail the traditional knowledge on the identification, harvesting, preparation and utilization of *H. abyssinica* by communities of Abaya district, Borana Zone, Oromia Regional State, Ethiopia. The medicinal value of *H. abyssinica* to the rural communities is highlighted. Factors influencing current utilization rates are identified and current management and conservation strategies examined. This paper provides an overview on description of the study sites and the methods used to document traditional knowledge. The traditional processing, medicinal uses and importance of various parts of *H. abyssinica* are described. The degrees of threat on its population and local conservation efforts as well as suggestions to promote sustainable utilization are presented.

Materials and methods

Study sites

Abaya district is located at the northern tip of Borana zone between longitude of 37° 40' - 38° 40' E and latitudes of 6° 14' - N 6° 25' N and 372 km away from Addis Ababa to the south (Fig. 1). The altitude ranges between 1100 m a.s.l. and 2400 m a.s.l.. The district is boarded by Nations, Nationalities and Peoples of Southern Ethiopia Regional State in the north and east, Lake Abaya in the west and Gelana district in the south. The total area of the district is approximately 1871.34 sq. km or 187,134 hectares, and this comprise about 2.2% of the total area of the zone and the district is further divided into 26 'kebeles' (the smallest administrative unit).

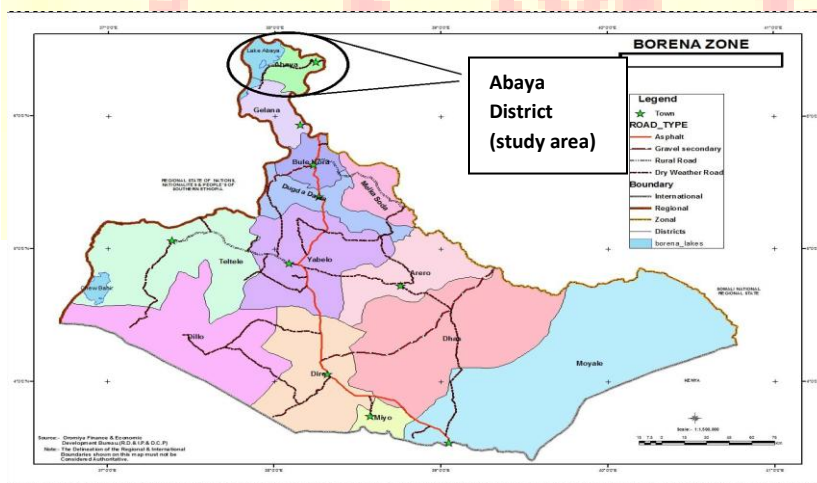


Fig 1: Location of study area in Borana Zone, Oromia Regional State, Ethiopia

According to Central Statistical Agency administrative report (2012) Abaya district has a total population of 104,374 of which 52,547 (50.3%) are males and 51,827 (49.7%) are females. According to the data obtained from the District Agricultural Office, out of 187,134 hectares of the total area of the district, 45,928 (24.54%) hectares are known to have potential for agriculture (cultivable land), grazing land shares 60,666 (32.42%) hectares, forests and bush-land comprises 11,814 (6.31%) hectares, water bodies (Abaya Lake) share 62,925 (33.63%) hectares and others comprise 5,801(3.1%) hectares of land.

The rainfall distribution of the study area is bimodal (two rain seasons). The main rainy season is from June to September ('Kiremt' or 'Mahar') and the short rainy season is from February to April ('Belg'). The average annual rainfall is 107.72 mm and, the mean annual average temperature of the district is 20°C. The study was conducted in twelve 'kebeles' (the smallest administrative unit) in Abaya District, Borana zone of Oromia National Regional State from April to October 2013. Prior to data collection, discussions were made with elders and local authorities to select the 'kebeles' where traditional healers were found. The 'kebeles' were selected based on availability of traditional healers, and on the recommendations of elders and local authorities in the Abaya district.

