

THE EVOLUTION OF THE ETHNOBOTANY OF ACHA (*Digitaria exilis* staph) IN SOME COMMUNITIES OF PLATEAU STATE FROM THE 1970S TO DATE

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ABSTRACT

Acha (*Digitaria exilis* Staph) most times referred to as “the grain of life” in many parts of Africa is indigenous to Africa and one of the oldest cereal crops in the continent which has been cultivated for thousands of years by Africans. The genus “*Digitaria*” has over 300 species with just a few cultivated either as fodder or for human consumption. Despite its ease of cultivation, Acha has been listed as one of the neglected crops of Africa and also as a lost crop due to neglect by researchers, farmers etc. the work on “The evolution of the ethnobotany of Acha (*Digitaria exilis* staph) in some communities of Plateau State from the 1970s to date” aimed at investigating the changes in the relationship of Acha with the indigenous people in some parts of Plateau State,

Introduction:

Ethnobotany

Ethnobotany is a relatively new field of study (Caruso, 2015; Clay-Poole, 2016; Karst *et al.*, 1983), The term “Ethnobotany” was coined by J. W. Harshberger in 1895 (Idu, 2009) to indicate plants used by the aboriginals.

Ethnobotany, a relatively new science deals with the various principles, which govern such relationship between man and vegetation. Ethnobotany means all the sources of the plants towards humankind and the other species

Nigeria where Acha is mostly cultivated, the research work also aimed at finding the specific ethnobotanical areas of neglect and its impact on the people and how the plant can be rediscovered for the benefit of humanity. The work (which is an observational study) involved the use of two hundred and fifty (250) questionnaires across three (3) local government areas in Plateau State where the crop is mostly cultivated. The results revealed a great change in the ethnobotany of Acha from the 1970s to date with a reduction in production as many farmers have turned to other crops which they believe to bring more income and easy to cultivate due to mechanization. Hence, there is a great need for a turnaround and serious consideration to be made into the areas of research and making improvement in the cultivation of Acha as many pieces of research have shown Acha to be one of the greatest cereals with a lot of health benefits.

Key Words: Ethnobotany, Acha, Indigenous, Lost Crops, Neglected Crops.

growing on the earth (Hoft *et al.*, 1999; Pradeiczuk *et al.*, 2017; Ugbogu, O. A.; Chukwuma, 2019).

From “ethno”-the study of people and “botany”- the study of plants, Ethnobotany is considered as a branch of ethnobiology (Idu, 2009). It deals with the study and evaluation of plant-human relations in all phases and the effect of plant environment on human society (Balick, 2005; Clément, 1998; Gaoue *et al.*, 2017; Idu, 2009; Lawal *et al.*, 2020).

Although many see ethnobotany (just) as a science that deals with medicinal plants (Kamagaté & Koffi, 2014; Vogl *et al.*, 2004) Ethnobotany is the study of the interaction between plants and people, with a particular emphasis on traditional tribal cultures (Agrawal, 2018; Clément, 1998; Vogl *et al.*, 2004) while the study of indigenous medicinal plants is known as ethnopharmacology (Kamagaté & Koffi, 2014; Pabón, 2017; Reddy *et al.*, 2019).

A radical change in the cultural knowledge base and the abandonment of many traditional practices are taking place worldwide as a result of migration, acculturation, and interruption of intergenerational knowledge

transmission (Clay-Poole, 2016; Clément, 1998; Gaoue *et al.*, 2017; Pradeiczuk *et al.*, 2017).

Acha

(*Digitaria exilis* Staph) popularly known as Acha in Nigeria is a cereal crop with West African origin and belonging to the family *Gramineae*. There is scanty knowledge about its evolution, origin, distribution and genetic diversity even within West Africa, despite its ancient heritage and eminent importance (Chinwe *et al.*, 2015; Jideani, 2012; Okeme *et al.*, 2017; Philip & Itodo, 2006).

Acha is known with various names, such as fonio, fundi, findi, acha or “hungry rice”, the crop has been so neglected that it is called the lost crop of Africa, having received but a fraction of the attention accorded to sorghum, pearl millet, and maize (Chinwe *et al.*, 2015; Jideani, 2012; Philip & Itodo, 2006).

