Germplasm collection and ethnobotany of taro (*Colocasia esculenta* L. Schott*)* from nineteen districts in the Ashanti, Eastern and Western regions of Ghana

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ABSTRACT

Germplasm collection and ethnobotanical documentation are necessary for effective conservation and management of plant genetic resources. Taro (*Colocasia esculenta* L. Schott) is one of the staple root and tuber crops in Ghana. The study reports the germplasm and ethnobotanical information of taro collected from 19 districts in the Ashanti, Eastern and Western regions of Ghana. A germplasm collection expedition was undertaken in 58 towns in the districts. Fifty donors were interviewed on ethnobotany of taro, using a questionnaire based on International Plant Genetic Resources Institute (IPGRI) descriptors for taro. Sixty taro accessions were collected from fields (34), home gardens (23), roadside stalls (2) and the wild (1). Respondents comprised of 27 males and 23 females. (62%). According to respondents of the survey, taro is used for food (100%), animal feed (44%) and folk medicine (4%). The corms (100%) and leaves (64%) are the parts of the plant used. The crop is grown mainly on a small scale for subsistent use by 70 per cent of the respondents. Taro leaf blight (TLB) and lack of planting materials were the main constraints to large scale production. Respondents perceived the outbreak of TLB was due to the use of agrochemicals in farming practices in recent times (80%), irradiation (26%) and mythical reasons (10%). There is the need to educate taro growers on the causes and management of taro leaf blight.

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Introduction

Taro *(Colocasia esculenta* L. Schott) is a member of the Araceae family, widely consumed as a staple in Asia, Africa and central America (Melese Negussie, 2015). Taro grows largely in humid tropical areas of the world (Singh *et al*., 2012). Taro contains about 35 g of total carbohydrate per 100 g corm, which is twice the amount contained in potatoes (*Solanum tuberosum*) (USDA, 2016). Taro contains 11% protein on dry weight basis, and also rich in minerals, Vitamin C, thiamin, riboflavin and niacin (Melese & Negussie 2015). It is better than cereals such as rice, wheat and sorghum in Vitamin C, Vitamin E and potassium (USDA, 2016). More than 10 million tonnes of taro was produced worldwide in 2014 with Nigeria, China, Ghana, Cameroon and Papua New Guinea being the top five producers (FAOSTAT, 2014).

Taro is propagated as a dry-land crop or under flooded conditions using side suckers, small corms, corm pieces or the apical part of the corm with the basal portion of the petioles attached. Since taro is clonally propagated it has a narrow genetic base for crop improvement. Genetic resources of taro have been largely maintained by farmers through the selection of

varieties that have adapted to different agro-ecologies until recently (Ramanatha Rao *et al*., 2010). Genetic resources of plants are acquired through collecting, donations and exchange with researchers and institutions that hold them (Jaramilo & Bsena, 2002). Collection of plant genetic resources (PGR) ensures that crop diversity is captured to prevent genetic erosion and for crop improvement purposes. Collection missions are either specific or broad based. Specific collection mission aims at obtaining variability in a particular crop (Aboagye, 2007).

According to Ramanatha Rao, (2010) taro is embedded in many cultures as a result of its selection for a wide variety of uses. Ethnobotany records the components of a culture on plant use and currently ensures that it is sustained (Osawaru & Dania-Ogbe, 2010). Taro is used as food by humans, fed to animals and has medicinal uses in certain parts of the world. Corms are baked, roasted, or boiled as a source of carbohydrates, leaves are frequently consumed as a vegetable representing an important source of vitamins, and petioles and flowers are consumed in certain parts of the world (Ramanatha Rao *et al*., 2010). Taro is often regarded as an orphan crop, because intensive research on taro has not been carried out as compared to cassava, yam and potatoes. Collection of taro genetic resources and documentation of its indigenous knowledge is necessary for effective conservation and improvement of the crop. The results of germplasm collection and documentation of the indigenous knowledge on taro in the Ashanti, Eastern and Western regions of Ghana is reported in this study.

