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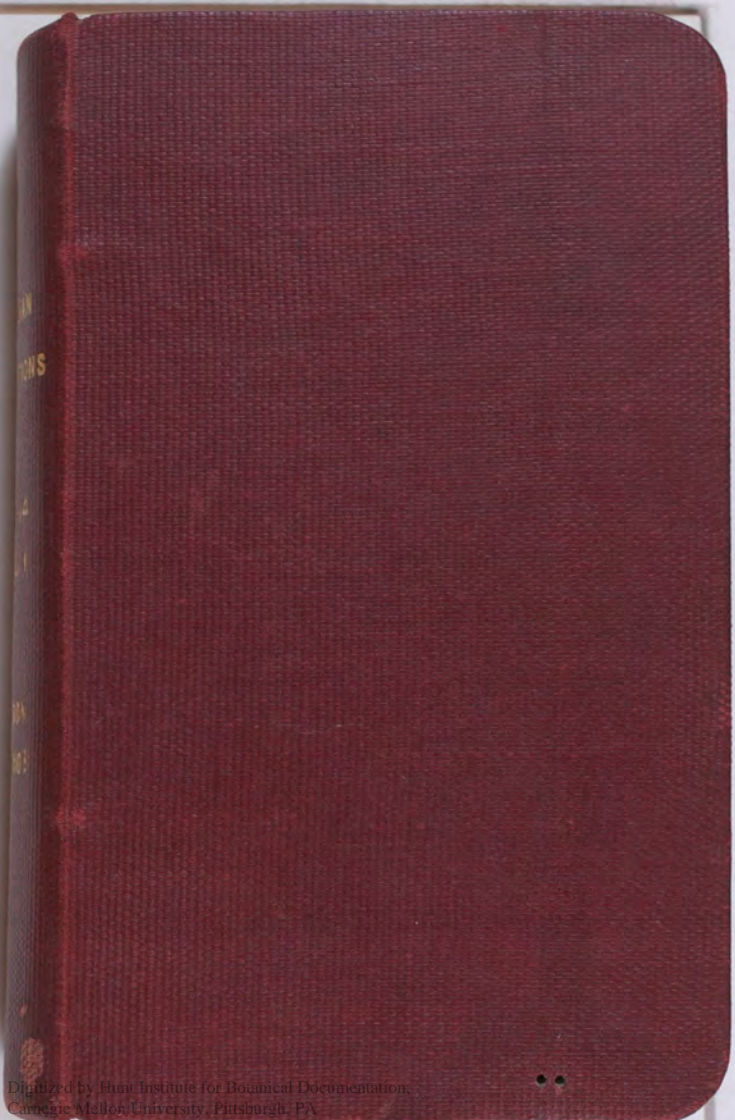
The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

BRAZILIAN
EXPLORATIONS

1913-14
VOL. I

WILSON
POPENOE



SONS

2

1

40792
268

See Isaac Hirsch of
Hirsch and Co.
New York
Has large rubber plantation
+ knows Bahia. Muller.

Mr. Henri Pittier wants
botanical material of
any Sapotaceae from Brazil

In cabling to office
use A.S.B. 6th edition, or
Postal or Western Union
International codes. Address
all cables "Phuribus Wash-
ington"; adding "Fairchild" when
for Mr. Fairchild

Mr. Stuntz wants mosses
from Brazil. Collect with
capsules where possible, &
put in envelope with
data re locality + date
on outside.

Form for
Mango Description.

General form
Cross section
Size
Weight
Measurements
Stem
insertion, length + character.
Base
Character.
Shoulders
Cavity: form, depth, breadth,
markings.
Apex.
form, nat. location, size.
Surface
texture, color.
Skin.
texture, thickness, adhesion.
Flesh
color, aroma, texture, juice.
Flavor
Quality.
Seed
form, size
Remarks
Characteristics of growth
+ Productiveness.

Flora do Brazil
por M. Pio Corrêa

Directoria General de
Estatística.

Rio Janeiro 1909
apud Ministerio da Agricultura

Historia das Plantas
Medicinaes e Utéis
do Brazil

por Theodor Peckolt e
Gustavo Peckolt

Rio de Janeiro
Laemmert e C. Editores
66 Rua do Ouvidor
1899

Leave New York	Oct 4
Ar. Barbados	" 10
" Bahia	18
" Rio de Janeiro	" 21

Brazil. Name

"The name is derived from that of the well known dye-wood, Caesalpinia brasiliensis, which formed the most valuable part of the first cargoes brought to Europe from the new land. This wood was called in Portuguese "pau brazil", on account of its resemblance to "bragas", "red hot cinder". In course of time, the "land of the Brazil wood" became "Brazil" - Domville-Figer in "A-S. of Brazil".

Stories of Antares

A.B.A. Travelers Checks

\$50 - # B898960 to
B898979

\$100 - # A290610 to
A290619

\$20. - C1804690 to
C1804699
C1804730 to
C1804739

Brown Shipley and Co's
Letter of Credit #/B102912

~~Dictionary~~
Carriers Lemon Squeezer
Eyeglasses
Sprengel

Scale up to 40 lbs
graduate 200 cc or larger
~~Hand lamp - light to~~

Get list of all Experimental
Stations in Brazil
and list of publications,
i.e., periodicals for
Mr. Swingle. Stations
Agronomical, Horticultural,
Zoological, etc.
Buy all books bearing
on Agriculture in Brazil.

F.R.D. wants photos of
hybrids of
Llama x Alpaca
Alpaca x Vicuna
Llama x Vicuna

Hummucke Zebu hybrids
So. American forms of
Zebu rays.

When photographing hybrids
get photos of both parents.

Pomegranates in N. Y.
 market shipped by
 St.uffer Exchange, Cal
 Dat emit bottles being
 put out by Hills Bros
 Co.
 met Gifford Pinchot

Oct 4 Shamel owes
 me \$20
~~Shamel owes me \$20~~
 I owe Shamel \$50 for
 lodging in N. Y.
 I owe Shamel \$7, Barbados
 112

Col Roosevelt says he
 wants to see more other
 tree grown to the improvement
 of our native fruits in
 American
 at Boying match
 In Demerara they
 speak of rainy season,
 dry season, + mango season

Oct 9 1913. When we opened
 one window at 7 am we
 looked out on St. Eustacia
 crisis. Its volcanic cone
 was beautiful. I took
 the glass & saw Dutch
 flag in building near
 Waters edge.

Julia Gordon (acid) Petrus
 best sponges in Trinidad
 of Mr. Geo. R. Alston. Have
 recently introduced recently
 the 13 legal ranges.

Oct 9 1913

Passed St. Eustacius at 7.15 a.m. Went in very close & saw Dutch flag flying. Passed on Frederick side. It is a small island with an old crater at one end the top now eroded away. Not much sign of new culture a few fields visible.

At 7.15 came alongside St. Kitts. Beautiful island surrounding a large volcanic cone, on the slopes of ash are many sugar fields, & sugar works. Clouds hanging around the peak. Many coconuts scattered thru the sugar cane fields. The island is demerol green and so perfectly beautiful.

small chard near shore. We are probably $\frac{1}{2}$ - $\frac{3}{4}$ mile from shore and can see everything very plainly. I am charmed by the beauty of the island. It is enchanting. A large promontory near the water is crowned by an old fort, as this morning high I can see every detail of it plainly. The view from it must be beautiful. I think it better the most beautiful island I have ever seen. How I would like to get ashore. Bunch of monkey full, who stands up by itself near the shore, the land rises away rapidly to the central peak now hidden on the air spitting clouds. Beyond monkey hill we pass more sugar fields & more

12
Palma. It is raining on a
small part of the
island, but the rest
it is clear. St. Eustacia
is not more than 500
yds, & runs majes-
tically out of the sea
We are running into the
spray of the water & in
light. The air here on
the water is balmy but
invigorating. The island
is all rocky fields, the
sides of the hills, the
fields not ending or quite
to pass up the slopes.
There are some deep
canyons coming down to
the sea & the natural
vegetation is light green
& not apparently very
large. At 8:15 we are
off the leeward side of
this island, & out of
the rain. The clouds
are shifting constantly.

13
At 9.10 a.m. we were
alongside Nevis. It is
a small island, with
a central volcano
peak, around which the
clouds were hanging
superbly beautiful. The
town lay right at its foot.
We are close in shore
& can see everything
plainly. It is very sim-
ilar to St. Kitts, but
less cultivated. The
clouds hang around the
peak, shifting constantly.
It is a beautiful day, the
air fresh & balmy, could not
be finer. The water is
a beautiful color. The
town looks substantial, as
did the one on St. Kitts.
How different are the
towns here from those East!
The islands look attrac-
tive in every way. Wish
I could get ashore.

14 Mango, Oct 9, 1935

Geo. R. Alston Port of Spain, Trinidad. got 300 fruits from garden mango last yr. 3rd crop expected to ship mangoes next yr. Juice & select sweet mangoes. Garden acid. In 3 best of Trinidad says there are no fossils to put a date in case of one but he knows, wh has delight. Season gone to August.

Alston is strong for spelling Coconuts. Says Chambers Eric gives this as correct word & it is becoming general in England now. Niggers in Trinidad use not to burn trees during full moon, as trees will bleed, the moon having effect of drawing sap up in the tree.

15- Oct 9. 10 a. m. White running between Nevis & Montserrat, near Slighty, Antigua, but at distance.

10.30 we passed Redonda, a small rock sticking out of the sea, about midway between Nevis & Montserrat. It looks like a very old volcanic cone. I am surprised at the proximity of the Islands, I thought they were farther apart.

at 11.30 we are off Montserrat, somewhat further than Nevis. I think I can make out some green with the naked eye, and they show up well with the telescope. We are very close to land. Clouds hang around the mountain and obscure the highest peaks. The whole island is a beautiful green. Not so many Coconuts as at St Kitts.

At 10.45 we were off Plymouth, & I looked out with the glass & could see the people in their streets very plainly. No e. palm tree place with shrubs like I have seen in the photos of the West Indies. Lots of *Coccoloba* around the town. A beautiful place.

Further down the island we could make out many lime groves on the mountainside. The slopes come right down to the water, and there is no level land. I think this is a prettier island than St. Kitts. It is not large. Water. The lower end of the island runs along the water, and runs up to a peak now buried in the clouds. Can see surf breaking on the

According to ship's observations. Water was 80°F at our same temperature, latitude 16° 27' at noon

2.15 Off Guadalupe

This island seems to be more heavily wooded than the others yet seen. One of the men on board says Martinguel looks just like this. We have just passed a small village near the N. end of the island with a fine looking church in it. Houses look different from those in other islands; there are more red roofs. Island is ^{more} verdant than the others seen. Raining on about half the island.

Lower down the island we passed a beautiful valley filled with *Agave* palm. This island is truly tropical in appearance, & a beauty. At 3.15 we passed Bassa here, the prettiest town

18
I have seen down here
It is ~~features~~ in appearance to get dark and hard to
from the English house & seems to me to have a very
frisky appearance. It has
a fine large port & a church
with little spire. Very solid
structurally built, & made
of stone & has scattered
at a beautiful place.
Many cultivated fields on
the shore here about the
main camp lying around
highest peaks. Looking
back on Base Terra it
was the prettiest scene
ever set eyes on. The island
ends with 3 high peaks, around
the base of which are several
small plantations. A mountain
is visible in the distance,
& nearer are Les Saintes

5. 20 p.m. we are
at Rodonca, near
St. John's. It looks a
great deal like Guad-

29
the clouds, It is beginning
to get dark and hard to
see the details of the
islands, but it is fully
as beautiful as the
others.
5. 45 we are off the center
of the island. The central
peak is hidden in clouds.
The island is the equal
of Guadalupe in natural
beauty, but so far has not
as much cultivation. It
is very rugged.

Barbados, Oct. 10. W.

Leaving Bridgetown we go by Senty to St. John. View from here about the most beautiful scene ever seen looking down over the water, beautiful color, the magnificent landscape spoke with such beauty.

Coming up here many women going to market with baskets of fruit on their heads. Beautiful scenery. Many night huts.

Go ashore on Truly. Also White Rose, Sylvia on leaving musicians come off. During my fruit etc.

Anona muricata fruit bought in Barbados Oct. 10, 1913. Price 2d.
Length $9\frac{1}{2}$ ins., circumference 15 inches. Form oblong conical to cylindrical. Flattened at base & rounded or broadly pointed at apex. Color dull light green. Surface covered with short soft spines about $\frac{1}{8}$ - $\frac{1}{2}$ inch long. Skin soft & easily broken. Flesh soft & cottony, acid, with slightly flavor somewhat resembling May apple. Weighs about 2 lbs. Flavor peculiar. This was the finest specimen of *Anona muricata* I have ever seen, and the best one I have tasted.

Oct 16 1913. We came in sight of land today at about 11 a.m. Then when we got nearer the coast until evening. When we first saw land we were about Natal, Brazil. The land is rather low & undulating, and heavily wooded. The hills are about 1000 feet high at most. Temperature of air at noon 80, water 78.

Oct 17 1913
 Lat 11° 11' S. Long 36° 8' W
 Speed 15.1 knots
 Air 83 Water 78

- Bahia Oct. 18, 1913 -
 At daybreak today we were in the Bahia de Todos os Santos, and anchored at about 6.30. As soon as we had finished breakfast we went ashore in boat "Lusitana" at 34000 each for round trip. Boatmen only spoke two or three words of English. Landed at Wharf and went to elevator, about 100 yards back from water front. For 100 reis we were carried up in an Otis machine to the Cidade Alto, the main part of the city. Here we land at one edge of the Praça, an open square about 200 yds across, surrounded by some of the best buildings in the city and serving as a terminus for all tram lines. We started in to find our way to the post office and after inquiring of a couple of people

we were shown to a walk to Caballo. We
 branch post office dry as a good sized orange
 old negro. We longed to go ahead of us and
 stamps and mailed out made straight for it.
 letters. We then tried to locate an auto or car
 extent, and lay on for hire, but found none on side and the trip
 and decided to go to by a bill about 100-150
 American Consulate. Perfect high. We went into
 we found a clerk who spoke and found the orange
 a little English, and having varying scabs, some
 to get an auto for us, most mature. Shamel got
 this were all in use by used at once several types
 Col Roosevelt's party and with which he is familiar
 was not sure just how in California. The trees
 soon he would be able appear rather unhealthy,
 to get me. We worked there being considerably
 to see some orange tree dead wood, and the leaves
 and got directions from sometimes showing signs
 for reaching Caballo by chlorosis. We also
 train. Taking the car saw evidence of gummosis
 marked Calcala we rode and found two scale
 these the district of small insects, one of which was
 shape and out into the Sarssetia alone. The latter
 suburbs. After a ride was not common, but
 of about 30 minutes smaller, elongated, light
 descended at Bana brown scale was very
 Ladere from which it common on some of

the trees, and the ants were very abundant around it. On a fruit taken in here at Bahia and eaten at table found brown rot, a spot about $\frac{1}{2}$ in. in diameter and evidently arising from a structure in the center of the decayed spot. We also found evidence of withering fungus, *Colletotrichum* and *glucosporoides*.

We spent about half an hour in this grove finding a number of trees bearing ripe oranges with seeds in them, evidently seedlings. There was a small hut in the grove occupied by some negroes. They sold us a few oranges and informed us that the owner of the grove was a

Senhor Orelho. Near the negro hut was a row of large pitanga bushes, some of them being in fruit. A jack fruit was also growing near the hut. On the way back to the ram way we met an old negro carrying a wicker basket containing about a dozen or 15 good sized oranges after some despatching we bought the fruit and basket for 2\$400.

As we were approaching the ship we were accompanied by an American and two Brazilians. The American informed us that one of the Brazilians, Dr. Mello Felho, Director of Agriculture had been appointed by the Secy. of Agriculture to meet us, and invite us to accompany him in his travels for a view of

the city, but when he got to the ship in the morning he found we had already gone ashore. He gave the most cordial welcome in the name of the government and assured us of their hearty cooperation in our work, placing himself & the information possessed by the Dept. of Agr. at our service. Shamuel expressed our appreciation and assurance of our desire to be of assistance to Brazil in any and every way possible. Sr. Manoel Filho said he would visit Rio for a member of the Dept. of Agr. there & meet us on arrival.

At Sea, between Bahia and Rio, Oct. 19, 1913.

An important incident occurred yesterday in which Mr. Shamuel played a part, and he has asked me to set down the most important facts here as he recounted them to Mr. Dorsell and me at the time. Mr. Shamuel was seated at a writing desk in the smoking room when Mr. A. G. Fontes of Rio came and seated himself at the opposite side of the desk. Mr. Shamuel noticed that Mr. Fontes seemed much agitated over something. Before long Mr. Fontes looked up and his eyes met Mr. Shamuel's. The two have become very intimate during the last few days of the voyage, and Mr. Fontes has expressed great interest in our

expedition, Mr. Shameless remarked to Mr. Fontes that he had just been obliged to see for the first time a Bahia manell orange tree in its native home for the first time, and went on to express his pleasure at receiving at Bahia and appreciation of the attitude of the people of Brazil toward our expedition. Mr. Fontes replied that he, on the other hand, had just suffered an insult which he could not forget, and went on to tell Mr. Shameless in a voice that portrayed his agitation and emotion, how Mr. Hager, secretary to Mr. Roosevelt, had told him that his chief recollection of Bahia was the posters of men whose backs were covered with ulcers and advertised a cure for syphilis.

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 Mr. Hager went on to say that the expedition tendered Col. Roosevelt by the people of Bahia had been a farce, - the soldiers could scarcely stay in their quarters back, there were not enough autos to go around, and he was hard put to find a seat. He went on to show the Brazilian name, saying it was one of the 16th power. Mr. Fontes took these remarks very much to heart, especially as they were offered him in the presence of a number of other people, and considered that he had suffered an unpardonable insult. He was writing two memoirs, one of which he was going to send to his friend the Chief of Police at Bahia and another to a friend at Rio, and getting that they be

given to the daily paper publishing these remarks of a member of Roosevelt party in his reception at Bahia.

Mr. Shamel saw that the publication of such remarks would inflame Brazilians against Col. Roosevelt and the American people in general and might seriously interfere with our enterprise. Inasmuch as we had come on the same boat as Col. Roosevelt and might be connected with his party, the minds of Bahians therefore attempted to dissuade Mr. Fortes from sending the message and finally persuaded him to modify them so as to credit the remarks to the Colonel's opponent and not give the impression that they came from the Col. himself.

Fortes and hastened on deck, where he informed Prof. W. M. Hays of the occurrence, and also Mr. G. K. Cherie, of the Roosevelt party. Mr. Cherie sincerely appreciated Mr. Shamel's action and told the Colonel of the matter. I later saw Col. Roosevelt, Mr. Cherie, and Mr. Fortes in earnest conversation, and understood the Colonel was able to persuade Mr. Fortes that the remarks were merely those of a high school boy, and not his own sentiments in the least, and Mr. Fortes did not send the telegram. In view of the extremely important effect the publication of such remarks, which would doubtless have been credited by some papers to Col. Roosevelt himself, might have

had on the attitude of
the Brazilian people, and
especially the Bahians
who would certainly have
taken it as a serious
insult after they had gone
to such pains to give
the Colonel a royal
welcome, I think it
extremely fortunate that
Mr. Shand happened to
be on hand just when he
did, and was sufficiently
intimate with Mr. Fontes
to be taken into his confi-
dence, as very few others
would have been. Mr.
Fontes is a Brazilian, and
Brazilians feel very deeply
any slighting remarks about
their country.

Federal Express
Rue Alameda

Oct. 19, 1913
423 miles from Rio
at 18 15" S Long. 38 50" W
air 74° water 75°

Castro de La Fayette
New Dicionario
Grafy-Portuguez
Portuguez-Grafy
Gouzier Treres
#1.80

Monroe Palace Wed
9.45 to meet Dr. Willis

American Embassy
30, Rue Carvalho
Montevideo

Bahia Tangerine
 form oblate, slightly taper-
 ing immediately around base



Tangerine from Bahia
 taken on S. J. Vandyck,
 Oct. 20, 1913. Skin yellowish
 green, mottled greenish yellow.
 Flesh deep orange color.
 Very juicy, flavor sweet
 and fairly good. 14 seeds
 developed.

\$1.08 = 3\$074

£1 = 15\$600

Palmitos

~~Juicabos~~ Palmitos

We ate a dish by the name in a restaurant in Rio. The waiter said it was young palm shoots as the name would indicate, but I doubt this: I seemed to me to be some sort of Caladium or allied plant, of which the inner shoots were taken and boiled with a sort of cream sauce. The flavor was somewhat smoky and very agreeable.



Orange eaten at Hotel International, Rio Janeiro
 Color bright orange greenish
 young stem greenish
 seeds 6 or 7. Flavor very
 sweet, good. Color of
 flesh deep orange
 Oct 21 1913

Rio Janeiro, Oct 22

In a restaurant today
ate some 'mamão com
creme', or papaya
with cream. The papaya
was cut in cubes and
rich cream and sugar
put over it. It was
being good indeed.

Large basket nest of
at nursery is *Gigantochloa*

Brunfelsia mexicana
shrub with blue & white fls.

Gardim Botânico 41

Palmeira Real =
Oreodera oleacea Mart.
muito empregado para
ornamentação de parques e
jardins. Antilhas

Rainfall at Rio
27.5 ins. per annum

Wether Palm bought
by D. João from Portugal
10.5 yrs old. 40 meters
high. All palms in
plant of this sp. are
descended from this plant
of name of Cuba. Planted
here in 1805.
Avenue of palms in Jardim
is 780 metres long
Car Aquas Terreas,
and Charge at Estação para
Carcovaço for Corcovado
peak

Dr Willis says in
Mauritius the leaves
are thrashed of the
mango trees with bamboo
poles, to induce fruit.
Brazilians knock the
leaves on 5. João Cap-
itella, 9 of June say
it must be done in
the day of open country
to see well to do it.

Rose in Jardim are
trees brought from India
probably about 100
years ago. None of them
yet have produced natives
yet.

Sajenda Bon Porto
Near Arica.

Close to Rio
has mango better than
Dr Willis has eaten
anywhere East

Dr Willis thinks reason
why of mangos does not
fruit may be "wet feet"
No. 139

Colest recorded temp-
erature for Rio is 53°.
Garden is 4 ft above
sea level.

Lowest Dr Willis has re-
corded is 59, yet lowest
reading in tropics the
moment the sun comes
up.

Dr Willis is thinning out
gardens to give vistas

Jardem Botânico

Rio Janeiro Oct 22 1913

The row of mango trees at Fazenda Bem Posta Willie believes to have been brought from India at the instigation of Dom João, always 100 yrs ago. Dr. Willis says they are seedlings, but the gardeners maintain that each tree in the row is of a different variety. The gardeners say the trees have never matured fruit; they bloom and set small fruits. (It may be possible that bore in their young days.) Other mangoes in the garden are in fruit at this time. Dr. W. thinks the failure due to "wet feet" but if it affects these trees it should affect the others in the same district.

N.B. Saw three trees on Nov. 3 & see there are some small green fruits on

Should investigate mangos grown at Bem Posta Eds. do Rio de Janeiro. Wh. Dr. Willis says they are finer than those he has eaten in

British Library

Rua Gonçalves Dias 20
Rio Janeiro

Botanic garden fairly common
Jornal de Agassiz

Rio Janeiro Oct. 23 1913

At this time the mangoes are just going out of bloom in most cases, the fruit from the first blossoms being about size of a walnut. I have seen a few trees whose fruit appeared to be half grown or more.

I examined some mango flowers from a tree near the hotel and found only one fertile stamen altho there were, in some cases, 2 others pretty well developed almost half the size of the fertile one, but with much shorter stalks

Chayote is called here Quechua. We ate it at Tamary, au beurre, and was excellent.

Argem

The above boiled, with the addition of salt, pepper and butter without the condiments it tasted a little sweet, but season it was very good.

There is a row of very large mango trees in grounds of Hotel Trujal
Rio de Janeiro

Put Mate leaves
in cup, add 2-3
spoons sugar, then
take 2 live char-
coals and put in
cup, and after they
have burned for 5
mins, then add
hot water

Recipe for preparing
Mate given me by
Chaffin in Tyrola trip

Mara
Delichotia Patagonica

Palmito, from Metherohn

Soap
Seales
Charcoal
Sodium Hyposulfite
Alum Chloride

163 Rio Branco
fruit store

Get map of Bahia
white vest

Cleaning Seeds.

Oct. 24 We had a quantity of Jaboticaba seeds to clean this morning, and found they could not be cleaned with a knife or in water. Mr. Dorsett suggested rubbing them in sand, which we did, and found it very successful. The sand showed not of course. This method would doubtless work equally well with seeds of all sorts of Eugenia, Lonicera, and other where there is a soft watery pulp adhering to the seeds.

