

ETHNOMEDICINAL EXPLORATION OF *HAANQUU* FRUIT AMONG THE OROMO OF ETHIOPIA

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Abstract: The study of ethnomedicine has remained part of anthropological research practice since time immemorial. Ethnomedicine as a domain of knowledge refers to the study of traditional knowledge used for medical purposes. This paper presents a study on *haanquu* plant (*Embelia schimperi*), one of the most widely known ethnomedicinal plant among the Oromo of Ethiopia. The study was conducted from January to June 2011 to explore and document the medicinal plant knowledge and use by the people. After several revisions, the study has taken its present shape in June 2013. Data were generated through in-depth interviews and analysis of observations and relevant archives. The Oromo traditionally use several ethnomedicinal plant species to manage different human ailments like tapeworm. The people predominantly use *haanquu* plant species to curb tapeworm menace. Results indicate that traditional healers' indigenous knowledge was not necessarily correlated with their reported social status such as age and educational level. High degree of consensus was observed among traditional healers in treating tapeworm (*minni*) with minced *haanquu* plant beans. The use of this plant species was significantly established for remedy measures. There is report of widespread practice of this ethnomedicinal plant species. But this pervasive practice does not show significant variation with respect to the presence of multiple users of the reported species. The results also show that ethnomedicinal plant species used by the Oromo are under serious threat due to several factors. This indicates the need for attention towards their conservation.

Keywords: Ethnomedicine; *Haanquu* plant; Tapeworm; Oromo; Horro Guduru; Ethiopia.

INTRODUCTION

Research to find out new plant medicine is actively carried on by drug companies, botanical gardens, universities, and government laboratories. Anthropologists have little role in the laboratory side of this process. Their research role is in the field—documenting the context of plant use and studying the cultural classification and explanation of illness. They observe and interview healers and their patients. This kind of study is called ethnomedicine and is part of medical anthropology (Townsend, 2008).

Ethnomedicinal plants have been used since ancient times for human healthcare (Townsend 2008). Still they remain the most widely used medication system in developing nations (Suttan and Anderson, 2004; Chivian and Bernstein,

2008). In areas where there is inadequate provision of modern medicine large segment of people rely on ethnomedicinal treatments to get relieved from health problems. Over 80 per cent of the population in Ethiopia, for instance, depend on traditional medicines (Abebe, 2001; Yineger et al., 2008) to get rid of both internal and external diseases. Apart from insufficient provision of modern medical facilities, the reliance of the people on ethnomedicine has been for reasons of ease of access, cost-effectiveness, entrenched acceptability, and biomedical benefits (Yineger et al., 2008).

Nevertheless, numerous species of ethnomedicinal plants are threatened in the country mainly due to overexploitation, overgrazing, habitat loss and alteration,

destructive harvesting techniques, and deforestation (Hamilton 2004). The loss of medicinal plant species has also been exasperated by the attrition of the age old accumulated indigenous knowledge on traditional use and management of these plants as its transfer system is widely known to be pathetic (Abebe, 2001; Abebe and Ayehu, 1993; Addis et al., 2001).

Among the Oromo of Ethiopia, ethnomedicinal plant knowledge and use is underreported. Even most of the studies made on ethnomedicine so far in Ethiopia as a whole are not focused on specific ethnic group (Yineger, 2004) or ecology. The Oromo are rich in medical lore. The use of flora in treating human and livestock ailments is common. Traditionally, people with tapeworm among the Oromo self-treat with extracts of *haanquu* beans or *heexoo* the local name for a slender flowering tree (botanical name *Hagenia abyssinica*). Both of these plant species have proven *taenicidal* properties. *Taenicidal* refers to any treatment that kills tapeworms. Medical treatment is to give a single dose of praziquantel (about 10 mg tablet for every kilogram of the patient's body weight), which is highly effective at killing tapeworms. Thus, patients are not expected to prescribe praziquantel, which is given at a health centre. Against the preceding backdrop, the main objective of this paper is therefore to explain the ways how the Oromo explored *haanquu* beans as a cure to tapeworm and then to document some folkloric imperatives about this ethnomedicinal plant species. With particular reference to *haanquu* plant, the paper discusses associated indigenous knowledge among the Oromo inhabiting the northwestern part of Oromia regional state in Ethiopia. This area is specifically named Horro Guduru (Figure 1).

THE PEOPLE AND LOCATION

The Oromo in general are distinguished as ancient people, great African nation (Kanno, 2005). They speak Afaan Oromo (Oromo language), the largest Cushitic language family in number of speakers in the Horn of Africa,

perhaps in the whole of Africa. Gragg and Kumsa (1982) found that [Afaan Oromo] is considered one of the five most widely spoken languages from among the approximately thousand languages of Africa. The Cushitic language family to which Afaan Oromo belongs is indeed the largest language family in its number of speakers in the Afro-Asiatic super language family spoken in Africa in general and Ethiopia in specific. This is possibly due to the largest share contributed by the Afaan Oromo speakers. Afaan Oromo has very rich vocabulary and it is the third most widely spoken language in Africa, exceeded only by Arabic and Hausa Fulani (Gadaa Melba, 1988; Hordofa, 2001; Beyene and Tolera, 2006). Sociologically and ethnographically viewed, thus, the Oromo are one of the largest ethnic groups in Africa, maybe next to Hausa of Nigeria (Hassen, 1990; Beyene and Tolera, 2006).

Until recently, the Oromo people constitute the largest ethnic group in Ethiopia accounting for 50 to 60 per cent of the population of the 'Ethiopian Empire state' (Tilahun, 1993). They are "a very ancient race, the indigenous stock, perhaps, on which most other peoples in this part of Eastern Africa [Horn of Africa] had been grafted" (Bates 1979). The Oromo people mostly reside over a vast region of Ethiopia predominantly Hararge, Bale, Arsi, Borana, Guji, Jimma, Illu Abba Bor, Wallagga, Horro Guduru, Shewa, Southwestern part of Gojjam, and Wallo in Ethiopia. This is apart from their evident residence in some East African counties such as Kenya (Beyene and Tolera, 2006).