Materials and Methods

The study area

The study was conducted in it districts in the Ashanti, one district in the Eastern and two districts in the Sefwi area of the Western regions, located in the moist semi-decidious forest zone of Ghana (www.fao.org, vegetation of Ghana). The area is located between latitudes 06°10 N and 07°24 N and longitudes 001° 04 W and 002°30 W. Average annual rainfall ranges from 1230 mm to 1570 mm. Fig. 1 shows map of the districts in the study area.

Fig. 1. Map of the study area

Collection of taro germplasm

Suckers and corms were collected from 58 towns and villages in 19 districts in November 2015. The germplasm were collected from fields, home gardens and roadside. Stops were made after every 10-20 km drive to collect samples. A minimum of five suckers or corms were sampled from each collection site into polyethylene bags and labeled with a collector's number. Passport data of each sample was recorded at the collection site. Information recorded was the date of collection, geographical positioning system (GPS) coordinates, name of town or village and district, source of germplasm and cultural practice. The collected accessions were brought to the CSIR–Plant Genetic Resources Research Institute (PGRRI) for conservation and characterization. The accessions were planted in poly pots in the dry season and were later planted under field conditions to multiply them prior to agromorphological characterization.

Ethnobotanical survey

A questionnaire on ethnobotany based on IPGRI collecting descriptors for taro was administered to 50 respondents who donated taro germplasm (IPGRI, 1999). Respondents were interviewed on local vernacular name of accession, cooking methods and time used,

available recipes, parts of plant used, palatability, uses, growing conditions, associated flora and seasonality and importance of taro. A response corresponding to each answer provided to the questions in the survey was scored one point as well as other answers provided by respondents.

Data analysis

Data collected was analyzed by expressing them in percentages, summarized and discussed.

Results and Discussion

Germplasm collection

A total of 60 taro accessions were collected from 58 towns and villages in 19 districts in the Ashanti, Eastern and Western regions of Ghana. Passport data for the collected accessions is recorded in Table 1. Majority (50) of the accessions were collected from the 16 districts in the Ashanti Region. Two accessions were collected from one district in the Eastern Region and eight from two districts in the Western Region. Twenty three accessions were collected from home gardens, 34 from fields, two from roadside stalls and one accession from the wild. Collection and conservation of root and tuber crop genetic resource are important exercises that safeguard their genetic diversity for future and crop improvement purposes (Aboagye & Nyadanu, 2015).

TABLE I

Passport data of sixty taro accessions collected in the 19 districts in Ghana.