Jaboticaba
Rio Janeiro, Oct 24 1913

Silva Bastos says Jaboticaba is a tupi word, and gives Jaboticaba as the correct spelling of it.

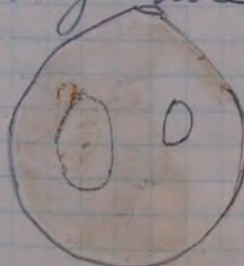
Fruits bought in the public market on Oct. 24, at 2\$500 for 400 fruits, about a peck or a peck and a half. That the small boys are very fond of them was proved on the way

home. Mr Dorell was standing in front of the Hotel Avenida with the basket of fruits, and six or eight quince-loops came up and began to steal fruits out of the basket.

In general appearance some of the fruits suggest a small black fig, which have no "neck", outline scuppernon grape. They are purplish maroon in color, usually darker at apex and shading off to almost green at basal end. No stem adheres to the fruit. The skin is firm, slightly glossy, and one eighth of an inch thick. It is tough and not easily broken. Enclosed by a mass of whitish translucent pulp, which suggests the pulp of a grape.

embedded the seeds, were mally four, but one or more often undeveloped. Three seems to be the commonest number of perfect seeds, but I have found many with only three and a few with one. Five

are also found in some areas. They are oval or slightly reniform in outline, flattened, and more than 1/8 inch in length. The pulp adheres to them rather firmly. The flavor is strongly suggestive of grape but has a peculiar tang not found in the latter fruit. It is pleasantly acid and quite agreeable.



jaboticaba
nat. size

Pomological description
of the Jaboticaba, as
purchased in Rio Janeiro
market Oct. 24, 1913

General form slightly
oblate to very broadly
obovate, the fruit being rather
variable in the shape
near. Cross section reg-
ularly round. Dimensions
length $1\frac{1}{8}$ to $1\frac{1}{2}$ ins.; breadth
th $\frac{1}{8}$ to $\frac{1}{5}$ ins. Stem
none. Base of fruit in
some cases slightly ex-
serted, in others slightly
flattened. Apex usually
slightly flattened, with
the 4 sepals, which are
dried and a slightly ren-
iform and almost un-
noticed. In a well de-
fined circle $\frac{3}{16}$ ins. in
diameter, the surface
smooth, slightly
glossy, color crimson
maroon, deepest
at apex and shading
to light green at base.
Skin

1/16 inch thick, tough and
leathery and not easily
broken, not adhering to the
flesh, which comes out in
a body like that of a grape.
Flesh translucent white,
almost transparent, jelly-
like but meaty, full of
juice, with practically no
flavor. Flavor vinous, pleas-
ant. Seeds normally 4,
one to three are sometimes
absent. Three normal
seeds, in the commonest num-
ber, in rare instances
there are five. They are
3-1/2
compressed, $\frac{1}{8}$ inch
thick, seed coats very
thick, the flesh adhering
to seed.

Stueckhoff, *Carnea* *Leão e Cia*
Oct. 25 1913

Sao Paulo large

Morta " "

Coroa

Branca

different sorts of Jaboticaba.

Saw Jaboticaba of

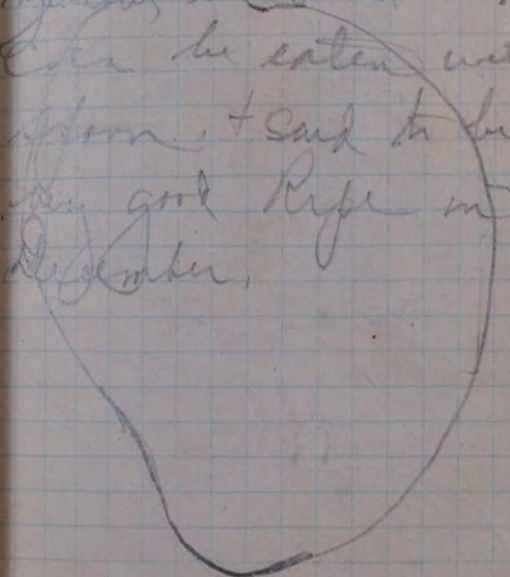
var. Coroa in fruit

here. Foliage is small

and fruit also small

open in December

Mango Rosa came
from Bahia. Fruit
yellow with red cheek.
Can be eaten with
spoon. + said to be
very good. Ripe in
December.

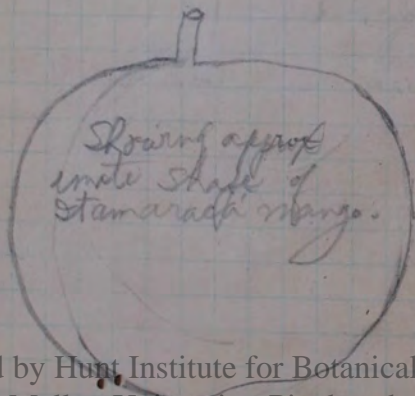


Eckhoff, Carmelo Leão e Cia

Tamaracá, açucena

in Dec. Tree seems
to be a good bearer.

Fruits nearly full
grown now, but also
some flowers on tree



Showing approx
white shade of
Tamaracá mango.

Propagation of mango
by sowing, or seedling,
in 5 gal. cans, march
bud with raffia

Says Tamaracá is
best of all

Carlota	} vars of mangos grown by Eckhoff Carmelo Leão & Cia
Augusta	
Tamaracá	
Espada	
Rosa	

Mango

lots of fungus on
fruit and dead
flower stalks. Mang.
du Rose had many
fruit blown off in
recent tempest

Caesalpinia echinata
Pau Brazil

Caesalpinia ferrea Mart
is the ferro or iron
wood

Enteroger edulis =
Palmito

City = Moquegua
floribunda

Guaiacum Cavendish

has large foliage

Better flesh is good
for Pores

Cabelluda

José da Silva Gandra

Rua Haddock, Lobo

no 228
with Eickhoff, Carneiro
Lima + Co

62
U.S. mail on
SS Byron Nov. 5 -
next mail arriving
4 days

Fazenda Monte Alegre
do
Dr. Aristide Fair
Realengo

Somewhere near Rio, grows
fine large round oranges.
Saw some on exhibit
in window of Hortulanaria
77 rua do Ouvidor. They
can give address and
further information. Said
to be Bahia hands.



63
Star Apple
(*Chrysophyllum caribae*)
Rio de Janeiro Oct 25 '23

Color purple maroon and
green. Outer flesh purple
white. Inner flesh on pulp
white, almost transparent.
Seds in this specimen 4

at Library look up
works on Tupi lang-
uage, and economic
plants of Brazil.

Pelotas, Rio Grande do Sul
Bon Retiro, duas
horas de Pelotas. Ha
um lanajero

Features of Rio
Royal Palace
Clean Streets
Botanic Garden

Carapa guayanensis

Harper No. 156

Family Meliaceae.
Tree vulgar Andiroba
Patia Amazonas

Planted on Alia Carlos
Gash

Avenue of old mango
trees is

Alia Barão de
Caparemas

long avenue of
Royal Palms in
Alca Barbosa Pal
rices, & was planted
in 1842.

No. 586 *Gustavia*
angusta L. (Myrtaceae)
Brazil. Name vulgar
Gleniparana.

Flowers large, lvs up to
8 m long, bipinnately
canalate. Flowers
white and dull pink.
Stem 1/2 - 3 m in diam

Tree 30 ft high

No. 24, *Stenocalyx*
Brosilensis Berg.
"Grunipama"

Slop 128 time 5 sec

No. 256 *Platonia*
insignis, (Guttiferae)
Bakery. Amazonas
Slop 32 Ey 1/2 No 5

Jaca
Ey 3. Slop 32, time 1 sec

No. 2545

Grevillea Precaria
São Paulo

Small tree, about 15 ft

Highs very broad + spreading
but rather open in growth

Bark somewhat rough, grey

brown. Leaves, 6-8 ins

long, 5 to 6 ins wide, deeply

and coarsely divided, lanceolate

above, silvery beneath

Flowers rose red, in

long spikes. Very sim-

ilar in foliage to G.

[unclear]

different in habit of
growth

9583 Helicteres

Sarcocolla (Malvaceae)

leaves like an abut-

ilva, 15 ft high, trunk

branched from ground up.

Sed. joints twisted squares

Look up Cajanus
flavus

1752 Bromeliaceae

Aclomea nudicaulis

Gravata de pedra.
Slip out [unclear]

Dendrocalamus giganteus Mones
culm. 90 m in diam

O maior das bambues
de crescimento extra
ordinariamente rapido
From Burma

Bambusa spinosa
in flower at Botanic
Garden

Oreodoxa olivacea
Palma Mate

What is hedge in
point of John Botanic

Mate in tablet form
put up by Henke and
Ria, Rua Dr. Pedrosa
no. 196, Curitiba, Parana,
sold in Rio Janeiro
stores at 3\$1000 per
box of 100 tablets
for 1 cup each.

Mr. Catambry

Barbacena 1200 ft

Mnas Graes

Mr Wright will be there in January. There are Eucalyptus

for fruits, Jaboticabas, & a few other native fruits

Mr Wm. P. Wright

Chefe de Fruticultura

Nucleo Colonial

Ataraya

Campo Belly, Estaca

Rio Janens

University of Fresno Cal

expect to go back in

October 28 1913

On the way out to Barca Velha we passed numerous mangrove trees in fruit. The trees here are quite large and many are bearing heavy crops, the fruits appear to be in most cases about 1/2 grown, altho I have seen some that were still very small, as well as many trees still in flower and have also seen a few that were practically full grown and beginning to color up on one check.

I noticed a number of young trees whose tops were covered with dead flower stalks, looking just like those trees in Florida that are attacked by the *Colletotrichum*. The fact that only part of the trees here are so affected should

be worth looking into
as it may be found that
some plants are resistant
to the fungus.

I examined some
mango flowers from
a tree at the hotel
and found one flower
with two fertile stamens
altho in all other cases
there was only one
fertile one and 4
vestigial or rudimentary
ones of varying degrees
of development, some in
which the anther was
fairly good size, but did
not show any signs of
being fertile.

Branca Velha, Oct 28
Cyanus andrew called
Guanda

Guarase of two kinds,
Branca and vermelha
Gardner says alike in quality

Azoeira eiva, the
Lecima so extensively
grown at Inter place

Sagrat. called Mespon
or mespon

Cote - large green thick
spongy fruit
Cabelluda - small
yellow hairy fruit

Saboteada tree
 At Catramby place
 80½ ins. in circ.
 1 ft from ground, 6
 main branches, start-
 ing about 2½-3 ft from
 ground. Fruits on old
 wood 3 ft from ground,
 on main branches, esp-
 ecially under sides, &
 all over young branches

Araca ayda
 From Catramby place
 La de Jandos
 Oct. 28, 1913



diameter 1½ ins.



sepal
 diameter 1½ ins

Araca azeda.

The young branches are
4 angled.

The fruits of the sp
are light yellow when
mature, globose or slight
subglobose, flesh white
and juicy.

leaves, and quite
acid. The flavor is not
much as in most grasses
and has very little flavor
and is from the pronounced
acid acidity. Seeds are
medium sized not very
abundant surrounded by
a whitish pulp. Would
probably be of no value as
a table fruit but may be
good for doves.

These plants at Catramby's
place are about 12 ft high,
upright in growth, with an
unbranched trunk and
rather sparse foliage.
They resemble that of
Pachira Friedrichsthalianum
as I saw it at Reasoners,
Gross, Sw.

Cabelluda seen at Bem-me-quer, a
 Catramby's place is composite similar to
Phyllocalyx tomentosus our daisy, - "He loves
 Berg, habitat state of me, He loves me not"
 Rio Janeiro. Name Cabelluda in portuguese this is
 luda refers to having "Bem-me-quer, man-me-
 quer." Silva Bastos.

Cabelluda is feminine
 of cabelludo, an adjective
 meaning "that which has
 much hair" - que tem
muchos cabelos (Bastos)
 From Latin capellus

Boletim Agrícola de
Pernambuco, Recife.

Boletim de Agricultura
Parahyba

Boletim de Agricultura
São Paulo

Boletim da Directoria de
Agricultura, Indústrias,
e Obras Públicas.
Bahia

Boletim do Museu
Goeldi, Belém

Chacaras e Quintaes
São Paulo.

Correio Agrícola
Bahia

Exposição Agrícola
São Paulo

Fazendeiro
S. Paulo.

Revista Agrícola,
Industrial e Commer-
cial Mineira.
Bello Horizonte

Annuaire de Biblio-
theca e Archivos
Publicos do Parai
Belem

Archivos da Escola
Universitaria de Minas
Minas

Avicultura Brasileira
Santos

Boletim Postal Exper-
imental de Avicultura
Pindamonhangaba
São Paulo

Creator Paulista
São Paulo
Lavoura Jaraense
Belem

Revista do Museu
Paulista
São Paulo

Revista da Sociedade
Scientifica de S. Paulo.
São Paulo.

Solo
Paracicaba
São Paulo

86
(Duplicatas)
Boletim da Diretoria
de Agricultura, Bahia
Correio Agricola
Bahia

87
Banca Velha, near Rio
October 30 1913
Pitanga grows here to 15
feet in height, woody,
the trunk sometimes single
& sometimes branched just
ground up. Fruits are ripe
now, but only a few, man
at house says says fruits are
only eaten, raw not cooked
in some form, and sap
cross is almost over, most
of this fruit being ripe last
month.

Peach.

The small peach
we bought in Rio market
grows commonly at Fátima
Pereira & others around Banca
Velha. The tree is small,
not over 10-15 ft high,
& a very profuse bearer.
The seeds in the fruit were sent to
this climate. The ripe
fruit is small but...



small peach from
 Fort St. Jea, natural
 flesh is whitish, tinged with
 pink toward stem. Surface
 is hairy, whitish green, with
 a pink cheek. Flavor very
 good, not at all bitter. Many
 of the fruits contained insects

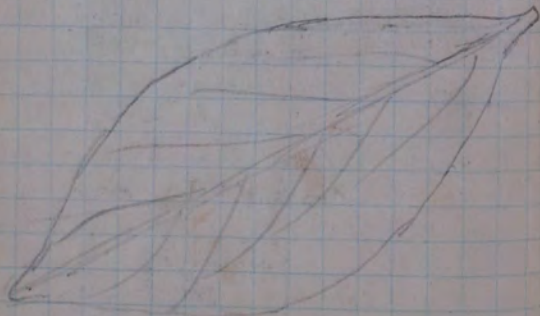
large mango in fruit of
 Fort St. Jea called mango
 de Rosa. It is a seedling
 from at Catramby says
 name Rosa regina because
 flower stalks are red.

Mango Biala

Guarda - red tipped with
 long beak, at Catramby's



Flower of shrub with deep blue & white flowers from *Tontis glaci*. Flowers begin deep violet blue and then fade to white.



Catramby Glace
Pontis d'Agua
October 30, 1913

Cabelpuda leaf with eye



Cabelpuda. The fruits are slightly less than one inch in diam, oblate in form, orange yellow in color. The skin is thick & encloses one or two large seeds surrounded by a small quantity of pulp, juicy with a peculiar sub-acid flavor, not particularly good if they are eaten raw. Skin hairy. Leaves glossy green.

92

Birds hang around the
Jaboticaba trees all the
time. They are very
fond of the fruits

93

Two kinds of mangoes here,
Lepida & da Rosa; also the
mang. Brata, which seems to
be the name of some sort
of seedling type. Seems to
me that Lepida is a
seedling type, of typical
curved form, something like
Santalata, while da Rosa
looks more like Bombay
type.

Fruits at Catrambys plant

- meia
- Quamocoma
- Jaca
- Araca
- Goiba
- Abelluda
- Manga
- Sapoti
- Pitanga
- Jaboticaba
- Caju
- Carambola
- fruta de pao
- fruta de conde

- laranja da chiva
- laranja sebeta
- laranja da terra
- laranja da pera
- tangerina
- limão doce
- limão doce
- limão azedo
- limão gallego
- condessa
- pecego
- uva
- mamão

Abiu (*Lucuma* sp.)
 Abacati
 Tamarindo
 Jambó

Photographing.

In taking life size photos of fruits, Mr. Darrett has found that a 256 stop and 30 seconds exposure gives a good strong negative here at this season of the year. The camera has been placed in a door 5 ft wide opening onto a 2 ft wide balcony with full light.

25 to 35 secs. for cut fruits
 35 to 40 for whole fruits
 on very bright day this time might be reduced a little and increased on a very cloudy day.
 Dark green fruits take 5 to 10 seconds longer than light yellow fruits.

98 Niteroy, Nov 1 1933

Castanho do Mato
evidently an Annona
growing in a yard
near Niteroy. I had
seen the tree elsewhere
in Brazil.

Cabelluda trees -
20-30 ft high

Dates

Oct. 30, 1933

I noticed in one of the fruit
stores in Rio a shipment
of dates (tamaras) which
appeared to me to be Degleria
fruit. The price was
3 \$ 00, or \$ 1.00, a kilogram.

Cabelluda
Phylloclyptomenus Berg.
This is said to be a native
of the State of Rio de Janeiro.
I have seen trees in 5 or 6
places about the city of Rio, but
it cannot be called common,
and does not seem to be very
highly esteemed. On Nov. 10
at Niteroy, we saw several
fine trees (the largest between
20 and 30 feet high). The
largest of these trees was
not so large as in the garden
of Catramby's place
of which an outline of a leaf
is shown on another page.



Single leaf, nat. size, from
Niteroy. The leaves
are green above, dull
tomentose beneath.

In growth the
tendrils of *Nyctaginia*
were of this form
in some instan-
ces, in others a
little less spread-



The foliage was badly
attacked by some fungus
leaving yellow spots all
over the leaves, and also
grayish areas. The foliage
of this tree was fairly dense.

The fruits are borne in
great abundance on the
smaller twigs and branches
and as far as I have observed
are sessile. The flowers
are said to appear in
and the fruit ripens in
Nov. The largest fruit
slightly less than one
inch in diameter. Form
globose to slightly oblate.
A small raised disk at
apex about 1/16 inch in
diameter. Color when ripe

separating readily from the
stalk, tomentose beneath
netly, whence the name
"Cattalinda" or "Lary"
is soft and juicy, but lack-
ing in quantity. Enclosing
seeds, usually two, large
angular, oval, flattened,
slightly reniform in shape. The
shell about to these dimensions
and in flavor is mildly
starched, greatly resembling
mangos, quite agreeable.

The pulp, a thick coat of fibrous
material, is
and as far as I have observed
are said to appear in
and the fruit ripens in
Nov. The largest fruit
slightly less than one
inch in diameter. Form
globose to slightly oblate.
A small raised disk at
apex about 1/16 inch in
diameter. Color when ripe



transverse
section
natural size



longitudinal
section
natural size

Alcornoque

Lucuma caribaea?

Bears fruit called Alcornoque

This tree is fairly common around Rio Fortes has a good number of trees in orchard form. They are about 12-15 ft high, very densely foliated. The leaves come clear down to the ground. At this time Nov. 1, 1913, there is no ripe fruit on the trees, and only an occasional green one, about the size of a large pigeon

Guernigama

Eugenia guernigama Vell.*Sipocaulon brasiliense*

Grow under the latter name in the Rio Botany garden. I have seen 3 or 4 trees in open areas around Rio. At the Nov. 1, the flowers have just dropped and an opening cup of fruit has set. The tree is an unusually handsome one, and all should be obtained as introduction.

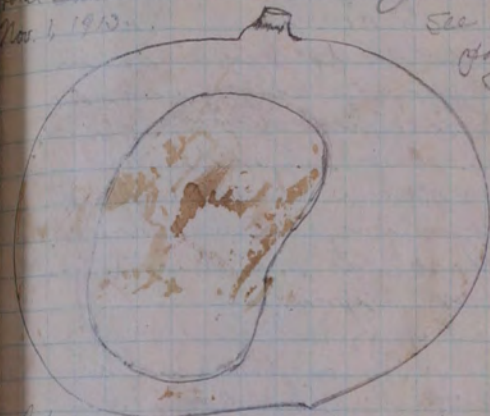
mango

The mangos here to an immense size around Rio, my fact I think there is a larger proportion of large trees here than I have ever seen elsewhere. Perhaps, this is due to the deep rich soil.

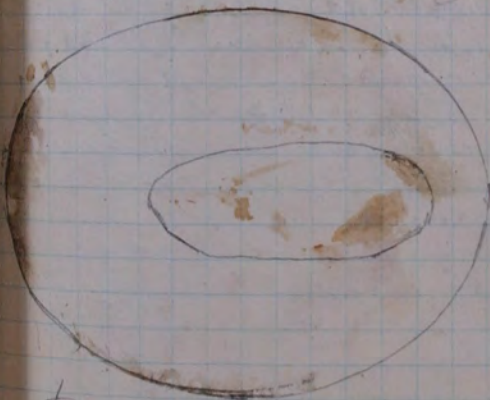
A peculiar thing which I have noted with regard to mangos is that many of the trees which are cropping at this time crops of half or three quarters grown fruit are also in bloom. This seems especially true of Tamaracá, but it is true of others as well.

Tamaracá mango.
Hotel Internacional, Rio de Janeiro.
Nov. 1, 1913.

See next page



longitudinal section, natural size



transverse section, natural size

Stamaraca mango

The drawings of this mango shown on the preceding page were taken from a large fruit picked by the gardener on top of the hill of the hotel Internacional. The tree from which it was taken appeared to be grafted and was in bloom as well as carrying fruits of varying sizes. Some of them almost matured by the condition of the specimen from which the drawing was made. I should think it was just about full grown. The seed was well developed, altho the outer husk was not hard and I could see no evidence of more than one embryo. *Stamaraca* is considered one of the very best mango here and is grafted by working. I have seen

Oct. 30 1913

Chayote:

We have had Chayote served to us at the hotel in 2 ways, one baked and creamed. An *heuro* it is a very fine article and much better than when this summer. I cut a small piece here creamed. I did not like it so well; it had a rather sweet taste and not enough character. The Chayote seems to be a very popular vegetable here and has been seen in the market every time I have gone there. It is called *chuchin* here, which Silvia Costas says is a corruption of the *Boenak* Chochos.

1880 Janeiro Public Market
Nov. 3, 1913

Mamão

Jaca

Jaboticaba

Manga

Chá de

egg plant

Zouros

Pumpkins

Peppers

Abacaxi

Coconut

Bananas

Watermelon

35

onions

ginger

Salmitos

alium

cauliflower

string beans

Sweet potato

tomatoes

oranges

lemons

limes

artichokes

lima beans

small peaches

grapes

figs

plums

potatoes

carrots

cabbages

The above were noted
in the market today. The
mangos were said to come
from São Paulo

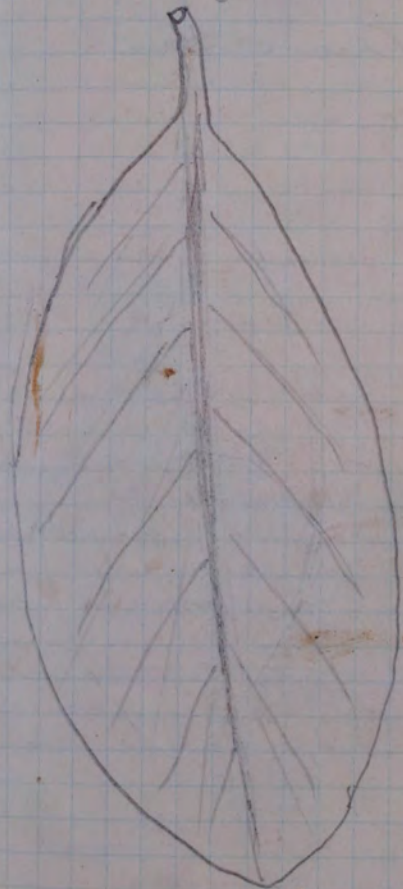
11 Botanic Garden, Rio
Nov 3/93
Michelia champaca

America.

Arvou sacrada na
India, dedicada a
Vischnu. Extrai-se
de suas flores agra-
davel essencia."

This tree is quite common
in Rio as a street
tree. We mistook it
at first for the arvoledo.
Flowers are very fragrant
but the tree seems to
drop its leaves a good
deal, like *Grevillea*
robusta.

Botanic Garden, Rio 111
Psidium araca



leaves thick, glossy smooth
young wood, grouped

112

Psidium littorale

leaves thick, glossy
young branches round



Botanic Garden, Rio 113
No 486. Nov 3 '13

Mimosa
coriacea

Called Abrico. This
is the fruit we saw
at Netheroy, called
Abrico

2717. *Rollinia*
esperitosantensis
"Araticum" Brazil
ht 24 ft.

