

## ENSET (*ENSETE VENTRICOSUM*, MUSACEAE) ETHNOBOTANY: RESEARCH STATUS, GAPS AND KEY MESSAGES

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**ABSTRACT:** Enset (*Ensete ventricosum* (Welw.) Cheesman, Musaceae) is an ethnobotanical icon considering its economic, sociocultural, environmental and symbolic roles. This paper reviews how far the enset research undertaken so far has taken up its ethnobotany. The objective is identification of the specific gaps and casting hints on ethnobotanical research that needs to be undertaken in future efforts for an understanding of the place of enset and its system in the life of the people who care for it. Considering the scope of studies and the recent methodological advances in ethnobotany, it is imperative to see how far previous enset research has benefited from it in data collection and analyses and what enset has missed. The current trend in enset ethnobotanical research along with the gaps and key messages vis-à-vis perspectives of sustainable development take the main thrust in this review. The review showed that cross-disciplinary and cross-cultural data are inadequate and applications of recent ethnobotanical methodologies are at low level. Aspects of cognitive ethnobotany, quantitative ethnobotany and coverage of the full range of enset culture with same research protocol are areas not covered. Furthermore, ethnobotanical modeling of the enset system has not been researched. The paper targets the major gaps and key messages for embarking upon full scale enset ethnobotany research. It is hoped that the ideas will serve as basis for initiating future ethnobotanical research on enset that engages both qualitative and quantitative approaches in an integrated and balanced manner.

**Key words/phrases:** Agroecology, Common research protocol, Ethnobotanical modeling, Meta-analysis, Quantitative enset ethnobotany.

### INTRODUCTION

The reciprocal relationship between the enset (*Ensete ventricosum* (Welw.) Cheesman, Musaceae) crop and the people who manage the crop and use its products can best be studied in the scientific dominion of enset ethnobotany. Enset is one of the major staple/co-staple food crops with many more use values. It is widely cultivated in the southern and southwestern parts of Ethiopia. The species occurs in a wide range of agroclimatic zones, all the way from about 1200 to 3300 metres above sea level and its cultivation primarily as a food crop happens in the range of 1450-3300 m stretching

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from the hot moist lowlands to the cold sub-humid sub-afroalpine and afroalpine highlands (Fig. 1). Where enset is cultivated, it plays critical roles in the livelihoods of about 20 million Ethiopians, providing a range of services as food, forage, medicine and maintenance of environmental health as well as with a number of socio-cultural roles as a symbolic plant used for condolences and rituals (Gebre Yntiso, 1996). It is a species where farmers recognize individual plants in their gardens and where the human-plant bondage is extremely strong partly due to the long history of use by different cultures. The role of human culture in agro-biodiversity use and management becomes very visible in the reciprocal interactions observed between the enset plant and the people in the enset zone. Thus, it is an ideal plant for application of a mix of qualitative and quantitative ethnobotanical approaches in research in order to explicate the knowledge encoded in the stories, poems, rituals, oral literature and the wide array of other practices and knowledge domains.

Ethnobotany has a collection of research tools and techniques appropriate for the study of indigenous botanical knowledge of useful plant species. It becomes even much more useful with many practical values when the plant of interest is a food crop, indigenous, has long history of use in multiple cultures (Brandt *et al.*, 1997), as food, part of traditional medicine, in the peoples' material culture (Gebre Yntiso, 1996) and many other use values and this is the case with enset. Enset satisfies all these and other related attributes and would greatly benefit from a full-blown comprehensive ethnobotanical investigation. One of the main reasons why ethnobotanists and ethnoecologists concern themselves with the collection and analysis of indigenous and local knowledge on crop species and their ecology is to be able to present the knowledge in a scientifically sound format. Indigenous botanical knowledge retrieved and organized following scientifically permissible procedures is critical as a source of evidence not only to justify the scientific worth of such knowledge but also to customize it for practical application. Ethnobotanical research requires elaborate studies applying both qualitative and quantitative approaches and this is achieved through extensive data collection and deep analyses taking various locations, agroecologies and communities. It is further noted that ethnobotany is a relatively new addition in science and that quantitative ethnobotany is known only since 1987. It was initially used in forest research, later applied to individual plants, and then to some crops. Up to recently, it has been undergoing methodological refinements; and not well understood and practiced by many. The strength of ethnobotany is related to the strengths of