The plant is a small annual herbaceous plant that grows to a height of 30-80 cm. it is grown in various parts of Nigeria, Sierra Leone, Ghana, Guinea-Bissau, Togo, Mali, Benin Republic and Cote d’Ivoire (Philip & Itodo, 2006; Shamle *et al.*, 2014).

Acha is not a demanding crop and will tolerate a wide range of soils, be they sandy, loamy, even stony and shallow. Very clayey soils are less suitable.

Digitaria (Acha) has over 300 species, of which only about three or four are mostly grown as cereals and for human consumption (Okeme *et al.*, 2017; Philip & Itodo, 2006) the common species cultivated in West Africa are *Digitaria exilis* or white fonio, and *Digitaria iburua* or black fonio, iburu etc. Acha (*Digitaria spp*), considered as one of the lost crops of Africa (Philip & Itodo, 2006), Acha remains an important food crop for millions of people in West Africa and the biggest challenge faced by farmers today is the production of enough quantity to meet the growing demands for its products (Philip & Itodo, 2006).

Acha is often prepared on a small scale mostly below 1 ha and only a few farmers cultivate between 1-2 ha using traditional hand-tools. No proven technology/mechanization exists for its production. The ridging hoe is

mostly used to make ridges for planting acha. The soil may not be loosened at all if it is of light texture. The hoe has the following parameters defining its size: length of the handle is 60-70 cm; length of the blade is 30-40 cm; width of the blade is 15-25 cm; thickness of the blade is 3.5 cm and rake angle is 60°.

Weeding is done manually using bare hands to pull out weeds as it is done with rice, weeding is carried out 2-3 weeks from the time of planting.

Acha plants grow to a height of 30 to 80 cm. The plant is due for harvest from 60-120 days after plant emergence, depending on the local varieties and other growth factors, Acha is harvested by cutting the stock with curved sickles or sharp knives. The stem tops with pinnacles are tied into small sheaves after which they are tied together. Harvesting contributes to the high cost of the production process, involving family and friends coming together to harvest the crop manually. Mechanization of the harvest is difficult because the stems are often lodged (Aviara *et al.*, 2017; Okeme *et al.*, 2017).

Threshing of acha is very tasking and takes a great deal of time, and current methods often contaminate the final product with sand. The grains are obtained by beating the sheaves with a traditional threshing stick on a swept floor, wide flattened rock or on tarpaulin, the grains mostly get contaminated with sand and other debris at this stage (Aviara *et al.*, 2017; Okeme *et al.*, 2017).

After threshing, the largest pieces of straw are collected by hand and are generally used as animal feed. The mixture of grain and small pieces of straw left in the threshing area is transferred to a rough disc-like-woven surface. The grain with straw is lightly lifted into the air, where the heavier grains fall back on the disc-like-woven surface and the light straws blown off by air current; this is done continuously until the grains are free from straws. The encased grains in protective hulls are released by pounding (impact and rubbing action) in a mortar using a pestle, a process called dehulling. This activity is usually carried out traditionally by women. This manual dehulling has a very low output, with each woman hulling between

1 and 2 Kg/h, it is very tedious and time-consuming. constituting a major bottleneck in its processing and utilization.

Acha is one of the most nutritious grains because it is rich in methionine and cysteine.

Besides, it is among the World's best-tasting cereals. Acha contains about 7% crude protein that is high in leucine (9.8%), methionine (5.6%) and valine (5.8%). It is believed that its methionine content is twice as high as those of egg proteins (David *et al.*, 2019; Okeme *et al.*, 2017; Philip & Itodo, 2006; Ukim *et al.*, 2013).

The potential for the production of this grain in Nigeria and West Africa is high, as it is superior to other cereals in performance under moisture stress and low soil fertility. It also has a good capacity to respond to improved inputs (Chinwe *et al.*, 2015; Nyam *et al.*, 2017; Priyadarshani *et al.*, 2000).

METHODOLOGY

Study Area

The research was carried out within three (3) LGAs of plateau state where Acha is grown mainly i.e. Riyom, Barkin Ladi and Jos South as reported by (Nyam *et al.*, 2017). A total of 24 communities were visited within these LGAs; 12 being rural areas while 12 were semi-urban areas.

Sampling Technique

A structured questionnaire was used to collect data (mostly as a guide) from the respondents, but verbal (oral) interview/explanation was mostly used to get the required information from respondents as most of the respondents (in rural areas) are illiterates and the questions were kept simple because of the literacy level of (most) of the respondents.