In ecology the aforesaid regions are chiefly inhabited by the Oromo. Most of these regions are currently situated in Oromia regional state of Ethiopia and unfold the richest expanse in the Horn of Africa. Livestock, coffee, oil seeds, spices, mineral resources, forest and wildlife are all diverse and abundant (Beyene and Tolera, 2006). As an instance, about 3.1 million hectare, or slightly less than three-fourth of Ethiopia's current total forest cover is found in Oromia regional state (Buzuayehu et al., 2002; OFWE, 2009).

Several studies portray the Oromo as distinct people having exhibited egalitarian ethos. Some of these studies demonstrate the rich universe of Oromo Gadaa system. The Gadaa system refers to typical socio-political, economic, religious and cultural system or heritage of the Oromo (Legesse, 2000; Hassen, 2007; Dewo, 2009). The Gadaa system as Oromo traditional institution consistently reveals five social sets with five grades, each with eight years duration. Among the Oromo of Horro Guduru the five grades—from junior to senior as per Gadaa age reckoning—entail *Itti Makoo* (0-8), *Dabballee* (9-16), *Foollee* (17-24), *Dooroma* (25-32), and *Luba* (33-40). This Gadaa age reckoning does not necessarily well-match with the biological age of an individual passing through Gadaa stages. Conversely, one can be at his *Itti Makoo* (0-8)—the most infant *Gadaa* age possible—while he is still in his teens or even highest in his biological age and vice versa.

Among the Oromo of Horro Guduru, who are mostly referred to as descendants of the fourteen clans of Horro (*Kudha Arfan* Horro), the stage after the *Foollee* grade is relatively more critical. Individuals in the two stages earlier to the *Foollee* are less likely required to shoulder public responsibilities. As a case in point, individuals in the *Itti Makoo* class and grade are traditionally considered kids, though biologically they could be adults. And the *Dabballee* group is often vested with the duty of looking after livestock. But the stage of *Foollee* signals a turning point in assuming public obligation. It symbolizes the time when one is required to engage in societal defense to the extent of staying away from home for long just on guard of national security. Hence, the *Foollee* group and stage in the Gadaa system marks the military force of Oromo nation. After serving in this stage with military duty, the Gadaa system requires them to pass on to the next grade known as the *Dooroma*—stage of preparation for holding political office. As the time required to stay in each grade is eight years, one would pass on to the public leadership stage called *Luba* or *Abbaa Gadaa* at the expiry of

Dooroma period. It was documented that *haanquu* as ethnomedicinal plant was discovered by the military section of the Oromo society at a place named Haruu Shuwaa, some 180 years back now (Simbirtu, 1993).

Geographically, the Oromo of Horro Guduru are located in northwestern part of Oromia regional state in Ethiopia, between 9°10'53" N to 10°17'03" N latitude and 36°39'36" E to 37°40'13" E longitude. This astronomical location in Ethiopia falls in Eastern Africa. Map 1 shows the location of Ethiopia in Africa in specific and the world at large.

The Horro Guduru has diverse relief features. It has elongated and rugged mountainous panoramic views. There are mountainous ridges, with unevenly blinking chain covering large topographic displays in this Eastern African part of northwestern Oromia regional state.

According to Sadeta (2007:24), the Horro Guduru landscape has a total area of about 786,900 hectare (ha) and average elevation ranging between 1000-3300m above mean sea level (a.m.s.l.). It has a vast plateau land (58.56%), a very small proportion of low lands (23.76%), mountains (6.64%), and other topographic features (11.04%). The Horro Guduru has many big mountains such as Balbala (3178m), Dabisho (2980m), Jaldessa (2950m), Tulluu Guddanee (2747m) and Tulluu Korma (2820m). There are several rivers and streams in the area which are sourced from many of these mountainous grounds. The dominant soil types are Rendzinas, Haplic and Luvic Phaeozems, which are generally infertile, red tropical, soils but suitable for heterogeneous existence of tropical vegetation and fauna. *Haanquu* plant, which is a shrub like branches of vines the fruit of which is used for medicinal purposes for tapeworm diseases, is among such diverse vegetation favoring the preceding ecological behaviour. *Haanquu* shrub is reported to have been limited to certain ecological traits in tropical Africa such as the Horro Guduru. This might hint that its medicinal discovery and utilization by the Oromo could be a work of environmental kismet or opportunity, as

Map 1 : Ethiopia's geographic location in Africa and the world



Source: <http://en.wikipedia.org/wiki/Ethiopia>, accessed on 26 January, 2012

other areas which could not naturally able to bear this plant would have not revealed the providence.