No.	*Collection No.*	*Crop species*	*Region*	*District*	*Town/Village*	*Latitude*	*Longitude*	*Sample source*
1	ADA 2015 001	*Colocasia esculenta*	Ashanti	Asante-Akim South	Bompata	06° 28.38 N	001° 05.58 W	Garden
2	ADA 2015 002	*Colocasia esculenta*	Ashanti	Asante-Akim South	Behwe	06° 42.08 N	001° 12.27 W	Garden
3	ADA 2015 003	*Colocasia esculenta*	Ashanti	Asante-Akim North	Woraponso	06° 49.09 N	001° 14.92 W	Garden
4	ADA 2015 004	*Colocasia esculenta*	Ashanti	Asante-Akim North	Patriensa	06° 39.59 N	001° 10.60 W	Garden
5	ADA 2015 005	*Colocasia esculenta*	Ashanti	Asante-Akim South	Juaso	06° 35.17 N	001° 07.03 W	Field
6	ADA 2015 006	*Colocasia esculenta*	Ashanti	Ejisu-Juabeng	Nnobewam	06° 37.35 N	001° 17.87 W	Field
7	ADA 2015 007	*Colocasia esculenta*	Ashanti	Ejisu-Juabeng	Nnobewam	06° 37.35 N	001° 17.87 W	Field
8	ADA 2015 008	*Colocasia esculenta*	Ashanti	Ejisu-Juabeng	Bomfa	06° 36.93 N	001° 18.00 W	Field
9	ADA 2015 009	*Colocasia esculenta*	Ashanti	Amansie East	Asiwa	06° 25.49 N	001° 19.94 W	Field
10	ADA 2015 010	*Colocasia esculenta*	Ashanti	Ejisu-Juabeng	New Ampabame	06° 42.40 N	001° 25.19 W	Field
11	ADA 2015 011	*Colocasia esculenta*	Ashanti	Ejisu-Juabeng	Asotwe	06° 44.82 N	001° 27.40 W	Garden
12	ADA 2015 012	*Colocasia esculenta*	Ashanti	Sekyere-East	Effiduase	06° 50.79 N	001° 23.54 W	Field
13	ADA 2015 013	*Colocasia esculenta*	Ashanti	Sekyere-East	Asokore	06° 50.61 N	001° 23.17 W	Field
14	ADA 2015 014	*Colocasia esculenta*	Ashanti	Kumawu	Wonoo	06° 54.27 N	001° 18.68 W	Field
15	ADA 2015 015	*Colocasia esculenta*	Ashanti	Kumawu	Bodomase	06° 53.87 N	001° 15.10 W	Garden
16	ADA 2015 016	*Colocasia esculenta*	Ashanti	Kumawu	Woraso	06° 52.38 N	001° 16.83 W	Garden
17	ADA 2015 017	*Colocasia esculenta*	Ashanti	Sekyere-East	Banko	06° 56.20 N	001° 23.33 W	Wild
18	ADA 2015 018	*Colocasia esculenta*	Ashanti	Afigya Sekyere South	Asuafo	06° 59.48 N	001° 22.95 W	Garden
19	ADA 2015 019	*Colocasia esculenta*	Ashanti	Sekyere Central	Kyebi-Nsuta	07° 10.07 N	001° 20.59 W	Garden
20	ADA 2015 020	*Colocasia esculenta*	Ashanti	Sekyere Central	Kwaaman Atia	06° 58.78 N	001° 16.18 W	Garden
21	ADA 2015 021	*Colocasia esculenta*	Ashanti	Sekyere West	Mampong Tatafrom	07° 04.67 N	001° 24.47 W	Field
22	ADA 2015 022	*Colocasia esculenta*	Ashanti	Ejura-Sekyedumase	Adidwan	07° 15.17 N	001° 24.12 W	Garden
23	ADA 2015 023	*Colocasia esculenta*	Ashanti	Ejura-Sekyedumase	Ejura	07° 23.34 N	001° 22.11 W	Garden
24	ADA 2015 024	*Colocasia esculenta*	Ashanti	Sekyere East	Agona Jamasi	06° 58.16 N	001° 28.69 W	Field
25	ADA 2015 025	*Colocasia esculenta*	Ashanti	Sekyere East	Kona	06° 52.60 N	001° 30.40 W	Field
26	ADA 2015 026	*Colocasia esculenta*	Ashanti	Ejisu-Juabeng	Adanwomase	06° 48.79 N	001° 28.72 W	Garden
27	ADA 2015 027	*Colocasia esculenta*	Ashanti	Ejisu-Juabeng	Donaso	06° 41.72 N	001° 27.27 W	Garden

