Hunt Institute for Botanical Documentation
5th Floor, Hunt Library
Carnegie Mellon University
4909 Frew Street
Pittsburgh, PA 15213-3890
Telephone: 412-268-2434
Email: huntinst@andrew.cmu.edu
Web site: www.huntbotanical.org

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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.

TAXIR DEMONSTRATION OCTOBER 8, 1968

Working Papers:

Enclosed are working papers to which reference will be made during the demonstration. Please bring these with you to all sessions.

Contents:

Left-side:

1. "I/R in Biology"
2. "Procedural Flow Chart to Prepare the DATA BANK for Input to TAXIR"

Right-side:

1. "Table of Descriptors for Curating Manihot Specimens"
2. "Manihot Curatorial Bank", Sample Book, Morph Data Bank
3. "Sample Queries and Responses: Accessioner and Key"
4. "Sample BOOK"

There are several copies of the Curatorial Bank Control Vocabulary and various BOOKs for your perusal.

SCHEDULE FOR TAXIR DEMONSTRATION - TUESDAY, OCTOBER 8, 1968

Phys. Sci. Res. Bldg. #2, Room 375A

30th Street, East Campus

Morning

9:00 Introduction - Rogers

9:30 General Description - Estabrook

10:10 Coffee

10:30 Data Gathering - Fleming and Appan

11:20 Language and Queries - Brill

12:00 Lunch - Harvest House, Century Room

Afternoon

2:00 Group demonstrations on computer - Brill and Wong

3:00 Coffee

3:15 Summary - Rogers

3:20 Cost:Benefit - Hersh

3:45 - 5:00 Open Question Period

6:00 Dinner - Harvest House, Century Room

PARKING FOR TUESDAY DEMONSTRATION

In parking lot of Scott Carpenter Park, West side of 30th St.
Directly across from Phys. Sci. Res. Bldg. #2.

TAXIR DEMONSTRATION

INTRODUCTION

1. ANNOUNCEMENTS

Phone service: calls to my office will be taken, brought to your attention at earliest possible time. No phones in this room, but pay phone in hall-way, second floor, near entrance.

Secretarial assistance: Mrs. Metcalf here to assist in case of some need.

Travel arrangements: anyone needing ride to airport, please check with Mrs. Metcalf.

Lunch and dinner: unfortunately, Dutch, but at lunch, we will pay, and ask that you reimburse Mrs. Metcalf $2.50. She has receipts for those who need them. Dinner--you pay the chasier of Harvest House.

2. ORGANIZATION OF THE DEMONSTRATION

Schedule very tight.

Booklet for each contains descriptions and samples of each stage to help review the events and information given.

Formation into groups: because of cramped quarters in computer room and size of display tubes, necessary to have small groups for the part of demonstration at 2:00 PM. See your group assignment. Groups are color-coded by your booklet folders.

3. INTRODUCE MEMBERS OF THE TAXIMETRICS TEAM: See your list of Participants.

4. FORMAL WELCOME.

Pleased to have you take time from your busy schedules.

Your presence indicates a concern for this aspect of your endeavors.

5. WHAT IS INFORMATION RETRIEVAL?

Very popular effort these days, with many different groups participating.

Meaning of IR varies from group to group.

Concepts not well defined.

All of us store and retrieve some information every moment.

Our concept of IR will develop, we hope, during this meeting.

Demonstration needed to determine where our system fits into a user's activities.

Impossible to get these concepts across in short time.

We speak here largely to the biologist-user, not to the systems analyst or programmer.

6. REQUIREMENTS FOR DEVELOPMENT

Specialists in subject

Math for logic and consistency

Programming skills of high order

Integration of these efforts, the team working in daily contact.

7. BASIS FOR DEVELOPMENT

I, as taxonomist, with connections in two large herbaria.

Recognition of significance of taxonomic methodology already developed.

Recent advances in computer technology (last decade).

Ideas generated separately and together over the past ten years.

Formal proposal funded by OSIS in July, 1967.

Conferences with a number of you to broaden our perspectives, and discover needs of various types.

8. COST-EFFECTIVE STUDIES

Important to know the costs in order to develop a system in orderly fashion.

More important to know the effectiveness, time-saving, and usefulness of the system.

These are integral parts of our investigations, and you will hear about these after you have seen the formal presentation of the system.

Keep in mind various parts, with reference to costs & benefits.

9. FINALLY, our goals are not only to develop systems, but to work with you in forging a system for your own needs.

Dave, In your introductory comments tomorrow, you might ask each participant to write the following correction into the Table of Contents which occurs with his working papers. Right-side: 2. should read "Samples of Some TAXIR Statements" and Not "Monthot Curatorial Bank". As we know the Curatorial Bank does not occur in this handout.

THANX

George

INTRODUCTION

1. The following paper describes the procedures used to do a cost/effectiveness analysis. This analysis relates the costs of operation of a given system to its effectiveness: in other words, what it costs a given system to do a certain set of tasks.

This enables us to compare one system to another, or to look carefully at the components of one system.

2. Information about the TAXIR system is then presented.

SYSTEMS ANALYSIS: COST/EFFECTIVENESS

I. Systems Analysis: the Major Steps

A. All aspects of the system under study are observed by the systems analyst. Each portion of the system is flow charted. When fitted together these portions constitute a procedural flow chart of the system.

The flow chart(s) indicate how the system operates; exactly what is done and the order in which tasks are faced.

Flow charts (at this stage) do not necessarily indicate optimal (in terms of efficiencies, costs, completeness, etc.) procedures, but only what the analyst has observed.

B. Once flow charts are established, costs are analyzed for each procedure in the system as displayed. Essentially the amount of time needed for any given procedure is analysed, as well as the time needed to complete all procedures in the flow chart.

To obtain money costs, time used is multiplied by the rate of return for the input under consideration. If for example, we use 3 hours of a biologist's time (Ph.D. level), 3 hours is multiplied by the rate of return to the Ph.D. biologist which may be $8.00 per hour. Thus the cost for that procedure is 3 hours X $8/hour - $24.00).

It should be obvious that 1) breaking down costs to its components (time used, rate of return) is more instructive than merely using money terms, and

2) money costs can always be computed.

C. That which is accomplished by the various portions of the system and the system as a whole is analyzed. A set of criteria is established to test how well the system puts out desired material from what was put in. For an information retrieval system we may use as criteria

1. How user oriented is the system in terms of
   a. data preparation
   b. the types of answers to the queries?
2. How flexible the system is, for example
   a. can new data be added and old data deleted (updating)
   b. can corrections be made once the system is operating, etc.?
3. Can the system be changed once installed?
4. Does it aid in administering large information collections (as in a museum) or does it make the task of administration more difficult?

D. Finally we have an analysis for a system:

1. the procedural flow charts
2. the costs for each procedure
3. the effectiveness of the system as held up to a set of criteria

a. From these data we can generate combined information on the costs of putting data in and getting information out relative to the attributes and drawbacks of the system;

b. The system under study can be scrutinized and changed to make it more efficient (less costly) and/or more effective. Efficiency in operation and effectiveness are optimized with respect to each other.

c. Then the system under study can be compared to other systems (related or not) which have been analysed in the same way

4. The final product should be a system which will optimally fill a user's demands given his set of problems and his resources. Where necessary a system is altered to meet the individual user's demands. Technically this is not part of a cost/effective analysis but is a problem of systems design and implementation. The cost aspect, though, does place a constraint on a system the user can adopt and is essential to get optimal use from limited resources.

II. Systems Analysis: Cost/Effectiveness for TAXIR (studied from 8.23.68 thru 10.5.68)

A. Notes on preparing data for input and computer operations.

1. Please note:

a. The analysis which follows is drawn from observations of one system, TAXIR. That system has been tested on 27 curatorial characteristics of one data bank, the collection of herbarium sheets of the genus Manihot. To date only a portion (1990 specimens of 6000) of the entire bank has been used as input to the system.

b. The information which follows is interesting and if used correctly is instructive. It is not meant to be used as a basis of comparison of any other system with TAXIR, nor of any other data bank for use in any system including TAXIR. Information issued in the future will allow for these comparisons.

c. The procedures (which appear on the enclosed flow charts entitled "Preparation of Data for Input to TAXIR") were developed by Mr. S. G. Appan, Dr. David Rogers, and Mr. Henry Fleming, all of the Taximetrics Laboratory.

2. The flow charts are color coded red, red-magenta, green and blue.

a. The red lines

(1)represent the first major iteration. This procedure is repeated for each specimen (item) under consideration. Thus input data to TAXIR contains 1990 items.

(2) Information was abstracted from (i) the notations and physical specimen on the herbarium sheets, and (ii) file records consisting of 3 x 5" index cards previously prepared by Dr. Rogers. For all entries most information was taken from the specimens. (It is possible that other institutions might use their file records [such as catalog] for direct input.)

b. The red-magenta lines. If a specimen was though to be a TYPE, a literature search was done. This occurred in approximately 25% of all specimens studies.

c. The green lines

i. represent the second major iteration. This was repeated for each of the 26 descriptors for each specimen under study. (27 descriptors less the descriptor entitled "Type Designation" already processed.)

ii. The condition of the notations on the herbarium sheets (specimens) varied in quality. In 5% of all specimens the notations were poor (illegible, confused, incorrect, etc.) but in 95% of the specimens the notations were good to fair.

iii. The 'instantaneous recording process" used

(a) Data from 40% of the specimens were directly recorded on coding forms (FORTRAN 80-column). These were then sent to professional key-punch operators for the punching of cards.

(b) Data from 60% of the specimens were keypunched directly by Mr. Appan as he worked.

d. The blue lines represent procedures for

i. getting all data on punched cards
ii. having the card deck duplicated and stored for security reasons (in case of loss or destruction of the working deck.

3. Data verification and correction

a. These procedures are relatively straightforward. A good deal of research is being done on this section to develop a fast and efficient system. At present, most verification is done by the worker.

b. Checking the data back to the herbarium sheets was not done at this time.

c. All other procedures were carried out completely and very carefully. This is a must for effective use of the TAXIR system.

d. Once a clean bank is obtained it is recorded on tape (or disk) for computer input. A tickler file is used to assure that the tape is reprocessed every 3 months to insure against deterioration.

4. Computer operations

a. Accessioner

i. The cost of "building" Accessioner is incurred only initially, or each time that it is updated.

ii. After building Accessioner it is stored on tape (or disk) and can be queried when desired.

b. Book: once built Book is stored on tape and printed. Printing costs here indicate rates charged for an on-line, high speed printer. This is expensive, for the tape can be run to a slower speed printer at lower costs.

B. Cost Analysis

1. All figures are expressions of time in seconds except where indicated.

2. Rates

a. All worker input time was by a highly trained biologist (M.A. in Agronomy and two years toward a Ph.D. in Botany)

b. Key punching was done on an IBM 26.

c. All computer work was done on a CDC 6400 at the University of Colorado Computing Center. Standard operating rates applied. ($300/450 per hour CPU, $60/90 per hour PPU, where the first figure is for use of less than half of core storage, the second for half or greater core storage.)

3. Times: Data preparation for input

a. Red-magenta lines. Literature search for "Type Designation" 225 ± 180 sec.

b. Green line iteration

i. From file record and herbarium sheet
(a) Good notations 185 ± 15 sec.
(b) Poor notations 360 ± 60 sec.
ii. From file records only. 155 ± 15

c. i. Additional time required for worker to key punch directly 25 ± 10 sec.
ii. Approximate rate of professional key punching, in columns/minute, 143 ± 10 (the average item was expressed in 230 columns)

d. Red lines - all other than above 90 ± 30 sec.

e. To locate and correct data approximately 40,000 seconds were expended. About 5% of all specimens contained a mistake. Over-all data verification and correction cost 20 seconds/item in the entire data bank.

4. Times and money costs for computer operations

BOOK				ACCESSIONER			
	1990 Items, 7 Descriptors				1990 Items, 20 Descriptors		
	CPU [a]	PPU	Money Cost		CPU	PPU	Money Cost
Build	23.2	145.0		Build	147.4	113.5	
Sort	1.8	1.4		Store	0.5	2.3	$13.41
Store	0.5	2.3		Query [b]			
Print	18.1	13.0		Type I	0.2	0.1	$0.017
Subtotals	43.6	161.7	$9.49	Type II	0.6	0.4	$0.06
External charges [b]			$8.30				
		TOTAL	$17.79				
	Entire core				Accomplished in 1/2 core		

a. Here a sample query was run a number of times, and average times expended are reported. The query was more complex than the average would be.

b. Cost per lines printed and pages of paper consumed.

C. Effectiveness of TAXIR

1. TAXIR is a highly user oriented Information Retrieval system. The user must determine:

a. what specimens will come under analysis;

b. what characteristics (descriptors) will be used

c. the form in which the data is entered into the machine is up to the user - it can be in English, or any such "natural" language, it can be highly biologically (or chemically or mathematically, etc.) oriented; or it can be in any other code or contrived language. This is solely the user's option.

d. Any hardware input system can be used: cards, tapes, etc.

e. There is not fixed format prescribed. The user may determine his input format. (A fixed format is not precluded.)

2. The procedural flow chart for data preparation is opened to the user's needs. But a highly efficient system is suggested and has been developed.

3. The TAXIR language (for querying) is simple and very close to user oriented English.

4. Dependent on the user's needs the data, once entered, can be quickly and inexpensively and completely manipulated. Large quantities of usable information can be put out rapidly at relatively low cost.

a. Books can be prepared relatively inexpensively to serve as very well cross-indexed catalogs. Such books could be for in-house, and shared with other institutions and scientists. They enable a wider knowledge of what material is available where, for research.

b. The Accessioner can be used by the individual research scientist in his work, for analysis of material, or to facilitate getting the material necessary for research.

c. The administrator can make use of either Book or Accessioner to keep daily track of the institution's holdings.

5. In general the entire system has several advantages to the institution's administrator:

a. The system enables the use of other techniques which will assist the institution in making optimal use of its present resources, and plan and program the use of future resources.

b. Administrators can know expenses as they correspond to outputs; thus can keep tighter control of the various operations and work in progress.

c. Administrators as scientists can better plan expansion of research once they know what they have in their institutions, and the kinds of problems that can be handled by the system.

More on TAXIR will be available in the near future. If you have specific questions, please do not hesitate to submit them.

