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Etymology of Folk Nomenclatures for *Sphenostysis stenocarpa* (Hoechst *ex* A. Rich) Harms

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ABSTRACT

Folk nomenclature is habitually established for species that have attained high utilitarian and cultural significance by custodians of such plants worldwide. Such folk names assigned to species often carry etymological values such as therapeutic effects, morphological features, mythical connotations, and their allegorical values. This research sought to unveil the etymology in folk nomenclatures of *Sphenostysis stenocarpa* (Hosch ex A. Rich) Harms (African Yam Bean). Three hundred and fifty respondents were randomly selected from 13 local communities in Ebonyi State in South-eastern, Nigeria. Data were collected through oral interviews with semi-structural questionnaires, along with focused group discussions. Analysis of data was carried out using simple statistical methods involving frequencies and percentages. The results recorded ten folk nomenclatures assigned to this species in seven dialects affiliated to cultural values within these communities. Etymologically, the results also revealed that out of the ten folk names of AYB cryptic connotations, five reflected their trust in the gods that answered their prayers, two were attributed to the healing potentials inherent in this crop for medicine, three names were associated with the seeds, while one referred to feminist attachment to the crop, another to its resilience/ adaptability to climatic stress and one as a sustainer of farmers. Considering that folk nomenclature is based mainly on qualitative data and the information outside the scientific domain, they are nonetheless highly valued because they are based on long-term interactions, utilization and observations of the custodians of these natural resources. However, these data are equally vulnerable to erosion if not properly documented and conserved for posterity.

Keywords: etymological values, traditional knowledge, classification, custodians, *Sphenostysis stenocarpa*

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INTRODUCTION

In the history of man's time on earth, folk nomenclature has been the underpinning factor for plant selection, improvement and conservation. This understanding embodies one of most philosophical and enduring connections that we have with our surrounding ecosystems. In some regions of the world this knowledge has submitted to the forces of acculturation, extermination, and globalization, however, in most tropical countries it is still allied to the socio-cultural, spiritual and economic lives of the associated indigenous communities [1]. Traditional plant taxonomy involves the classification and naming of plants by custodians not trained in scientific classification approaches. They make natural evaluation of specimen organized around ideas grounded in the way they perceive and interact with their environment.

Plant folk nomenclature is therefore an expression that considers the people's point of view and their desire to distinguish different species through the expression and use of verbal communication. Unlike the scientific names, the folk ones do not have an authority. Plant folk names are the area of overlap where botany meets ethnology, mythology, folklore, linguistics and philology [2]. Folk names of plants are the root of traditional plant biodiversity knowledge. It is the systematic information that remains in diverse social structures despite remaining unwritten, but preserved through oral tradition, and its associated generational transference [3]. Traditional knowledge of biodiversity concerns the names, uses, and management of plants and animals as perceived by the local and or indigenous people of a given area. Folk nomenclature is usually developed for species that have attained high utilitarian and cultural significance. These names often convey etymological relation to its specific therapeutic effects, nutritional capacity, morphological features, mythological connotations, allusive statements and allegories in communities where such nomenclatures exist [4,5].

The Convention on Biological Diversity stresses the need to respect, preserve and maintain the knowledge, and practices of indigenous communities relevant for the conservation and sustainable use of biological diversity. The inherent potential of biodiversity as a capital resource for innovating value added products for food, nutrients, pharmaceuticals, cosmetics and other natural products for commercial exploitation requires competency of correct identification of the material used. Berlin *et al.* (1973) [6] stated that ethnographers and biologists have made significant efforts

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to understand more fully the nature of folk biological classification particularly with the naming and classification of plants in non-western societies. This approach illuminates man pre-scientific understanding of his ecosystem and the services it provides. It therefore has relevance to ecosystems services and sustainable exploitation of these potential crop resources.

One of the most significant global threats to biodiversity is the erosion of ethno-botanical knowledge caused by the demise of the aging custodians of this knowledge without appropriate documentation of this wealth of knowledge [7]. Unveiling the cryptic nomenclature of any species helps resolve the puzzles and difficulties encountered in understanding the etymological facts attached to a particular species by its custodians. Singh (2008) [8] reported that although local names are not recommended directly for scientific accounts, as they lack uniformity and consistency, they undoubtedly serve as an effective parameter for scientific interpretations in search engines for new useful plants, or new uses of known plants.