2567. *Annonaceae*
Rollinia geraensis
Araticum or *carapa*
ht 18 ft

No. 617 *Cocos* *insequens*
 Brazil *mont*
 ht 9 ft.

2909.
Rosa *cinerea*
 Brazil - *Primitiva*

95. *Rheedia* *brasiliensis*
Sacupary

No. 51
Spathodea
candellabrum

Botanic Garden Rio ¹¹⁵
 Nov 3, 1913
 94/12.

Corypha *umbraculifera*
 Australia

The collection of palms is very extensive and very fine, altho many of the specimens are still quite small.

The *Myrtaceae* are well represented, but many specimens are stunted in wood or have much dead wood on them. Things are labeled pretty well but many of the old labels are becoming indistinct.

116

Rio de Janeiro, Nov 4

Saw mango Rosa in
the fruit stores today a
good few dozen. It is a
beautifully colored and
very attractive fruit

117

Mango purchased
Rio Jupiá Market, Nova
M(B) and said to come from
São Paulo.

Weight 180 grammes

Color orange yellow at
base, changing to yellowish
green at apex dots
symptoms light greenish
Flesh deep orange color
juicy but very fibrous and
of rather flat watery flavor
This is not a whole
mango, but sold as such
market here at 3\$000 a do
Consequently it is a very good
reference and in the fruit
probably less its only
market value.

See illustration opposite
of longitudinal section of
this fruit.



Rio de Janeiro. Nov 4

In the nursery of
Eckhoff, Carneiros Leão
& Cia. on rua Santa
Alex^{an}drina, there is
a large Feijoa bush
It is in flower at this
time, but one of the gar-
deners says it does not
bear fruit. He called
it goiaba.

Ch. Rivière:

"Les Bambous" in
"Revue de Géographie" 1902

Ch. et Aug. Rivière

"Les Bambous"

Paris 1879

Société Nationale d'Acclima-
tation.

Chacaras e Quintaes
Directeur, Comte Amédée
A. Barbiellini,

Rua Assembleia 32

São Paulo

1/23

Boletim de Agricultura
de
Estado de Bahia
"Direction de l'Agriculture"
Mereis, 123
Bahia

L'Agriculture Pratique
des Pays Chauds
A. Challamel, Editeur
17 rue Jacob,
Paris
Abonnement 20 f.

123

Journal d'Agriculture
Tropicale
164, rue Jeanne d'Arc
prologie Paris
Abonnement 20 f.

A Fazenda
Julia A. Barboza
179 rua do Hospicio
Rio de Janeiro
20 f. per year.

124

Francischi wants *Peregrina*
subulata, whose thorns
are used as phonograph
needles.

Bahian's place
near Petró.

Elvadio Esteres d'Assis
Cabullo

Coronel Barretto
Cabullo

Should visit above three
places in Bahia, where
oranges are grown.

Bahia, Nov 8, 1918¹²⁵
Mr. Starão says they
always just orange but
up there.

Says *Jaboticaba* does not
do very well in Bahia,
too tropical. Variety is
small here, it is called
mirita.

Mango tree on rua Victoria
just below our Pensão
is 166 ins. in circ. 3 ft
from ground I estimate
its height at 65 ft, and
spread of 100 ft

12^b Bahia, Nov 8 1913

Mr Ferrão says the island of Itaparica is across the bay from Bahia, grows very few grapes and has numerous trees known by name. For the product of one particular tree a man in this annually pays 2 contos, whether there is any fruit or not, the owner gets his money.

One of the finest flowered mangos in Bahia is called Bourbon & is free from fiber

He thinks grafted mangos bear more regularly than seedlings. latter do not always bear every year.

Two crops of mangoes here, one about December and one June these two

usually produced by same tree. Ferrão may account for some trees yielding their fruit in Dec & some in June

Guirapã americana
quite common here

Ladera do Acousti
is 4-5 blocks from Bahia

Castanha do Para
used for fences by planting posts which grow.

Para grass called here Capim d'Angola planted in groves, used for stock feed

Panegante

128 On Rio Britas, Nov 9
Linda is cleare
guineensis

Putanga used for
a hedge

Urucu' gives color
ing on the skin. Sometimes
used for rice.

Jasmin do Cabo
the pink frangipani

Caja used for fence
plant just a which
take root + grow. Spans

Chacara Boa Sorte

On Rio Britas, Nov 9 '29
Orange trees $\frac{1}{2}$ m. apart

Purple flowered le-
guminous tree is sucu-
gira. Used for making
spokes.

Arapa-jirim

... similar to the kind

Cupressu do Parã
looks like Star Apple.

Jaca dura } two
 } kinds
 } of
 } molle

130 Rua Brotas Nova
tabernaemontana not fragrant

Mango Augusta
Fruits are shaped some
thing like Stenandria but
slightly larger at apex

Cyrtandra bria, an insect
with hymen on head which
when it flies against a
tree, hair strokes in
back of it. Cannot see
why it is venomous
to kill the bees also
poison it flies against

Scarabaeid wood bark
yellow brown, very sticky

On Rua Brotas, the
place like Rio Vermelho

1336 orange tree
in the place

131
Pedro J. M. de Amorim,
Rua Brotas
Bahia
1000 orange trees in
the district

Muscle (palm)
used in hats & coffee
bundles up the fruits
also here. Epices?

Langada, a cyprinid
body of 6 legs tied to-
gether, used in fishing
both of a net. almost
3 ft wide & 12 ft long,
paddled by man
standing on it.

Ice costs here 100 reis
per kilo

132 Photos of Rio -

36, 31, 47, ~~34~~, 67,
5, \$ for Mr. Dorset

and any other good ones
not duplicates of those
already purchased.

36, 31, 38, 67, 5, 63
18, 29, and any other
good ones up to 15 for

Mr. Shamel

May 8

Shamel owes me

\$300

133

Henri Etienne
Avenida Gomes
Dreie 62

Queijos Petits Suisse
Double Crème

In Jardim Botânico
look up:

Cocos Maria Rosa
(C. macrocarpa)

Carica sfs.

Dining room steward 3\$
" " " 3\$
" " " 1\$

Carfare \$300
0 300

15 de Novembre

Leave cards with

Dr Toledo
 Dr. Jardim
 Mr Morgan
 Mr Willig
 Mr Leigh
 Mr Bates
 Mr Catramby

Bank
 P. O.
 Consuls
 R. M. S. P.
 Stevenson

Have sent from Washington

500 sheets, thick 2 in
 50 envelopes, long

Villa Rosita
 Vista Alegre
 Villa Alceste
 Villa Maria
 " Zaira

\$300.00 - Oct 31 1913

922 \$200

stamp 0 \$30

921 \$900 amt recd

now 3
 in \$700.00 in checks

307 \$400

less stamp 307 \$100

What is the Cocca so
Common about Rio?

What is the mistletoe
cactus

Want

Carbon paper

velvet

thin paper for frames

scales

5 Kilos Unlabeled line

1 trowel

Look up Bull of Caty Exp.
Station on Chlorine, Brazil

Steamer tickets

Consul

Bank

outhin

Curt G. Pfeiffer

Vice-President

Geo. Borgfeldt Co

New York

Post Rua 1° de março

Mr. J. Butler Wright

Secy of Embassy of
U.S.

30, Rua Carvalho Monteiro
Rio de Janeiro

Les noms des fous

Se trouvent partout

138

Dr. James Rodway
Georgetown,
Demerara

Mr. Leo E. Miller says
has been studying fruit
of tropical fruits, espec
ally mango, and can
furnish information.

Leo E. Miller

American Museum of
Natural History
New York.

Going to South America
with Col. Roosevelt's party
Mammalogist and
Ornithologist. Has traveled
much in Northern South
America & knows many
of the fruits.

139

Dr. J. Baptista de Mello
Filho

Inspector
Inspeção Agrícola Federal
11.º Distrito
Bahia

Cernesto Alonzo Jackson
Ministro do Evangelho
Caixa 184
Bahia

Carlos F. Stapp
Director do Collegio Amer-
icano Egypcio
Rua do Hospicio 47
Bahia

140

Sape' grass Sape'

Cama mirim = small
cane, sweet used raw tomirim = little (Indian)
Assu big "Sweet potatoes 24500
a sack

35 vars of cane.

Cayana best var, but now
attacked by insect, + not
so widely grown.Cambuca looks like
Jubikuala from AlagoasCariman = mandioc
paste.

Melon 14800

Orpington eggs 60000 dozen

141

Azeite de Cheiro, the
oil of dendê palm, costs
\$1000 for qt bottle

Fuk

Melo white look
100 lbs

garoupa

Vermelho

gingibre - ginger

Groseille = a fruit
like jitunga, but yellow.Small baskets made
of passara fiber.
very good in Bahia
Para.

142

Cariman, (North Brazil)
a tupi word: *Favos*
manduca

Bastos Dias e Cia.
Photographers
rua Gonçalves Dias
52
Rio de Janeiro

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Mango Description.

General Form

Cross Section

Size

Weight

measurements

Stem

Insertion, length, character.

Base

Character

Shoulders

Cavity form, depth, breadth, max.

Apex

form

Nash location + size

Surface

Texture, color, lvs.

Skin

Texture, thickness, adhesion

Flesh

color, aroma, texture, juice

Flavor

Quality

Seed

form, size

Remarks. Season.

Characteristics of Growth

and Productiveness

147

Bahia, Monday Nov. 10, '13

To Dr. Fortunato da Silva's
roça at Cabulla, with
Sr. Ferrão.

Cabulla

Mr. Ferrão says this is a
Semitic word, meaning "tra-
dition".

Cupim.

This is the local name for
the termites, whose nests
are not uncommonly seen in
the tops of trees. We noticed
some in a mangaba tree at
this place.

Herwa de passarinho.

a sort of mistletoe which grows
on trees here, sometimes on
the orange. There is a large
variety called herwa de rato,
or rat plant. The name
means "bird's plant." Ferrão
says it is disseminated
by birds, who eat the fruits
and the seeds, after pass-
ing them the alimentary tract,
the deposited on other trees.

Guavas

Mr. Ferrão describes the following guavas as occurring here:

Araca de boi (Cattle guava)
Often found in cane fields. Cattle eat it.

Araca goiata

Araca de Cuba, a white fruit
Araca-cagão, a large tree but small fruit.

Pitombo in flower at this time
Flowers falling and fruit setting

Jabuticaba murta

A small tree here under the name does not appear to me to be the same sp. as the jabuticaba of Rio.

Guamirama

Tree here about 30 ft high
Flowers have just fallen and the fruit is setting.

Citrus

There is very little gum mosii here. One or two trees today attacked, but most of the trees are free from it. The trees are fertilized with 60 kilos per tree of fresh horse manure applied once a year.

Seedless Fruits

Mr. Ferrão says they have the theory here that a tree can be made to produce seedless fruits by cutting out the pith and then letting the branch grow together again.

Machete is called here facão, or "large knife"

Mata pasto a plant which Mr. Ferrão thinks might be good for green manuring. It is very hard to kill out once it becomes established in a pasture, and chokes out the other grasses.

Surucucu'

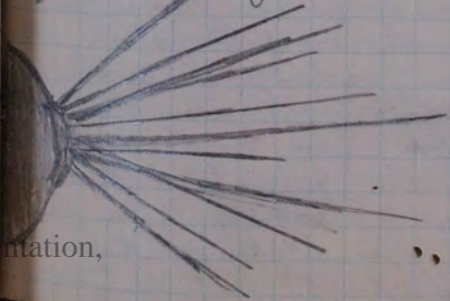
Appears to me to be a *Pereskia*, possibly it is *P. subulata*, the one Francisco wants thorns of for use as photograph needles. There are two hedges of it along the road near da Silva's place, one on each side of the road. Mr. Ferrás says the young shoots are cooked and eaten altho the thorns are thought to be poisonous. Stems are 3-4 inches thick at base of old. Leaves set on stem $\frac{1}{2}$ inch apart, and there is a cluster of 5 to 12 (?) thorns arising from the stem near the base of each leaf. The spines are 1 to 2 inches long, slender, black, very sharp, hard.

Ferrás says the plant takes its common name from a snake called Surucucu'.

Flowers are pink, about $1\frac{1}{2}$ inches in diameter, looking not unlike pink single roses.



leaf of Surucucu', natural size. Spines of same.



Palm oil

Two kinds of oil are made from the dendé palm of Mr. Ferrão. One kind is made by taking the residue of the fruit, which yields a yellow oil, the one commonly used in cooking. From the inside of the seed is obtained a white oil like Coconut oil.

Abacate

Mr. Ferrão says most of the abacates ripen here in December.

Mangos

Mr. Ferrão says there is a very fine mango tree in the interior of Bahia, which produces probably the finest mango in the state. They are shipped to Rio. Seven or eight years ago he planted about a dozen seeds of this tree.

one for the first time. Of all the trees, only one was like the parent, but the one produced fruit identical with the parent in every particular.

Introduction

Mr. Ferrão says many of the exotic fruits now grown in Brazil were introduced by Dom João VI. The original guava tree is still growing in Jardim Botânico at Rio. Thinks the best oranges may have been introduced from Portugal by Dom João. Thinks most of the fruits came to Rio first and thence to Bahia. Dom João was much interested in plants and did a great work in introducing new ones into Brazil.

Bahia, Monday Nov 10 '13

Pitanga Sherbert
Mr. Dorsett and I tried yesterday a pitanga sorbete, which we found to be very good. The color was very attractive, bright, cherry red color, not so pink as strawberry ice. The flavor is peculiar. The price here is 0\$500 per dish.

Bahia, Nov 11, 1913

To call on the Governor of Bahia state and the Intendant of Bahia city, with Mr. V. A. Argollo Ferrão. Governor welcomed us cordially, and assured us that they would do everything possible to further our success. The Intendant, Dr. Paulo Brandão, also placed himself at our service and seemed very much interested in our mission.

Gempago.

Mr. Dorsett and I tried a sorbete made of gempago today, and found it very good. The flavor somewhat resembled guinea; it was very sweet, and quite agreeable. Price of the sorbete was 0\$500. There is no color to this ice

Bahia, Tuesday, Nov 11 '13.

Major João Henrique de Faria, Adjutante de Orden do Governador called on us this evening to return our visit to the governor of the afternoon and to offer the services of the government in whatever way we might require.

The governor's name is Seabra

Caldo de Canna

We have tried several glasses of this drink here. It is cane juice, expressed in a roller mill, and is served with or without the addition of lemon juice. We take it with lemon. It is even than a trifle too sweet for us. It seems to be a very popular drink here, and is sold at 100 reis per glass. About a tea-spoonful of lemon juice is added to a glass of cane juice, making it both palatable and sweetened with a fresh cane taste added.

Bahia, Tuesday Nov. 11, '13.

Mango

Mrs. Velho says the mango is considered a deadly fruit for foreigners here in Bahia, unless taken in the morning on an empty stomach, and followed by a glass of cold water.

Roca

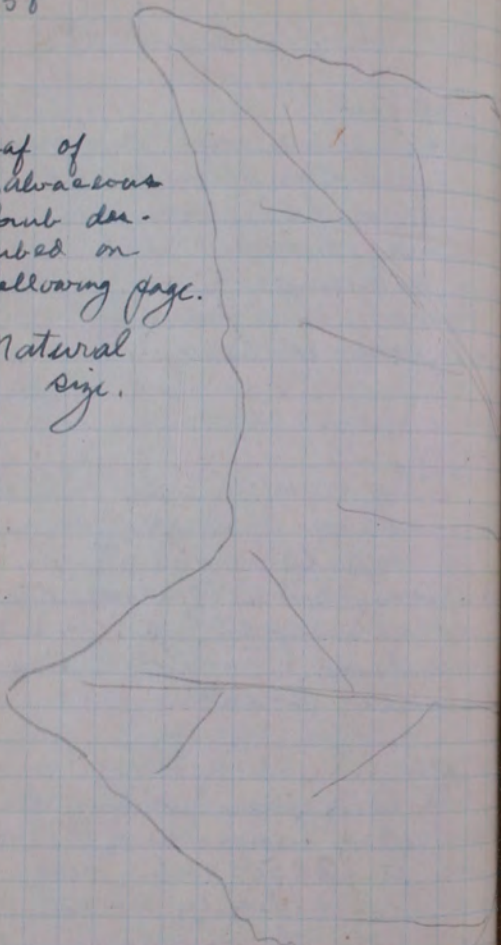
This term is used in Bahia in place of Chacara as a general rule. As to its derivation, Silva Bastos says "do al. ross?" It is a Brazilian term, meaning a small ranch.

Caroa

Passed a man in the street today selling hammocks of Caroa fiber at 2\$500 each. They were poorly & cheaply made. Came from the northern interior of Bahia.

Leaf of
Malvaceous
shrub de-
scribed on
following page.

Natural
size.



Petiole
4 3/8 in long.

Bahia, Tuesday Nov. 11, 1935

Malvaceous shrub.

Mr. Dardet and I saw a beautiful pink flowered malvaceous shrub on the car to Barra, about 5 or 6 blocks below our pensão. It was 15 or 18 ft high; a leaf is shown on preceding page. The leaves are light green, in color slightly subscent. The flower is fully 4 inches in diameter, looking exactly like a double hibiscus, but bright rose pink in color, the petals heavily veined. Flowers are single, on stems 4-5 in long. The plant does not seem to produce a great number of flowers at one time, but is striking and beautiful.

Derivation of Names -
Arabic.

Roman, or romã, the pomegranate, from arab rumman.

Tamara, the date, arabic word.

Bahia Nov. 11, 1913

Otaheite Gooseberry

Cicca disticha. This fruit is called groselha (gooseberry) in the market.

cross
sectionnatural
size

Here it is light yellow in color, slightly tinged with green, the flesh meaty and very juicy. Seeds two, very large, completely filling cavity. Flavor is acid but not sharply so, perhaps resembling a gooseberry somewhat but rather lacking in character.

It is variable in form and size, the above outline being that of a good specimen. Oblate or compressed

Bahia, Wed. Nov 12 1913

Mamão

See drawing on next page. A peculiar form of this fruit, purchased in the public market at \$2.00.

The fruit is distinctly oblate in form, and all that we saw were uniform in this respect. The base is slightly flattened, and the apex decidedly flattened. Length $3\frac{1}{2}$ ins. width $4\frac{1}{2}$ ins.

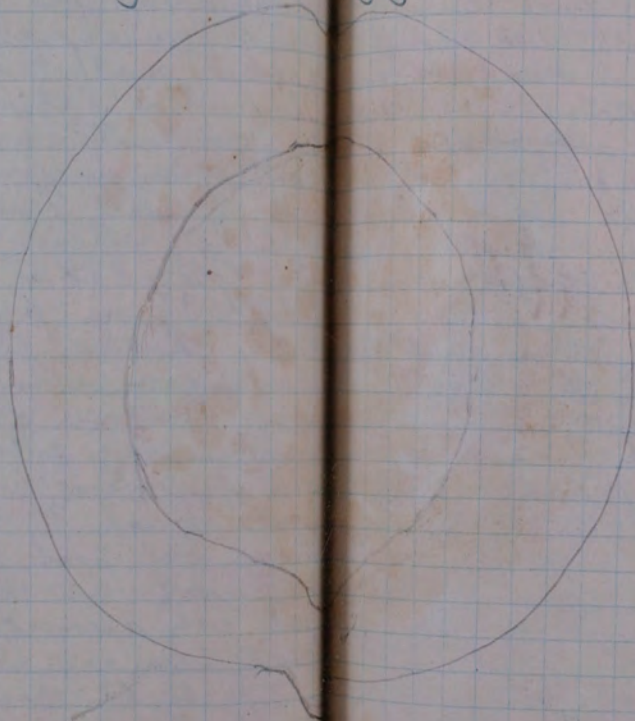
Cavity shallow flaring; apex mamiform, about $\frac{1}{4}$ inch above surface of fruit.

Skin smooth; color deep orange yellow, very attractive. Flesh $\frac{3}{4}$ inch thick at widest point, light orange color, soft and melting.

Seeds very numerous, seed cavity large; flavor pleasant, slight disagreeable odor, probably about as good in flavor as the larger varieties.

Mamão

see preceding and following pages for description



longitudinal section

Bahia Nov. 11, 1913

Marrão

Cont'd from 163.

The greatest objection to this fruit is the fact that the flesh is not thick enough. Otherwise it would be an admirable commercial variety as it is of good shape and size to handle.

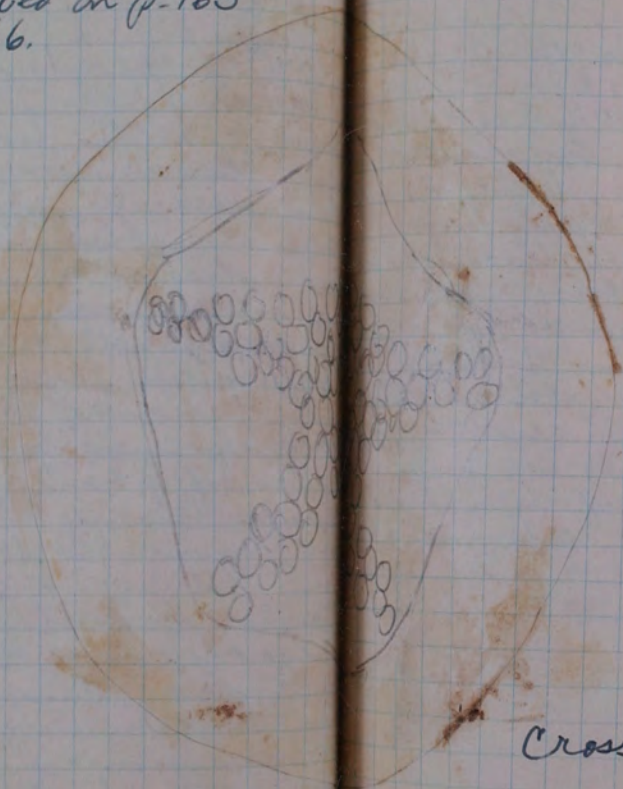
The fruits all had 3 to 4 longitudinal knife cuts through the outer skin, from base to apex. The woman that sold them said this was done to allow the milk to run out. These are the first fruits I have seen cut this way here.

Bahia, Wed. Nov 12, 1913. ¹⁶⁷Tupio Guarani.

Met by appointment, at U.S. Consulate, Mr. Moore, a negro from the United States who knows something of languages. He says there is a published grammar and dictionary of Guarani. Tupio and Guarani are semi languages with colloquial differences. Says Indian plant names were given with reference to character, uses of plants. Says natives on the São Francisco all speak Portuguese now, but some of the old people know the Guarani language. Says knowledge of it among Europeans is very limited. Says Guarani is very similar in construction to old Roman.

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Mamão
described on p-163
and 166.



169

Cross section

170 Bahia, Nov. 12. 1913

Melon from Joazeiro.

Purchased in the Bahia market for 1\$700. The length is 10 inches, breadth $5\frac{1}{2}$ inches. Externally dull straw color, light, deeply ribbed with broad furrows. Flesh $\frac{1}{4}$ inch thick, whitish salmon color, meaty, flavor more pronounced of musk melon than Casaba.

Seeds moderately abundant. Mr. Ferrão says this is a very poor specimen of the variety of melon. Probably not worth introducing to the States.

Bahia, Nov. 13 1913 171

Dates

Mr. Ferrão says a man at Castro Alves, Eds. da Bahia, planted some date seeds and got one tree which produces good dates.

Have long hot season on Rio São Francisco, with maximum of 40°C . Should be excellent country for dates.

Man at Castro Alves only got 1 female palm from his seeds the rest being males.

Grapes on Rio São Francisco

Mr. Ferrão says grapes bear three times a year on São Francisco, but do not contain enough sugar to make wine. Temperatures are too high to permit of wine making.

172 Bahia Nov 12 1913

Mamão

The Ferrão says the Indian mamão is usually propagated here by cutting a small branch or broken off and planted.

Two kinds here; the smaller variety is mamão and the large long variety the mamão da Índia. The latter is by far the choicest.

Bahia Nov 12 1913

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Abacaxi

This fruit is very abundant in the markets, and is without doubt the finest fruit here, with the exception of the navel orange. I have never eaten finer pineapples anywhere, in fact I have never eaten so good. We have them every noon, and never put any sugar on them; they are simply sweet in themselves. The price of good specimens is now 0\$300 each but I am told they become cheaper later in the season when they are more abundant.

