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About the Institute

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.

- Taxonomy Laboratory

December 22, 1965

Professor Jacques Barrau
Department of Anthropology
Yale University
New Haven, Connecticut 06520

Dear Jacques:

I am terribly sorry that it is only now that I have been able to get at my specimens and slides. Are you still interested in having them? If so, I will send them to you.

Sincerely,

David J. Rogers
Professor of Botany

DJR/pam

Yale University *New Haven, Connecticut 06520*

DEPARTMENT OF ANTHROPOLOGY

23 November 1965

Professor David J. Rogers
Department of Botany and Plant Pathology
Taxonomy Laboratory
Colorado State University
Fort Collins, Colorado 80521

Dear Dave,

*

Sorry to answer on Hal's behalf your letter dated October 25th about cassava or Manihot slides and specimens. What we are looking for is

- i) a series of slides of some of the main Manihot cultivars;
- ii) some slides on processing;
- iii) a few specimens of some cultivars on which students could see (not touch!) some aspects of the variation of domesticated Manihot.

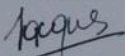
If you could send them now, I may be able to use this material on Wednesday, December 8th. The whole material will be returned to you by Hal at the end of December.

My Setaria work is proceeding slowly, and it looks more and more that field work is necessary.

How is your new work?

Best regards.

Yours sincerely,



Jacques Barrau
Visiting Professor of Ethnobotany

JB:mae

* He is in the Philippines -

- Taxonomy Laboratory

December 17, 1965

Dr. Carl C. Moh
Instituto Interamericano de Ciencias
Agrícolas de la OEA
Centro de Enseñanza e Investigación
Turrialba, Costa Rica

Dear Dr. Moh:

At last we have arranged for the necessary documents which will allow you to send cuttings of (cultivars) of Manihot esculenta. I would like to have about six cuttings each of three cultivars. I leave the selection of the individual cultivars to you. If there are any that you have found particularly interesting from a cytological standpoint, you might consider sending these.

The instructions as we understand them are as follows:

- _____ Do not pack the materials with any vegetable material or soil.
- _____ Pulp free fibers such as coconut fibers, wood shavings, or vermiculite can be used.
- _____ This material should not be wrapped in plastic, but in paper.
- _____ Place the yellow and green labels on the outside of the package (please note the information required on the back of each of the green and yellow labels).
- _____ Place the three shipping labels with my name on the outside of the packages.
- _____ Send by Air Parcel Post.
- _____ Please mark on the packages - PERISHABLE - KEEP FROM FREEZING.

I will be pleased to reimburse you for all the expenses involved in all of this, and I deeply appreciate your willingness to send it to me.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/pac

- Taxonomy Laboratory

December 17, 1965

Director of Information
Agricultural Experiment Station
University of Florida
Gainesville, Florida

Dear Sirs:

I understand that Manihot esculenta (cassava or manioc), are now being raised, to a small extent, on a commercial scale in southern Florida. I would appreciate it very much if you could tell me which authority and his address I might write to, to obtain valuable cuttings from this plant for experimental purposes here at Colorado State University.

Thank you for your assistance.

Sincerely,

David J. Rogers
Professor of Botany

DJR/pac

DEC 16 1965

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
PLANT QUARANTINE DIVISION
209 RIVER STREET, HOBOKEN, N. J. 07030

December 14, 1965

AIR MAIL

Professor David J. Rogers
Taxonomy Laboratory
Department of Botany and Plant
Pathology
Colorado State University
Fort Collins, Colorado 80521

Dear Professor Rogers:

We regret the delay in replying to your recent letter relative to importing Manihot cuttings from Costa Rica but we have had an unusually large number of applications and inquiries in recent weeks and have not been able to answer all of them as promptly as we would like.

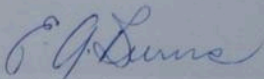
Soil-free, certified cultivars of M. esculenta are admissible under permit from all countries. Inasmuch as the material is to be used for experimental work at Colorado State University it may be imported under permit No. 37-7502 issued to the University. Incidentally, the permit is lodged with Dr. S. S. Wheeler. Air shipments, both air parcel post and air freight, from Costa Rica usually enter at Miami. The University's permit is valid on that port. Should you elect to have shipments made by air parcel post merely send the enclosed green-and-yellow labels to the shipper with instructions for him to follow the directions on the reverse side of the labels themselves. Only one label is needed for each parcel. Please also instruct the shipper to enclose a slip of paper bearing your name and university address within each parcel so that the cuttings will be re-addressed for delivery to you after clearance at our inspection station. For importations by means other than mail please see paragraph 13 of enclosed circular Q.37-2.

2
3
4
5

Shipments of propagating material must undergo plant quarantine clearance at the inspection station at or nearest the first port of arrival. There would be no danger of freezing while the plants were in our station or in our custody. However, it would be well for the shipper to mark the containers "Perishable - Keep from Freezing" so that they will be given proper handling and stowage in transit.

It would not surprise us if there were some commercial plantings of cassava underway in southern Florida. Prior to our trouble with Cuba and the issuance of a Presidential Proclamation in February 1962 which placed an embargo on fruits and vegetables from that country, a good portion of the cassava roots imported for food came from Cuba. The proclamation cut off that supply. In the last few years there have been some sizeable importations of cassava propagating material into southern Florida, probably with the view to developing a crop in that area.

Sincerely yours,

A handwritten signature in blue ink, appearing to read "E. A. Burns".

E. A. Burns
Head, Permit Section

Enclosures:

3 Miami labels (No. 37-7502)
Circular Q.37-2

- Taxonomy Laboratory

November 22, 1965

Mr. E. A. Burns
Import Permit Section USDA
Plant Quarantine Division
209 River Street
Hoboken, New Jersey 07030

Dear Mr. Burns,

In recent correspondence with Dr. Howard L. Hyland (copies of which I think have been sent to you) he suggested that I arrange with you for a special import permit for Manihot cuttings from Costa Rica. It is not clear exactly what procedure I should follow and so I appeal to you to set up the prescribed procedure.

As I explained to Dr. Hyland, it is my intention to bring into the greenhouses here at Fort Collins several cultivars of Manihot esculenta. We will use the plants grown from these cuttings in basic cytological studies of the species. To date it has not been possible to get adequate pictures of the vegetative chromosomes of this genus, and we are most anxious to develop methodologies for these cytological studies. As you may know, I have been interested in the study of Manihot for a number of years and am now embarking on a program of cytological investigations in hopes that we may learn something about the classification of these tropical plants.

Since it is unlikely that Manihot species have any opportunity to become adapted to this climate, there is little likelihood of them spreading beyond my greenhouses. There are no commercial plantings of Manihot to my knowledge in the continental United States; and it is unlikely, therefore, that if there were any serious diseases or pests they would be spread to plantings in this country.

The cuttings for propagation are to be sent to me by Dr. Carl C. Moh of the Interamerican Agricultural Experiment Station in Turrialba, Costa Rica. The cuttings will be taken from healthy

Letter to Mr. E.A. Burns
November 22, 1965

Page 2.

plants in Dr. Moh's experimental plots, and so it is unlikely that I will be receiving plants with any disease problems.

I trust that you will be able without too much difficulty to arrange for a special permit for me. We will have one problem, and that is that these are cold-sensitive plants and any very long exposure to cold weather will have a deleterious effect on them. If you can suggest some means by which the plants may be permitted into the United States with the least length of cold exposure, I will appreciate that information as well.

Sincerely yours,

David J. Rogers
Professor of Botany
Formerly Curator of Economic Botany
New York Botanical Garden

DJR/ec

NOV 22 1965

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
CROPS RESEARCH DIVISION
BELTSVILLE, MARYLAND 20705

November 19, 1965

Dr. David J. Rogers
Department of Botany and
Plant Pathology
Colorado State University
Fort Collins, Colorado 80521

Dear Professor Rogers:

This will acknowledge your November 8 inquiry regarding importation of Manihot cuttings from Costa Rica. We are suggesting you make arrangements with the following agency to obtain a special import permit.

Mr. E. A. Burns
Import Permit Section USDA
Plant Quarantine Division
209 River Street
Hoboken, New Jersey 07030

A copy of this letter, along with this acknowledgement, is going direct to Mr. Burns in order to expedite arrangements for this permit. Had this Branch an interest in Manihot at this time we would have arranged to bring the material under our own permit through the Inspection Station in Washington, D. C. and sent forward a part of the shipment to you. Since we are not interested this accounts for our recommending the above procedure. We would like for reference purposes to learn what you may finally receive from Costa Rica, should we have other inquiries from U.S. workers who may later express an interest in the plant.

Sincerely yours,



Howard L. Hyland
Plant Introduction
New Crops Research Branch

File Copy
42

- Taxonomy Laboratory

November 18, 1965

Eng. Agr. Edgard Sant'Anna Normanha
Chefe da Secao de Raizes e Tuberculos
Instituto Agronomico
Caixa Postal, 28
Campinas -- Est. S. Paulo -- Brasil

Dear Dr. Normanha,

I am pleased and honored by your invitation to submit a paper concerning Manihot esculenta. I certainly will wish to contribute, and very obviously my interest will be in the systematic aspects of mandioca. We will shortly complete our classification of the cultivars of this species, and this should give us some useful material to present.

I wonder, in connection with the publication of a Monograph, if by chance you have corresponded with Dr. Van Biema of Geismar and Company, New York. I have corresponded with Dr. Van Biema on several occasions concerning the publication of a book by several authors on the same subject as you have requested in your letter. Have you heard from Dr. Van Biema, and is the publication which you are contemplating something of which Dr. Van Biema is aware? Dr. Van Biema had the idea of assembling a number of authorities for a book on the same subject, and it may be that his correspondence has something to do with yours. I know that he has your name and is aware of your interest in these plants. I am sending him a copy of this letter so that he may be aware of your interests, in the event that you have not corresponded with him.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/ec

CC - Dr. Van Biema

INSTITUTO AGRONÔMICO

CAIXA POSTAL 28
CAMPINAS - EST. S. PAULO - BRASIL
SECRETARIA DA AGRICULTURA DO ESTADO DE SÃO PAULO

6517

N.º

Mencionar este número na resposta

30

Campinas,

de setembro de 1965

Dr. David J. Rogers
Department of Botany
Colorado State University
Fort Collins, Colorado 80521
U.S.A.

Dear Dr. Rogers:

It is our aim to put together the original writings of a group of about 30 authors and specialists on different subjects dealing with the cassava plant, in all its fields of studies, in order to issue some kind of Monograph on Manihot esculenta, Crantz.

We hope to be honored with your valuable contributions dealing with the different subjects you have studied. The writing may be an original one or a reproduction of an already published matter.

Each author may write on different subjects and several authors may write on the same matter.

Language will be portuguese.

I will be glad to give you further informations if necessary.

Thank you very much.

Very truly yours

Edgard S. Normanha
Engº Agrº Edgard Sant'Anna Normanha
Chefe da Seção de Raízes e Tubérculos

SRT Nº 945

29/set/65

ESN/JM:-

Sept. 2, 1965

Dr. Gerhard Van Biema
Geismar & Company, Inc.
10 East 40th Street
New York, N. Y.

Dear Dr. Van Biema:

Thanks for your letter of Aug. 24th. While I have officially begun my activities here in Colorado, (address above) I will be occupied some time in setting up my operations here. There are many "growing pains" in this institution, and it will probably take longer to get going than I can project at the moment.

Have you contacted dr. William O. Jones of the Stanford Food Research Institute in Stanford, California? He wrote a comprehensive book on the economics of manioc back in the late fifties. He might be interested in up-dating that work, but I have not been in touch with him for some time, so I can't answer whether or not he has continued his interest in this crop.

Other than Dr. Jones, I cannot think of anyone who has any particular research interest in the crop. You are probably in a better position than I on the products and processing of manioc. I am not familiar with the qualities of manioc starch, whether it be unique or have some property distinctive from all other starches, etc. Would you provide this aspect in the projected book? It is a vital aspect, and one that I do not think has been covered at all well previously.

Let me know of any developments.

Sincerely,

David J. Rogers
Professor of Botany

GEISMAR & COMPANY, INC.

10 EAST 40TH STREET • NEW YORK, N.Y. 10016

GEISMAR & COMPANY, INC.
NEW ORLEANS 12, LA.

GEISMAR & CIA., LTDA.
SAO PAULO, BRAZIL

TELEPHONE
MURRAY HILL 6-0442

CABLE ADDRESS
MARABRES NEW YORK

August 24, 1965

(Dictated August 23, 1965)

Dr. David J. Rogers
Curator of Quantitative Taxonomy
The New York Botanical Garden
Bronx, New York 10458

Dear Dr. Rogers:

Upon my return from vacation, I found your letter of August 4th on my desk. As I am going out of town again for a week, I should like to drop you a line before leaving.

I was pleased to hear that you are interested in getting together with a suitable group regarding a publication on the various aspects of manioc. At the moment, I am waiting to hear from Dr. Normanha and I shall certainly contact you as soon as I have his reaction. Do you have anyone else in mind who would be in a good position to contribute? Your moving to Colorado will make it a little more difficult to communicate, however I should think that such communications could be handled quite satisfactorily by mail. In any case, I should like to congratulate you upon your new position. Kindly let me know your new address and the date after which letters should be addressed to you in Colorado.

With best regards,

Yours sincerely,

GEISMAR & COMPANY, INC.

Gerhard Van Biema
Gerhard Van Biema
Technical Director

GVB:ams

August 4, 1965

Dr. G. Van Biema
Geismar & Company, Inc.
10 East 40th Street
New York, New York 10018

Dear Dr. Van Biema:

Thank you for your letter of July 29 with the enclosed paper on tapioca.

I am interested in your suggestion for a book or monograph and think that this would be a fine thing. I am in the midst of a preparation of a manuscript for a book right now and would not be able to participate in such a thing for a few months. I agree that something should be done to start this thing, and I would appreciate any suggestions that you may have in connection with it.

One complicating factor may be the fact that I am changing position from the New York Botanical Garden to the Department of Botany at Colorado State University, Fort Collins. I do not intend to change my line of interests and will continue to pursue studies of Manihot, both from the cultivated species standpoint and from the standpoint of the whole genus. I will be interested in whatever reactions you may have to ~~this~~ letter.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

GEISMAR & COMPANY, INC.

10 EAST 40TH STREET • NEW YORK, N. Y. 10016

GEISMAR & COMPANY, INC.
NEW ORLEANS 12, LA.

GEISMAR & CIA., LTDA.
SAO PAULO, BRAZIL

TELEPHONE
MURRAY HILL 6-0442

CABLE ADDRESS
MARABRES NEW YORK

July 29, 1965

*Migis Lodge
South Casco, Maine*

Dr. David Rogers
The New York Botanical Garden
Bronx, New York

Dear Dr. Rogers:

With reference to our telephone conversation a few weeks ago, I am pleased to enclose a copy of my paper, "Tapioca and Other Food Starches" which I presented at the April meeting of the American Chemical Society.

As the entire presentation, including question and answer period was limited to thirty minutes, the paper really constitutes no more than a summary of what could be written on this subject.

It would be quite a challenge to put together a book or monograph covering more thoroughly the various aspects of manioc from the biology and history of the plant to the various industrial and food uses of the final products. Would you be interested in participating in such a venture, assuming that enough contributors could be found who are specialists in the various fields involved?

With best regards,

Yours sincerely,

GEISMAR & COMPANY, INC.

G. Van Biema
Gerhard Van Biema
Technical Director

GVB:ams
Enc.



IN REPLY REFER TO:

K14

NOV 18 1965
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UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
Big Bend National Park, Texas 79834

November 16, 1965

Mr. David J. Rogers
Professor of Botany
Colorado State University
Fort Collins, Colorado 80521

Dear Mr. Rogers:

We have no records of Manihot occurring in Big Bend National Park.

An authority on the flora of West Texas is Dr. Barton Warnock,
Biology Department, Sul Ross State College, Alpine, Texas. Perhaps
Dr. Warnock could tell you if Manihot grows in this region.

Sincerely yours,

Douglas B. Evans
Park Naturalist

- Taxonomy Laboratory

November 8, 1965

Chief Naturalist
Big Bend National Park
(near) Terlingua, Texas

Dear Sir:

We are monographing plants of the genus Manihot, a member of the Euphorbiaceae. The distribution of the species of the genus is of critical interest to us. This neotropical genus has several Mexican species, and one species has been reported in Texas in the Brownsville area. We wondered if one of your rangers who had an interest in botany has reported any Manihot within the National Park. We would appreciate any information you have, whether in the affirmative or negative.

Thank you for your consideration.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/ec

November 8, 1965

Dr. Howard L. Hyland
New Crops Research Branch, A.R.S.
U. S. Department of Agriculture
Beltsville, Md.

Dear Dr. Hyland:

Dr. James of the National Seed Storage Laboratories here at Colorado State University recommends that I write to you for the appropriate forms and so forth needed for the introduction of living plant material from abroad.

I would like to import propagating materials (that is, cuttings) of several varieties of Manihot esculenta from Costa Rica. I have been interested in the studies of Manihot for a number of years, and would like to have some living materials of these specimens to grow here in our greenhouses. The object of this is to do cytological studies on this genus, and particularly on the cultivars of Manihot esculenta.

So far as I know, Manihot esculenta is not cultivated anywhere in the United States except as oddities in such places as botanical gardens. It is nowhere a commercial crop, and there are no relatives of this genus or species that are grown commercially in the United States. The plants that I wish to import are presently being raised at the Interamerican Institute of Agricultural Sciences at Turrialba, Costa Rica. The plants, therefore, should be in good vigor and health as they have been under examination and test by the Interamerican Institute. close
^

Will you please forward to me the necessary forms for introduction and instructions about the introduction of the plant materials?

Very sincerely yours,

David J. Rogers
Professor of Botany

- Taxonomy Laboratory

November 8, 1965

Dr. Carl C. Moh
Instituto Interamericano de Ciencias
Agrícolas de la CEA
Centro de Enseñanza e Investigación
Turrialba, Costa Rica

Dear Dr. Moh,

Thank you very much for your prompt answer to my request for
Manihot cuttings.

I have attempted to get clearance from the U.S.D.A., but have
found that I have to write to Washington to get this. If this
does not come through within a week, I will write you again
suggesting that you send the cuttings directly. I deeply
appreciate your kind offer.

Very sincerely yours,

David J. Rogers
Professor of Botany

DJR/ec



INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fue establecido por los Gobiernos de las Repúblicas Americanas en 1944 para promover su desarrollo económico y social a través de la educación y la investigación.

CT/FI/3.1/548

Centro de Enseñanza e Investigación
TURRIALBA, COSTA RICA

Cable: IICA - Turrialba

November 3, 1965

Dr. David J. Rogers
Professor of Botany
Taxonomy Laboratory
Dept. of Botany & Plant Pathology
Colorado State University
Fort Collins, Colo. 80521

Dear Dr. Rogers:

There is no problem for us to send the Manihot cuttings that you request, except you may need an entry permit from US authorities to let the material into the United States. The U.S.D.A. Seed Laboratory in Fort Collins should be able to give you the needed information.

If you encounter difficulty in obtaining the permit, we may try to send the material to you directly.

Let me know which way would suit you best.

Best regards,

Sincerely,

Carl C. Moh

El Instituto tiene su Dirección General en Costa Rica: Apartado 4359, San José. Sus tres Oficinas Regionales abarcan los siguientes países: Zona Andina: Apartado 478, Lima, Perú (Bolivia, Colombia, Ecuador, Perú y Venezuela); Zona Norte, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Apartado 4359, San José, Costa Rica (México, Istmo Centroamericano y Antillas Mayores); Zona Sur, Casilla de Correo 1217, Montevideo, Uruguay (Argentina, Brasil, Chile, Paraguay y Uruguay). Mantiene dos centros: Centro de Enseñanza e Investigación, Turrialba Costa Rica, y Centro de Investigación y Enseñanza para la Zona Templada en el Instituto Fitotécnico del Uruguay, La Estanzuela, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Zona Sur, Casilla de Correo 1217, Montevideo. Administra los Proyectos 19 (Enseñanza Técnica Profesional) y 201 (Crédito Agrícola) del Programa de Cooperación Técnica de la OEA, patrocinados por el Consejo Interamericano Económico y Social (CIES). Mantiene también núcleos de investigación y enseñanza para graduados en instituciones de los países miembros.

- Taxonomy Laboratory

October 29, 1965

Dr. Carl C. Moh
Inst. Interamericano de Ciencias
Agrícolas de la OEA
Turrialba, Costa Rica

Dear Dr. Moh,

I wonder if I might trouble you for a few cuttings of Manihot
esculenta that I may propagate here in Colorado. I am not
particular about the particular varieties that you might send.
As a matter of fact, only three or four different types
would be all that I would be interested in. If you would send
them to me here, I will be more than willing to pay whatever
transportation costs are involved. I would guess that sending
them by parcel post would be the easiest way.