Sphenostylis is a genus of flowering plants in the legume family, Fabaceae and sub-family Faboideae. It is a small genus with seven species occurring in the dry open forest and forest savannah within the West and South African tropical zones [9]. However, current research, emanating from technological advancement, now recognizes eight species, to include *Sphenostylis stenocarpa* (Hochst. Ex. A. Rich.) Harms, *S. gossweileri* Baker, F, *S. marginata* E. Mey, *S. ornate* (Welw. Ex Baker) A. Chev, *S. schweinfurthii* Harms, *S. angustifolia* Sond, *S. briartii* (De Wild.) Baker F., *S. erecta* (Baker f.) Hutch. *ex.* Baker F. [10]. Three species of *Sphenostylis* are of high food security and medicinal value in Africa, including the under-exploited *Sphenostylis stenocarpa,* commonly known as African Yam Bean (AYB).

Sphenostylis stenocarpa is a neglected and underutiliszed genetic resource. It is a perennial climbing species whose morphotypes can be prostrate, or erect around 1–3 m in height. Its leaves are trifoliate, 2.7 to 13 cm long and 0.2 to 5.5 cm broad. The raceme inflorescence exhibits an acropetal mode of floral pattern with pink flowers blended with purple and slightly twisted backward characteristic of all the Fabaceae (Fig 1)**.** It is cultivated for its edible tubers and seeds which have high nutritional values comparable with those of other African root crops such as yams and sweet potatoes [11]. The essential proteins in AYB are similar to those of soybean and whole

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chicken eggs [12,13]. In some local Nigerian communities, it is used occasionally in menus as cooked pottage, snacks, condiments served with stock fish during traditional marriages, new yam festivals and burial ceremonies. In ethno-medicine, AYB is used as a remedy for diabetes, stroke and insomnia while industrially it is exploited in fortifying bread, milk, biscuits and indome [14].

Figure 1. Growth habit (top left & middle), flower type (top right), fruit pods (bottom left) and seed coat colour variations (bottom right) of *Sphenostylis stenocarpa* (Hochst. *ex.* A. Rich.) Harms. Photos by Adewale D B. and Nnamani C.V

Several studies have been carried out on the morphological characterization in AYB with respect to yield [11], biochemical profiles and nutritional composition [15, 13], physiological seed quality [16] and genetic diversity [17, 18]. However, there is a dearth of information on the cryptic

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meaning of the multiplicity of folk nomenclatures of this prospective promising plant genetic resource as assigned by its local custodians. The present project sort firstly, to examine the multiplicity of folk nomenclatures of AYB in 13 indigenous communities from Ebonyi State in South east, Nigeria, secondly to infer their cryptic meaning and thirdly, document the etymologies of their folk names. The output from this work is intended to clarify and facilitate an efficient and informed exploitation of this germplasm for breeders, conservationists, taxonomists and ecologists. It will aid in recognizing the vital role this species plays in the life of these people by highlighting the sacred linkages existing between traditional societies and their phytodiversity. This will expand the knowledge on this species, enhance traditional biodiversity management as well as conservation at the community level and provide robust information on new paradigms for research and exploitation of this plant.

RESULTS AND DISCUSSION

Social background of respondents across Ebonyi State

This study investigated meaning in folk names of AYB a multipurpose species used in the daily lives of local communities in Ebonyi State. The social economic background of the respondents in these communities showed that 60 out of the 250 respondents, i.e. 24% were at least 70-years-old. While 21.6%, 20%, 20% and 14.4% of these respondents were within the age limits of 66-69, 50–59, 40-49 and 36–49 respectively (Table 1). Clearly, the majority of respondents were greater than 50-years-old. The implications of this are that potentially valuable plant knowledge is disproportionally resident in the older generation and their involvement AYB cultivation, management and conservation is more likely to be lost soonest. This is exacerbated by the limited involvement of younger generations in the ethno-taxonomy of AYB as recorded here and a likely progressive decline in cultural knowledge on this species. This agrees with [7], who emphasized the most significant global threat to biodiversity was the erosion of traditional knowledge due to the demise of the aging custodians of this knowledge. This underpins the notion that, the synergy between the scientific domain and indigenous knowledge has deteriorated due to a lack of understanding and trust between these two domains [14].