RESEARCH METHODOLOGY

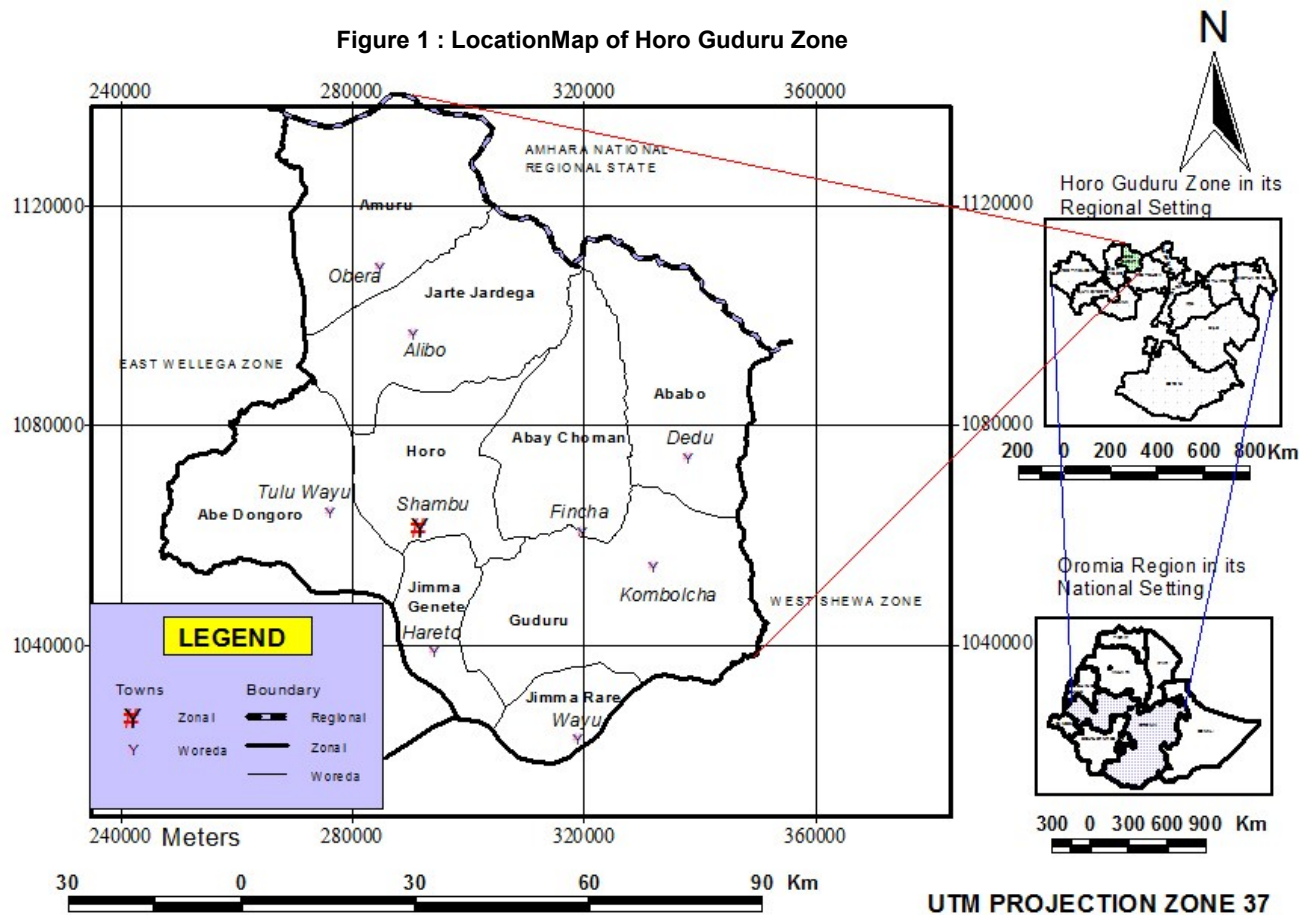
The Oromo ethnic group residing in northwestern Oromia regional state in Ethiopia was the target informants of this study. Some four key informants were purposively selected from among the local elders occupying the highlands of Horro Guduru. As compared to other potential informants, these key informants were believed to know the genesis of the traditional medication system under study, apart from their proverbial knowledge on its recipes, application and current status. Being located through snow-balling method, their ideas were supposed to represent the Oromo ethnomedicinal plant knowledge under discussion. In addition, a taste of five different unobtrusive observations were conducted while

the folk medicinal treatment was applied by traditional healers against tapeworm illness. This was so to cross-check the data generated through in-depth interviews with the key informants. Moreover, relevant archival analysis was made to explore and substantiate reported evidences on the emergence of *haanquu* as an ethnomedicinal plant rooted in Oromo folk medicinal history.

RESULTS AND DISCUSSIONS

Discovery of *Haanquu* Fruits as a Cure to Tapeworm

Critical inquiry into the folk medicinal domain among the Oromo of Horro Guduru reveals that the people have a kind of innovation in curbing tapeworm. The folk medical innovation against tapeworm was recognized after a perfect discovery of its medicine from *haanquu* tree species. The discovery has passed through



Source: Adapted from Finance and Economic Development Bureau of Oromia. *N.B: The boundary delineation on this map must not be authoritative*

Source: Sadeta 2007, p.32

testing and experimentation of several tree species from which only *haanquu* has shown valid result.

According to a local archive named Simbirtuu, *haanquu* as a folk medicine against tapeworm was discovered by the Oromo through testing fruits of 21 plant species on patients of the disease. It was believed that, prior to Amhara colonial conquest in 1870s, the Oromo military had took the experimentation on fruits of 21 tree and shrub species. The underlying Amhara colonial provocation among the Macca Oromo was clearly realized since 1830s. Table 1 shows the plant fruits selected for the experimentation by the Macca Oromo descendants, likely in this decade.

Tapeworm parasite among the Oromo was believed to have emanated from eating uncooked meat. *Simbirtuu* (1993) reveals that the Oromo

did not eat raw meat prior to the colonial invasion. But the eve of colonial conquest had compelled the military, particularly the *Foollee* class of the Gadaa system to live for long away from home in defense of Oromo nation boundary without provision or supply of military ration. This had caused the *Foollee* to begin slaughtering animal booties, especially goats and sheep and eat uncooked meat. After certain days of consuming raw meat, they had witnessed segments of tapeworm in their stool. Steadily, almost all military members experienced unusual illness which triggered them to find solution from fruits of trees and shrubs in the ecology at hand.

