Cultivation and Consumption of Teff in Gojjam Highlands: Implication for Understanding the Beginning of Food Production in Ethiopia

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Abstract

The origin of agriculture in Ethiopia has often been attributed to external influences. However, some clues now suggest its probable indigenous origin. This study investigates major activities associated with the cultivation and consumption of the indigenous cereal teff in the Gojjam highlands of north western Ethiopia. A comparison is made also with the main activities involved in the cultivation and consumption of other cereals growing in the region. Unlike most other crops, the activities associated with exploitation of teff are rather unique. Although teff is laborious to cultivate, it is generally the most preferred staple and widespread food crop. Its utilization is embedded in different cultural and ritual practices which is absent among crops introduced from outside. The study suggests that well-established cultural and ritualized activities based on the cultivation and exploitation of indigenous crops might have preceded the arrival of crops from the Near East. The paper also shows that local context and specific details of crop cultivation and consumption are important in understanding agricultural origins in a specific area.

Introduction

Ethiopia is considered as one probable centre for plant domestication in the world (Harlan 1969, 1971, 1993; Melaku 1991). Nevertheless the local or external origins of agriculture are still debated (Bellwood 2005; Hildebrand 2003; Neumann 2005). Research on teff (Eragrostis tef) is considered essential to this debate because it is argued that people might not have domesticated this small seed cereal if Near Eastern crops were already available in the region (Barnett 1999; Lyons and D’Andrea 2003; Phillipson 1993). Teff has seeds that are 1-1.5 mm in length and 2500-3000 seeds constitute a gram. Rain cited in Alemsedeg (2006:4) also states, “the weight of 150 grains of teff is almost a grain of wheat”. Its small size and use in un-charred form may hinder its preservation and recovery in archaeological contexts (Barnett 1999; Phillipson and Reynolds 1996). This paper investigates cultivation and consumption of teff in order to provide an understanding of the beginning of agriculture in Ethiopia.

I conducted an ethnographic study in Gojjam (Figure 1), a province primarily bounded by the Blue Nile Gorge and the Lake Tana Basin (Muse 1993). The region was isolated from foreign influence until the first quarter of the 20th century AD (Gebru 1991). It is inhabited by Amhara, Agew, Shinasha, Gumuz, Oromo, and Woyo peoples, who either adhere to Christianity, Islam or to other traditional religious beliefs (Dombrowski 1971:46, 67). The area is the major grain producing region where teff is highly valued and widely cultivated (Galperits 1981; Westphal 1975). According to current administrative boundary, sites in the study area are located within the Amhara and Benshangul Gumuz Regional States. The data is collected from eight rural villages occupied by Semitic speaking Amhara, Cushitic Agew and Omotic-speaking Shinasha. The specific sites are Dagmawi (2995 masl), Kencher (2480 masl), Diwaro (2420 masl), Wad Iyesus (2015 masl), Gashena (2590 masl), Ambiki (2094 masl), Mekuy (1664 masl) and Laymenti (1760 masl). Eighty households were observed and interviewed between July 2008 and February 2009.

Cultivation of Teff

Studies show that the cultivation of teff is the most labourious of the cereals. On average, teff cultivation requires eight ploughings. Repeated ploughing destroys weeds, breaks and softens the soil, and increases the water-holding capacity of the soil. Unless teff fields hold enough water before sowing, the yield will decline significantly. Before broadcasting the seed, teff fields are often trampled by cattle. The gaps between rows are also levelled, and grasses and other plant residues are removed. If teff fields are not trampled, the tiny teff seeds will be buried under
Figure 1: Location of the study area.
the soil and weeds will dominate the crop within two or three days after sowing. However, trampling on waterlogged lands will bury the soil under the surface water, and for this reason waterlogged fields are not trampled. The Shinasha, who used to cultivate teff using a slash and burn system, rarely trample their teff fields.