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Table 1. Social background of the Igbo speaking **respondents** in Nigerian West Africa **across Ebonyi State**

S/N	Age	Number of Respondents		Total	Percentage (%)
		Male	Female		
1	30-39	15 (14.7)	21 (21.3)	36	14.4
2	40-49	18 (20.4)	32 (29.6)	50	20.0
3	50-59	20 (20.4)	30 (29.6)	50	20.0
4	60-69	24 (22.0)	30 (32.0)	54	21.6
5	>70	25 (24.5)	35 (35.5)	60	24.0
Total		102	148	250	100

Educational background of respondents across Ebonyi State

With respect to the level of education of the respondents, 34.4% had no formal education, 26.8%, 22.4% and 16.4% had primary school training, secondary school education and tertiary school education respectively (Fig. 3). These results are similar to those of [19], who reported that 64% of traditional healers, who were the custodians of indigenous knowledge of medicinal plants in the Blouberg area of South Africa, had no formal education, while 32% had primary school certification with only 4% having attended secondary school. However, their educational levels have not limited them from communicating orally their knowledge on AYB for posterity and for translating AYB benefits to those outside their local communities. This is in line with the report by [20] that, documentation of indigenous knowledge still faces challenges which range from custodian's lack of formal education, poor underpinning research, computer illiteracy, a lack of government support for collecting indigenous data and poor finance to document and store such knowledge. The current situation is founded on the notion that this knowledge lacks relevance and therefore does not need conservation [21]. These challenges are a major bottleneck in investigating the molecular genetics of such crops along with limited resources in developing countries where underpinning research is limited [22].

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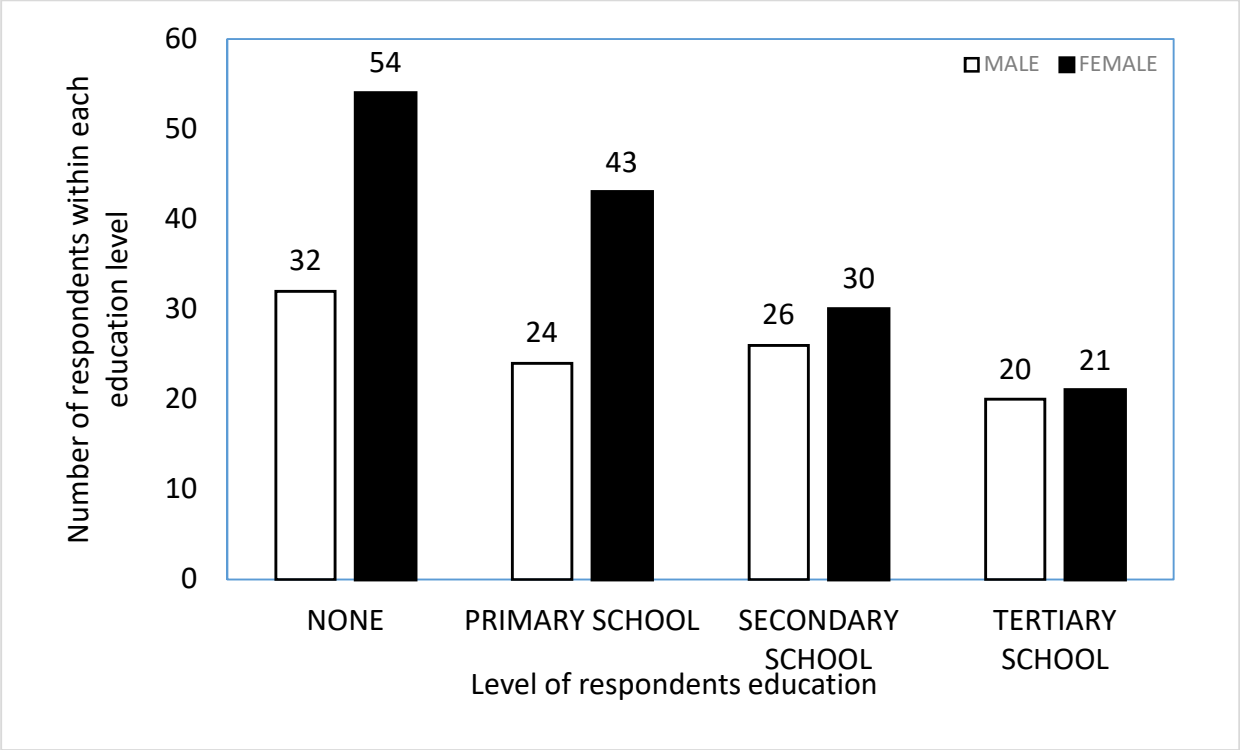