In effect, experimentation was conducted by the Oromo military generals of the episode who subjected 50 patients to experimentation with the fruits of the trees and shrubs displayed above. Accordingly, these 50 patients were grouped into

Table 1: Plant fruits subjected to experimentation for tapeworm medicine by the Macca Oromo

Plant Names (Vernacular & Botanical)	Plant Type	Parts Experimented	Results
Harbuu (<i>Ficus sur</i>)	tree	fruit	failure
Baddeessa (<i>Syzygiun guineense</i>)	tree	"	"
Goosuu (<i>Syzygiun spp.</i>)	tree	"	"
Waddeessa (<i>Cordia Africana</i>)	tree	"	"
Gambeelloo(<i>Gardenia ternifolia</i>)	tree	"	"
Agamsa (<i>Carissa spinarum</i>)	shrub	"	"
Goraa (<i>Rubus apetalus</i>)	shrub	"	"
Haanquu (<i>Embelia schimperi</i>)	shrub	"	successful
Dhoqonuu (<i>Grewia ferruginea</i>)	shrub	"	failure
Hudhaa (<i>Ximenia americana</i>)	shrub	"	"
Coffee (<i>Coffee arabica</i>)	shrub	"	"
Harooressa*	shrub	"	"
Dhimuu*	shrub	"	"
Ogiyoo or Zeytuna*	shrub	"	"
Midhaan-durbaa*	shrub	"	"
Madaalee*	shrub	"	"
Raamsoo*	shrub	"	"
Tunjoo*	shrub	"	"
Laaluu*	shrub	"	"
Roqaa*	shrub	"	"
Meexxii (<i>Phoenix reclinata</i>)	shrub	"	"

Source: Simbirtuu, 1993; p. 22-23. *Botanical names not found

several experimentation sets. Each set comprised of two persons. The collected fruit samples were processed or pounded and given to the patients with cooked cucumber/pumpkin. Patients of tapeworm need to ingest the pounded *haanquu* beans early in the morning before breakfast. The patients under experimentation were controlled to fast (abstain from food) until evening. From the experiment, only two patients to whom a processed *hanquu* fruits was applied were cured from the disease. Other fruits did not able to serve the purpose. To validate the success achieved on two patients—discovery of *hanquu* fruit's remedial power against tapeworm diseases, the remaining 48 patients were provided with the medicine being discovered.

Eventually, all patients were cured from the disease. The result helped not only to control tapeworm menace but also in an inapprehensive consumption of fresh and raw meat.

Before winding up this part it is important to discuss in a reiterative way some points highlighted in the preceding assertions. Since its discovery in 1830s, *haanquu* is used among the traditional Oromo people of Ethiopia as medicine to eliminate adult *Taenia saginata* from human intestine. The anthelmintic effect of an extract of powdered fruits of *Embelia schimperi* was believed to have been discovered in an experimental parasite/human setup. In one experiment, two men with adult tapeworms of *Taenia saginata* were treated with powdered

beans of *haanquu*, isolated from the plant. Significant effects in entire *Taenia saginata* removal from intestinal tracts were observed in these men treated with the powdered beans. A clear indication of the removed tapeworm in the men was observed in feces after treatment. The killing effect of the powdered *haanquu* beans shown in the two men was corroborated with another experiment comprising 48 men suffering from the same disease. In this case too, after treatment a significant result was observed in the patients' health. The achieved results indicate that the crushed beans of *Embelia schimperi* taken orally by the Oromo people indeed have an anthelmintic effect against human intestinal tapeworms. This assertion is consistent with Bogh et al. (1996) who found nearly similar results among the Maasai of Tanzania. But in the latter case application of the experimental control was on parasite/rodent models despite the witnessed similarity in killing this intestinal parasite, beef tapeworm. The medicinal use of *haanquu* is portrayed in the fact that it is a drug which consists of the fruits of *Embelia schimperi* Vatke. At the time of Oromo colonial conquest, the drug was used in the form of an unstrained infusion of the powdered beans, which is swallowed with cooked cucumber or pumpkin or some tasty liquids such as honey as *haanquu* powder is too bitter to be ingested solely.

No matter access to some modern medical facilities are currently underway in Horro Guduru, the local people still favor this traditional medicine to treat tapeworm than opting for the modern biomedical pharmaceuticals. The local communities believe that the efficient solution for tapeworm disease lies at their disposal without charge of money. Similarly, in time of livestock disease cure they often prefer application of folk veterinary medicine through traditional experience to modern veterinary and experts.

Despite their blatant discovery of *haanquu* beans as tapeworm remedy, the Oromo until now did not own any patent right about the exploration. Nor was critical study carried out on the ethnomedicinal knowledge of *haanquu* plant

among them to attest whether this discovery stemmed from indigenous knowledge system or diffused in from other cultures.

Few Points about *Haanquu* Plant

Haanquu (*Embelia schimperi* Vatke) is one of the five known species of the plant family named Myrsinaceae (Manguro et al., 2004). The fruits of this plant are used by some ethnic groups such as the Maasai as an antibacterial and anthelmintic remedy, especially against beef tapeworm (*Taenia saginata*). These biological activities have been supported by systematic studies (Bogh et al., 1996). Recent studies have shown that a methanolic extract of the fruit has inhibitory effects on hepatitis C protease (Hussein et al. 2000). Phytochemical studies reported the isolation of long alkyl chain substituted benzoquinones (Midiwo et al. 1988, Manguro et al. 2004). Among them is embelin, a compound with a wide spectrum of biological and pharmacological properties. Anthraquinones have been also isolated from *haanquu* berries (Arot and Williams 1997). *Haanquu* has also inhibitory or antidote effect against some viruses through its pentacyclic triterpenoids (Machocho et al., 2003).

