Planting Ideas--
Plant Propagation as an Integrating Theme for Botany, History, and Culture
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Richard Frazier

When I was in the sixth grade on the eve of what we thought was the Apocalypse, we were taken to the film room of the red brick schoolhouse. The aim was not to hear the promise of the nucleus but rather to view old scratched black and white images of forest people sputtering through the very latest in audiovisual hardware. These half-dressed women of the Amazon basin were squeezing the grated tubers of manioc in some fibrous contraption. The narrator made his comments with the same avuncular calm used to report the aborted invasions of far-off tropical islands or the kidnappings of national heroes of newly independent African nations or assassinations or the price of soybeans and winter wheat on the noon report. What he actually explained was that such primitive technology had to be used to render the plant product not poisonous.

I am not sure what the point was then to hearing about forest people while we sat in schools in southern Missouri named for figures like Eugene Field and Mark Twain. Around this time there were sand bags and rations which we saw during drills to the basement. My father dug a fallout shelter in the back yard. I am sure that somewhere in Cuba at that time someone was digging a heap to plant manioc. Columbus may have thought Cuba was Japan; in the Caribbean he had eaten bread which he called after the local name, *casabe'.* The recipe for the bread was the first one brought to Europe from the Americas. The missiles were never launched; Cuba was not invaded. In junior high where the building was named for some local school administrator from the past, we were the first to participate in a racially integrated school. The African American students who came had left a building named for a president. These events, too, could be considered part of the great chain of consequences precipitated by Columbus' landfall. While we in the American south had been segregated scholastically, we shared gastronomically in a common cuisine shaped by the traditions of African and European kitchens and foodstuffs from both the old and new worlds. I grew up with stewed greens, cornbread, fried fish and hush puppies, black-eyed peas, okra, sweet potatoes, and barbecue. Occasionally there was tapioca pudding, usually instant.

Years later I found myself in a village in West Africa at the end of the road. Living the small town life was not so unfamiliar; everyone knew or wanted to know everyone else's business. And there was a natural but expected politeness and neighborly concern. Agriculture was, of course, life. Human affairs revolved around the rhythms and concerns of farming and food. In the cycle of greetings, one might inquire, "Have you eaten food today?" It was understood that food was rice. The daily rice meal was topped by a palm oil stew, seasoned with onions, chilis, and dried fish, and thickened with a vegetable base, like peanut paste, sweet potato leaves, pumpkin, eggplant, fern tips, other greens, or the ubiquitous cassava leaves. Sometimes the dish was supplemented with animal protein of diverse origin. In the Krio language of Sierra Leone, a stew for rice is called *plasas*, a contraction of palaver sauce, so called because all the ingredients are shouting with one another to be heard. I must have eaten cassava leaf on rice almost every day for two years; for one of those years our neighbor, Mama Konie, sent the delicious food over right after school. Occasionally, we had boiled cassava root or, as a special treat, a fermented doughlike food called fufu. Fufu was most often accompanied with okra stew, a close cousin of Louisiana gumbo. Everyone laughed about how a fufu meal demanded a nap for dessert. At one bus stop on the main road to Freetown, the capital, hawkers sold fried fish served on flat tortilla-like bread made from cassava root flour.

My most recent teaching position has been at the Singapore American School. When I first moved to Singapore, I was surprised at seeing cassava growing wild along highways, in abandoned gardens, at the edge of the forest reserves. One Thanksgiving while I was marooned by floods in a

settlement of original people on the edge of one of the last great expanses of Malayan rainforest where tiger, rhinoceros, and elephant still roam, we ate boiled cassava root and mousedeer. Half a world away from its original home in the neotropics, cassava, manioc, tapioca, yuca, ubi kayu was being consumed at the edge of the world's oldest virgin rainforest. How had it gotten there? How had it become an indigenous food in Africa? Who were the dispersers, the propagators?