Ethnobotanical data collection

Forty eight traditional healers (36 males and 12 females) were selected from the selected twelve 'kebeles' of the district based on the recommendation from elders and local authorities. The ages of the healers were between 45 years and 80 years. A brief group discussion was made with the informants at each 'kebele' prior to data collection to get their consent and to explain to them that their cooperation is a valuable contribution to the documentation of the traditional medicinal plants of the district. Interview, group discussion, and field observation were employed to collect data on knowledge and management of medicinal plants. The group discussions were conducted to elaborate the methods of preparation, administration and conservation of the medicinal plants. Interviews were conducted in 'Afan Oromo' language. During the study period, each informant was visited two to three times in order to confirm the reliability of the information. The responses that were not in harmony with each other were rejected. Questions were asked in a stepwise manner by first asking relevant data on their age,

sex, address, level of education and occupation. Following to that, informants were asked to share their knowledge on the utilization of *H. abyssinica*. This included: how long and for what purpose they have been using *H. abyssinica*, plant parts used, preparation methods, forms used (fresh/dried), and mode of application, identification, collection and utilization. Respondents were asked to state the status/degree of scarcity of the species, factors affecting the current utilization rate and if there were any management and conservation activities taking place in the area.

As this study was conducted along with an ecological study of *H. abyssinica* a number of plant species were encountered in the study area. The reported medicinal plants were collected during the field walks and trees, shrubs, herbs and climbers were listed. Voucher specimens were collected, pressed and deposited in the National Herbarium of Addis Ababa University (AAU). The plants identification was performed both in the field, and at the National Herbarium of AAU. A descriptive statistical methods, percentage and frequency were used to analyse the data on reported medicinal plants and associated indigenous knowledge.

Results and discussion

Tree identification, collection, utilization, modes of preparation and means of application

Informants in all sites knew *H. abyssinica* many of them since their childhood. *H. abyssinica* is a dioecious species with separate male and female trees that are identified under the local name 'Hexxo'. Trees with bright pinkish-red inflorescence and bulkier flower heads are considered to be female and the ones with yellowish color and feathery flower heads are regarded as male trees. About 42 (34 male and 8 female) of the respondents stated that they are able to differentiate between male and female trees.

Informants stated October to February as the 'best time' for plant collection. Collection during these months is interrelated with the fruiting and flowering phenology of *H. abyssinica*. Apart from the inflorescences, collection of other plant parts (e.g. root, bark) can be carried out any time. Respondents further stated that though it is possible to collect plant part at any time of a day, but it is more preferable to do it in the morning. This is associated with the effectiveness

of the medicine. 38 (79.2%) of respondents explained that parts of *H. abyssinica* collected in the morning time could have strong and effective medicinal properties to treat any ailment. Common technique to collect plant parts includes climbing the tree, which is usually done by children. Leaves on lower branches, as well as pieces of bark, are gathered by hand while roots are collected by digging. Forked branches of trees and bamboo sticks are used to collect the inflorescence part and they carefully cut the tree trunk to obtain the sap. The amount of plant parts collected by the people depends on the uses. A family collects a small quantity if the use is aimed for domestic purposes. For example, to prepare a self-made remedy against intestinal ailments, a small amount of plant parts (mostly the inflorescence) is collected. Alternatively, several sacks could be collected if intended to be sold on the local market.

Utilization of *H. abyssinica* was stated as significant to the communities of the study areas. This confirms its considerable value to different communities of the district which is also stated in the literature (Amare, 1976; Addis, 2001; Balemie, 2004). This particular study confirms that parts of *H. abyssinica* are used against several human ailments. Medicinal uses were categorized as intestinal, digestive, circulatory, respiratory and nervous system, among others, disorders (Table 1). The anthelmintic action of *H. abyssinica* against tapeworm (*Taenia saginata* Goeze), whose widespread occurrence grounds in the consumption of dishes containing raw beef, has been mentioned by all informants. *H. abyssinica* has been also described as a powerful remedy for intestinal parasites, especially against cestodes (Desta, 1995; Giday *et al.*, 2007; Wondimu *et al.*, 2007; Yinger and Yewhalaw, 2007; Lulekal *et al.*, 2008; Yinger *et al.*, 2008). In the 19th century, the species was included in most European pharmacopoeias as an effective drug against intestinal worms, which made it one of the most famous African plants at that time (Lounasmaa, 1974).