PARTICIPANTS - TAXIR DEMONSTRATION

Charles J. Austin	MEDLARS, Computing Center, Univ. of Colorado Medical Center
Arthur S. Boughey	Dept. of Population Biology, Univ. of California, Irvine
Kent Bridges	Dept. of Population Biology, Univ. of California, Irvine
William A. Briggs	College of Arts and Sciences, Univ. of Colorado
Richard Brown	Longwood Program, Univ. of Delaware
John Chronic	Department of Geology, Univ. of Colorado
Richard Cowan	Smithsonian Institution
Gilbert Daniels	Hunt Botanical Library, Pittsburgh
Thomas Galloway	Office of Scientific Information Services, NSF
Morris Garnsey	Dept. of Economics, Univ. of Colorado
Gary Godsey	U.S.Forest Service, Rocky Mt. Expt. Station, Colo. State Univ.
Clyde Goulding	Philadelphia Academy of Natural Science
Nelson Hairston	Zoology Museum, Univ. of Michigan
Mason Hale	U. S. National Museum
L. W. Hudson	USDA Plant Introduction Station, Washington State Univ.
Edwin James	USDA National Seed Storage Lab., Colorado State Univ.
Boyd T. Jones	Northwest Regional Manager, Control Data Corp.
Arnold Kluge	Zoology Museum, Univ. of Michigan
Jay Kopelman	Office of Research Services, Univ. of Colorado
E. Rex Krueger	Computing Center, Univ. of Colorado
Askell Löve	Dept. of Biology, Univ. of Colorado
Doris Löve	Dept. of Biology, Univ. of Colorado
Robert A. MacDonald	American Horticultural Society Plant Records Center
John Marr	Institute of Arctic and Alpine Research, Univ. of Colorado
Paul Maslin	University Museum, Univ. of Colorado
William Mayer	Biological Sciences Curriculum Study, Univ. of Colorado
James Peters	U. S. National Museum
Dan Piacesi	U. S. National Museum
Ray Pitsker	Computing Center, Univ. of Colorado
John Reeder	Rocky Mountain Herbarium, Univ. of Wyoming
Charlotte Reeder	University of Wyoming
Lou Ann Roberts	Computer Center, Texas Tech. College
Peter Robinson	University Museum, Univ. of Colorado
Hugo Rodeck	University Museum, Univ. of Colorado

Stanwyn Shetler	U. S. National Museum
William E. Walden	Computing Center, Washington State University
George Watson	U. S. National Museum
William A. Weber	University Museum, Univ. of Colorado
R. L. Williams	Director of Medical Systems Marketing, Control Data Corp.
Elizabeth Zipf	BioSciences Information Services of BioAbstracts

TAXIMETRICS LABORATORY

S. G. Appan	Graduate Student. Interested in classification of Manihot (Euphorbiaceae)
R. C. Brill	Computer Systems Analyst. Graduate student in botany.
H. M. Christensen	Associate Mathematician
G. F. Estabrook	Mathematician; mathematical models for biology
H. S. Fleming	Biological Systematist, coordinator
G. N. Hersh	Graduate Student in Econometrics and Systems Analysis
Genevra Metcalf	Secretary
D. J. Rogers	Project Leader, Taxonomist
J. W. Wong	Programmer, graduate student in computer science

PRINTED: 10/01/68

A SAMPLE BOOK OF A FEW MANIHOT SPECIMENS

BELOW IS A LIST OF THE DESCRIPTORS FOR THIS BOOK IN THEIR HIERARCHICAL ORDER.

COUNTRY OF COLLECTION
PROVINCE/STATE OF COLLECTION
HERBARIUM
MOST RECENT IDENTIFICATION
COLLECTOR
COLLECTOR NUMBER
HERBARIUM ACCESSION NUMBER
ITEM NO.

NUMBER OF ITEMS IN THIS BOOK = 47

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ID: SAMPLE BOOK RUN-1 OCT. 68

BOOK TITLE A SAMPLE BOOK OF A FEW MANIHOT SPECIMENS

BOOK MODULE: COUNTRY OF COLLECTION (16), PROVINCE/STATE OF COLLECTION (17),
HERBARIUM (19), MOST RECENT IDENTIFICATION (3), COLLECTOR (10),COLLECTOR NUMBER
(11),HERBARIUM ACCESSION NUMBER (20).

NO. OF DESCRIPTORS 27.

DEFINE ITEMS:
1, ,  ,M.PAUCIFLORA BRANDEGEE , ,NO , ,TYPE ,BRANDEGEE T.S. ,M.PAUCIFLOR
A T.S.BRANDEGEE ,PURPUS C.A. ,3418 ,1 ,1908 ,6 , ,MEXICO ,PUEBLA ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
UC ,1311175 ,2 ,4 ,1 ,2 ,2 ,1 ,NA.

2, ,  ,M.PAUCIFLORA BRANDEGEE , ,NO , ,TYPE ,BRANDEGEE T.S. ,M.PAUCIFLOR
A T.S.BRANDEGEE ,PURPUS C.A. ,3418 ,1 ,1908 ,6 , ,MEXICO ,PUEBLA ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
UC ,1378785 ,2 ,2 ,1 ,1 ,2 ,1 ,NA.

3, ,  ,M.PAUCIFLORA BRANDEGEE , ,NO , ,TYPE ,BRANDEGEE T.S. ,M.PAUCIFLOR
A T.S.BRANDEGEE ,PURPUS C.A. ,3418 ,1 ,1908 ,6 , ,MEXICO ,PUEBLA ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
NY ,NO ,2 ,2 ,1 ,1 ,1 ,1 ,NA.

4, ,  ,M.PAUCIFLORA BRANDEGEE , ,NO , ,TYPE ,BRANDEGEE T.S. ,M.PAUCIFLOR
A T.S.BRANDEGEE ,PURPUS C.A. ,3418 ,1 ,1908 ,6 , ,MEXICO ,PUEBLA ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
US ,1941146 ,2 ,2 ,1 ,1 ,1 ,1 ,NA.

5, ,  ,M.PAUCIFLORA BRANDEGEE , ,NO , ,TYPE ,BRANDEGEE T.S. ,M.PAUCIFLOR
A T.S.BRANDEGEE ,PURPUS C.A. ,3418 ,1 ,1908 ,6 , ,MEXICO ,PUEBLA ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
MO ,1771294 , 2 ,2 ,1 ,1 ,1 ,1 ,NA.

6, ,  ,M.PAUCIFLORA BRANDEGEE , ,NO , ,TYPE ,BRANDEGEE T.S. ,M.PAUCIFLOR
A T.S.BRANDEGEE ,PURPUS C.A. ,3418 ,1 ,1908 ,6 , ,MEXICO ,PUEBLA ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
F ,276352 ,2 ,2 ,1 ,1 ,1 ,1 ,NA.

7, , ,M.PAUCIFLORA BRANDEGEE ,NEWCOMB G.B. ,NO , ,SP ,NA ,NA ,KIMNACH M
. ET DORAN R. ,161 ,NO ,1959 ,11 ,17 ,MEXICO ,OAXACA ,4.8 MI. BEYOND TEO
TITLAN TO TECOMAVACA,UC ,M 184602 ,2 ,2 ,1 ,1 ,1 ,2 ,3350 FT. OR M.

8, , ,M.PAUCIFLORA BRANDG. , ,NO , ,SP PHOTO ,NA ,NA ,SMITH C.E. ,S.N.
 ,NO ,1962 ,8 , ,MEXICO ,PUEBLA ,VENTA SALADA/S OF TEHUACAN,NO ,NO ,0
 ,0 ,0 ,0 ,0 ,2 ,SPEC. NOT YET DEPOSITED .

9, , ,M.PAUCIFLORA BRANDG. , ,NO , ,SP ,NA ,NA ,CONZATTI C. ,4130 ,NO
 ,1901 ,5 ,25 ,MEXICO ,OAXACA ,CUESTA DE SAN BERNARDINA ,US ,1081208 ,2
 ,2 ,1 ,1 ,1 ,1 ,NA.

10, , ,M.PAUCIFLORA BRANDG. , ,NO , ,SP ,NA ,NA ,SMITH C.E. ET PETERSON
 F.A. ET TEJEDA N.,3563 ,13 ,1961 ,7 , ,MEXICO ,PUEBLA ,TEHUACAN AREA/NEA
R COXCATLAN ON CERRO AJUEREADO,F ,1556223 ,1 ,1 ,1 ,1 ,1 ,2 ,CA 1000-180
0 M. .

11, , ,M.PAUCIFLORA BRANDG. , ,NO , ,SP ,NA ,NA ,PURPUS C.A. ,5841 ,N
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ID: MANTHOT CURATORIAL DATA BANK - 30 SEPT. 68


ACCESSION MODULE:
USES (1, NAME, 3),
VERNACULAR NAME (2, NAME, 6),
MOST RECENT IDENTIFICATION (3, NAME, 9),
MOST RECENT IDENTIFIER (4, NAME, 7),
TYPE DESIGNATION (7,NAME,4),
AUTHOR (8,NAME,5),
COLLECTOR (10, NAME, 9),
DUPLICATE SPECIMENS (12, NAME, 9),
YEAR OF COLLECTION (13, BOTH, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760,
1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 17
74,1775,1776,1777,1778,1779,1780,1781,1782,1783,1784,1785,1786,1787,1788,1789,
1790,1791,1792,1793,1794,1795,1796,1797,1798,1799,1800,1801,1802,1803,1804,1805,
1806,1807,1808,1809,1810,1811,1812,1813,1814,1815,1816,1817,1818,1819,1820,1821,
1822,1823,1824,1825,1826,1827,1828,1829,1830,1831,1832,1833,1834,1835,1836,1837,
1838,1839,1840,1841,1842,1843,1844,1845,1846,1847,1848,1849,1850,1851,1852,1853,
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1870,1871,1872,1873,1874,1875,1876,1877,1878,1879,1880,1881,1882,1883,1884,1885,
1886,1887,1888,1889,1890,1891,1892,1893,1894,1895,1896,1897,1898,1899,1900,1901,
1902,1903,1904,1905,1906,1907,1908,1909,1910,1911,1912,1913,1914,1915,1916,1917,
1918,1919,1920,1921,1922,1923,1924,1925,1926,1927,1928,1929,1930,1931,1932,1933,
1934,1935,1936,1937,1938,1939,1940,1941,1942,1943,1944,1945,1946,1947,1948,1949,
1950,1951,1952,1953,1954,1955,1956,1957,1958,1959,1960,1961,1962,1963,1964,1965,
1966,1967,1968),
MONTH OF COLLECTION (14, CODE, JAN., FEB., MAR., APR., MAY, JUNE, JULY, AUG.,
SEPT., OCT., NOV., DEC., JAN.-FEB., FEB.-MAR., MAR.-APR., APR.-MAY, MAY-JUNE,
JUNE-JULY, JULY-AUG., AUG.-SEPT., SEPT.-OCT., OCT.-NOV., NOV.-DEC., DEC.-JAN., *
VARIABLE ),
DAY OF COLLECTION (15, CODE, 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,
21,22,23,24,25,26,27,28,29,30,31,VARIABLE),
COUNTRY OF COLLECTION (16, NAME, 4),
PROVINCE/STATE OF COLLECTION (17, NAME, 7),
HERBARIUM (19, NAME, 5),
CONDITION OF FLOWERS (21, CODE, ABSENT, PRESENT),
CONDITION OF FRUIT (22, CODE, ABSENT, IMMATURE, DAMAGED, MATURE),
CONDITION OF ROOTS (23, CODE, ABSENT, PRESENT),
MATURE SEEDS (24, CODE, ABSENT, PRESENT),
CONDITION OF SPECIMEN (25, CODE, POOR, FAIR, GOOD),
ADDITIONAL COMMENTS (26, CODE, ABSENT, PRESENT)*

NO. OF DESCRIPTORS 27*

READ INPUT FROM TAPE*

DEFINE ITEMS:
1, , ,M.PAUCIFLORA BRANDEGEE , ,NO , ,TYPE ,BRANDEGEE T.S. ,M.PAUCIFLOR
A T.S.BRANDEGEE ,PURPUS C.A. ,3418 ,1 ,1908 ,6 , ,MEXICO ,PUEBLA ,
VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA,
UC ,131175 ,2 ,4 ,1 ,2 ,2 ,1 ,NA*

2, , ,M.PAUCIFLORA BRANDEGEE , ,NO , ,TYPE ,BRANDEGEE T.S. ,M.PAUCIFLOR
A T.S.BRANDEGEE ,PURPUS C.A. ,3418 ,1 ,1908 ,6 , ,MEXICO ,PUEBLA ,
VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA,
UC ,1787A5 ,2 ,2 ,1 ,1 ,2 ,1 ,NA*

3, , ,M.PAUCIFLORA BRANDEGEE , ,NO , ,TYPE ,BRANDEGEE T.S. ,M.PAUCIFLOR
A T.S.BRANDEGEE ,PURPUS C.A. ,3418 ,1 ,1908 ,6 , ,MEXICO ,PUEBLA ,
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ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

PRINT CONTROL VOCABULARY*

1. OUTLINE OF MEDIAN LOBE
   OPTION=CODE NO. OF STATES= 8
   1. LINEAR
   2. TRUNCATE
   3. OVATE - OBLONG
   4. OVATE - OBLONG/PANDURATE
   5. PANDURATE: BASAL PORTION ROUNDED
   6. PANDURATE: BASAL PORTION PRODUCED WITH ROUNDED APEX
   7. PANDURATE: BASAL PORTION PRODUCED WITH POINTED APEX
   8. HASTATE/GLADIATE

2. LEAF VENATION
   OPTION=CODE NO. OF STATES= 2
   1. CAMPTODROMOUS
   2. CRASPEDODROMOUS

3. BASAL LOBULE APEX TERMINATION
   OPTION=CODE NO. OF STATES= 3
   1. SPINE
   2. NO SPINE
   3. NO BASAL LOBULE

4. SHAPE OF BASAL LOBULE APEX OF CRASPEDODROMOUS LEAVES
   OPTION=CODE NO. OF STATES= 3
   1. ACUMINATE
   2. CUSPIDATE/DILATED
   3. CAMPTODROMOUS LEAVES

6. NUMBER OF LOBES/COMPARATIVE SIZE
   OPTION=CODE NO. OF STATES= 7
   1. 3
   2. 3 + OCCASIONALLY 2 SMALLER
   3. 3 + 2 SMALLER
   4. 3 + 2 SLIGHTLY SMALLER
   5. 3 + 2 SMALLER + OFTEN 2 MINUTE
   6. 3 + 2 SLIGHTLY SMALLER + 2 SMALLER
   7. 5 - 9 OCCASIONALLY MORE

7. SIZE OF THE MEDIAN LOBE
   OPTION=CODE NO. OF STATES= 11
   1. LENGTH < 2.5 CM; WIDTH 1 - 2.5 CM
   2. LENGTH 2.5 - 5 CM; WIDTH 1 - 2.5 CM
   3. LENGTH 5 - 12 CM; WIDTH 1 - 2.5 CM
   4. LENGTH 5 - 12 CM; WIDTH 1 - 2.5 CM; DEEP INDENTATION
   5. LENGTH 5 - 12 CM; WIDTH > 2.5 CM
   6. LENGTH 5 - 12 CM; WIDTH > 2.5 CM; SHALLOW INDENTATION
   7. LENGTH 5 - 12 CM; WIDTH > 2.5 CM; DEEP INDENTATION
   8. LENGTH > 12 CM; WIDTH 1 - 2.5 CM
   9. LENGTH > 12 CM; WIDTH > 2.5 CM
   10. LENGTH > 12 CM; WIDTH 1 - 2.5 CM; INDENTATION
   11. LENGTH 5 - 12 CM; WIDTH < 1 CM

8. LOWEST LOBE SHAPE
   OPTION=CODE NO. OF STATES= 7
   1. SAME AS MEDIAN LOBE

CONTINUED ON NEXT PAGE

2. SLIGHTLY SMALLER THAN MEDIAN LOBE: NON-SYMMETRIC
3. ABOUT 1/2 AS LONG AS MEDIAN LOBE: APEX CUSPIDATE
4. ABOUT 1/4 AS LONG AS MEDIAN LOBE: APEX ATTENUATE
5. ABOUT 1/2 AS LONG AS MEDIAN LOBE: S - SHAPED
6. VARIABLE: USUALLY SAME AS MEDIAN LOBE
7. ABOUT 1/4 AS LONG AS MEDIAN LOBE: APEX ROUNDED