Much of the original forest in Malaysia has been replaced by trees from other lands--the oil palm from West Africa and the para rubber from Brazil. When I ask my students how they have come to be in Singapore, they usually answer because of their parents' jobs. If I ask why the jobs are in Singapore and continue pressing why (becoming the penultimate bore), we end up at the turn of the fourteenth century, when the products of the Malay archipelago, the cloves and the nutmeg and mace, were the fuel of the world's economy. I put forth to my students that they are in Singapore, at the American School, ultimately because of plants, because of the tremendous desire in Europe for the tropical products of the Indies. When Columbus set sail, the world was changed forever. Sugar came to the Caribbean; its original home had been New Guinea. Africans followed through several centuries of the horror of slavery. The economies of Europe fattened as slave labor and sugar both changed the human diet and, in a sense, financed the Industrial Revolution. Interestingly, American tapioca, manioc, cassava became established in the very regions of West and Central Africa where slaves were taken.

What a strange notion to propose to middle schoolers, that their lives are intimately intertwined with the lives of plants! While they may have been subjected to a premature and didactic vocabulary of photosynthesis, few are foolishly susceptible to the scientific magic that plants grow out of thin air. "Plants are boring," many will say. How can students be roused to consider the coupling of human life and the vegetable kingdom? One way is through taste; we will come to that. Another is the bizarre, and we have tried plants that lure and digest insects, and plants that wilt upon touching, and flowers that borrow a wasp's mating instincts to deliver pollen. And in addition to proposing that plants are responsible for the presence of my students in Singapore, I push the view past the comfortable chauvinism of human superiority and suggest that we humans have been domesticated by plants. Our role in the fabric of life is to serve the plants that have chosen us, our cultivars, to protect and propagate them. The ecological transformations wrought by humans on both global and local scales have many times been connected to the dispersal and enlargement of range of some plant. Consider the biological magnitude of the claim that no human culture that has ever tried sucrose has ever given it up. How coincidental is it, for example, that the invention of the motorcar and the expansion of Brazilian rubber to the old world came at the same time? Cars need tires to go on roads which go deeper into the forests which are cleared to grow rubber to make tires to go on cars that go on roads deeper into the forests which are cleared and so on. How do we know, I ask my students, that our various addictions to foods and drinks and drugs, of course, but also to products like rubber with its roads and insulated wires and even to paper are not part of the master design of plants to exploit us humans? We laugh at the hardworking ants carrying seeds or the busy bees pollinating, but are we any different? It is very interesting and perhaps very important for middle schoolers to play with points of view. Some students are disturbed by the prospect that humans may not be masters of the web of existence. Other students are, however, invigorated by new ways of looking at the world and by new navigations of one's place in it.

My exemplary plant, Manihot esculenta, (tapioca, cassava, manioc, yuca, ubi kayu) has another characteristic that makes it a perfect specimen for helping botanical novices become infatuated with the symbiosis of plant and human. A favored technique is to begin with a seemingly innocuous question that soon provokes with a new perspective or an unexpected phenomenon. We may take "wild" cuttings from the tapioca plants during some expedition. Or I may bring in a bundle of cuttings and ask the students, "What are these?" Predictably, they answer, "Sticks." When I continue, "What do you think will happen if we plant these in the soil or place them in jars of water?" they reply, "Nothing," or "Die," or "Rot," or sometimes, "Grow." It is a perfect time to think about growth, how it occurs, what it means. I ask students to draw pictures of what they think growth may be like, what will indicate whether or not growth has taken place. A multitude of ideas about growth usually appears including the strong opinion that sticks do not grow. We have our discussion on a Thursday or Friday, and students plant cuttings after talk, writing and drawing about what they expect. While not exactly a fabled beanstalk, a tapioca cutting will show distinct and noticeable changes by Monday. Of course, there is some variation in the rate and extent of growth. But enough cuttings show changes that students are surprised or intrigued or puzzled.

For those that expect nothing, the surprise is compelling. For those that expect growth, few predict the particular changes that occur. Tapioca's rapid growth matches the impatient attention span of beginning students; its hardiness and its ability to grow even in poor soil make it an ideal specimen for the exploration of vegetative propagation. It is very likely that the qualities which make it ideal for middle school plant study are some of the same ones that contributed to its remarkable expansion throughout the tropics as an important crop.