I haven't any growing specimens of yuca with me, and I feel a
little bit lonesome without them. This is the reason that I
want them up here, although I do hope that I will be able to
get some students interested in various aspects of the study
of these plants. One of the things that I would like very much
to get students going on, if I could possibly do so, is the
physiological character of HCN production -- metabolic pathways,
environmental influence, etc. This is, of course, a factor that
is very difficult to work out, and I'm not just sure how to
attack the problem. But inasmuch as we have a number of good
physiologists on the staff here, it may be possible to get
somebody going who can do some good work with this particular
aspect. I trust that it will be little trouble for you to send
me the materials. I will appreciate it very much.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/ec

October 29, 1965

Dr. Howard Irwin
Department of Botany
Universidade de Brasilia
Brasilia, F.D., Brazil

Dear Howard,

Your manuscript arrived very shortly after we got here, and I didn't have the opportunity at the time to acknowledge it. I hope that everything is all right with the manuscript and that you have submitted it for publication. Have you heard anything about the time it will appear?

I hope that you and family have been able to get settled in Brazil and with a minimum of trouble. I am sure that something must have gone awry, with all the fancy arrangements you had to make.

We are more than pleased with our new situation here. The Dept. of Botany has just lost a chairman. The man who had been on the faculty as chairman for about twelve years had lost the confidence of just about all the staff in the department. Of course, this was something that was already in the mill when I came, and my appointment has nothing to do with him particularly. Henry and George and Bob Brill and I are all now situated in one of the oldest buildings on campus, the Old Music Building. We are pretty happy about the place because it is our own building, and we will have enough room for ourselves to spread out, to spread out specimens, and also have enough room for a number of students. I have a new course to offer in taximetrics next spring. This is something, of course, we are eager to do and to get going on a graduate program. I think we have the interest of a number of the staff and faculty who want us to prepare their students, and this is exactly what we are looking for. In taxonomy, we have Harold Herrington (He's the oldtimer who wrote The Flora of Colorado.) and a young fellow who got his degree at the Rancho Santa Ana Botanic Garden, Claremont College. His name is Bill Klein. He did his work under Munz and naturally worked on Oenothera. Of course, he came under the influence of Vern Grant out there, and his take-off is biosystematics. At the

COPY

Letter to Dr. H. Irwin
October 28, 1965

Page 2.

moment, the department as far as taxonomy is concerned, is not really "gung ho", but I think we will be able to shift this picture quite rapidly.

I wonder if it would be too much to ask you to look for seeds of *Manihot* for me. I have some room in the greenhouse now, and there is nothing like the situation in New York where I cannot go in and diddle with my own materials. So, there is a better chance that I can get something growing here. If you have any chance to get seeds, just put them into a regular envelope and send them along. I don't think there will be any trouble. Some of those odd species that you find on the cerrado will be most welcome. If you can get that one species -- the one with the simple, unlobed leaves again, this will be most helpful. Anything, of course, in *Manihot* will be useful to me and I will be more than happy to have it.

Connie and I are well set up in a little home we rent. We haven't decided on what sort of house to buy. The town of Fort Collins is loaded with houses for sale, although most of them seem to be higher priced than we are willing to pay at this particular time. It seems, however, that if we wait until the middle of the winter, we will have a better chance to get the prices down into the range that we are interested in. The kids love the schools here, which is a real shift from what we had in New York, where we had to practically force them to go to school at the point of a pitchfork.

Once again, I hope that your stay in Brazil will be profitable, and that we will be hearing from you soon. Give my best to Marian and the kids.

Most sincerely
signed Dave

David J. Rogers
Professor of Botany

DJR/ec

- Taxonomy Laboratory

October 28, 1965

Mr. Kenneth D. Knievel
Office of International Programs
South Hall, Colorado State University
Fort Collins, Colorado, 80521

Dear Ken,

Our conversation yesterday has stimulated me to sit down and write out my thoughts about a program for mandioca (Manihot esculenta). This crop is so critical amongst millions of tropical lowland people that it deserves to receive the very best we can offer in the way of technical assistance.

Let me review the situation with this crop before getting into suggestions for work on it. Mandioca is a new-world crop, raised by native Indians long before the advent of Europeans. The methods of culture are still essentially those practiced by the Indians. This is not entirely bad, but it is certainly no "pat on the back" for those interested in tropical agriculture. Mandioca is seldom, if ever, a large-scale crop. Rather, it is a kitchen garden, door-yard crop where each family raises enough for immediate needs and little more. I have seen, in all my travels to study this particular crop, only one really organized, large-scale planting of mandioca for commercial production. There are areas in the state of Sao Paulo where large-scale production occur, or so I understand. Surely, there are suppliers of local markets, but these are not sufficient to supply a steady, useful quantity for commercial production and the local needs. There are good reasons for this. There does not exist in the tropical countries any kind of assistance from local banks, from government or private enterprise, the kind of funding necessary to guarantee the local farmer a return on his time and effort to raise the raw materials necessary to the whole project. If a private investor from the U.S. goes into the tropical areas with a fancy factory but is not willing to subsidize the farmers with long term, low credit money we can guarantee failure. This is true in our own country -- it is doubly true in the underdeveloped ones. And, in the case of mandioca, there is going to have to be much technical back-up, because the farmers are going to run into many problems that they cannot solve by themselves when they begin plantation-size growing of this crop. Inevitably, there will be disease problems, insect pests, nutritional deficiencies, etc. which require the attention of pathologists, physiologists,

geneticists and the like. This is not idle prediction -- it just happens, no matter what the crop. But we may forget that many of our temperate zone crops, or tropical crops raised for temperate zone markets have already had all this attention. Look at sugar, coffee, cacao, etc., etc. Commercial organizations are willing to, and have, paid tremendous amounts of money and time for research. The United Fruit Company's efforts just on bananas is a good example. No such effort has been made with Manihot.

It would seem to me wise to begin with pilot programs -- not full-blown production schemes. This should involve the whole framework of agriculture, engineering, economy, marketing and consumer, but in microcosm. Select a small group of farmers, the progressive ones, back them with long-term loans, with local agricultural know-how, have the whole flow of the work organized in advance, so that no hitch comes at any critical stage. Carry through production with essentially home-made processing equipment, not fancy, made-in-Germany stuff. Get your local technicians into the work -- they're going to become involved anyway, if the thing's to be a success.

To get such a program going, one needs a fairly small staff, but these staff members must be top-notch, well-rounded people who know something about the tropics and the special problems presented there. There aren't too many people in the U.S. who really know what tropical agriculture is all about. To get what is needed, you'll have to do as the Rockefeller Foundation has done in Mexico -- get good men, pay them well, and leave them with the job until they succeed. You can't do research overnight.

I'm sure that you're stuck with an impossible task of selling this idea to a program that was not set up for this type of objective. But, if this idea isn't sold, you can chalk up another failure of "good old American know-how".

I leave you with this. I haven't even mentioned my own research -- if you cannot sell what I suggest above, my part in the whole fabric will never get a hearing. I know -- I've banged my head on this wall for nearly fourteen years.

Sincerely yours,

David J. Rogers
Professor of Botany

DJR/ec

Letter to Mr. K. K. Knieval
October 28, 1965

P. S. No. 1:

I have in my possession two manuscripts written by a chap named Arnold Krochmal who has been doing some agronomic and horticultural investigations for what he calls Cassava, which is the same thing as Mandioca. These might have some interest to you for reading; but I cannot publicly display this material inasmuch as it has not been released for publication yet. I am sure Dr. Krochmal would not mind your reading this. If you want to do so, I will be glad to let you see them. It is pertinent because he talks about agricultural development of mandioca in the state of Sao Paulo.

P. S. No. 2:

I have read over very rapidly the thesis by Ish Kansaw. There are some rather glaring errors in the introductory material which we can clear up in pretty short order. I think this will have a useful effect on the thesis, and I will be glad to go over them with Ish.

Manihot

- Taxonomy Laboratory

October 25, 1965

Dr. Harold C. Conklin
Department of Anthropology
Yale University
Box 2114, Yale Station
New Haven, Connecticut 06520

Dear Hal,

I'm not just sure what you are looking for in the way of Manihot specimens. I don't have any duplicates that I can give you, and the specimens that I'll be working on are not available right now for any length of time. How long did you have in mind to keep this material? I'm not sure either just what you're looking for in the way of color slides of Manihot. Do you want just individual pictures of the cultivars, or do you want something about the processing? I had a very nice series of slides on the typical Indian processing of the Mandioca or Cassave down in South America. Unfortunately, I made the mistake of lending these to my good friend, Richard Evans Schultes of the Botanical Museum of Harvard University, and he has proceeded to loose the original set. He has sent me duplicates. These, of course, have lost a considerable amount of their original color. If you guys over there in the Ivy League schools could get together, maybe you could get yourself a good set of them, but believe me, Schultes is on my No. 1 List right now. If you are willing to throw a stick of dynamite into Harvard, go ahead and do so. Let me know more specifically what you are after, and I will try to supply it.

Sincerely,

David J. Rogers
Professor of Botany

DJR/ec

Yale University *New Haven, Connecticut*

DEPARTMENT OF ANTHROPOLOGY

20 October 1965

Dr. David J. Rogers
Department of Botany
Colorado State University
Fort Collins, Colorado

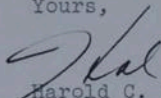
Dear Dave:

You remember our conversation last August about "illustrative sheets" illustrating good collection and preservation procedures for handling cultigens (with particular reference to Manihot). Could you send us a set of duplicates or loan sheets for this purpose? And how about a set of duplicates or originals that we can have duplicated of some of your color slides of Manihot? Jacques Barrau and I would be most appreciative of anything along these lines that you could send us, and we could use them within the month.*

How are things in your new set-up?

Best regards.

Yours,


Harold C. Conklin

HCC:mae

* We'll gladly reimburse you for any expenses involved

10/11/65 ps. 42
Manihot

October 4, 1965

Dr. Bassett Maguire
Head Curator
Coordinator of Tropical Research
The New York Botanical Garden
Bronx, New York 10458

Dear Dr. Maguire:

Thank you for your letter of July 12, 1965, which I believe was answered temporarily by Mrs. Helen Speck of this department. This was a form letter which you sent to various institutions concerning the loans of specimens to the New York Botanical Garden for the use of Dr. David J. Rogers. In the letter you referred to the transfer of our loan No. 169, consisting of 8 specimens of Manihot to Colorado State University at Fort Collins for the use of Dr. Rogers there.

I am sorry that I have been late in answering this letter through absence from Claremont while I was on sabbatical leave.

With best wishes,

Sincerely yours,

Lyman Benson
Professor and Head
Department of Botany

LB-w

Sept. 27, 1965

Dr. Egbert A. Tai
Department of Agriculture
University of the West Indies
St. Augustine, Trinidad, W.I.

Dear Dr. Tai:

I have just read a notice in the journal BioScience of the forthcoming symposium on Tropical Root Crops.

Having been interested in Manihot esculenta for the past ten or twelve years, I am vitally interested in this symposium. Will you please supply me with particulars? Is there room for speakers in the symposium? My interests are largely from the systematic standpoint, attempting to provide an adequate classification scheme for the cultivars. However, I have interested myself in many other aspects of the study of cassava, and have gathered much data from many sources.

I am at the moment working up a study on a computer-aided classification of M. esculenta cultivars, and should have this ready before the proposed symposium.

I shall be pleased to hear from you.

Sincerely yours,

David J. Rogers
Professor of Botany

Sept. 21, 1965

Dr. Richard Evans Schultes
Botanical Museum
Harvard University
Oxford Street
Cambridge, Mass.

Dear Dick:

You will recall that I sent you a series of slides (kodachromes) of Manihot to be used in some sort of public lecture you were developing.

I need to have these slides returned as I must give a seminar in the early part of October. Your prompt return of these slides will be appreciated.

Sincerely,

David J. Rogers
Professor of Botany

Return requested to
CSU 8/12/65

April 15, 1965

Dr. Richard Evans Schultes
Botanical Museum
Harvard University
Cambridge, Massachusetts

Dear Dick:

I am sending seven Kodachromes illustrating the processing of Manihot in British Guiana and two Kodachromes of the plants from Manaus.

The processing Kodachromes are duplicates and therefore another duplicate made from these will reduce even more their color accuracy; but they should serve your purposes. These processing pictures were taken by Steve Tillett when he was on a collecting trip down there in 1960. These are the best I have and I hope they will be satisfactory.

I am sending them by registered mail, and I expect that you will understand that I would want you to be very careful with them. Let me know if these will be satisfactory. If not, I have several others that might do the trick.

Sincerely

DJR:MDF

BOTANICAL MUSEUM OF HARVARD UNIVERSITY

Oxford Street
Cambridge, Massachusetts 02138

April 12, 1965.

Dear Dave -

I am working up a popular lecture entitled "The Twelve Plants that Feed Mankind". One of these is cassava. I do not have interesting Kodachromes showing this plant & its uses. Before I make black-&-whites, I decided to ask you if you had 4 or 5 good Kodachromes showing 1) the plant; 2) preparing flour from the toxic form; 3) cakes of cassava drying; etc. & if you'd be willing to have made (or let me make) a duplicate transparency. If so, could you let me know. I have a talk scheduled on May 17, so must be sure soon if I need to use my own black-&-whites or not. I will appreciate very much your help & of course, stand ready to reciprocate with any of my own photographs.

Sincerely,

Dick

August 4, 1965

Dr. Carl C. Moh
Nuclear Energy Program
Inst. Interamericano de Ciencias Agricolas
Turrialba, Costa Rica

Dear Dr. Moh:

I look forward to having the chance to see you again at the Genetics Meeting in Fort Collins. I will plan to be in Fort Collins about the first of September.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF



INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fue establecido por los Gobiernos de las Repúblicas Americanas en 1944 para promover su desarrollo económico y social a través de la educación y la investigación.

Centro de Enseñanza e Investigación

TURRIALBA, COSTA RICA

Cable: IICA - Turrialba
CT/FI.3/3.1/180

July 27, 1965

Dr. David J. Rogers
The New York Botanical Garden
Bronx, New York 10458
U. S. A.

Dear Dr. Rogers:

It was nice to hear from you. Each Manihot cultivar in our collection has an arbitrary number, so the pollen sterility data can be directly referred to the cultivar very easily. The pollen sterility study was made in March and April this year. We would like to repeat this study once more to insure its accuracy.

Mr. Sohmer is working in our laboratory and will prepare the Manihot specimens. He told me that he may prepare three sets, one for each of us.

I shall be in Fort Collins for the Genetics Meetings the first week of September. Hope I can see you at that time.

Sincerely,

Carl. C. Moh
Nuclear Energy Program

El Instituto tiene su Dirección General en Costa Rica: Apartado 4359, San José. Sus tres Oficinas Regionales abarcan los siguientes países: Zona Andina: Apartado 478, Lima, Perú (Bolivia, Colombia, Ecuador, Perú y Venezuela); Zona Norte, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Apartado 4359, San José, Costa Rica (México, Centroamericano y Antillas Mayores); Zona Sur, Casilla de Correos 1217, Montevideo, Uruguay (Argentina, Brasil, Chile, Paraguay y Uruguay). Mantiene also centros: Centro de Enseñanza e Investigación, Turrialba, Costa Rica; y Centro de Investigación y Enseñanza para la Zona Templada en el Instituto Fitotécnico del Uruguay, La Estanzuela, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Zona Sur, Casilla de Correos 1217, Montevideo. Administra los Proyectos 39 (Enseñanza Técnica Profesional) y 201 (Crédito Agrícola del Programa de Cooperación Técnica de la OEA), patrocinados por el Consejo Interamericano Económico y Social (CIES). Mantiene también núcleos de investigación y enseñanza para grandes escuelas de los países miembros.

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INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fue establecido por los Gobiernos de las Repúblicas Americanas en 1944 para promover su desarrollo económico y social a través de la educación y la investigación.

FI/3.1/3

Centro de Enseñanza e Investigación

TURRIALBA, COSTA RICA

Cable: IICA - Turrialba

June 2, 1965

Dr. David J. Rogers
Curator of Quantitative Taxonomy
The New York Botanical Garden
Bronx, New York 10458

Dear Dr. Rogers:

This is to acknowledge receipt of your letter of May 28. I am happy to know that Dr. Jancey is coming down here to collect Manihot. I don't think there will be any housing problem for him at Turrialba if he is only staying a few days. Mr. Sohmer will also be arriving around the middle of June to work on Manihot cytology.

You might like to know the progress here on Manihot cytology: by examining the pollen, we found that the sterility in our materials (about 80 cultivars) ranges from 0 to 100 percent. We have found a suitable cytological technique for preparing permanent slides for meiotic chromosome observation. Some cultivars have complex chromosomal structural changes that need some time to figure out the structural relationship.

Best regards,

Sincerely yours,

Carl C. Mohr

Carl C. Mohr, Head
Nuclear Energy Program

El Instituto tiene su Dirección General en Costa Rica: Apartado 4359, San José. Sus tres Oficinas Regionales abarcan los siguientes países: Zona Andina: Apartado 476, Lima, Perú (Bolivia, Colombia, Ecuador, Perú y Venezuela); Zona Norte, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Apartado 4359, San José, Costa Rica; (México, Istmo Centroamericano y Antillas Mayores); Zona Sur, Casilla de Correos 1217, Montevideo, Uruguay (Argentina, Brasil, Chile, Paraguay y Uruguay). Mantiene dos centros: Centro de Enseñanza e Investigación, Turrialba Costa Rica; y Centro de Investigación y Enseñanza para la Zona Templada en el Instituto Fisiológico del Uruguay, La Estanzuela, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Zona Sur, Casilla de Correos 1217, Montevideo. Administra los Proyectos 39 (Enseñanza Técnica Profesional) y 201 (Crédito Agrícola) del Programa de Cooperación Técnica de la OEA, patrocinados por el Consejo Interamericano Económico y Social (CIES). Mantiene también núcleos de investigación y enseñanza para graduados en instituciones de los países miembros.

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May 28, 1965

Dr. Carl C Moh
Cytogeneticist, Nuclear Energy Program
Instituto Interamericano de Ciencias
Agrícolas de la OEA
Turrialba, Costa Rica

Dear Dr. Moh:

One of my assistants, Dr. Robert Jancey, who has been studying Manihot with me for the past year, is planning to drive down through Central America and would like to stop to see you at Turrialba. He will probably be there some time after the 15th of June, although his schedule is somewhat flexible and it might be a week on either side of this before he reaches Costa Rica.

He will be appreciative of anything you can do to assist him. He will probably be wishing to make collections, and he may need to have temporary housing at the Institute if it is possible. This latter point is not the most critical at the moment, however. He will probably not spend more than a few days in Costa Rica and perhaps not more than one or two days at or near Turrialba.

Thanking you in advance for your assistance to him,

Sincerely

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

CC: Dr. Jancey

May 17, 1965

Dr. Jacques Barrau
c/o Department of Anthropology
Yale University
New Haven, Connecticut

Dear Jacques:

I have read your paper, "L'Humide et Le Sec," with great interest. As requested, I have made a few notes on it that occurred to me as I read through the paper. I take the liberty of returning the preprint with my notes on the applicable parts.

Only one thing I did not note in the paper itself was that I was surprised not to see anything about Manihot esculenta. You pointed out that sweet potatoes were probably introduced in the 17th century. It is likely that Manihot likewise was introduced at about the same time. It has been remarkably well accepted by those folks who already have a root culture tradition. Would it add anything to this story? I should think it would.

How are you coming along with the data recording on rice and millet?

Sincerely

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosure

Yale University New Haven, Connecticut

DEPARTMENT OF ANTHROPOLOGY
Box 2114 Yale Station

Dear Dave,

Many thanks for your useful comments on my "L'humide et le sec". I greatly appreciate them and will take them into account when I revise this paper for publication.

I did not mention Manihot because it has been a rather late comer (19th century) into the South Pacific area. However, your suggestion is a good one and I shall add a section on the place and status of introduced plants.

Work on rice and millet is proceeding slowly as the end of the academic year with exams and the like is not the best time for research.

I have just paid a very short visit (a week) in Paris. Professor R. PORTÈRES, laboratoire d'ethnobotanique (formerly laboratoire d'Agronomie tropicale) at the Paris MUSEUM NATIONAL D'HISTOIRE NATURELLE told me that, in spite of several attempts, they did not succeed in subscribing to Economic Botany (They would like to purchase back numbers too). What should be the best way?

best regards, Yours sincerely

HOW (J. BARROU)

May 3, 1965

Dr. Frederick G. Meyer
U. S. National Arboretum
Washington 25, D. C.