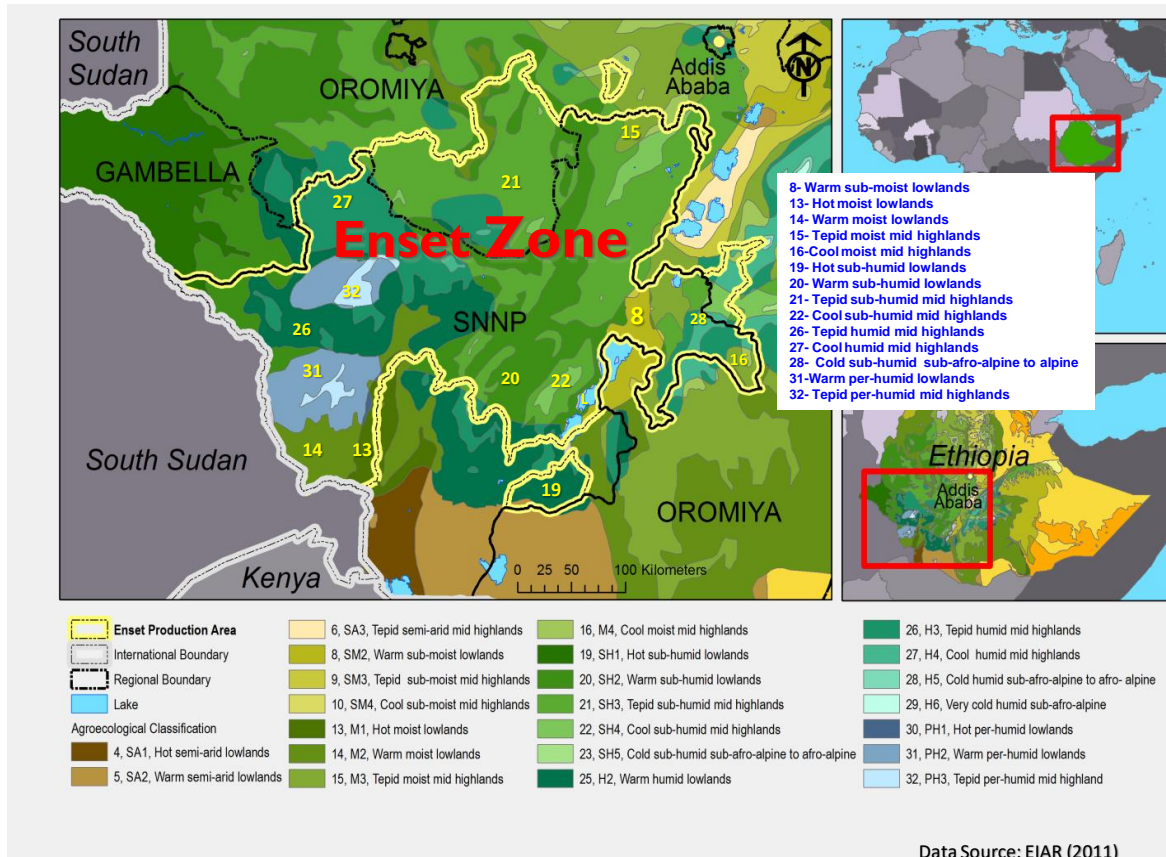


Fig. 1. Map of Ethiopia showing enset cultivation areas with agroecological zones.

its disciplinary pillars (botany, ecology, anthropology, mathematics and other related fields), thus requiring being conversant in these and other related fields.

Ethnobotany is a helpful discipline in the enhancement of the crop and building its profile further firming up comprehensive understanding in a scientific context. The knowledge generated in this way is used for improving the production and utilization of the crop species. In this regard, it would be good to see how far formal science has come or lagged behind in the case of enset, which is an indigenous staple, emblematic, symbolic and charismatic species commonly seen in the living compounds of households in the midland areas of Ethiopia.