A typical fruit is shown in the drawing on the following page. This specimen was 18 inches long, from the base to the apex of the fleshy part of the fruit, and $4\frac{1}{8}$ inches in diameter at the broadest

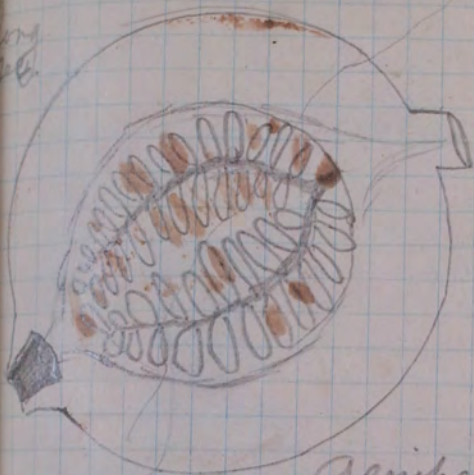


Pineapple, cont'd.

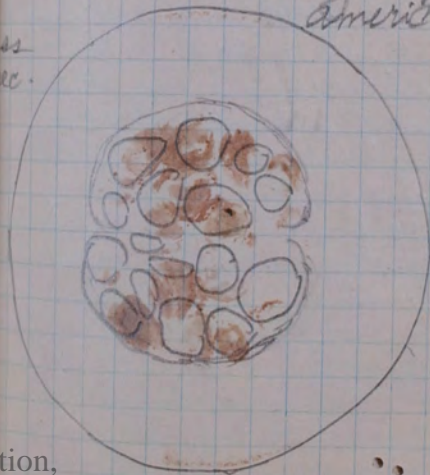
Point, which is usually near the base. The commonest shape is oblong-conical, with a tendency to become pronouncedly conical. In color the fruits when ripe are yellow brown or golden brown, light. The eyes are not deep, and the fruit is prepared for eating by slicing off the outer covering with a sharp knife. The flesh is not quite solid, but is full of radiating fibres with a few open spaces. Color of flesh is translucent whitish yellow when fully ripe. Core about $\frac{3}{4}$ inch in diameter, not very hard. Crown about 4 inches long, the leaves short and broad, edges sharply serrated. Flavor deliciously sweet and melting. Almost syrupy when fully ripe. Seems to decay very quickly when kept in the market here.

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*Genipa
Americana*



Fruit Seasons

Mr. Ferrão says many fruits, including oranges and mangoes, have 2 seasons. There are even two crops of He thinks this is due to the moist and warm climate, which allows the trees to rest. In the case of the orange, the main season is in the winter, June and July, but there is another and lighter crop in summer, about Dec.

Milk

500 to 800 Rs per litre

Bahia Thues. Nov 13, 1913 '79

To Roca of Colonel Frederico da Costa, in Matatu.

Solidade car, 2 sections

Aleurites

Leaves are boiled + the water in wh they are boiled in is bathed in, its cure rheumatism

Caryota

The palm called here Cariota, meaning that it came from Rio

Citrus

4000 orange trees here at his sons place, about 1/4 mile from his, also an orange grove. Soil not quite as red as in some other locations we have seen. Has more than 1000 trees. Very healthy + in fine condition. Has 1000 young trees just planted, as well as 1000 in bearing. Name is Padre da Costa

Number of Navel Oranges	
✓ Frederico da Costa	6000
✓ Pedro da Costa	2000
✓ Lugo	10000
✓ Barretto	3000
✓ Cardosa	1000
✓ Fortunato da Silva	1000
Demetris	7000
Amorim	1500
Grove in litigation at Cabell	2000
Elvidio Esteres	3000

Dr. Mello's census shows
30,000 but Argallo thinks
there are nearer 50,000 or
60,000

Oranges
Navel trees here $4\frac{1}{2}$ - 5 yrs old
about 15 ft high, foliage of
healthy deep green color, carry-
ing good crops of fruits $2\frac{1}{2}$ - $\frac{2}{3}$
diam, + in some cases
small groves. Fruits and
leaves are clean, and ap-
parently free from scale.
all budded on laranja da
terra.

Main crop in June & July;
light crop in December.
A few fruits ripening at all
times of the year.

Trees broad and spreading
in form, branching close to
ground. Can see thru any
of the trees, but they are
more densely foliated than
in uncared for groves. Ground
is clean here, and seems
to have been cultivated
before the recent rains.

Fruits from 2 to $3\frac{1}{2}$ ins.
in diameter at this time.

Bark clean, very few lichens
on trunks of trees

Small black ladybird.
~~from~~ from Cape a man
 came here to get them - they
 combat scale.

Found soft, yellow scale (?)
 on one leaf.
 one red ladybird on
 leaf.

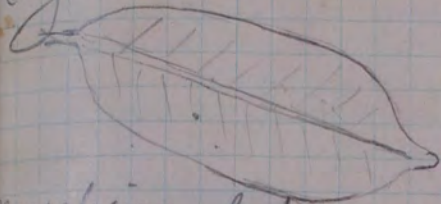
Suckers or water-
 sprouts called ladrão.

Where the mangaba is
 found wild oranges can
 be grown successfully -
 Mr. Ferrão

Found quantities of
 a long brown scale on
 some young trees. Also a
 small white scale and
 one white fly.

Black scale common
 with the brown scale

Mangaba



mangabeira leaf
 natural size

Tree is rather scraggly, wood
 supple and tough. Bark
 thick, gray. Yields latex
 freely when wounded.
 Latex is coagulated with
 alum, but of slow price of
 rubber does not pay to harvest
 it.

Fruit does not keep well.
 Makes fine jam - tree grows
 very slowly I ought to be
 badly, growing South to Par-
 aguay & Argentine

Found peculiar in taste -
 a natural baked apple. Tree
 crops a year, one in June &
 July, other in December
 one been sent to St. Louis
 from here.

Sweet Potatoes

one red veined variety
white veined
Large variety with round
leaves.

Orange Stocks

Mansery of *Laranja da*
terra seedling here.

Rows $2\frac{1}{2}$ ft apart

Plants about 1 ft apart
in rows, on an average, but
not set at regular dis-
tances. Trees variable
in height, from 6 ins to $2\frac{1}{2}$
feet.

Budding

Orange budded in Dec.
and has also been done in
Jan. and July but at
that they are busy with
their crop. They find when
you they can find time
but consider end of August
& Sept. best time

Two & three year olds

They pay 100 to 200 reis to
the budger for each tree that
grows.

Bud about 20 cms. above
surface of soil. Always
bud when wrap the
bud with leaf of *Nicoria*
palm.

Age of Orange trees

Tree 3 yrs old here 9-10 ft
high. Would be 5 yrs in Calif.
heights

Fruits on eastern side of
orange trees much sweeter than
those on western side.

Oruta

any tree grown from seed, as
opposed to enfeitado or grafted

Nicoria

In the interior this palm is
thick, sometimes 150 per acre.
Goats eat the fruits as fleshy
sweet succub. The seeds are
thrown into alimentary canal,
the people gather them to

crack and obtain the kernel
which can be eaten or
made into oil, or given
chickens. Leaves used
for thatching, straw hats,
carpets. Very slow in
growth. Also make dust
out of the leaves.

The palm here is 15-25
ft high, with the leaves
sparsely arranged on the
trunk. Leaves 8-12 ft
long, rather glaucous in
color, leaflets 18 ins long
+ 1/2-3 ins broad.

Saw wild vanilla
growing on its trunk. Leaf
bases adhere to trunk
almost to ground.

Coconut

Saw 2 palms killed
by rhinoceros beetle

Baskets

Baskets carried
across backs of horses to

Cassava

Cahia Thurs. Nov 13, 1913 187
Left by J. Baptista de Mello filho
fazenda Santa Monica
Estação Juaporana -
B. F. Central do Brazil
Mungos Cozada + Rosa, grafted
Bacara da Couceição

Sylvestre Ferraz

Sul de Minas

B. F. Ribe Sul Mineira
Mello says they have here
the first collection of fruit
seed in Sp. Amensa. Little
nest in low land

Escola de Pomicultura Barbacena

Estozo da Carta

Pluviometria da Região
semi-árida do Brazil

por
Horacio E. Williams e
Roderic Crandall
serviço Geológico e Mineral-
ógico do Brazil.
Instituto de Viçosa, 2
Barras Publicas.

Inspeccoria de Obras
Contra as Secca.
1910

Esboço da Carta
Hydrographica. Same
as last map.
1910

Advantages of Bahia

Natural rainfall instead
of irrigation.
Absence of freezes
Cheap labor

Drawbacks of Bahia

Lack of best transporta-
tion facilities

Bahia, Thurs. Nov 13, 1913.

de the Inspeccoria das
Obras Contra as Seccas.

They have 7 projects on hand,
building reservoirs in the
low sections of the int-
erior to store up water against
drought, for the use of
cattle and people. With-
out these reservoirs the
cattle often die in a dry
season and the people are
forced to temporarily abandon
their farms.

Public Gardens

City spends 30 contos a year on its public parks and gardens.

Ants

Where watermelons are grown, along the bay ants are very troublesome, being very fond of watermelons and eating up all the vines. People go in canoes to Barra Falsa, on lower side of bay beyond Itaparica & bring back loads of a leguminous plant called passi. They slice this in the melon patches. Ants eat it, & fatten so that their mandibles become softened & remain so for several weeks. They cannot cut the melon vines, and thus it is possible to grow them and mature a crop of melons.

Chico Sunday Nov. 14, 1913

Transfer car, then change to Calçada car to Barra. Can go direct from Barra on Calçada car.

At Barra, Cor. Dométrico near Barra. It is the two largest orange plantations.

Passiflora macrantha grows well here

Passiflora grass

retains 350 to 400 metres per acre. One of the most profitable crops in this region. Small bundles 400 rees each.

Budding oranges

Budding on I. da Chira. They lose a great many. This stock not as good as Ya terra.

Life of Orange tree.

Only live 20-30 yrs here
Live longer if new growth
encouraged, but better to
plant new trees.

Keeping qualities.

Some oranges are very
sweet they keep well, when
they are watery they do not
keep well. Can keep those that
are full of sugar until they
dry up without decaying.

Fruiting age.

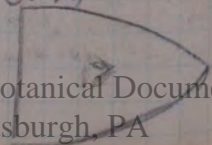
Has been grafted last year in
July that are in bearing now.

Budding

Budding best done when bud
has started to grow.

Makes incision inverted
T, long cut 1-1 1/2 inch long.

Bud wood large, 1 inch in
diam, old & hard, buds
cut like this



rapped tightly with 1/2 leaf
cut of muscadine palm, a string
3/4 inch wide + 1 1/2 ft long.
Stems used were 3 yrs old,
the ones we saw. Smaller can
be used.

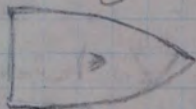
On 15 days cut this wrap,
+ 30 days after budding cuts
tops of lign about 2 in
above bud.

Do China is objectionable
because as it is because it
does not heal well above
the bud, & rolls down into
the bud sometimes.

When budding is done few
many buds are from heat. Hence
have to wait until trees are
almost a inch in diameter &
thumb high.

If budding is done in dry
weather very few buds last
of annual. Some many buds
die.

In transplanting young trees in full growth they cut back all soft new growth.



When bark slips well on both sides & does not hit the loss of bark.

Always bud in summer & fall down, but not so decrease. Have found many died in decreasing snow.

Labor costs 24000

Manure
Very little used

Fruits of Dec. are almost ripe now. Those of main or winter crop July, about 1 inch in diameter now.

Some culture
No cultivation given the trees but ground fairly clean only small weeds being present.

Trunk of tree covered with lichens. Old trees 25 yrs.

Ground mulched in places with stable litter & manure.

Soil not so red as in many places here. A sandy brown, grayish brown with dry.

Considerable gummosis on some of the trees.

Good abacate trees here

Some of the trees planted on very steep hill slopes

Has 1 man paid by month 24000 per day. Best work done by day labour

"Coronel Decca" is Cor.
Demetrios nickname, by which
he is known here.

Some orange trees give
1000 fruits per year but
the average is about 500.

Laranja de Cravo may
bear 10,000 fruit in one
crop, and usually does
afterwards. Obligate to thin
out the fruit in this variety.

Sells fruit from 500
per 100 to 1500, depending
on season, size & quality
of fruit.

Cleaning the land
affects the season of
flowering & if land is
not well cleaned at one
time there is a variance
in crop. Land cleaned
twice a yr. at cost of
10 \$/acre here.

Does not lay for picking,
as fruit all sold on tree.

The cassava only hold 25
oranges in each basket, when
large fruit. Small ones 50
or 60 per each basket.

4 yr trees 12 ft high.

More than 100 trees to
a tarpa. When soil is very
good 120-130.

Demetrios says he has 7000
trees but Argolfo says it is
near 10,000.

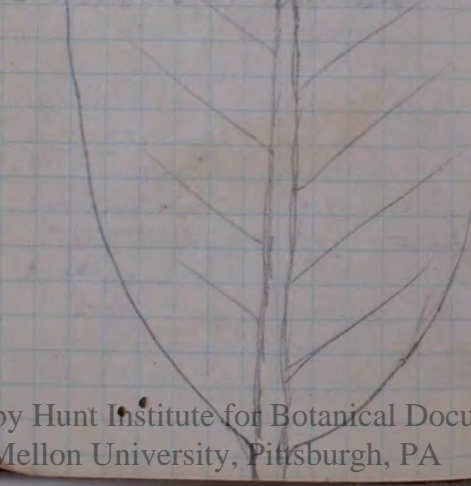
On Ladeira da Pira
Vizinha Buzinhos
orange trees 60 yrs old

Thinks grafting high is very
desirable for ~~more~~ could see
like this as trees resist
disease etc better.

Araticum

Tree 30 ft high, fruits
few and only about 1/2
line in diam. Grows much
much like *Cherimoya*.
Fruits short and not very
abundant. Said to be
a very good fruit.

Carbohydrate stores well +
deeply red. Fruit
broadly heart shaped. Tree
very slender in form, + tall
leaves very thick and stiff
glossy, deep green.

*Para grass*

Can plant one acre for 20 to
40 \$/acre. One man opens a
furrows, other sets plants.
If land is good, first cutting
in 2 months.

Clearing land for planting
cost 10 to 20 \$/acre
Rows of grass 18 ins to 2 ft
apart.

Abacate

Some trees bear 3000 fruits yr.

Grape wine

Trials this at Col. Demetrio
light red in color. Has dis-
tinct taste of cashew apple
and is a trifle 'suckery'.
Is not very strong, and not
a bad drink.

Orange Culture

Cop. Demetrio has grown oranges wh weighed over 2 lbs each.

It was amusing to watch Cop. Demetrio's face as I showed him our packing rack & methods of packing the fruit. It was evident that he didn't take much stock in it.

Wraps for buds

Leaves of the Nicotia palm are used for this purpose. The leaflets are cut off, heated over a fire, and then placed in water until used. For use the leaflet is divided at the midrib & the midrib thrown away leaving a strip $\frac{1}{2}$ - $\frac{3}{4}$ inch wide at center and about 18 inches long, wh is used

Coronel Demetrio says he can bud 400 orange trees in a day.

When both both budwood & stock are in good condition they can grow buds without tyings & they will grow.

Best time to bud from rising to full moon. In descending moon there is no sap in the tree & the buds die.

Best buds are from ripe wood. Taken just at the time the eye is going to start into growth.

Bahia, Sat. Nov. 15, 1913

To casa of Coronel
Frederico da Costa, in
Matatu.

Orange districts

The principal orange
districts of Bahia are
Cabulla
Brotas
Matatu
Retiro
Barra
Sabueiro

Jaca

Fruits are good feed
for horses + cattle.

Cattle feed

Dr. Costa gives Cotton
Seed + parunka of manioc,

He has 100 cows, + feeds 14
sacks of 80 liters per day

Para grass principal
green feed.

Capim guiné also used

This is the largest dairy
in Bahia

Two or three cows here with
pink blood, one showing the
pink very plainly. Said
to be resistant to ticks.
Cattle of interior of Bahia
are mixed European
streams, Portuguese +
Spanish

Using Oranges.

Oranges keep sometimes
for 6 mos, the only diffi-
culty they have in speaking
is in fruits dropping to the
ground and becoming bruised

Shipping

Has sent oranges to Europe & the States & they get there in good condition.

People know they must not touch fruits with finger nails.

Also know that they must not be dropped or bumped together.

Oranges to be shipped packed before they are quite ripe.

Has never shipped oranges fully ripe - always picked a trifle green.

Fruits in this Dec are not so sweet & good as those in June.

Orange packing sack which holds 25 to 50 lbs in Calif. would only hold 20 B. oranges. The mouth of sack would

Ground cleaned in grove 2 or 3 times a year at cost not exceeding 16 \$000 per acre each time.

Says in Java even the earth certain you say & everything can be swallowed.

Says it is not difficult here to teach people correct & proper methods of handling.

If they irrigated here the summer crop would be as large as winter. Each time the ground is cleaned and they have a rain, the trees flower.

Present oranges are considered here the best. Col. de Costa says it is a different variety. Has a thinner skin than others. Smallest oranges are better than large ones.

Co. da Costa
 Co. Demétrio
 Co. Lago

Three most important & interested growers in Bahia & should come to San Francisco 1915.

Putting number of trees in Bahia, large & small at 40,000, and 100 trees to acre, gives 400 acres of oranges in this district.

How big is one tarifa?

"If I could sell all my land at 50 or 100 milreis per tarifa, I would have a colossal fortune." He has 20,000 tarifas.

Calculating at 200 oranges to tree, & 4.00 in for 100 8 milreis per tree. 80 trees to tarifa makes 640 milreis per tarifa from return.

You can plant 100 trees to tarifa, but 50 is much better.

Expenses are 3 beginning, 200 reis per tree, sapling in main 100 reis per tree. The only fruits in trees that require it most. 200\$ 600 per tarifa including all expenses, leaving 440\$ per acre profit. Fruit is sold in whole tree price quoted, of 4\$ per 100 fruits, or a low price, often getting more than this.

The land man from his own dairy, & does not buy any. Very hard to buy it here. Not much used in orange groves.

Fruits seem to be larger
as a rule than in Calif.

Some trees on lime stock
laborer says. Better for
damp soil
after clearing give leave
weeds on the ground.

Rice

grown in Rio Grande
do Sul + São Paulo

Para grass

Can get about 9 crops a
yr in lowlands, which if
is irrigated. Can be cut
40-50 days after last
cutting, in lowlands. Do
not grow nearly so fast
in uplands.

Bahia, Sunday Nov 16, 1913 209

took dinner (at noon) with
Mr. + Mrs. Argallo Ferrão
at their home.

Bananas

Mr. Ferrão gives the
following varieties as
being all those grown
in Bahia:

Prata

Quero

Anã

Macã

da Terra

Angala

Maranhão.

São Thomé

" "

Rosca

Haiti

Cayana

Mangos

From an article written
by Mr. Argallo Ferrão
in the local press
I extract the following:

re the mangoes of Itaparica island.

"As mangas as mais afamadas de Itaparica São

Fidalga (meaning arise to chat)

Cabrinha (little goat)

Pão de Lát (kind of pudding made of eggs, flour & sugar)

Fingos d'Ovos (partita made of yolk of egg & sugar)

Dama da Ouro (golden lady)

Manga a Porta (mango at the door)

Coco Velado (coconut after germination & liquid inside has disappeared)

Chupa Mel (sucks honey)

Ananas (pineapple)

Jamelleira (a sp. of Ficus)

Libanassa (almond)

Tio Chico (uncle Chico, or Francisco)

Formosa (fine, lovely)

estando o Sr. Jovino Philippe de Mattos colleccionando expertos de todos ~~clases~~ ellas na sua roca de Itaparica prestando assim aos pomocultores valioso servico."

Styuba grows in the interior, in Serra de Styuba. Fine mango

São Lourenço mango grown in municipio of Jaguaripe.

Familias

Argello says families are unusually large in dry interior of State. Sometimes 20 to 25 children. Infant mortality not as high as in coast.

Catinga

A Tupi word, applied to dry thorn brush regions of interior of Bahia.

Jua (Zizyphus)

Fruit tastes like poor cherry. Make tea of leaves and bark. Tree never without foliage. Common in the Catinga.

Carva

Common in the Catinga. Not cultivated, but fiber harvested from wild plants. Fiber retted rather easily.

Sertão

means uplands. applied to interior of state.

Milk + Oranges

Mrs. Argollo says the production & raising of oranges are two most profitable industries in

Bahia, Mon. Nov. 17, 1913

area of Coronel Lago.

Calçada car, 2 sections.

Got off at Baixa da La-
deira then up straight just
beyond to slant, keeping road
to right where it branches.

Chapaza do Cabella
Wedge

From front gate to house is
a fine hedge of pitanga on
both sides of walk. Hedge
is about 4 ft high x 3 ft
thick. It is kept trim-
med and fairly smooth.
This plant is probably the
commonest hedge plant in
Bahia. It sometimes is al-
lowed to grow to 6 ft or a
little more. Hedges do not
as a rule produce much
fruit. There seems to be
none here at all. Hedge
is quite dense.

Tabete, Goosecherry

Two trees here about 50-
ft high, beautiful

tree, densely foliated
 fruit hangs down in
 bunches like grapes,
 both from young wood &
 from the larger branches.
 Skin faint taste very
 much like a green
 gooseberry. It is not ripe
 yet.

Romã

Two rows of Coringan
 area from house to gate.
 Fruit does not seem
 to get more than 2 1/2
 in diameter here, & the
 skin is usually spotted
 with fungus. These if any
 are 8 1/2 feet in height.

Oranges

Planted about 6 m. apart

Umpo

Has one seedling here that
 is well known & is called
 cara suja (dirty face)

Umpo

It grows here but
 out all dead wood and
 all sickly wood, leaving trees in ^{odd} _{shape}

Umpo

Large tree cannot
 be encompassed by 5
 men with out stretched
 arms. About 10 meters
 in circumference, 102 ^{cm} _{high}
 26 ft in circumference
 Spread of 90 ft

Umpo grass

Too coarse for horses but
 good for cattle. Grows in
 swampy land.

and

13 acres cost him 8 contos,
 with man-lance & 800
 orange trees.

Values orange groves
 at 10\$ per tree

Crop

Oranges bear about
100 fruits per tree the
fruit varying from 3 to
6 inches the best
quality from 7 to 13
months per 100.

Returns

Oranges return about
4\$ per tree net per yr

General

Col. Lagos trees are up to
about 25 yrs. old, and as a
rule in good condition.
This is the first place I
have seen any real pruning
done & he has done a good
deal. Uses considerable
manure.

Bees

Has several hives of native
bees called Urucen,
which do not sting. They
are larger than our bees.

color. The hives are
made of beer cases, about
2 1/2 ft long, 1 ft thick, & 18
in high. There is a small
hole in the front of the box
through which the bees enter,
and one bee always stands
guard in this opening. They
have narrow channels under
the hive.

Stocks

Mr. Argello says reason
for using *Loranga de terra* is used
is because it more suc-
cessfully budded than other
stocks.

Origin

Says no one knows origin
of *Loranga de selecta*



See
Page
222

Base da
Ladice

22 Cabulla	3 00
Barra do Lago	3 00
Barra do Lago	3 2 00
Barra do Lago	3 5 00
Barra do Lago	1 5 00
Barra do Lago	2 0 00
Barra do Lago	2 5 00
Barra do Lago	2 0 00
Barra do Lago	2 00
Barra do Lago	5 00
Barra do Lago	2 0 00
Barra do Lago	2 5 00
Barra do Lago	3 0 00

Cabulla	
Barra do Lago	2 00
Barra do Lago	2 00
Barra do Lago	5 00
Barra do Lago	1 5 00

Barra do Lago	
Barra do Lago	1 5 00
Barra do Lago	1 5 00
Barra do Lago	1 5 00

Cruz de Jesus

Leite

300

Petrô

Bahiana

2000

S. Gonçalo

Pudimati 400

Vários

João Portuguese 3000

Bama

Guedes e Vários 2000

Rio Vermelho

7000

Above list of principal
orange growers prepared
by common consent of the
Council of the

Mr. Angelo says nearly all
the development in orange
culture here has come within
the last 5 or 6 yrs. Pres-
umably that very few groves
were planted.

Oranja Africana

a sort of grape fruit, seem-
ingly old tree here.

Inhame = yam



Location of
Orange groves
at Cabulla

Coronel
Lago

Bahia Texas Nov 18. 1923

Abacaxi

Peddled about the streets
all over the city, and sold
now at 300 reis each.
Carried in baskets (cas-
sus) fastened across
horses' back, one on each
side. This is probably
the most popular
fruit in Bahia at
the present time, the
orange being its only
competitor. The small
one, called ananas
is said to be grown
only in the interior +
sections where they
cannot get abacaxi. It
is much poorer in
lycote than the latter.
Abacaxi sorvetes
are peddled all
about the streets also.

Angalhas saddle for
packing Cassias on
boards on backs of
animals.