Botanical description reveals that *haanquu* is a species of flowering plant (Plate 1) native to the high-elevation regions of tropical Africa including Ethiopia. It is one of the five species of genus *Embelia* Burn, and is a monocot plant. *Haanquu* is a small tree up to 15 m in height but often a shrubby vine with smooth red-brown bark said to have edible leaves. It is thus more identifies as a thin shrub, with thin branches, and thin, peeling bark. It propagates by seedlings and wildlings.

The leaves are green, up to 30 cm long, with a finely serrated margin. The leaves are reported to be edible and are used as food in eastern Africa. The flowers are white, produced in panicles 30-60 cm long on a hairy stalk from the leaf axil. Fruits are many on stalks, each rounded, about 6 cm across, red to black when ripe, tipped by the old style, one seed inside. Fruits are consumed as a medicine against tapeworms and other intestinal parasites in normal times. Fruits are collected and

Plate 1 : Partial view of some distinguishing parts of *haanquu* plant



consumed during food shortage periods for the sake of normal food consumption and not as a curative measure against any disease. The fruits are often seen in markets and are sold as purgatives and vermifuge or tapeworm expellant. It is generally believed to have found from 1,700-2,600m elevation, in areas receiving 1000-1500 mm of rainfall annually (Hyde 2002). It cannot be found flourishing in deforested areas due to its vine nature which needs resting on some relatively thicker and branching tree canopy hosting herbal and shrubby undergrowth. These habitat or ecological traits are mostly situated in forests or along forest margins, on river banks and on hills in woodland. *Haanquu* is used as a food plant by wild birds and animals including monkeys, apes and gorilla, apart from some insects.

Haanquu plant as distinguished by its botanical name has about fourteen different synonyms: (1) *Embelia abyssinica* Baker, (2) *Embelia bambuseti*

Gilg and Schellenb., (3) *Embelia batesii* S. Moore, (4) *Embelia dasyantha* Gilg and Schellenb., (5) *Embelia gilgii* Mez, (6) *Embelia guineensis* Baker, (7) *Embelia kilimandscharica* Gilg, (8) *Embelia mujenja* Gilg, (9) *Embelia nyassana* Gilg, (10) *Embelia pellucida* (Hiern) K. Schum., (11) *Embelia retusa* Gilg, (12) *Embelia tessmannii* Gilg and Shellenb., (13) *Embelia tibatiensis* Gilg and Schellenb., (14) *Pattara pellucida* (Hyde 2002). It is important to note that the species of *Embelia schimperii* Vatke is somewhat variable, particularly in leaf-shape, and occurs widespread in Africa. This explains the extensive synonyms pertaining to the plant species. The present study rather reports the initial discovery and indigenous knowledge systems about *haanquu* plant species as an ethnomedicinal plant among the Oromo of Ethiopia.

Plate 1 depicts that *haanquu* plant is a climbing shrub or liane with long trailing branches, the

climbing aided by short hardened lateral branchlets. Leaves spirally arranged, crowded at the ends of branches, very variable in shape, thinly fleshy, hairless, rounded or notched at the apex; margin entire. Flowers are in spikes on the old lateral shoots, whitish to yellowish. Fruits are somewhat depressed-spherical, about 5 mm in diameter, scarlet or red-blackish when ripe.

The use of *haanquu* beans as anthelmintic among the Oromo covers almost the whole population. This is consistent with other findings that even a quarter of Ethiopia's pharmacopeia has been made up of *haanquu* (Pankhurst 1990). This author clearly shows that the primary use of *haanquu* as medicinal plant in Ethiopia was well into the nineteenth century, though he did not mention which ethnic group might have started or discovered it at the outset. But he underscored that *haanquu* was used to combat human tapeworm infestation which was endemic due to widespread consumption of dishes containing raw beef. Pankhurst notes that frequent doses of *haanquu* were the common cure. The date on which the medicine was administered virtually constituted a holiday for the patient. In most cases, the patient used to vacate all normal

activity. The statement 'the master has taken his *haanquu*,' being synonymous with 'he cannot receive you today.' *Hanquu* ingesting in fact served as an excuse or justification for not keeping appointments, being used by the debtor who did not wish to meet his creditor, by the accused who wished to avoid going to court, and by the official who sought to delay answering the Emperor's summons (Pankhurst, 1990). *Haanquu* in Afaan Oromo is also the name of the human tapeworm. Thus, it is normal among the Oromo to address both the plant and the tapeworm with the name *haanquu* simultaneously. This argument is based on this widespread Oromo narration, "*haanquun na dhufte ka'een haanquu dhuga*". Translated as, "*haanquu* (to mean tapeworm) has infected me so let me ingest *haanquu* (to mean powdered *haanquu* plant beans).

Ingesting *Haanquu* Beans to Cure Tapeworm: Recipes and Efficacy

Critical view of the recipes on how to administer *haanquu* plant beans to remove tapeworm from human intestine and the efficacy thereof unfolds that the Oromo used to treat tapeworms through oral medication. But oral medication is limited to

Plate 2 : Cucumbers/pumpkin and coffee cup



The way a patient ingests powdered *haanquu* beans

the use of powdered *haanquu* beans. To treat tapeworm menace, grounded fruits of *Embelia schimperi* are macerated in cooked cucumber or pumpkin (locally named *dabaaqula*). Then the medicine is ingested in an empty stomach and the patient would remain refrained from eating or drinking whatever sort of ingestion for full daytime or one night. It is more likely that human digestive system does not absorb this drug well. It either dissolve or attack (and kill) the adult tapeworm. The tapeworm's scolex, i.e., neck and head needs to come out of the patient's intestine in their stools. If the scolex is not destroyed, it is believed that the tapeworm can grow again. Medication used for treating adult tapeworm infection is often referred to as *anthelmintic medication*. Anthelmintic means that it kills the parasitic worm, and makes the worm pass out of the gut in the patient's stools.