Although teff germinates in a few days, teff cultivation needs critical care at this time because the rain easily washes away the seeds. On waterlogged areas, contrary to other grains, teff germinates without decay because it grows with shallow roots. For this reason, teff is frequently sown in waterlogged areas. Teff is cultivated once a year. Depending on local ecology and the type of teff sown, its sowing period varies from early July to the end of August. Unlike other crops, sowing of teff is accompanied by group labour, and food and drink is provided including slaughtering of fattened sheep or chickens. Teff fields are rotated with different crops but for agronomic reason, it is never rotated with wheat. Since virgin grassland fields are suitable for teff, they are preferable for teff cultivation. Weeding teff is more difficult than for other crops due to the painstaking task of separating the thin teff plants from the weeds.

### Harvesting, Threshing and Storage of Teff

Harvesting time varies from mid-November to late January. The red and early maturing cultivars are harvested earlier than other varieties and earlier in non-water-logged than in water-logged areas. Harvesting is performed with group labour accompanied by the ceremonial offering of food, drink and with singing. The harvested teff is left in the field usually for two or three days in order to dry and to prevent decay. The drying process also eases threshing. Threshing of teff involves cooperative work and different socio-cultural activities. With the exception of finger millet, these practices are rare in the threshing of other cereals. A circular threshing floor is prepared next to the pile of harvested teff. The threshing floor is plastered with cattle dung mixed with water. Straw from previously threshed teff is placed on the floor and trampled by people or by cattle. To reduce the loss of this tiny seed, residues of other cereals are rarely used to prepare teff threshing floors.

After the plastered threshing floor is well dried, threshing proceeds by trampling the teff using muzzled oxen. Threshing teff is very tiresome and meticulous work that may take a number of days. Following the removal of large straws by forks and a wooden brush, farmers 'plough' the threshed grain in rows using their feet in order to expose the smaller straw at the surface. This straw is then removed and the grain is collected for further winnowing. Since the hull of teff is tiny, cleaning and separating hulls from the seed takes diligence. The process involves further winnowing by hand or by using a wooden table spoon and winnowing brush so that the tiny residues can be separated by wind. The bigger residues and soil particles are then removed slowly with a winnowing brush. Lighter residues are removed using either a basket or leather fan and a winnowing brush. A person picks up the grain in a basket and gently drops it in a circular motion. This helps to remove the smaller chaff. In spite of such meticulous activity and care, teff generally produces a low yield compared to other crops. Yet, as farmers in the study area explained, teff is more resistant to drought and provides a better yield than other crops particularly in time of rain shortages. Teff is also nutritious and it is used for different ritual purposes. In addition, teff straw is the most preferred fodder for cattle and for plastering walls, grain storage granaries and other household utensils.

Large granaries are usually reserved for storing teff. Apart from Laymenti, teff grains are stored inside the house because of the high demand for teff and its ability to resist pests. Because the main house is used for cooking, it encourages pest damage on pulses and other grains. Therefore, farmers prefer to store grains (except teff and finger millet) outside the house. Teff and finger millet have long storage duration whereas other crops may not be stored safely for even a year. Teff can be stored safely for about eight years on average, and teff’s storage in the house is attributed to this quality. Teff is stored in granaries made of sun dried mud rings, which are fitted one over the other. Teff straw is used as a plastering mixture with the clay paste. A large container (gota) may have ten sun dried rings while the smaller one (gushgusha) may have two or three rings. Each ring of the gota and gushgusha has a breast like feature that serves as a mark in fitting one ring on top of the other. Terminology for features of the granary rings, e.g. tut (breast), enat (mother) and for the bot-
tom ring *liji* (literary child) indicate a symbolic relationship between the granary and the female body (Figure 2).