9. BASE OF LAMINA
OPTION=CODE NO. OF STATES= 5
1. NON-PELTATE
2. NON-PELTATE: RUDIMENTARY LOBES PRESENT
3. NARROWLY PELTATE: 0.2 - 0.5 CM
4. WIDELY PELTATE: > 0.5 CM
5. VERY NARROWLY PELTATE: < 0.2 CM

10. LAMINA AT BASE OF MEDIAN LOBE SINUS
OPTION=CODE NO. OF STATES= 4
1. LAMINA DISJUNCT: LEAF APPEARS COMPOUND
2. LAMINA CONNECTED: NARROW < 0.5 CM
3. LAMINA CONNECTED: VARIABLE NARROW - WIDE
4. LAMINA CONNECTED: WIDE > 0.5 CM

11. WIDTH OF MEDIAN LOBE BASE
OPTION=CODE NO. OF STATES= 4
1. ONLY MIDRIB WITH PRACTICALLY NO LAMINA
2. < 0.25 CM
3. VARIABLE: NARROW - WIDE
4. > 0.25 CM

12. SHAPE OF SINUS
OPTION=CODE NO. OF STATES= 8
1. FIG. 1
2. FIG. 2
3. FIG. 3
4. FIG. 4
5. FIG. 5
6. FIG. 6
7. FIG. 7
8. FIG. 8

13. SHAPE OF PRIMARY CONSTRICTION OF MEDIAN LOBE
OPTION=CODE NO. OF STATES= 7
1. MOSTLY LONG: INCISED
2. MOSTLY LONG: CLEFT
3. MOSTLY SHORT: OCCASIONALLY LONG/SINUATE
4. MOSTLY SHORT: OCCASIONALLY LONG/ENTIRE
5. SHORT
6. NO CONSTRICTION: OVATE - OBLONG/LINEAR/TRUNCATE
7. NO CONSTRICTION: HASTATE - GLADIATE

14. POSITION/SHAPE OF SECONDARY CONSTRICTIONS OF MEDIAN LOBE
OPTION=CODE NO. OF STATES= 10
1. WITHIN/BELOW THE PRIMARY CONSTRICTION USUALLY DEEP
2. WITHIN THE PRIMARY CONSTRICTION RARELY BELOW
3. RARELY PRESENT BUT WITHIN THE PRIMARY CONSTRICTION
4. NO SECONDARY CONSTRICTION: PANDURATE
5. NO SECONDARY CONSTRICTION: OVATE - OBLONG/LINEAR/TRUNCATE

CONTINUED ON NEXT PAGE

6. ONE CONSTRICTION ONLY BELOW THE BASAL LOBULE
7. SEVERAL SHALLOW CONSTRICTIONS ABOVE THE BASAL LOBULE
8. NO CONSTRICTION: GLADIATE
9. NO SECONDARY CONSTRICTION: HASTATE
10. A VERY SHALLOW CONSTRICTION NEAR APEX

15. SHAPE OF MEDIAN LOBE APEX
OPTION=CODE NO. OF STATES= 15
1. FIG. 1
2. FIG. 2
3. FIG. 3
4. FIG. 4
5. FIG. 5
6. FIG. 6
7. FIG. 7
8. FIG. 8
9. FIG. 9
10. FIG. 10
11. FIG. 11
12. FIG. 12
13. FIG. 13
14. FIG. 14
15. FIG. 15

16. ABAXIAL SURFACE WAX PATTERN OF LEAF
OPTION=CODE NO. OF STATES= 3
1. SMOOTH
2. STUBBY
3. FARINOSE

17. PETIOLE LENGTH
OPTION=CODE NO. OF STATES= 3
1. SHORT < 5 CM
2. MEDIUM 5 - 15 CM
3. LONG > 15 CM

18. ARRANGEMENT OF LEAVES
OPTION=CODE NO. OF STATES= 2
1. VERY CLOSE ROSETTE-LIKE
2. WIDER SPACED

19. PLANT GROWTH HABIT
OPTION=CODE NO. OF STATES= 11
1. VINE
2. DECUMBENT SHRUB
3. SPINDLING SHRUB
4. ERECT SMALL SHRUB
5. ERECT TALL SHRUB - ERECT LOW TREE
6. LOW SPREADING TREE - SPREADING SHRUB
7. CROOKEDLY BRANCHING LOW TREE
8. TALL WOODY TREE
9. ERECT SHRUB OF VARIABLE HEIGHT
10. WEAK STEMMED TRAILING SHRUB
11. ERECT WOODY SHRUB

20. INFLORESCENCE
OPTION=CODE NO. OF STATES= 7

CONTINUED ON NEXT PAGE

1. SOLITARY FLOWER: RARELY 2
2. RACEME: SUBSPICATE/CORYMBOSE
3. RACEME: SUBSPICATE
4. RACEME: VARIABLE OF LESS THAN MEDIUM LENGTH
5. PANICLE: MEDIUM SIZE
6. PANICLE: LONG WITH MUCH BRANCHING
7. RACEME: LONG

21. POSITION OF FEMALE FLOWERS IN THE INFLORESCENCE
OPTION=CODE NO. OF STATES= 4
1. DIVERSE
2. ONLY ABOVE THE LOWER HALF OF RACHIS ON LONG PEDICELS
3. ONLY AT THE BASE OF INFLORESCENCE
4. FLOWER SOLITARY

22. OPEN FLOWER REFLEXION
OPTION=CODE NO. OF STATES= 2
1. REFLEXED
2. STRAIGHT

23. NATURE OF BRACTEOLES
OPTION=CODE NO. OF STATES= 4
1. FOLIACEOUS
2. NON-FOLIACEOUS
3. NO BRACTEOLE: FLOWER SOLITARY
4. SEMI-FOLIACEOUS

24. COLOR OF BRACTEOLE IN HERBARIUM MATERIAL
OPTION=CODE NO. OF STATES= 3
1. PURPLISH
2. GREENISH WHITE
3. NO BRACTEOLE

25. NATURE OF BRACTLETS
OPTION=CODE NO. OF STATES= 3
1. FOLIACEOUS
2. NON-FOLIACEOUS
3. ABSENT

26. COLOR OF MATURE FLOWER TEPAL
OPTION=CODE NO. OF STATES= 2
1. GREENISH YELLOW
2. PURPLISH STREAKED

27. SHAPE OF MATURE MALE BUD
OPTION=CODE NO. OF STATES= 6
1. LONG ALMOST TUBULAR
2. ALMOST TUBULAR WITH A TENDENCY TOWARD INFLATION AT THE BOTTOM
3. DISTINCTLY CONSTRICTED IN THE MIDDLE/INFLATED AT THE BOTTOM
4. CONE SHAPED
5. CAMPANULATE
6. AURICULATE

28. LENGTH OF MALE TEPAL
OPTION=CODE NO. OF STATES= 2
1. > 2 CM
2. < 2 CM

CONTINUED ON NEXT PAGE

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29. POSITION OF FRUITS IN THE FRUIT CLUSTER
OPTION=CODE NO. OF STATES= 4
1. BASAL
2. ABOVE THE LOWER HALF OF THE RACHIS
3. BASE UPTO APEX OF INFLORESCENCE
4. SINGLE FRUIT CONNECTED WITH THE STEM DIRECTLY

30. COLOR OF FLOWER BUDS
OPTION=CODE NO. OF STATES= 2
1. GREENISH YELLOW
2. PURPLISH

31. SIZE OF MATURE FRUIT
OPTION=CODE NO. OF STATES= 5
1. SMALL: HEIGHT < 1.25 CM
2. MEDIUM: HEIGHT 1.25 - 1.75 CM
3. LARGE: HEIGHT 1.75 - 2.5 CM
4. VERY LARGE: HEIGHT > 2.5 CM
5. VARIABLE: 1.25 - 2.5 CM

32. FRUIT SURFACE
OPTION=CODE NO. OF STATES= 3
1. WITHOUT RIBS
2. PERCEPTIBLY RIBBED
3. PROMINENTLY RIBBED

33. FRUIT APEX
OPTION=CODE NO. OF STATES= 3
1. WITHOUT POINT
2. SLIGHTLY POINTED
3. PROMINETLY POINTED

34. SEED SIZE/SHAPE
OPTION=CODE NO. OF STATES= 7
1. SMALL ROUND: < 1 CM
2. SMALL OBLONG: < 1 CM
3. MEDIUM ROUND: 1 - 1.5 CM
4. MEDIUM OBLONG: 1 - 1.5 CM
5. LARGE ROUND: 1.5 - 2 CM
6. LARGE OBLONG: 1.5 - 2 CM
7. VERY LARGE: > 2 CM

35. PUBESCENCE OF YOUNG STEM
OPTION=CODE NO. OF STATES= 3
1. PUBESCENT
2. SPARSELY PUBESCENT
3. GLABROUS

36. PUBESCENCE OF MATURE STEM
OPTION=CODE NO. OF STATES= 3
1. PUBESCENT
2. SPARSELY PUBESCENT
3. GLABROUS

37. TEPAL PUBESCENCE
OPTION=CODE NO. OF STATES= 3

CONTINUED ON NEXT PAGE

1. PUBESCENT
2. GLABROUS
3. SPARSELY PUBESCENT

38. PUBESCENCE OF BRACTLETS
OPTION=CODE NO. OF STATES= 3
1. PUBESCENT
2. GLABROUS
3. SPARSELY PUBESCENT

39. ROOT
OPTION=CODE NO. OF STATES= 2
1. TUBEROUS
2. NON-TUBEROUS

40. COLOR OF MATURE STEM
OPTION=CODE NO. OF STATES= 5
1. REDDISH BROWN
2. DARK REDDISH BROWN
3. BROWNISH GREY
4. GREENISH BROWN
5. SILVERY GREY

41. POSITION OF BRACTLETS IN THE PEDICEL
OPTION=CODE NO. OF STATES= 5
1. AT HALFWAY
2. NEAR THE BASE
3. ONE NEAR BASE; ONE AT HALFWAY
4. NEAR TOP
5. NO CONSISTENT PATTERN

42. BRACTEOLE MARGIN
OPTION=CODE NO. OF STATES= 3
1. SMOOTH
2. SERRATE
3. NO BRACTEOLE

43. PUBESCENCE OF OVARY
OPTION=CODE NO. OF STATES= 2
1. PUBESCENT
2. GLABROUS

44. PUBESCENCE OF PEDICEL
OPTION=CODE NO. OF STATES= 2
1. PUBESCENT
2. GLABROUS

48. ROGERS ET APPAN IDENTIFICATION
OPTION=CODE NO. OF STATES= 21
1. M.PAUCIFLORA T.S.BRANDEGEE
2. M.WALKERAE CROIZAT
3. M.MICROCARPA MUELL.ARG.
4. M.MICROCARPA SSP. PARVICOCCA STAT.NOV.
5. M.MEXICANA I.M.JOHNSTON
6. M.ANGUSTILOBA [TORR.] MUELL.ARG.
7. NEW TAMAULIPAS SPECIES
8. M.CHLOROSTICTA SANDLEY ET GOLDMAN

CONTINUED ON NEXT PAGE

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9. NEW OAXACA SPECIES
10. M.LUDIBUNDA CROIZAT
11. M.DAVISIAE CROIZAT
12. M.AESCULIFOLIA [H.B.K.] POHL
13. M.AESCULIFOLIA SSP. INTERMEDIA STAT.NOV.
14. M.ESCULENTA CRANTZ
15. M.AURICULATA MCVAUGH
16. M.ISOLOBA STANDLEY
17. M.CAUDATA GREENMAN
18. M.MICHAELIS MCVAUGH
19. M.FOETIDA [H.B.K.] POHL
20. M.PRINGLEI WATSON
21. M.TOMATOPHYLLA STANDLEY

These are sample queries as posed in the TAXIR language and responded to by the TAXIR Accessioner:

The first requests the types from Mexico. It is a Query 1.

The second requests the Palmer E. collections. It is a Query 2 and further requests information on geography and date.

The third is to discover the quality of the collections from herbarium ARIZ.

The fourth query is one which might be posed in preparation for a field trip to the Sonoran Desert region of Mexico.

The next queries are posed to a new data bank of the morphology of the Central American species. These queries illustrate how the TAXIR Accessioner may be used as a simultaneous key.

The fifth query attempts to identify the unknown M. tomatophylla Standley. The description here made was rich enough to eliminate all but three species.

The sixth query uses the "Result" feature of the TAXIR Accessioner to include another criterion in the description. This was sufficient to make the determination unique.

In the seventh query our unknown specimen consisted of nothing more than a single seed. A simultaneous key, such as the TAXIR Accessioner, allows us a best possible guess.

The eighth, ninth and tenth queries show the simultaneous key identification of the unknown M. isoloba Standley. These show how the Result feature of the TAXIR Accessioner may be iterated as often as is needed.

QUERY LIST ITEMS WITH COUNTRY OF COLLECTION,
MEXICO AND NOT TYPE DESIGNATION,SP*

RESPONSE:

6	2	8	4	3	1	60	5	69	165
209	211	210	208	354	330	358	356	355	331
359	351	367	357	491	435	431	502	487	437
433	489	436	432	488	455	438	434	490	683
750	746	786	744	685	784	748	772	788	743
684	751	747	771	787	678	745	785	682	749
794	826	822	830	796	828	824	795	827	823
831	789	797	829	793	825				

NO. OF ITEMS IN QUERY RESPONSE = 76

QUERY - GIVE INFORMATION ON: COUNTRY OF COLLECTION, PROVINCE/STATE OF COLLECTION, AND YEAR OF COLLECTION FOR COLLECTIONS WHICH HAVE COLLECTOR, PALMER E.*

(2)

RESPONSE:

ITEM NO.	REQUESTED STATES
49	MEXICO, JALISCO, 1886
53	MEXICO, JALISCO, 1886
51	MEXICO, JALISCO, 1886
55	MEXICO, JALISCO, 1886
50	MEXICO, JALISCO, 1886
54	MEXICO, JALISCO, 1886
52	MEXICO, JALISCO, 1886
56	MEXICO, JALISCO, 1886
137	MEXICO, SONORA, 1887
135	MEXICO, SONORA, 1887
134	MEXICO, SONORA, 1887
136	MEXICO, SONORA, 1887
225	MEXICO, SINALOA, 1897
223	MEXICO, SINALOA, 1897
224	MEXICO, SINALOA, 1897
342	MEXICO, COLIMA, 1890
334	MEXICO, COLIMA, 1890
332	MEXICO, COLIMA, 1890
344	MEXICO, GUERRERO, UNKNOWN
343	MEXICO, GUERRERO, UNKNOWN
333	MEXICO, COLIMA, 1890
438	MEXICO, CHIHUAHUA, 1885
683	MEXICO, SINALOA, 1891
786	MEXICO, DURANGO, 1896
685	MEXICO, SINALOA, 1891

2, Cont.