### **Sources of information**

Fragmented facts about enset ethnobotany mainly dealing with vernacular names of landraces and uses were collated through Internet browsing at Google scholar and other means. A large number of research reports and sources including books, articles, theses and personal observations were reviewed. Furthermore, viewpoints that frequently transpire in formal and informal discussions and debates were assessed. The resulting information was viewed in the context of the current state of ethnobotany and to see the gaps and challenges. The findings were then synthesized to sift out the key messages that emerge. Thus, review and recollection of scattered facts and critical reflections on the way forward constituted the main thrust in the preparation of this review and analyses on the current state of enset ethnobotany in Ethiopia.

### **CURRENT ETHNOBOTANY RESEARCH STATUS, GAPS AND CHALLENGES**

#### **Current status**

Skimming through the Enset literature shows that some studies have touched upon its ethnobotany even though most of the early works neither called it ethnobotany nor applied standard ethnobotanical/ethnoecological methodology. Furthermore, many of the studies that presented ethnobotany-like narratives on enset tended to be more of compilations of checklists (Zippel, 2002; Almaz Negash and Niehof, 2004) and short profiles of vernacular names of clones (farmers' varieties/landraces) that were shaped over generations and maintained for millennia. Another aspect that went on being researched was the utilitarian aspect of the different parts of the plant as well as of the standing crop. There has been a lot of interest to understand enset and its system right from the days of James Bruce (who produced a

drawing of the plant along with 200 species of Ethiopia's indigenous useful plants). Foreign travelers, explorers and resident researchers of different disciplinary areas have written about enset but its ethnobotany did not go beyond recording vernacular names and uses for a long time. Westphal (1975) described the enset cultivation system and Okigbo (1990) depicted the system as a homegarden agrosystem while Zemedet Asfaw and Ayele Nigatu (1995) focused more on plant diversity and Zemedet Asfaw and Zerihun Woldu (1997) dealt with crop associations in homegarden system wherein enset is the key species. Admasu Tsegaye (2002), noting the keen description that enset growing farmers could provide including by considering it the enemy of famine, rightly underlined the practical values of the knowledge of the local people regarding use, diversity, productivity and adaptation to agroecological settings. At this juncture, it is worth noting that the local knowledge documented by researchers can be integrated with formal science to optimize the management of enset agrobiodiversity in association with the companion crops, and this will contribute to the improvement of farming systems as well as preservation of the bio-cultural heritages. Some among these researchers have applied limited methods of ethnobotany in their efforts to understand the enset system (Shigeta, 1991; Yemane Tsehaye and Fasil Kebebew, 2006; Sato, 2009; Talemso Seta *et al.*, 2013). However, most works of the past often had heavier hands on botanical, agronomic and anthropological perspectives. From the varied studies, a host of utilitarian attributes of enset have cumulated over the years (Fig. 2). At most, such studies were overwhelmingly dominated by utilitarian and qualitative approaches in their ethnobotanical drive and belong to the general category of basic ethnobotany that largely relied on qualitative data. The primary reason for the dominance of such approaches is the underdeveloped nature of ethnobotany at global level in general, and in Ethiopia in particular. The current era of quantitative ethnobotany expects more rigorous research through balancing qualitative and quantitative approaches particularly focused on the grey area in enset research.