Figure 2. Educational background of the Igbo speaking respondents in Nigerian West Africa across Ebonyi State

Occupational background of the respondents

Majority (40%) of the respondents were farmers involved in cultivation of AYB, along with other crops. These other crops were always their major source of subsistence, with AYB relegated to a position as minor/orphan crop. Those respondents which were not farmers were composed of civil servants, 12.4%, traders, 22%, privately employed, 10.4% and 15.2% who were unemployed (Figure 3). Many traders were involved in selling of AYB both dry and newly harvested fresh seeds. An examination of gender diversity, in relation to a respondent's occupational status, shows females as the major stakeholders of AYB genetic resources.

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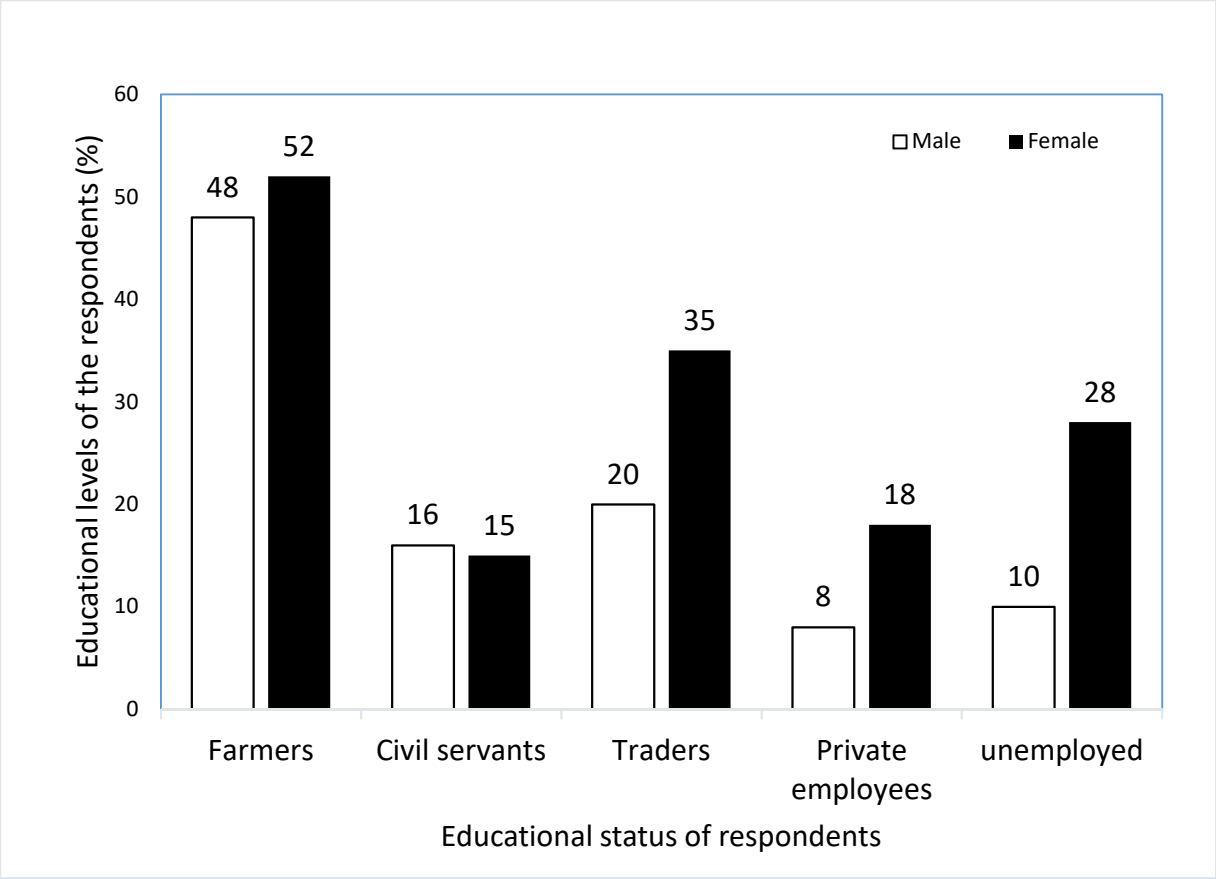