784 MEXICO, DURANGO, 1896

788 MEXICO, DURANGO, 1896

684 MEXICO, SINALOA, 1891

787 MEXICO, DURANGO, 1896

785 MEXICO, DURANGO, 1896

682 MEXICO, SINALOA, 1891

842 MEXICO, TAMAULIPAS, 1907

838 MEXICO, TAMAULIPAS, 1907

840 MEXICO, TAMAULIPAS, 1907

843 MEXICO, TAMAULIPAS, 1907

839 MEXICO, TAMAULIPAS, 1907

789 MEXICO, DURANGO, 1896

837 MEXICO, TAMAULIPAS, 1907

841 MEXICO, TAMAULIPAS, 1907

NO. OF ITEMS IN QUERY RESPONSE = 39

QUERY PROVIDE INFORMATION ON: CONDITION OF FLOWERS, CONDITION OF FRUIT, CONDITION OF ROOTS, MATURE SEEDS, AND CONDITION OF SPECIMEN FOR SPECIMENS WITH HERBARIUM, ARIZ.

(3)

RESPONSE:

ITEM NO.	REQUESTED STATES
37	PRESENT, ABSENT, ABSENT, ABSENT, FAIR
97	PRESENT, MATURE, ABSENT, UNKNOWN, FAIR
113	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
95	PRESENT, ABSENT, ABSENT, ABSENT, FAIR
79	ABSENT, MATURE, ABSENT, UNKNOWN, POOR
94	ABSENT, MATURE, ABSENT, UNKNOWN, FAIR
118	ABSENT, MATURE, ABSENT, PRESENT, FAIR
114	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
106	ABSENT, MATURE, ABSENT, PRESENT, FAIR
112	ABSENT, ABSENT, ABSENT, ABSENT, POOR
104	ABSENT, MATURE, ABSENT, PRESENT, FAIR
120	ABSENT, MATURE, ABSENT, PRESENT, FAIR
125	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
155	PRESENT, ABSENT, ABSENT, ABSENT, POOR
127	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
130	PRESENT, ABSENT, ABSENT, ABSENT, POOR
126	ABSENT, ABSENT, ABSENT, ABSENT, POOR
142	PRESENT, IMMATURE, PRESENT, ABSENT, FAIR
128	ABSENT, MATURE, ABSENT, PRESENT, FAIR
225	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
243	PRESENT, ABSENT, ABSENT, ABSENT, POOR
295	PRESENT, IMMATURE, ABSENT, ABSENT, POOR
297	ABSENT, ABSENT, ABSENT, ABSENT, POOR
293	PRESENT, ABSENT, ABSENT, ABSENT, POOR
304	ABSENT, MATURE, ABSENT, PRESENT, FAIR

3, Cont.

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        284   PRESENT, ABSENT, ABSENT, ABSENT, FAIR
        292   PRESENT, ABSENT, ABSENT, ABSENT, POOR
        308   ABSENT, ABSENT, ABSENT, ABSENT, POOR
        286   ABSENT, IMMATURE, ABSENT, ABSENT, POOR
        313   ABSENT, MATURE, ABSENT, UNKNOWN, POOR
        477   PRESENT, MATURE, ABSENT, UNKNOWN, FAIR
        760   ABSENT, MATURE, ABSENT, PRESENT, POOR
        748   PRESENT, ABSENT, ABSENT, ABSENT, POOR
        747   PRESENT, ABSENT, ABSENT, ABSENT, FAIR
        820   PRESENT, ABSENT, ABSENT, ABSENT, FAIR
        807   ABSENT, MATURE, ABSENT, PRESENT, FAIR
        815   PRESENT, ABSENT, ABSENT, ABSENT, FAIR
        797   ABSENT, MATURE, ABSENT, PRESENT, FAIR
        801   ABSENT, ABSENT, ABSENT, ABSENT, POOR
NO. OF ITEMS IN QUERY RESPONSE =   39
READ INPUT FROM CARDS*
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QUERY STATE: MONTH OF COLLECTION, DAY OF COLLECTION, PROVINCE/STATE OF COLLECTION, CONDITION OF FLOWERS, AND CONDITION OF FRUIT FOR COLLECTIONS WITH PROVINCE/STATE OF COLLECTION, CHIHUAHUA OR DURANGO OR SINALOA OR SONORA*

RESPONSE:

(4)

ITEM NO.	REQUESTED STATES
101	AUG., 10, CHIHUAHUA, ABSENT, ABSENT
85	JUNE, 30, CHIHUAHUA, PRESENT, ABSENT
97	AUG., 10, CHIHUAHUA, PRESENT, MATURE
89	UNKNOWN, UNKNOWN, SONORA, PRESENT, ABSENT
95	SEPT., 2, SONORA, PRESENT, ABSENT
103	JULY, 12, SINALOA, PRESENT, ABSENT
87	UNKNOWN, UNKNOWN, SONORA, ABSENT, ABSENT
99	AUG., 10, CHIHUAHUA, ABSENT, IMMATURE
91	SEPT., 13, SONORA, ABSENT, ABSENT
94	SEPT., 2, SONORA, ABSENT, MATURE
102	AUG., 10, CHIHUAHUA, PRESENT, MATURE
86	JUNE, 30, CHIHUAHUA, PRESENT, ABSENT
98	AUG., 10, CHIHUAHUA, PRESENT, MATURE
90	JULY, 25, SONORA, PRESENT, ABSENT
96	SEPT., 2, SONORA, ABSENT, MATURE
88	SEPT., 9, SONORA, ABSENT, ABSENT
100	AUG., 10, CHIHUAHUA, PRESENT, MATURE
137	UNKNOWN, UNKNOWN, SONORA, ABSENT, MATURE
133	SEPT., 12, SONORA, ABSENT, ABSENT
131	SEPT., 12, SONORA, ABSENT, MATURE
135	UNKNOWN, UNKNOWN, SONORA, ABSENT, ABSENT
146	UNKNOWN, UNKNOWN, SONORA, PRESENT, ABSENT
134	UNKNOWN, UNKNOWN, SONORA, ABSENT, MATURE
132	SEPT., 12, SONORA, ABSENT, MATURE
128	OCT., 5, SINALOA, ABSENT, MATURE

4, Cont.

136 UNKNOWN, UNKNOWN, SONORA, ABSENT, ABSENT
225 SEPT., VARIABLE, SINALOA, PRESENT, IMMATURE
223 SEPT., VARIABLE, SINALOA, PRESENT, ABSENT
235 UNKNOWN, UNKNOWN, SINALOA, ABSENT, MATURE
224 SEPT., VARIABLE, SINALOA, PRESENT, IMMATURE
303 SEPT., 1, SONORA, ABSENT, MATURE
245 AUG., UNKNOWN, SINALOA, PRESENT, ABSENT
299 SEPT., 1, SONORA, ABSENT, MATURE
307 SEPT., 25, SINALOA, ABSENT, MATURE
305 AUG., 17, SINALOA, ABSENT, MATURE
301 SEPT., 1, SONORA, ABSENT, MATURE
293 JULY, 17, SONORA, PRESENT, ABSENT
309 NOV., 23, SINALOA, ABSENT, MATURE
304 SEPT., 1, SONORA, ABSENT, MATURE
246 JULY, 28, SINALOA, PRESENT, IMMATURE
262 JULY, 10, SINALOA, PRESENT, ABSENT
300 SEPT., 1, SONORA, ABSENT, MATURE
308 AUG., 25, CHIHUAHUA, ABSENT, ABSENT
244 AUG., UNKNOWN, SINALOA, PRESENT, ABSENT
306 AUG., 17, SINALOA, ABSENT, IMMATURE
302 SEPT., 1, SONORA, ABSENT, MATURE
294 JULY, 17, SONORA, PRESENT, ABSENT
346 SEPT., 21, SINALOA, ABSENT, IMMATURE
311 NOV., 23, SINALOA, ABSENT, MATURE
350 SEPT., 21, SINALOA, ABSENT, IMMATURE
348 SEPT., 21, SINALOA, ABSENT, MATURE
313 NOV., 23, SINALOA, ABSENT, MATURE
360 UNKNOWN, UNKNOWN, SINALOA, PRESENT, ABSENT
347 SEPT., 21, SINALOA, ABSENT, MATURE

312 NOV.. 23, SINALOA, ABSENT, MATURE

310 NOV.. 23, SINALOA, ABSENT, MATURE

4, Cont.

349 SEPT.. 21, SINALOA, ABSENT, ABSENT

314 SEPT.. 21, SINALOA, ABSENT, MATURE

345 SEPT.. 22, SONORA, ABSENT, MATURE

438 UNKNOWN, UNKNOWN, CHIHUAHUA, ABSENT, MATURE

675 AUG.. 22, SINALOA, PRESENT, ABSENT

677 AUG.. 22, SINALOA, PRESENT, MATURE

676 AUG.. 22, SINALOA, PRESENT, ABSENT

674 AUG.. 22, SINALOA, PRESENT, IMMATURE

735 JULY, 11, SINALOA, PRESENT, ABSENT

774 AUG.. 6, CHIHUAHUA, ABSENT, ABSENT

683 UNKNOWN, VARIABLE, SINALOA, PRESENT, MATURE

782 SEPT.. 5, CHIHUAHUA, ABSENT, MATURE

679 JULY, 12, SINALOA, PRESENT, ABSENT

778 AUG.. 6, CHIHUAHUA, PRESENT, MATURE

786 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

776 AUG.. 6, CHIHUAHUA, PRESENT, ABSENT

685 UNKNOWN, VARIABLE, SINALOA, PRESENT, ABSENT

784 UNKNOWN, UNKNOWN, DURANGO, PRESENT, ABSENT

681 AUG.. 30, SINALOA, ABSENT, MATURE

780 SEPT.. 5, CHIHUAHUA, ABSENT, MATURE

788 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

775 AUG.. 6, CHIHUAHUA, PRESENT, ABSENT

684 UNKNOWN, VARIABLE, SINALOA, ABSENT, ABSENT

783 OCT.. 29, CHIHUAHUA, ABSENT, MATURE

680 AUG.. 30, SINALOA, ABSENT, MATURE

779 SEPT.. 5, CHIHUAHUA, ABSENT, MATURE

787 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

678 JULY, VARIABLE, SINALOA, PRESENT, ABSENT

777 AUG., 6, CHIHUAHUA, PRESENT, ABSENT

(4, Cont.)

785 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

682 UNKNOWN, VARIABLE, SINALOA, PRESENT, ABSENT

781 SEPT., 5, CHIHUAHUA, ABSENT, MATURE

730 JULY, 10, SINALOA, ABSENT, ABSENT

773 AUG., 6, CHIHUAHUA, ABSENT, ABSENT

818 JULY, 6, SONORA, PRESENT, ABSENT

802 SEPT., 6, SONORA, ABSENT, MATURE

794 AUG., 10, CHIHUAHUA, ABSENT, MATURE

810 JULY, 7, SONORA, PRESENT, MATURE

790 SEPT., 24, CHIHUAHUA, ABSENT, MATURE

806 OCT., 14, SINALOA, ABSENT, MATURE

798 SEPT., VARIABLE, SONORA, ABSENT, MATURE

814 JULY, 30, SONORA, PRESENT, IMMATURE

820 JULY, 6, SONORA, PRESENT, ABSENT

804 OCT., 14, SINALOA, ABSENT, MATURE

796 AUG., 10, SONORA, ABSENT, MATURE

812 JULY, 7, SONORA, PRESENT, IMMATURE

792 AUG., 23, CHIHUAHUA, PRESENT, MATURE

808 OCT., 7, SONORA, ABSENT, ABSENT

800 SEPT., 23, SONORA, ABSENT, ABSENT

816 JULY, 6, SONORA, PRESENT, ABSENT

819 JULY, 6, SONORA, PRESENT, ABSENT

803 OCT., 14, SINALOA, ABSENT, MATURE

795 AUG., 10, CHIHUAHUA, ABSENT, MATURE

811 JULY, 7, SONORA, PRESENT, ABSENT

791 SEPT., 24, CHIHUAHUA, ABSENT, MATURE

807 OCT., 14, SINALOA, ABSENT, MATURE

4, Cont.

799 SEPT., VARIABLE, SONORA, ABSENT, MATURE

815 JULY, 31, SONORA, PRESENT, ABSENT

789 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

821 NOV., 1, SINALOA, ABSENT, MATURE

805 OCT., 14, SINALOA, ABSENT, MATURE

797 AUG., 10, SONORA, ABSENT, MATURE

813 AUG., VARIABLE, SONORA, ABSENT, MATURE

793 AUG., 10, CHIHUAHUA, ABSENT, MATURE

809 OCT., 7, SONORA, ABSENT, ABSENT

801 SEPT., 23, SONORA, ABSENT, ABSENT

817 JULY, 6, SONORA, PRESENT, ABSENT

900 SEPT., 4, CHIHUAHUA, ABSENT, MATURE

NO. OF ITEMS IN QUERY RESPONSE = 124

MEMO: I WOULD LIKE TO PLAN A FIELD TRIP TO THE SONORAN DESERT.

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

KEY TO ROGERS ET APPAN IDENTIFICATION:
LEAF VENATION, CAMPTODROMOUS AND
BASE OF LAMINA, NARROWLY PELTATE: 0.2 - 0.5 CM.

(5)

RESPONSE:

ITEM NO.	REQUESTED STATES
22	M.MICHAELIS MCVAUGH
14	M.TOMATOPHYLLA STANDLEY
11	M.CAUDATA GREENMAN
104	M.MICHAELIS MCVAUGH
13	M.CAUDATA GREENMAN
506	M.CAUDATA GREENMAN
508	M.TOMATOPHYLLA STANDLEY
507	M.MICHAELIS MCVAUGH

NO. OF ITEMS IN QUERY RESPONSE = 8

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

KEY TO ROGERS ET APPAN IDENTIFICATION:
RESULT AND OUTLINE OF MEDIAN LOBE,
PANDURATE: BASAL PORTION ROUNDED.

(6)

RESPONSE:

ITEM NO.	REQUESTED STATES
14	M.TOMATOPHYLLA STANDLEY
508	M.TOMATOPHYLLA STANDLEY

NO. OF ITEMS IN QUERY RESPONSE = 2

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

KEY TO ROGERS ET APPAN IDENTIFICATION:
SEED SIZE/SHAPE, VERY LARGE: > 2 CM.

(7)

RESPONSE:

ITEM NO.	REQUESTED STATES
501	M.FOETIDA [H.B.K.] POHL

NO. OF ITEMS IN QUERY RESPONSE = 1

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

(8)

KEY TO ROGERS ET APPAN IDENTIFICATION:
LEAF VENATION, CAMPTODROMOUS AND BASE OF LAMINA,
NON-PELTATE.