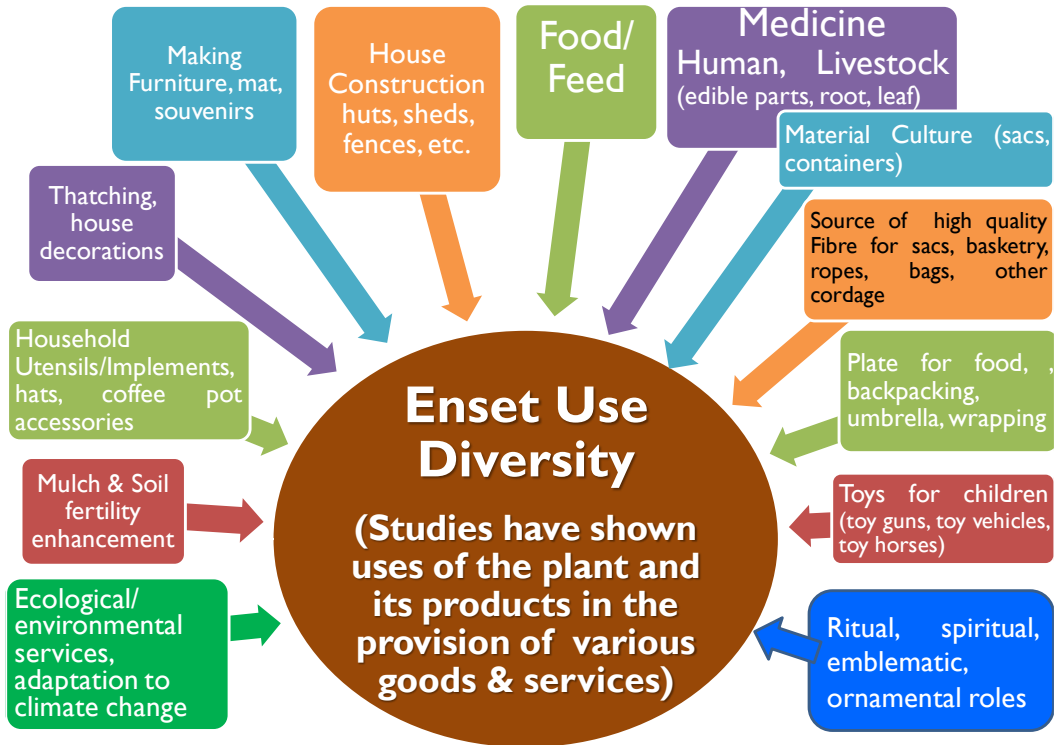


Fig. 2. Facts compiled in previous studies on the uses of enset compiled from different sources.

### Major research gaps

The ethnobotany of enset has been touched by many research works in one way or another, albeit the disconnected and variable nature in contents, scope and methods. This is mainly because a full scale cross-cutting enset ethnobotany has never been undertaken across all cultures and agroecological zone of its production and food systems. The limited ethnobotanically-oriented studies have generally been incomplete and lacked adequate coverage. There has been no formal research with the primary goal focused to the ethnobotany of this crop. Earlier studies have generally been ancillary to other studies and are with incomplete coverage and methodological disparities. Similarities and differences in the ethnobotanical knowledge of communities belonging to the Omotic, Nilotic, Cushitic and Semitic stocks and to the ethnicities within each of them have not been investigated and satisfactorily addressed, though of both academic and practical relevance. Some studies of enset ethnobotany were undertaken on isolated sites and cultures and fail short of providing a complete story of the bigger picture while others written in some foreign languages have not

been accessible to young resident researches. Since enset cultivation enjoys a wide latitudinal and altitudinal stretch engaging different ethno-linguistic communities, a much richer ethnobotanical/ethnoecological role can be hypothesized. There is, therefore, a real need to examine the depth and breadth of enset ethnobotany in the different cultures and agroecological zones re-defining new approaches and methodologies. The research gaps can be seen under lack of sufficient cross-disciplinary data and paucity in the application of a broad range of ethnobotanical methods derived from botany, ecology, anthropology, economics and related fields. Application of mathematics, statistics and computational tools is also at low level.

Enset ethnobotany is in a fragmented state with variable content, scope and methodological spectrum. Full scale enset ethnobotany research across cultures as well as agroecological and livelihood zones is not known. There was no formal research primarily targeting enset ethnobotany and most studies focused at few communities or locations. Known studies are in most cases incomplete, lacked adequate coverage in many aspects with noticeable methodological disparities. The research mostly lacked hypothesis testing and application of statistical methods even though the species is an excellent and a very ideal candidate for ethnobotanical research on account of observations made so far, the available research outputs and its history and origin. The available ethno-data are insufficient, not allowing comparisons across cultures, locations, agroecologies and livelihood zones. A monograph on enset ethnobotany is lacking as the data is incomplete/insufficient and short of being inclusive.