Table 1: Medicinal values of parts of *H. abyssinica* in Abaya District

Plant parts used and percentage of respondents										
	Flower	%	Leaf	%	Bark	%	Wood	%	Root	%
Diseases treated	Intestinal worms (tape worm)	100	Diarrhea	75	Fever/Cough	64.6	Stomachache (reddish color liquid from the sapwood)	64.6	Stomachache	66.7
	Wound healing	64.6	Typhoid	58.3	Stomachache	95.8			Abdominal pain	75

Epilepsy	54.2	Cough	62.5	Cold/bronchitis	66.7			Throat disease	60.4
Hepatitis	58.3	Healing injured part	54.2	Dermal diseases	62.5			Cancer (mixed with other plants)	58.3
Sexually Transmitted Diseases (STDs)	70.8			Malaria	79.5				

In general, plant parts of *H. abyssinica* are processed either in fresh or dried forms. Children or elder people collect the plant part which is intended for remedy preparation. Usually elderly men are responsible for harvesting the bark and root part. The process of preparing medicine from female flowers is simple yet requires care. Preparation comprises different steps, and considers details like which part needs to be used, amount and substances to be mixed (if any), and time to prepare the solution. For the preparation the flower is sun-dried so that it can easily be separated from the whole inflorescence. After drying the flower is roasted on an iron plate and pounded using a pestle and mortar. Usually women are responsible for this job. A small amount of dried flowers is ground into a powder and then sieved. Afterwards the fine powder is kept in a bowl. Eventually, the fine powder is mixed with different substances (Table 2) and then consumed. The preparation is usually carried out during the night and the remedy has to ferment for some time. The shortest possible fermentation time usually takes 2-3 nights. Informants noted that keeping the remedy for a longer time helps to reduce bitterness and increase the effectiveness of the medicine.

Table 2: Substances mixed with powdered flowers of *H. abyssinica*

Substances to be mixed with <i>H. abyssinica</i>
Cold water
Warm water
Milk
Sour defatted milk ('Arera')
'Aguwat' (whey)
Honey
Banana
<i>Echinops kebericho</i> Mesfin ('Kebericho')
<i>Girardinia bullosa</i> (Steudel) Wedd. ('Dobi')

<i>Embelianschimperi</i> Vatke ('Hinkoko')
<i>Brassica oleracea</i> L. (Cabbage)
<i>Cucurbita pepo</i> L. (Pumpkin)

In all of the study sites, it is usually taken orally in the form of a decoction. However, it can also be consumed in the form of paste (e.g. by mixing the powdered flower with banana or honey). Usually children and very weak patients prefer to swallow the sweet paste as the medicine is bitter. Respondents mentioned that the suspension can be consumed with *Girardinia bullosa* (Steudel) Wedd ('Dobi warabechaa') or *Cucurbita pepo* L. (pumpkin) seed, or *Brassica oleracea* L. (cabbage) or *Embelia schimperi* Vatke ('Hinkoko'). Fruits of *Embelia schimperi* Vatke are usually grinded, macerated in water and mixed with the already prepared *H. abyssinica* solution. Another ethnobotanical study conducted (Wondimu, 2007) reported that pounded flower of *H. abyssinica* is mixed with the root of *Croton macrostachyus* Hochst. ex Del. or leaf of *Grewia ferruginea* Juss. for worm expulsion. Respondents in the present study sites believe that mixing the two medicines could result in great medicinal effect against intestinal worms, help reduce bitterness of the medicine as well as nausea. All respondents stated that it needs to be consumed in the morning on an empty stomach. The patient is not allowed to eat after taking the medicine until the segments of the worms are expelled from the intestine. They further noted that the traditional mentioned medicine would be more effective when the worms are made to starve. Preventing a patient from eating for some time is also mentioned (Giday and Ameni, 2003). Informants in the study sites stated that after having consumed the medicine, people usually experience nausea, stomach/abdominal pain and continuous diarrhea which may last for about 6 hours, and these side effects are considered to be normal in the community. Usually after 4 to 5 hours segments of the worm are expelled. The patient is then provided with a warm meal, such as porridge and /or meat soup. All respondents stated that by no means is the patient allowed to drink alcohol drinks because the interaction reduces the effectiveness of the medicine. The communities in the study area believe that the medicine would be effective if it is prepared by a virgin girl, a sterile woman or menopausal woman in her menopause.