Dear Fred:

I am remiss in not having answered your letter of the 12th of April and acknowledged your photograph of Manihot esculenta in Ethiopia. I indeed appreciate this.

You asked when your paper on coffee is to be published. It is in the No. 2 issue which is in the mails now if you haven't already received it. Sorry it has taken so long, but I believe we are going to catch up with things now and come along with papers faster.

I am also pleased that you are willing to house my Manihot specimens. Things seem to be coming along fairly well with the classification now, and it shouldn't be too long before I can make a report on these materials. I certainly hope I can get not only the species but the whole genus Manihot wrapped up very shortly. This will be done on our computer program and should be a very interesting case.

Incidentally, we have used our computer program on the classification of a section of the genus Cassia where Howard Irwin prepared the data for us. Howard is very pleased with the results of the computer analysis inasmuch as it gave him a classification where he was not able previously to make any headway with the variations that occurred. I mention this because I know that you are going to run into tremendous problems when you get into the classification of Coffea. I am offering the facilities of the Department of Quantitative Taxonomy to you for advice and help in the event that you feel that you want to use our computer methods. It takes a considerable amount of know-how to get going on a project like this, more in the mechanics of the thing than anything else. If you have the interest and the opportunity to do so, let me know and we will talk about the possibility of collaboration.

Give my best to Jean.

Sincerely

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
CROPS RESEARCH DIVISION

NATIONAL ARBORETUM

ADDRESS REPLY TO:
UNITED STATES NATIONAL ARBORETUM
WASHINGTON 25, D. C.

April 12, 1965

Dr. D. J. Rogers
New York Botanical Garden
Bronx Park
New York, New York

Dear Dave:

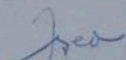
I managed to get a photograph, herewith enclosed, of Manihot esculenta Crantz at one place where I saw it in Ethiopia, namely at Teppi, the same locality I collected material on my first trip. I saw it at another locality, in Harar province, a single plant in a field but didn't photograph it. At Teppi, this plant is cultivated only or almost exclusively as a living hedge, and I wouldn't say it is widely grown even there. The total number of plants is small as compared with coffee, cabbage, and some other kinds of food plants. In Ethiopia, I don't think manihot is very much grown, as compared with parts of central Africa.

Am just a little curious as to when my coffee paper might appear in ECONOMIC BOTANY. I am now writing about my most recent trip, and it would be good to get the first paper out before the follow-up, if possible.

Whenever you want to deposit your manihot specimens in an herbarium we will be very glad to give them the best of curatorial care and space. Please keep us in mind whenever you are talking with other folks who document specimens of cultivated plants.

Very best regards to you and yours,

Sincerely,



Frederick G. Meyer
In charge of the Herbarium
U. S. National Arboretum

Encl.

April 28, 1965

Mr. Charles A. Hoffman, Jr.
Department of Anthropology
Florida Atlantic University
Boca Raton, Florida 33432

Dear Mr. Hoffman:

In reply to your letter of the 23rd, I am enclosing several reprints that may be of use to you. I am not certain which paper you refer to that you heard at Montreal because I gave two separate symposia, each of which seems to have some bearing upon the interests that you have.

There is one paper on our computer methodology in taxonomy which may have some merit for your quantitative analyses. I also enclose a paper which gives some speculations on the origins of Manihot. This may be of interest to you. If you are speaking of those papers given at the AAAS meetings, the one before the Society for Economic Botany is just now being sent off to the editor to be incorporated in the symposium issue which will not appear until next December.

In answer to the question in your last paragraph, I do not think that you will have much of a chance of finding manioc pollen in soil analyses. First of all, the pollen produced by the cultivars is sticky and is not usually shed very well from the anthers. Secondly, the amount of pollen produced by the cultivars of manioc is minimal. The plant seemingly selected against flowering and fruiting. Another consideration is that the pollen of manioc can be very easily confused with the pollen from two or three other genera related to it. The genera Jatropha and Cnidoculus have pollen of almost identical morphology. Given the possibility that you find a pollen grain that looks something like these plants, it would be extremely difficult to determine whether or not you indeed had manioc.

Bin. Sin
AIBS
Torr.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosures

FLORIDA ATLANTIC UNIVERSITY

BOCA RATON, FLORIDA 33432

DEPARTMENT OF ANTHROPOLOGY

23 April 1965

Dr. David J. Rogers
New York Botanical Gardens
Bronx Park, New York

Dear Dr. Rogers:

I am planning to carry out archaeological investigations in the Bahama Islands this summer as part of my dissertation research for the Univ. of Arizona. I plan to make use of quantitative analyses of all data (cultural and environmental) and the complete integration of the ecological picture into the cultural reconstruction.

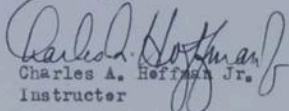
In the next few years I hope to develop a better understanding of the relationship between man and his island environment, with particular emphasis upon the Caribbean area.

With this in mind I am writing you for reprints of any publications that might tie in to this type of investigation. I am particularly interested in obtaining a copy of the paper you delivered before the AAAS in Montreal last December 30.

May I also take this opportunity to ask you one question: Will manioc (*Manihot* sp.) produce a pollen that can be picked up in an analysis of the soil?

Thanking you very much in advance, I am

Sincerely,


Charles A. Hoffmann Jr.
Instructor

April 12, 1965

Dr. Gestar Johnson
Department of Chemistry
Colorado State University
Fort Collins, Colorado

Dear Dr. Johnson:

Enclosed is a reprint on Manihot (cassava) in which you will find some discussions that may be meaningful in terms of the difficulties of differentiation of the varieties. I am also enclosing a reprint on the analysis of amino acids in the foliage as well as a reprint on the crude protein analysis of the foliage. I think that these give an indication of the complexity of the group of species and may give helpful information to your student concerning the five varieties he is testing.

I will be interested in hearing if anything further develops in this area with the type of study that you are proposing. It is quite unlikely that there will be real differences between five selected varieties for several reasons: (1) The age of the plant very likely has an effect upon the starch. (2) The varieties selected might indicate some variability between the varieties, but this would have little likelihood of being meaningful unless a comparative study were done across a large enough sample of varieties to know whether there are intermediate forms as I am confident there must be.

I hope these comments have some meaning for you. If not, perhaps you can get more information by questions which I shall try to answer.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDP
Enclosures

April 5, 1965

Mr. George S. Bass
Apartado Aereo 13768
Bogota, Colombia

Dear Mr. Bass:

Your letter of March 31 has just come. I am sorry that I have not prepared the table requested by you. In view of the content of your letter, it would seem to me something that would not necessarily be useful to do until some solution has been made to the bug problem mentioned in your letter.

I am sorry that it is not possible for me in the name of the Garden or my own research project to go after the kind of information that you are looking for. It is not apparently the sort of thing that these people are willing to let out if they have not done so, and this is not really in my line of business anyway. As you have pointed out and as I had suggested earlier, this type of problem is not in my province, and I am the worst guy in the world to advise you on it. I really suspect that you yourself could get farther in the investigation of this than I could.

I am sorry to fall down on you this way, but it is really something that I should not be trying to advise you on.

Sincerely

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

GEORGE S. BASS

37 Mt. Vernon St.
Boston, Mass.
Tel. 227-0610

APARTADO AEREO 13768
BOGOTA, COLOMBIA
TELEFONO 42-33-85

Dr. David J. Rogers
The New York Botanical Garden
Bronx Park
New York 58, N. Y.

31 Mar 1965

Dear Dr. Rogers,

The day before yesterday I got quite a scare. Near Santiago, Dominican Republic I visited the site of what once was Corn Products' yuca plantation - 8,000 acres, 2,000 men, a 400 T/day factory, a R.R., etc. Now, the only remains that can be seen are a few broken foundations through the underbrush. A fellow there told me it was due to a bug that attacked the leaf of the yuca. There was no remedy.

Would you be willing to consider the idea of contacting Corn Products in the name of the Garden or in the name of your research project to learn more about why their project failed. I realize you couldn't relay to me any confidential information, but perhaps you would be able to indicate if the reason for failure was in fact a bug, or bad administration, world prices or what. A few phone calls might lead you to the man that was in charge of the project who might prove very interesting to talk to from the standpoint of your professional interests aside from my personal ones.

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GEORGE S. BASS

37 MT. VERNON ST.
BOSTON, MASS.
TEL. 227-0610

APARTADO AEREO 13768
BOGOTA, COLOMBIA
TELEFONO 42-33-85

I certainly don't want to start into this business knowing that one bug could resist all insecticides + biological controls and completely destroy 8,000 acres of yucca. The fellow I talked to was in the plantation and for Corn Products for a good many years so he should be telling the truth. He said they tried spray, dusting + even a team of 100 bug pickers. They piled the bugs (worms) up in baskets, but still they couldn't stop them. This fellow expressed his philosophy of the one great danger that was pointed out by my mushroom friend + I believe by yourself. He said that one plant living alone, like a human, is exposed to only a few problems, but when it lives with thousand + millions of other it is then exposed to the millions of each one.

I'm writing this at 3.00 AM following my late arrival here so I haven't checked my mail to see if your outline has arrived or not. Neither have I had time to work on + verify program of search for man to do yucca + site survey. This bug thing has kept me awake all night. I would appreciate any effort you could make to develop information on this subject. In any case, please don't mention me or anything about anyone interested in yucca in Colombia.

Many thanks.

Mar. 30, 1965

Dr. William R. Coe
Department of Anthropology
University of Pennsylvania
Philadelphia, Penna.

Dear Dr. Coe:

I was pleased to see your paper, "Tikal, Guatemala, and Emergent Maya Civilization", and would be pleased to receive a reprint of it when they are available. I should also be pleased to receive, if still available, a reprint of your paper "Cultural development in Southeastern Mesoamerica, published in 1963.

I enclose a reprint of one of my papers on Manihot esculenta, in which I indicate the Mesoamerican area as of particular interest for the development of this crop. I am gathering all evidence available to bolster my intuition that the Mayan, or preMayan peoples were responsible for the development of this crop.

If you have any evidence, published concerning any of the American crop plants, from your own or colleagues' work, I will be pleased to know of it.

Sincerely yours,

David J. Rogers
Curator of Quantitative Taxonomy

Encl.

INSTITUTO AGRONÔMICO

CAIXA POSTAL, 28
CAMPINAS-EST. S. PAULO-BRASIL
SECRETARIA DA AGRICULTURA DO ESTADO DE SÃO PAULO

Nº

Mencionar este número na resposta

Cit.65-52.

de
March 29th, 1965.

de 19

Dr. David J. Rogers
Curator of Quantitative Taxonomy
New York Botanical Garden
Bronx Park, New York 58
New York, U. S. A.

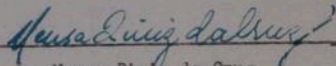
Dear Sir:

Your bottles for collecting material of Manihot were received after long delay. Unhappily they arrived quite broken, and other materials ruined by the spilling of acetic acid and alcohol, the instructions, however, were completely unnecessary, because Mr. Mendes, who is a cytologist, uses about the same techniques. But we are ready to collaborate with you in this field.

I have been studying this genus the last two years and intend to research the group phylogeny through the cytology. Now my work is the classification of some species, and genus geographic distribution. My methodological approach is through the biology of reproduction. In the meantime I can collect the material you want and to collaborate with you in this field. Please let me know if you are still interested in receiving material.

I should like to have your papers on the genus. I shall send you the mine, expecting your suggestions and critics.

Yours respectfully,



Neusa Diniz da Cruz
Biologist of Instituto Agronômico

February 25, 1965

Dr. Jose de Js. Jimenez
Calle Maximo Gome 54
Santiago de los Caballeros
Republica Dominicana

Dear Dr. Jimine :

This is just to notify you that the root
samples of Manihot dominguensis have arrived.

I am very happy to have them.

The publication which you recently requested
has been forwarded to you.

Once again, thank you for your collaboration.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

February 1, 1965

Dr. Jose de Js. Jimenez
Calle Maximo Gomez 54
Santiago de los Caballeros
Republica Dominicana

Dear Dr. Jimenez:

I appreciate your further letter concerning the ecological data for Manihot dominguensis. It is strange that this particular species seems to occur in rather widely disjunct geographical areas. An almost identical species is found in the varzeas or low-lying, frequently inundated areas along the Amazon River. We are not quite certain how to interpret this in terms of species as yet.

I am sorry to say that the root specimens of the plants which you sent to me have not as yet arrived. As soon as they come in, we will be certain to notify you of their arrival.

You asked about the work of Croizat on Manihot published in 1942. Unfortunately, Mr. Croizat's work has not stood the test of time, and his interpretations of species are all wrong in taxonomic reality. We have had to discard many of his decisions as being not valid.

I am enclosing herewith the only reprint available on Manihot that may be of interest to you. Once again let me thank you very sincerely for your very much appreciated cooperation.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosure

Dr. JOSE DE JS. JIMENEZ

Calle Máximo Gomez 34
SANTIAGO DE LOS CABALLEROS
REPUBLICA DOMINICANA

Enero 23, 1965

Sr. David J. Rogers
The N. Y. Bot. Garden
Bronx Park, N. Y.

Muy distinguido amigo:

Recibí su muy amable carta y estoy encantado que le haya gustado el material del Manihot domingensis que le envié. Todavía no me ha informado si recibió el sistema radicular de la planta que le envié en una caja aparte. Estas raíces son de la misma planta de la cual le envié el material botánico.

La región donde crece nuestra planta es una de las zonas más lluviosas del país ya que se encuentra a la entrada de los vientos alisios (trade-winds). Me comunicó el Prof. Marciano que había mucha humedad donde él recolectó la planta. El nombre de Arroyo Seco dada a la región es uno de los muchos nombres que existen en nuestro país para denominar lugares áreas enormes. Como Ud. comprenderá este nombre de Arroyo Seco se le da a una comarca muy grande. A lo mejor en alguno de sus sitios ha habido algún Arroyo que con el correr de los años se haya secado.

Hay además un carácter diferencial con Manihot esculenta. Esta tiene los pulvinales de las hojas engrosados en forma de tubérculos. Después de la caída de las hojas se ponen mucho más gruesos lo que le da a la planta un aspecto "moniliforme". M. domingensis el tallo es liso.

Me gustaría recibir sus trabajos sobre Manihot lo mismo que sobre cualquier otro tema.

Dígame si el trabajo de Croizat sobre Manihot publicado en 1942 vale la pena pedirlo y tenerlo.

Esperando que estos nuevos datos le sean de utilidad soy como siempre su afmo amigo y S. S.

Jose de J. Jimenez

February 10, 1965

Dr. Jacques Barrau
Department of Anthropology
Box 2114 Yale Station
New Haven, Connecticut

Dear Dr. Barrau:

I am pleased to know that you are visiting at Yale this year and look forward to your visit here. I am not certain just what materials will be available for your students at the Botanical Garden other than the displays that we have on our first floor museum, although what we have there is more for the lay public than for those who are working at a professional level. There are some living materials (coffee, cacao, Musa, etc.) in the greenhouses. I will leave to your suggestion what other materials might be of interest here at the Botanical Garden.

The Puerto Rican market about which you inquire is located at about 110th Street (running for several blocks north and south) on Park Avenue in Manhattan. The markets themselves are in "stalls" underneath the elevated tracks of the New York Central Railroad. There is a very nice selection of all sorts of typical Latin American objects, not only of food materials but also of drug plants as well as clothing, etc. I am sure this will be a very useful visit.

I am sorry if I did not include you on the mailing list for the article on the origin of cassava. I am enclosing a reprint for you as well as one for Hal Conklin to whom I will be pleased if you give my best regards. I shall let Dr. Dansereau know of your regards.

Sincerely

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosures-2

P.S. We note from our files that a copy of this paper was sent to you in New Caledonia. It may have gone astray.

J. BARRELL

YALE UNIVERSITY
DEPARTMENT OF ANTHROPOLOGY
51 HILLHOUSE AVENUE

5 Feb. 1965

BOX 2114, YALE STATION
NEW HAVEN, CONN., U.S.A.

Dear Dr. Rogers.

I am spending the spring semester at Yale as visiting professor in Ethnobotany and I am of course planning a trip to New York to see you and visit the botanical garden where I guess you have probably quite a few plants or specimens my students should see.

As a matter of fact, I am planning to take them to New York for some "field work" exercise at the Puerto Rican market there. What is the best day of the week and the best hour to visit this market and where is it located?

If we go to New York on a Saturday for instance

we could visit the botanical garden after the "exploration"
of the Puerto Rican market.

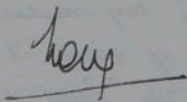
I understand that you have published recently an
article on the origin of canna. May I ask you if
you have two reprints available? one for Hal CONKLIN
and one for myself.

With many thanks in advance and my best regards,

Yours sincerely

P.S. Would you please convey
my regards to Dr. DANSEMAN

J.



(Jacques Barrou)



McGILL UNIVERSITY
MONTREAL

Botany Department

February 1, 1965

Dr. David J. Rogers
Curator of Quantitative Taxonomy
The New York Botanical Garden
Bronx Park
New York 58, N.Y.

Dear Dr. Rogers,

In answer to your letter of January 8th inquiring about my method for HCN, I use a very simple sodium picrate paper method. This is not quantitative, although if you use measured amounts of plant material it can be roughly quantitative. A strong reaction would be one in which the paper turns a rusty red in a very few minutes to a few hours; a moderately strong reaction would be one in which such a change takes days; a weak reaction would be one in which there is a definite ~~to be~~ slight colour change in a week; and a negative reaction would be one in which there is no change in a week. This is not, of course, a rapid field method, and I know of none. I am afraid you will have to search the literature, and if you are successful, I should be glad to have the reference.

I enclose a copy of one of my papers which describes my method briefly.

Yours sincerely,

R.D. Gibbs

R.D. Gibbs
Professor of Botany

*W.D. 27, 8/65
M.D. 10/65
S. HCN 21
OT*

January 8, 1965

Dr. R. Darnley Gibbs
Department of Botany
McGill University
Quebec, Canada

Dear Dr. Gibbs:

I think I recall that you published a rapid method for the determination of HCN. I am very much interested in the possibilities of using a simple method for the comparison of HCN glucosides in varieties of Manihot.

Would you please let me know if you have a reprint discussing this method, and if not, will you please suggest where I might find a rapid field method for HCN evaluation?

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

Smith Kline & French Laboratories · 1500 Spring Garden St., Philadelphia, Pa. 19101

January 4, 1965

Dr. David J. Rogers
New York Botanical Garden
Bronx Park
New York 58, New York

Dear Dave:

The most modern treatment which I have at hand for the determination of HCN in plant materials is given in Vol. 4 of "Modern Methods of Plant Analysis" by K. Paech and M. V. Tracey, Springer, 1955. The chapter begins on page 676 and runs several pages; I have enclosed only those dealing with quantitative determinations. This does not appear to be a "field test" but would require a reasonable laboratory to carry out effectively.

The qualitative test using picric-acid paper which can be found in Rosenthaler, "The Chemical Examination of Plants", G. Bell and Sons Ltd., London, 1930 may be adaptable to a semi-quantitative method good enough for your purposes. I don't have any experience with it.

If I can be of further help, please call on me.

Sincerely yours,


Robert F. Raffauf, Ph.D.
Science Information Department

jm
enc.

demnach besonders geeignet sein, Spuren von HCN nachzuweisen. Auch die Berliner-Blau-Reaktion ist hierzu noch von einer ausreichenden Empfindlichkeit, während die Silber-Reaktion in der beschriebenen Ausführung etwas weniger empfindlich ist (s. dagegen mikrochemischer Nachweis). Es ist immer zu empfehlen, zur qualitativen Blausäure-Bestimmung wenigstens zwei verschiedene Prinzipien zu verwenden.

Nach BAUSSWIK (1921) kann der *mikrochemisch-qualitative Blausäure-Nachweis* mit der Silber- und Benzidin-Reaktion folgendermaßen geführt werden: In eine kleine Glaskammer (Objektträger mit Glasring verkittet) wird wenig Pflanzenmaterial mit Wasser und 1 Tropfen Äther oder Chloroform befeuchtet. Den Verschuß nach oben bildet ein Deckgläschen mit einem Tropfen 1%iger AgNO_3 -Lösung, die mit Methylenblau schwach angefärbt wird. Wird HCN aus dem Untersuchungsmaterial freigemacht, so entstehen in dem Tropfen Körnchen, Nadeln, Ranken, Drusen und Sphärite von AgCN , die vom Methylenblau deutlich blaugrün gefärbt sind. Die Empfindlichkeit der Methode beträgt $0,06\gamma$ HCN.