224

Bahia, Tues. Nov. 18, 1913

To place of

Miguel de Teive Aguiar
Rua Coronel Gen. Romão
DistrictMangoFruit has been here
Fruit we have seen in BahiaGeographia Atlas do
Brasil e das Cines
Partes do Mundo,Confusine o Atlas do
Brasil de BarãoHomem de Mello e D.
F. Homem de Mello.

F. Brigue & Cia

Rio de Janeiro

Bahia, Tues. Nov. 18, 1913 ²²⁵*Eugenia malaccensis* (?)longitudinal
section of
fruit
natural
sizeDrawing a longitudinal sec-
tion of a fruit called Jambo
with name as applied also to
Eugenia jambos purchased from
a fruit vendor. I take it
to be *Eugenia malaccensis*.Externally the fruit is
a beautiful semi-translu-
cent pink color, the surface
slightly roughened, but
shining. The fruits are
produced in small
clusters of 2 to 5.There is practically no
skin on the fruit, the
firm, crisp exterior layer

of flesh seeming to take
the place of skin. Inside
the layer of flesh is
a cavity filled with more
or less spongy tissue, in
which the seeds should
be embedded but in the
few specimens I have
seen I have found
no seeds.

The flavor is spicy, and
at first taste somewhat
suggests the clove. The
crisp flesh does not
seem to melt up in the
mouth and like that of
the rose apple probably
should not be swallow-
ed. The fruit seems to be
one that would make
a good jelly. For its
spicy, unique flavor it
is well worth growing.

A leaf, natural size,
is outlined on the page
opposite. They are dark
glossy.



228 Nov. 19, 1913 Wed.

Amacéo to Saldanha
about 15 kilometres
Bama city. From Rio
nelho about 12 kilometres

Left Inspectoria de Agri-
cultura at 7 a.m. on horse
back with Dr. Argello Ferraz
Came first to Baitos, just
Amazonian place. Saw all
the way locally, mangrove
and Coco palms, with mango
& cashew & breadfruit trees
Sometime after leaving
Baitos we left the deep
red soil & came onto a
light white sand. Looking
a great deal like Florida
sand, but with many rolling
hills. Here there were
passawa, many cashews,
Gon. merrii, a few long
lyneliad some Caesalpinia
& low scrub. This sandy
was confined to region close
to Atlantic Coast

229

Pernambuco to
Pitiassu

Ways to climbing Coco palms
cut made from dense
palm

Palm hats
made from Merri fiber
very soft & light worth
2000 here

Pindaba
palm of wh leaves are
over together to make
doors.

230 Bahia, Wed Nov 19 1913

Papaya

Fruit bought in Mercado Novo on Nov. 17, at cost of 700 res. Large long variety, called "Mamão de Índia". Length $11\frac{1}{4}$; width at broadest point $5\frac{3}{4}$. Broadest about 3 inches from apex. Form oblong-obovate. Flesh $1\frac{1}{4}$ inches thick, bright orange color, slight musky odor. Seeds very numerous. Flavor rich and very good. Practically free from objectionable musky odor. Color externally yellow & green. The skin has been slit from base to apex in four places to allow milk to escape. The variety can be considered a very good papaya.
Photo made No 740

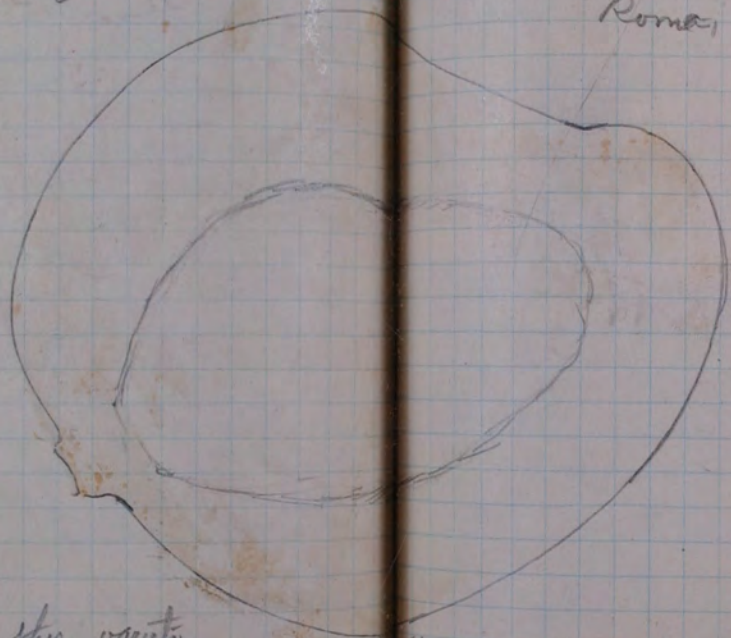
Bahia, Thurs. Nov. 20 1913 231

Went with Dr. Argollo and Dr. Martin by auto on drive north of city.

Bahia, Thurs Nov 20 1908

Mango Rosa

unripe but practically
full grown fruit, from

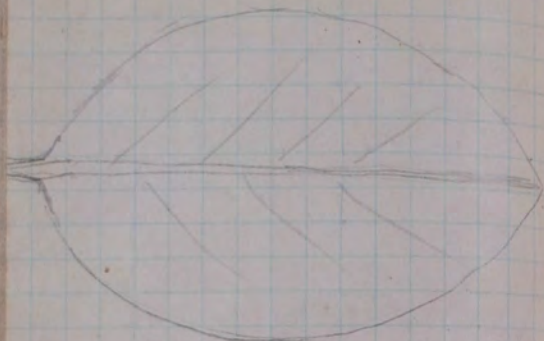


Trees of this variety
are quite productive here.
Fruit varies greatly in form.

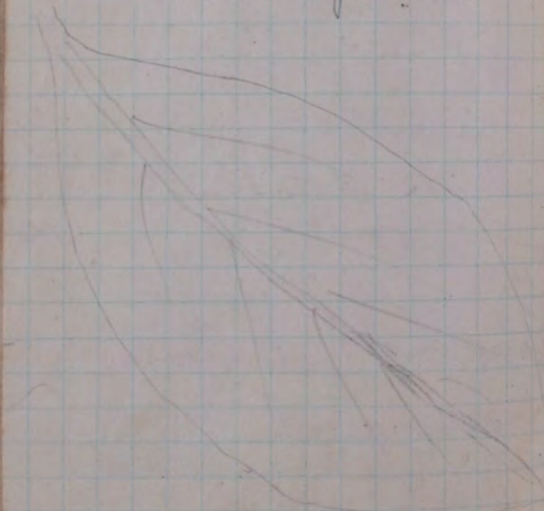
Miguel de Teive Angello
Rosa Coronel
Roma, Bahia

The seed is Solembryonic
containing 7 embryos in + 8 in
another

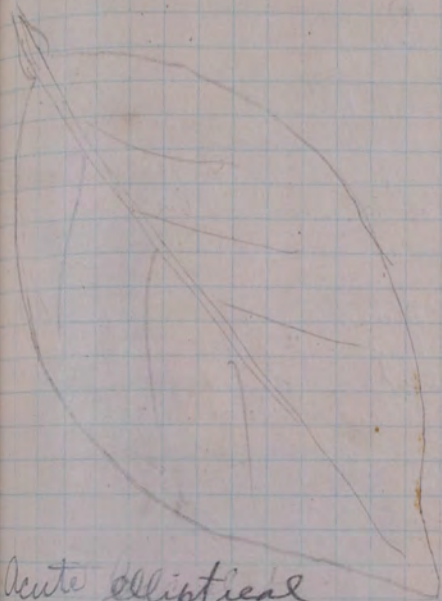
234



ovate elliptical



235



acute elliptical

Types of orange
leaves, Dr. Fortunato da
Silva's roca, Cabulla

- 18 ²³ ~~18~~ Number
- 2 Original, removed, agglutinated
 - 3 Height
 - 4 Spines
 - 5 Habit growth
 - 6 Duration
 - 7 Height of head
 - 8 Number main branches
- Foliage
- 9 Density
 - 10 Color
 - 11 Shape leaf
 - 12 Size
 - 13 Petiole none. Size.
 - 14 Spines
- Fructs
- 15 No. of gum crop
 - 16 " " " "
 - 17 Total
 - 18 variations
 - 19 arrangement
 - 20 color
 - 21 navel
 - 22 scale
 - 23 tongue
 - 24 mottled leaf
 - 25 gum disease
 - 26 plant parasites

Bahia Friday Nov 21 1918 237
 to casa of Dr. Fortunato
 da Silva Cabella to study
 mangrove trees in his grove.

Dr. V. A. Argello Ferraz
 47 Rua Carlos Gomes
 Bahia

238 Bahia, Sat. Nov. 22, 1913

To Mercado Novo, in
Cidade Baixa, with Mr. D.

Bahia Monday Nov. 24

to Dr. Fortunato de
Silva, Cabella, for orange
studies.

Bahia, Tues. Nov. 25, 1913 239

to Dr. F. da Silva's

Wed. Nov. 26, 1913

to Dr. F. da Silva's

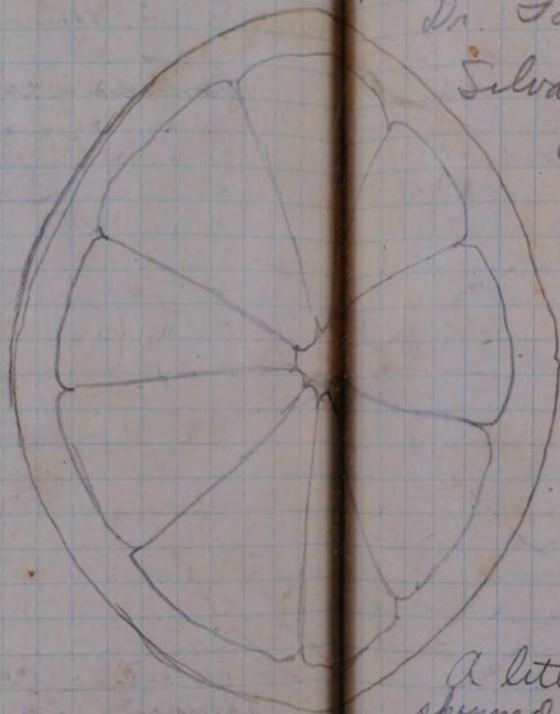
Budding

Dr. Azevedo is going to try
cutting high to prevent
gum disease.

Rogassiano Constantino
da Silva.

240

Laranja de umbigo



241

from Select tree #1
 Dr. Fortunato da
 Silva's grove,
 Cabulla
 Bahia

A little coarser
 skinned than the
 average here

24 Bahía, Wed. Nov 26 1913

Dr. Fortunato da Silva's
place, Cabulla.

To reach here take the road
to the left where it branches
at Cabulla, and come past
the church. After about
 $\frac{1}{2}$ mile you pass enormous
jaca trees on left side of
road, standing by itself.
Next gate beyond the trees
is Dr. da Silva's.

The house is low, one story
and nestles in behind some
shrubbery & trees about 75
feet from front gate. The
walk to the gate is about
25 feet broad & lined with
Arcaea lutescens and immense
crotona of various colors.
The front gate is typical of
the region, two high stone pillars
with ironwork gate between.
The view of the low, plastered
house with its tiled roof from

243

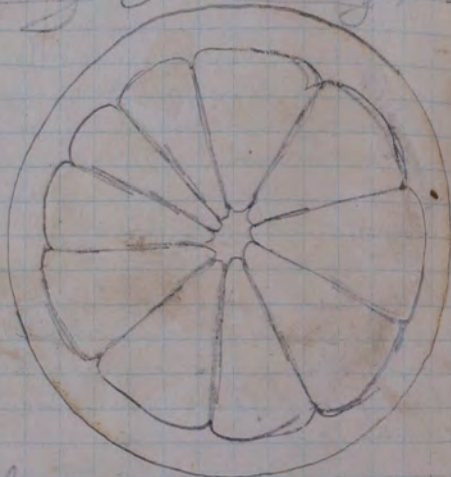
from the front porch one
looks out thru the alley
of arcaea & crotona, past a
wall of coco palms just across
the road, into an orange
grove. Just back of the palms
are crotona bordering the walk
are *egletes*, *tabernaemontana*,
rossa fragrans, *eremura*,
and a *pitanga* hedge lining
the lot.

The house is surrounded by
a broad cement veranda, with
large pillars & low iron
railing. Inside is typical
of good houses here, cement
floor, white walls with a
piece of blue, high ceilings
and doors.

In the grove surrounding
the house are many fine
fruit trees, and a few ornamental
shrubs of which *Muraya*
sp. is one of the finest.
Two large cabbage palms just
behind the house.

244 Bahia, Thrus Nov 27 1933
To Dr. Fortunato da Silva
Caballa

Fruit of June 1914 crop
Trays de umbigo, etc.



Show development at drawing
time. Pulp light streaked
color, skin deep green.
Flesh acid, rather dry at
present. Skin very thick.

From number 2-2, in

245

Biribari
This fruit grows on a tree
wh. looks like Atahete
gooseberry.
Fruit good to clean
clothes.



Color translucent light
green both externally
& internally. Specimen above
shown only had one seed,
but others had more.
Man da Silva says
fruits sometimes eaten
but too acid to
eat raw.

246

Laranja de umbigo

Plot 1, tree 1-2



Dr. Fortunato
da Silva

247

Cabula, Bahia

Nov 27 1913

248 Bahia, Thurs Nov 27 1913

Greenifama

Tasted this fruit for first time today, at Dr. J. da Silva's, Est. da Silva's. Only a very few ripe fruits on the tree. I presumed one as being one of the best myrtaceous fruits I have eaten. I met no larger than a cherry, & of such color, i.e. deep crimson. The green signals pretense beyond apex about 1/2 inch or more. I met no fleshy & contains 2 seeds about size of small cherry stone. The flavor might be likened to that of a sweet cherry. It is very agreeable & free from any disagreeable taste so often present in myrtaceous. The tree bears prodigiously, & a very handsome as well.

249 Bahia, Thurs 27 Nov. 1913

Galutricaba roxa



Cross sec. showing seeds

Fruit from Dr. J. da Silva's Est. da Silva's at Cabulla. This is the best flavoured galutricaba I have eaten & is absolutely free from any disagreeable tawar. It is the same variety, apparently, as the lot I've bought in Rio, except that the seeds in this are pure white instead of pink & other respects it seems to be the same thing. Skin very thick, full juicy, & really delicious & eatable. I may call it Galutricaba roxa

Mango

Behind the house, on
slope of hill at 99
Victoria, very fine fruit
of the Guadalupe
hill give timberwood.

Manga Rosa at the
Amojun's place, Costa

Rosa bears young &
heavily.

Famous mango beyond
Villa Nova at Serra
Hambra

Santa Antimo de Jesus

Boat to Nazareth, train on

Amargosa
great tobacco country.

Both above places with
seems the Guadalupe say
great tobacco country

Mathers & Co

257 Bahia, Fri. Nov 28 1913

10 m. hgt. + bark; describing orange fruit

Jatropha

Dr. Argollo thinks white
sueded *Jatropha* at da
Silvas in var. *muicata*

gracata

253

254

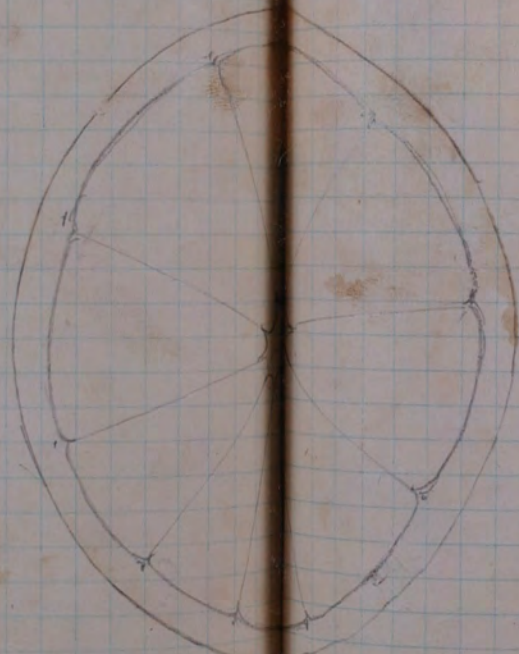
Bahia, Fri. Nov. 28, 1913

Laranja de umbigo

Select tree No. 1

Dr. Fortunato da Silva

Cabullo.



255



Apical section thru navel
of an orange from Dr.
Fortunato da Silva

Laranja Cravo.

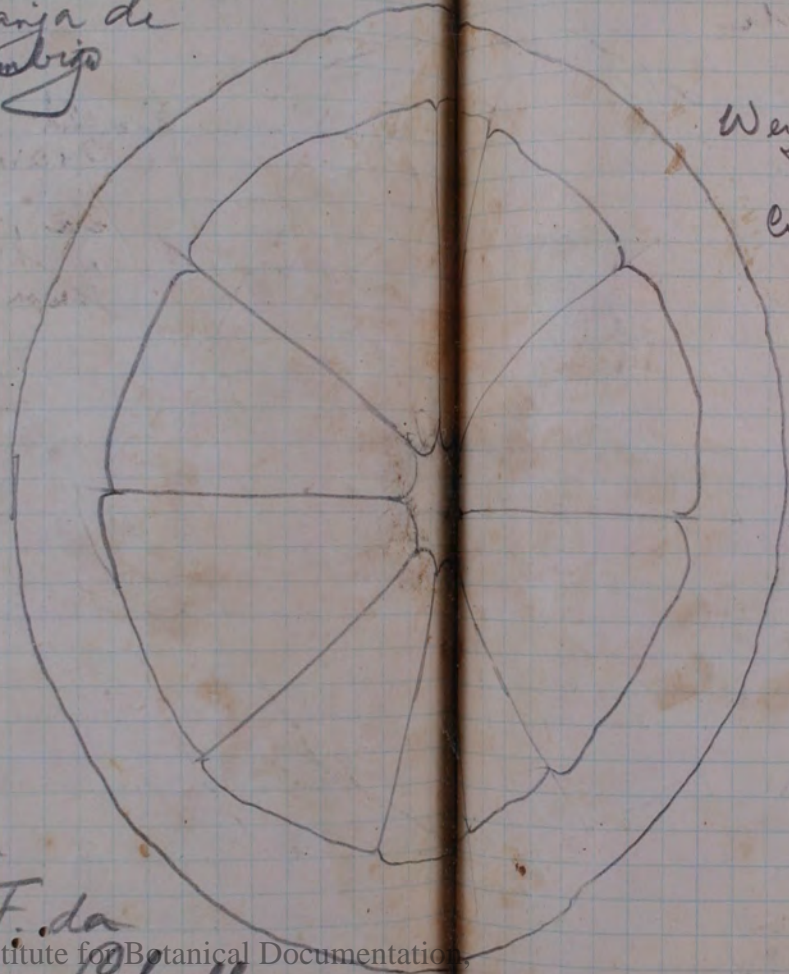


Laranja cravo, from
Dr. Fortunato da Silva,
Cabulla, Bahia

Nov. 27, 1913

258

Laranja de
Urbino



259

Weight
1050 grams
circ 17 1/2 in
Diam 5 1/2 in

from
Dr. F. da
Silva Cabral

260

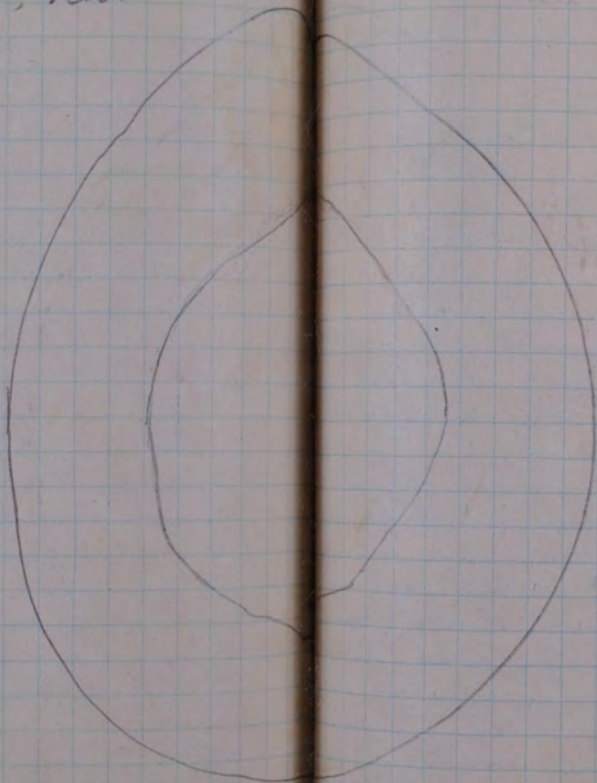
Have tried the following
kinds of sorvetes:

Pitanga
Abacaxi
Genipapo.
Abacaxi
manga

261

262

Avocado No 1.
Purchased in Mercado
Novo, Bahia, Nov.
28, 1913.



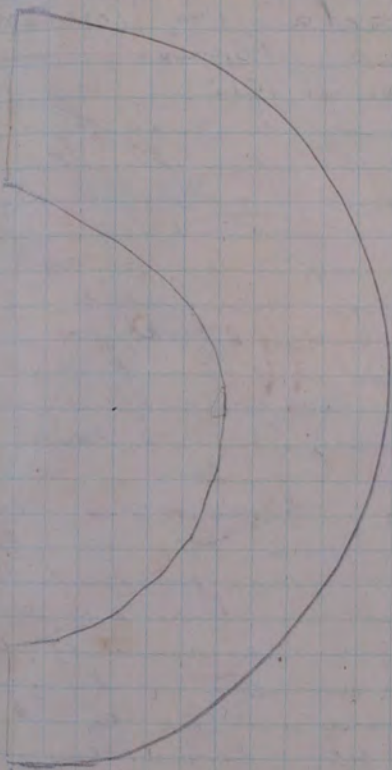
263

the View Photo 909.
directional " 902.

Avocado No. 1.

General form broadly obovate, almost round. Cross section regularly round, size medium large, weight 700 grammes, length $4\frac{1}{2}$ inches, breadth at widest point $2\frac{1}{4}$ inches. Stem missing from this specimen; base tapering slightly, cavity shallow, flaring, medium broad, markings none; apex slightly depressed; surface smooth, yellowish green in color, with many irregular, small patches of russet; skin less than $\frac{1}{16}$ inch thick but tough and granular; flesh $1\frac{1}{8}$ inches thick at widest point, pale green near skin, cream colored toward seed cavity not ripe enough to test flavor but no fibers in flesh and of attractive appearance; seed irregularly oblate, weight 85 grammes, smooth or nearly so, one coat adhering closely to flesh + one loosely to

Avocado No 1.

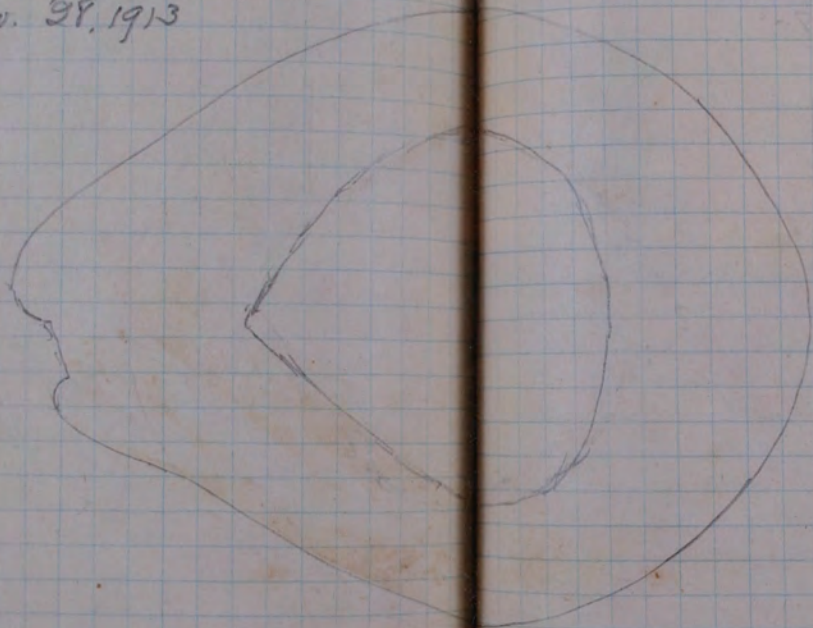


transverse section of $\frac{1}{2}$ of fruit to show thickness of flesh.

266

Avocado No 2.