Figure 3. Occupational status of the Igbo speaking respondents to African yam bean folk nomenclature in Nigerian West Africa across Ebonyi State

Respondent's opinion on ethno meaning associated with AYB

All the respondents consulted had knowledge of the folk nomenclature linked with AYB and the associated factors hindering its use and availability in their communities (Table 2). Their responses indicated that these names were very frequently associated with gods (82.3%), however this was not considered as the major factor restricting accessibility to this species. This was not considered, by the respondents, responsible for the crop's orphan status with respect to breeders or conservationists. Other factors such as AYBs dominating growth habit, when intercropped with yam, a major staple, its long cocking time and low market demand were attributed to the crop underutilization (Figure 3). This is in accordance with [23] where such crops are considered to have been overlooked by research scientists, extension services and policy makers; governments rarely allocate resources for their promotion and development. These factors contribute to further to the decline in farmers planting crops like AYB.

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Table 2. Respondents opinion on folk names and meaning associated with AYB determined from responses from Igbo speakers in Nigerian West Africa across Ebonyi State

S/N	Items	Yes %	No %
1.	We have ethno meaning of AYB name across the state	100	0.0
2.	The name is associated with God	83.3	14.7
3.	The name has affected the use of AYB	88.7	11.3
4.	The folk names of the crop (AYB) is good	100	0.0
5.	The name has an impact on the crop	72.7	27.3