The very appearance of growth closely following the exploratory question, "What do you think will happen?" renews the general discussion of growth in the specific context of the tapioca cuttings. With little hesitation students pose new questions. Many students have asked, for example, "Does it make a difference if the cuttings are placed upside down?" or "Will cuttings do better from the top or the bottom of the mother plant?" Other typical questions are:

How fast do the leaves grow?
How many leaf sprouts will grow?
What is the average leaf size?
Does the size of the cutting matter?
How does the length of the original cutting change??
Which cuttings will grow leaves first?
Which leaf scars will grow leaves first?
Do leaves always come from the same places on the cuttings?
Is the number or percentage of new sprouts affected by the position of the cutting on the original plant?
How do the places where new roots appear compare to the places where new leaves appear?

What is interesting in the new questions is that they are sometimes experimental in the sense of suggesting a relationship between variables. The variables are often posed as performance measures especially focused on a limit. Accepting this view of students' experimental questions makes it possible to begin the process of inventing and defining observables. The process can be likened to deciding how a game is to be scored. Students use words like *grow, matter, fast* easily but rarely consider the problem of one cutting with one big leaf and one cutting with many little leaves. Which should be considered the faster growing? The discussion of questions and observables leads to more precisely defined variables. From such a discussion a set of variables is selected by all the participating classes and a general experimental design is chosen. Typical variables are:

Names of the group members.
Period (related to time of day when planting occurs and observations made).
Day of observation.
Top or bottom of mother plant.
Planted right side up or upside down.
Total leaf length (the length of all the leaves on a cutting greater than one centimeter measured from the
Number of leaves which are greater than one centimeter in length.
Cutting length.
Cutting diameter .
Number of leaf scars.
Sprouting sequence or sprouting order based on position of sprouts.
Position of first sprout.
Position of second sprout.
Position of third sprout.
Position of fourth sprout.

The variable of total leaf length turns out to be a useful growth measure in that it is relatively easy to obtain and does seem to correspond to ideas students have about growth. Although it totals only one dimension of leaf growth, total leaf length represents the length "score" of all the leaves above a minimum as if they were laid out end to end. Total leaf length can be demonstrated concretely with a spare set of

leaves obtained from an extra cutting. The large number of other variables gives each group an opportunity to make a number of observations and measurements.

In a set of experiments done in a recent year each group had four cuttings. Two were from the top of the mother plant and two were from the bottom. One top was planted right side up and one upside down. The bottoms were treated like the tops. My set of seventh grade classes considered one hundred twenty cuttings in total, a manageable and perhaps respectable sample size. The large number of observations made on each cutting allowed for a variety of experimental questions to be pursued. Most questions fell into investigations of growth rates or growth sequences. Credit was tied to sample size considered in the final analysis. The most credit was gained from examining the entire set of cuttings. Middle credit was based only on the set from a particular class. Minimum credit depended on describing the growth changes in one's own four cuttings. All the results were compiled in a database. Each group was responsible for entering data after every observation period. The students were skilled enough to enter the results and with some class time devoted to the application of ordering and selecting functions, students were able to analyze particular configurations of data.

Student products were experimental reports written in a scientific format. These reports went through at least one revision and were evaluated on the basis of analysis and sample size. This part of the tapioca project represented an emphasis on experimentation, including the invention and negotiation of observables. The design of the experiments evolved from initial questions like those cited above to a more focused set as listed below:

> Which will show the greater increase in total leaf length--the right side up bottom cuttings or the right side up tops?
>
> When four different cuttings from a tapioca plant--right side up top, right side up bottom, upside down top, and upside down bottom--are placed in soil, which will show the most leaf growth, the next most, and so on?
>
> What is the difference of total leaf length, sprouting, and cutting length of tapioca which was planted right side up and upside down?
>
> How does taking stems from tapioca plants and placing them right side up (bottoms and tops) and upside down (bottoms and tops) affect the sequence of budding from the leaf scars on the stems?
>
> Does the right side up or the upside down grow faster? Then which grows faster, the top pieces or the bottom pieces? What combination would grow the best?
>
> What is the difference between the number of buds and leaves that sprouted from tapioca stems planted right side up compared to those planted upside down?