Currently, the medicine is being utilized by the communities of all kebeles (the smallest administrative unit) of the study area. 42 (87.5 %) respondents explained that this self-made remedy is widely accepted within the communities as its hygienic effect gives great psychological satisfaction. Nevertheless, the prevalence of gastrointestinal upset after consumption is forcing people to reduce the intake or to change the means of preparation. Women actively take part in updating the traditional knowledge and try out different methods to reduce the side effects associated with drinking the medicine. Female respondents explained that they consume the medicine in the form of a decoction. A small amount of powdered flower is boiled and served in the form of tea. Another means of application included the utilization of bark in the form of smoke. They explained that during postnatal period, mothers smoke the bark by heating it over the fire. This practice eases muscle aches and stiff joints, stimulates blood

circulation and boosts the immune system. In addition, the powdered seeds were applied on wounds and cuts.

Prescription dosage, side effects and remedies against side effects

The majority of informants explained that both self-made, and medicines prescribed by healers need to be taken in specific doses, but they stated different amounts. Common measurement units mentioned in all communities include tea cups, water glasses and cans. Respondents explained that the dosage depends on age, sex, physical appearance of a person, health condition and severity of pain. Similar studies have also mentioned such measurements (Abebe and Ayehu, 1993; Addis *et al.*, 2001; Balemi *et al.*, 2004). 46 (95.8%) of respondents believe that the dosage usually depends on age and sex. For instance, the smallest portion of the solution (≤ 250 ml) was usually given to very old people as well as to young boys and girls. In general, men consume the largest portion (500 ml to 750 ml) followed by women (300-500 ml). All female respondents explained that there was a tradition to take very small amounts during gestation periods, usually when a woman starts her 3rd or 4th month of pregnancy. Some of them continue till the 8th month. There are also cases when a woman drinks shortly before delivery time. The women believe that it helps in reducing pain during delivery, and improves the health of both baby and mother. A health condition of a patient is another aspect considered before taking the medicine. They further stated that comparatively an extra amount is provided for a very ill person. In former days, it was compulsory for children to drink *the* suspension once a month when they reached at the age of 7 or more. The reason was by this time the children have already started eating raw meat. Overall, no age guideline is used as standard, but it is merely a decision made by the family.

Usually, medicines have some side effects, and self-made ones are no exceptions. All Informants in the study area stated that severe stomach pain accompanied by diarrhea and occasional nausea were the usual side effects of the medicine prepared from *H. abyssinica*. The frequency and seriousness varied greatly from patient to patient. A person may also suffer from muscular tiredness, fatigue and could even faint, if taking an overdose. The administration of an overdose may be linked to a belief that extra consumption could result in an enhanced medicinal effect; however, it has been reported that blindness and changes in the central nervous system function have been found in people who took an overdose of *H. abyssinica*. It is also reputed to cause abortion in women and even death. Despite widespread use as an anthelmintic, few reports noted that it was found to be toxic (Amare, 1976). In the present study, informants also mentioned the negative effect of the medicine such as gastrointestinal upset, however, if serious problems occur due to an overdose, the person is usually provided with a remedy to counteract the side effects. This could include boiled milk, yogurt, coffee or water.