Wird das Deckglas in gleicher Weise mit einem Tropfen Benzidin-Reagens (Gemisch von 1 ml 3%iger Cupriacetat-Lösung, 10 ml 5%iger Benzidinacetat-Lösung und 16 ml Wasser) versehen, so entstehen blaue Nadeln oder Körnchen. Die Empfindlichkeit dieser Methode beträgt $0,02\gamma$ HCN.

Ist nur mit äußerst kleinen Mengen von Blausäure zu rechnen, dann verfährt man so, daß man mindestens 1 kg Pflanzenmaterial aufbereitet. Dieses wird in möglichst frischem Zustand zerkleinert und mit Wasser befeuchtet. Dazu verwendet man am besten einen Langhals-Rundkolben mit Waschflaschen-Einsatz. Nach mehreren Stunden unter Verschuß wird mit verdünnter Schwefelsäure angesäuert (nach BISHOP kann man auch ganz langsam auf 100° erwärmen, abkühlen lassen und dann ansäuern). Nach dem Ansäuern verbindet man sofort über eine Waschflasche mit KOH oder NaOH (10–20 ml 10%ig) mit der Wasserstrahlpumpe. Die durch das Untersuchungsmaterial gesaugte Luft wird vorher durch zwei Waschflaschen mit HgCl_2 (1:20)-Lösung und NaOH (10%ig) von CO_2 und eventuellen HCN-Beimengungen der Raumluft befreit. Es wird nun über mehrere Stunden ein starker Luftstrom durch das System gesaugt. Schäumen kann durch Octyl- oder Caprylalkohol vermieden werden (einige Tropfen). Der HCN-Nachweis kann nunmehr in der alkalischen Lösung geführt werden, am besten zuerst mit der Rhodanid-Reaktion, sodann mit der Berliner-Blau-Reaktion und mit der Silber-Reaktion. Der positive Ausfall von mindestens zwei Reaktionen zeigt mit Sicherheit Blausäure im Untersuchungsmaterial an.

II. Quantitative Methoden.

Für die quantitative Bestimmung der Blausäure kommen praktisch nur die Silber- und Berliner-Blau-Reaktion in Frage. Die Titration mit Jodlösung nach FORDOS und GELIS bis zur Gelbfärbung ($\text{HCN} + \text{J}_2 = \text{JCN} + \text{HJ}$) sowie die Titration mit Brom ($\text{HCN} + \text{Br}_2 = \text{BrCN} + \text{HBr}$), wobei der in äquivalenter Menge entstehende Bromwasserstoff mit Lauge titriert wird, sind nicht spezifisch und empfindlich genug. Die Silber-Reaktion wurde bisher fast ausschließlich angewandt. Die *gravimetrische Bestimmung* (Ausfällung als AgCN und Wägung des getrockneten Niederschlages oder des durch Glühen erhaltenen Silbers) ist zwar sehr exakt, aber umständlicher und weniger empfindlich als die *titrimetrischen Silber-Verfahren*, die deswegen allgemein bevorzugt werden. Die meisten quantitativen HCN-Bestimmungen von Pflanzen sind mit dem letztgenannten Verfahren durchgeführt worden. Man unterscheidet eine Titration in saurer von einer solchen in alkalischer Lösung. Für die Vornahme der erstgenannten wird zuerst

mit NH_3 und AgNO_3 im Überschuß versetzt, das Filtrat mit HNO_3 angesäuert und mit Ammoniumrhodanid und FeCl_3 als Indikator das überschüssige Silber zurücktitriert (VOLHARD).

Für die Titration in alkalischer Lösung benutzt man KJ als Indikator. Sobald ein Mol von 2 Mol HCN in AgCN übergeführt wurde, entsteht ein bleibender Niederschlag von AgJ , da durch das 2. Mol HCN das zuerst gebildete AgCN in das lösliche Komplexsalz $\text{K}[\text{Ag}(\text{CN})_2]$ übergeführt wird. Der erste überschüssige Tropfen von AgNO_3 -Lösung erzeugt eine bleibende Trübung. Dieses bereits auf LIEBIG-DENIGES zurückgehende Prinzip wurde von den meisten Autoren mit Erfolg für die HCN-Bestimmung in Pflanzenmaterial verwandt (TREUB, ROSENTHALER, BISHOP, WINKLER u. v. a.). BISHOP hat empfohlen, für die Titration zur besseren Erkennung der ersten AgJ -Opaleszenz einen dunklen Hintergrund zu wählen, wodurch er eine Empfindlichkeit von 0,00001 g HCN mit einer Fehlerbreite von 1–3% erreichen konnte (Umschlag deutlich nach 1 Tropfen $n/100$ AgNO_3). Dies befähigte ihn, die HCN-Bestimmung an dem Material eines einzigen Blattes durchzuführen.

Die HCN-Titration mit AgNO_3 in alkalischer Lösung. Man versetzt einen aliquoten Teil der alkalischen HCN-Lösung mit 2 ml NH_3 -Lösung (10%ig) oder NH_4Cl -Lösung (20%ig) bis zur deutlich ammoniakalischen Reaktion, setzt ein Körnchen Jodkali oder 3 Tropfen einer 5%igen Jodkali-Lösung hinzu und titriert mit einer $n/50$ oder $n/100$ AgNO_3 -Lösung (3,398 resp. 1,699 g auf 1000), bis gegen einen dunklen Hintergrund der erste Tropfen der AgNO_3 -Lösung eine bleibende Opaleszenz verursacht. 1 ml $n/100$ AgNO_3 -Lösung entspricht 0,54 mg HCN oder z. B. $0,54 \cdot 11,522$ Dhurrin.

Die kolorimetrische Bestimmung der Blausäure kann nach BERL und DELPY vorgenommen werden. Ein aliquoter Teil der alkalischen HCN-Lösung wird mit einem Überschuß von Ferrosulfat (5 ml einer 3%igen Lösung) und 3–5 Tropfen einer 5%igen FeCl_3 -Lösung 15 min lang gekocht. Nach dem Erkalten wird mit 10%iger Salzsäure angesäuert und mindestens 5 Std. stehen gelassen. Je nach der Menge der zu erwartenden Blausäure wird auf 50 oder 100 ml aufgefüllt und im Kolorimeter gegen eine unter gleichen Bedingungen mit bestimmten HCN-Mengen erhaltene Suspension von Berliner-Blau verglichen.

Die kolimetrische Bestimmung der Blausäure ist auch in einfacher Form nach einer Testfleckenmethode durchzuführen, die auf GETTLER und GOLDBAUM zurückgeht und deren Brauchbarkeit SEIFERT für die Blausäure-Analytik bestätigen konnte. Sie ist für HCN absolut spezifisch und von einer derartigen Empfindlichkeit, daß Bruchteile von einem Mikrogramm noch einwandfrei ermittelt werden können.

Das Prinzip der Methode besteht darin, daß aus der HCN-haltigen Lösung das HCN-Gas durch Ansäuern mit H_2SO_4 in Freiheit gesetzt wird, mit einem Luftstrom oder dem Strom eines inerten Gases, wie Stickstoff, ein mit Ferrosulfat und NaOH präpariertes Testpapier passiert, wo es absorbiert wird. Beim Behandeln des Testpapiers mit HCl entsteht auf diesem ein Fleck von Berliner-Blau dessen Intensität der in Freiheit gesetzten HCN-Menge direkt proportional ist. Durch Vergleich des nach dem Trocknen erhaltenen Testflecks mit einer Standardreihe von Testflecken, die unter gleichen Bedingungen von bekannten HCN-Mengen gegeben wurden, läßt sich mit einer für die praktischen Belange ausreichenden Genauigkeit der HCN-Gehalt des Substrates ermitteln. Die Methode ist von einer überraschenden Einfachheit und eignet sich besonders für seriennäßige Routine-Bestimmungen, da sie schnell durchführbar ist.

Herstellung des Testpapiers. Man löst 5 g Ferrosulfat (krist. p. a. Merck) in 50 ml Wasser und filtriert, falls ein unlöslicher Rückstand bleibt. In diese

Lösung taucht man ein Blatt Filterpapier (Schleicher & Schüll 589³). Nach 5 min wird es herausgenommen und an einer Klammer freihängend an der Luft getrocknet. Das eben lufttrockene Papier wird dann einen kurzen Augenblick in eine 20%ige Natronlauge eingetaucht und wieder getrocknet (nicht dem direkten Sonnenlicht aussetzen). Aus dem trocken schmutzig grün aussehenden Papier schneidet man runde Scheiben von 2,5 cm Durchmesser. Diese gebrauchsfertigen Testpapiere lassen sich über einen Zeitraum von einigen Monaten verwenden, wenn sie kühl und im Dunkeln aufbewahrt werden.

Die Apparatur. Die Bestimmung wird in einer Apparatur vorgenommen, wie sie die Abb. 1 zeigt. A, B und C sind 50 cm³ fassende Reagenzgläser mit einer lichten Weite von 2–2,5 cm mit Waschflascheneinsätzen. In A wird die durchgesaugte Luft resp. der durchgedrückte Stickstoff aus der Stahlflasche mit Reduzierventil von eventuellen HCN-Beimengungen durch 10 ml HgCl₂-Lösung (10%ig) und in B durch 10 ml 10%ige NaOH von CO₂ befreit. In C wird die zu untersuchende alkalische HCN-Lösung in aliquoter Menge (1–5 ml) eingefüllt, durch den Einfülltrichter D mit 5 ml 10%iger H₂SO₄ angesäuert. Das HCN-haltige Gas passiert in E das Testpapier. Es wird gehalten von sog. Glasflanschen, die aufeinander eingeschliffen das Testpapier zwischen sich aufnehmen (Abb. 2). Ein Flanschen-Durchmesser (lichte Weite) von 10 mm wird zumeist ausreichen. Eine lichte Weite von 5 mm kann die Empfindlichkeit noch um ein Beträchtliches steigern.

Die Bestimmung. In E wird ein Testpapier eingelegt. Man kann aus einer dünnen Kapillare ein kleines Tröpfchen Wasser zum leichten Anfeuchten auf tropfen, was sich für eine gleichmäßige Ausbildung des Testflecks als günstig erwiesen hat. D wird mit 10 ml 10%iger H₂SO₄ gefüllt. Dann wird die zu untersuchende Lösung (1–5 ml je nach der zu erwartenden HCN-Menge) eingefüllt. C wird in ein auf 80–90 C° erwärmtes Becherglas mit Wasser bis zur Höhe des Flüssigkeitsspiegels eingetaucht. Nun wird mit Hilfe einer Wasserstrahlpumpe (im einfachsten Fall genügt der Unterdruck einer mindestens 2 l fassenden MARIOTTESchen Flasche) ein lebhafter Luftstrom durchgesaugt, oder aus einer Gasbombe Stickstoff durch das System gedrückt, und die Apparatur auf Dichtigkeit geprüft. Sodann läßt man die H₂SO₄ aus D in C einlaufen und reguliert den Luft- oder Stickstoffstrom so ein, daß in der Sekunde etwa 2 Blasen durchgehen. Nach 15 min wird das Testpapier herausgenommen, in 20 ml 10%iger HCl

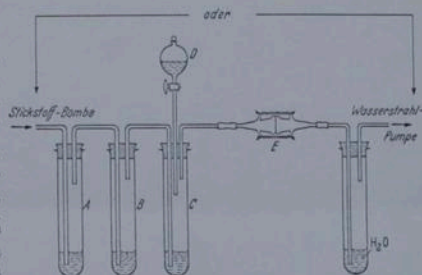


Abb. 1. Testflecken-Apparatur zur HCN-Bestimmung.

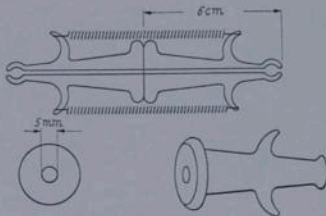


Abb. 2. Glasflanschen.

solange gebadet, bis das Papier bis auf den Berliner-Blau-Fleck vollkommen weiß geworden ist. Das Testpapier wird dann noch einige Minuten in fließendem Leitungswasser gewässert, getrocknet und mit der Standard-Testfleckenreihe verglichen, die unter völlig gleichen Bedingungen mit bekannten Mengen von analysenreinem Cyankalium erhalten wurden. Bei einem Flanschdurchmesser von 10 mm ist der Bereich von 0,1 bis etwa 5 γ als optimal anzusehen. Der Berliner-Blau-Fleck ist für das Vorliegen von HCN beweisend, seine Intensität ein quantitativer Ausdruck für seine Menge.

Weniger die eigentliche Bestimmung der Blausäure als ihre *quantitative Isolierung aus dem zu untersuchenden Pflanzenmaterial* bereitet Schwierigkeiten.

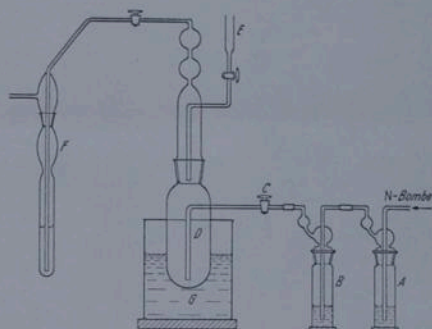


Abb. 2. Apparatur zur Zersetzung der HCN-Glykoside und Isolierung der Blausäure.

Aus den bereits an früherer Stelle gemachten grundsätzlichen Ausführungen heraus sollten folgende Grundforderungen eingehalten werden:

1. Das enzymatische Gesamt-HCN-Verfahren (WINKLER) oder die Kombination von enzymatischer und säurehydrolytischer Spaltung der Blausäureglykoside sollten den einfachen enzymatischen oder ausschließlich säurehydrolytischen Verfahren vorgezogen werden.

2. Die Entfernung des HCN-Gases aus dem Reaktionsgemisch sollte einheitlich nach dem Aerationen-Verfahren vorgenommen werden.

3. Vor der eigentlichen Bestimmung der Blausäure sollte diese in alkalischer Lösung absorbiert werden.

Außerdem sollte die Tatsache Berücksichtigung finden, daß die Zersetzung durch Enzyme nur in einem bestimmten pH -Bereich optimal ist. Die Spaltung von Amygdalin ist bei pH 6,0, die von Prunasin bei pH 4,9 und die von Linamarin bei pH 6,0, allgemein zwischen pH 5,0 und 6,0 optimal.

In Anlehnung an die apparativen Prinzipien von BRUNSWIK (1923) LUEDTKE (1952) u. a. ist die Schliffapparatur der Abb. 3 für die Zersetzung der Blausäureglykoside und die Isolierung der in Freiheit gesetzten Blausäure zu empfehlen. Die Waschflasche A enthält 20 ml 2%ige Sublimatlösung zur Absorption eventueller HCN-Beimengungen der durchgesaugten Luft oder des durchgedrückten Stickstoffs. Waschflasche B enthält 20 ml 10%iger NaOH zur Absorption von CO_2 . Über den Hahn C kann der Gas-Durchgang reguliert werden. D nimmt das zu untersuchende Pflanzenmaterial auf. E ist ein Einfeldtrichter,

über den Enzympräparationen oder Säure zum Substrat gegeben werden können, ohne daß die Apparatur zu dem Zweck geöffnet werden muß. *F* ist das Absorptionsgefäß für HCN, das mit 10 oder 20 ml NaOH (0,1—1,0 normal) beschickt wird. *G* ist ein Becherglas mit Wasser, das erhitzt werden kann. Für Mikrobestimmungen ist zu empfehlen, die Ausmaße der Apparatur entsprechend klein zu halten.

Zur Zersetzung der Blausäureglykoside kann man folgendermaßen vorgehen: Man bringt das zu untersuchende Pflanzenmaterial in gut zerkleinerter Form in bestimmter Menge je nach der zu erwartenden HCN-Menge mit Wasser (5 g Trockenmaterial mit 50 ml, 10—20 g Frischmaterial mit 25—30 ml [WINKLER]) zusammen, setzt Pufferlösung (für Linamarin nach LUEDTKE (1952) 48 ml Citratpuffer¹), 2—3 Tropfen Capryl- oder Octylalkohol zur Vermeidung von Schaumbildung hinzu, mischt gut durch und läßt mindestens 3 Std. oder über Nacht bei geschlossener Apparatur autolysieren². Dann wird unter langsamer Erwärmung des Wasserbades auf 100° C (BISHOP) 2—3 Std. durchlüftet. Darauf läßt man auf 35° abkühlen und setzt aus dem Einfülltrichter eine Lösung oder Suspension von 0,1 g Emulsin in 20 ml Wasser hinzu. Man läßt nach guter Durchmischung erneut 3 Std. bei geschlossener Apparatur stehen und aerisiert unter langsamem Erwärmen ein zweites Mal.

Anstelle der Zugabe von Emulsin³ kann man nach der 1. Aeration aus dem Einfülltrichter auch 30%ige H₂SO₄ (bei 5 g Trockenmaterial 25 ml, bei 10 g Frischmaterial 20 ml) zusetzen. Man läßt bei Raumtemperatur 15 min stehen und durchlüftet unter Erwärmung des Wasserbades auf 100° C 2—3 Std.

Überall dort, wo es angängig ist, sollte der Arbeitsweise von DUNSTAN und HENRY der Vorzug gegeben werden. Die Forscher isolierten das Blausäureglykosid zuerst durch mehrstündige Extraktion des zu untersuchenden Pflanzenmaterials mit Alkohol im Soxhlet. Der Alkohol wird (möglichst unter vermindertem Druck) abgedampft und im Extraktionsrückstand wird die Blausäure durch Erhitzen mit H₂SO₄, was mit der Apparatur nach Abb. 3 vorgenommen werden kann, in Freiheit gesetzt. Der die cyanogenen Glykoside enthaltende Extraktionsrückstand kann auch direkt in die Testfleckenapparatur zur HCN-Bestimmung überführt werden.

Literatur.

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¹ 21,01 g Citronensäure + 8,0 g NaOH ad 1000, davon 30 ml + 18 ml 0,1 n-NaOH-Lösung.

² Inaktiviertes Frischmaterial wird nach ROSENTHALER mit einem wäßrigen kalt hergestellten Extrakt der gleichen Frischpflanze, der durch längere Aeration absolut von HCN befreit wurde, angesetzt.

³ Überall dort, wo Emulsin nicht wirksam ist, wird das spezifische Enzym, z. B. Linamarase, oder aber der gut durchlüftete kalt hergestellte wäßrige Auszug der zu untersuchenden Pflanze selbst verwendet.

- C. r. Acad. Sci. (Paris) 141, 16; 142, 552; 145, 1115. KLUNGE: Zit. n. POSENTHALER. — ROBERT: Chem. Zbl. 1901 I, 51. — KOLTHOF: Z. analyt. Chem. 63, 188 (1923). — LOCKEMANN: Ber. dtsch. chem. Ges. 34, 2127 (1901). — LUEDTKE: Biochem. Z. 322, 310 (1952); 323, 428 (1953). — MIRANDE: C. r. Acad. Sci. (Paris) 149, 140 (1909). — MOIR: Proc. Chem. Soc. 1910, 115. — PACHE: Biochemie und Physiologie der sekundären Pflanzenstoffe. S. 250—252, Berlin-Göttingen-Heidelberg, Springer-Verlag 1950. — PÉCHE: Sitzber. Wien. Akad. Wiss. 121, 33 (1912). — PERTINI-GASTALDI: Zit. n. ROSENTHALER. — ROSENTHALER: Nachweis organischer Verbindungen. S. 491 bis 499, Stuttgart 1914 u. Blausäureglucoside in G. KLEIN: Handbuch der Pflanzenanalyse, Bd. III (2), Wien 1931. — SEIFERT: Dtsch. Z. gerichtl. Med. 41, 441 (1952). — VAN GIFFEN: Pharmaz. Weekbl. 41, 1043 (1910). — VOLHARD: Ann. Chem. 190, 47 (1878). — VORLAENDER: Zit. nach ROSENTHALER. — WARTH: Mem. Dep. Agric. 7—8, 1—29 (1923—1926); zit. nach WINKLER. — WERHUIZEN-THIERY: Pharmaz. Weekbl. 42, 271 (1905). — WESTER: Ber. pharmaz. Ges. 24, 123 (1914). — WINKLER: J. Assoc. Agricult. Chemists 24, 541 (1951).