28	ADA 2015 028	*Colocasia esculenta*	Ashanti	Ejisu-Juabeng	Asienimpong	06° 39.69 N	001° 26.92 W	Field
29	ADA 2015 029	*Colocasia esculenta*	Ashanti	Bosomtwi	Piase	06° 35.40 N	001° 27.10 W	Field
30	ADA 2015 030	*Colocasia esculenta*	Ashanti	Bosomtwi	Kuntanase	06° 32.59 N	001° 28.41 W	Garden
31	ADA 2015 031	*Colocasia esculenta*	Ashanti	Bosomtwi	Worakese	06° 31.32 N	001° 30.32 W	Field
32	ADA 2015 032	*Colocasia esculenta*	Ashanti	Bosomtwi	Worakese	06° 31.21 N	001° 30.37 W	Field
33	ADA 2015 033	*Colocasia esculenta*	Ashanti	Amansie West	Kokofu	06° 30.24 N	001° 31.95 W	Field
34	ADA 2015 034	*Colocasia esculenta*	Ashanti	Amansie West	Boaman	06° 27.89 N	001° 33.84 W	Field
35	ADA 2015 035	*Colocasia esculenta*	Ashanti	Amansie West	Bekwai	06° 27.48 N	001° 34.70 W	Field
36	ADA 2015 036	*Colocasia esculenta*	Ashanti	Amansie West	Anwiankwanta	06° 27.79 N	001° 37.96 W	Garden
37	ADA 2015 037	*Colocasia esculenta*	Ashanti	Amansie West	Asanso Patasi	06° 25.46 N	001° 38.22 W	Field
38	ADA 2015 038	*Colocasia esculenta*	Ashanti	Amansie Central	Heman	06° 20.48 N	001° 37.89 W	Field
39	ADA 2015 039	*Colocasia esculenta*	Ashanti	Amansie Central	Kwapia	06° 17.05 N	001° 39.34 W	Garden
40	ADA 2015 040	*Colocasia esculenta*	Ashanti	Obuasi	Obuasi	06° 14.04 N	001° 40.53 W	Garden
41	ADA 2015 041	*Colocasia esculenta*	Ashanti	Obuasi	Binsere	06° 12.63 N	001° 42.39 W	Field
42	ADA 2015 042	*Colocasia esculenta*	Ashanti	Amansie Central	Kwapia	06° 17.39 N	001° 39.33 W	Roadside stall
43	ADA 2015 043	*Colocasia esculenta*	Ashanti	Bosomtwi	Ahwiren	06° 30.04 N	001° 25.24 W	Field
44	ADA 2015 044	*Colocasia esculenta*	Ashanti	Bosomtwi	Lake Bosomtwi Abono	06° 31.97 N	001° 25.78 W	Field
45	ADA 2015 045	*Colocasia esculenta*	Ashanti	Atwima Mponua	Nyinahin Nkwanta	06° 42.15 N	001° 44.66 W	Field
46	ADA 2015 046	*Colocasia esculenta*	Ashanti	Atwima Mponua	Antwi Agyei Nkwanta	06° 28.99 N	002° 14.07 W	Field
47	ADA 2015 047	*Colocasia esculenta*	Western	Bekwai Bibiani Anhwiaso	Bibiani Gyidi	06° 27.74 N	002° 17.95 W	Garden
48	ADA 2015 048	*Colocasia esculenta*	Western	Bekwai Bibiani Anhwiaso	Domenabo No.1	06° 23.55 N	002° 17.57 W	Garden
49	ADA 2015 049	*Colocasia esculenta*	Western	Bekwai Bibiani Anhwiaso	Afamu	06° 20.42 N	002° 16.38 W	Garden
50	ADA 2015 050	*Colocasia esculenta*	Western	Bekwai Bibiani Anhwiaso	Sefwi Asawinso	06° 15.06 N	002° 13.39 W	Field
51	ADA 2015 051	*Colocasia esculenta*	Western	Bekwai	Sefwi Bekwai	06° 11.63 N	002° 19.55 W	Field
52	ADA 2015 052	*Colocasia esculenta*	Western	Sefwi-Wiawso	Sefwi-Wiawso	06° 12.53 N	002° 29.61 W	Field
53	ADA 2015 053	*Colocasia esculenta*	Western	Sefwi-Wiawso	Sorano	06° 11.78 N	002° 21.71 W	Field
54	ADA 2015 054	*Colocasia esculenta*	Western	Bibiani Anhwiaso Bekwai	Adukrom	06° 20.42 N	002° 17.95 W	Roadside stall
55	ADA 2015 055	*Colocasia esculenta*	Ashanti	Atwima Mponua	Akotaa	06° 31.32 N	002° 11.82 W	Garden
56	ADA 2015 056	*Colocasia esculenta*	Ashanti	Atwima Mponua	Asibe – Nkwanta	06° 36.32 N	002° 03.48 W	Field
57	ADA 2015 057	*Colocasia esculenta*	Ashanti	Atwima Mponua	Kentikyiren	06° 38.22 N	001° 56.16 W	Garden
58	ADA 2015 058	*Colocasia esculenta*	Ashanti	Atwima Nwabiagya	Afari	06° 41.93 N	001° 46.94 W	Field
59	ADA 2015 059	*Colocasia esculenta*	Eastern	Kwahu West	Kwahu Fodoa	06° 42.95 N	001° 05.32 W	Field
60	ADA 2015 060	*Colocasia esculenta*	Eastern	Kwahu West	Danteng Nkwanta	06° 36.08 N	001° 04.93W	Field

TABLE 2

Cropping system and cultural practice of collected **germplasm**

	Frequency	*Percent*
Cropping system		
Monocropping	13	21.7
Mixed cropping	47	78.3
Cultural practice		
Rainfed	23	38.3
Flooded area	35	58.4
Irrigated	2	3.3

Taro was cultivated mainly in association with other crops by 78.3 per cent of germplasm donors (Table 2). The crop was planted together with plantain, oil palm, cocoa, cassava, sugar cane, avocado, pawpaw, rice and orange trees. According to the Consultative Group for International Agricultural Research (CGAIR) (1997), in West Africa, edible aroids are grown in association with tree crops. Crops planted together with taro served as a source of shade. About 22% of taro collected was monocropped.