Necessary recipes that are followed to apply effective treatment involve: (1) cutting fresh *haanquu* beans, (2) grinding the beans by pestle and mortar as fresh as they are, (3) measuring the dosage of the powder by coffee cup (*shinii*), (3) wrapping the powder with cooked cucumber or pumpkin to avoid risk of bitterness, (4) swallowing the enfolded *haanquu* powder early in the morning before breakfast, (5) staying in fasting for daytime long to help the medicine effectively kill the parasite from intestinal wall, and (6) having been served with porridge dish after 8 to 12 hours of treatment to help the patient get saved from potential side effects.

Tapeworms are treated with medications taken by mouth, usually in a single dose. In modern biomedical principle, the drug of choice for tapeworm infections is niclosamide. Praziquantel and albendazole can also be used. Some may believe that treatment with *Embelia schimperi* is often unsuccessful resulting in only partial removal of the intestinal worm. This assertion contradicts the Oromo indigenous knowledge or ethnomedicine about *haanquu* plant beans that they are efficient medications to remove beef tapeworm as internal parasite from human intestine.

Ecology and Health: Uncertain Relationships

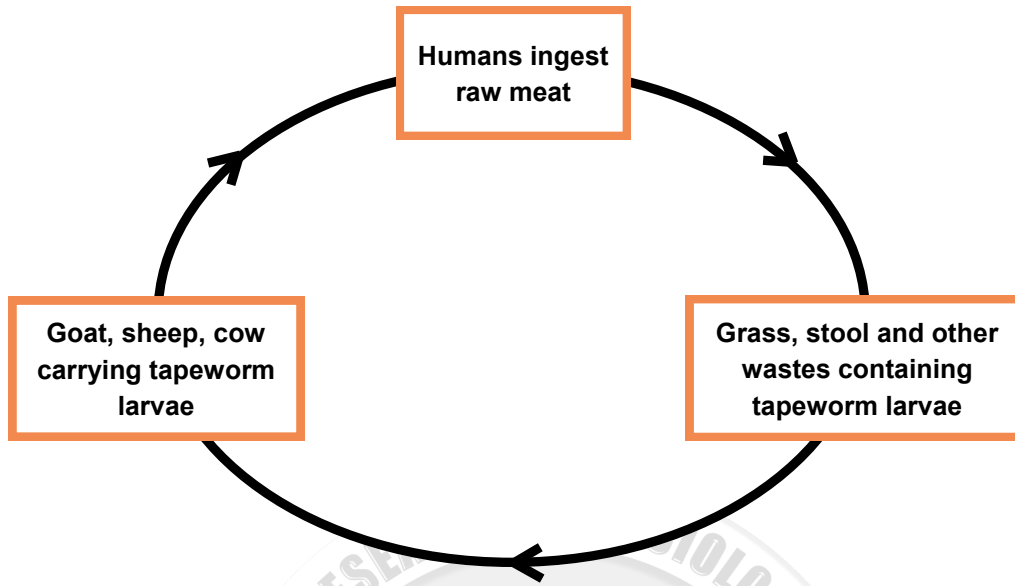
The ways humans interact with the environment may bring symbiotic or detrimental impacts on themselves. In this sense, relationships occurring with the organisms interacting in an ecosystem could result in health problems, though precautionary notice is less likely. This may imply that it is nearly uncertain to have conspicuous understanding regarding the influence of the wider interacting system in the general ecological setup on humans and vice versa. Such may result from the complex ecological relationships among organisms wherein human health could often be impeded with diseases like tapeworm. Figure 2 demonstrates how human health as an entity dependent on the wide-ranging ecological ensemble is quite prone to ingestion-induced internal diseases such as tapeworm. The wider ecology could easily vitiate human health, given desirable and forewarned precautions are less likely in place. Tapeworm is an externally-driven parasite despite its category as internal disease.

Sources also show that tapeworm infection happens from environments with less sanitation and care for personal hygiene (http://en.wikipedia.org/wiki/Tapeworm_infection).

Tapeworm infestation is the infection of the digestive tract by adult parasitic flatworms called cestodes or tapeworms. Live tapeworm larvae are sometimes ingested by humans when they consume raw or undercooked meat. Once inside the digestive tract, a larva can grow into a very large adult tapeworm measuring up to 25 meters and can survive as long as 20 years. Beef tapeworm infection as a result of interactions with environments with less sanitary system is called *taeniasis*.

Tapeworms or cestodes are intestinal parasites. They are worms that are flattened like a tape measure. A tapeworm cannot live freely on its own. It survives within the gut (intestine) of an animal, including a human. A parasite is an animal or plant that lives in a host, another animal or plant. In an ecological interaction, when such a featured infection is passed from an animal to a human it is called zoonosis. The reality in Horro

Figure 2 : Simplified view of tapeworm transmission cycle in ecological interaction



Guduru environment indicates that for humans it is ingestion of larvae cysts in raw meat or muscle tissue of some eatable animals such as those mentioned in Figure 2 which often causes tapeworm infection. Thus tapeworm can be caused by eating raw or undercooked meat from an animal that has the larval form of the tapeworm cysts in its muscle tissue. Once ingested, the larvae then develop into adult tapeworms in the intestines. By attaching themselves to the walls of the intestine some tapeworms cause irritation or mild inflammation, while others may pass through to the stool and exit the body. Even while being treated for certain tapeworm infections, re-infection can result from ingesting tapeworm eggs shed by the adult worm into the stool, as a result of insufficient personal hygiene.