Study Population

The people that were used as respondents were natives of those areas and are people of not less than fifty (50) years of age who grew up (mostly or absolutely) within that community and have good knowledge of the culture and traditions of the study communities from the years of interest.

Respondents were selected as available, provided they meet the above conditions without discrimination to gender.

Sample Size

A total of 250 respondents were used; 125 from the rural areas while 125 were from the semi-urban areas of the three (3) LGAs that were surveyed.

Consent

The Informed consent of respondents was properly sought as explanations were properly made to the purpose of the research work and were told they had the right to decline without any penalty.

RESULTS

Table 1: Has the Use of Acha Changed from the 70s to Date?

	Yes	No
Rural	125	0
Semi Urban	125	0

Table 2: Some ways in which acha was used in the 70s

S/No	Uses of Acha	Rural	Semi-Urban
01	Food	Yes	Yes
02	Animal feeds	Yes	Yes
03	Making of local mattress	Yes	Yes
04	Part of items for payment of dowry during marriages	Yes	Yes
05	Straw mixed with clay for building	Yes	Yes
06	Straw and chaff used as a source of energy	Yes	Yes
07	Part of items for the appeasing of God in traditional religion	Yes	Yes
08	Affected the naming of people	Yes	Yes
10	Some activities surround the processing of acha created forums for discussions	Yes	Yes
Table 3: Some common ways in which acha is used today			

S/No	Uses of Acha	Rural	Semi Urban
01	Food	Yes	Yes
02	Animal feeds	Yes	Yes
03	Making of local mattress	No	No
04	Part of items for payment of dowry during marriages	Yes	Yes
05	Straw mixed with clay for building	Yes	Yes
06	Straw and chaff used as a source of energy	Yes	No
07	Part of items for the appeasing of God in traditional religion	No	No
08	Affected the naming of people	Yes	Yes
10	Some activities surround the processing of acha created forums for discussions	No	No
Table 4: Has the change in the uses of Acha affected the way of life of people?			
		Yes	No
	Rural	125	0
	Semi Urban	112	18

Table 5: In what ways do you think the lifestyle has been affected?

S/No	Response
01	Poor health due to change in diet from the neglect of Acha
02	Bad things happening to us (the locals) because God is not happy with the people due to changes in their beliefs
03	Bad habits among the youths and the general population due to the lack of forums where issues are discussed by community elders.
04	Loss of vocabularies within the languages.
05	Changes in the way people build houses

DISCUSSION

One of the main uses of Acha is food; all the respondents agreed that the grain has provided food for them for ages and this agrees with the work of (Nyam *et al.*, 2017; Okeme *et al.*, 2017; Ukim *et al.*, 2013).

The respondents mentioned of the recipes to include: “tuwo”, porridge (“Gote”), “kunu” and many other varieties of local dishes

The locals have been using the acha straw as hay to feed cattle and the chaff after dehulling for pigs, this in line with the work of (Okeme et al., 2017; Ukim et al., 2013) who reported that the grains are efficiently digested by farm animals.

The straw and chaff have for long been used for beddings, they are sewed into tarpaulin sacks, bags or other materials to make local mattresses.

The straw is mixed with mud for making bricks for building, the straw in the bricks adds for strength to the bricks and helps them (mostly) against washing by rain.

The straw and chaff have been used by locals as a source of energy for cooking, a special baking process known as “gup” where the food (mostly tubers, like cocoyams, sweet potato etc,) are put in a clay pot, the mouth of the clay put is covered with a little wet clay and the put turned up-side-down. The straw is then hipped on the put and lit with fire.

There are a lot of traditional beliefs and relics surrounding the acha plant, as it has been used as a food of sacrifice to appease God.

Humans are often given names that are associated with acha, names that have “Chun” attached to them like “Chun-dung”, “Chun-gyang”, etc.

Traditionally, the threshing of acha is in two stages, (“kyi-chun” and “dag-chun”) the first is strictly a men affair while the latter, strictly a women’s affair. This threshing is always done in groups of many family members (clans) and these occasions have always, traditionally and officially been used by the elderly men and women to advise, educate, rebuke, admonish, the younger men.

All the respondents (in both rural areas and semi-urban centres) agree that there are changes in the way acha has been used by the indigenous people from the 70s to date.