RESPONSE:

ITEM NO.	REQUESTED STATES
63	M.AESCULIFOLIA [H.B.K.] POHL
50	M.PRINGLEI WATSON
177	M.AESCULIFOLIA [H.B.K.] POHL
60	M.CHLOROSTICTA STANDLEY ET GOLDMAN
7	M.PAUCIFLORA T.S.BRANDEGEE
71	M.AESCULIFOLIA [H.B.K.] POHL
103	NEW OAXACA SPECIES
381	M.ESCULENTA CRANTZ
45	M.ISOLOBA STANDLEY
36	M.LUDIBUNDA CROIZAT
248	M.CHLOROSTICTA STANDLEY ET GOLDMAN
171	M.AESCULIFOLIA [H.B.K.] POHL
39	M.ISOLOBA STANDLEY
201	M.AESCULIFOLIA SSP. INTERMEDIA STAT.NOV.
218	M.CHLOROSTICTA STANDLEY ET GOLDMAN
79	M.AESCULIFOLIA [H.B.K.] POHL
33	M.CHLOROSTICTA STANDLEY ET GOLDMAN
383	M.ESCULENTA CRANTZ
150	M.AESCULIFOLIA [H.B.K.] POHL
512	M.AESCULIFOLIA [H.B.K.] POHL
74	M.AESCULIFOLIA [H.B.K.] POHL
52	M.PRINGLEI WATSON
183	M.AESCULIFOLIA [H.B.K.] POHL
61	M.CHLOROSTICTA STANDLEY ET GOLDMAN
8	M.PAUCIFLORA T.S.BRANDEGEE

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

(8, Cont)

78	M.AESCULIFOLIA [H.B.K.] POHL
19	M.CHLOROSTICTA STANDLEY ET GOLDMAN
389	M.ESCULENTA CRANTZ
49	M.ISOLOBA STANDLEY
35	M.LUDIBUNDA CROIZAT
27	M.DAVISIAE CROIZAT
513	M.LUDIBUNDA CROIZAT
5	M.FOETIDA [H.B.K.] POHL
77	M.AESCULIFOLIA [H.B.K.] POHL
58	NEW OAXACA SPECIES
43	M.ISOLOBA STANDLEY
268	M.AESCULIFOLIA [H.B.K.] POHL
245	M.CHLOROSTICTA STANDLEY ET GOLDMAN
86	M.AESCULIFOLIA [H.B.K.] POHL
57	M.CHLOROSTICTA STANDLEY ET GOLDMAN
519	M.ESCULENTA CRANTZ
153	M.AESCULIFOLIA [H.B.K.] POHL
510	M.CHLOROSTICTA STANDLEY ET GOLDMAN
502	M.PAUCIFLORA T.S.BRANDEGEE
504	M.PRINGLEI WATSON
359	M.AURICULATA MCVAUGH
505	M.ISOLOBA STANDLEY
509	NEW OAXACA SPECIES
501	M.FOETIDA [H.B.K.] POHL
511	M.DAVISIAE CROIZAT

NO. OF ITEMS IN QUERY RESPONSE = 50

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ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

KEY TO ROGERS ET APPAN IDENTIFICATION:
OUTLINE OF MEDIAN LOBE, LINEAR AND RESULT.

RESPONSE:
  ITEM NO.    REQUESTED STATES
        45    M.ISOLOBA STANDLEY
        39    M.ISOLOBA STANDLEY
       382    M.ESCULENTA CRANTZ
        49    M.ISOLOBA STANDLEY
        43    M.ISOLOBA STANDLEY
       505    M.ISOLOBA STANDLEY
NO. OF ITEMS IN QUERY RESPONSE =     6
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(9)

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ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

KEY TO ROGERS ET APPAN IDENTIFICATION:
SHAPE OF MEDIAN LOBE APEX, FIG. 8 AND RESULT.

RESPONSE:
  ITEM NO.    REQUESTED STATES
        45    M.ISOLOBA STANDLEY
        39    M.ISOLOBA STANDLEY
        49    M.ISOLOBA STANDLEY
        43    M.ISOLOBA STANDLEY
       505    M.ISOLOBA STANDLEY
NO. OF ITEMS IN QUERY RESPONSE =     5