The reports were based on three weeks of growth. While longer periods of observation are warranted scientifically, factors of interest and enthusiasm play a role in decisions about closure and timing. During the experimental phase, students conducted other levels of investigation. A practical reason for the other activities was that the actual observations only took a small portion of the class time over the three week period of growth. More importantly, the experiment only provided a narrow way of relating to the plant. It is quite possible to make the observations mechanically and to analyze the growth patterns on the basis of numerical patterns without ever considering the wonder of plant growth. My own interaction with the plant had other dimensions besides the experimental and I wanted to provoke a fuller engagement with the plant.

The actual effort of preparing the plant material and the soil added important elements to the activity. Many of my students had had little experience gardening or farming. The opportunity to wield shovels and chunkels (an Asian hoe-like shovel) and to dig and shape planting beds was novel and interesting for many students. (One year my students dug a pond for our ecology garden; the manual labor was the highlight for some!) I enjoyed giving directions for making heaps while watching seventh

graders dig holes. From the way many middle schoolers take to the physical manipulation of materials like soil and water, I often wonder if our children are not deprived of some important basic experiences with the transformations of shape and quantity in the material world. There are students who find exploration of a garden space with a spade as compelling as toying with the latest computer simulation.

An important component to the plant project was the creation of life-sized models of a significant portion of the adult tapioca plant. Models have a variety of functions in science. Life-sized models require close looking at shapes, sizes, and the arrangement of parts. Such models are like three-dimensional drawings, requiring the creators to engage in a replication of the plant's architecture. Interestingly, nearly every group managed to make leaves whose sizes and shapes fell within normal limits. However, only two models out of thirty from the most recent group conducting the model assignment duplicated the correct phyllotaxy. I had shown students how to decipher the arrangement of leaves on the stem. For the tapioca, if one counts leaves between pairs that are exactly above and below one another, there are five, not counting the starting leaf of the pair. If a string were tied to the starting leaf and wrapped around the stem going from leaf to leaf, it would take two wraps to get to the next one directly above the starting leaf. The numbers two and five are from the Fibonacci series which appears in a variety of situations in the natural world, often where growth is involved. If one views a stem of tapioca end on with a string wrapped from leaf to leaf, a five-pointed star can be imagined. Some varieties of tapioca exhibit a five-sided stem. The leaves grow from the "vertices" of the pentagon. Students are fascinated that such a pattern hides in the seemingly messy luxuriance of plant growth, yet the salience and simplicity of such a pattern can escape the notice of students even when they construct the models.

It is one thing for students to become surprised at the extent of unexpected growth or the residence of some pattern beneath one's normal notice and another to feel the full impact of plants in history, of plants in our lives. For many students the most exciting part of the project on the tapioca/cassava/manioc was research into the role of the plant in human culture and history. Resources of all sorts were employed from the novels of Chinua Achebe (Nigeria) and Jorge Amado (Brazil, esp. Bahia) to interviews with parents, relatives, neighbors, market vendors, security guards, workers and maids. Often when a Singaporean is asked about tapioca, he or she will giggle as if touched by a bittersweet nostalgia. Older Singaporeans respond that tapioca is "Occupation Food" because the Japanese took all the rice during World War Two. Apparently, every backyard, right of way, and abandoned lot was planted with the tapioca. These patches now grow wild in many locations--the source for some of our specimens. Small garden plots near the high density housing projects still do grow the plant for home consumption. In searching out firsthand accounts of human "interaction" with the plant, students naturally acquired recipes. They often became curious about the preparation and taste. While the reports on the propagation experiments had been done individually, the work on the plant's place in human culture and history was presented by each group to their respective class. Many of the presentations were punctuated by food. The international character of the school produced a diverse menu of tapioca based consumables--chips from Indonesia, leaves from West Africa and the Philippines, pudding like desserts from the U.S., and other desserts and cakes from Malaysia, Singapore, and Thailand. Manioc is a staple in the Brazilian diet and some students read accounts of the traditional Amazonian manioc beer that is often chewed first to change the starch into fermentable sugars. Some students searched the local wet markets where the plant diversity is staggering to those of use who rarely consider what appears in the modern supermarket.