Purchased in Mercado
 novo Bahia,
 Nov. 28, 1913



Side View Photo. 910
 Sectional " 903

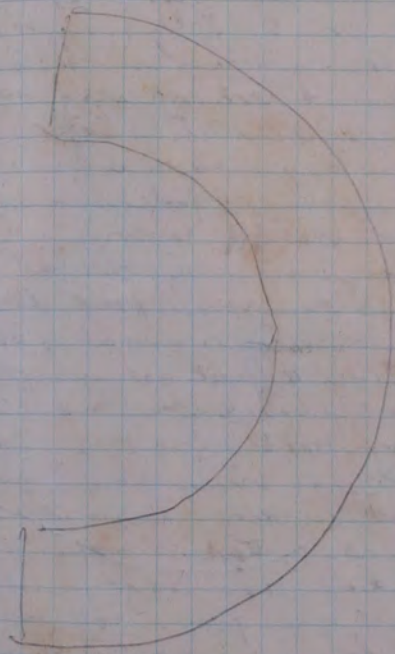
267

Avocado No 2.

General form oblong pyriform, slightly necked, cross section round; size medium weight 480 grammes, length $5\frac{1}{2}$ in, breadth $3\frac{1}{2}$ in, stem missing from this specimen; base tapering but not very distinctly necked, cavity shallow, flaring regular; apex rounded, slightly oblique; surface very smooth, light green in color, with numerous medium sized yellowish dots skin less than $\frac{1}{16}$ inch thick, but not granular; flesh $\frac{5}{8}$ inch thick on side of fruit greenish near skin deep creamy yellow toward cavity, firm, smooth, free from fibers; flavor rich, a trifle dry; quality good to very good, seed concealed rather rough, weight 50 grammes medium size, one coat adhering loosely to flesh, the other adhering loosely to seed.

Date: Nov. 29, 1913

Avocado No 2.

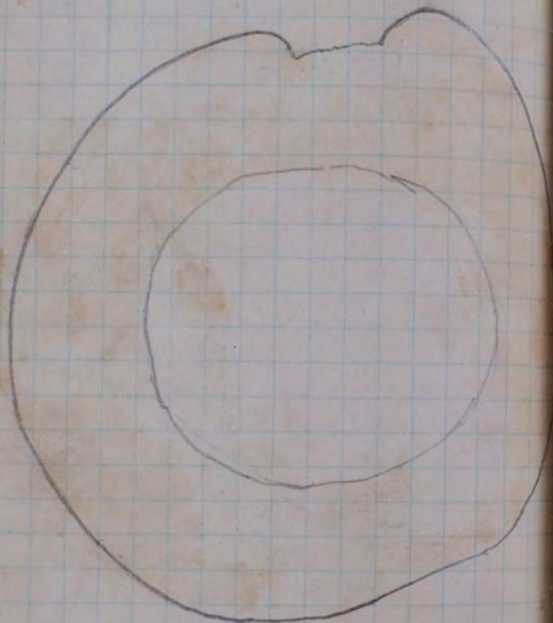


transverse section of one half of fruit.

270

Avocado No 3.

Purchased in Mercado
Novo, Nov 28 1913



271



Photo no 904 • (5x8)

272

Avocado No 3.

General form spherical,
 cross section round; size
 medium small, weight 300
 grammes, length $3\frac{1}{2}$ ins.,
 breadth $3\frac{1}{4}$ ins.; stem
 missing; base slightly conical,
 cavity shallow, rather broad,
 rounded; apex flattened,
 somewhat oblique; surface
 smooth, crimson maroon
 in color, with numerous small
 yellowish sunken dots; skin
 less than $\frac{1}{16}$ inch thick,
 not granular, pliable; flesh
 $\frac{3}{4}$ inch thick, greenish near
 skin, deep yellow near cavity,
 with dark purple longitudinal
 streaks towards skin, soft-
 bathery, oily; flavor almost
 too oily, but not nutty; quality
 good; seed oblate, medium
 size, 60 grammes, both coats
 adhering loosely to seed.

Nov. 29, 1913

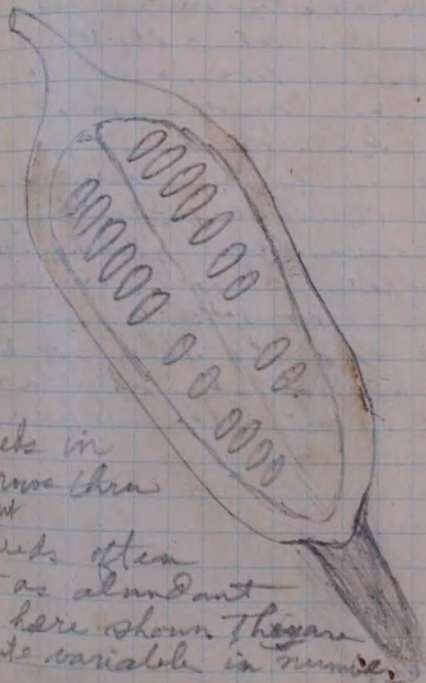
Bahia Nov 29 1913 273

Stravata (Nov 29, 1913)

Photos

905 (white background)

906 (black ")



Seeds in
 Brown thin
 nut

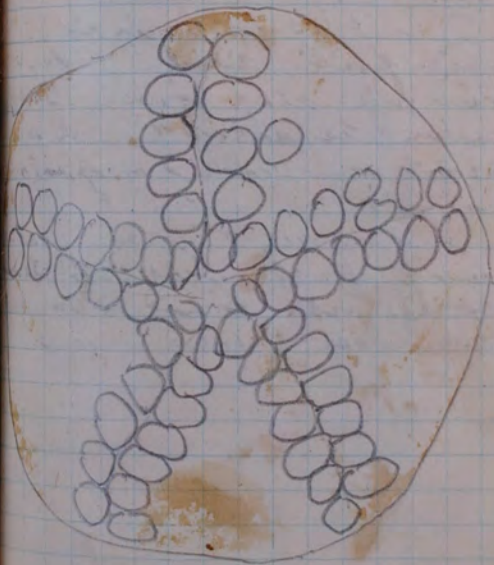
Seeds often
 as abundant
 as here shown. They are
 quite variable in number.

Gravata

Dz. Argello says this is a bromeliaceous plant, a sort of wild Ananas. It grows in the sertão.

Fruct is translucent white, sometimes greenish towards base. Apex crowded by dry brown calyx (?) $\frac{3}{4}$ - 1 inch long. Skin not well defined, about $\frac{1}{8}$ inch thick; said to be the mouth of cater. It has crisp juicy, delightfully acid and aromatic, somewhat suggesting pineapple, not fragrant. Seeds vary in number & is located in the fruit. Small, flat, and black, hard. Bought them in the market at 100 reis for 6.

Ramã (Pomegranate)
Nov. 29, 1913



Romã

This fruit is not common in the market, but a few can nearly always be found at this time. The size is usually always small, the one shown in drawing on preceding page being one of the largest ones we have seen.

The pulp is very scanty and pinkish white in color, not very attractive. The flavor is about the same as that of a poor pomegranate in Calif.

Externally they are light brown, tinged with red more or less, not as red in color as those I saw in Arabia

Bahia Nov 29 1913

Pitanga

In clearing seeds out of some pitangas obtained at Dr. Fortunato de Silva's place, Calulla, Mr. Dorsett found them badly infested with larvae, much as the *fabricabas* were in Rio Janeiro.

Cocos schizophylla Mart.
= *Cocos dracuni* Neum.
The Nereis palm

Museu A. Diniz
Bahia

Has excellent collection of Botanical and scientific works, and good collection of specimens, especially Mineralogy, Conchology, woods & Indian implements.

Rio São Francisco

Mr Jean Meyers whom
we met at Da Argueda
says it is best to carry a
filter bottle when
thing on the Rio. They
be bought at Casa
Inglesa Bahia. Also
possible to carry a
hammock, which can be
bought at Ityuba, where
the train stops, on the
way to Itaperiú, at 70\$
90\$ each

Maps

Dr. M. Arrojado Lisboa
of the Inspectoria de Obras
Contra as Seccas, says:
The best map of Bahia
state is the one by Branner,
of which I have a copy (F107); this
map is lacking in some details
but everything on it is accurate,
whereas on some of the other
maps much of the topography
is pure guess work.
Hornum de Nello's Atlas do
Brasil, while the best yet
published, is at least 50%
guess work in so far as
topography is concerned. The
towns are probably located
fairly accurately.
No map of Bahia city ever
published, the one or two
have been drawn up.

Jarofa

Cassava meal fried
in butter & browned,
used to stuff turkey

282

Navel oranges on
Rd São Francisco

Get Photos of:

283

Cut specimen of -
Cherry, at Or da Silva -
Pintiri " " "

284

285

1 brush
1 "
oil

300
100
800

	100
Jaboticaba	3.000
Tabellada	6000
Pitanga	500
Guava?	450
Gumixama	456.000
Rheedia	

Colombia
Pastelaria Piedada
at 7 hours 3040

		100		7520 ^a
Guava	100	4	04	
Pitanga	300	2		
Guava	300	2		
Woodack	800	2		

Nov 28 Cash

150 in checks	
3074	got 3,020
600	
1250	452
1000	700

Mixture of Raes
Bore goods
Misc Exp
Orange Culture
Transportation
fuel, saltles
cars
long package off car

A Mio Pracere
Labor omnia vincit

Harris

Send white fly material
to Berger
Buy out cotton + boxes
+ killing bottle

Guava



Mango Description

- General Form
- cross section
- Size
- weight
- measurements
- Stem
- insertion, length, character
- Base
- character,
- shape, etc.
- cavity form, depth, breadth, markings
- Apex
- form
- mark location + size
- Surface
- texture, color, dots
- skin
- texture, thickness, adhesion.
- Flesh
- color, aroma, texture, juice
- Flavor
- Quality
- Seed
- form, size
- Remarks, Season
- Characteristics of Growth and Productiveness

Directoria das Rendas
 Da Falcão, Director
 is interested in Orange
 Culture and knows
 about introduction of
 Bahia orange into Alagoas

22 scale, insects

23 fungi

24 parasites plant

28 depth roots

Want publicação
 No. 13, Serie I-A, of
 Inspectoria de Obras
 Contra as Secas.

"A tamarieira e seu
 cultivo" por Alberto
 Lefgren. Março de 1912.

Portuguese - French Grammar
 by Arney

292 Bahia, Wed Dec 3 1913

To casa of Coronel Frederico da Costa, Maratuba

Picking Oranges

Saw men picking the fruit for market by standing tree. Clip off fruit, leaving about 2 ins of stem attached to it and allow it to fall to the ground.

Canoes

Commonly are made of Vignathicum (?) and also of Cedro

Munturi

Preparation of green Cashu nuts eaten with salt fish etc.

293 Bahia, Thurs. Dec. 4, '13

Area of Col. Frederico da Costa

finished trees in Plot I yesterday. Commenced on Plot II today.

Plot I lies S.W. of the house, on a gentle slope facing the W. Trees are about 15 yrs old, and given clean culture. Contains 56 trees, 7 in each row. 6 of these are lemons, + the rest aranja de umbigo.

Found little brown scale, white fly, cottony scale, + aphid + black scale. Trees not very productive, but not so badly attacked by gum disease as in Dr. Fortunato Dr. Silva's grove.

294

Plot II

Faces N. or slightly N.W.
 on slope of 6 to 8 degrees
 55 trees in this plot 11
 rows of 5 in a row 5
 trees ash tangerines.

These trees are the most
 healthy, vigorous, and best
 care of any I have seen up
 to the present. They appear
 to be 8-10 yrs old. They
 are broad & spreading
 with dense heads of foliage
 reaching almost to the
 ground. Color of leaves
 is deep, healthy green.
 Trunks are not as thick
 covered with lichens as
 the other plots we have
 studied. There is very
 little scale.

I found one tree in this
 plot bearing 371 fruits, of which
 about 300 were Dec. 10, 1909,
 ready to pick now. Con-
 sidering the fact that
 these trees are 8-10 yrs old

295

Should compare favorably
 with those in California.

Plot started with Capim
 & ligda, & considerable
 cow manure applied.

Dr. Falcão
 Director de Rendos

Gravata

In taking the seeds out of these fruits Mr. Doretto found that the acid contained in the skin of the stem on his fingers clear down to the flesh in several places. He used his thumb & finger to force open the fruit & work the seeds out. I cut the fruit open with a knife & pushed the knife to remove the seeds, with the result that my fingers did not get sore. There is evidently a very strong acid in the skin.

Mercado Novo
 Dec 6 1913

Pineapples
 sold in skin
 Bananas various kinds
 red
 Water melons

Large baskets of them

Mangoes

Pumpkins

Orange

Mandarins

Coconut

Olives

Peppers

Dried Shrimps

Sugar Cane
 I cut in sections

Gloh
 Yams
 Potatoes
 Gravata
 x Mamão
 Custard Apple
 Chayote
 grapes
 x Pomegranates
 x Lemons
 Tomatoes small
 Apples from the states
 Musk melons from Jaquin

x Sapoti

x Pimenta

Nouri hats + brushes
 Caspadma
 Dende Oil
 Baskets
 Cotton - Water d. lbs
 Patente
 Garman
 Tampa
 Bucket Orange trees
 Wooden forms
 Peanuts

One section occupied
by cafe & pastry sellers.
Another fish market
Another kumch kraach
from Germany
Japanese section very
popular
Many kinds of small
cakes
Korue & fresh meats

Bahia Monday Dec 8, 1913

Goa of Col. Frederico de
Costa Matutu

place of Orange Grove
the Coronel's property his
property at 3 contos
per acre.

the Coronel is Vice
President of the Senate
of Bahia state.

Twenty years ago he bought
the 200 acres at 30 contos
and the rent was about
3 contos per acre. Has
spent 60 contos into buildings.

Orange Grove
Orange plantations let out
land at rent of 20% to
30% of crop to natural
laborers who live on
Col's land and do labor
one day 1\$ to 1\$ 200 per
day.

Cajuí.

General form exclusive of seed oblong, obovate, flattened at both ends; cross section round; stem not present on specimen, base flattened, cavity shallow, rounded and coarsely furrowed, narrow, apex depressed to conform to shape of seed, surface smooth, like the touch, bright yellow to scarlet in color, skin very thin, few acorns; flesh meaty, overflowing with juice, aromatic, clear light yellow in color, flavor peculiar to this fruit, after taste suggesting banana, aromatic, soft; seed common, 1 inch long, $\frac{3}{4}$ in. wide, attached to outside of fruit at apex.

Bahia, Dec 9 1913 Tues.



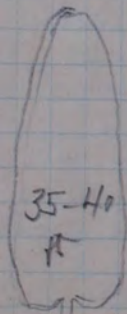
long; sec.
three seed

Cajuí from roça of Col.
Demétrio, Cruz da Cosme.
natural size
good average fruit for Bahia

Bahia Dec 9 1913 Wed.

To roça of Cal. Demétrio
Cruz do CarmoAraticum

The fruits on this tree are much larger than they were on our last visit here, but they say they will not ripen until January. The flesh of this fruit is yellow and Mr. Cruz all says the quality is not as good as the fructa de Conde.

35-40
ft

Bahia Dec 10 1913 Wed.

To roça of Cal. Demétrio

selecta arang

Two trees among the small oranges here wd bear fruits with seeds and without seeds, apparently almost identical in size with the Rio selecta. Probably a reversion to Cal. seca say, they are grafted on ambrigo stock.

Bahia Dec 11, 1913. Thursday
To piazza of Coronel Lago,
Cabulla.

Very little scale on trees here
found cottony, brown, white
fly pupal cases, and conical
scale.

Many Australian navels
here, Cel. says his trees
bear regularly every year.
Crop seems to be rather
small, however.

Mango tree

Circumference 25 ft (7.96 ft)
Spread or way 96 ft diam
" after 120 ft
Cel. thinks this tree
over 100 years old, perhaps
150. Bears about every
third year, and the fruits
are good. Says it's the
largest mango known in
Bahia and people
bring them from Pernambuco

any there are none as
large there.

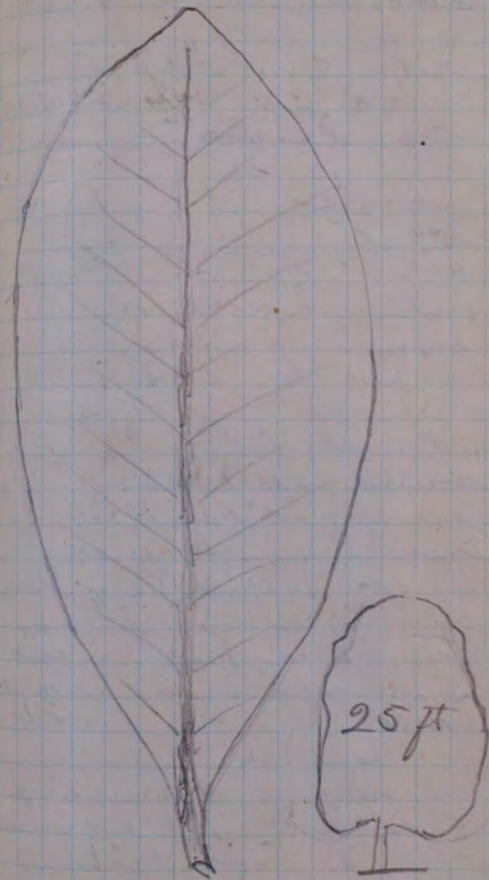
11350 square feet
covered by shadow of
this tree, taking width
of shadow at 120 ft

308
Bahia, Dec 12 1938 Friday

To roça of Col. Lago and
roça of Dr. Fortunato da
Silva, Cabula

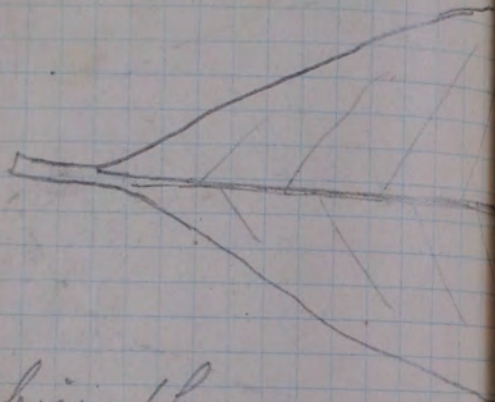
Grumixama

The tree at Dr. Fortunato's
place, wh was just com-
mencing to ripen its fruit
on our last visit (see
notes) has ripened its entire
crop and the fruit has
all been picked, eaten by
birds, or fallen to the ground
and picked up
nearly 2 quarts of seed
under the tree. The seed
was clean and dry and
in excellent shape in most
cases. A few in moisture
under leaves near trunk
had already germinated.
Tree about 25 ft high, densely
foliated. Leaves leathery,
deep, glossy green.



Grumixama (see page
opposite)

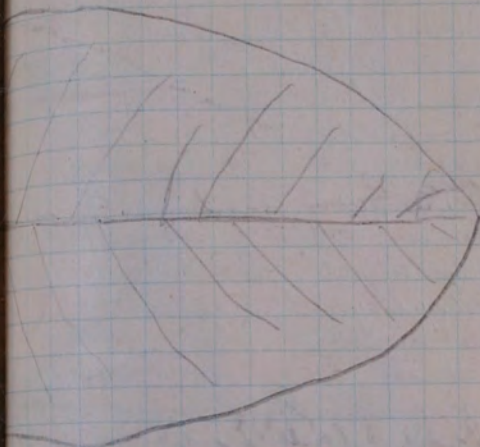
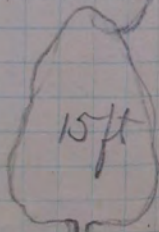
Bohna, Dec 12 1913



Abiero (Lucuma
caimito)

From Dr. Fortunato de
Silvas place, Caballa

Tree not in fruit. About
15 ft high, densely fol-
liated.



Leaves glossy green, veins
rather prominent.

312
Pitomba

Specimens obtained at Cal
Elvidio Esteres Assis, Calull
Gave beginning to ripen at
After June. Those on tree at
Du. F. da Silva's place not
yet ripe.

Tree very handsome. Foliage
dense, deep green in color,
glossy, the tree compact and
shapely. Would be a fine
ornamental tree.

Fruit borne on small wood
General form broad, pyramidal
length about 1 inch, breadth
 $3/4 - 7/8$ inch; base slightly
tapering, cavity small, shallow
rounded, regular, open into
small rudimentary leaflets at
insertion of stem. Stem 1 inch
long, slender. Apes very
(and in piece)

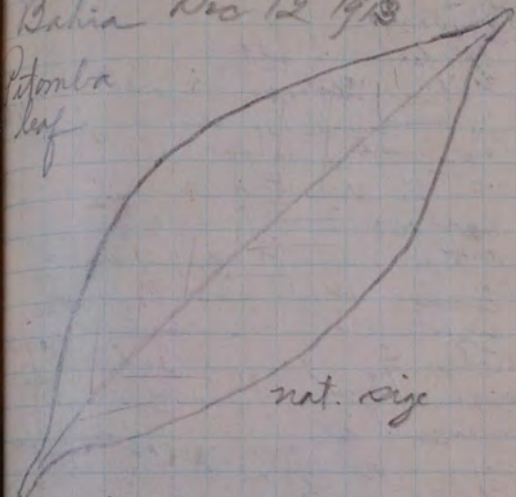


general view
nat size

Bahia Dec 12 1913

313

Pitomba
leaf



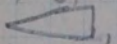
nat. size

leaf thick, leathery, stiff.
deep green above, light green
beneath. Veins scarcely
noticeable on upper surface



general
view
nat size

37
Pitomba (cont'd)

brood, eye $\frac{3}{8}$ inch wide and
 $\frac{1}{4}$ inch deep, sepals persistent
#5, about $\frac{1}{2}$ inch long, , light green in color,
surface smooth, deep orange
yellow in color; they thin
rather tender, flesh
light yellow-orange soft
when fully ripe about $\frac{1}{8}$
inch thick, flavon acid,
aromatic, peculiar seed,
round, about $\frac{1}{2}$ inch in diam.
attached to one side of
seed cavity.



315
Bahia, Dec 13, 1913 Sat.
Col. Baretto, Cabulla.

sp. of Spondias very
common to Bahia except in
habit of tree which is upright
and tall in place of low
spreading. Common around
Bahia.

It is
the man who grafted orange
trees was a Portuguese here
in Cabulla, and the work
was done in 1822.

stocks
Col. thinks laranja da terra
is best.

Best trees Col. has here
are 40 yrs.
Thinks they will live and
bear well for 50 yrs. His
40 yrs old are still bearing
well.

Col. Baretto

Invalid, and evidently
very poorly. quite old.

Crop

Says some trees give more
than 1000 fruits each yr.

Small grove here 40 yrs old,
on da terra stock. Bearing
well. Bobby gummed on
trunk and main branches,
but the vigor of the tree
does not seem to be seri-
ously impaired. Found
small quantity of brown
scales, white leaf leeward
cases, cottony scale &
mealy bug. Lichens on
trunk. No clay fungus &
little leaf fungus. I noted
one very large navid on
1st tree examined. but most
are small.

all #2. Some clay fungus
& leaf spots. *Periderma*
sprung from da terra stock.

Several fruits on several
trees.

Trees are fully 30 ft high
in some cases and perhaps
even taller in spread
upright, not very densely
foliated, but bearing
fine big crops of fruit.
Trunks covered with lichens
and fungus.

Cornel Baretto bought
the place 40 yrs ago &
there were already mavel
wreaths on the place. Says
the Portuguese mos first
budded crabs in Bahia on
this section *Cabreana* 1852,
year of Brazilian independence.



Showing joint where 40 yr
old rubber granules were
budded in Lavanga da Tona

mentaly
in two cassias, on mule
load there were
100 of small size
74 " large "

134
67 average in each cassia

Cratium
Bark makes good
rope or bark rope, when
fresh

Bahia Monday Dec 15 1913
To place of Dr. Miguel de
Teive e Argollo Roma

Annona muricata

Saw this in car line
to Roma. Not common
here.

Dende

Fruits are picked by
men who climb palms
with ropes used to climb
coco palms. Pay 900 reis
per palm for gather-
ing the fruit.

Taja

Mr. Argollo says the
the bark of this tree is
sometimes 2 inches or more
in thickness, and easy
to carve, though fairly
solid. They make
spirits & carved
figures of it.

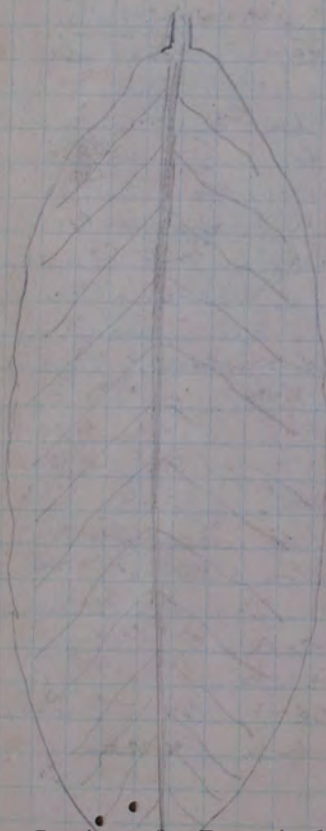
used for fence posts,
but staples often full
with ap. thick bark.
Easily grown from
cuttings.