READ INPUT FROM CARDS

END
ELAPSED TIME IN SECONDS SINCE LAST TIME STATEMENT
CENTRAL PROCESSOR:   11.570     PERIPHERAL PROCESSOR: 1406.429
```

(10)

A SAMPLE BOOK OF A FEW MANIHOT SPECIMENS

BELOW IS A LIST OF THE DESCRIPTORS FOR THIS BOOK IN THEIR HIERERCHICAL ORDER.

COUNTRY OF COLLECTION
PROVINCE/STATE OF COLLECTION
HERBARIUM
MOST RECENT IDENTIFICATION
COLLECTOR
COLLECTOR NUMBER
HERBARIUM ACCESSION NUMBER
ITEM NO.

NUMBER OF ITEMS IN THIS BOOK = 47

MEXICO

COAHUILA

F

M.ANGUSTILOBA [TORR.] MUELL.ARG.
MARSH E.G.
1163
1224398
47

TEX

M.ANGUSTILOBA [TORR.] MUELL.ARG.
MARSH E.G.
1163
TLLEG.
48

HIDALGO

GH

M.CARTHAGINENSIS [JACQ.] MUELL.ARG.
WALKER E.J.
1003
NO
21

JALISCO

GH

M.MEXICANA
PALMER E.
156
NO
49

NY

M.MEXICANA
PALMER E.
156
NO
50

NUEVO LEON

F

M.ANGUSTILOBA [TORR.] MUELL.ARG.
EDWARDS M.T.
411
902956
45

PERKINS A.E. ET HALL J.M.
3565
1511454
39

MO

M.MEXICANA JOHNST.
GREGG J.
198
1771295
32

TEX

M.ANGUSTILOBA [TORR.] MUELL.ARG.
EDWARDS M.T.
411
1181948
46

RH369
44

MEXICO

NUEVO LEON

TEX

M.WALKERAE CHUTZAT
CRUTCHFIELD J. ET JOHNSTON M.C.
5466 A
180147
41

OAXACA

UC

M.PAUCIFLORA BRANDEGEE
KIMNACH M. ET MORAN R.
161
M 184202
7

US

M.PAUCIFLORA BRANDG.
CONZATTI C.
4130
1081208
9

PUEBLA

F

M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
276352
6

M.PAUCIFLORA BRANDG.
SMITH C.F. ET PETERSON F.A. ET TEJEDA N.
3563
1556223
10

MO

M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
1771294
5

MO

M.PAUCIFLORA BRANDG.
SMITH C.F.
S.N.
NO
8

NY

M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
NO
7

TEX

M.PAUCIFLORA BRANDG.
SMITH C.F. ET PETERSON F.A. ET TEJEDA N.
3563
209011
13

MEXICO
PUEBLA
UC
M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
131175
1
178785
2
M.PAUCIFLORA BRANDG.
PURPUS C.A.
5841
187528
11
US
M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
841146
4
M.PAUCIFLORA BRANDG.
ROSE J.N. ET PAINTER J.H. ET ROSE J.H.
10114
453614
12
TAMAULIPAS
ARIZ
M.ANGUSTILOBA [TORR.] MUELL.ARG.
LESUEUR H.
246
70283
37
F
M.ANGUSTILOBA [TORR.] MUELL.ARG.
LESUEUR H.
246
1003350
36
GH
M.ANGUSTILOBA [TORR.] MUELL.ARG.
KENOYER L.A.
C 142
NO
31
M.SP.
PRINGLE C.G.
2243
NO
24
MICH
M.ANGUSTILOBA
HERMANN F.J.
13695
NO
34

MEXICO

TAMAULIPAS

MICH

M.ANGUSTILOBA [TORR.] MUELL.ARG.
BARTLETT H.H.
10413
NO
35

13695
NO
33

TEX

M.ANGUSTILOBA [TORR.] MUELL.ARG.
LESUEUR H.
246
88371
38

M.WALKERAE CROTZAT
CRUTCHFIELD J. ET JOHNSTON M.C.
5523
186634
40

5572 B
186345
29

5784 F
ILLEG.
42

GRAHAM I. ET JOHNSTON M.C.
4721 B
174836
43

JOHNSTON M.C.
5363 B
179951
30

UNKNOWN

UNKNOWN

F

JATROPHA
SCHUTT A.
52
280989
16

42502
17

NY

M.WALKERAE CROTZAT
SCHUTT A.
S.N.
NO
14
15

USA

TEXAS

A

M.WALKERAE CHUTZAT
BARKS H.B.
S.N.
NO
22
23

MO

M.CARTHAGINENSIS [JACQ.] MUELL.
WORNOCK R.H. ET BARKLEY F.A.
147
1272285
1A

MO

M.WALKERAE CHUTZAT
ROGERS D.J.
522
NO
25

UC

M.CARTHAGINENSIS [JACQ.] MUELL.ARG.
WORNOCK R.H. ET BARKLEY F.A.
147
869189
19

US

M.WALKERAE CHUTZAT
WORNOCK R.H. ET BARKLEY F.A.
147
1887761
20

TAXIR DEMONSTRATION OCTOBER 8, 1968

Working Papers:

Enclosed are working papers to which reference will be made during the demonstration. Please bring these with you to all sessions.

Contents:

Left-side:

1. "I/R in Biology" 0
2. "Procedural Flow Chart to Prepare the DATA BANK for Input to TAXIR" 7 (front ½)

Right-side:

1. "Table of Descriptors for Curating Manihot Specimens" 22
2. "Manihot Curatorial Bank" 31
3. "Sample Queries and Responses: Accessioner and Key" 29
4. "Sample BOOK" 24

There are several copies of the Curatorial Bank Control Vocabulary and various BOOKs for your perusal.

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ID: MANTHOT CURATORIAL DATA BANK - 30 SEPT. 68


ACCESSION MODULE:
USES (1, NAME, 3),
VERNACULAR NAME (2, NAME, 6),
MOST RECENT IDENTIFICATION (3, NAME, 9),
MOST RECENT IDENTIFIER (4, NAME, 7),
TYPE DESIGNATION (7,NAME,4),
AUTHOR (8,NAME,5),
COLLECTOR (10, NAME, 9),
DUPLICATE SPECIMENS (12, NAME, 9),
YEAR OF COLLECTION (13, BOTH, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760,
1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 17
74,1775,1776,1777,1778,1779,1780,1781,1782,1783,1784,1785,1786,1787,1788,1789,
1790,1791,1792,1793,1794,1795,1796,1797,1798,1799,1800,1801,1802,1803,1804,1805,
1806,1807,1808,1809,1810,1811,1812,1813,1814,1815,1816,1817,1818,1819,1820,1821,
1822,1823,1824,1825,1826,1827,1828,1829,1830,1831,1832,1833,1834,1835,1836,1837,
1838,1839,1840,1841,1842,1843,1844,1845,1846,1847,1848,1849,1850,1851,1852,1853,
1854,1855,1856,1857,1858,1859,1860,1861,1862,1863,1864,1865,1866,1867,1868,1869,
1870,1871,1872,1873,1874,1875,1876,1877,1878,1879,1880,1881,1882,1883,1884,1885,
1886,1887,1888,1889,1890,1891,1892,1893,1894,1895,1896,1897,1898,1899,1900,1901,
1902,1903,1904,1905,1906,1907,1908,1909,1910,1911,1912,1913,1914,1915,1916,1917,
1918,1919,1920,1921,1922,1923,1924,1925,1926,1927,1928,1929,1930,1931,1932,1933,
1934,1935,1936,1937,1938,1939,1940,1941,1942,1943,1944,1945,1946,1947,1948,1949,
1950,1951,1952,1953,1954,1955,1956,1957,1958,1959,1960,1961,1962,1963,1964,1965,
1966,1967,1968),
MONTH OF COLLECTION (14, CODE, JAN., FEB., MAR., APR., MAY, JUNE, JULY, AUG.,
SEPT., OCT., NOV., DEC., JAN.-FEB., FEB.-MAR., MAR.-APR., APR.-MAY, MAY-JUNE,
JUNE-JULY, JULY-AUG., AUG.-SEPT., SEPT.-OCT., OCT.-NOV., NOV.-DEC., DEC.-JAN.,
VARIABLE ),
DAY OF COLLECTION (15, CODE, 1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,
21,22,23,24,25,26,27,28,29,30,31,VARIABLE),
COUNTRY OF COLLECTION (16, NAME, 4),
PROVINCE/STATE OF COLLECTION (17, NAME, 7),
HERBARIUM (19, NAME, 5),
CONDITION OF FLOWERS (21, CODE, ABSENT, PRESENT),
CONDITION OF FRUIT (22, CODE, ABSENT, IMMATURE, DAMAGED, MATURE),
CONDITION OF ROOTS (23, CODE, ABSENT, PRESENT),
MATURE SEEDS (24, CODE, ABSENT, PRESENT),
CONDITION OF SPECIMEN (25, CODE, POOR, FAIR, GOOD),
ADDITIONAL COMMENTS (26, CODE, ABSENT, PRESENT)*

NO. OF DESCRIPTORS 27*

READ INPUT FROM TAPE*

DEFINE ITEMS0
1*  ,   ,M.PAUCIFLORA BRANDEGEE  ,  ,NO  ,  ,TYPE  ,BRANDEGEE T.S.  ,M.PAUCIFLOR
A T.S.BRANDEGEE  ,PURPUS C.A.  ,3418  ,1  ,1908  ,6  ,  ,MEXICO  ,PUEBLA  ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
UC  ,131175  ,2  ,4  ,1  ,2  ,2  ,1  ,NA*

2*  ,   ,M.PAUCIFLORA BRANDEGEE  ,  ,NO  ,  ,TYPE  ,BRANDEGEE T.S.  ,M.PAUCIFLOR
A T.S.BRANDEGEE  ,PURPUS C.A.  ,3418  ,1  ,1908  ,6  ,  ,MEXICO  ,PUEBLA  ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
UC  ,178785  ,2  ,2  ,1  ,1  ,2  ,1  ,NA*

3*  ,   ,M.PAUCIFLORA BRANDEGEE  ,  ,NO  ,  ,TYPE  ,BRANDEGEE T.S.  ,M.PAUCIFLOR
A T.S.BRANDEGEE  ,PURPUS C.A.  ,3418  ,1  ,1908  ,6  ,  ,MEXICO  ,PUEBLA  ,
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ID: SAMPLE BOOK RUN-1 OCT. 68

BOOK TITLE A SAMPLE BOOK OF A FEW MANIHOT SPECIMENS

BOOK MODULE: COUNTRY OF COLLECTION (16), PROVINCE/STATE OF COLLECTION (17),
HERBARIUM (19), MOST RECENT IDENTIFICATION (3), COLLECTOR (10),COLLECTOR NUMBER
(11),HERBARIUM ACCESSION NUMBER (20)*

NO. OF DESCRIPTORS 27*

DEFINE ITEMS:
1*  .   ,M.PAUCIFLORA BRANDEGEE  ,  ,NO  ,  ,TYPE  ,BRANDEGEE T.S.  ,M.PAUCIFLOR
A T.S.BRANDEGEE  ,PURPUS C.A.  ,3418  ,1  ,1908  ,6  ,  ,MEXICO  ,PUEBLA  ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
UC  ,131175  ,2  ,4  ,1  ,2  ,2  ,1  ,NA*

2*  .   ,M.PAUCIFLORA BRANDEGEE  ,  ,NO  ,  ,TYPE  ,BRANDEGEE T.S.  ,M.PAUCIFLOR
A T.S.BRANDEGEE  ,PURPUS C.A.  ,3418  ,1  ,1908  ,6  ,  ,MEXICO  ,PUEBLA  ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
UC  ,178785  ,2  ,2  ,1  ,1  ,2  ,1  ,NA*

3*  .   ,M.PAUCIFLORA BRANDEGEE  ,  ,NO  ,  ,TYPE  ,BRANDEGEE T.S.  ,M.PAUCIFLOR
A T.S.BRANDEGEE  ,PURPUS C.A.  ,3418  ,1  ,1908  ,6  ,  ,MEXICO  ,PUEBLA  ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
NY  ,0  ,2  ,2  ,1  ,1  ,1  ,1  ,NA*

4*  .   ,M.PAUCIFLORA BRANDEGEE  ,  ,NO  ,  ,TYPE  ,BRANDEGEE T.S.  ,M.PAUCIFLOR
A T.S.BRANDEGEE  ,PURPUS C.A.  ,3418  ,1  ,1908  ,6  ,  ,MEXICO  ,PUEBLA  ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
US  ,841146  ,2  ,2  ,1  ,1  ,1  ,1  ,NA*

5*  .   ,M.PAUCIFLORA BRANDEGEE  ,  ,NO  ,  ,TYPE  ,BRANDEGEE T.S.  ,M.PAUCIFLOR
A T.S.BRANDEGEE  ,PURPUS C.A.  ,3418  ,1  ,1908  ,6  ,  ,MEXICO  ,PUEBLA  ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
MO  ,1771294  ,  2  ,2  ,1  ,1  ,1  ,1  ,NA*

6*  .   ,M.PAUCIFLORA BRANDEGEE  ,  ,NO  ,  ,TYPE  ,BRANDEGEE T.S.  ,M.PAUCIFLOR
A T.S.BRANDEGEE  ,PURPUS C.A.  ,3418  ,1  ,1908  ,6  ,  ,MEXICO  ,PUEBLA  ,
   VIC. OF SAN LUIS TULTITLANAPA/NEAR OAXACA.
F  ,276352  ,2  ,2  ,1  ,1  ,1  ,1  ,NA*

7*  .   ,M.PAUCIFLORA BRANDEGEE  ,NEWCOMB G.B.  ,NO  ,  ,SP  ,NA  ,NA  ,KIMNACH M
. ET  ORAN R.  ,161  ,NO  ,1959  ,11  ,17  ,MEXICO  ,OAXACA  ,4.8 MI. BEYOND TEO
TITLAN TO TECOMAVACA,UC  ,M 184602  ,2  ,2  ,1  ,1  ,1  ,2  ,3350  FT. OR M.*

8*  .   ,M.PAUCIFLORA BRANDG.  ,  ,NO  ,  ,SP PHOTO  ,NA  ,NA  ,SMITH C.E.  ,S.N.
  ,NO  ,1962  ,0  ,  ,MEXICO  ,PUEBLA  ,VENTA SALADA/S OF TEHUACAN,NO  ,NO  ,0
  ,0  ,0  ,0  ,0  ,2  ,SPEC. NOT YET DEPOSITED *

9*  .   ,M.PAUCIFLORA BRANDG.  ,  ,NO  ,  ,SP  ,NA  ,NA  ,CONZATTI C.  ,4130  ,NO
  ,1921  ,5  ,25  ,MEXICO  ,OAXACA  ,CUESTA DE SAN BERNARDINA  ,US  ,1081208  ,2
  ,2  ,1  ,1  ,1  ,1  ,NA*

10*  .   ,M.PAUCIFLORA BRANDG.  ,  ,NO  ,  ,SP  ,NA  ,NA  ,SMITH C.E. ET PETERSON
 P.A. ET TEJEDA M.,3563  ,13  ,1961  ,7  ,  ,MEXICO  ,PUEBLA  ,TEHUACAN AREA/NEA
R COXCATLAN ON CERRO AJUEREADO,F  ,1556223  ,1  ,1  ,1  ,1  ,1  ,2  ,CA 1000-180
0 M.  *

11*  .   ,M.PAUCIFLORA BRANDG.  ,  ,NO  ,  ,SP  ,NA  ,NA  ,PURPUS C.A.  ,5841  ,N
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ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

PRINT CONTROL VOCABULARY*

1. OUTLINE OF MEDIAN LOBE
   OPTION=CODE NO. OF STATES= 8
   1. LINEAR
   2. TRUNCATE
   3. OVATE - OBLONG
   4. OVATE - OBLONG/PANDURATE
   5. PANDURATE: BASAL PORTION ROUNDED
   6. PANDURATE: BASAL PORTION PRODUCED WITH ROUNDED APEX
   7. PANDURATE: BASAL PORTION PRODUCED WITH POINTED APEX
   8. HASTATE/GLADIATE

2. LEAF VENATION
   OPTION=CODE NO. OF STATES= 2
   1. CAMPTODROMOUS
   2. CRASPEDODROMOUS

3. BASAL LOBULE APEX TERMINATION
   OPTION=CODE NO. OF STATES= 3
   1. SPINE
   2. NO SPINE
   3. NO BASAL LOBULE

4. SHAPE OF BASAL LOBULE APEX OF CRASPEDODROMOUS LEAVES
   OPTION=CODE NO. OF STATES= 3
   1. ACUMINATE
   2. CUSPIDATE/DILATED
   3. CAMPTODROMOUS LEAVES

6. NUMBER OF LOBES/COMPARATIVE SIZE
   OPTION=CODE NO. OF STATES= 7
   1. 3
   2. 3 + OCCASIONALLY 2 SMALLER
   3. 3 + 2 SMALLER
   4. 3 + 2 SLIGHTLY SMALLER
   5. 3 + 2 SMALLER + OFTEN 2 MINUTE
   6. 3 + 2 SLIGHTLY SMALLER + 2 SMALLER
   7. 5 - 9 OCCASIONALLY MORE

7. SIZE OF THE MEDIAN LOBE
   OPTION=CODE NO. OF STATES= 11
   1. LENGTH < 2.5 CM: WIDTH 1 - 2.5 CM
   2. LENGTH 2.5 - 5 CM: WIDTH 1 - 2.5 CM
   3. LENGTH 5 - 12 CM: WIDTH 1 - 2.5 CM
   4. LENGTH 5 - 12 CM: WIDTH 1 - 2.5 CM: DEEP INDENTATION
   5. LENGTH 5 - 12 CM: WIDTH > 2.5 CM
   6. LENGTH 5 - 12 CM: WIDTH > 2.5 CM: SHALLOW INDENTATION
   7. LENGTH 5 - 12 CM: WIDTH > 2.5 CM: DEEP INDENTATION
   8. LENGTH > 12 CM: WIDTH 1 - 2.5 CM
   9. LENGTH > 12 CM: WIDTH > 2.5 CM
   10. LENGTH > 12 CM: WIDTH 1 - 2.5 CM: INDENTATION
   11. LENGTH 5 - 12 CM: WIDTH < 1 CM

8. LOWEST LOBE SHAPE
   OPTION=CODE NO. OF STATES= 7
   1. SAME AS MEDIAN LOBE

CONTINUED ON NEXT PAGE

2. SLIGHTLY SMALLER THAN MEDIAN LOBE: NON-SYMMETRIC
3. ABOUT 1/2 AS LONG AS MEDIAN LOBE: APEX CUSPIDATE
4. ABOUT 1/4 AS LONG AS MEDIAN LOBE: APEX ATTENUATE
5. ABOUT 1/2 AS LONG AS MEDIAN LOBE: S - SHAPED
6. VARIABLE: USUALLY SAME AS MEDIAN LOBE
7. ABOUT 1/4 AS LONG AS MEDIAN LOBE: APEX ROUNDED

9. BASE OF LAMINA
OPTION=CODE NO. OF STATES= 5
1. NON-PELTATE
2. NON-PELTATE: RUDIMENTARY LOBES PRESENT
3. NARROWLY PELTATE: 0.2 - 0.5 CM
4. WIDELY PELTATE: > 0.5 CM
5. VERY NARROWLY PELTATE: < 0.2 CM

10. LAMINA AT BASE OF MEDIAN LOBE SINUS
OPTION=CODE NO. OF STATES= 4
1. LAMINA DISJUNCT: LEAF APPEARS COMPOUND
2. LAMINA CONNECTED: NARROW < 0.5 CM
3. LAMINA CONNECTED: VARIABLE NARROW - WIDE
4. LAMINA CONNECTED: WIDE > 0.5 CM

11. WIDTH OF MEDIAN LOBE BASE
OPTION=CODE NO. OF STATES= 4
1. ONLY MIDRIB WITH PRACTICALLY NO LAMINA
2. < 0.25 CM
3. VARIABLE: NARROW - WIDE
4. > 0.25 CM

12. SHAPE OF SINUS
OPTION=CODE NO. OF STATES= 8
1. FIG. 1
2. FIG. 2
3. FIG. 3
4. FIG. 4
5. FIG. 5
6. FIG. 6
7. FIG. 7
8. FIG. 8

13. SHAPE OF PRIMARY CONSTRICTION OF MEDIAN LOBE
OPTION=CODE NO. OF STATES= 7
1. MOSTLY LONG: INCISED
2. MOSTLY LONG: CLEFT
3. MOSTLY SHORT: OCCASIONALLY LONG/SINUATE
4. MOSTLY SHORT: OCCASIONALLY LONG/ENTIRE
5. SHORT
6. NO CONSTRICTION: OVATE - OBLONG/LINEAR/TRUNCATE
7. NO CONSTRICTION: HASTATE - GLADIATE

14. POSITION/SHAPE OF SECONDARY CONSTRICTIONS OF MEDIAN LOBE
OPTION=CODE NO. OF STATES= 10
1. WITHIN/BELOW THE PRIMARY CONSTRICTION USUALLY DEEP
2. WITHIN THE PRIMARY CONSTRICTION RARELY BELOW
3. RARELY PRESENT BUT WITHIN THE PRIMARY CONSTRICTION
4. NO SECONDARY CONSTRICTION: PANDURATE
5. NO SECONDARY CONSTRICTION: OVATE - OBLONG/LINEAR/TRUNCATE

CONTINUED ON NEXT PAGE

6. ONE CONSTRICTION ONLY BELOW THE BASAL LOBULE
7. SEVERAL SHALLOW CONSTRICTIONS ABOVE THE BASAL LOBULE
8. NO CONSTRICTION: GLADIATE
9. NO SECONDARY CONSTRICTION: HASTATE
10. A VERY SHALLOW CONSTRICTION NEAR APEX

15. SHAPE OF MEDIAN LOBE APEX
OPTION=CODE NO. OF STATES= 15
1. FIG. 1
2. FIG. 2
3. FIG. 3
4. FIG. 4
5. FIG. 5
6. FIG. 6
7. FIG. 7
8. FIG. 8
9. FIG. 9
10. FIG. 10
11. FIG. 11
12. FIG. 12
13. FIG. 13
14. FIG. 14
15. FIG. 15

16. ABAXIAL SURFACE WAX PATTERN OF LEAF
OPTION=CODE NO. OF STATES= 3
1. SMOOTH
2. STUBBY
3. FARINOSE

17. PETIOLE LENGTH
OPTION=CODE NO. OF STATES= 3
1. SHORT < 5 CM
2. MEDIUM 5 - 15 CM
3. LONG > 15 CM

18. ARRANGEMENT OF LEAVES
OPTION=CODE NO. OF STATES= 2
1. VERY CLOSE ROSETTE-LIKE
2. WIDER SPACED

19. PLANT GROWTH HABIT
OPTION=CODE NO. OF STATES= 11
1. VINE
2. DECUMBENT SHRUB
3. SPINDLING SHRUB
4. ERECT SMALL SHRUB
5. ERECT TALL SHRUB - ERECT LOW TREE
6. LOW SPREADING TREE - SPREADING SHRUB
7. CROOKEDLY BRANCHING LOW TREE
8. TALL WOODY TREE
9. ERECT SHRUB OF VARIABLE HEIGHT
10. WEAK STEMMED TRAILING SHRUB
11. ERECT WOODY SHRUB

20. INFLORESCENCE
OPTION=CODE NO. OF STATES= 7

CONTINUED ON NEXT PAGE

1. SOLITARY FLOWER: RARELY 2
2. RACEME: SUBSPICATE/CORYMBOSE
3. RACEME: SUBSPICATE
4. RACEME: VARIABLE OF LESS THAN MEDIUM LENGTH
5. PANICLE: MEDIUM SIZE
6. PANICLE: LONG WITH MUCH BRANCHING
7. RACEME: LONG

21. POSITION OF FEMALE FLOWERS IN THE INFLORESCENCE
OPTION=CODE NO. OF STATES= 4
1. DIVERSE
2. ONLY ABOVE THE LOWER HALF OF RACHIS ON LONG PEDICELS
3. ONLY AT THE BASE OF INFLORESCENCE
4. FLOWER SOLITARY

22. OPEN FLOWER REFLEXION
OPTION=CODE NO. OF STATES= 2
1. REFLEXED
2. STRAIGHT

23. NATURE OF BRACTEOLES
OPTION=CODE NO. OF STATES= 4
1. FOLIACEOUS
2. NON-FOLIACEOUS
3. NO BRACTEOLE: FLOWER SOLITARY
4. SEMI-FOLIACEOUS

24. COLOR OF BRACTEOLE IN HERBARIUM MATERIAL
OPTION=CODE NO. OF STATES= 3
1. PURPLISH
2. GREENISH WHITE
3. NO BRACTEOLE

25. NATURE OF BRACTLETS
OPTION=CODE NO. OF STATES= 3
1. FOLIACEOUS
2. NON-FOLIACEOUS
3. ABSENT

26. COLOR OF MATURE FLOWER TEPAL
OPTION=CODE NO. OF STATES= 2
1. GREENISH YELLOW
2. PURPLISH STREAKED

27. SHAPE OF MATURE MALE BUD
OPTION=CODE NO. OF STATES= 6
1. LONG ALMOST TUBULAR
2. ALMOST TUBULAR WITH A TENDENCY TOWARD INFLATION AT THE BOTTOM
3. DISTINCTLY CONSTRICTED IN THE MIDDLE/INFLATED AT THE BOTTOM
4. CONE SHAPED
5. CAMPANULATE
6. AURICULATE

28. LENGTH OF MALE TEPAL
OPTION=CODE NO. OF STATES= 2
1. > 2 CM
2. < 2 CM

CONTINUED ON NEXT PAGE

29. POSITION OF FRUITS IN THE FRUIT CLUSTER
OPTION=CODE NO. OF STATES= 4
1. BASAL
2. ABOVE THE LOWER HALF OF THE RACHIS
3. BASE UPTO APEX OF INFLORESCENCE
4. SINGLE FRUIT CONNECTED WITH THE STEM DIRECTLY

30. COLOR OF FLOWER BUDS
OPTION=CODE NO. OF STATES= 2
1. GREENISH YELLOW
2. PURPLISH

31. SIZE OF MATURE FRUIT
OPTION=CODE NO. OF STATES= 5
1. SMALL: HEIGHT < 1.25 CM
2. MEDIUM: HEIGHT 1.25 - 1.75 CM
3. LARGE: HEIGHT 1.75 - 2.5 CM
4. VERY LARGE: HEIGHT > 2.5 CM
5. VARIABLE: 1.25 - 2.5 CM

32. FRUIT SURFACE
OPTION=CODE NO. OF STATES= 3
1. WITHOUT RIBS
2. PERCEPTIBLY RIBBED
3. PROMINENTLY RIBBED

33. FRUIT APEX
OPTION=CODE NO. OF STATES= 3
1. WITHOUT POINT
2. SLIGHTLY POINTED
3. PROMINETLY POINTED

34. SEED SIZE/SHAPE
OPTION=CODE NO. OF STATES= 7
1. SMALL ROUND: < 1 CM
2. SMALL OBLONG: < 1 CM
3. MEDIUM ROUND: 1 - 1.5 CM
4. MEDIUM OBLONG: 1 - 1.5 CM
5. LARGE ROUND: 1.5 - 2 CM
6. LARGE OBLONG: 1.5 - 2 CM
7. VERY LARGE: > 2 CM

35. PUBESCENCE OF YOUNG STEM
OPTION=CODE NO. OF STATES= 3
1. PUBESCENT
2. SPARSELY PUBESCENT
3. GLABROUS

36. PUBESCENCE OF MATURE STEM
OPTION=CODE NO. OF STATES= 3
1. PUBESCENT
2. SPARSELY PUBESCENT
3. GLABROUS

37. TEPAL PUBESCENCE
OPTION=CODE NO. OF STATES= 3

CONTINUED ON NEXT PAGE

1. PUBESCENT
2. GLABROUS
3. SPARSELY PUBESCENT

38. PUBESCENCE OF BRACTLETS
OPTION=CODE NO. OF STATES= 3
1. PUBESCENT
2. GLABROUS
3. SPARSELY PUBESCENT

39. ROOT
OPTION=CODE NO. OF STATES= 2
1. TUBEROUS
2. NON-TUBEROUS

40. COLOR OF MATURE STEM
OPTION=CODE NO. OF STATES= 5
1. REDDISH BROWN
2. DARK REDDISH BROWN
3. BROWNISH GREY
4. GREENISH BROWN
5. SILVERY GREY

41. POSITION OF BRACTLETS IN THE PEDICEL
OPTION=CODE NO. OF STATES= 5
1. AT HALFWAY
2. NEAR THE BASE
3. ONE NEAR BASE; ONE AT HALFWAY
4. NEAR TOP
5. NO CONSISTENT PATTERN

42. BRACTEOLE MARGIN
OPTION=CODE NO. OF STATES= 3
1. SMOOTH
2. SERRATE
3. NO BRACTEOLE

43. PUBESCENCE OF OVARY
OPTION=CODE NO. OF STATES= 2
1. PUBESCENT
2. GLABROUS

44. PUBESCENCE OF PEDICEL
OPTION=CODE NO. OF STATES= 2
1. PUBESCENT
2. GLABROUS

48. ROGERS ET APPAN IDENTIFICATION
OPTION=CODE NO. OF STATES= 21
1. M.PAUCIFLORA T.S.BRANDEGEE
2. M.WALKERAE CROIZAT
3. M.MICROCARPA MUELL.ARG.
4. M.MICROCARPA SSP. PARVICOCCA STAT.NOV.
5. M.MEXICANA I.M.JOHNSTON
6. M.ANGUSTILOBA [TORR.] MUELL.ARG.
7. NEW TAMAULIPAS SPECIES
8. M.CHLOROSTICTA STANDLEY ET GOLDMAN

CONTINUED ON NEXT PAGE

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9. NEW OAXACA SPECIES
10. M.LUDIBUNDA CROIZAT
11. M.DAVISIAE CROIZAT
12. M.AESCULIFOLIA [H.B.K.] POHL
13. M.AESCULIFOLIA SSP. INTERMEDIA STAT.NOV.
14. M.ESCULENTA CRANTZ
15. M.AURICULATA MCVAUGH
16. M.ISOLOBA STANDLEY
17. M.CAUDATA GREENMAN
18. M.MICHAELIS MCVAUGH
19. M.FOETIDA [H.B.K.] POHL
20. M.PRINGLEI WATSON
21. M.TOMATOPHYLLA STANDLEY

TABLE OF DESCRIPTORS

FOR CURATING MANIHOT SPECIMENS

Number of Descriptor	Name of the Descriptor	Option	Module	Comments (See Control Vocabulary)
1	Uses	NAME	Accessioner	Here should appear
2	Vernacular name	NAME	Accessioner	conventions adopted
3	Most recent identification	NAME	Accessioner & Book	by the user.
4	Most recent identifier	NAME	Accessioner & Book	
5	Other identifications	NAME	Book	
6	Rogers et Appan identification	NAME	Accessioner & Book	
7	Type designation	NAME	Accessioner	
8	Author	NAME	Accessioner	
9	Original name of type	NAME	Book	
10	Collector	NAME	Accessioner	
11	Collector number	NAME	Book	
12	Duplicate Specimens	NAME	Accessioner	
13	Year of collection	ORDERED NAME	Accessioner	
14	Month of collection	CODE	Accessioner	
15	Day of collection	CODE	Accessioner	
16	Country of collection	NAME	Accessioner & Book	
17	Province/State of collection	NAME	Accessioner & Book	
18	Precise locality of collection	NAME	Book	
19	Herbarium	NAME	Accessioner & Book	
20	Herbarium accession #	NAME	Book	
21	Condition of flowers	CODE	Accessioner	
22	Condition of fruit	CODE	Accessioner	
23	Condition of roots	CODE	Accessioner	
24	Mature seeds	CODE	Accessioner	
25	Condition of specimen	CODE	Accessioner & Book	
26	Additional comments	CODE	Accessioner	
27	Comments	NAME	Display	

These are sample queries as posed in the TAXIR language and responded to by the TAXIR Accessioner:

The first requests the types from Mexico. It is a Query 1.

The second requests the Palmer E. collections. It is a Query 2 and further requests information on geography and date.

The third is to discover the quality of the collections from herbarium ARIZ.

The fourth query is one which might be posed in preparation for a field trip to the Sonoran Desert region of Mexico.

The next queries are posed to a new data bank of the morphology of the Central American species. These queries illustrate how the TAXIR Accessioner may be used as a simultaneous key.

The fifth query attempts to identify the unknown M. tomatophylla Standley. The description here made was rich enough to eliminate all but three species.

The sixth query uses the "Result" feature of the TAXIR Accessioner to include another criterion in the description. This was sufficient to make the determination unique.

In the seventh query our unknown specimen consisted of nothing more than a single seed. A simultaneous key, such as the TAXIR Accessioner, allows us a best possible guess.

The eighth, ninth and tenth queries show the simultaneous key identification of the unknown M. isoloba Standley. These show how the Result feature of the TAXIR Accessioner may be iterated as often as is needed.

QUERY LIST ITEMS WITH COUNTRY OF COLLECTION,
MEXICO AND NOT TYPE DESIGNATION,SP*

(1)

RESPONSE:

6	2	8	4	3	1	60	5	69	165
209	211	210	208	354	330	358	356	355	331
359	351	367	357	491	435	431	502	487	437
433	489	436	432	488	455	438	434	490	683
750	746	786	744	685	784	748	772	788	743
684	751	747	771	787	678	745	785	682	749
794	826	822	830	796	828	824	795	827	823
831	789	797	829	793	825				

NO. OF ITEMS IN QUERY RESPONSE = 76

QUERY - GIVE INFORMATION ON: COUNTRY OF COLLECTION, PROVINCE/STATE OF COLLECTION, AND YEAR OF COLLECTION FOR COLLECTIONS WHICH HAVE COLLECTOR, PALMER E.*

(2)

RESPONSE:

ITEM NO.	REQUESTED STATES
49	MEXICO, JALISCO, 1886
53	MEXICO, JALISCO, 1886
51	MEXICO, JALISCO, 1886
55	MEXICO, JALISCO, 1886
50	MEXICO, JALISCO, 1886
54	MEXICO, JALISCO, 1886
52	MEXICO, JALISCO, 1886
56	MEXICO, JALISCO, 1886
137	MEXICO, SONORA, 1887
135	MEXICO, SONORA, 1887
134	MEXICO, SONORA, 1887
136	MEXICO, SONORA, 1887
225	MEXICO, SINALOA, 1897
223	MEXICO, SINALOA, 1897
224	MEXICO, SINALOA, 1897
342	MEXICO, COLIMA, 1890
334	MEXICO, COLIMA, 1890
332	MEXICO, COLIMA, 1890
344	MEXICO, GUERRERO, UNKNOWN
343	MEXICO, GUERRERO, UNKNOWN
333	MEXICO, COLIMA, 1890
438	MEXICO, CHIHUAHUA, 1885
683	MEXICO, SINALOA, 1891
786	MEXICO, DURANGO, 1896
685	MEXICO, SINALOA, 1891

2, Cont.

784 MEXICO, DURANGO, 1896
788 MEXICO, DURANGO, 1896
684 MEXICO, SINALOA, 1891
787 MEXICO, DURANGO, 1896
785 MEXICO, DURANGO, 1896
682 MEXICO, SINALOA, 1891
842 MEXICO, TAMAULIPAS, 1907
838 MEXICO, TAMAULIPAS, 1907
840 MEXICO, TAMAULIPAS, 1907
843 MEXICO, TAMAULIPAS, 1907
839 MEXICO, TAMAULIPAS, 1907
789 MEXICO, DURANGO, 1896
837 MEXICO, TAMAULIPAS, 1907
841 MEXICO, TAMAULIPAS, 1907

NO. OF ITEMS IN QUERY RESPONSE = 39

QUERY PROVIDE INFORMATION ON: CONDITION OF FLOWERS, CONDITION OF FRUIT, CONDITION OF ROOTS, MATURE SEEDS, AND CONDITION OF SPECIMEN FOR SPECIMENS WITH HERBARIUM, ARIZ.

(3)

RESPONSE:

ITEM NO.	REQUESTED STATES
37	PRESENT, ABSENT, ABSENT, ABSENT, FAIR
97	PRESENT, MATURE, ABSENT, UNKNOWN, FAIR
113	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
95	PRESENT, ABSENT, ABSENT, ABSENT, FAIR
79	ABSENT, MATURE, ABSENT, UNKNOWN, POOR
94	ABSENT, MATURE, ABSENT, UNKNOWN, FAIR
118	ABSENT, MATURE, ABSENT, PRESENT, FAIR
114	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
106	ABSENT, MATURE, ABSENT, PRESENT, FAIR
112	ABSENT, ABSENT, ABSENT, ABSENT, POOR
104	ABSENT, MATURE, ABSENT, PRESENT, FAIR
120	ABSENT, MATURE, ABSENT, PRESENT, FAIR
125	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
155	PRESENT, ABSENT, ABSENT, ABSENT, POOR
127	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
130	PRESENT, ABSENT, ABSENT, ABSENT, POOR
126	ABSENT, ABSENT, ABSENT, ABSENT, POOR
142	PRESENT, IMMATURE, PRESENT, ABSENT, FAIR
128	ABSENT, MATURE, ABSENT, PRESENT, FAIR
225	PRESENT, IMMATURE, ABSENT, ABSENT, FAIR
243	PRESENT, ABSENT, ABSENT, ABSENT, POOR
295	PRESENT, IMMATURE, ABSENT, ABSENT, POOR
297	ABSENT, ABSENT, ABSENT, ABSENT, POOR
293	PRESENT, ABSENT, ABSENT, ABSENT, POOR
304	ABSENT, MATURE, ABSENT, PRESENT, FAIR

3, Cont.)

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        284   PRESENT, ABSENT, ABSENT, ABSENT, FAIR
        292   PRESENT, ABSENT, ABSENT, ABSENT, POOR
        308   ABSENT, ABSENT, ABSENT, ABSENT, POOR
        286   ABSENT, IMMATURE, ABSENT, ABSENT, POOR
        313   ABSENT, MATURE, ABSENT, UNKNOWN, POOR
        477   PRESENT, MATURE, ABSENT, UNKNOWN, FAIR
        760   ABSENT, MATURE, ABSENT, PRESENT, POOR
        748   PRESENT, ABSENT, ABSENT, ABSENT, POOR
        747   PRESENT, ABSENT, ABSENT, ABSENT, FAIR
        820   PRESENT, ABSENT, ABSENT, ABSENT, FAIR
        807   ABSENT, MATURE, ABSENT, PRESENT, FAIR
        815   PRESENT, ABSENT, ABSENT, ABSENT, FAIR
        797   ABSENT, MATURE, ABSENT, PRESENT, FAIR
        801   ABSENT, ABSENT, ABSENT, ABSENT, POOR
NO. OF ITEMS IN QUERY RESPONSE =   39
READ INPUT FROM CARDS*
```