**Socio-Cultural and Ritual Practices Associated with the Cultivation of Teff**

In Ambiki, teff fields are trampled on the seventh or the ninth day of the final ploughing to ensure increased yield. Thick rolled bread from teff cooked on an open hearth will be served in the meantime. It is believed that the bread can ‘smell’ the field and increases the yield. Similarly, in Gashena, both flat and thick bread from teff is presented to those who work in the teff field, but it is the teff field which is served first. A piece of this food is thus thrown onto the field. Sheep or chickens may also be slaughtered. In Kencher and Ambiki, teff harvesting begins after some teff was harvested from the centre of the field. This grain is then threshed at home, baked into *kitta*, and served to the family. The assumption behind this practice is that the family should taste the new harvest before the evil spirit tastes it. It is also meant to inaugurate the new harvest. Similarly, in Laymenti, some amount of teff is left at the centre of the field that is to be harvested separately, baked into *chimbo* and served to the family. In some areas at threshing time, a mixture of medicinal plants *Lepidium sativum* and *Ruta chalepensis* is sprayed over the threshing floor and the teff, and remains there until the yield is collected. It is believed that this protects the teff from being taken away by evil spirit through mysterious means. Thus farmers frequently spray the medicine during winnowing. Before threshing starts in Laymenti, a cock is slaughtered on the teff threshing floor. People believe that unless the teff threshing floor is served with food, it will not provide a good yield. As a consequence, different food stuffs and beer are served. A person passing near to the thresh-
preparation of Teff

Across the study area in Gojjam, teff is used to prepare porridge, gruel, beer, injera, chimbo and other local bread such as kitta, chibito, ingoncha, and anebabero. Injera is large, thin flat bread made from fermented batter. Kitta is unleavened or slightly leavened flat bread similar in size to injera, but it is thicker than injera. Chibito is unleavened kitta that is rolled like a ball. Ingocha is mostly leavened thick bread but it is small in size. Anebabro is two leavened kitta, placed one on top of the other during baking. Chimbo is similar to injera and kitta, but it is much thicker and smaller. Kitta, chibito, ingocha and anebabero are infrequently prepared; kitta and anebabero are often used in social gatherings and feasts. Kitta, chibito, and anebabero are prepared from teff flour only. Injera among the Amhara and Agew, and chimbo among the Shinasha, are consumed the most frequently and are the preferred breads prepared from teff. Although injera can be baked from barley, sorghum and finger millet; teff is often added to ease the baking process because it makes the batter ferment within a short period. As women argued, compared to other cereals, teff batter can be baked into injera even when it is not fermented. Therefore, its addition to other cereals eases the tasks or technicalities related to baking. It also increases the quality of the injera. For this reason, people buy or acquire teff in exchange.

All of these bread types are baked using ceramic griddles, but I will focus on the preparation of the staple breads: injera and chimbo. In preparing injera from teff, the grains are cleaned, sieved, ground, and sieved again. Water is added to the flour to make a batter. It is then kneaded and fermented. The fermented batter is diluted with water and the yeast (the thin fluid) gradually floats on the batter and is removed manually through decantation. The batter is again diluted with water and eventually baked into injera. Teff batter may be fermented for a week, but it can also be kneaded and baked even within a day. Fermenting the batter adds flavour, volume, texture and softness. Due to its quick fermentation quality, teff flour is generally easier to prepare into injera. Besides, it can be stored for some days and it is palatable and comfortable for digestion, and it is even described as the “patient’s diet.” To ease hand grinding, teff grain may be slightly heated first on the ceramic griddle.