Among other aspects, the review showed that there is lack of sufficient cross-disciplinary and cross-cultural data; paucity in the application of recent ethnobotanical methods/tools and low level of application of computational tools. Cognitive aspects, quantitative ethnobotany, coverage of the entire enset culture, communities and agroecologies and ethnobotanical modeling of the enset system are the most disregarded aspects in research.

### **The challenges**

Ethnobotany research presents challenges of different types and magnitude even though it offers some opportunities. In Table 1, the main opportunities are presented with the possible challenges that may hinder enset ethnobotany research in future efforts.

Table 1. Opportunities and challenges in enset ethnobotany research.

Opportunities	Challenges
Many agroecological zones, administrative areas, different cultural backgrounds. This good for comparisons, sorting the common heritages and capturing the unifying features as well as studying the unique knowledge of different groups.	Ethnobotany is undergoing development, training needs are high budget shortage may prevail as it has been hitherto
Very many (more than 20 million people) cultivate it for major uses and it involves more than 20 ethnolinguistic communities. This offer a rich material and knowledge pool to learn from.	Low number of trained ethnobotanists; limited capacity to apply the methods accurately and the usual misconceptions and biases against ethnobotany
Many households outside enset growing areas keep one or two enset plants in homegardens for minor uses (ornamental, wrapping, baking, etc.), which provide additional indigenous knowledge (IK) source	Disparity in research methodology and approach when different researchers work separately without coordinating their research methodologies and making collective decisions
Rich crop use diversity and genetic diversity; presence of wild genes widening options for describing the use modes in a comparative manner and presence of companion crops (e.g. <i>Brassica carinata</i> )	Incomplete and unequal coverage of enset cultivator communities and areas of cultivation
Generate data that can help to explain and answer some of the problems mentioned by many, prepare ethnobotanical profiles of locations, communities and groups, distinct landraces	Lack of necessary background studies for many enset cultivator communities and areas

### SYNTHESIS AND KEY MESSAGES

The research gaps identified in this review need to be addressed through sustained application of comprehensive ethnobotanical methods. The areas of enset cultivation have to be matched with the new agroecological zones of Ethiopia (EIAR, 2011) and the ethnic identities have to be handled by the method of meta-analysis of data derived from all key areas as a minimum. Such an approach will show the aspects of similarities among and between areas as well as the differences. Unless a full scale ethnobotanical research is deployed on enset, it will not be easy to unwind the “story” of this crop, which has been ‘written up’ by generations of farming communities and a legacy inherited from ancient hunter-gatherer ancestors (Brandt, 1996; Brandt *et al.*, 1997) of its present-day cultivators and user farmers. The knowledge to be captured and analyzed is knowledge that has been accumulating for thousands of years and will not give in hands unless the state of the art in ethnobotany science is applied. A better future for enset and those who make their livelihoods on it can be realized with such an approach and the crop and the people will stand to serve one another as it has always been. Thus, enset has to serve the people while being served by them. The paper finally pledges to provide hints to the desirable forward steps in its key messages. Some plausible ideas about the ethnobotanical research direction that could be realized as research problems for subsequent investigation in reflective peer actions are given as follows:



1. Identify major enset culture areas and agro-ecological zones along with those considered marginal for its cultivation. With the help of GIS data generate distribution maps by zones and weredas superimposing the new agro-ecological zones (EIAR, 2011) and the ethnicities to see the results of interaction between agro-ecology and culture (language/ethnicity) and other comparison parameters;
2. Use same (common) ethnobotanical research protocol (same set of structured interview questions) across key locations and cultures and apply this and other methods to locations and communities to study enset ethnobotany. In this connection, it is important to bear in mind that Westphal (1975) and later other researchers (e.g. Zerihun Doda, 2007) considered that for the Gurage, Hadya, Kambata, Tambaro Sidama and Gedeo ethnic communities, enset is a vital staple food while for the Wolayta, Gamo, Gofa, Amaro, Yem, Kafitcho and others the crop is a co-staple with cereals. Other communities including the Aari, Sheko, Siltie, Konso, Dawro, Konta, Dizi, some Oromos and others also use enset to a greater and lesser extent and this situation has been dynamic. The magnitude of use and cultivation of enset vis-à-vis other crops has been shifting from one side to the other and this has to be looked into. A partial identification of enset cultivation areas and the cultivator communities has been collated from various sources, including Shigeta (1991); Zippel (2002); Zerihun Doda (2007), is given in Fig. 1 and Table 2.
3. Carry out key informant interviews across key locations and cultures with guided ethnobotanical field tour/walk interviewing farmer conservators and indigenous experts and conduct analysis on preferences, priorities, consensus factors, ranks comparisons and calculate indices of cultural significance, importance, relative importance and other data sets.
4. Apply mathematics, statistics and relevant computational tools of quantitative ethnobotany;
5. Prepare checklists of vernacular names of enset landraces and material culture made from enset for the different locations/ethnicities noting cognate names;