It is unfortunate that the examples of students' projects on the plant's role in human life got lost at sea. They never arrived from my mailing from Singapore. I recently used the Internet to try to solicit some evidence of the wealth and diversity of human's relationship with tapioca. Just from queries to newsgroups, I received recipes from Latin America, the Caribbean, West Africa, India, Malaysia, and Indonesia. Often a longing nostalgia would show through the text, as people wistfully recalled grandmother recipes and quaint names. A Sierra Leonean lamenting the tragedy of the civil strife there called for stories from fellow citizens about the sweetness of life before the conflict. Several responded mentioning specifically the taste of fresh cassava leaves.

I recently took a group of prospective science teachers on a field trip to several supermarkets in Illinois. We were contemplating the biodiversity in evidence just in the produce sections and speculating on how the plant products in the stores could be used to bring students into a deeper appreciation of the fabric of life on earth. Every specimen had a story of propagation and dispersal and of symbiosis with

humans as fascinating as that of the cassava. Every culture has special relationships with plants as part of their history from the Irish and the Andean potato to the mid-Western farmer and the Asian soybean to the African American and cotton and rice and sugar. Every culture has a cuisine which fuels pride, identity, and nostalgia. Because of the fundamental and ubiquitous role of plants in human life, it is easy to relegate them to the mundane and ordinary and boring. It is, however, much more exciting and is perhaps much more dutiful for us science teachers and our students to celebrate the wonder of plants in our history and our lives.

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A Sampling of E-Mail correspondence on tapioca/cassava/manioc and related topics:

My wife is from El Salvador and makes a delightful and VERY tasty
old dish that I cannot spell. Definitely old-style home cookin'.

Yucca Conchicherones (sp?)
Cut yucca into large chunks and boil for a few hours until
detoxifed. Add a tablespoon or so of olive oil & some basil for taste.
Cut pork into pieces the size of M&M's.
Cut the cooked yucca up further into pieces about 3/4" to 1" across.
Fry both together until pork is done.
Put lots of curdido (sp?) and chili (salsa) on it and start eatin'.

Ken Young
Well fed in San Jose

Richard--
In regard to your post to rec.food.historic about manioc: My sister recently returned from a two year stay in Gabon, where manioc is the staple of the diet. I know that she did learn a number of ways to prepare it, which I can question her about if you like.

I have heard that the root, commonly served like mucillagenous mashed potatoes, while filling, has less nutritional content than potatoes or rice. (and to my mind is far less tasty than either.)

I can also tell you that my sister's favorite local dish was one made with Feuille de Manioc (sp? anyway... the leaves). Other than the leaves, the dish includes hot peppers, peanut butter and tinned sardines.

Here is a Malaysian "recipe" for yucca root:

Remove the bark from the root then grate the root finely. Squeeze out some of the starch then add sugar and about half the amount of coconut(e.g. 50g of coconut for 100g of yucca). You can use dessicated coconut as sold for baking purposes. Add sugar and spread the mixture on a pan that will give at least 1" depth. Place it in a steamer and cook until the mixture turns translucent. (Optional: place it in the oven after steaming to give it a nice golden colour on the surface). Allow to cool and cut into squares.
Yucca have a delicate flavour that is easily overwhelmed by too much sugar.

Have fun!!

Leong

I am pleased to tell you that in Sierra Leone
(and possibly some other parts of W. Africa) we prepare one of the most wicked palm oil stews with the LEAVES of the cassava plant. Originally seen as somthing of a poor mans dish (my late Aunt would never eat it, claiming it was food for goats) it is now a regular dish in the SL diet.