December 22, 1964

Mr. Fred Olsen
Yorkstead
Mill Reef
Antigua, West Indies

Dear Mr. Olsen:

In response to your letter of the 13th, I am enclosing some other reprints which you may keep. The poisonous factor is not free HCN as it occurs in the plant; it is tied up as a glycoside. In answer to question B--does the HCN which appears reduce by evaporation?--I would suggest that it does indeed and that the major endeavor to get rid of HCN is accomplished by grating and that the subsequent squeezing of it is only insurance that all is indeed gone. I would not know nor do I think that any work has been done to determine the rate of departure of HCN from the grated manioc. It would be interesting to know the rate, but I'm not sure whether it would be valid for any other sample than the one tested.

You asked for methods of analysis for the HCN. Inasmuch as I am not personally acquainted with these methods and inasmuch as it will take some time before I can look up the full details of them, I will delay answering this particular portion of your letter until I have had the opportunity to get the advice of a person much more acquainted with this field than I.

With best wishes for the New Year,

Sincerely

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosures

YORKSTEAD
MILL REEF
ANTIGUA, W. I.

Dec 13 '64

Dear Dr. Rogers,

The months of October & November turned out to be so crowded with preparing shipments of our "art object" for use this winter by various colleges that I saw no favorable time to invite you to visit us at Guilford. I shall keep this in mind and contact you in the early summer.

We came down on Dec 2 for our winter stay in Antigua, and I find that the local agricultural office maintains a small plot of sweet & bitter manioc, but unfortunately they have no chemist & no facilities. Nevertheless I am hoping to work up some interest in running tests (probably I'll have to do them myself) to see if & how the HCN content increases with age, & what difference there may be between the HCN content of sweet & bitter manioc as they designate the varieties.

Since I visited you (Oct 9) I have wondered about a few items on which I have no way of ascertaining information, but which may be readily known to you.

- a) Is the poisonous factor free HCN or is it a complex of CN with some carbohydrate or other ingredient?
- b) Does the HCN content rapidly reduce by evaporation? For example, would grated manioc lose its HCN if exposed to tropical sunlight for several hours & become edible?
- c) What quantitative analytical technique for HCN in grated cassava would you consider to be acceptable?

I find that I failed to bring with me to Antigua the copy of your paper on Manihot esculenta. Do you have another spare copy, or could you lend me one until June '65? I would like to show it to Dr. Mangotom who is in charge of our gardening unit here?

With kindest regards,

Fred Olsen

Rogers

37 MT. VERNON ST.
BOSTON, MASS.
TEL. 227-0610

GEORGE S. BASS

APARTADO AEREO 13768
BOGOTA, COLOMBIA
TELEFONO 42-33-85

← *Perhaps somebody in your
office can use this. I took
the subway back.*

20 Jan 1965

Mr. A. H. Sargood
125 Tower St.
Kingston
Jamaica, West Indies

Dear Mr. Sargood,

Please forgive me for writing to you without prior introduction. I will explain the rather circuitous circumstances responsible for this letter.

I am a private investor in Colombia, South America, specializing in organizing new ventures. While in Colombia I was approached by someone who claimed he could make starch from cassava (yucca) and make a lot of money from it. This would be for the local market.

In trying to find more about this plant, I was instructed by a leading botanist at Harvard to talk with Dr. David Rogers, who is recognized as the person who knows the most about this plant. Dr. Rogers was most kind and gave considerable amount of time to me.

He stated that as far as he knew you were the only person outside of Brazil that knew anything about the practical side of this business and that was operating a large plantation in conjunction with a plant.

Since I plan to be going to Colombia in about ten days with a friend, I was wondering if we could stop by Kingston on the way down and pay a very short visit. It would be extremely interesting for us and we would greatly appreciate such an opportunity.

Sincerely,
George S. Bass
George S. Bass

cc: DRogers
AApp

Dear Dr. Rogers,

*Thank you so much for the
opportunity to visit with you. I hope something
concrete will develop so that we can work together
on this.*

Sincerely, George

January 18, 1965

Dr. Thomas W. Whitaker
U.S.D.A., A.R.S.
U. S. Horticultural Field Station
Post Office Box 150
La Jolla, California 92038

Dear Tom:

Thank you kindly for sending the reprint on early Nazca embroideries. I am very glad to have this because I had had a misinterpretation of the age of some of those coastal cultures, usually dating them earlier than they should have been.

I agree with your identifications; they are all good. It doesn't seem that there is any chance of error. In some way these people managed to capture the "essence" of the plant.

A matter of small concern is that there seems to be a growing battery of opinion that the epithet esculenta is best for Manihot rather than utilissima.

I thought altogether that the symposium was a very good one. I enjoyed participating in it and hearing your paper and those of the others whose work has been similar.

Thanks again for thinking of sending me the reprint.

Sincerely

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
U. S. Horticultural Field Station
P. O. Box 150
La Jolla, California 92038

January 11, 1965

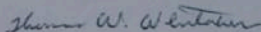
Dr. David J. Rodgers
The New York Botanical Garden
Bronx Park
New York 58, New York

Dear Dave:

In the discussion of your paper on manioc at the Montreal Meetings, there was some mention of the paucity of archeological material of this species. In my younger days I had the poor judgment to attempt to identify the plants represented on a piece of embroidery from a pre-Inca burial dated at about A.D. 600. The results are recorded in the enclosed reprint. One of the plants corresponds roughly to my idea of what an Indian of that time might design to represent the cassava plant. It occurred to me that you would be interested.

With kindest regards and best wishes for the New Year.

Very sincerely yours,



Thomas W. Whitaker
Geneticist

P.S. Your stimulating paper was well received, and the ensuing discussion quite enlightening.

Enclosure



- Taxonomy Laboratory

January 3, 1965

Dr. Carl C. Moh
Inst. Interamericano de Ciencias
Agrícolas de la LEA
Centro de Enseñanza e Investigación
Turrialba, Costa Rica

Dear Dr. Moh:

Thank you for your letter of December 22. I have just now had the opportunity to answer it.

Concerning the various questions you pose: I don't think that the shipment will be much damaged by cold, particularly if, on the outside of the parcel, the statement is made "Perishable - Do Not Allow to Freeze, Deliver Immediately." I think that we included in our materials such a statement to that effect. Another question that you had was that dealing with the cost of the mailing from Miami to here. According to the regulations that I have, after the plant material has cleared the plant quarantine the material is returned to the mails and goes forward to its destination here at Fort Collins under the original postage. Therefore, I assume that the cost of the mailing should be figured at your end as though you were sending it directly to Fort Collins. But, the material will obviously pass through the plant quarantine at Miami because of the labels on it. That is, the yellow and green labels which you will put onto the outside of the package.

I am not in any particular rush for this material and I would suggest that you do it at your convenience whenever it is possible.

Thanks again for your questions and attention to this request.

Best wishes for the new year.

Sincerely yours,

David J. Rogers
Professor of Botany

DJRZpm



INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fue establecido por los Gobiernos de las Repúblicas Americanas en 1944 para promover su desarrollo económico y social a través de la educación y la investigación.

CT/FI/3.1/726
Centro de Enseñanza e Investigación
TURRIALBA, COSTA RICA

Cable: IICA - Turrialba

December 22, 1965

Dr. David J. Rogers
Professor of Botany
Department of Botany & Plant Pathology
Taxonomy Laboratory
Colorado State University
Fort Collins, Colo. 80521

Dear Dr. Rogers:

The entry permits for the Manihot cuttings have arrived. On the permit, it states that it requires inspection certificate issued by the Costa Rican officials. During the holiday season, it is difficult to find the proper person here to issue this certificate. If you don't need the materials in a hurry, I would like to have the arrangements made after the new year.

Another problem might come up which we ought to consider. This is winter time, and I surmise the temperatures are below zero in Colorado. Could the cuttings take a few days of low temperature treatments during transportation? If not, would you think that it might be better to send the material next spring?

Since we only are allowed to send the material to Miami and cannot directly address the box to you, can you inform the Miami office that you will pay the shipment cost from Miami to Fort Collins?

Let me know what your opinion is.

Merry Christmas and Happy New Year.

Yours truly,

Carl C. Moh
Carl C. Moh

El Instituto tiene su Dirección General en Costa Rica: Apartado 4359, San José. Sus tres Oficinas Regionales abarcan los siguientes países: Zona Andina: Apartado 478, Lima, Perú (Bolivia, Colombia, Ecuador, Perú y Venezuela); Zona Norte, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Apartado 4359, San José, Costa Rica (México, ICAES Centroamericano y Antillas Mayores); Zona Sur, Casilla de Correos 1217, Montevideo, Uruguay (Argentina, Brasil, Chile, Paraguay y Uruguay). Mantiene dos centros: Centro de Enseñanza e Investigación, Turrialba Costa Rica; y Centro de Investigación y Enseñanza para la Zona Templada en el Instituto Fitotécnico del Uruguay, La Estanzuela, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Zona Sur, Casilla de Correos 1217, Montevideo. Administra los Proyectos 39 (Expediente Técnico Profesional) y 201 (Crédito Agrícola) del Programa de Cooperación Técnica de la OEA, patrocinados por el Consejo Interamericano Económico y Social (CIES). Mantiene también núcleos de investigación y enseñanza para graduados en instituciones de los países miembros.

November 13, 1964

Dr. Jose de Js. Jimenez
Calle Maximo Gomez 34
Santiago de los Caballeros
Republica Dominicana

Dear Dr. Jimenez:

Thank you very kindly for your letter of October 24 with your kind offer to collect *Manihot domingensis*. I have discovered that the epithet "*domingensis*" was never published. However, it seems to me that this is a very good species, and I will probably take up the name suggested by Urban and Ekman.

Enclosed herewith are photographs of the collections made by Ekman as well as collections made by two other collectors, Abbott and Miller. I trust the photographs will be useful to you. I have extracted the collection data from the labels and also include a copy for your benefit.

The areas of the collections are almost all in the Samana Peninsula. From these collections it would seem that the plant is fairly well distributed, although I would guess that it is quite rare at any one spot. I trust that the enclosed information will be helpful and that you will have an opportunity to collect the material for me. I will be very pleased to see anything that you may be able to collect.

Of course, full environmental data concerning the locality will be very much appreciated. If you can notice whether the areas in which *Manihot domingensis* grows seems to be badly disturbed areas or whether the places that the plants grow are in undisturbed localities, this will be helpful. If you could make a note of the type of soil in which the plants are growing, this would be helpful. Of course, samples of the fruits and flowers as well as of the mature vegetative leaves would likewise be helpful. If you have an opportunity to do so, I would appreciate it if you could take up the roots of one of the plants to determine whether or not this "*yuca cimarrona*" has enlarged roots as does *Manihot esculenta*. Perhaps you may notice that the plant has an odor; if it does, suggest the nature of that odor. All of this type of information is very useful in the collections. Furthermore, the color of the petiole, the stem, and the young foliage at the apex of the plant is also quite useful information.

Any piece of this type of information that you may have an opportunity to collect will be very much appreciated. Thank you kindly for your endeavors.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

Dr. JOSE DE JS. JIMENEZ

Calle Máximo Gomez 54

SANTIAGO DE LOS CABALLEROS

REPUBLICA DOMINICANA

Oct. 24, 1964

Sr. David Rogers
New York Botanical Garden
Bronx Park, N. Y.

Estimado Sr. Rogers:

Ud. recordará que nos conocimos en el Congreso de Edimburgo y que me pidió Ud. material botánico de Manihot domingensis.

A mi llegada he consultado todo lo que tengo sobre la Flora Dominicana y no la he visto citada para aquí, es decir, para nuestra Isla.

Como me ha sucedido muchas veces que he encontrado muchas plantas de Urban y Ekman que no fueron publicadas por haber muerto poco antes de ser identificadas y que sin embargo fueron distribuidas a los Herbarios le pido que me envíe lugar de recolección, número de la misma, descripción si fue publicada, nombre vulgar, etc., y todo lo que pueda ayudarme a localizarla. Envíeme una fotografía del espécimen.

Después de haber comprobado que no la conocía ahora estoy tan interesado como Ud. en recolectarla.

Muy sinceramente suyo su afmo.

Jose de J. Jimenez

October 26, 1964

Dr. Frederick G. Meyer
Jimma Agricultural and Technical School
Box 307
Jimma, Ethiopia

Dear Fred:

I am sorry the galley was so late in getting to you and ~~that~~ you had so much trouble with it. Some of the corrections that you wanted were what we might call "editorial niceties." One, for example, was the inclusion within the single quotes of a comma following the fancy epithets. These are correct according to editorial procedures. Wherever changes are appropriately made by you, these will be incorporated. Don't worry about the correction cost--nobody ever does pay it anyway.

My special request for information concerning Manihot will be not necessarily adequate documentation of specimens, but I would like to have a general photograph, black and white and in color if you have the opportunity to do so, of the cultivation of Manihot. A scene showing the field or the plants with a "native" standing by would be handy. If you can find the common names used by the Ethiopians for their varieties, it would be interesting. Thanks for offering.

I hope you have luck with your coffee.

Sincerely

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

OCT 19 1964

Rome, Italy
October 13, 1964

Dr. D. J. Rogers
New York Botanical Garden
Bronx Park
New York 58m N. Y.

Dear Dave:

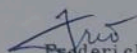
Enclosed herewith is the corrected mss. of my coffee paper. It almost followed me to Ethiopia where I might have been forced to read it under a coffee bush. I have pushed it along, however, and return it from Rome, where I would rather be out on the town than sitting here in the hotel room doing this. Nevertheless, I hope you can make something of what I have collected. In a few instances, I don't agree with the editor's changes, and have so stated. I don't think I ought to be charged for mistakes that are not really mine. The citation of cultivars was incorrect as corrected, I had them right the first time. Most of the corrections are the printer's and not mine anyway. I am not sure what you want to do about the proofs on illustrations, since I shall be out here, and probably in the bush in a very short time. Unless there seems to be something out of the ordinary, I would suggest you go ahead with the pics and push the article through the press.

I leave for Addis Ababa tomorrow from here, arriving on Thursday A. M. I am here now tending to finance, and other administrative details with FAO, the agency sponsoring my trip. There will be a man from India, another from Uganda and Tanganyika along, plus four Ethiopians from Jimma and Alemaya (the Oklahoma sponsored high school and college). This will be a concerted effort to really document C. arabica, plus collecting insects and fungi that harbor the plant. I intend to collect associated plants that grow with the coffee plant, because this is a part of a plant community, and not just one plant under the sun as all coffee "experts" see it. I think we may make more sense out of it approached ^{as} a biological entity rather than a novelty. Do you have anything special you want, such as more manihot, when I find it, or is it all the same kind of stuff in Africa.

My forwarding address until about January 15 will be:
Jimma Agricultural and Technical School, Box 307, Jimma, Ethiopia.

All the best,

Sincerely,


Frederick G. Meyer

October 9, 1964

Dr. Fred Nartey
Universitetets Planteфизиологiske Laboratorium
O. Farimagsgade 2A
Copenhagen K, Denmark

Dear Dr. Nartey:

Under separate cover we are sending you the reprint of the article you requested.

I personally have no seed supply of Manihot esculenta (M. utilissima). I suggest that you address your request for seeds to Dr. Edgard S. Normanha, Seccao de Raizes e Tuberculos, Instituto Agronomico de Campinas, Campinas, Sao Paulo, Brazil.

It would also be well to write to Dr. Carl C. Moh at the Instituto Interamericano de Ciencias Agricolas de la OEA, Turrialba, Costa Rica. He will likely have materials that may or may not represent specifically sweet and bitter cultivars.

I trust that these two sources will be able to provide you with your requirements.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

Copenhagen

6.10.64

Dear Dr. Rogers,

I shall be most grateful if you could send me a Reprint of your paper The origins and Development of *Manihot esculenta* and allied species, an abstract of which appeared in the American Journal of Botany, 1962, 49, p. 678.

I am also interested in some seeds of *M. utilis* Pohl (both sweet and bitter). Perhaps you could arrange to send me some, or indicate to me as to where they may be available.

Thank you very much indeed.

Yours faithfully

F. H. W.
Fred Harley.

September 11, 1964

Dr. Egbert Walker
United States National Arboretum
Washington 25, D. C.

Dear Dr. Walker:

I have not been able to locate any author for Manihot that fits the description Crit. Nomenclat. between K for Read and W for Wang. I can offer you the bibliography on the taxonomy of Manihot that I have available in card form if you care to see it.

Of course, many of the references are not to Asiatic or near-Asiatic work on Manihot, but you may care to select out some of them. The only real work I know by any author in Asian areas is by Chandraratna, but of course this does not fit the required information. At any rate, please be assured that my card references on Manihot are available to you in the event that you would like to see them.

Thank you very kindly for the mention of the work that is in progress by Professor Tanaka. I will take this up with our editor, Dick Schultes, to see whether there is some way in which we can possibly get an article from Professor Tanaka and if there is some way between Harvard and New York to get the whole work into some sort of a publication. I have no thoughts on this at the moment but do agree that it is a valuable piece of work that should be available to workers all over the world. Thank you for the suggestion.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
CROPS RESEARCH DIVISION

NATIONAL ARBORETUM

ADDRESS REPLY TO:
UNITED STATES NATIONAL ARBORETUM
WASHINGTON 25, D. C.

September 8, 1964

Dr. David J. Rogers
New York Botanical Garden
Bronx Park
New York 58, New York

Dear Dr. Rodgers:

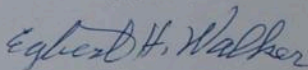
As Dr. Fosberg tells me you are working on Manihot, I am writing for possible assistance in correcting an apparent error in my Bibliography of Eastern Asiatic Botany Supplement. On p. 517 in the index are listed the references for Manihot. One is "Read, B. E., 1941 (Crit. nomenclat.)". However, Read's paper is not a critical treatment of nomenclature. This makes me suspect some intervening reference was lost out. If so it probably was some author between Read and Wang. Do you know of any critical nomenclatural work by such an author? I suppose if I read all references on the 100 intervening pages I might locate it, but if you happen to know such an author, it would simplify the task. I'm not asking you to read those pages! In answer, please just drop a note into the enclosed envelope. Thanks.

A recent letter from Professor Tyozaburo Tanaka, the well-known Japanese specialist on Citrus, told of his present undertaking, the expansion of Sturtevant's "Edible Plants". He said Sturtevant dealt with "not more than 3000 plants" and that so far his work is reaching to over 4000 plants" and he is still going. He asked about the possibility of getting the FAO to duplicate his manuscript sheets "which may reach 10,000 very soon" for deposit in some American institution, as they "will be of value as a record of food resources of the whole countries to help hungry peoples". Now, I don't feel there is any place in Washington that would go to bat on this proposition, so I am tossing out the idea to Economic Botany to see if any suggestions would be forth coming. Perhaps you would want to see if Dr. Schultes has any interest in mulling over this idea. I assume Tanaka sees no prospects of publishing his voluminous data, so is looking for a place to put the results of his valuable findings where someone might use them, and incidentally perhaps to stir up a publisher.

Now it occurs to me that Dr. Tanaka might be invited to submit to Economic

Botany, a paper related to his present work. He pointed out rightly that investigations on the world's food plants should take in the oriental sources, and that that can only be done by one familiar with the languages involved, which he is. Such a paper might be a first step in finding a place interested in his material. His address is 1324 Usogawa, Sumiyoshi=cho, Hishaginada-ku, Kobe, Japan.

Sincerely yours,

A handwritten signature in dark ink, reading "Egbert H. Walker". The script is cursive and fluid, with the first letters of the first and last names being capitalized and prominent.

Egbert H. Walker

Encl.

September 9, 1964

Mr. Fred Olsen
Box 303
Guilford, Connecticut

Dear Mr. Olsen:

I find that my secretary has very efficiently sent to you a reprint that will answer some of the questions that you asked in your letter of August 29. I suspect, however, that there are many more questions arising from your interests that were not answered therein, and the chances are that it would be profitable if we could get together for a chat. I would be glad to see you if you will let me know when it is convenient for you to come. Thank you for your interest in Manihot.

I am interested in the information that you have gathered as well because obviously much more detailed knowledge of its early history and use is critical in establishing its pattern of distribution and spread.

I do not expect to be away from New York for the next couple of months but will have a few commitments on days that may not be convenient; so if we can exchange a possible set of dates, this will probably be best for both of us.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

FRED OLSEN
Box 303
GUILFORD, CONN.

Aug 29 64

Dr David J Rogers
Bronx Park NY

Dear Dr Rogers

My good friend Edgar Anderson has suggested that I contact you regarding a problem I had placed before him.

For several years I have been studying the Arawaks, & have dug their artifacts extensively on the island of Antigua, & to a minor degree on about twenty other islands of the Lesser Antilles.