Taro grows under both upland and flooded conditions. The taro collected was cultivated in flooded areas of the fields and gardens, rainfed and under irrigation. Majority (58%) of taro accessions collected during the expedition was cultivated in flooded areas of the fields and gardens visited. These plants were located in waterlogged areas and along streams. Farmers perceived that taro was a water-loving plant and, therefore, preferred planting in such places. Taro was irrigated with rice in 3 per cent of the farms visited. About 38 per cent of taro farmers relied on rainfall for the cultivation of the plants. Table 2 shows cropping system and cultural practices.

Gender, ethnicity and primary occupation of respondents

Fifty respondents, comprising 27 males and 23 females were interviewed in 19 districts in the Ashanti, Eastern and Western regions of Ghana during the germplasm collection expedition (Table 3). All respondents donated taro from their fields or gardens. Only 26 per cent of respondents were fulltime farmers. All the other respondents were engaged in different kinds of primary occupation. They were artisans, traders, students, housewives and civil servants (Table 3).

TABLE 3

Gender and primary occupation of respondents.

Characteristic	*Frequency*	*Per cent*
Gender		
Male	27	54
Female	23	46
Occupation		
Artisans	8	16
Civil servants	3	6
Farmers	13	26
Housewives	3	6
Students	4	8
Traders	19	38

Respondents in the study area hailed from different ethnic groups. In all, seven ethnicities were represented in the survey: Adansi, Asante, Asante-Akyem, Dagarti, Ewe, Kwahu and Sefwi (Fig. 2), and most of the respondents (62%) in the ethnobotany survey belonged to the Asante ethnic group. Local vernacular name for taro is "brobe" and,or "kooko" in the Twi dialect according to respondents in the Ashanti and Eastern regions. Twelve respondents knew the local name "brobe" only, 13 used "kooko" only and 19 used both "brobe" and kooko" interchangeably. The people of Sefwi in the Western Region of Ghana called taro "kuffour" in their Sefwi dialect.

A type of taro locally called "Antwebo" was collected in a farm at Worakese town (Fig. 3). According to the donor of the accession, the corms were only edible after boiling for a long time. It was, therefore, cooked overnight and eaten the following day.