QUERY STATE: MONTH OF COLLECTION, DAY OF COLLECTION,
PROVINCE/STATE OF COLLECTION, CONDITION OF FLOWERS, AND CONDITION OF FRUIT FO
COLLECTIONS WITH PROVINCE/STATE OF COLLECTION, CHIHUAHUA OR DURANGO OR SINALO
OR SONORA.

RESPONSE:

(4)

ITEM NO.	REQUESTED STATES
101	AUG., 10, CHIHUAHUA, ABSENT, ABSENT
85	JUNE, 30, CHIHUAHUA, PRESENT, ABSENT
97	AUG., 10, CHIHUAHUA, PRESENT, MATURE
89	UNKNOWN, UNKNOWN, SONORA, PRESENT, ABSENT
95	SEPT., 2, SONORA, PRESENT, ABSENT
103	JULY, 12, SINALOA, PRESENT, ABSENT
87	UNKNOWN, UNKNOWN, SONORA, ABSENT, ABSENT
99	AUG., 10, CHIHUAHUA, ABSENT, IMMATURE
91	SEPT., 13, SONORA, ABSENT, ABSENT
94	SEPT., 2, SONORA, ABSENT, MATURE
102	AUG., 10, CHIHUAHUA, PRESENT, MATURE
86	JUNE, 30, CHIHUAHUA, PRESENT, ABSENT
98	AUG., 10, CHIHUAHUA, PRESENT, MATURE
90	JULY, 25, SONORA, PRESENT, ABSENT
96	SEPT., 2, SONORA, ABSENT, MATURE
88	SEPT., 9, SONORA, ABSENT, ABSENT
100	AUG., 10, CHIHUAHUA, PRESENT, MATURE
137	UNKNOWN, UNKNOWN, SONORA, ABSENT, MATURE
133	SEPT., 12, SONORA, ABSENT, ABSENT
131	SEPT., 12, SONORA, ABSENT, MATURE
135	UNKNOWN, UNKNOWN, SONORA, ABSENT, ABSENT
146	UNKNOWN, UNKNOWN, SONORA, PRESENT, ABSENT
134	UNKNOWN, UNKNOWN, SONORA, ABSENT, MATURE
132	SEPT., 12, SONORA, ABSENT, MATURE
128	OCT., 5, SINALOA, ABSENT, MATURE

4, Cont.