Regarding the current utilization of *H. abyssinica* the majority of respondents about 27 (56.3%) stated that they are currently not utilizing the medicine. This is primarily due to an increase in awareness of side effects from unknown dosage. Introduction of modern medicines

and the declining of *H. abyssinica* population in the forest also play a great role. For instance, all informants stated that the tradition of using the plant as medicine still exists, but it becomes more and more difficult to collect the inflorescence as today few scattered trees exist in the area. In addition, people have realized the advantage of taking modern medicines that do not have many unwanted effects that also help them continue with their daily task without serious side effects.

Traditional knowledge and its transfer

In most developing countries, including Ethiopia, traditional knowledge on the medicinal uses of plants has been passed down from generation to generation as part of an oral tradition. Informants in all study sites stated that elder men usually share their knowledge with one of their sons, most often to the first-born. This particular son may be chosen because the father loves him very much or the son is especially keen and interested in traditional medicine (Bishaw, 1990). This was mentioned by all male informants. Female respondents however explained that they prefer sharing their knowledge with their daughters. Traditional healers play a key role in transferring traditional knowledge in the society. Respondents explained that in need of help, it is customary to visit a traditional healer. People visit healers because they believe that healers have good knowledge of traditional medicines. In the study sites almost all of the healers were elder men. Informants explained that there are very few female healers in the area. The stated reason was that women have less interest in the practice. Men are reported to take it seriously, and for some it is even used as a base for supporting their family. Moreover, the studied communities believe that male healers have better knowledge than women, and hence the medicine prescribed by them is perceived to be more powerful. Such believes have resulted in the transfer of traditional knowledge mostly between the healer (men) and his children (mostly sons). In the present study sites even though female informants were few in number they were observed to have a higher level of knowledge than men regarding the detailed processing of parts of *H. abyssinica* for different medicinal purposes, especially against intestinal diseases.

By and large, in all of the study sites interest towards utilizing traditional medicine is diminishing among the younger generation. Some of the reasons mentioned include: the tendency to modern education, the migration to cities for profitable jobs, the decline of the medicinal plant population due to deforestation, and the introduction of modern medicines. Similarly, some elder people were becoming reluctant to take traditional medicines when they have already experienced severe side effects. Due to these factors, the practice is now becoming more and more outdated. This is also mentioned in another study (Balemie *et al.*, 2004). Thus, many individuals are not willing to share their information with their children. In the present study more information was obtained from elderly informants than the young ones. This could indicate a lack of interest which ultimately results in loss of knowledge. Similar studies conducted in the country also support such findings (Gedif and Hahn, 2003).

Market condition

Even though the population of *H. abyssinica* is no longer as abundant as before, its medicine is still available in local markets for a low price. Dried flowers were commonly found in all markets of the study sites. A quarter of a kilo of dried flowers was sold for about 1 ETB (equivalent to 0.1 USD). Usually small plastic cups or cans are used to measure the quantity. For one quintal the maximum price could reach up to 60-70 ETB (3-4 USD). Sometimes it may even reach up to 100ETB (6 USD). Income derived from this sale is of particular importance to the poor households, especially for women, in meeting their basic needs such as food. They explained that in the former days it was common to barter for two cups of dried flower with one cup of cereal crops like barley or wheat. In general, women, especially those who are married, or elders, were major vendors in the market. Unlike elder men young children help their mothers in selling the medicine. In line with this, healers also explained that they prepare medicine using different parts of *H. abyssinica* and its contribution to their income is considerable.

Current population of *H. abyssinica* and Conservation activities

The population of *H. abyssinica* has decreased due to the growing pressures from various anthropogenic factors. This study revealed that all informants in all of the study sites were aware of the scarcity of the species in their locality. Recalling their childhood times, they explained that there were plenty of *H. abyssinica trees* in the surrounding forests, but now the population has reduced significantly. Informants stated that an increase in human population, leading to settlement changes and land clearing for agriculture, was the main driving factor for the decline in the *H. abyssinica* population. Residential area expansion led to a significant loss of forest land as more people needed more lumber to build their houses. This ultimately created a big pressure on the surrounding forest. In addition, the extent of communities' involvement in agriculture seems to be increasing in all of the study sites. Informants categorized possible causes with the greatest impact on the depletion of *H. abyssinica* population as due to: heavy utilization i.e. selective cutting for (1) timber, (2) furniture, (3) house construction, (4) firewood use (5) medicine and (6) all other uses combined.