I am not an expert on its preparation but it is cooked according to the general recipe for a palm oil stew. We make palm oil stews from various tropical leaves including those of sweet potato (I. batata), greens (calaloo;Amaranth), kren-kre (dont know the name but it is slimy and the Koreans sell it in their shops in USA), Okra (fruit), and sorrel (fruit). There are some others (including a very bitter leaf) but as I have no names you will ahave to find a W.African botanist. The basic procedure is to boil a broth of beef, smoked fish or beef etc intestines and other interesting parts of the animal with onions and peppers. The leaf is added to this at an early stage and about 3/4 of the way through, palm oil is added to give a characteristic colour and taste to the stew.

Preparation of the cassava leaves is more complicated than some of the others and this is almost certainly for detoxification as well as making the leaves chewable! after cutting the leaves up (discarding the stalks) the leaves are pounded with a mortar and pestle and the juice is squeezed out. the chaffy leaf is then added to the stew. Typically, we tended to eat Cassava leaf stew with rice which is a little different from the others which are preferred eaten with fufu which is what we use the tuber for....

Eluem

The most common way we prepare kasava is to cut them into small pieces (1 inch?) and boil them in water (with little bit of salt) for about half an hour to make them tender enough...and eat with spicy curry..(kasava + fish curry is a well known combibation in our place)... as the main dish (equivlant to pototo in the western world)

Another method is to cut kasava into 1 inch sections, dry it in the sun or above the oven for days..and store..when there is aparty etc.. take some of the dry kasava pieces and deep fry them..to make a nice snake..that is alll I know..

..bye
ravi

hi, read your message in two newsgroups,and saw one answer that tells your that tapioca is not grown in india.
i have a coworker from kerala, and he explained me in detail how they cook tapioca, and not only that, he explained me how the plant looks,and how they used to reproduce it at his home in kochin.
as i am originally from argentina, and with 40 years in the usa, i used to eat tapioca quite a bit.honestly i never knew were it comes from,etc.
another funny thing is that i just came back from a business trip to indonesia and singapore, and a friend or mine, who has a filipino maid, offered me tapioca,as they eat in the phillippines. it was boiled until soft,and added a sweet cream, plus shredded cocoanut.
in the states (i do not where you are located)it is offered in a granular form in the supermarkets, and i eat it once in a while at a restaurant where he eat regularly.

: I remember the people from a different village -of Garifunas descent-
: would come to town selling 'balmy'. I think this was made my grinding the
: cassava and rinsing out all the starch/milk, then taking jus the fiber
: and making it into a loaf about .25 inch thick. This was then dried in the
: sun and used to dip into the gravy of your food and eaten along with your
: meal. It thus took on the flavor of whatever it was accompanying.

That sounds a lot like the "casabe" that the Taino indians used to eat in Cuba, Hispaniola, Puerto Rico, etc. when the Spanish arrived in the 1490's. You can find casabe (now packed in plastic bags) in stores throughout those islands as well as in Miami.

Cubans eat yuca mostly boiled and marinated in "mojito" made from sour oranges, garlic and salt.

Left over yuca is often cut in sticks and fried to a golden brown..delicious!

Of course, at least here in Miami, you can buy "yuca chips" everywhere.

Best regards,

Ignacio Emilio Fiterre

"Bammy" is one of the culinary legacies left by the Arawaks Indians.
You may remember that the Arawaks (or Tainos) came from South America.
There are still large numbers of them living in Guyana and Suriname.

If you grow up rural Jamaica, you may remember one of the games that kids played in which they would pile on one poor unfortunate soul while chanting "Cissada (cassava) want more weight". This was referring to the pressing out of the cassava juice in the "bammy-making" process.

In the Smithsonian Natural History museum in Washington D.C., there is a example of the long tube that was used by the Arawak to squeeze the juice out of the cassava.