Some of the few changes include:

- ***Changes in types of foods:*** all respondents agree that the type of foods have changed as acha is now used for modern foods like cakes, pastries, couscous, cookies, puddings etc.
- ***Changes in beliefs:*** while most people in the urban centres believe that most of these beliefs are just relics and superstitious beliefs, a lot of

people in the rural areas still hold on to these beliefs, as they still believe that a lot of sicknesses and bad things that happen to us today are because of our neglect of these beliefs passed to us by our ancestors and accepting the white man's beliefs.

- ***Changes in Architecture:*** there used to be special rooms ("fwang") built in every house for the dehulling (pounding) of acha, and special stores which are completely lost in the semi-urban centres but still seen in very few houses in the rural areas,
- ***Lost of Vocabulary:*** there are words that are attached to acha either in the traditional beliefs, farming, processing or other ways that are gradually going to extinction due to the changes in the ethnobotany of the crop-plant. Some of these words are: "vwal, Fwang, gup, wollom, shenyer, etc."
- ***Lost of discussion forums:*** the idea of having the elderly coming to talk to the younger ones during these forums is almost lost in both the semi-urban and rural areas.

CONCLUSION

Summary

Many people believe that there is a change in the production/uses of Acha over time and these changes have affected the ethnobotany of acha among the peoples of Plateau State where acha is mostly cultivated and used by the locals.

These changes have affected the way of life of the people as most of the festivals that were connected to acha have been lost, the foods and ways of preparation have changed and various other local uses of acha have been dropped by the people.

These changes have affected the lexicon and vocabulary of these people as words that were associated with some festivals or uses/names are no longer in common day usage.

Many of these changes cannot be reversed as modernization is being accepted into the cultivation and processing of acha.

Recommendations

Community leaders, traditional rulers and all stakeholders at the grassroots levels should be educated and encouraged to see to it the positive values that are being lost as a result of these changes in ethnobotany are restored and maintained.

Government at the local levels should make conscious efforts to include ethnobotany into the curriculum of pupils in subjects like primary science to keep the children updated with this knowledge and to help in preserving the local endangered languages.

The government should make efforts to encourage and create more awareness into the cultivation of indigenous crops, give grants to farmers and researchers for work on these local indigenous crops.

There should be special funding for farmers to go into the cultivation of indigenous, neglected crops to help preserve these crops from going into extinction.

The general public should be educated on the health benefits of consuming indigenous foods as most of them are healthier than the exotic (genetically modified) imported crops.

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APPENDIX



Appendix 1: Acha Field Ripe for Harvest



Appendix 2: Acha heads Ready for Harvest



Appendix 3: Women Harvesting Acha



Appendix 4: Harvested Acha Sheaves Ready for Threshing



Appendix 5: Threshed Acha Grains Ready for Dehulling



Appendix 6: Dehusled Acha Grains Ready for Cooking



Appendix 7: Threshed Acha Hay used for other purposes

Appendix 8: Consent Letter

The Federal Polytechnic Mubi
PMB 35, Mubi
Adamawa State

Dear Respondent

Consent Letter

The bearer of this questionnaire is a staff of the Federal Polytechnic Mubi and a student of the University of Jos. carrying out a research on “the evolution of the ethnobotany of Acha (*Digitaria exilis* staph) in some communities of Plateau State from the 1970s to date”.

The bearer seeks your consent to kindly answer the questions that follow this letter, all information gathered will strictly be used for academic purposes and will be treated with the utmost confidentiality.

You are to note that it is within your right to accept or decline the request of the bearer without any consequences as no rewards will be made for accepting and no penalty for declining.

Yours Sincerely
Toy, B. D.

QUESTIONNAIRE

1. Region (A) Rural (B) Semi-Urban
2. Has the use of Acha changed between the 1970s and today? (A) Yes (B) No (C) Not Much
3. Name 5 ways Acha was used in the 1980s
4. Name 5 ways Acha is used today.....
5. Which of the following may be the reason for the change in the use of Acha?
 - (a) Other Alternatives
 - (b) Difficulty in processing
 - (c) People just think it's primitive
 - (d) Less profit
6. Has the change in the uses of Acha affected the way of life of people? (If there is any) (A) Yes (B) No (C) Not Much
7. In what ways do you think the lifestyle has been affected? (If there is any)