Barley is a non-indigenous crop that is used as an ingredient for making injera in some of the study area. Hence, its preparation into the griddle baked staple food (injera) needs close examination. In
preparing *injera* from barley, the grain is slightly heated on a griddle, pounded, winnowed, and ground and sieved. The coarser flour will be ground again but some amount is used as malt. Malt is made with the coarse grained barley flour mixed with hot water and fermented for about a week (Figure 3). Fine barley flour is kneaded with the coarser malted flour and left at least for two weeks to ferment. It is then diluted with hot water and added to teff, finger millet or sorghum flour. This mixture is again left to ferment for about 12 hours. The yeast floating on the top of the batter is manually decanted or poured out. Finally, the batter is diluted with water and baked into *injera*. However, using malt is unknown in the predominantly teff and finger millet using areas of my study area. Even barley consuming areas of Gojjam do not use malt when they bake *injera* from teff alone. The use of malt to make *injera* from barley or in barley consuming areas is related to the fermentation quality of barley. Women argue that unless barley batter is fermented, it is hard to bake it into *injera*. But barley batter requires more time to ferment (from two weeks up to a month) even with the addition of this fermenting ingredient. Although longer duration of fermentation eases baking, it makes the barley *injera* too sour. Flour from teff or other cereals, or fine barley flour is added to minimize bitterness, to ease baking and to soften the *injera*. Consequently, in the study area, barley *injera* is difficult to eat and it is hardly ever made into bread.

Unlike *injera*, the batter for *kitta*, *chibito*, *ingocha* and *anebabero* does not require fermentation for more than twelve hours. *Chimbo*, the typical Shinasha bread, does not need fermentation for more than two days. It can be baked within a day and is always prepared at breakfast, lunch and dinner. *Chimbo* can be made from teff alone or in combination with finger millet and sorghum.
Ritual Uses of Teff

Among the Amhara and Agew, unfermented thin flat bread made from teff with pounded noog is served to the family to ensure a successful transition from winter to summer. Unfermented and unleavened teff ingocha from the Meskel Ceremony is believed to be a good medicine for abdominal pain. Slightly fermented beer from red teff or finger millet is served as well. However, before anybody tastes the beer, a drop is poured onto the pillar of the house. In Dagmawi, where teff is not cultivated, red teff porridge is eaten after taking the traditional medicine for tapeworm. It is believed to have a strong healing power. When an epidemic occurs, unleavened kitta or chibito from red teff with pounded noog, porridge and yesat ingocha (bread cooked on an open hearth) are thrown at the junction of a road. Roasted barley may be offered as well. People believe that teff porridge placed on the main road will protect people and cattle against epidemics. In Laymenti, people prepare another ceremony to protect against epidemics two weeks later by offering chimbo and bordie (local drink) from red teff and sorghum are offered at the same location. After a benediction by three elders, a piece of chimbo and part of the bordie is flashed on the surface as a provision for the ancestor spirits, and then everyone tastes the food. This keeps the spirit of the ancestor happy so that it protects the people from the epidemic. Red teff kitta is commonly prepared when a person feels sick. In some areas, unfermented thin flat bread teff is served in a lavish coffee ceremony on the first day of the month in order to ensure the successful transition to the next month.

Red teff porridge is also offered when a woman gives birth. Among the Shinasha, such porridge is prepared strictly from red teff and men are not allowed to taste it. In Ambiki, if the labour at delivery is extended, the woman is painted with fermented batter from her forehead to the nose. This is believed to ease delivery and protect the mother from evil spirits. Unleavened thick teff bread baked on an open fire is served for the same purpose. In Ambiki, when lightning strikes red teff porridge is prepared at that spot. After a blessing by the elders, a piece of porridge is thrown at the spot where lightning strikes, and then the porridge and red teff bordie are served to the people attending the ceremony. In Laymenti, bordie, chimbo from red teff and sorghum, and pounded noog are served to prevent people from another lightening strike. The person whose property is affected by the thunder does no work on that day of the week for the rest of his life. In Laymenti during burials, chimbo from teff, finger millet or sorghum is thrown at a road junction to prevent the re-occurrence of death. After burial, chimbo and injera are presented to the mourners. In Gashena, when a cow gives birth, porridge from teff and milk of that cow is served to the family and the neighbourhood. The calf tastes the porridge first and then parts of its body are painted with the mixture. Although barley is dominant in the area, farmers sow teff for this ceremony. Porridge from teff is served also to bridal couples at the marriage feast. Serving porridge prepared from teff to all participants is a sign of wealth and status. At a special marriage feast, beer is served to the bride and injera is shared among the people attending the feast. Unfermented teff kitta is also used in the church every Sunday. Even people who do not cultivate teff serve teff kitta at church. However, for the Holy Communion, only a special wheat cultivar is presented because, as the priests explained, it is mentioned in the Bible. The term injera also symbolizes livelihood, good fate, and wealth.