Therefore, with reference to the Horro Guduru scenario the following two ways are considered risk factors or transmission ways for tapeworm infection mainly as a result of uncertain or unpredictable interaction with environmental entities: (1) general lack of personal hygiene, especially if one washes his or her hands infrequently the risk of transferring infection into ones mouth is greater; and (2) consuming raw or undercooked meats, especially larvae present in meats may infect people if eaten raw or

undercooked. Hence, most people become infected after ingesting tapeworm larvae, not egg as there is no report of egg tapeworm infection in the area. But it is believed that as the beef tapeworm lives in the gut and can easily be treated it is relatively harmless. Perhaps because of this premises, the health uncertainties resulting from less sanitized human-environment interactions did not yet led to horrors of tapeworm in Horro Guduru, despite its prevalence among the Oromo inhabiting its vast rural areas devoid of toilets.

It may be queried that how the victim could clearly know whether he or she has been infected with tapeworm before deciding to ingest *haanquu* beans. Some people may experience upper abdominal discomfort, diarrhea, and loss of appetite. Apart from this, symptoms for infection is generally recognized when the infected person passes segments of proglottids in the stool (looks like white worms), especially if a segment is moving or crawling. Clear symptom is something the patient feels and reports, while as a sign some other people including intimates may detect. But it is not uncommon for an infected person to have no apparent signs and symptoms. Even if symptoms are present, they may be so mild that many people believe they are caused by something else.

If signs or symptoms are present, they may include the following (may vary depending on the type of tapeworm): (1) segments from the tapeworm in stools called proglottids, victims experience discomfort around the anus when proglottids are discharged and diagnosis is made on the basis of seeing the flat white proglottids wriggling or fidgeting in the stools; (2) abdominal pain just above the stomach; (3) vomiting; (4) nausea or unsettled stomach; (5) general weakness; (6) inflammation of the intestine (enteritis), which often causes diarrhea as well; (7) diarrhea; (8) gradual weight loss; (9) altered appetite or loss of appetite; (10) sleeping difficulties; etc.

Actually, signs and symptoms may depend on what type of tapeworm it is as there are other most severe types of tapeworm like pork tapeworm compared to beef tapeworm, how severe the infection is, and which tissues (which part of the body) are infected. Nevertheless, tapeworm can be prevented by observing good hygiene, i.e., washing hands thoroughly with soap and water after using the toilet and before eating. The most important prevention method is rather ingesting thoroughly cooked meat. Sometimes cooking meat to a temperature of at least 66°C (150F) or freezing raw meat for at least 12 hours is suggested. These will kill larvae or eggs. Medication of *haanquu* beans is believed to be toxic to the tapeworms and can kill them off quite easily. In modern biomedical system, biltricide is a common medicine recommended for the treatment of tapeworm infection (<http://www.squidoo.com/tapeworm>). But this is a curative approach as compared to the preventive approaches demonstrated above.

Threats to Ethnomedicine

Number of indicated threats to *haanquu* as Oromo ethnomedicinal plant species was significantly high. The most significant threats indicated by key informants involve forest destruction and the locales' swinging attitude about the plant for remedies against tapeworm and other non-medical use. Deforestation as a threat was mainly due to agricultural land

expansion. In fact, anthropological findings show that the significance of tropical forest as a source of medicines is not merely coincidental but related to ecology. The tropics contain a disproportionate percentage of the total number of species. Many of the important medicinal plants come from tropical forests (Townsend 2008). Hence, part of the threat of logging these forests is that the source of future pharmaceuticals may be lost.

The local community in Horro Guduru appear to have sandwiched amid the medicinal and other uses of *haanquu* plant. On one hand, they used to utilize the plant's beans for tapeworm treatment. On the other, they purposively engage in massive cutting of *haanquu* vines to the extent of uprooting of the plant's very existence just for construction of bee hives and utilization for firewood. This swinging once for remedies and simultaneously for material consumption has a part in discrediting the traditional values for ethnomedicinal plants. Moreover, the absence of practice by traditional healers to conserve or widen ethnomedicinal plants was a considerable threat.

Introduction of modern medicines also played an enormous role. Taking modern medicines is more preferred among large section of the population, particularly the educated class and their networks in the family and the larger society. It is believed that modern medication systems do not have many unwanted effects and help the people continue with their daily routine without serious side effects. The introduction of modern medicine has affected the value of traditional medicines in general, though the short supply of such drugs is a problem. Niclosamide, Mebendazole and Albendazole were among the common modern medicines with anthelmintic properties (Assefa et al. 2010). These drugs have different dosages and are given to a patient based on age and/or weight. The price was about 3 to 5 ETB (about 0.18 to 0.30 USD) at the time of the field study. But no cash is required to administer *haanquu* beans. People, mostly the youngsters, buy these modern medicines from local drug shops. The

youngsters believe that modern medicines do not have many side effects and are simple and ready to be used. The youngsters further believe that traditional medicines have not been scientifically ascertained and traditional healers give medicines by trial and error at the cost of the patient's health. Due to these reasons they prefer modern medicines over traditional ones. Still, informants mourn that the tradition of drinking *haanquu* still exists, but it becomes more and more difficult to collect the fruits as hardly any scattered shrubs exist these days due to deforestation and overexploitation for non-medicinal use.

On the whole, interest towards utilizing traditional medicine is diminishing among the young generation hinting to the fact that ethnomedicine in general would be seriously jeopardized within few decades. Reasons entail exposure to modern education which has seldom incorporated lessons on traditional medicine in the area and exposure to cities where use of traditional medicine is less recommended. Likewise, some elderly were showing reluctance to take traditional medicines when they have been exposed to experiences of their youngsters who disregard ethnomedicine in favour of modern biomedical treatments. In fact, decline of medicinal plants owing to deforestation and the introduction of modern medicines at the grassroots reinforce each other to serve as serious threats to prevalence of ethno-medication systems. Due to these factors, the practice is now becoming more and more outdated. This assertion is consistent with other studies (Assefa et al. 2010)

CONCLUSION

This paper has attempted to demonstrate a remarkable traditional medicinal plant knowledge and practice as explored and documented on Oromo folk medicinal plant named *haanquu*. The Oromo greatly value *haanquu* plant for its therapeutic properties. Though all parts of this medicinal plant are important to local communities, the most frequently used part are the fruits, which carry anthelmintic properties, and are used against tapeworms.