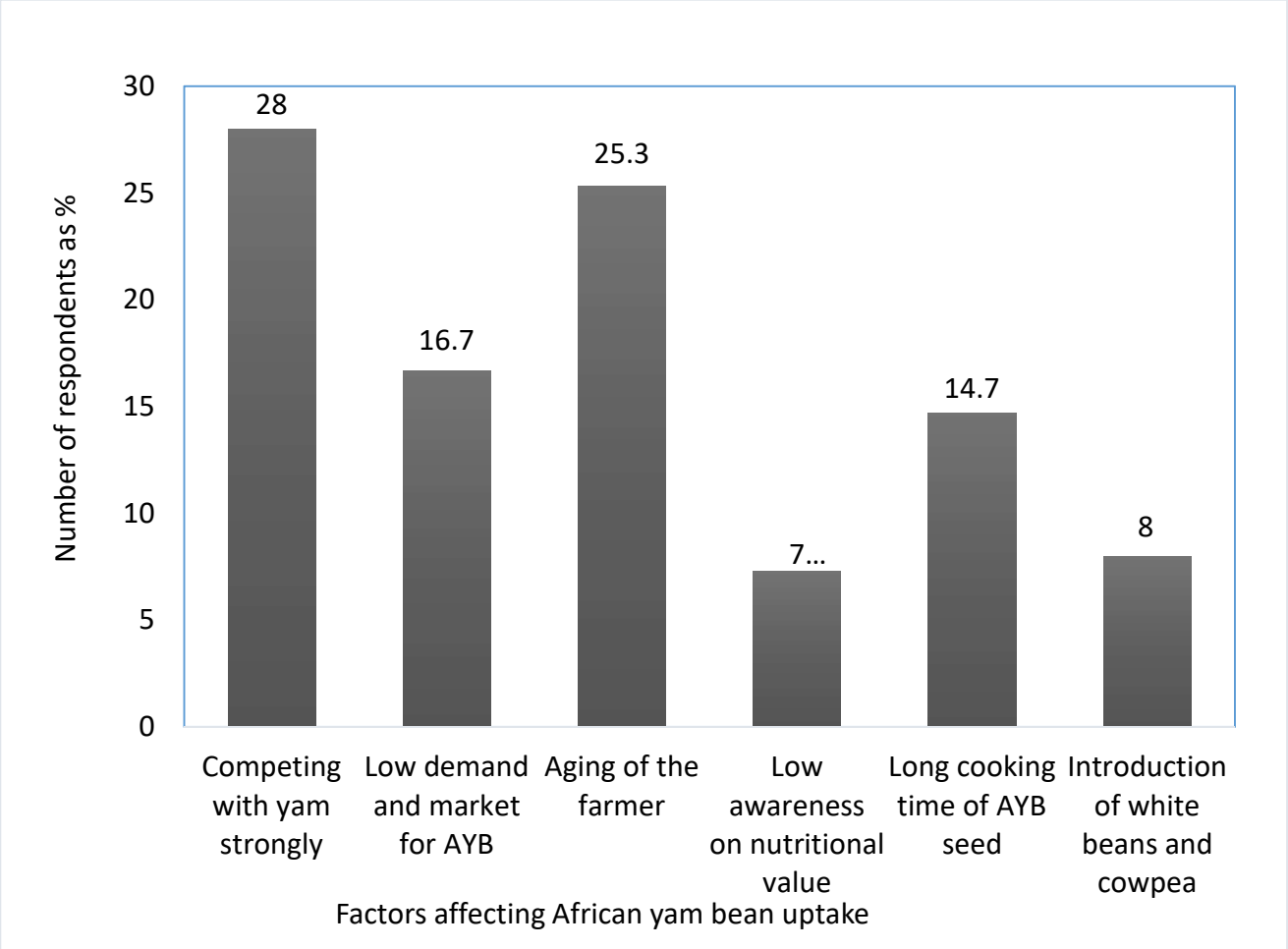

Fig 3: Respondents opinion from Igbo speakers in Nigerian West Africa across Ebonyi State on the uptake of African Yam Bean across State.

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Folk nomenclature, meaning and reasons behind African Yam Bean *naming in Ebonyi State*

This study recorded the folk conceptualization of the custodians of AYB in Ebonyi State and the cryptic values attached to this natural resource. The informants listed the multiplicity of folk names used for AYB in their communities as related to their stated dialects. Among the eleven ethnic groups, AYB goes by different folk nomenclatures based on its status and position in their socio-cultural settings. The respondents recorded folk names as "Azama", "Azaaki", "Aza-ama", "Azaakuru", "Etiti", "Onyiaoduru", "Eriwa", "Irigirigi" (Table 4). The cryptic meaning of these folk nomenclatures were recorded along with the reason(s) behind their use by the respondents (Table 4).

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Table 4. Diversity of names, meaning and etymological facts of African yam bean names used by Igbo speakers in Nigerian West Africa across Ebonyi State

S/N	Ethnic group	Name	Meaning	Etymological facts
1	Izzi	Azama	Feeder of people	They believed that God had answered their prayer by giving them this crop to feed themselves when there was serious faming on the land.
2	Ezza	Azama	Healing food for the people Medicine	In the past when kwashiorkor was the major problem facing the people of Ezza, boiling the crop, eating AYB and the use of water from the cocked seeds to bath provides healing.
3	Ikwo	Azaaki	Multiple seed-food provider Seed	They named AYB Azaaki because of the multiple food types it provides, which help poor farmers when they cultivate the crop. They believe that cultivating AYB is a way of avoiding hunger.
4	Ngbo	Azaakuru	Plant small and harvest plenty (dominating crop). God	Ngbo people said that they name it Aza-akuru because, it is a passive crop but when planted, it will dominate the whole farm and yield a lot of food types both the seed and the tuberous root. A dominating crop that God gave to help poor farmers.
5	Ntezi and okpoto	Etiti	Subduer of hungry (the Central hungry killer). God	They believed that God has given them the crop to feed them during a time of famine. When the poor cannot cultivate other crops, AYB is only crop that can feed people even when the quantity is small.
6	Afikpo	Azuma	Food server God and Medicine	They name this crop Azuma because of its great feeding capacity and its ability to stop some illness, e.g. stomach disorder. They believed that God answered their prayer in times past.
7	Ohozara	Aza-ama	Dominating food crop. God and medicine	Prayer answered by God through the giving of this crop to provide food even when other crops are yielding little food. It yields great food for the poor. The solution

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				to the illness, in this they name this crop Aza-ama believing that God of harvest called "Njoku" has answered their prayers.
8	Nkalagu	Azaku	Food helper of the poor God	They called it "Azaku" because of the role it played during famine in times past. They believed that God provided it to help the poor through its simplicity cultivation.
9	Ohafia-Agba	Azama	Feeder of people Adaptation to climate change	They believed that the God of harvest has provided this crop to sustain his people when other crops do not perform very well on the farm. AYB can compete in and adapt to many different environments.
10	Agba, Nkalegu and Igboasa	Eriwa	Minor crop that feeds many people. Gender	It's a women's crop that helps to sustain the people when the major crops (the man's crops like yam, rice and cassava) are finished in the bans, particularly after planting. AYB is usually intercropped with other crops by women hence it is termed women's crop.
11	Ezza and Ikwo	Onyiaoduru	Sustainer and friend of the farmer. Sustainer	Respondents believe that after eating AYB, the consumer keeps drinking water through the day and it gives sufficient energy to work without fatigue.
12	Ngbo and Izzi	Mgbadumu	Saving seed Seed	When labourers are hired to work on farm. They eat the food in the morning and it will keep them active until evening in the absence of hunger.
13	Ohofia-Agba	Irigirigi" and Azama	Many seeded plant. Seed	