Heavy grazing and browsing impact from both livestock and wild animals was also mentioned as a reason that hampers the growth of young seedlings. Uncontrolled fire setting was another cause mentioned by informants. In many instances communities set fire to stimulate a new herbaceous growth to be used as livestock fodder but sometimes the fire burns trees and destroys large areas. In addition, trees may be killed by debarking. Reasons could be the extraction of bark for medicine or a systematic way of killing the whole tree. The effort to conserve the species in the study areas seems minimal. They explained that they usually transplanted seedlings from nearby forests to their backyards. Management practices included watering, fencing and adding organic fertilizer to the seedlings. Conversely, the majority of informants explained that even if they have the interest they were 'not able' to plant *H. abyssinica* trees. Lack of seedlings is one of the reasons for not planting. Although they were not capable

enough to find as many seedlings as they would like to have some informants were able to collect and transplant wild seedlings from the forest but the seedlings did not survive due to anthropogenic pressure. In addition, the community usually prefer to plant fast growing exotic species such as *Eucalyptus spp.*

By and large, respondents in the study area highlighted the importance of *H. abyssinica* in their community. Because of its role in the society, people in the study areas described *H. abyssinica* in local language 'Afan Oromo' as 'Hangefa Muka' meaning 'one of the oldest and most respected trees'. However, its population is drastically declining, and therefore, they would like to plant seedlings and carry out appropriate management activities. Consequently, they call for support from agricultural bureau or any other development organizations to get seedlings. Moreover; they suggested that carrying out an extensive awareness creation effort in their localities is timely. Providing continuous care for seedlings and setting up of protective boundaries against livestock browsing should be encouraged.

Conclusion

Communities in the study areas highly value *H. abyssinica* for its medicinal properties. Though all parts of this medicinal plant are important to local communities, the most frequently used and mentioned part are the flowers, which carry anthelmintic properties, and are used against intestinal parasites (e.g. tapeworms). Current utilization of the tree species could be the result of a continued dependence of the local communities for their medicinal need. *H. abyssinica* is marketable thus provides the opportunity to raise household income. This study has shown that returns from selling mainly its dried flowers are important, particularly to the poor households. Even though *H. abyssinica* offers diverse products, the tree population is in decline due to anthropogenic factors. This study provides insight into the local importance of *H. abyssinica* as well as the degree of threat on its population. The scarcity of the species in the locality was mentioned by all respondents. In all study areas, the extent of communities' involvement in agriculture was found to be high and seems to be increasing. This could result in more and substantial losses of *H. abyssinica* population which could ultimately lead to the fading away of the indigenous knowledge associated with the species.

Knowledge about identification, harvesting, preparation and utilization methods is still maintained within the community but in general, interest towards utilizing the traditional medicine is diminishing among many especially with younger people. Despite its widespread use the suspension of *H. abyssinica* as a medicine is found to be harmful to health particularly when it is taken in large quantities. The prevalence of gastrointestinal upset following consumption is leading the majority of people in the study sites to reduce, modify way of intake or stop drinking completely. The medicine is not taken by the majority of informants because of its side effects; some however (especially women and elderly people) still utilizing it. This may perhaps help to ensure the maintenance of knowledge on the species. In conclusion, it is useful to assist communities to document their knowledge. Moreover, averting illegal cutting and allowing

natural regeneration of the population by protecting young seedlings from human and livestock destruction can help conserve this species. Creating public awareness and community-based management is timely and the current plantation activities that are carried out in the study sites should be further encouraged.

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