Since the discovery of tapeworm as raw meat dish borne disease, the Oromo often used to avoid consuming uncooked meat. Particularly the young under 18 years of age are not allowed to eat raw meat because of experience, moral and psychological reasons. This is one of the widely known preventive strategies against the parasite among the people. This is apart from other possible preventive methods including keeping personal hygiene and environmental sanitation. Ingesting *haanquu* beans is a curative approach to the disease. Overall, both approaches appear to have been the direct or indirect ramification of human interaction with other organisms or elements in the wider ecology.

There was no significant age and gender disparity in the identification, and recipes and application of *haanquu* beans as cure to tapeworm parasite as the people mostly used to apply self-administered medication. But, the older traditional healers had greater knowledge and use of ethnomedicinal plant species than the younger ones. This may imply that the indigenous medicinal plant knowledge and use could be applied regardless of considerable age and gender barrier. It could also indicate that indigenous ethnomedicinal knowledge of *haanquu* beans would not be vitiated for lax of transferring the desired knowledge and skill about its remedy for tapeworm among the younger generation. Customary healing could be a transferable knowledge and its use of ethnomedicine can be obtained from individuals, parents or the larger society despite the educational status of both the mentor who pass on the knowledge over to another and the receiver of the knowledge. This means that the indigenous medicinal plant knowledge and use is independent of the educational level of traditional healers.

But it was realized that the young generation have developed low interest to inherit and use ethnomedicinal knowledge, just in favour of modern biomedical systems. This assertion is consistent with the claim that medicinal plant knowledge and use increased with age (Estomba

et al., 2006) when the community suffered an important erosion of ethnomedicinal plant knowledge (Yineger et al., 2008). Although knowledge about identification, harvesting, preparation and utilization methods of *haanquu* beans is still maintained within the community, in general interest towards utilizing the traditional medicine is diminishing, especially among the young generation. Assefa et al. (2010) have also drawn similar conclusion from the study of other area and people in Ethiopia. Despite its widespread use *haanquu* medicine is found to have some side effects as it is usually taken not in a scientifically ascertained manner. Gastrointestinal upset following consumption leads patients to develop dislike against it in the midst of increasing use of modern medications.

Preservation of *haanquu* beans for remedies has never been the norm among the Oromo as the remedy by powder of these beans should be used mainly as freshly cut as they are. This might also be attributed to the availability of ethnomedicinal plant species in their area as most of them were plant species that natural forests provide. The Oromo rather used to keep garlic to prevent malaria and treat headache and honey for its medicinal use in treating cough associated with headache. In some ethnic groups, example, those inhabiting north Peru (Bussmann and Sharon, 2006), some remedies were prepared using dried plant material when fresh material was not available, and when the plant material had to be transported from other regions.

The Oromo prescribe different doses of remedies for different age groups. More amounts of remedies were given for adults than children to treat the same disease such as tapeworm. Though such prescription variation was practiced, still the amount prescribed by healers for both children and adults might not confirm with the standard prescriptions in modern medical literature (Seifu et al., 2006). It is believed that the remedies in modern medicine used to treat ailments had no adverse effects on patients, though there were some side effects in the

remedies prepared from *haanquu* beans as ethnomedicinal plant. Here, certain side effects entail temporary irritation and vomiting at the time of application.

Nowadays, the use of *haanquu* beans in treating tapeworm as part of ethnomedicine is uncommon and the profusion of this ethnomedicinal plant species even differed significantly with respect to multiple uses of the species over years. This might be due to impact of anthropogenic pressure on the survival of ethnomedicinal plant species. It was observed that *haanquu* as ethnomedicinal plant was under serious threat mainly due to deforestation in response to agricultural land expansion as well as consumption for construction and firewood. Deforestation due to agricultural land expansion is the principal threat to medicinal plant species in other areas like the Yunnan of China (Ji et al., 2005). Despite the increasing and widespread threat to ethnomedicinal plant species, evidences less likely reveal that the indigenous people have been practicing any conservation measures to ensure the sustainability of such plant resources. This calls for pertinent interventions at least to lessen the core pressure on ethnomedicinal plant resources and ensure their foresighted conservation. This assertion is because even if *haanquu* offers diverse products, the shrub population is in a state of increasing decline. Despite its ethnomedicinal importance the local community were found to be lax in that they were putting the plant species in a blink of jeopardy as a result of agriculture-induced deforestation. This has led to scarcity of the species in the locality nowadays. The elderly informants evoke their earlier period experiences on resource abundance and compare those to the current situation of local realities. Given the increasingly declining status of this ethnomedicinal plant at present, not only the species would disappear within few decades but there would eventually be fading away of the indigenous knowledge associated with the species.

No matter what it is uncommon to cure tapeworm with the plant species, large majority of the

elderly still utilize *haanquu* beans in treating tapeworm. This may warrant the maintenance of indigenous knowledge on the species. Therefore, it should be suggested that the local communities ought to be assisted to document and promote their knowledge of ethnomedicinal plants. This could be ensured through strategies like granting patent rights to the indigenous people in areas of their ethnomedicinal plant exploration. *Haanquu* beans as part of ethnomedicinal plant species was discovered by the Oromo in 1830s. Thus the people deserve possession of patent right on this matter as they have less likely acquired the knowledge from other cultures. Also, discouraging lax cutting and allowing natural regeneration of *haanquu* plants by protecting young seedlings from human and livestock destruction can help the local community to conserve and promote their ethnomedicinal plant species. This could be achieved through public awareness creation and community-based supervision.

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