Manga de Rosa
 from Dr. Miguel
 de Teive e Agallo's
 place, Ponta
 Bahia Dec. 15, 1913

Specimen which
 was photographed
 cut in halves
 longitudinally
 to show poly-
 embryony of seed.

324 Bahia, Dec 15 1908
"Mangostão da Africa"



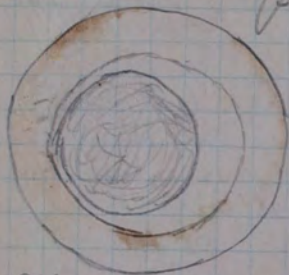
long. side
of fruit of
lightly above
natural size

325
Dr. Miguel Argollo's Place
Mangostão da Africa

A small, apparently tree
shrubby and scraggly tree,
not more than 8 ft high,
called by the name by
Dr. M. A. Argollo. May be
a geranium. A leaf
is shown in outline
opposite. The leaves are
thick and stiff, the mar-
gins slightly re-curved,
the veins prominent on
the under surface. Color
deep green above, light
green beneath.
Fruit, shown opposite. The
color is deep orange C.C.
106. Skin is thin and
not very tough. Sulp. very
soft & juicy and of a
slightly acid flavor,
quite agreeable. Seeds
2, oblong, compressed on
one side, very large.
Smooth, brown. Said to
have been imported by Dr.
Argollo. Very few fruits on tree.

3rd Bahia Dec 15 1913 Monday

Jambo (*Eugenia jambos*)
From Dr Miguel Argüelles
Place, Bahia



Cross section

This fruit is pale straw colored with no reddish tint as sometimes possessed. The aroma is delicious and the flavor as good as any I have eaten. There seems to be considerable difference in the quality of *jambos* from different trees. There is much difference in size amongst the fruits on the same tree.

327

Bahia Tues. Dec 16 1913

To Col Decan + Col. Fda Costa

Simbira

Fruits good to season food

Also medicinal, used in ulcers etc.

Fruit dried + kept for seasoning foods

Tree 25-35 ft high



The bark, when fresh, makes an *imbira* or bark rope, though not the true *imbira* which is made from *imbira* tree.

Encosto = reaching

Bahia Wed. Dec 17 1913
To roça of Sr. Bahiana
R. Two

Sarapiera

Sandy lands on which
abacaxi is planted will
not grow anything else even
mandarins. Can only
grow pines on land & no
land is then abandoned
abacaxi eaten by people,
bad pest.

Tabernaemontana - Jemim

Ants

Bahiana says in orchard
off 100 selecta oranges
when there is one ~~orange~~
the ants will leave the
selecta alone & cut
the leaves of Tanga

Cavalle - stock plant

Has two kinds of laranja
do terra, amarga
& tanga

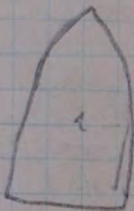
Amarga has practically
no thorns, skin thick
& less firm, not as good
as tanga for eating

Tanga best for budding
on. Has many more
thorns than amarga. Much
less acid. Leaves seem
about the same. This is
the variety Birch reported
in sea being used as stock

Curving
Stock plants tanga &
amarga plus. Use same
kind of buds as Decca &
tree with N. curvi. Buds
5-8 in above ground.
Has 2000 plants in
nursery.

Mauri =

Leaves cut & dried
in sun yield white latex
but small quantity
English form for culture
add this palm to that
part as for fiber.
Seeds good, oil +
butter. Palmito good
Young shoots good to eat
Shells good for fuel



Orange buds cut by Dr.
Bahiana.

Pica

12 prints see for 4800
here at place. In market
sell for 500 reis each.

Calaro

Baskets in wh plants
are put in. Made from
Hence leaf stalks, split.
Sell for 1100 reis in
quantity 60 reis each.
Wh made in Sabroiro

Oranges

de fumbigo sells at 4 to
12000 per 100 here

Oranges. Price

In Mercado Novo
ask 100 reis for fruit (Some
marked 80 reis) would
probably sell for 80

Feijão
 Cook beans, 24 lbs
 in lit. given at
 Alagoinhas in Feijoad

Dec 18 1913 Thursday
 at Bahia 7:30 a.m. via C.F.
 Bahia - São Francisco
 station Agua Comprida,
 8 kilometres from Bahia. To
 casa of Coronel Argollo

Periferi station
 distance from Bahia 10^x960
 altitude 5^m920
 Mr Argollo says this place
 belongs to Coronel Frederico
Costa. Station about 100
 yards from sea shore.

Capim Milião = bogies
 that get brown grass but
 Mr Argollo says it is
 an annual & is killed
 out by grazing.

Empap wine

João de Teive & Argollo
 Agua Comprida

Sapota larger than
Sapote round
in place of Congress

Buri palm
whose fiber is used to
make long sacks
of which farinha is
made.

Puruba sort of bamboo
which grows like
cane & whose fiber makes
coarse sieves for farinha

Long straw bags called

Tapeti, they are made
here and cost 1 \$ 200 each
will last 60 days of constant
work if well made.

Rattete, machine for grinding
mandioca. Two cylinders
about 8 ins in diameter and
each 6 ins long covered by
the work horse.

with about the condenser
back saw in one case in
the by stall with coarse
dispositions which leave
the sticking up like a
rod along water about 1 inch
out, the hole 1/4 inch in
diam. These two sit on
a table 2 1/2 ft high 2 x 5 ft
and operated by
a hand crank on
each side. The
rawhide bands
are by 5 ft drive wheel
rotated 180 deg from
top down, & operated by
hand crank at other
side.

Mandoca drops into large
wood box. The
water in tapeti is and
squeezed by applying pres-
sure of large pole on top
which extends the sacks
down. The poisonous
liquid, containing prussic
acid, out. That liquid on
a large jar over brick
floor. The liquid is caught
in wooden basin & stored
in vat on bottom side

of bark is saved to
starch clothes. The inner
fine grained, forming
breadings in tapes &
removed & dried by
heat over in large
oven over brick furnace.

La Rosa Mango
Manga da Rosa

from roca of Dr Miguel de
Teixeira e Argollo, Roma.

General form compressed
oval, blending to cordate;
cross section oval; size
medium large, weight 480
grams, length $4\frac{5}{8}$ ins,
breadth at widest part $3\frac{7}{8}$ ins;
stem insertion oblique, long,
rather slender; base slightly
flattened, cavity shallow,
flaring, somewhat irregular,
left shoulder very broad &
rounded, right shoulder less
prominent, apex very
slightly beaked, not sharp
with 1 inch two longitudinal
apex small depression; sur-
face smooth, color rich
yellow tinged with salmon,
one side of fruit overspread
with bright rose red, vary-
ing to salmon red or
flame red, beautiful
& striking. Numerous fungus

spots + discolorations
 dots and marblings sub-
 cutaneous, slightly lighter
 in color than skin. Skin
 1/16 inch thick, adhering
 rather closely, tough &
 firm, 1 inch thick at wrist
 1st joint (on shoulder) deep
 yellow in color, aromatic
 faint but very agreeable
 & free from turpentine odor, smell
 firm and meaty, slightly
 fibrous, particularly on
 shoulders, juicy but not ex-
 cessively so; flavor arom-
 atic, sweet, & absolutely
 free from turpentine but a
 tingle below standard in
 character; quality good;
 seed 3/8 in. long, fine brush
 at widest part, about 1/8 thick,
 oblique, located at apex
 fully embryonic, fibrous proce-
 ding on edge where fibrous
 in long, other parts short
 fiber fine. Season December
 January at Bahia.

Dec 18 1913

Wild Abacaxi

grown on hillsides
 around Agua Comprida 28
 kilometers N. of Bahia.
 Plant seems practically
 identical with cultivated
 pineapple, but spines on
 leaves a little less abun-
 dant.

The joints are up to 8-10
 inches in length, with bracts much
 more prominent than in
 cultivated abacaxi, being 1-1 1/2
 inches in length & rose red in
 color, dull on outside. The
 leaves of crown are more
 coarsely serrated than in
 cultivated abacaxi I have
 seen. Flesh is fairly solid
 white in immature specimens
 examined, seeds very few and
 small. May be a cultivated
 form run wild. Fruit said
 to be eaten by natives
 occasionally.

Dec 19 1913

Manga da Rosa



Specimen described in

Dec 21 1913

Manga da Rosa
Color

The color of this mango when ripe is most beautiful & striking, in fact about the finest I have ever seen. The ground color, which is seen on the unexposed side of fruit, is a beautiful pale apricot, tinged with green until fruit is fully ripe. The exposed side is heavily over-spread with flame scarlet, deepest at basal end and gradually lightening toward apex to reddish salmon. The subcutaneous dots, light yellow in color, show up prominently on this red cheek. See noted numbers in Code des Couleurs.

Roy C. Andrews
 Curator of Mammalogy
 Am Museum
 New York

a friend of Robert H.
 Becker of the Field
 Museum of Natural
 History Chicago whom I
 met in Bahia Dec 19 1913.

Robert H. Becker is a graduate
 of Beloit. Has been
 in interior of Bahia collecting
 specimens for the
 museum New York to
 Lagoa Santa.

344

Bahia Dec 21 1913

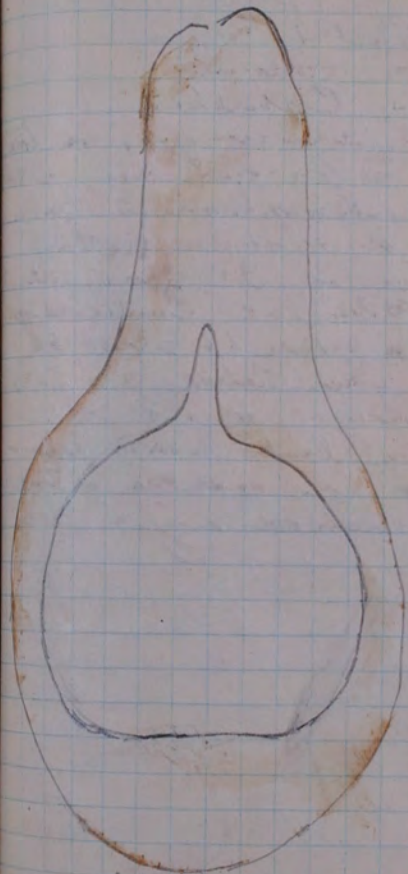
Avocado #4

From Coronel Barretto's
peace, Catulla.

This specimen was too
green to permit an accurate
late description. It was
obtained because of its
exceptionally prominent neck.
See *Arbores. Cordanae* for
color of skin a yellowish
green. Skin thick & tough.
Seed large for size of
fruit. Photo was made
of the tree and one of the
fruit natural size.

345

Avocado #4



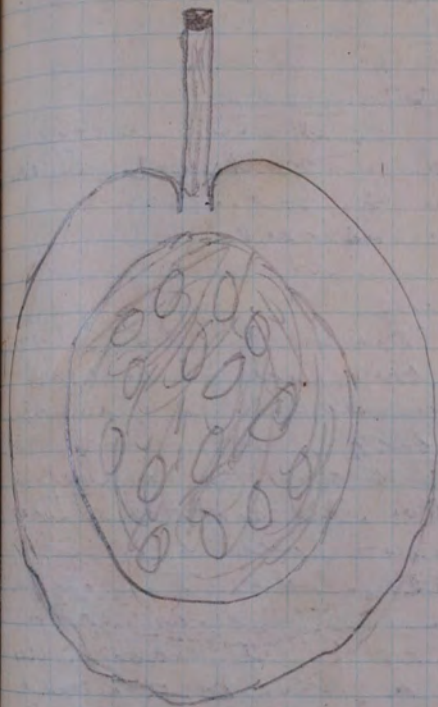
nat. size

**Pages 346-349
are missing in this volume.**

Bahia Dec 21 1913

Maracuja

This *Passiflora* is said to grow wild in the mattoz around Bahia. Specimens examined came from a vine on the terrace near the house of Dr. Fortunato de Silva Caballero. The fruit in color light green but specimens were not very ripe. The pulp surrounding the seeds is light orange yellow in color and of subacid taste not much better than *P. edulis*. This fruit does not seem to be very greatly esteemed & I have only seen a few specimens in the gardens here in Bahia.



Maracuja
see opposite page.

Interview with Mr. Frank
Baine Dec 22, 1913

Umburana

A seed very aromatic
used to put into tobacco
from the interior. It will
give us seeds.

Interior

Says the part of the country
is just full of interesting
and valuable plants.

Rubber

Has scheme for producing
rubber. Plant the trees
 anew every year. At 10
 months the trunk and
 leaves are full of latex.
 Plant it like sugar cane
 & take plants to mill
 & press it like cane. Think
 this will greatly reduce the
 cost of producing rubber.
 Has been trying to work
 but this plan for 5
 yrs. & says it looks just
 like a good selection

Bamboo

Have fine bamboo
 in his region

Some kind, very thick
 toguara. It called
 very small kind in
 Cotuias.

Another kind in mata
 cipo country.

Cuts the joints & dries
 them out of them in
 dry country where there
 is no water.

Grapes

Best grape he has seen
 in Brazil grown in
 Petropolis, across Rio
 São Francisco

Sapoti

Biggest he has seen in
 Ilheus

Imbu Several qualities.
Round

Long best kind

Hairy ones

Grows 4-5-600 ^{ft} above sea. In Catingas everywhere. Leaves abundant. Cattle thrive on it. + poor people live on it. Pigs fatten on it.

Umburana

a large tree grows commonly in Amazon. Seeds get into tobacco leaves.

Aructa de Sabão
appears to be an Alluvantes fruit macerated, put in boiling water and fat skimmed off. Natives use it. Ripens Aug-Sept.

Muscuba

looks like a nutmeg gives fine oil in good quantity. Very abundant back of Ilheos.

Longuista has place

green leaf given to checker with broken leg, afterwards kill the bug, find a green coloration around wound. called Mastrous. Seed used to make "sure shot" worm medicine. that has great medicinal qualities.

Timber

very hard to kill trees
Fire doesn't burn it,
Timber no good
kauri. Plant cuttings
in August. Trees all
green & flower on top
& round some like
or fruit, if not, are
me. Temp 80-90 in
shade during August, 100
in sun.

Soils.

A heavy timber land.
The soil dries up
quick if no rain. In
Catingas ground lakes
& ~~in~~ ^{the} ~~soil~~ ^{soils} cannot get
out. Catingas contain
soils rich in iron.

Mandioca grows in
Malta Ccpa, also
corn & coffee.

Heavy timber land not
to slash. grows
coffee, cane, cacao,

lettuce grows best in
Catingas soil.

Specauante abundant
in his region.

Have sort of clover, which
grows in rains.

Indians
 Dirty & lazy. Use no
 salt in food.

Honey abundant in this
 region.

Absolutely no danger
 in interior, either from
 man or animal. Never
 carries a weapon.

Carriguda

Tree in interior which
 yields valuable pulp for
 paper making.

Jacaranda

Wood used for bows
 by Indians. Bowstring
 made of Tucum.

Wages

1\$500 a day on his
 ranch. Has 40000 acres
 all fenced.

500 per 16 kilos of cotton
 for picking.

Thulin's Frank

Conquista

Bahia - Brazil

Sabi

a wet land reed
 used for making matting &
 padding which goes under
 cangalhas.

Bahia, Dec. 23, 1913. Tues.

To Itaparica island

Guabiruba

20 ft high, upright tree.
Says it is variety from
São Paulo. Local variety is
yellow.

Mangos

Has Manganga da Rosa &
Espada by grafted types
Also one he calls Ita-
maraca but it is fruit
compressed, different from
one at Rio

Mango must be grown on
hillsides here.

Mang. da Rosa very large
here

Has sent to London for
Allonia named trees, these

Best mangos on Itaparica on
sublimis. Better in flavor
than grafted trees.

Ita-manga

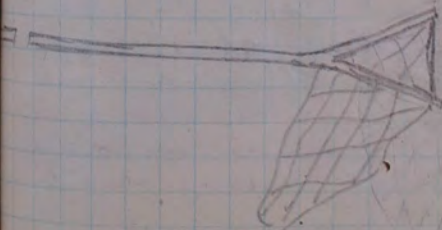
I fruit here, but not yet ripe.
Size of hens egg, good crop.
Fruit green at color.

Itaruba

Tree 20 ft high, slender,
only a few fruits on it.

Picking mango

net bag about 1 ft deep
placed at end of long pole,
with forked ends, so spring
across open ends.



Cajus of Itaparica
 named as best in region
 flavo kind called Cajú
 de manteiga

Manga de Rosa grows at
 Itaparica better than in
 any other section.

Thinks best mangos here
 came from Bowdoin.

180 variedades here, which
 are worth 15 to 30 milreis
 per 100 fruits, all known
 by name.

Dama de Ouro is best
 flavored mango in island.

Caju manteiga
 best Cajú of Itaparica
 yellow in color. Large one
 they will know in island.
 Better flavored than those
 seen best Cajú in Bahia
 called *de leite*

Caju amarella
 Itaparica



Good specimen of Cajú
 from Itaparica

Dama de Ouro mango
 bears 3 to 4 thousand
 fruit in one crop. The
 trees produce up to
 15,000 fruits. These trees
 called dama de ouro.
 Tree 30 meter high.

One old tree at edge
 of village where show
 full of bloom and
 setting a young crop
 altho set a just ripen-
 ing a crop.

May be 2 or 3000 mangoes
 on island.

Caballa for oranges
 Taparica for mangoes
 & caju.

Saperowth is orange
 probably due to soil



Small seedling mango of
 Taparica of good
 flavor but rather fibrous

Manga Augusta

① Joaquim da Silva
Colégio "Antonio Pereira"

3. Rua dos Capangas

② ~~_____~~
Revue. "Proterea"

③ Antonio Coutinho

Joseph Coullquier
young priest

Alto de Santo Antonio

Mango tree 90 ft in
spread trunk 15 ft
in circumference

Dr Antonio Calmon de
Almeida

man we took dinner with
at _____

island is about 36 kilometers in
length and 12 in width at base
at point _____

Storing mangos

In a house in Itaperian
we saw oranges being ripen-
ed in off the tree they
were laid out in cement
floor in cool, dark room,
with good ventilation.

Bahia, Dec. 25, 1913. Thursday

Mangaba

General form oval to
 roundish oval; dimensions
 length $2\frac{1}{2}$ ins. breadth $2\frac{1}{8}$
 ins.; stem long, rather
 stout, inserted squarely,
 base rounded, cavity slightly
 furrowed shallow, narrow
 rounded; apex rounded,
 surface smooth, light
 yellowish green overspread
 and splashed with brown-
 maroon, especially towards
 basal end; skin almost
 membranous, very easily
 broken, adhering closely
 to the flesh; flesh white
 soft and melting, pronounced
 aroma; flavor suggesting
 that of striped apple but
 with a strong rather
 resinous principle which
 is objectionable, seeds
 several compressed
 oval, about $\frac{3}{8}$ inch in
 diameter scattered thru
 the flesh; season Nov.

December here at Bahia.

The tree is common
 in the wild state on the
 hillsides about the city.
 There is a saying that
 wherever the mangabira
 grows there oranges
 can be successfully cul-
 tivated.

The fruit is used for
 doses and sherbets. It
 is also eaten raw by the
 natives.

Specimen from Col. Demetrio,

Cruz do
Cosme

natural size

When picked from the tree the fruit is usually firm and when cut open a milky sap exudes from the flesh coagulating into rubber. In a day or two the fruit softens to the texture of a very ripe peach, and when cut there is no milky sap.

The wild trees as a rule do not bear a large number of fruits, and those produced vary greatly in size. The specimen described and drawn was as good a crop as I saw in Bahia.

The fruits are sold in small quantities on the markets.

Many of the wild trees around Bahia show signs of having been tapped for rubber.

Guabiroba or
Qualiraba.

Specimen from roca of Dr. Antonio Calmon de Faria e Almeida, Itaparica.



Leaves moss green, rough, the veins sunk on upper surface, standing out prominently on lower surface, finely netted. Edge of leaves more or less recurved.

Branches pubescent, young wood round.

Leaves opposite.

Tree upright but

leaf, nat. very open, in growth, and not heavily

372

foliated



Fruit depressed globose about 1 inch in breadth and $\frac{3}{4}$ inch in thickness. Apex crowned by persistent 4-5 partite calyx. Disc about $\frac{1}{2}$ inch in diameter. Base slightly flattened, stem short. Skin yellowish green, tomentose pubescent and slightly rough. end toward apex $\frac{1}{16}$ - $\frac{1}{8}$ inch thick, enclosing a mass of translucent, whitish pulp, very soft and juicy, in which numerous seeds the size of common quava seeds are embedded. Taste similar to a quava, but not mushy, resembles quava a rather poorly

373

flavored Feijoa,

The plant is rare here, in fact I have only seen it in this one garden. It is said to have come from São Paulo.

374 Bahia, Dec 25 1913
Mango.

Seedling Type 1, from
Itaparica.

General form oblong, length
 $4\frac{3}{4}$ in., breadth $3\frac{1}{4}$ in.
Stem inserted well down on
dorsal side; base rounded,
dorsal shoulder falling away
and almost none, ventral
shoulder high, rounded and
broad, cavity practically
none; apex round, with
a slight beak $\frac{1}{2}$ inch above
long apex on ventral side;
nail $\frac{1}{16}$ inch above point of
beak, a round, slightly raised
dot; surface smooth deep
yellow in color, marked by
numerous patches of fungus
dots subcutaneous, numerous,
lighter than skin, small, skin
thick, moderately tough,
adhering rather closely. flesh
pale orange color, juicy
and very aromatic, but
full of fiber. Flavor spicy
sweet, delicious. seed $3\frac{1}{2}$ in.
2 in x 1 in, fiber in

375



dorsal and ventral edges
 1-1/2 ins long, tough + rather
 coarse, on other parts of
 seed but little fiber; form
 oblong, rounded at apex.
 Monoembryones Season
 December at Haparica.

More fibrous than the
 other seed lungs from Haparica examined.

Mango

Seedling type 2, from
 Haparica.

General form oblique,
 cross section oval, length
 4 ins, breadth 3 1/2 ins, thickness
 3 ins; stem inserted
 obliquely; base flattened
 obliquely, cavity broad,
 shallow, flaring, regular;
 apex broadly pointed,
 beak none, mark a slight
 depression about 3/4 inch above
 long apex; surface smooth,
 light greenish yellow, with
 many patches of fungus; dots
 numerous, large, rounded,
 deep yellow. Skin thin but
 firm and tough, closely ad-
 hering; flesh deep yellow
 in color, aroma pronounced
 but not especially agreeable,
 very juicy, fairly free from
 fiber; flavor a trifle flat
 sweet, quality fairly good;
 seed 3 ins x 1 3/4 ins x 3/4 ins,
 oblong-oval, fibrous on
 ventral edge, but fibers
 not over 1/2 inch long, + on

378

rest of seed very short. More
embryonic. Season December.

Resembles Alfonso type
in form. Not very fibrous,
but only fair in quality.



Nak

Bahia, Dec 25 1913 379

mango
Seedling type 3, from
Taparica.

General form oblong compressed;
length $3\frac{3}{8}$ ins width $2\frac{1}{8}$ ins,
thickness $2\frac{3}{8}$ ins; stem
inserted squarely; base
flattened, cavity very shallow
or almost none; apex
rounded, beak none, nak
a slight prominence $\frac{3}{8}$ inch
above long. apex; surface
smooth, deep yellow to orange
yellow, tinged and mottled
with green, and marked by
numerous fungus spots;
skin thick, tough, ad-
hering closely. flesh
bright yellowish orange, very
juicy, firm, free from much
fiber, aroma pronounced,
spicy, pleasing; flavor
very sweet and spicy,
quality good, seed $2\frac{1}{2}$ in
 $\times 1\frac{5}{8}$ $\times \frac{3}{4}$ inch, deeply
grooved on surface, oblong,
short fiber on ventral
edge, but very little on

380

other parts, compared to most
seed bug mungs; season
December.

A range of good eating
qualities, for a seed bug, though
small in size.



381

See opposite page

Mango trees / Chingapally
Manga da Rosa

fruit the
Manga da Rosa

fruit the
Manga da Rosa

Manga
aspella

citrus

cut
indicated
from the tree

tree

Manga da
Rosa

fruit
8 ft high

tree

3

2

1

0

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

Theriac

To roca Coronel, Dr. Miguel
de Teive e Argello, Roma,
Caminho d'Aveia car from
post of Elevador Lacerda, by
3 seccoes.