Table 2. Enset cultivation areas by region, zone/wereda and ethnic relations and identities.

No	Region	Zone/Wereda	People	Language Family
1	Southern Nations, Nationalities and Peoples Region	Wolayta Zone	Welayta	Omotic
2		Yem Special Wereda	Yem	Omotic
3		Gamo Gofa Zone, Gamo Wereda	Gamo	Omotic
4		Gamo Gofa Zone, Gofa Wereda	Gofa	Omotic
5		Dawro Zone	Dawaro	Omotic
7		Konta Special Wereda	Konta	Omotic
8		Basketo Special Wereda	Basketo	Omotic
9		Keffa Zone	Kafficho	Omotic
10		Sheka Zone	Sheko	Omotic
11		Bench-Maji Zone	Bench, Maji, Dizi	Omotic
12		South Omo, North Aari Wereda	Aari	Omotic
13		South Omo, South Aari Wereda	Aari	Omotic
14		Gurage Zone	Gurage	Semitic
15		Silti Zone	Siltie	Semitic
16		Kebena Wereda	Kebena	Semitic
17		Sidama Zone	Sidama	Cushitic
18		Gedeo Zone	Gedeo	Cushitic
19		Kembata-Tambaro Zone	Kambata, Tambaro, Alaba	Cushitic
20		Hadiya Zone	Hadya	Cushitic
21	Segem Zone, Konso Wereda	Konso	Cushitic	
22	Oromia Region	Arsi Zone, Kofele Wereda	Oromo	Cushitic
23		Arsi Zone, Kokosa Wereda	Oromo	Cushitic
24		West Shewa Zone, Wenchi Wereda	Oromo	Cushitic
25		West Shewa Zone, Jibat and Mecha Wereda	Oromo	Cushitic
26		Jimma Zone	Oromo	Cushitic
27	Gambela Region		Majang/Majanger	Nilotic

Source: Shigeta (1991); Zippel (2002); Zerihun Doda (2007), and others

6. Map the food, medicinal, environmental, fodder, emblematic/cultural and other roles of enset and its landraces;

7. Sort similar ethno-varieties, use categories, management and cultural (cosmovision) blocks and likewise make note of differences and generalizations that can be drawn up for hypothesis testing in either case;

8. Collect culture, location, gender, language disaggregated and aggregated data sets to facilitate in-depth analyses;

9. Collect indigenous knowledge (IK) through analysis of poems, songs, sayings, beliefs and enset ethnotaxonomy to know people's levels of understanding (cognitive domain) and attitudes towards enset;

10. Study ethnobotany of crops associated with enset cultivation system and their compatibilities including the ethnobotany of wild enset (eppo in

Keffa);

11. Carry out a multi-stage analysis and generate comparative ethnobotanical data and conduct an overall (and group) meta-analysis; and
12. Use the agro-ecological, agro-biodiversity and ethnicity data and attempt ethnobotanical modeling (Benifez *et al.*, 2016) of the enset production system of key locations in Ethiopia.