Discussion of the Results

For millennia, the Horn of Africa had regular contact with the people of the Nile Valley and the Red Sea world (Clark 1988; Fattovich 1988, 1993, 1996; Mitchell 2005; Moulins et al. 2003). The region also served as a crossroads for early crop dispersal between Africa and Asia (Blench 2003; Fuller 2003; Haaland 1999, 2007). For this reason it is difficult to underestimate the role of external influence on the origins of Ethiopian agriculture, although there is no archaeobotanical evidence to prove it (Agazi 1997; Brandt 1984, 1997; Butler et al. 1999; D’Andrea et al.1999). This paper suggests that agriculture may have begun independently in Ethiopia. The data shows that teff is cultivated in different elevations, agro-climatic zones, and diverse soil types that are unfavourable for other cereals. Other major crops such as wheat and barley are not widely cultivated in the Gojjam highlands even in areas suitable for their cultivation. In addition, wheat, one of the major crops (Harlan 1997), is not commonly cultivated in barley growing areas of Gojjam. This seems to be related to cultural choice. Norman et al. (1995:99) states that
food preference, more than climate and soil, dictate cereal cultivation. The intense labour and meticulous care involved in teff cultivation and processing, despite its low yield, can also be factors that support its cultivation before the introduction of crops from outside of Africa. As Leach (1999) states, people fail to adopt even domesticated crops if they demand more labour. Hunter and gatherers concentrate first on favourite foods or those having high return. Demand for increased yield may thus lead to domestication (Diamond 1997). In the study area, it is teff which is more labourious but low yielding. Hence, it is unlikely that people adopted teff after the introduction of less labourious and more productive crops from outside of the region. Ehret (1979) suggests that a late Pleistocene food crisis ultimately resulted in the domestication of indigenous crops in Ethiopia. Climatic instabilities are evident in the Horn of Africa since the early Holocene (Barnett 1999). Crops with constant yields in unreliable environmental conditions might be selected for cultivation (Hastorf 1999; WilCox 1999). The storability and drought resistant qualities of teff might have encouraged teff cultivation during such episodes. The various rituals most essentially related to the cultivation of teff strengthen this assumption. The important cultural and ritual values associated with teff (even in areas of Gojjam that hardly cultivate it) in comparison with those associated with introduced crops, imply that there is an old established tradition or cultural system that is based on indigenous crops. The relative ease of using teff to prepare a variety of foods and its versatile use, also support its early cultivation.

Conclusion

Studies of Ethiopian prehistoric agriculture focus mainly on external influences as the main stimulus for its origin. These studies are also restricted to northern Ethiopia and Eritrea (Butler et al.1999), and there is insufficient data that investigates local cultural, social and ecological factors that might link the origin of agriculture to other parts of the country. Examining crop exploitation in a specific setting may be essential to understanding the issue because Ethiopia has many native crops, diverse environments and cultural groups (Endashaw 1997). This study shows that, as compared to the cultivation and consumption of most other crops, teff exhibits some contrasting and unique qualities and processes. It is the most labourious and time consuming crop to process and it produces the smallest crop yield. Teff is the most suitable and preferred crop for preparing ceramic griddle-baked food stuffs in Gojjam. Moreover, its cultivation and consumption is accompanied by various social and ritual practices that are absent for introduced crops. All of these factors may indicate the value of teff to distinct and ancient subsistence strategies. The use of introduced cereals for ceramic griddle-baked injera also indicates their incorporation into the local culinary tradition. The role of external influence in igniting agriculture in Ethiopia can thus be challenged or questioned, although more research has to be conducted within this field before final conclusions can be drawn.

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