Source: Field work 2016 - 2018

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Traditional botanical knowledge, of local people, is encoded and revealed in plant naming which is of high utility in the community. This is shown in the responses from Izzi, Ezza, Afipko and Ohozara community where AYB is called *"Azama" translated to "dominating food crop". The solution to illness, in this way they name this crop Azama believing that God of harvest called "Njoku" has answered their prayers by given this crop to provide food even when other crops are failing them and yielding little food.* This is concordant with [4] who noted that names highlight the perception of the plant by indigenous people in relation to their environment and culture. He concluded that plants can be named after their status, forms, colour, texture, growth form, habitat, taste as well as other inanimate materials they utilize in their environment.

Respondents from Ezza and Ikwo called AYB *"Onyiaoduru" i.e. the sustainer and friend of farmers.* The etymological connotation of this indicate that after eating AYB, farmers were energized and able to keep working for a stained time period in the absence of hunger. AYB consumption may also encourage drinking of water throughout the day. This is in synergy with the report by [21], who noted that ethno-botanical nomenclature is usually developed for species that have attained high utilitarian and cultural significance and that these names are usually assigned to species that carry etymology that may relate to specific therapeutic effects, morphological features, mythological connotations, allusive statements and allegories in the community's cultural life.

Ethno-taxonomic names are the root of traditional biodiversity knowledge and the cryptic meaning of such names is an indispensable component in understanding the interactions of the people with their natural resources. Despite this, [24] stated that the existence of such knowledge is globally threatened by a range of exogenous factors which including conflict, internal displacement, modern education, commerce, and international movements of people. It was also suggested that to avoid this erosion, information on folk nomenclature should be documented and conserved.

In Agba, Nkalegu and Igboasa communities, AYB is called "Eriwa" translated to "a minor crop meant for women that feeds many people. *It is minor, a less important crop cultivated by women"*. This conforms with the report that orphan/understudied crops provide food for resource poor farmers and consumers in Africa as they often adapt better (increased growth and yield) under

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adverse environmental conditions where major staples can fail to thrive [22]. However, respondents in Ngbo have a different perspective AYB where it is known as "Azaakuru" translated as "*plant small and harvest plenty (dominating crop)". They indicate that "it is a dominating crop that God gave poor farmers to sustain them".* Custodians of traditional knowledge gave names to plant resources which they find beneficial, vital and significant to their wellbeing [21]. Folk nomenclature through the meaning of plant names is an essential encoding element to understand the traditional botanical knowledge of the local people [4].

Etymology affiliation of AYB folk nomenclature in different communities

The custodians of this multipurpose plant in these communities supported the notion that their analyses and structured folk nomenclatures were derived from etymological ideologies. These results showed that out of the 10 folk nomenclatures for AYB, cryptic connotation revealed from folk names, indicated that five of these names reflected their relationship with their gods, two were linked to healing prospective and three were referenced to the feature of the plant parts such as seed, while one was attributed to women (as a female crop). One of these names emphasizes the resilient potential of the crop to climate stress and one as a 'sustainer of farmers'. This conforms to the use of vernacular names, assigned to this species, and associated etymology with respect to specific therapeutic effects. [4]. Some respondents indicated that local names are an aid to memories of past times during periods of famine.