We have found cassava girdle sherds in every layer bearing any ceramics including the earliest layers of Saladoid pottery. This style of pottery is found in Porto Rico, the Virginis, several of the Lesser Antilles & Trinidad about 100-200 AD and along the Orinoco as far as Roraima, which is roughly half way to the Amazonian water shed as early as 1000 BC.

Vegetative planting ^{of} ^{later} manioc seems to be quite well spread in central & eastern Venezuela in ancient sites but appears to give way to maize cultivation in Western Venezuela & Colombia.

Since the Arawak "nation" seems to have been quite energetic in its expansion through the entire Antilles, I have been interested in speculating if this might be attributable to their promotion of a cassava economy. Perhaps too, if the Arawaks were the discoverers or developers of the better manioc technology, this might have been a boner cause.

of their success in establishing themselves in the Antilles.

My question therefore is, "Was bitter manioc indigenous to Venezuela or to locations readily accessible to the Arawaks?" It would seem to be reasonably certain that it was being cultivated by the Arawaks about 1000 BC in the galleries along the Orinoco. Also manioc cultivation is still very strongly entrenched in much of northern South America, since I have seen cassava as the preponderant food in quite remote campsites of Arawaks, Caribs, & Oyanaes in the Surinam jungle, & it has been adopted too by the Bush Negroes.

However, Dr Anderson mentioned that you had suggested Mexico as the primary center for manioc domestication, which is something of which I had not heard previously. I am familiar with Carl O. Sauer's "Agricultural Origins & Dispersals" in which he suggests a "Hearth of Tropical Plantains" a little west of Maracaibo but says very little about manioc.

I would appreciate any information you can give me as the early history of manioc, & any reference to available data. Also I should very much enjoy visiting you at Bronx Park if that would be convenient to you.

Sincerely yours

Reichel-Dolmatoff Fred Olson

Very reprint
sent 9/2/64
with card note
your return
office on 9/8/64

CORPORACION BOLIVIANA DE FOMENTO
PROYECTO DE DESARROLLO DEL ALTO BENI - USAID.

Form. FAB-26

CASILLA CORREO No. 1124
LA PAZ - BOLIVIA

DIRECCION TELEGRAFICA
"CORFOMENTO"

La Paz. September 3. 1964

Dr. David J. Rogers
Curator of Quantitative Taxonomy
The New York Botanical Garden
Bronx Park. New York 58. New York.
United States of America.

Dear Dave:

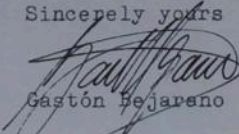
Just a few minutes ago I received your letter of August 21. Up to this moment we have not received the visit of Dr. Maguire and no news from him either.

I returned from the jungle on the 14 of August specially to meet Dr. Maguire, in my schedule is that I have to return to San Borja on the 8 th of September, knowing an approximate date of Maguire's arrival perhaps I could spend more time here, few days ago I send a Cable (All American Cables) to Maguire in New York asking about news.

Thank you for the wonderful news about the bibliographical material, I phoned immediately to Ian Hutchinson FAO officer who was very glad too and offered to move some possibilities, I will go today to the American Embassy USIS and see if I can get some help from there, any way I will tell you immediately any news. One of the books that I need more urgently is: P.W. Richards "The Tropical Rain Forest" Cambridge University Press 1964, I know that this is a book but perhaps you could get for me an extra copy.

Waiting in great expectation for Maguire and the bibliographic material receive the gratitude and friendship of your old friend.

Sincerely yours



Gastón Bejarano

P.S. It is most probable that on the first days of November I will assist to a Congress of Forests in Curitiba Brasil.



INSTITUTO INTERAMERICANO DE CIENCIAS AGRICOLAS DE LA OEA

El Instituto es un organismo especializado de la Organización de los Estados Americanos. Fue establecido por los Gobiernos de las Repúblicas Americanas en 1944 para promover su desarrollo económico y social a través de la educación y la investigación.

Centro Tropical de Investigación y Enseñanza para Graduados

TURRIALBA, COSTA RICA

Cable: AGROEA - Turrialba

August 31, 1964

Dr. David J. Rogers
New York Botanical Garden
Bronx Park
New York 58, N. Y.

Dear Dr. Rogers:

I greatly enjoyed visiting your laboratory and only regret that we did not have more time to talk about yucca.

Since I came back from the U. S. last week, I have met Mr. Sohmer and have briefly discussed the cytology of yucca with him. My assistant, Mr. Julio Valerio, is working on cytological methods for the mitosis and meiosis. While the yucca chromosomes are rather small, they are not as difficult to prepare as those of beans with which I have been working.

Dr. Soria sends his regards.

Sincerely yours,

Carl C. Moh

Carl C. Moh
Cytogeneticist
Nuclear Energy Program

CCM:mg

El Instituto tiene su Dirección General en Costa Rica: Apartado 4359, San José. Sus tres Oficinas Regionales abarcan los siguientes países: Zona Andina, Apartado 478, Lima, Perú (Bolivia, Colombia, Ecuador, Perú y Venezuela); Zona Norte, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Apartado 4359, San José, Costa Rica (México, Istmo Centroamericano y Antillas Mayores); Zona Sur, Casilla de Correos 1217, Montevideo, Uruguay (Argentina, Brasil, Chile, Paraguay y Uruguay). Mantiene dos centros: Centro Tropical de Investigación y Enseñanza para Graduados, Turrialba, Costa Rica; y Centro de Investigación y Enseñanza para la Zona Templada en el Instituto Fitotécnico del Uruguay, La Estanzuela, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Zona Sur, Casilla de Correos 1217, Montevideo. Administra los Proyectos 39 (Enseñanza Técnica Profesional) y 201 (Crédito Agrícola) del Programa de Cooperación Técnica de la OEA, patrocinados por el Consejo Interamericano Económico y Social (CIES). Mantiene también núcleos de investigación y enseñanza para graduados en instituciones de los países miembros.

August 19, 1964

Dr. Carl Sauer
Department of Geography
University of California
Berkeley, California

Dear Dr. Sauer:

I enclose a reprint of my article concerning
my ideas on the origins of the cultivated species,
Manihot esculenta.

I trust that you will find this information
interesting and worthwhile.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosure

August 19, 1964

Dr. Alicia Lourteig
Museum National d'Histoire Naturelle
Laboratoire de Phanerogamie
57 Rue Cuvier
Paris V, France

Dear Dr. Lourteig:

The several reprints of your work on the
Euphorbs arrived yesterday. I appreciate them
very much.

I enclose a paper I have written on Maninot
that may interest you.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDP
Enclosure

August 17, 1964

Dr. M. A. Aubreville
Director, Museum National d'Histoire Naturelle
Laboratoire de Phanerogamie
57 Rue Cuvier
Paris V, France

Dear Dr. Aubreville:

Recently Dr. Rogers was privileged to examine the material of Manihot in your herbarium. Unfortunately, due to the pressure of time, he was unable to annotate all of the material.

It would be appreciated if these Manihot specimens could be sent on loan. The specimens have been specifically marked in your herbarium.

Sincerely yours

Arthur Cronquist
Acting Head Curator

AC:NDF

August 17, 1964

Dr. Alicia Lourteig
Museum National d'Histoire Naturelle
Laboratoire de Phanerogamie
57 Rue Cuvier
Paris V, France

Dear Dr. Lourteig:

I can not say how great was my pleasure in having an opportunity to know you and to be able to see as much Manihot as was possible through your help. I am deeply indebted to you for your endeavors on my behalf.

I have just asked for a letter to be sent to Dr. Aubreville, copy of which is enclosed. I trust that this is satisfactory.

Once again, I am very much in your debt and hope that I may be able to help you in some way some time.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosure

April 28, 1964

Dr. M. A. Aubréville
Director, Muséum National d'Histoire Naturelle
Laboratoire de Phanérogamie
87 Rue Cuvier
Paris V, France

Dear Dr. Aubreville:

I am hoping to be at the Muséum in July, from the 22nd through the 27th approximately. I would like to examine your collections of the genus Manihot (Euphorbiaceae). I trust that it will be possible for me to work there during this time.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

MUSEUM NATIONAL D'HISTOIRE NATURELLE
LABORATOIRE DE PHANÉROGAMIE
RUE BUFFON PARIS (VI) TEL. GOBELINS 30-35

17 Rue Buffon

Dear Dr. Rogers

Paris, 12th May 1964

Many thanks for your letter. Glad to know you are coming. I always remember you as a w.d. fellow, a good explainer of a Valentine and a good helper for the diagnosis of Cephaelis. But alas, I would have never given you dealing with Wassiliw! I have done the African ones during the war at Tucuman. And Officially you have been told very welcome. Unofficially but as truly as possible I am telling you the following: 7th I do not know what region you are working on if all the Seneca for you do not tell any details; and you would be able to see the historical material, if any! but for the bulk of collections from America I can tell you that you would not have all due

to the great abundance of material unincorporated.

Sony! it is one of my families habit to weary others with cause or borrow others, that I could not find time to re-classify mine (for all America). This, is just to be honest with you and to avoid disagreeable surprises. Anyway, again glad to meet you again, and I shall do all I can for helping you. If you have the courage to get through all the perils you can find to cross, I shall help you out, and authorize you to do so. Let us see.

Looking forward seeing you, I am sincerely yours

Adly.

P.S. I shall attend the Congress and remain in London until + 6-8 September.

Greetings to all - D.L.

July 17, 1964

Dr. Carl C. Moh
c/o Murray Hill Hotel
42 West 35th Street
New York, New York

Dear Dr. Moh:

The only possible time that I will have will be on Monday, July 20, and probably the morning is the best time. We are leaving for the International Botanical Congress on the 21st. I will be very pleased to talk to you about the problem of yuca material and other activities.

I suggest that you take the New York Central Harlem Division train to the Botanical Garden stop from Grand Central Station as the easiest way to get here. There is a train leaving Grand Central at 9:42 A.M. and arriving at the Botanical Garden at 10:05 and another leaving Grand Central at 11:30 A.M., arriving here at 11:53.

In case neither of these two times is convenient to you, you can take the D train of the 8th Avenue subway line to Bedford Park Boulevard and walk from there to the Botanical Garden, about 8 blocks east. The most convenient, however, is the New York Central Train.

I expect to be out pretty much all afternoon on Monday so hope that you can make it in the morning.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF



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Centro Tropical de Investigación y Enseñanza para Graduados

TURRIALBA, COSTA RICA

Cable: AGROEA - Turrialba

July 10, 1964

Mr. David J. Rogers
Curator of Quantitative Taxonomy
New York Botanical Garden
Bronx Park
New York 58, NY

Dear Mr. Rogers:

I expect to be in New York from July 20-24, and I would like to visit your laboratory and discuss the yucca collection. If this is convenient for you, would you please drop me a line in confirmation to the following address:

Dr. Carl C. Moh
c/o Murray Hill Hotel
42 W. 35th. St.
New York City, NY

In your note, you could let me know which date is most suitable for you.

Sincerely yours,

Carl C. Moh, Cytogeneticist
Nuclear Energy Program

/mg

cc: J. Soria

El Instituto tiene su Dirección General en Costa Rica: Apartado 4359, San José. Sus tres Oficinas Regionales abarcan los siguientes países: Zona Andina, Apartado 478, Lima, Perú (Bolivia, Colombia, Ecuador, Perú y Venezuela); Zona Norte, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Apartado 4359, San José, Costa Rica (México, Istmo Centroamericano y Antillas Mayores); Zona Sur, Casilla de Correos 1217, Montevideo, Uruguay (Argentina, Brasil, Chile, Paraguay y Uruguay). Mantiene dos centros: Centro Tropical de Investigación y Enseñanza para Graduados, Turrialba, Costa Rica; y Centro de Investigación y Enseñanza para la Zona Templada en el Instituto Fitotécnico del Uruguay, La Estanuela, c/o Instituto Interamericano de Ciencias Agrícolas de la OEA, Zona Sur, Casilla de Correos 1217, Montevideo. Administra los Proyectos 59 (Enseñanza Técnica Profesional) y 201 (Crédito Agrícola) del Programa de Cooperación Técnica de la OEA, patrocinados por el Consejo Interamericano Económico y Social (CIES). Mantiene también núcleos de investigación y enseñanza para graduados en instituciones de los países miembros.

THE RUBBER RESEARCH INSTITUTE OF MALAYA

TELEGRAMS & CABLES:
"SEARCHING" KUALA LUMPURCODE
BENTLEY'S COMPLETE PHRASETELEPHONE NOS. K. L.

{	72051
	72052
	72053
	72054

OFFICES AND LABORATORIES:—
3RD MILE AMPANG ROAD
KUALA LUMPURPOSTAL ADDRESS:—
POST OFFICE BOX NO. 150
KUALA LUMPUR, MALAYA.PLEASE ADDRESS ALL COVERS
TO THE DIRECTOR

30th July 1964

BY AIR MAIL

This letter is sent on the understanding that its contents shall not be published or otherwise
transmitted to a third party without the consent of the Director.

PLEASE QUOTE Bot. 3269

Dr. D.J. Rogers,
Curator of Quantitative Taxonomy,
New York Botanical Garden,
Bronx Park,
New York 58,
New York, U. S. A.

Dear Dr. Rogers,

Many thanks for your letters of 24th June and 9th July. These
seem to cover all the available information about GX 879.

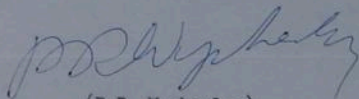
The matter has been discussed with our plant breeder, whose view
(with which I am in agreement) is as follows:—

1. GX 879 in itself does not seem to have been very spectacular, because it has never hit the headlines so to speak and it appears doubtful if its more recent custodians have worried much about preserving it.
2. Under the conditions described above it is doubtful if authentic material is readily available.
3. The real interest is that there is good authority that the cross (Hevea x Manihot) has been made and might be repeated.
4. As far as the Hevea brasiliensis parent AV 33 is concerned, this has now been superseded by two generations of further breeding and selection. We have clones which yield three to four times as much.
5. With respect to the Manihot parent you may recollect that this correspondence arose from our request for an identification of a specimen whose latex particles had been shown by microscopy to be more similar to H. brasiliensis than to M. utilissima (syn. M. esculenta), which you placed as close to M. glaziovii.

6. Therefore it would seem most profitable to try to repeat the Heyea x Manihot cross using an advanced selection such as one of our RRIM 600 series on the one hand and our M.sp.aff. glaziovii on the other. We would not overlook the possibility that one of the cassava varieties might prove more fertile.
7. It is suggested that these crosses be made in our next main pollination season early in 1965, if possible a cytological check will be made first.

Our main interest is practical, but we shall be pleased to report any results to you which may have a bearing on the taxonomy of this rather interesting group of the Euphorbiaceae. We are most grateful for the interest shown and help given.

Yours sincerely,



(P.R. Wycherley)
Ag. Head of Botanical Division

July 9, 1964

Dr. P. R. Wycherley
The Rubber Research Institute of Malaya
Post Office Box No. 150
Kuala Lumpur, Malaya

Dear Dr. Wycherley:

From Dr. W. E. Klippert, Vice-President and General Manager of the rubber plantations of the Goodyear Rubber and Tire Company I have the following information concerning the cross between Hevea and Manihot:

Clone GX-879 was made about 1930-35 on Dolok Merangir Estate of the Goodyear Sumatra Plantations Company, and originated as a hand pollinated cross of AVROS-33 x Manihot utilissima. (AVROS = Algemeene Vereeniging van Rubberplanters ter Oostkust van Sumatra, or General Association of Rubber Planters of the East Coast of Sumatra).

AV-33 was a seedling selection cloned at the Proefstation (Experiment station) of the AVROS near Medan about 1920, and the Manihot parent was in a collection of various material assembled at Dolok Merangir Estate by W. N. Bangham, then Director of Plant Research for Goodyear-Sumatra.

Goodyear made clonal material available to the U. S. Department of Agriculture when the rubber plant investigations work for Latin America was under the direction of the Bureau of Plant Industry, Soils & Agricultural Engineering with headquarters at Beltsville, Maryland.

The mentioned locations in Mexico and Haiti were probably the cooperative rubber stations at El Palmar, Vera Cruz, Mexico, and Marfranc, Haiti.

Following World War II, most of the rubber investigations were, as you know, transferred to the foreign agricultural aid programs with the respective countries, and whether or not there has been a continuation of these stations and of this clone is difficult to determine.

You might obtain further information by writing either or both of the following retired U. S. Department of Agriculture men, who worked on this program when it was directed from Beltsville:

Dr. P. R. Wycherley

-2-

July 9, 1964

Dr. R. D. Rands
Lake o' the Hills
Lake Wales, Florida

Mr. L. G. Polhamus
7410 Ridgewood
Chevy Chase, Maryland

I am informed that the Goodyear estates in Latin America do not have this clone any longer.

Whether or not this information is useful to you, I cannot ascertain.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

July 9, 1964

Mr. W. E. Klippert
Vice President and General Manager
Rubber Plantations
The Goodyear Tire & Rubber Company
Akron 16, Ohio

Dear Mr. Klippert:

Thank you kindly for the information concerning the hybrid between Hevea brasiliensis and Manihot utilissima. I shall follow up the search for the hybrid by writing to the gentlemen recommended by you.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

GOOD YEAR

The Goodyear Tire & Rubber Company

AKRON 16, OHIO

cc: J B Golden

June 29, 1964

Mr David J Rogers
Curator of Quantitative Taxonomy
The New York Botanical Garden
Bronx Park
New York 58, New York

Dear Mr Rogers:

Your letter of June 24 addressed to Mr Golden of our Public Relations Department has been referred to me.

1 Clone GX-879 was made about 1930-35 on Dolok Merangir Estate of the Goodyear Sumatra Plantations Company, and originated as a hand pollinated cross of AVROS-33 x Manihot utilissima. (AVROS = Algemeene Vereeniging van Rubberplanters ter Oostkust van Sumatra, or General Association of Rubber Planters of the East Coast of Sumatra).

2 AV-33 was a seedling selection cloned at the Proefstation (Experiment station) of the AVROS near Medan about 1920, and the Manihot parent was in a collection of various material assembled at Dolok Merangir Estate by W N Bangham, then Director of Plant Research for Goodyear-Sumatra.

3 Goodyear made clonal material available to the U S Department of Agriculture when the rubber plant investigations work for Latin America was under the direction of the Bureau of Plant Industry, Soils & Agricultural Engineering with headquarters at Beltsville, Maryland.

4 The mentioned locations in Mexico and Haiti were probably the cooperative rubber stations at El Palmar, Vera Cruz, Mexico, and Marfranc, Haiti.

As you probably know, the rubber investigations in Latin America were transferred from the Department of Agriculture some years ago, and placed under the A.I.D. programs in the respective countries involved. I do not know what remains of these stations at the present time as I have not visited either in recent years.

5 You might obtain further information by writing either or both of the following retired U.S.D.A. men, who worked on this program when it was directed from Beltsville.

Dr R D Rands
Lake 'o the Hills
Lake Wales, Florida

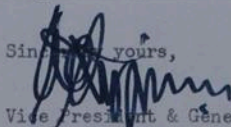
Mr David J Rogers
Page 2
June 29, 1964

or,

Mr L G Polhamus
7410 Ridgewood
Chevy Chase, Maryland

We do not have this clone any longer on any of the Goodyear estates in Latin America.

Sincerely yours,



Vice President & General Manager
Rubber Plantations

W E Klippert
lh

June 24, 1964

Mr. James Golden
Public Relations Department
Goodyear Tire and Rubber Company
114 East Market Street
Akron, Ohio

Dear Mr. Golden:

At the suggestion of Mr. P. Earle of the Public Relations Department of Goodyear here in New York, I am writing to you for information. In my position here at The Garden, I have been interested in the study of plants related to the Brazilian rubber tree, *Hevea brasiliensis*. I have found from a mimeographed booklet that a hybrid was made between the Brazilian rubber plant and *Manihot utilissima*. The information that this hybrid was made is in a mimeographed booklet entitled "list of eastern clones in the western hemisphere with countries where the clones are now located."

This mimeographed item was compiled by a Mr. C. N. Hittle of the U. S. Department of Agriculture in 1951. It gives, besides the parentage of each clone, the location where it is kept. The particular case in point is listed as clone Gx879 (Av-33x *Manihot* ult.) H.M. The Gx means Goodyear cross pollination progenies; these were made in Sumatra. In parentheses are the parents of the cross pollination. It seems that there is an inversion of the letters in the abbreviation after *Manihot*; it should be utli. The clone Av stands for Algemeene Vereeniging van Rubber planters te Oostkust van Sumatra. Finally, the H stands for Haiti and M for Mexico, countries where this clone has been established.