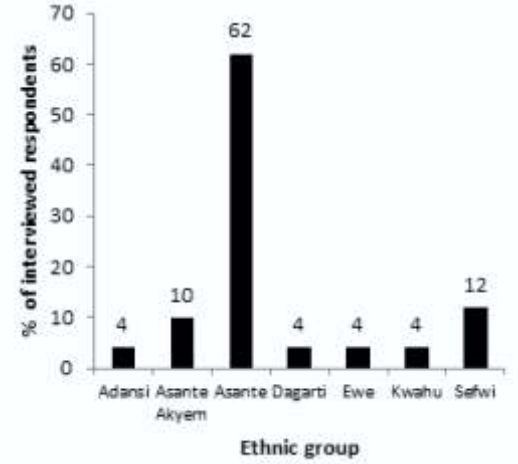

Fig. 2. Ethnicity of respondents from the survey

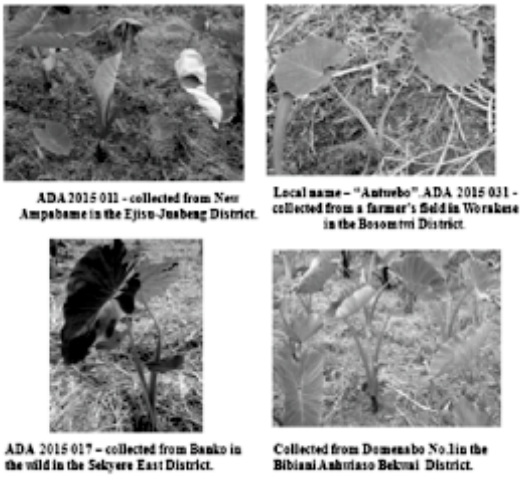

Fig. 3. Morphological features of some collected accessions

Importance and management of taro

Taro was cultivated in the survey area for subsistence consumption and income. Majority of respondents (70%) reported that they cultivated taro for their personal use only (Table 4). About 30 per cent of respondents cultivated taro for sale and personal use. The amount of produce sold depended on surpluses after home consumption. Mostly taro was planted on a very small scale in the gardens and farms surveyed. Two major constraints to large scale production of taro were identified. The first major constraint to large scale production, according to respondents, was the outbreak of the TLB disease. All respondents perceived the disease as responsible for the loss of taro germplasm, which grew naturally in flooded areas without being cultivated. Yield losses to TLB by up to 50 per cent for corms and 95 per cent for leaves have been reported (Singh *et al*., 2006; Nelson, Brooks & Teves 2011). *Phytophthora colocasiae* has been identified as the main causative agent of the disease (Omane *et al*., 2012).

According to Singh *et al*. (2012) TLB poses a grave threat to food security and loss of crop genetic diversity, as well as impact on personal incomes and national economies if not controlled. However, 80 per cent of respondents attributed the outbreak of the disease to the use of agrochemicals in farming practices in recent times (Table 4). Some 10 per cent of respondents perceived the loss of taro was mythical: "yam producers in Ghana placed a spell on the crop so as to increase the demand for yams and, hence, the disease outbreak". Others attributed the outbreak of the disease to irradiation (26%) from eclipses. There is the need to enlighten farmers and the general public on the cause and management of TLB.

Inadequate healthy planting materials are the second major constraint to large scale production mentioned. Planting materials were obtained from reserves of the previous harvest (54%), and fellow farmers or friends (30%) because no established seed system was available (Table 4). Since taro is propagated vegetatively, sharing of planting materials among farmers can contribute to the spread of TLB to other farms. Some respondents (16%), however, reported that taro sprouted spontaneously in their farms after clearing the land for new plantations. Spontaneous sprouting after land preparation has also been reported for cocoyam in a study conducted in Ghana (Ramanatha Rao *et al*., 2010).

TABLE 4

Frequency of ethnobotany response in the survey

	Frequency	*Percent*
Importance of taro		
Subsistence	35	70
Both cash and subsistence	15	30
Respondents perception on causes of TLB disease		
Use of agrochemicals	40	80
Mythical issues	5	10
Effect of irradiation from Eclipses	13	26
Unknown	5	10
Source of planting materials		
Farmers own	27	54
Friends	15	30
Spontaneous sprouting	8	16
Frequency of taro use		
Monthly	17	34
Seasonal	33	66
Part(s) of plant used		
Corm	50	100
Leaves	32	64
Cormel	50	100
Uses of taro		
Food	50	100
Animal feed	22	44
Medicine	2	4
Main corm cooking method		
Boiling	50	100
Roasting	39	78
Frying	50	100
Boiled and pureed with fish and vegetables	43	86
Consistency of boiled corm		
Firm	7	14
Soft	48	96
Mealy	11	22

Taro is usually planted at the onset of the major rainy season and the field is maintained by weeding according to respondents. Planting, field maintenance and harvesting are done manually by all respondents without the application of weedicides and fertilizers. Apart from plants that sprout spontaneously, side suckers, apical portions of corms and corm pieces were used as planting materials by respondents in the survey. Corms are mostly harvested in the dry season (November–February) in batches as and when they are needed for home consumption or sale.

Uses and characteristics of cooked taro

Majority (66%) of respondents use taro during the harvesting season (Table 4). About 34 per cent of respondents use taro more frequently depending on its availability in their gardens or farms. Corms, cormels and leaves were the parts of taro used. All respondents were familiar with the use of taro corms, about 64 per cent of respondents knew of the use of taro leaves (Table 4). Taro was reported to be used for food by all respondents (100%), 44 per ent reported it was used as animal feed and 4 per cent for medicinal purposes (Table 4). Hegdehogs, grasscutters, goats, snails and ducks were the animals that were reported to feed on taro. The leaves were reported to be used medicinally to treat mature boils. Heat is applied to tenderize the leaf and then placed on the boils.