#### REFERENCES

- Admasu Tsegaye (2002). **On Indigenous Production, Genetic Diversity and Crop Ecology of Enset (*Ensete ventricosum* (Welw.) Cheesman)**. Ph.D. Thesis, Wageningen University and Research Centre, the Netherlands.
- Almaz Negash and Niehof, A. (2004). The significance of enset culture and biodiversity for rural household food and livelihood security in southwestern Ethiopia. *Agr. Hum. Values* **21**: 61–71.
- Benifez, G., Malero-Mesa, J. and Gonzalez-Tejero, M.R. (2016). A model to analyze the ecology and diversity of ethnobotanical resources for Granada Province, Spain. *Biodiv. Conserv.* **25**: 771–789.
- Brandt, S.A. (1996). A model for the origin and evolution of enset food production. In: **Enset-Based Sustainable Agriculture in Ethiopia**, pp. 36–46 (Tsedeke Abate, Steven, C.H., Brandt, A. and Seifu Gebremariam, eds.). Proceedings from the International Workshop on Enset held in Addis Ababa, Institute of Agricultural Research, Addis Ababa.
- Brandt, S.A., Spring, A., Hiebsch, C., McCabe, J.T., Endale Tabogie, Mulugeta Diro, Gizachew Wolde-Michael, Gebre Yntiso, Shigeta, M. and Shiferaw Tesfaye (1997). **The “Tree against Hunger”: Enset-Based Agricultural Systems in Ethiopia**. American Association for the Advancement of Science with Awassa Agricultural Research Center, Kyoto University, Center for African Area Studies and University of Florida, Washington, DC.
- EIAR (Ethiopian Institute of Agricultural Research) (2011). New agroecological map of Ethiopia. Coordination of National Agricultural Research System, Ethiopia. EIAR, Addis Ababa.
- Gebre Yntiso (1996). Economic and socio-cultural significance of enset among the Ari of southwestern Ethiopia. In: **Enset-Based Sustainable Agriculture in Ethiopia**, pp. 1119–1121 (Tsedeke Abate, Steven, C.H., Brandt, A. and Seifu Gebremariam, eds.). Proceedings from the International Workshop on Enset held in Addis Ababa, Institute of Agricultural Research, Addis Ababa.
- Okigbo, N.B. (1990). Homegardens in tropical Africa. In: **Tropical Homegardens**, pp. 21–40 (Landauer, K. and Brazil, M., eds.). United Nations University Press, Tokyo.
- Sato, Y. (2009). Ethnobotanical study of local practices maintaining landrace diversity of bananas (*Musa* spp.) and Enset (*Ensete ventricosum*) in East African Highland. Kyoto University Kyoto Working Papers on Area Studies No.61 (G-COE Series 59) Information Depository.
- Shigeta, M. (1991). **The Ethnobotanical Study of Enset (*Ensete ventricosum*) in Southwestern Ethiopia**. Ph.D. Dissertation, Center for African Area Studies, Kyoto University.

- Talemos Seta, Sebsebe Demissew and Zemedede Asfaw (2013). Home gardens of Wolayta, Southern Ethiopia: An ethnobotanical profile. *Acad. J. Med. Plants* **1**(1): 014–030.
- Westphal, E. (1975). Agricultural systems in Ethiopia. Agricultural Research Report No. 826, College of Agriculture, Haileselassie I Univ., Addis Ababa and Agricultural Univ. of Wageningen, Wageningen.
- Yemane Tsehaye and Fassil Kebebew (2006). Diversity and cultural use of Enset (*Enset ventricosum* (Welw.) Cheesman) in Bonga *in-situ* Conservation Site, Ethiopia. *ERA* **4**: 147–157.
- Zemedede Asfaw and Ayele Nigatu (1995). Homegardens in Ethiopia: Characteristics and plant diversity. *SINET: Ethiop. J. Sci.* **18**(2): 235–266.
- Zemedede Asfaw and Zerihun Woldu (1997). Crop association of homegardens in Welayta and Gurage zones in Southern Ethiopia. *SINET: Ethiop. J. Sci.* **20**(1): 73–90.
- Zerihun Doda (2007). An ethnographic overview of enset producing peoples of Ethiopia. Report presented at the Enset Research Review Workshop. Retrieved on September 16, 2016.
- Zippel, K. (2002). Enset (*Ensete ventricosum* (Welw.) Cheesm.) in subsistence farming systems in Ethiopia. Paper presented at the Conference on International Agricultural Research for Development, October 9-11. Witzenhausen, Deutscher Tropentag.