We would like to know if there is someone in the Goodyear organization who could suggest where there is a plantation in Mexico maintained by Goodyear from which one might obtain the hybrid clone. If you can not answer this question directly, I would be very pleased to have your advice as to whom within Goodyear could tell us more about the locality of this particular cross. Thank you for your assistance.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

June 24, 1964

Dr. P. R. Wycherley
The Rubber Research Institute of Malaya
Post Office Box No. 150
Kuala Lumpur, Malaya

Dear Mr. Wycherley:

I promised earlier that I would forward to you the information concerning the hybrid cross between *Hevea* and *Manihot*. The information is finally forthcoming, and I report to you here the results. My information comes from a friend of mine, Dr. Jorge Soria, at the Instituto Interamericano de Ciencias Agrícolas de la OEA at Turrialba in Costa Rica.

Dr. Soria reports that they have in their library a mimeographed booklet entitled "list of eastern clones in the western hemisphere with countries where the clones are now located." This mimeographed item was compiled by a Mr. C. N. Hittle of the U. S. Department of Agriculture in 1951. It gives, besides the parentage of each clone, the location where it is kept. The particular case in point is listed as clone Gx879 (Av-33x *Manihot* ult.) H.M. The Gx means Goodyear cross pollination progenies; these were made in Sumatra. In parentheses are the parents of the cross pollination. It seems that there is an inversion of the letters in the abbreviation after *Manihot*; it should be utl. The clone Av stands for Algemeene Vereeniging van Rubber planters tev Oostkust van Sumatra. Finally, the H stands for Haiti and M for Mexico, countries where this clone has been established.

I have written to the Public Relations Department of the Goodyear Tire and Rubber Company, copy of letter enclosed, requesting information as to where this particular material may be located if it is still available. Would you be interested in receiving propagating material of this? I am sorry that there is no more information about the cross itself.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosure

THE RUBBER RESEARCH INSTITUTE OF MALAYA 240TELEGRAMS & CABLES:
"SEARCHING" KUALA LUMPUR.POST OFFICE BOX NO. 150,
KUALA LUMPUR, MALAYA.

Ref: Bot.3269

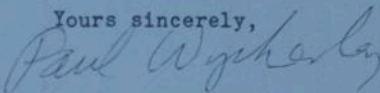
19th May, 1964.

Dr. D.J. Rogers,
Curator of Quantitative Taxonomy,
New York Botanical Garden,
Bronx Park,
New York 58,
New York,
U.S.A.

Dear Dr. Rogers,

Thank you for your letter of 11th May, at which point I would have let the correspondence rest. However, Mr. Ross, who is in charge of plant breeding here, would like any references to the reports of hybridization between Hevea and Manihot which may be readily available (if not, please do not worry).

Yours sincerely,



(P.R. Wycherley)
Ag. Head of Botanical Division

April 30, 1964

Dr. P. R. Wycherley
Botanical Division
The Rubber Research Institute of Malaya
Post Office Box No. 150
Kuala Lumpur, Malaya

Dear Dr. Wycherley:

Please forgive me for being so tardy in answering your letter of March 20, 1964. I have been trying to pin down some of the genetic material that has "drifted" into the specimens that you have.

The preponderance of the material must be referred to the species *Manihot Glaziovii* Muell. Arg. This is not an entirely satisfactory identification, however, inasmuch as these plants are obviously of a hybrid nature. We can only conjecture as to the possible additional types of genes that are present therein. It would require considerable population analysis and perhaps some experimental plant breeding to really pin down which entities have contributed to this complex.

In all of the species of *Manihot*, hybridization is a potential source of confusion, and this particular group, the rubber-bearing species, has been so thoroughly moved about from its native habitats into plantations where they got special genes that we can never be secure in our identifications.

I am sorry that we have been so long in coming to a conclusion on these plants. I had hoped by now to have worked out the details of the classification of the whole genus, but this is a much more complicated task because of the problems I mentioned earlier. I trust this will help to some extent.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

THE RUBBER RESEARCH INSTITUTE OF MALAYA

TELEGRAMS & CABLES:
"SEARCHING" KUALA LUMPUR.POST OFFICE BOX NO. 150.
KUALA LUMPUR, MALAYA.

REF: Bot.3269

20th March, 1964.

Dr. D.J. Rogers,
New York Botanical Garden,
Bronx Park,
New York, 58,
New York,
U.S.A.

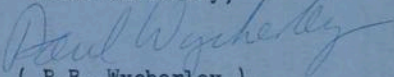
Dear Dr. Rogers,

Manihot

I refer to your letter to me (in England) dated 25th June 1962 and to Mr. Chandapilla here on 13th September 1962 concerning some specimens of Manihot we sent you. I was checking over our correspondence with herbaria and note that we do not seem to have had an identification yet (if such is possible). Mr. Chandapilla is away in Bangor, North Wales, and a letter may have followed him on, but I have not heard from him.

Is it possible to give a name to the plant please?

Yours sincerely,


(P.R. Wycherley)
Botanical Division

June 15, 1964

Dr. Gaston Bejamaño B.
Corporación Boliviana de Fomento
Casilla Correo No. 1124
La Paz, Bolivia

Dear Gaston:

I was very pleased to receive your letter of May 3. As soon as I saw the content of the letter, I thought that it would be well to take this matter up with the president of a new organization that may be of great assistance to you and to Bolivia and other tropical countries that are in need of great assistance in the development of a herbarium. You probably have received by now a letter from Dr. Bassett Maguire who is the president of the Association for Tropical Biology. He anticipates a visit to you in September and will at that time discuss the problem that you have posed to me.

I think that this is the very best procedure to follow--that you work through the Association for Tropical Biology. Eventually, of course, specimens for your herbarium will have to be identified by someone, and it will be necessary to distribute these specimens through one single organization. We are not certain whether the distribution can be or should be done through the New York Botanical Garden or, as in the case of the reply that you had received from the U. S. National Herbarium at the Smithsonian Institution, whether it might be organized through them. Some sort of cooperative endeavors will definitely have to be established, but we are not certain at this moment what the nature of this cooperation can or should be.

I trust that when Dr. Maguire visits you you will try to get from him some sort of a commitment as to a procedure for the operation. One possibility that occurs to me is that you, in cooperation with the Association for Tropical Biology and the New York Botanical Garden, might make an application to the National Science Foundation for a cooperative venture to collect and to organize a herbarium of Bolivian plant materials. This is one suggestion.

June 15, 1964

You may have possibilities for collaboration through the Association for Tropical Biology with other herbarium. I am not certain which institution or what organization would be most appropriate. Certainly FAO might be considered as a potential source of funds. Certainly you will need funds to carry on any extensive program. I hope that Dr. Maguire will be able to find some satisfactory *modus operandi*.

As far as my own research in *Manihot* is concerned, since I saw you I have visited Mexico and have come to the conclusion that the center or origin of the cultivated *Manihot* species probably was somewhere in the area occupied by the early Mayan Indians. I enclose a reprint that gives some ideas and description of this endeavor.

I was very pleased to hear from you. I am very glad to know that you are able to pursue some interesting works along the lines of mutual interest. Give my best regards to your wife and to the members of the Corporacion Boliviana de Fomento.

Very sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosure

THE NEW YORK BOTANICAL GARDEN BRONX PARK • BRONX 58 • NEW YORK

June 12, 1964

Sr. Gastón Bejarano B
Proyecto Alto Beni
Corporacion Boliviana de Fomento
Casilla Correo No. 1124
La Paz, BOLIVIA, S. A.

Dear Sr. Bejarano B:

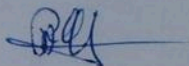
Dr. Rogers has been good enough to send me your letter to him of May 3, relative to the development of field activities in Bolivia.

You are indeed living in an area of great possibility in the development of field and herbarium study. The New York Botanical Garden has for many years been interested in the flora of Bolivia, but our competence in this direction is small.

During the month of September next I expect to be in La Paz on the behalf of the Association for Tropical Biology. If you are to be in the city at that time, I should look forward to discussing with you these matters of mutual interest. At a later time, when my itinerary is fixed, I will drop you a further note giving you the date upon which we will be in La Paz.

I look forward to meeting with you.

Sincerely yours,



Bassett Maguire, Head Curator
Coordinator of Tropical Research

BM:gg

blind cc: Dr. Rogers ✓

CORPORACION BOLIVIANA DE FOMENTO
PROYECTO DE DESARROLLO DEL ALTO BENI-USAID.

Form. PAB-25

CASILLA CORREO No. 1124
LA PAZ - BOLIVIA

DIRECCION TELEGRAFICA
"CORFOFOMENTO"

La Paz. May 3.1964

Dr. David J Rogers
Curator of Economic Botany
The New York Botanical Garden.
Bronx Park. New York 58. USA.

Dear Dave:

Long time has past since the last oportunitie we exchanged correspondance. During all this period I have been working in our old Alto Beni Project specilly in explorations, in these days I am very busy opening the Trail (cattle trail) from San Borja to Alto Beni and with the studies of the Marginal Highway of the Jungle, nice and pleasent work for my intrests.

We are trying to make once for all the Bolivian Herbarium, you know this country and so you will understand the grat needding of this material but the great difficulty to make "big shots" be interested in financig and helping this particular item.

A great fortune for aurselves is the presence of Ing. Ian Hutchinson Forest Inventory technitian from FAO who is much interested to make this work and have the proper determination of our forest species.

Therefor he has written to the UNited States National Herbarium of the Shmithsonian and by reply they said there were much interested in our material but that the identification of many families must be done by specialists all over the world, we feel that many of the material will reach your hands or the specialists ones there in de NY Botanical, there for I would appreciate very much to know about you and the intentions and possibilities of working our material in the Botanical Garden.

If this works as we plan we will be able to make a real good collecting for you people and I think that we both will collect benefits of all this.

How is your Manihot studies I will apreciate very much to have some of your published material for reference, please send it to me.

Waiting for your news, very sincerely yours



Gastón Bejarano B
Proyecto Alto Beni CBF.

June 12, 1964

Dr. Ted Nicholson
UNESCO
Place de Fontenay
Paris 7, France

Dear Ted:

My daughter and I will be coming to Paris on the 21st of July. If you are still in the vicinity, I hope we will have an opportunity to see you. Do I have the right address for you?

Incidentally, Dr. N. W. Pirie of the Rothamsted Experimental Station asked me recently for your address, and I have given him the one to which this letter is addressed.

During my week's stay in Paris I shall be working at the Museum National d'Histoire Naturelle, Laboratoire de Phanerogamie, 57 Rue Buvier, and I can probably best be contacted there through Dr. Alicia Lourteig. I do not yet have a hotel address in Paris, but I hope to have one soon.

I am looking forward to seeing you.

Sincerely

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

May 11, 1964

Dr. P. R. Wycherley
The Rubber Research Institute of Malaya
P. O. Box 150
Kuala Lumpur, Malaya

Dear Dr. Wycherley:

Thank you for your comments in your letter of May 5 (Bot. 3269). The things that led me to Manihot glaziovii were the morphologic characters of the flower, fruit and leaf in several specimens not only of the general collections but also those that I have made myself. Glaziovii is a wide ranging species with a number of ecotypes capable of colonizing areas from those extremely dry to those with a greater amount of moisture.

The similarity of the latex of these plants to Hevea brasiliensis is not surprising inasmuch as there have been reports of hybridization between Hevea and Manihot.

The status of M. dulcis is questionable. This is a "catch-all" used by Pax and Hoffman apparently for anything that they couldn't find a good place to fit. It may be that this name will have to be used because of nomenclatorial priority, but its general application does not fit the specimens that you have.

The status of M. dichotoma, heptaphylla, and piauhyensis is also very confusing. These are species named by Ule, and the taxonomy of Ule does not hold much reality.

I am glad to have your comments on the use of the tree and its present status in Malaya.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

THE RUBBER RESEARCH INSTITUTE OF MALAYA

TELEGRAMS & CABLES
"SEARCHING" KUALA LUMPURCODE
BENTLEY'S COMPLETE PHRASETELEPHONE NOS. [K.L.] 72081
72082
72083
72084PLEASE ADDRESS ALL COVERS
TO THE DIRECTOROFFICES AND LABORATORIES:-
3RD MILE AMPANG ROAD
KUALA LUMPURPostal Address:-
POST OFFICE BOX NO. 150
KUALA LUMPUR, MALAYA.

5th May 1964.

BY AIR MAIL

This letter is intended only for the use of the addressee, and is sent on the understanding that its contents shall not be published or otherwise transmitted to a third party, as coming from this Institute, without the consent of the Director.

PLEASE QUOTE Bot. 3269

Dr. D.J. Rogers,
Curator of Quantitative Taxonomy,
The New York Botanical Garden,
Bronx Park,
New York 58,
New York,
U. S. A.

Dear Dr. Rogers,

Manihot glaziovii M.A.

Thank you for your letter of 30th April in which you indicate that our specimens should be regarded as predominantly M. glaziovii, although evidently of hybrid origin or the product of introgression by other species whose identity it is not yet possible to determine.

I will inform the others interested in this plant of your opinion by copy of this letter. To refresh their memories I will mention again the history of this plant as known to us. We had previously called it M. dulcis after Corner's tentative identification in 'Wayside Trees of Malaya'. We had considered M. glaziovii to differ in various ways and to flourish in somewhat drier and more seasonal climates. Dr. Southorn of this Institute examined microscopically the particles in the latex of this and other plants, he concluded that the particles were different from those in the cassava plant and more similar to some in Hevea brasiliensis. We sought confirmation of identity through the Forest Research Institute and the Singapore Botanic Gardens, eventually being referred to Mr. Foreman at Kew and thence to you.

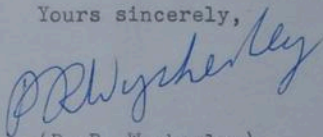
The plant we sent you is superficially at least - very constant in appearance throughout Malaya where it is planted from cuttings (probably always from cuttings) as an ornamental and quick growing shade tree up to 20 ft. tall, and perhaps to provide some browse for animals, despite alleged toxicity. It is not now exploited for latex and has only recently attracted any attention for research purposes (see above).

Burkill's 'Dictionary of the Economic Products of the Malay Peninsula' relates the introduction of four species of Manihot other than cassava, M. esculenta (M. utilissima), namely:-

M. dichotoma, glaziovii, heptaphylla and piauhyensis, all rubber-bearing. Any of these might in fact have been hybrids when imported or have hybridised since. In any event the extensive vegetative propagation of a somewhat atypical form as an ornamental has probably led to the present situation.

It is so extensively planted for quick shade in Malaya that I am sure its distribution for this purpose was independent of the waxing and waning of interest in it as a plant producing rubber.

Yours sincerely,



(P. R. Wycherley)

c.c. L.L. Foreman Esq.,
Royal Botanic Gardens,
Kew, Richmond,
Surrey, ENGLAND.

" Mr. Kochumen,
Forest Research Institute,
Kepong, SELANGOR.

" The Director,
Botanic Gardens,
Cluny Road,
Singapore 10.

May 4, 1964

Mr. Kenneth Arnold, President
Tapioca Importers Association
120 Broadway
Room 2650
New York 5, N. Y.

Dear Mr. Arnold:

Thank you for your letter of invitation dated April 30.
As I have already informed Mr. Morningstar, I am
pleased to accept the invitation and look forward to
meeting you and others.

I should be pleased to have some indication of the
amount of time you wish me to spend talking about tapi-
oca. Also, I look forward to further details as to
where the meeting will be held.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

TAPIOCA IMPORTERS ASSOCIATION

120 BROADWAY

ROOM 2650

NEW YORK 5, N. Y.

April 30, 1964

Dr. David J. Rogers
The New York Botanical Garden
Bronx Park
New York, New York

Dear Dr. Rogers:

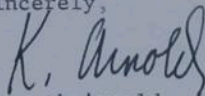
I have just returned from an extensive absence from my office and wish to now enthusiastically endorse Mr. Morningstar's suggestion that you be with us on June 11 at our luncheon meeting with Dr. Krochmal.

Your experience in the Cassava field will be an excellent take-off point for a short informal discussion with the membership.

I hope that you will be able to give us some of your time on that date, as I am sure all of our members are anxious to hear you.

Will you please call me or drop me a line to let me know if you could attend this luncheon.

Sincerely,



Kenneth Arnold
President

KA:jg

April 22, 1964

Mr. J. Morningstar
Morningstar-Paisley, Inc.
630 West 51st Street
New York 19, N. Y.

Dear Mr. Morningstar:

Thank you for your recent letter of invitation. It looks now as though I shall be able to participate, and I look forward to seeing you on June 11.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

MORNINGSTAR-PAISLEY, INC.

630 WEST 51st STREET, NEW YORK 19, N. Y.

JOSEPH MORNINGSTAR
CHAIRMAN OF THE BOARD

14 April 1964

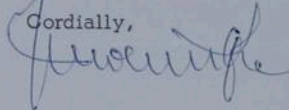
Dr. David J. Rogers
The New York Botanical Garden
Bronx Park
New York, New York

Dear Dr. Rogers,

Confirming my conversation with you, I do hope that you will save June 11 for us. I think if we could impose on you for a short talk, it would be of great help to us. I do not believe our membership has any idea of the vast variety of species of cassava.

Looking forward to seeing you, with kindest regards,

Cordially,



JM:nem

TAPIOCA IMPORTERS ASSOCIATION

120 BROADWAY

ROOM 2650

NEW YORK 5, N. Y.

May 25, 1964

Dr. David J. Rogers
Curator of Quantitative Taxonomy
The New York Botanical Garden
Bronx Park
New York 58, New York

Dear Dr. Rogers:

The arrangements are made for the June 11 luncheon meeting of the Tapioca Importers Association.

It will not be necessary for you to make a prepared presentation. The group will be small enough so that an informal discussion will be the order of the day. As you may already know, we have also asked Dr. Arnold Krochmal to attend. Dr. Krochmal is on his way to Thailand to work on an agronomy study of Cassava.

The luncheon will be held at the Princeton Club where the group will gather at 12 noon. The Princeton Club is located at 15 West 43rd Street, where we will have a private dining room.

We appreciate very much you taking time to share your experience with our members.

Cordially yours,



Kenneth Arnold
President

KA:11

P.S. Cassava in one
form or other will be in
the next Cookbook.
Many Thanks.
H.

"Sunnydale"
P.O. Box 992
Nassau,
Bahamas
April 16-64

Dear Mr. Rogers, —

Thanks for taking time out to
write to me — knowing you to be a very
busy man I am very pleased.

It doesn't seem possible that a
month has passed since the session
in North Carolina — indeed I enjoyed
every minute of it and have been
kept busy sending specimens to interested
persons and answering letters — a charm-
ing one from Harriette Barlow of Western
Michigan University. Sorting out the
many notes I look takes time, lots of it.

Here with the Cookbook, I compl-
I am to do the eighth edition soon — in aid
of charity here. Hope Mrs. Rogers will find
even one recipe that she likes — and give
her my very best regards —

With every good wish

(Mrs. Leslie H. H. G. S.)

Helen H. G. S.

April 16, 1964

Dr. D. L. Jennings
Scottish Horticultural Research Institute
Invergowrie, Dundee
Great Britain

Dear Dr. Jennings:

Under separate cover I am returning the Memoires de l'Institut Scientifique de Madagascar containing the article by Gilbert Cours on "Le Manioc a Madagascar." I very much appreciated your sending this paper; I have just now received a copy for myself.

I wonder if you will be attending the International Botanical Congress to be held at Edinburgh in August. I expect to be there; and if you happen to be in attendance, I would be very pleased to meet you there.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

April 8, 1964

Mrs. Leslie Higgs
Post Box 992
Nassau, Bahamas

Dear Mrs Higgs:

I trust that your return trip was uneventful and that you were satisfied with the presentation at the meeting. We certainly were and appreciated your attendance there.

I promised you that I would send a list of cassava recipes. I am sorry to say I can't come through with my promise. I thought I had a list of recipes in my file, but my memory was faulty. The only things I have are the enclosed two recipes which you may find interesting.

I recall that when I was in Jamaica someone told me of a list of 67 recipes that had been made up. However, I have no recollection of the source of these recipes, nor do I recall who actually told me about them. I would suggest that, if you wish to follow up on this, there are two possible sources of help. One would be the Director of the Department of Agriculture in Jamaica at Hope Gardens, Kingston. The other is the Institute of Jamaica which is in Kingston. I do not have the street address, but perhaps a letter to them would bring forth the desired information.

I trust that this is somewhat useful to you.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF
Enclosure

March 31, 1964

Dr. Louis O. Williams
Chief Curator
Department of Botany
Chicago Natural History Museum
Roosevelt Road & Lake Shore Drive
Chicago 5, Ill.

60605

Dear Louis:

In further reply to your letter of March 23, I now have the following additional comments.