TABLE 5

List of taro recipes

Taro recipe	*Frequency*	*Percent*
Boiled in salted water and eaten with stew or soup	50	100
Fried corm eaten with stew or sauce	50	100
Taro leaves stew or soup	32	64
Roasted corm	39	78
Corm pounded together with cassava into fufu	2	4
Taro corm pureed with fish, vegetables and palm oil	43	86

The main part of taro used for food is the corm. The main corm cooking methods according to the survey were boiling, frying, pureeing with fish and vegetables and roasting (Table 5). Peeled taro corms boiled in salted water or fried and eaten with stew, sauce or soup was the most preferred taro recipes during the study. All respondents were familiar with these recipes. About 86 per cent of respondents also reported that taro corms could be boiled and pureed together with fish, vegetable and oils. Corms were reported to be used in the absence of plantain and cocoyam for pounding "fufu" by 4 per cent of respondents (Table 5).

TABLE 6

Palatability of cooked corms and leaves

Plant part	*Number of respondents*	*Poor*	*Palatability percentage Acceptable*	*Good*
Corm	50	2	2	96
Leaves	32	0	9.4	90.6

Boiled corm was perceived as aromatic by all respondents. Ramanatha Rao *et al* (2010) reported that lipids, proteins, amino acids and sugars present in corms all give rise to volatile compounds when taro is cooked which contribute to the flavor. The taste quality of cooked corm was rated as good by 96 per cent of respondents. The consistency of boiled taro corm was perceived as either firm, soft or mealy. About 96 per cent of respondents perceived that boiled corms possessed a soft consistency, 22 per cent perceived it could be mealy and 11 per cent perceived it could be firm (Table 5). Time required for cooking corms is dependent on the cooking method used. Roasting required much time compared to boiling and frying (Fig. 4). All respondents perceived that more than 20 min was required to roast corms. About 80% and 88% of respondents indicated that between 5 to 20 minutes was required to fry or boil corms respectively.

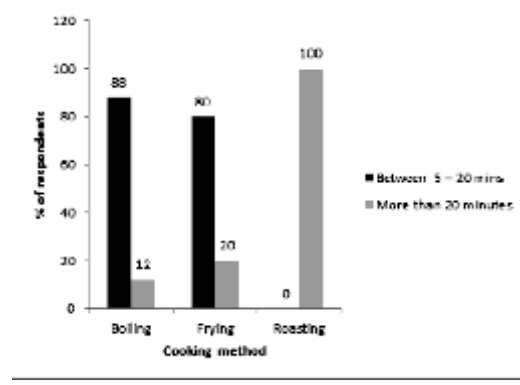

Fig. 4. Corm cooking method and time used.

Leaves of taro were also reported to be edible by 64 PER CENT of respondents (Table 5). They are used for the preparation of stew and soup. Among respondents which reported that leaves were consumed, 90 PER CENT perceived the taste quality was good. They, however, emphasized that only new and younger leaves were edible. Older leaves were reported to cause irritation and mouth sores irrespective of cooking. Acridity is the main anti-nutritive factor of taro due to the presence of needle-like calcium oxalate raphides in the plant (Bradbury & Holloway, 1988; Bradbury & Nixon, 1998)

No special uses for taro were reported in the study area. All respondents reported that taro was consumed by people of all age groups. Respondents, however, indicated that young people were discouraged from eating taro by the elderly in times past. This was done to prevent the youth from competing for the food resource with them since the cooked corm was much softer compared to other root and tubers and it was easy to masticate without teeth.

Conclusion

Sixty accessions of local taro germplasm were collected from 19 districts in the study area. The crop is widely known throughout all the districts in the study area by different local names, and is cultivated largely on a subsistent scale in mixed plantations. Corms and leaves are the main parts

of the plant used for food, animal feed and folk medicine. The crop is grown preferably under flooded conditions or in areas where water is readily available. TLB disease was the major cause of taro germplasm loss in local farms, gardens and naturally growing taro in the study area. Taro was still regarded as a favourite food despite the decline in production.

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