Manga da Rosa.

The fruit on these trees is
ripening up fast, and some
fruits are suffering from
a fungus spot, which causes
exudation of sap

Opposite page is plan of
1st row in mango orchard
showing location of the best
tree from which timberwood
should be cut. This tree
as shown in our photos,
is bearing a fine crop
of fruits, whereas the
others are as a rule not
heavily laden.

Manga

Manga

Eugenia
manga

Manga

Manga

3

2

1

0

1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

20

At Sea, Dec. 27 1913
S. S. "Byron".

At breakfast this morning we sampled one Manga da Rosa brought from Bahia. The fruit was quite solid and firm, but appeared to be ripe enough to eat. I cut it with a knife around the flat sides of the seed and removed the two sides of the fruit, and we then ate the pulp out with a spoon. There was practically no fiber in the two halves thus removed, the fiber remaining in the strip of flesh $\frac{1}{2}$ inch wide left around the edge of the seed.

The fruit had been in ice all night and was in fine condition for eating. The flesh was firm and cut like the flesh of a ripe muskmelon. It was juicy but the juice did

not run out of the flesh as it often does in the fibrous mango when you attempt to eat them.

The flavor of the flesh was sweet and pleasant but not as spicy or as highly aromatic as in some seedling mangos or the finest grafted sorts. Mr. Dorsett compares it to Surdershak and says it is not as good as Cecil. If compared to Surdershak, it must be a good specimen of that variety. It is not the kind we referred in Washington last summer. I do not think it is as good as Paeri or Mulgoba, but it cannot be classed as a poor mango, and its beautiful appearance and firm, solid texture are strongly in its favor.

Rev. W. A. Waddell

Wagner, Bahia
 Had a farm school at
 Wagner near Lençóis, now
 going to Mackenzie College
 as President.

go Rev. H. C. Anderson
 Rua de Federação
 Bahia.

Hartmann Reichenbach

Carta Geral da Repub.
 lica dos E. S. U. S. do Brasil
 at Rosenthal's, Rua São
 Bento, São Paulo.

Robert F. Lennington
 Curitiba Paraná

Carl Stepke
 Florianópolis
 Sta. Catharina

has named orange
 trees from Bahia

Rev. J. T. Houston
 Berkeley Cal

Mr. Lennington's father-in-
 law was in Bahia
 previous to Mr. Lennington
 to his father.
 Robert Lennington was his
 father's name missionary.

Mr. Lemington lived
near Graça church
in Bahia

Mr. Waddell knows
interior of Bahia like
a book. Will be in Bahia
about March. Can reach
him in case of Anderson

Rio de Janeiro, Dec 30 1913

Persea sp?

a tree growing near walk
from hotel Internacional to
Garden on hill top.

Slender, about 30 ft
high, branching about 5
ft above ground, few
branches rather open
page

Leaves light green, thick
stiff, somewhat glossy



Shape

elliptical-lanceolate,
apex acute to acuminate
leaves slightly aromatic
when crushed.

Fruit roundish oval
in form, purplish,
black in color smooth

395

and glossy externally.
 Contains one large seed,
 almost filling fruit, there
 being only a layer of pulp
 about 1/8 inch thick surround-
 ing it. Calyx is woody &
 very prominent.



Seed turns color on expos-
 ing to air, and turns
 as in above cross-section.

Rio de Janeiro, Dec 30, 1913 391

Manga da Rosa in
 market here, said to come
 from Pernambuco, selling
 at 24000 per fruit.

Caracão do boi, from
 campo grande, very large
 and juicy, mango yellow
 with green in color, at
 same price as Rosa.

6 AM
 7 PM

32\$400

São João

São João del Rei
 90 m
 on 5 Lavoura

Melon

Large melon 40\$000
 in market on Avenida
 in Rio must weigh 25 lbs.

Rio de Janeiro, Thurs Jan 1, 1914

Mango Carlota

Specimen from roça of De Lencoste
Calmon de Pin e Almeida,
Itaperica, Dec. 23, 1913.

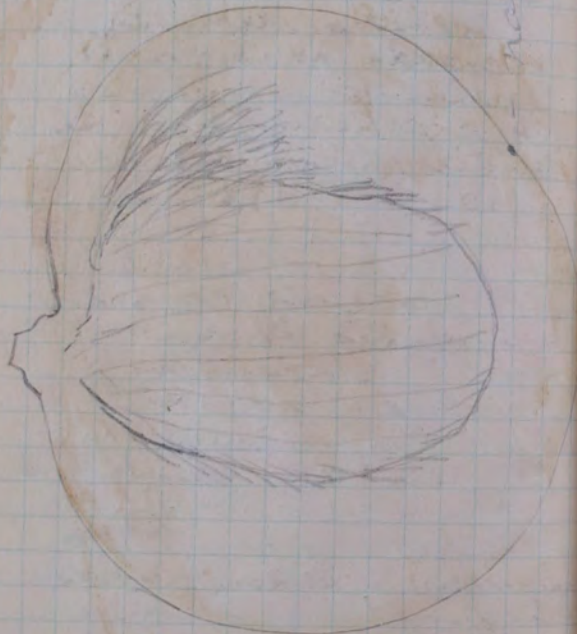
General form rounded
oblate, compressed laterally,
cross section ovate; size
medium small, length 2 1/2
breadth 3 1/2 ins, thickness
2 3/4 ins. stem inserted centrally
or nearly so; base flattened,
cavity practically none; slight
sunken on ventral side
of stem and raised on dorsal
side; dorsal shoulder
rounded, ventral shoulder
very broad, level, apex
blunt, not sunken 3/8 inch
above longitudinal axis;
surface smooth, dull orange
yellow in color, tinged with
greenish (C.C. 161), very
few fungus spots; dots
numerous subcutaneous.

in color than skin, skin
medium thick, firm and
tough, adhering closely;
flesh bright orange in
color, aroma pronounced and
agreeable, free from resin,
juicy, firm slightly
fibrous; flavor rich
fairly spicy, sweet; quality
very good; seed oblong
2 3/8 x 1 3/4 x 1 inch, fiber
on ventral edge long, else
where short and fine,
apparently monocarpic.
Season Dec-Jan at
Itaperica.

A mango of good
rich flavor and not
very fibrous. Rather
small but good size to
handle.

394

Maryo Carlota
Jan 1 - 1914



Rio, Jan 1 1914 There 395

Jardim Botânico

Palma Mater

Inscription on the tree
reads

"*Oreodora oleacea*
plantada por D. João II
Palma Mater das de
sua especie que se
cultivam no pary.
1808 - 1968."

54. *Garcinia cochinchinensis* Choisy
"Sacupary"

Moquilea tomentosa
"City" Rosaceae

Garcinia Cochinchinensis
tree about 40 ft high
broad



Sorvetes

They are very popular in Rio just now, there being many more of them offered than when we left. One of the best places to get them is Casa Esperid de Sorvetes, on rua Gongalves Dias downtown block below the Ave. das Hotel. Prices of fruit sorvetes in best cafes is 500 reis. In cheap places they are 300 or 300. Among the flavors I have seen offered here are:

Manga (one of the best of all)
 Abacaxi (good here as elsewhere)
 Caju (very good)
 Açaca (juice almost as good as mango)
 Coco

They are all plain water ices, and very good indeed.

Refrigerios

Following kinds are obtainable in the cafes here.

Refrigerio de Mango
 " " Caju
 " " Cocos
 " " Tamarindo
 " " Putanga
 " " Laranja
 " " Limão
 " " Abacaxi
 " " Mangaba
 " " Mangaõ

Rio, Jan 1-1914. Thurs.
Cambuca

Myrciaria plicato-costata

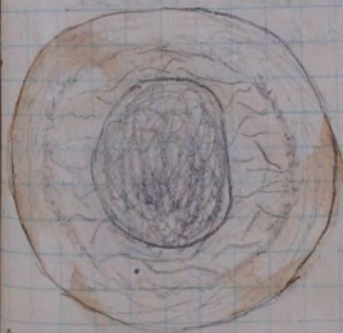
(See Barbosa Rodrigues
 "Hortus Fluminensis" and
 Berg in Mart, Fl. Bras.)

Specimens purchased in
 Rio market Dec 31 1913

General form obovate,
 cross section round, size
 length $1\frac{1}{2}$ in, width 2 lines;
 stem apparently none,
 as the flowers are
 sessile; base flattened
 cavity none; apex flattened
 calyx persistent, very
 small, brown, disk not
 over $\frac{1}{8}$ inch in diameter
 level with surface of fruit,
 surface smooth, orange
 yellow in color (K. 156)
 gets more; skin thin
 tenacious fairly tough,
 outer flesh $\frac{1}{4}$ inch thick,
 tough, leathery, very acid
 light orange

Cambuca

leaf deep
 green leathery,
 lighter
 below than
 above.
 alternate
 on br-
 anch.



Cross sec. of
 fruit, nat. size.



Seed,
 nat. size.

Cambuca Could form 398
 color, inner flesh (edible
 portion of fruit) soft
 translucent, jelly-like
 consistency, netted
 in appearance, subacid
 in taste; flavor resembles
 that of granadilla, agree-
 able but not delicious;
 seed oval or nearly so,
 compressed, 2 colored one
 light purple in color seed
 about $\frac{1}{8}$ inch in length,
 $\frac{3}{4}$ in breadth & $\frac{5}{16}$ in
 thickness. Seed coat deep
 brown, reticulated, not
 adhering very closely to
 the flesh.



fruit
 lat.
 view

There is a row of
 Cambuca trees in the
 Jardin Botánico bearing
 the garden number 58,
 and many of the trees
 are in bloom at this
 date. The flowers are
 small and inconspicuous,
 dull in color, and borne
 profusely along the
 leafy branches sessile.
 The tree grows about
 40-45 ft in height
 upright, with bark
 and trunk very similar
 to the jaboticaba, ex-
 cept that the trunk
 as a rule only divides
 into 3 or 4 main branch-
 es, about 4-6 ft from
 the ground.

We saw several trees
 growing among wild veg-
 etation across the road
 from the garden, and
 on 2 of them there were
 2 or 3 ripe fruits.

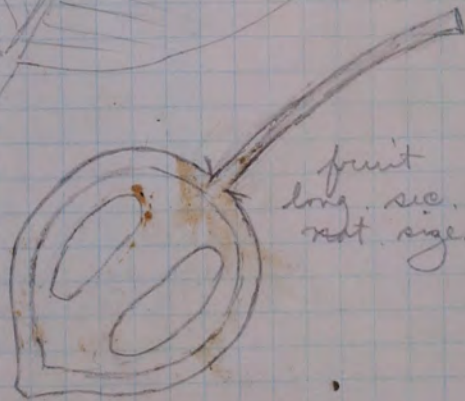
Rio de Janeiro, Jan 1-1914. Thurs

Rheedia Brasiliensis

"Sacupary", from Jardim Botânico. See photo of stems taken on 1st visit to Rio.

General form ovate, cross-section round; length $1\frac{1}{2}$, width $1\frac{5}{16}$ in. Stem $1\frac{1}{2}$ - $1\frac{3}{4}$ in. long, nearly $\frac{1}{8}$ in. thick; base rounded cavity none to shallow, narrow, corrugated; apex prominently pointed, blunt at extreme tip, with small brown area, surface smooth, slightly glossy, in color a light orange yellow (cc 186) tinged with greenish; dots none. Skin $\frac{1}{16}$ to $\frac{1}{8}$ in. thickness, tough, pliable, whitish, separating readily from the flesh; flesh in body surrounding the 2 seeds, each separ. with its pulp separate from the other, translucent to snowy white, juicy, melting, green like the pulp.

leaf nat size
dark green above, light green beneath



fruit
long. sec.
nat. size.

404

Rhodia brasiliensis, from 400
 subacid, and strikingly
 suggestive of the mango
 stem; seeds normally 2,
 oblong elliptical, flattened
 on the sides, about $\frac{1}{8}$ inch
 long, when cut yellow
 sticky fluid oozes out
 of them. Season Decem-
 January at Rio.

Should certainly be given
 a trial in Florida. Seeds
 could be obtained from
 Willis.

Rio, Jan 2-14. Friday 405

Mango Espada

Specimen from roça of
 Dr. Antonio Calmon de
 Pin e Almeida, St. Para-
 ica, December 23, 1913.

General form obliquely
 oblong, compressed
 cross section oval to
 almost round; size
 medium, length $4\frac{3}{4}$
 breadth 3, thickness $2\frac{3}{4}$ in.
 base prominently extended
 where it joins the stem,
 rising fully $\frac{1}{2}$ inch above
 the general surface of
 the fruit; ventral
 shoulder rounded, dorsal
 shoulder falling abruptly,
 insertion of stem to dorsal
 side of fruit; apex rounded,
 slightly wedge-shaped
 dors-ventrally, slightly
 beaked at peak, on ventral
 side about $\frac{1}{2}$ inch above
 longitudinal apex, peak
 a slight depression.
 surface finely undulating

color light greenish yellow
 with numerous subcutaneous
 dots, small, rounded, and
 lighter in color than skin
 and largest part of surface
 covered with fungus patches.
 skin thick, adhering closely,
 fairly tough; flesh bright
 orange yellow in color, with
 rich aroma, very juicy but
 full of fiber; flavor
 sweet and rich, with
 sufficient spiciness to be
 good, seed $3\frac{1}{2} \times 1\frac{1}{8} \times 1$
 oblong, very fibrous over
 entire surface, monsem-
 bryome. Season Dec-
 Jan. at Itapauca.

Too fibrous to be of
 any great value, altho
 very fair in flavor.



espada mango.

4:08 Rio Jan 2-1914. Friday

Mango Augusta

From roca of Dr. Antonio
Calmon de Pin e Almeida
Itaparica, Dec 23, 1913.

General form obliquely
oval, cross section oval
size small, length $2\frac{3}{4}$
breadth $2\frac{1}{2}$, thickness 2
ins, stem inserted obli-
quely; base obliquely
flattened, cavity practically
none, ventral shoulder high
& rounded, dorsal shoulder
shortly rounded; apex rounded
with a slight depression $\frac{5}{16}$
inch above long. axis,
surface smooth green yellow
in color, tinged + overlaid
with orange on cheek; dots
numerous, subcutaneous,
small, round, lighter than
skin thick firm and tough
adhering closely; flesh
pale orange in color,
very juicy, pleasant but not
very pronounced aromatic
fibrous, flavor

H.09

a triple lacking in char-
acter, subacid, not very
spicy; seed large for
size of fruit, obovate ren-
form, $2\frac{3}{4} \times 2\frac{1}{4} \times 1$, very
fibrous over entire sur-
face, monoembryonic; sea-
son Dec-January at
Itaparica.

Not a desirable variety.



- nak

410 Rio de Janeiro
Jan 2 - 1914

Mango

Dr. Willie says the variety exhibits the widest range of variation of any fruit he knows, there being in India varieties as large as a small teakettle, and others no larger than a plum. Thinks other variations largely due to mutations.

Manga da Rosa

comes from Pernambuco and is very abundant in the high class fruit shops of Rio. The best specimens I have seen were offered at 2# 50c each, ordinarily they are 1# 00c each. There seems to be a large demand for them. They by all odds the finest mango in appearance, which is shown in the market for, & is of distinctive color & to be certain eating shops.

Rio, Jan 2 - 1914. 471

Carambola



long, see
this
fruit.



bought in
Rio de Janeiro
market.

transverse section

412 Rio, Jan 2 1914

Manga da Rosa

The specimen out-
lined below was
purchased in the Rio
market for 2000. It
was said to have come
from Pernambuco.

Flavor fairly good,
but fruit very
fibrous and some
large for this
specy.

Manga da Rosa
shows a tendency
to be rather
fibrous.

Rio, Jan. 2, 1914.

413

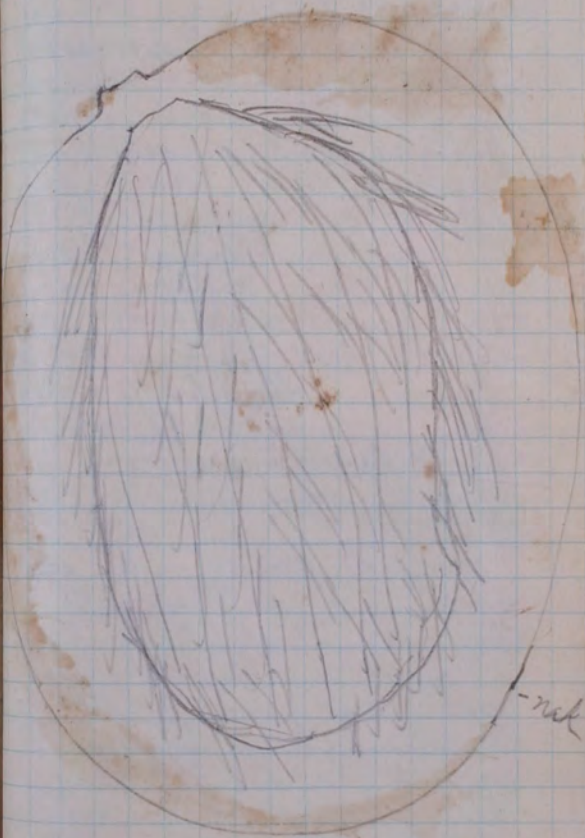


414

Rio, Jan. 2, 1914.

Seedling mango.Bought in market
at 1000.Weight 460 grams;
Color yellow green,
with many large sub-
cutaneous dots. Flesh
light orange to light
yellow, fibrous.

415



-ml

416 Rio, Jan 2, 1914.

Jaboticaba

we found in the market today several baskets of jaboticabas, and purchased about a peck of the fruits for \$5.00.

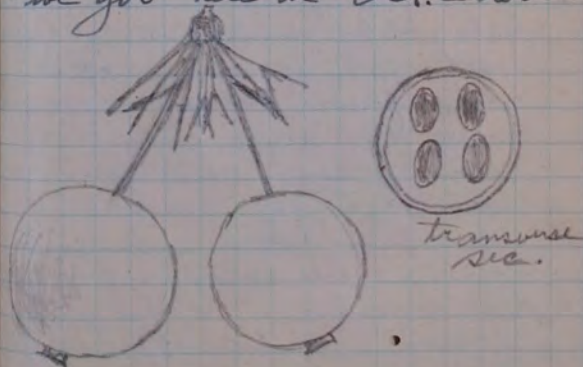
This fruit is not *Myrciaria cauliflora* for the fruits are not sessile, but produced (sometimes in bunches) on slender stems $\frac{1}{2}$ - $\frac{3}{4}$ inch long; may be *Myrciaria jaboticaba*.

Fruits commonly ~~of~~ spherical or nearly so, sometimes slightly pointed at base and apex, size varying from $\frac{1}{2}$ to 1 in. in diameter; surface smooth, glossy, deep, dark maroon in color, skin thick and very tough, difficult to break.

Fruit in bud surrounded by the seeds trans-

lucent white in 417 color, melting very juicy, but adhering closely to the seed; flavor acid or subacid, vinous, but does not seem quite as good as that of *M. cauliflora*. Seeds commonly four, rarely 1, 2 or more commonly 3, oval, compressed, about $\frac{1}{4}$ ^{$\frac{3}{8}$} inch in length, purplish pink in color.

not as good a fruit, as far as can be judged by these specimens as the jaboticabas (*M. cauliflora*) we got here in Oct. - Nov.



418 Rio, Jan 2, 1914

Espada mango

Fruit (seedling?) purchased in a fruit store on Avenida Rio Branco, price 500 reis.

General form oblong but peculiarly indented on dorsal side near basal end; size medium, length $5\frac{1}{4}$ ins, width $3\frac{1}{4}$ ins; base extended, ventral shoulder falling gradually, dorsal shoulder concave; apex rounded, with a slight depression $\frac{1}{2}$ inch above long. apex; surface slightly undulating, light yellowish green in color, dots few, subcutaneous, rounded, small, light or pale green; skin very thick, tough, adhering closely; flesh orange yellow in color, fibrous aromatic very juicy; flavor subacid spicy.

Typical of seedling mango.

419



Rio de Janeiro, Jan 1-1917

Löfgren

Dr. Willis says Löfgren knows the flora of Brazil better than any other man in Brazil. He came out in 1895 with an expedition and remained here. Is a Swede. Has recently come under Dr. Willis to have charge of the 3rd section work under him.

476 Envelopes
transparentes

477 Envelopes
carteiras

424

L. Selecta.

L. Pers.

L. Verticillata

L. Natal

L. China

At Rio

Grafted Rosa mangos
 Mr Fitzgerald.

Rosario Escola de Rodas
 Curves

Azeal, 40 miles beyond
 Petropolis, toward Entre
 Rios

Fazenda

Armando Tragas

345 General Camara

Dec 26 1913

425

2397.00 for \$80.00

Bahia

3000

Rate of 38000 per

80

100 less 300 rena

40000

stamps

80

~~270~~

240

0.1600

.020

04800

Dec 3 1913

Rio de Janeiro

Cashed \$300 in A.B. checks.

at 3074

300

9222.00

less

Stamps

300

9219.00

Mr. Gibbons
 Almirante Tamandará
 441
 Rio Janeiro

Pensão at which Mr. Newell
 stopped

Mapa Econômica do Brasil
 Serviço de Informações
 Ministério de Agricultura
 Rio de Janeiro

In Rio want

White typewriter paper
 Tupi dictionary

~~Mosquito net~~
~~Colony habitat background~~

~~Beetles~~
~~Plates & Films~~

Brandy
~~Carrying sack~~

Benzine
~~...~~

Mr. Lopez Rodrigues
 Artist
 As Armes do Paris
 Rua Chile
 Bahia

Distance Planting Oranges

In most groves the average
 is 16-20 ft. In Lagoas
 averages about 9 ft. all
 three. Rows same distance.
 80-100 trees per acre.

Size of Crop

at Barretos about 350-
 400, probably 350 on average
 on 4 yr old trees.
 at Itacis 250 per tree

History of Navel Orange in Bahia
 Extent + Location of Plantings
 Principal Orange Growers

Climate
 Situations + exposure of groves
 Soils

Planting - distance between trees
 rows, etc.

Culture

Tillage + weeding

Mulching

Cover crops

Subsoil + crop - Mandioca + coffee

Pruning

Water sprouts

Pests and Diseases

Insects

Fungus

Gonimosis

Chlorosis

Plant Characteristics

The Crop
 Seasons . Size of Crop
 Picking
 Grading
 Transportation
 Packing
 Marketing
 Profits of Orange Culture

The Fruit
 Characteristics. Description
 of typical navel orange

Other varieties of Citrus

Laranja cravo

tangerina

Laranja da terra

selecta

lima

Laranja de Africa

limão verde

" doce

lima

Propagation + Handling Young Trees

Stocks - age

Seed bed

Budding, in nursery + orchard

Transplanting

a Docira Domestica
 por D. Anna Correa

Cozinheiro Nacional

Manual do Chacareiro
 Brasileiro

Por Major Brantio Cordeiro

Dicionario da Lingua
 Tupi

Series of Churches
 Tamarind & fruit

Write embassy
 Consul
 Hummelt

Micro-marmorata
proper name Saguí

Transportation of Saguí
in city.

Cabbage palm

Indian Pondo

Senhor is N. American

I am very familiar with
N. Am. I worked at Paraná

Letouzia 14132

Location of grapes

Extent of " (recent extension)

Situations

Climate

Soil

Culture distance between trees

Tillage

Manuring

Pruning Pladras

Insecta

fungus

green scale

Chorizo

The Crop

Pickling

marinating

Packing

Profits

Season

Character of fruit, l. de umbigo

Other varieties of Citrus

laraya cross Selecta

tangerina

laraya de touro

tanga

de Apia

Mangaba
 Grumixama
 Mustard apple
 Manga all over
 Citanga
 Casaj
 Ghuipapo

Dr. Argollo wants to get
 address of American Cacao
 Co. to send samples of a
 gum wh grows here and
 learn price.

Lindolpha Lago
 Cabula of Bahia

Limão
 limão doce
 limão francês

Nursery operations
 Stocking seed
 Seed bed
 Budding - age of stocks
 Budding in orchard

Dec 26 1913
 Sent P.P.B. travelers
 checks A B 89 89 71 +
 B 89 89 72 totaling \$100.00 -
 2 cks for \$50 each!

Dec 17 1913
 Sent P.P.B. a.p.a.
 no C 180 4692 \$20.00

8 1/2 ground glass
 photos
 send trunk
 register letter
 haircut

Maria-Augusta Rodrigues
 da Costa

What did you find most
 newsworthy in France.

The little boys ^{and} ~~and~~ ^{and} already
 speak French

Omelet Brimingham

Couro leather
 salt's heel
 cozido sewed

You must find all about orange
 'do'

Brass band not navy silver