Conclusions

The research in this first study of ethno-cultural analyses of folk nomenclature on AYB has unveiled the verbal etymological ethics behind its folk nomenclatures in 13 local communities in Nigeria. The socio-economic characteristics of respondents involved in the survey showed a preponderance of have limited formal education, if any, and to be elderly, and who are therefore aging and not able to provide formal written documentary evidence of the wealth of knowledge in their custody of this species. The range of folk names was robust and their cryptic meaning varied in communities across Ebonyi State. The majority of these names reflected the etymological affiliation to prayers answered by their gods, the plant's healing capabilities, higher yields of AYB relative to others in stressed environments, the crops feminist rank and the value it adds to their community well-being. The study has also enhanced the recognition of key role this natural

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resources plays in the life of rural farmers by highlighting the sacred linkages between traditional societies and their phytodiversity. Considering that folk nomenclature is based primarily on qualitative data and information from non-scientific sources, conservation strategies are need which utilise tools from the scientific domain which are reinforced by policy to enable AYB exploitation and knowledge conservation for posterity. Plant folk names are the root of traditional biodiversity knowledge and information from such a domain supplements and supports environmental sustainability and biological conservation.

Materials and Methods

Study Area

The study area was Ebonyi State in South-eastern geo-political zone of Nigeria, dominated by the Igbo speaking kindred known as the "Salt of the Nation" due to the large salt deposit in parts of the state. The area is located within longitude of 6º 15'N 80 05'E and latitude 6.25º N, 8.08º E, within an area that covers 5,530 km^2 at an elevation of 48 m above the sea level [25]. The state is bounded to the north by Benue State, to the west by Enugu State, to the south by Imo and Abia States and to the east by Cross River State. Three senatorial zones are recognized in this state - Ebonyi North – comprising of Abakaliki, Ebonyi, Ishielu, Ohaukwu and lzzi LGAs: Ebonyi Central – comprising of Ikwo, Ezza North and Ezza South LGAs: Ebonyi South – comprising of Afikpo North, Afikpo South, lvo, Ohaozara and Onicha LGAs. These three senatorial zones are distributed over 13 local government areas. The study zone was characterized by the diurnal temperature ranging of 22ºC – 33ºC with a pseudobinodal rainfall pattern from early April to November, with rainfall ranging from 1500–2000 mm with a mean of 1800 mm. According to the flora of West Africa's regional system, the state is within the mosaic of low land rain forest and savannah vegetation belt [25]. The inhabitants of the state are predominantly farmers and traders. The main state crops produced are rice, yam, fruits and vegetables.

Sampling size and composition

The study was based on fieldwork conducted over two years and finished in late 2017 among the Igbo speaking people in Nigerian, West Africa. Interviews were conducted with 250 purposively selected informants (155 males and 95 females) from 13 communities in Ebonyi State. Ten traditional health practitioners (8 males and 2 females) were selected through convenience

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sampling method among the participants in these communities. They were included because of their extensive knowledge on the use of indigenous plant species as sources of medicine. These informants were aged between 25 and 90 years. This age group possess knowledge about the community's cultural traditions and values of indigenous nomenclature regarding indigenous plants.

Data collection

Verbal pre-informed consent was obtained from the participants before the interviews. Interviews were conducted in the local language using guided semi-structured questionnaires and guided by Research assistants, who were knowledgeable of the local dialects. The questionnaire was structured in line with the specific objectives of the study and were administered orally. The interviews were structured to cover questions pertaining to the multiplicity of folk nomenclatures of AYB. The research questions were focused on (i) identifying the socio-economic status of the respondents; (ii) recording the folk names and determining the cryptic meaning of these folk nomenclatures, (iii) reasons for assigning these names by the custodians. The questionnaire was independently evaluated to ensure there were no ethical issues. Rapid rural appraisal (RRA) and focal group discussion (FGD) were used to elicit farmers and stakeholders' awareness and knowledge of AYB, while semi-structured interview schedules were used to collect quantitative information from the selected respondents. The AYB stakeholders responded to a five-point scale survey employed to determine the magnitude of their responses as follows: to a very great extent (5 points); to a great extent, (4 points); to some extent, (3 points); to a little extent, (2 points); and to a very little extent, (1 point). The interviews were conducted within the respondent's homes. To understand the meaning behind the folk nomenclature in the different community dialects, literal translations were made based on specific author's expertise in these dialects. Translations consisted as a word-for-word explanation of vernacular names listed, or a free translation as an English equivalent. Furthermore, these names, and translated meanings were cross-referenced to the custodians in the communities to verify and approve the translations.

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Analysis of the structure and semantic of the folk nomenclature

Data obtained from the questionnaires were processed into a data matrix, percentages and analyzed. Data were analysed using simple averages, mean scores and standard deviations derived within Statistical Analysis System (SAS).

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