The Guyanese also have a thinner round cassava bread that is similar to our Jamaican "bammy bread". It is so thin that you can roll it like a roti. By the way, the best "Bammy and Fish" can be had at a little corner on the border of my parish, St. Elizabeth, and Westmoreland. So when you are next in Ja and heading west to Negril, take a right turn at the sign that says Brompton and you can't miss seeing the ladies with the big pudding pans at "Baada" (patois for Border, to continue another thread :-)

Arlene Laing

Cassava varieties fall into two types: 1) processing -- usually contains high starch and hydrocyanic acid as in cyanide as in poison; and 2) table -- minimal or negligible levels of cyanide. Cooking usually destroys the cyanide but the processing types are generally unfit for human consumption. For instance, a town in the Philippines once had a cassava poisoning scare when some consumers went down with food poisoning after eating cassava purchased from a local market. Upon further investigation, it turned out the the cassava were stolen from a farm that supplied cassava to a starch mill.

Hope this will clarify some.

Arthur

Yes, tapioca/cassava/manioc/manihot/ubi kayu contains toxic substances and cyanide does ring a bell. In SIngapore, there are 2 varieties commonly grown (or at least there were until recently). The type with the red leaf stalk contains less cyanide but takes longer to grow. The type with the light green leaf stalk is quite toxic and is used mainly for makinf starch, it needs special preparation before eating if it is to be eaten, it also grows into a tree. The leaves can be used as a vegetable, but they contain toxic substances so other vegetables are preferable.

Since there is a cassava/manioc/tapioca/yuca/ubi kayu thread i thought i'd start a sweet potatoe one. Anyone want to talk about sweet potatos? I have seen 2 types growing in singapore, one has heart-shaped leaves and the other one has maple-like leaves, the heart-shaped leaves variety has orange potatos and tastes sweeter and is more nutritious than the maple-leave type. There is also a purple-skinned variety sold in Yaohan supermarkets, imported from Japan, that type is rather tasteless. Both the leaves and roots are edible, and unlike tapioca, they do not contain cyanide and they have more vitamins. Propagation is by root or satem cuttings, and the crop grows fast, you can harvest them just a few months after planting.

Here in the UK, they seem to have a very limited variety of fruits and vegetables. I am missing some of those you get in the tropics.

In my hometown (Malinao, Aklan, Philippines) we have two kinds of cassava - balingka and balinghoy. The balingka variety has a whiter flesh and is the one usually eaten - the best of course is just boiling the peeled root and serving it hot with butter or margarine (there are also a variety of heavenly-tasting cassava cakes - bibingka). The balinghoy variety is more yellowish in color, grows in the wild and has probably more cyanide content because it is not eaten as much as balingka.

Ken

Here in South London I can buy limited selections of African food in Lewisham, Peckham & Deptford markets (seeing as I read this on soc.culture.african). The Nigerians & Ugandans I know round here seem to prefer Deptford. Brixton has a good reputation but I rarely get there. The street markets are often better than the shops. They all have more Caribbean food than African.

I went to a party the other day at the home of some friends from Sierra Leone, and they had a good selection of very African food brought by friends from all over London, so I suppose you have to know where to go.

Asian stuff is easier to come by. There are a number of good-quality if expensive shops just north of Leicester Square in Soho. There are some shops just 100 yards from me in Loampit Hill (Lewisham) run by Tamils from Sri Lanka which have a lot of stuff I don't recognise. (although it's often of poor quality) I bought some palm oil there on Saturday to try & cook myself some rice & fish like I had at the party I mentioned but it came out wrong (pleasant, but nothing like the way the Sierra Leonians made it!).
Any recipes gratefuly received!

Some of the supermarkets round here are doing better than they used to, but not brilliantly. Our local Tesco's has had a number of tropical fruits recently including cherimoyas, papaya (yuck), passion fruit (yum), starfruit & 2 kinds of mangoes (not the fibrous green ones I like best though). Even had cane once, although it was expensive,

Taro seems similar to something we call amadumbe (Zulu; ama- is a plural prefix) here, except amadumbe are less slimy. (For the uninitiated, this is a greyish, hairy tuber, related to the arum lilly.)