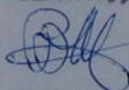
Both Drs. Rogers and Allen inform me that they need to retain the materials of your loan to us:

B-7784, B-7899, B-7917, B-8338 and B-8447 for further study.

Would you therefore kindly extend the period of loan for an additional year?

All regards,

Sincerely,



Bassett Maguire
Head Curator

BM:gg

Copy: Dr. Allen
Dr. Rogers ✓

B-7899

B-8338

B-8447

February 20, 1964

Dr. Gerardo Reichel-Dolmatoff
Apartado aereo 11313
Bogota 2, Colombia

Dear Dr. Reichel-Dolmatoff:

I am pleased to have your letter of the 15th requesting further information on the Mesoamerican origin of Manihot esculenta. The basis for my decision rests on my recent visits to various areas in Mexico.

When I was in Mexico, I spent a considerable amount of time in the lowland areas of Yucatan and a bit to the south toward the Guatemalan border. I found the cultivated yuca associated almost exclusively with the Mayan descendants. I found also that the Manihot (yuca) was interplanted with corn (maize) in what seemed to be a very precise agricultural pattern. I found among the present day Mayans both the bitter and the sweet (yuca dulce and yuca amarga), a fact that I had thought previously not to exist. Up until then I had thought that no HCN-containing varieties were to be found in the Mesoamerican areas. I found in the wild areas nearby the Mayan plantings wild species of Manihot whose morphological characteristics closely resembled the cultivated ones. I found a number of species of the genus Manihot which could have very likely served as ancestors for the cultivated species.

Now, taking all of these items together, one could argue as well, I suppose, for an origin in some other geographic area of Latin America—namely, Brazil. The one item that causes me to consider the Mesoamerican center is the origins of civilization and the datings of archeological materials. The age of civilizations seem to be greater in the Mesoamerican complex than in the other areas that might have been considered as a point of origin.

Let me say that this is a tentative conclusion. It is not as positive as might have been reported. It is subject to modification, given the appropriate evidence otherwise. I have no intention of forcing people to change their ideas. I merely find it useful to point out the potentialities of such localities for the origin of

February 20, 1964

yuca. I will be pleased to hear from you considering your own attitudes concerning the places of origin of Manihot esculenta. Only by cooperative endeavor do I think that such extremely complicated matters will ever be solved. The recent publications dealing with the origins of maize in the work of MacNeish, Mangelsdorf and others showed the kind of endeavor necessary before one can make absolute statements about origins. So much endeavor has been done on maize and so little on Manihot that it will take a lot more work before anyone has the answer.

Thanks again for writing. I trust that my comments here are useful.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

UNIVERSIDAD DE LOS ANDES
CALLE 18-A CARRERA 1-E
APARTADO AEREO 4976
CABLES: UNIANDES
BOGOTÁ, D. E. — COLOMBIA

Depto. de Antropología

February 15th, 1964

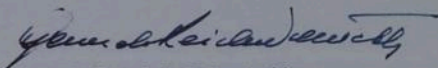
Dr. David J. Rogers
The New York Botanical Garden
Bronx Park
Bronx 58 , New York

Dear Dr. Rogers:

A few days ago I read in The Interamerican, a mimeographed anthropological newsletter, that you had obtained new evidence on the Mesoamerican origin of Manihot esculenta.

You know that, as an archaeologist, I am very much interested in this problem and I would greatly appreciate your kindness of giving me some additional information on this problem. I understand that the newsletter got its information from an article in the New York Times.

Very sincerely yours,


Gerardo Reichel-Dolmatoff
Chairman, Dept. of Anthropology

P.S. My private address continues to be: Apartado aéreo 11313
Bogotá-2, Colombia

December 26, 1963

Dr D. L. Jennings
Scottish Horticultural Research Institute
Mylnefield, Invergowrie
Dundee, Scotland

Dear Dr Jennings:

Thank you very much for the reprints and the
comments in your letter. We also appreciate very
much your sending your personal copy of Cours'
paper. We will have this duplicated.

With best wishes for the New Year, and thanks
again,

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

SCOTTISH HORTICULTURAL RESEARCH INSTITUTE

MYLNEFIELD

INVERGOWRIE

DUNDEE

DIRECTOR: T. SWARBRICK, M.Sc., Ph.D. SECRETARY: A. B. ROSS, F.C.C.S., A.I.A.C. TELEPHONE: INVERGOWRIE 441

WHEN REPLYING PLEASE QUOTE DLJ/JM

YOUR REF.

20th November, 1963.

Dr. D. J. Rogers,
Curator of Quantitative Taxonomy,
New York Botanical Garden,
Bronx Park,
NEW YORK 58,
U.S.A.

Dear Dr. Rogers,

Thank you very much for your letter and reprints.

I feel sure that you could obtain a copy of Greenway's paper on "Origins of some East African Food plants" from the Librarian, E.A.A.F.R.O., Box 21, Kikuyu, Kenya. Dr. Greenway himself has now retired. I think you would find Cour's monograph of interest and since I'm not so sure where you could get it I am lending you my copy; there is no hurry for its return but I would like it back sometime. I could also lend you my copy of Greenway's paper if you are not successful in obtaining one.

I believe that the East African work described in my papers was discontinued when I left, though the material is probably still being maintained. If you ever wished to obtain any of it, the Director of E.A.A.F.R.O. (Dr. E.W. Russell) is the person to contact, though I am still very interested in the crop and would be pleased to discuss any points about the work.

A few points which occurred to me while reading your papers are as follows:-

1. Many African tribes are very fond of using young cassava leaves as a green vegetable. They refer to it as "Kisamvu" and recognise differences between varieties in respect of leaf palatability (probably bitterness). Kisamvu is often sold as such, in native markets.
2. Varieties with bitter roots (e.g. Gide) are very popular in areas where wild pig or baboon are prevalent. The animals taste a root and then move along, instead of devastating the whole plot as they would with a sweet-rooted variety. The poisonous substances are removed by sun-drying or cooking, of course. Most cultivators like to "hide" a sweet kind within a perimeter of bitter ones. I once tried to breed bitter kinds with improved agronomic qualities.
3. No chemical investigations were ever done on the leaves of Manihot Melanobasis or its hybrids. In view of the results for the roots of this material, there may

.../...

Night Telephone Service:

Director's House: Invergowrie 592 Secretary: Dundee 82970 Caretaker: Invergowrie 441 Farm Manager: Invergowrie 442

Dr. D. J. Rogers,
NEW YORK 58.

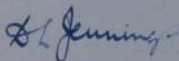
20th November, 1963.
Page 2.

be a case for looking at the leaves as well.

4. The removal of shoot tips for use as a vegetable has a disadvantage in areas where resistance to mosaic virus is important. Reprints of my paper dealing with "plucking" cassava plants in relation to their mosaic resistance are not at present available, but I hope to be able to send you one in a week or so.

I hope these remarks are of some interest to you.

Yours sincerely,



D. L. Jennings.

The Rachel McMasters Miller Hunt Botanical Library

Carnegie Institute of Technology Pittsburgh 13 Pennsylvania

GEORGE H. M. LAWRENCE, *director*

24 January 1964

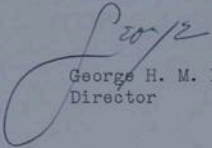
Dr. David J. Rogers
Curator of Quantitative Taxonomy
The New York Botanical Garden
Bronx Park
New York 58, New York

Dear Dave:

There is no question but what you should proceed exploring possible journals in which to submit your Manihot article for publication. Ideally, it seems to me you should try to get a grant to cover the actual publishing cost and put it in Economic Botany. Is it possible that one of the manufacturers of tapioca would make a grant as a tax-deductible item for the purpose, and for the credit line that would be granted them?

If I get any other inspiration I will pass it on. The only other thought that occurs to me as outside possibility is Bailey, but if the number of pages required is considerable I feel they too would want some subsidy. Bill Dress is the man to contact there concerning it if it appeals to you.

Most sincerely,


George H. M. Lawrence
Director

GHML:mh

January 21, 1964

Dr. George H. M. Lawrence, Director
The Rachel McMasters Miller Hunt Botanical Library
Carnegie Institute of Technology
Pittsburgh 13, Pennsylvania

Dear George:

Thanks for your letter of January 17. I should have checked with Rick first before writing to you, I am sure, but I realize now that the potentialities for publishing my bibliography of Manihot through your facilities are relatively small. Therefore, I would suggest that you donot try to include it on the agenda, except perhaps as your own interests may lie in this direction.

If you have any suggestions as to where I might apply for publication and for assistance in preparing the bibliography for publication, I would appreciate your comments.

Sincerely yours

David J Rogers
Curator of Quantitative Taxonomy

DJR:MDF

The Rachel McMasters Miller Hunt Botanical Library

Carnegie Institute of Technology Pittsburgh 13 Pennsylvania

GEORGE H. M. LAWRENCE, director

17 January 1964

(Dictated 14 January 1964)

Dr. David J. Rogers
The New York Botanical Garden
Bronx Park
New York, 58, New York

Dear Dave:

Your inquiry of 9 January, concerning the admissibility of a manuscript in our forthcoming yearbook HUNTIA on the literature dealing with Manihot esculenta poses an interesting question. It is one we have not yet considered as a matter of policy.

We have agreed that we will publish bibliographies of the writings of important plantmen. This goes hand-in-hand with our interest in botanical biography. The first volume of HUNTIA, now in press, contains a bibliography of the writings of David Fairchild. With it is also a commentary on the man.

Our Advisory Committee meets the last week of April and at that time I will raise the question you pose. I feel, however, that we are opening the floodgates to requests for space for a myriad of bibliographies that have been compiled on individual plants, and that these do not per se have a bearing on our studies of botanical literature and biography. They belong more properly in monographic studies of plants, or in journals dealing with plants, rather than in bibliographical media. These are my own personal reactions and I will present the question to our Committee without opinion from myself. My general practice, on all matters of policy, is to present the various facets of the problem and get Committee opinion with nothing contributed by myself. Their opinion then serves as a very excellent guide to final decisions made here.

I must say, that we would be much more interested in bibliographies of botanists, rather than of individual plants. On the other hand, we might very well consider publication of bibliographies of a broader scope, such as papers contributory to the study of herbals, or to the study of the literature of a particular botanical subject. As you know, we do have a Hunt Monograph Series, and a bibliography of the literature of economic botany might very properly comprise a volume of such a series. A bibliography on the history of plant exploration or plant explorers might be an admissible subject for that Series.

In any case, I'll be glad to present your idea, and if you have any amplification on it between now and the middle of March when the agenda

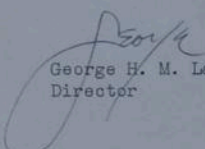
Dr. David J. Rogers

- 2 -

17 January 1964

will be made up, I'll be glad to have it. It is good to hear from you and I look forward to further liason.

Most cordially yours,



George H. M. Lawrence
Director

GHML:hbe

January 9, 1964

Dr. George H. M. Lawrence, Director
The Rachel McMaisters Miller Hunt Botanical Library
Carnegie Institute of Technology
Pittsburgh, Pennsylvania

Dear George:

As a result of the editorial in Biological Abstracts for December 1, which did a good job of describing your activities, I am prompted to ask whether you are interested in the bibliography that I have assembled on Manihot.

Over the years I have made a rather desultory accumulation of literature citations, most of which deal with some agricultural or cultural aspect of Manihot esculenta. I would estimate that we have about 600 entries now, none of which have been thoroughly checked or documented.

It occurred to me, however, that since we have gone this far it might be worthwhile to go ahead and complete the job of a bibliography. Are you folks interested in such an activity as this, and if so, have you any suggestions as to how I might get some assistance for checking the citations and being certain that we have made a fairly comprehensive coverage. I will be interested in hearing your reaction to this idea.

Sincerely yours

David J. Rogers
Curator of Quantitative Taxonomy

DJR:MDF

Botanical Bibliography Comes Into Its Own

THE BOTANICAL COLLECTIONS of the late Rachel McMasters Miller Hunt comprise a special library formally opened at Carnegie Institute of Technology, Pittsburgh, in 1961—and known as the Hunt Botanical Library. This is not a library in the conventional sense, but is an international center for bibliographical studies of plant science literature in general, and of systematic botany and horticulture and the history of the biological sciences in particular.

The Library's administration, guided by an Advisory Committee composed of Trustees of the supporting Hunt Foundation and six botanists of international repute, has implemented the donor's stipulation that the collections serve a useful purpose by initiating a program of research and publications that is vigorous in concept and exciting to contemplate. Whereas the literature of the physical sciences and of medicine has long attracted scholars and supporting organizations, this is the first time in America that an institute has been founded and is operating to do the same for the literature of the plant sciences.

The collections at the Hunt Botanical Library comprise: more than 10,000 titles of *books* in the fields of botany, early agriculture, herbals, medical botany, horticulture, and biography of biologists; some 6,000 *paintings, prints and drawings* of botanical subjects dating from the 17th century to the present; more than 1,500 *autograph letters* and 16,000 *manuscripts* of botanists of the 19th century and earlier; nearly 3,000 *portraits and photographs* of botanists. An active acquisitions program exists for each of these groups.

The research program provides for activities leading to the publication of: titles in the *Hunt Facsimile Series* (No. 1 published in April 1963); titles in the *Hunt Monograph Series* (No. 1 published in August 1963); a bibliography definitive *Catalogue of Books in the . . . Hunt Botanical Library* (vols. 1 & 2 published, vol. 3 in progress) [gratuitously distributed to botanical and bibliographical centers, but not for sale]; a multivolume encyclopedic work, *Bibliographia Huntiana*, now in progress, to provide detailed bibliographic studies of the estimated 18,000 titles of botanical works published between 1730 and 1840, and to include citations of all papers by the same authors in the periodicals of that period; and *Huntia*, a yearbook devoted to studies in botanical bibliography (vol. 1 to be published February 1964).

GEORGE H. M. LAWRENCE, *Director*
The Rachel McMasters Miller Hunt Botanical Library
Carnegie Institute of Technology
Pittsburgh, Pennsylvania

BIOLOGICAL ABSTRACTS, Volume 44(5): December 1, 1963

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH SERVICE
VIRGIN ISLANDS AGRICULTURAL PROGRAM
KINGSHILL, ST. CROIX
U. S. VIRGIN ISLANDS
U. S. VIRGIN ISLANDS 00850

January 6, 1964

Dr. David Rogers
The New York Botanical Garden
Bronx Park
New York 58, New York

Dear Dave:

Thanks a lot for the bibliography of cassava. As soon as it is on cards I will go over it, as I think we have a few references you may not have.

I will use it only for our work as you ask.

I was in Jamaica in December and visited Mr. Sargood's starch plant, which is mightily inefficient, but he is getting a good price on the market for neatly, attractively packaged laundry starch. There is some talk there of growing cassava for food production in specialized forms for export to England where there is apparently a large West Indian population.

In a vareity trial recently harvested our best yielder, a numbered variety, gave us over 20 tons to the acre; we have re-sown the same field with the same varieties in the same plan to observe the result of continued cropping without fertilizers, on yields.

Happy New Year,

Arnold Krochmal
Arnold Krochmal
Horticulturist

GEISMAR & COMPANY, INC.

10 EAST 40TH STREET • NEW YORK, N. Y. 10016

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NEW ORLEANS 12, LA.GEISMAR & CIA., LTDA.
SAO PAULO, BRAZILTELEPHONE
MURRAY HILL 6-0442CABLE ADDRESS
MARABRES NEW YORK

November 23, 1965

Dr. David J. Rogers
Professor of Botany
Colorado State University
Fort Collins, Colorado 80521

Dear Dr. Rogers:

I still have for acknowledgement your kind letter of September 2nd which, through an oversight, was not answered earlier, as well as the copy of your letter of November 18th addressed to Dr. Normanha which you were good enough to send me.

Just a few days ago, I received a letter from Dr. Normanha mentioning his plans and suggesting that I make one or more contributions to the proposed monograph. In my reply to Dr. Normanha I stated that I should be glad to comply and suggested the manufacture of Manioc Starch and/or the food and industrial uses for this product in the industrialized countries, as suitable topics. I also mentioned that I am pleased to be able to contribute to this monograph and have no intention of duplicating the work being done by Dr. Normanha. I did ask him whether there was any possibility of having the monograph printed in the English language as this would no doubt result in a much larger readership than that of a publication restricted to those who can read Portuguese.

With regard to your question in your letter of September 2nd, I would expect to discuss the specific properties of Manioc Starch, at least to the extent that these properties are of industrial importance and make it possible to utilize this type of starch in preference to other starches.

MANIOC LEAVES

We have recently been looking into the possibility of using dried Manioc Leaves for animal feed purposes. As you probably know, these leaves have quite a high protein and vitamin content, however the cost of collecting and drying them may be out of proportion to the value of the product. Would you, by any chance, be in a position to let me know the approximate weight of leaves, on the dry basis, which could be obtained per plant growing (1) in tropical areas such as Thailand or Central America and (2) in the sub-tropical regions of Brazil?

November 23, 1965

We are investigating this matter in Brazil but you may have some interesting data on this based on your own travels and observations.

With best regards.

Yours sincerely,

GEISMAR & COMPANY, INC.

G. Van Biema,
Gerhard Van Biema

GVB/ab

430
- Taxonomy Laboratory

November 1, 1965

Professor Gileno A. Barreto
2895 Aurora
University Towers
Boulder, Colorado

Dear Professor Barreto:

I have recently read a copy of the thesis presented to Colorado State University, Department of Chemistry, by Mr. Ishmeal Ransaw.

In Mr. Ransaw's thesis, he mentions he has made a comparative analysis of the starch qualities of five varieties of mandioca which were prepared for his studies at the University of Bahia under your direction.

As a botanist with a great interest in the over-all study of mandioca, it occurred to me that it would be a very good idea to have documenting herbarium specimens of each of the varieties which Mr. Ransaw has tested. We have found that the local names of mandioca varieties are not very good documentations for the best scientific studies of these plant materials. I would, therefore, like to have your recommendations as to how I may obtain herbarium specimens prepared according to a set of my instructions, which are representative of a plant material from which the five varieties were derived.

Please let me know if it is possible to ask someone on the staff at the University of Bahia, or of the Agronomic Institute in Cruz das Almas to prepare the above described specimens and send those to me here. Any name that you care to refer me to will be much appreciated.

Very sincerely yours,

David J. Rogers
Professor of Botany

DJR/ec

UNITED STATES DEPARTMENT OF AGRICULTURE
Agricultural Research Service
Plant Quarantine Division
209 River Street, Hoboken, N. J.

RESPONSIBILITIES OF PLANT IMPORTERS

1. To avoid delay in the clearance of importations of plant propagating material importers have four important responsibilities to assume. Failure to assume all of these may result in loss or deterioration of material.

These responsibilities are:

- a. To obtain, before placing orders, an import permit or to make certain that an existing permit provides for the entry of the desired material. If in doubt, obtain written assurance from the Plant Importations Branch, 209 River Street, Hoboken, N. J.
- b. To transmit appropriate instructions to the foreign shipper. Please read carefully ¶2 below and the ¶¶ cited therein.
- c. To make advance arrangements for meeting all Customs requirements. See ¶16.
- d. To supply labor, materials, etc. through broker or agent, when necessary. See ¶17.

WHAT THE FOREIGN SHIPPER MUST BE TOLD

2. The permittee should instruct the foreign shipper concerning the freedom from soil requirement; the use of approved packing materials; the woody seedling prohibition, the size-age limitations, the defoliation requirement, when necessary; the need for labeling, invoicing, and certification; and the means by which shipment is to be made. Information on these requirements appears in ¶¶3 to 13 which follow.

3. FREEDOM FROM SOIL. All plant material must be free from sand, soil, and earth. Leafmold and other decayed vegetable molds are considered as soil. Plants arriving in or contaminated with sand, soil, or earth may be refused entry.

4. PACKING MATERIAL. (a) Only approved packing material should be used. Leaves, forest litter, woods moss, and any similar material taken from or out of the ground and dried grasses, weeds, hays, and straws are not approved. Among the commonly used packing materials which are approved are peat moss, sphagnum, pulp-free coconut or other vegetable fibers (excluding sugarcane and cotton), osmunda fiber, excelsior (woodwool), shavings, sawdust, ground cork, buckwheat hulls, and vermiculite. Willow withes should not be used to tie bundles.

6986

PROJECT COLORADO

FEASIBILITY STUDIES-

-PRELIMINARY
DESIGNS

BRAZIL

BAHIA

CERAMICS
FOOD PROCESSING
MANDIOCA
PEANUT OIL
POULTRY
SLAUGHTERHOUSE

SUPERINTENDENCY FOR THE
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