In Southern Africa, a lot of staples are exotic imports - maize, most vegetables, wheat flour products, vegetable oils. I believe sorghum is local. There are 1 or 2 other indigenous fruits and vegetables I can think of. Given that
* the fossil record shows this to be one of the oldest homes of humanity
* medical evidence is against the proposition that humans are adapted to be pure carnivores (they get scurvey)

there ought to be a wider range of interesting edible plants (vegetables,

fruit, nuts, grain) in this part of the world. Has anyone put any effort into identifying such plants?

I have trimmed the newsgroups list since this is more of African interest.
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Richard,

I'm not sure you want to try eating cassava although there are several other tubers that can be quite good. I'm going to give you a few recipes that my family uses.

Cassava:
My aunt says that the best way to deal with this tuber is to harvest it and then allow it to sit for a few months in a DRY place before using it. Another thing you might want to try is rubbing salt and something really sour on the slices and setting them aside for some time and squeezing them out before seasoning and cooking them. Try lime juice or tamarind extract(which you can get in any Indian store.) However, it is best to use gloves when you work with cassava and to taste the dish VERY cautiously as it can make your mouth and skin itch terribly.

Make fairly thick slices. Season them with salt, paprika or cayenne pepper and sugar to taste. Set aside for about 3-4 minutes. Toss them in whole wheat flour and deep fry. This looks and tastes delicious. In fact you can do this with almost any vegetable.

Yam:
Out here in the U.S., especially in the South East, they call sweet potatoes yams but in India, one gets huge tubers that are called Elephant's Foot and really look like it. I'm sure you'll be able to find these in some Indian store - they call them "suran" in Hindi.

Cut the tuber into tiny cubes - an eighth of an inch is good. Sprinkle with salt and set aside for a few minutes. Heat some oil in a pan. Squeeze out the diced, seasoned vegetable and deep fry until golden brown and crisp. These can be stored in a jar as a crunchy snack or used to make a quick salad or a preserve.
Salad: Toss the fried yam with chopped onions, grated coconut, chopped green cayenne pepper(optional - if you want the flavor but can't deal with the spiciness, de-seed the pepper or just substitute bell pepper), coriander leaves and a pinch of salt. Add some lime juice and mix.
Preserve: Add cayenne pepper or paprika, turmeric powder, a pinch of asafetida and lime juice to the fried yam. Pack into a jar and use in a couple of days.

Both of these recipes are good served in reasonably small quantities with rice and mulligatawny soup and some stir-fried vegetables.

I'm not going to write too many more recipes. I'd like you to

write and tell me if you want any more and what you think of these. We use a whole lot of different tubers in India and every region of the country has different ways of preparing them. Coming, as I do from Bombay, I've picked up quite a few. Anyway my name is Lea Wise

It proves a formidable task to determine exactly which foodstuffs are truly indigenous to a region. With the exception of very isolated places (such as the Americas), it seems there has always been a lot of flow of technology all over the world with regards to agriculture.

That being said, I direct you to the almighty power of the banana. In the central part of Uganda (the regions of Buganda and Busoga), they cultivate over thirty varieties of bananas. Some are staple meal to be eaten with soups and greens at major meals - much as one would eat sorgum or millet (this type is called matooke). Others, though, are used for a wide variety of purposes from sweet eating bananas to juice making bananas - even beer brewing bananas! Because of the mild and lush climate of this area, the banana has come to be highly integrated into the society. Banana leaf fiber is still used extensively to make mats, baskets, and other utilitarian items. Traditionally, they even used banana tree stalks as the frame for their loose note xylophones (its work quite well, seeing as they are really just big bags of water.

So, even though the banana is not "indigenous" to this area (I think it originally comes from around Indonesia or perhaps S. America), it has been coopted so thoroughly that I doubt there is anyone in the world that knows as much about the plant as the Baganda.

Peace,
Wade

Thanks for your response.....I've been developing a fusion Brazilian burrito style sandwich modelled along the lines of Fejioada Completa. As you may know, this popular Brazilian dish is often served with a side dish of manioc meal cooked like a porridge.

I'll let you know what I come up with.

David Lee
Seattle, WA