136 UNKNOWN, UNKNOWN, SONORA, ABSENT, ABSENT

225 SEPT., VARIABLE, SINALOA, PRESENT, IMMATURE

223 SEPT., VARIABLE, SINALOA, PRESENT, ABSENT

235 UNKNOWN, UNKNOWN, SINALOA, ABSENT, MATURE

224 SEPT., VARIABLE, SINALOA, PRESENT, IMMATURE

303 SEPT., 1, SONORA, ABSENT, MATURE

245 AUG., UNKNOWN, SINALOA, PRESENT, ABSENT

299 SEPT., 1, SONORA, ABSENT, MATURE

307 SEPT., 25, SINALOA, ABSENT, MATURE

305 AUG., 17, SINALOA, ABSENT, MATURE

301 SEPT., 1, SONORA, ABSENT, MATURE

293 JULY, 17, SONORA, PRESENT, ABSENT

309 NOV., 23, SINALOA, ABSENT, MATURE

304 SEPT., 1, SONORA, ABSENT, MATURE

246 JULY, 28, SINALOA, PRESENT, IMMATURE

262 JULY, 10, SINALOA, PRESENT, ABSENT

300 SEPT., 1, SONORA, ABSENT, MATURE

308 AUG., 25, CHIHUAHUA, ABSENT, ABSENT

244 AUG., UNKNOWN, SINALOA, PRESENT, ABSENT

306 AUG., 17, SINALOA, ABSENT, IMMATURE

302 SEPT., 1, SONORA, ABSENT, MATURE

294 JULY, 17, SONORA, PRESENT, ABSENT

346 SEPT., 21, SINALOA, ABSENT, IMMATURE

311 NOV., 23, SINALOA, ABSENT, MATURE

350 SEPT., 21, SINALOA, ABSENT, IMMATURE

348 SEPT., 21, SINALOA, ABSENT, MATURE

313 NOV., 23, SINALOA, ABSENT, MATURE

360 UNKNOWN, UNKNOWN, SINALOA, PRESENT, ABSENT

347 SEPT., 21, SINALOA, ABSENT, MATURE

312 NOV.. 23, SINALOA, ABSENT, MATURE

310 NOV.. 23, SINALOA, ABSENT, MATURE

4, Cont.

349 SEPT.. 21, SINALOA, ABSENT, ABSENT

314 SEPT.. 21, SINALOA, ABSENT, MATURE

345 SEPT.. 22, SONORA, ABSENT, MATURE

438 UNKNOWN, UNKNOWN, CHIHUAHUA, ABSENT, MATURE

675 AUG.. 22, SINALOA, PRESENT, ABSENT

677 AUG.. 22, SINALOA, PRESENT, MATURE

676 AUG.. 22, SINALOA, PRESENT, ABSENT

674 AUG.. 22, SINALOA, PRESENT, IMMATURE

735 JULY, 11, SINALOA, PRESENT, ABSENT

774 AUG.. 6, CHIHUAHUA, ABSENT, ABSENT

683 UNKNOWN, VARIABLE, SINALOA, PRESENT, MATURE

782 SEPT.. 5, CHIHUAHUA, ABSENT, MATURE

679 JULY, 12, SINALOA, PRESENT, ABSENT

778 AUG.. 6, CHIHUAHUA, PRESENT, MATURE

786 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

776 AUG.. 6, CHIHUAHUA, PRESENT, ABSENT

685 UNKNOWN, VARIABLE, SINALOA, PRESENT, ABSENT

784 UNKNOWN, UNKNOWN, DURANGO, PRESENT, ABSENT

681 AUG.. 30, SINALOA, ABSENT, MATURE

780 SEPT.. 5, CHIHUAHUA, ABSENT, MATURE

788 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

775 AUG.. 6, CHIHUAHUA, PRESENT, ABSENT

684 UNKNOWN, VARIABLE, SINALOA, ABSENT, ABSENT

783 OCT.. 29, CHIHUAHUA, ABSENT, MATURE

680 AUG.. 30, SINALOA, ABSENT, MATURE

779 SEPT.. 5, CHIHUAHUA, ABSENT, MATURE

787 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

4, Cont.

678 JULY, VARIABLE, SINALOA, PRESENT, ABSENT

777 AUG., 6, CHIHUAHUA, PRESENT, ABSENT

785 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

682 UNKNOWN, VARIABLE, SINALOA, PRESENT, ABSENT

781 SEPT., 5, CHIHUAHUA, ABSENT, MATURE

730 JULY, 10, SINALOA, ABSENT, ABSENT

773 AUG., 6, CHIHUAHUA, ABSENT, ABSENT

818 JULY, 6, SONORA, PRESENT, ABSENT

802 SEPT., 6, SONORA, ABSENT, MATURE

794 AUG., 10, CHIHUAHUA, ABSENT, MATURE

810 JULY, 7, SONORA, PRESENT, MATURE

790 SEPT., 24, CHIHUAHUA, ABSENT, MATURE

806 OCT., 14, SINALOA, ABSENT, MATURE

798 SEPT., VARIABLE, SONORA, ABSENT, MATURE

814 JULY, 30, SONORA, PRESENT, IMMATURE

820 JULY, 6, SONORA, PRESENT, ABSENT

804 OCT., 14, SINALOA, ABSENT, MATURE

796 AUG., 10, SONORA, ABSENT, MATURE

812 JULY, 7, SONORA, PRESENT, IMMATURE

792 AUG., 23, CHIHUAHUA, PRESENT, MATURE

808 OCT., 7, SONORA, ABSENT, ABSENT

800 SEPT., 23, SONORA, ABSENT, ABSENT

816 JULY, 6, SONORA, PRESENT, ABSENT

819 JULY, 6, SONORA, PRESENT, ABSENT

803 OCT., 14, SINALOA, ABSENT, MATURE

795 AUG., 10, CHIHUAHUA, ABSENT, MATURE

811 JULY, 7, SONORA, PRESENT, ABSENT

791 SEPT., 24, CHIHUAHUA, ABSENT, MATURE

807 OCT., 14, SINALOA, ABSENT, MATURE

4, Cont.

799 SEPT., VARIABLE, SONORA, ABSENT, MATURE

815 JULY, 31, SONORA, PRESENT, ABSENT

789 UNKNOWN, UNKNOWN, DURANGO, PRESENT, MATURE

821 NOV., 1, SINALOA, ABSENT, MATURE

805 OCT., 14, SINALOA, ABSENT, MATURE

797 AUG., 10, SONORA, ABSENT, MATURE

813 AUG., VARIABLE, SONORA, ABSENT, MATURE

793 AUG., 10, CHIHUAHUA, ABSENT, MATURE

809 OCT., 7, SONORA, ABSENT, ABSENT

801 SEPT., 23, SONORA, ABSENT, ABSENT

817 JULY, 6, SONORA, PRESENT, ABSENT

900 SEPT., 4, CHIHUAHUA, ABSENT, MATURE

NO. OF ITEMS IN QUERY RESPONSE = 124

MEMO: I WOULD LIKE TO PLAN A FIELD TRIP TO THE SONORAN DESERT.

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

KEY TO ROGERS ET APPAN IDENTIFICATION:
LEAF VENATION, CAMPTODROMOUS AND
BASE OF LAMINA, NARROWLY PELTATE: 0.2 - 0.5 CM.

(5)

RESPONSE:

ITEM NO.	REQUESTED STATES
22	M.MICHAELIS MCVAUGH
14	M.TOMATOPHYLLA STANDLEY
11	M.CAUDATA GREENMAN
104	M.MICHAELIS MCVAUGH
13	M.CAUDATA GREENMAN
506	M.CAUDATA GREENMAN
508	M.TOMATOPHYLLA STANDLEY
507	M.MICHAELIS MCVAUGH

NO. OF ITEMS IN QUERY RESPONSE = 8

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

(6)

KEY TO ROGERS ET APPAN IDENTIFICATION:
RESULT AND OUTLINE OF MEDIAN LOBE.
PANDURATE: BASAL PORTION ROUNDED.

RESPONSE:

ITEM NO.	REQUESTED STATES
14	M.TOMATOPHYLLA STANDLEY
508	M.TOMATOPHYLLA STANDLEY

NO. OF ITEMS IN QUERY RESPONSE = 2

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

KEY TO ROGERS ET APPAN IDENTIFICATION:
SEED SIZE/SHAPE. VERY LARGE: > 2 CM.

(7)

RESPONSE:
ITEM NO. REQUESTED STATES

501 M.FOETIDA [H.B.K.] POHL

NO. OF ITEMS IN QUERY RESPONSE = 1

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

(8)

KEY TO ROGERS ET APPAN IDENTIFICATION:
LEAF VENATION, CAMPTODROMOUS AND BASE OF LAMINA,
NON-PELTATE.

RESPONSE:

ITEM NO.	REQUESTED STATES
63	M.AESCULIFOLIA [H.B.K.] POHL
50	M.PRINGLEI WATSON
177	M.AESCULIFOLIA [H.B.K.] POHL
60	M.CHLOROSTICTA STANDLEY ET GOLDMAN
7	M.PAUCIFLORA T.S.BRANDEGEE
71	M.AESCULIFOLIA [H.B.K.] POHL
103	NEW OAXACA SPECIES
381	M.ESCULENTA CRANTZ
45	M.ISOLOBA STANDLEY
36	M.LUDIBUNDA CROIZAT
248	M.CHLOROSTICTA STANDLEY ET GOLDMAN
171	M.AESCULIFOLIA [H.B.K.] POHL
39	M.ISOLOBA STANDLEY
201	M.AESCULIFOLIA SSP. INTERMEDIA STAT.NOV.
218	M.CHLOROSTICTA STANDLEY ET GOLDMAN
79	M.AESCULIFOLIA [H.B.K.] POHL
33	M.CHLOROSTICTA STANDLEY ET GOLDMAN
383	M.ESCULENTA CRANTZ
150	M.AESCULIFOLIA [H.B.K.] POHL
512	M.AESCULIFOLIA [H.B.K.] POHL
74	M.AESCULIFOLIA [H.B.K.] POHL
52	M.PRINGLEI WATSON
183	M.AESCULIFOLIA [H.B.K.] POHL
61	M.CHLOROSTICTA STANDLEY ET GOLDMAN
8	M.PAUCIFLORA T.S.BRANDEGEE

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

8, Cont.

78	M.AESCULIFOLIA [H.B.K.] POHL
19	M.CHLOROSTICTA STANDLEY ET GOLDMAN
389	M.ESCULENTA CRANTZ
49	M.ISOLOBA STANDLEY
35	M.LUDIBUNDA CROIZAT
27	M.DAVISIAE CROIZAT
513	M.LUDIBUNDA CROIZAT
6	M.FOETIDA [H.B.K.] POHL
77	M.AESCULIFOLIA [H.B.K.] POHL
58	NEW OAXACA SPECIES
43	M.ISOLOBA STANDLEY
268	M.AESCULIFOLIA [H.B.K.] POHL
245	M.CHLOROSTICTA STANDLEY ET GOLDMAN
80	M.AESCULIFOLIA [H.B.K.] POHL
57	M.CHLOROSTICTA STANDLEY ET GOLDMAN
519	M.ESCULENTA CRANTZ
153	M.AESCULIFOLIA [H.B.K.] POHL
510	M.CHLOROSTICTA STANDLEY ET GOLDMAN
502	M.PAUCIFLORA T.S.BRANDEGEE
504	M.PRINGLEI WATSON
359	M.AURICULATA MCVAUGH
505	M.ISOLOBA STANDLEY
509	NEW OAXACA SPECIES
501	M.FOETIDA [H.B.K.] POHL
511	M.DAVISIAE CROIZAT

NO. OF ITEMS IN QUERY RESPONSE = 50

ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

KEY TO ROGERS ET APPAN IDENTIFICATION:
OUTLINE OF MEDIAN LOBE, LINEAR AND RESULT*

(9)

RESPONSE:

ITEM NO.	REQUESTED STATES
45	M.ISOLOBA STANDLEY
39	M.ISOLOBA STANDLEY
385	M.ESCULENTA CRANTZ
49	M.ISOLOBA STANDLEY
43	M.ISOLOBA STANDLEY
505	M.ISOLOBA STANDLEY

NO. OF ITEMS IN QUERY RESPONSE = 6

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ID: MANIHOT MORPHOLOGICAL DATA BANK - 3 OCT. 68

KEY TO ROGERS ET APPAN IDENTIFICATION:
SHAPE OF MEDIAN LOBE APEX, FIG. 8 AND RESULT*

RESPONSE:
  ITEM NO.    REQUESTED STATES
        45    M.ISOLOBA STANDLEY
        39    M.ISOLOBA STANDLEY
        49    M.ISOLOBA STANDLEY
        43    M.ISOLOBA STANDLEY
       505    M.ISOLOBA STANDLEY

NO. OF ITEMS IN QUERY RESPONSE =     5

READ INPUT FROM CARDS

END
ELAPSED TIME IN SECONDS SINCE LAST TIME STATEMENT
CENTRAL PROCESSOR:   11.570      PERIPHERAL PROCESSOR: 1406.429
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(10)

PRINTED: 10/01/68

A SAMPLE BOOK OF A FEW MANIHOT SPECIMENS

BELOW IS A LIST OF THE DESCRIPTORS FOR THIS BOOK IN THEIR HIERARCHICAL ORDER.

COUNTRY OF COLLECTION
PROVINCE/STATE OF COLLECTION
HERBARIUM
MOST RECENT IDENTIFICATION
COLLECTOR
COLLECTOR NUMBER
HERBARIUM ACCESSION NUMBER
ITEM NO.

NUMBER OF ITEMS IN THIS BOOK = 47

MEXICO

COAHUILA

F

M.ANGUSTILOBA (TORR.) MUELL.ARG.
MARSH E.G.
1163
1224398
47

TEX

M.ANGUSTILOBA (TORR.) MUELL.ARG.
MARSH E.G.
1163
ILLEG.
48

HIDALGO

GH

M.CARTHAGINENSIS (JACQ.) MUELL.ARG.
WALKER E.J.
1003
NO
21

JALISCO

GH

M.MEXICANA
PALMER E.
156
NO
49

NY

M.MEXICANA
PALMER E.
156
NO
50

NUEVO LEON

F

M.ANGUSTILOBA (TORR.) MUELL.ARG.
EDWARDS M.T.
411
902956
45

PERKINS A.E. ET HALL J.M.
3565
1511454
39

MO

M.MEXICANA JOHNST.
GREGG J.
198
1771295
32

TEX

M.ANGUSTILOBA (TORR.) MUELL.ARG.
EDWARDS M.T.
411
1181948
46

88369
44

NUEVO LEON
TEX
M.WALKERAE CRUTTAT
CRUTCHFIELD J. ET JOHNSTON M.C.
5460 A
180147
41

OAXACA
UC
M.PAUCIFLORA BRANDEGEE
KIMNACH M. ET MORAN R.
161
M 184202
7

US
M.PAUCIFLORA BRANDG.
CONZATTI C.
4130
1081208
9

PUEBLA
F
M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
276352
6

M.PAUCIFLORA BRANDG.
SMITH C.F. ET PETERSON F.A. ET TEJEDA N.
3563
1556223
10

MO
M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
1771294
5

NO
M.PAUCIFLORA BRANDG.
SMITH C.F.
S.N.
NO
8

NY
M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
NO
3

TEX
M.PAUCIFLORA BRANDG.
SMITH C.F. ET PETERSON F.A. ET TEJEDA N.
3563
209011
13

MEXICO

PUEBLA

UC

M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
131175
1

178785
2

M.PAUCIFLORA BRANDG.
PURPUS C.A.
5841
187528
11

US

M.PAUCIFLORA BRANDEGEE
PURPUS C.A.
3418
841146
4

M.PAUCIFLORA BRANDG.
ROSE J.N. ET PAINTER J.H. ET ROSE J.H.
10114
453614
12

TAMAULIPAS

ARIZ

M.ANGUSTILOBA (TORR.) MUELL.ARG.
LESUEUR H.
246
70283
37

F

M.ANGUSTILOBA (TORR.) MUELL.ARG.
LESUEUR H.
246
1003350
36

GH

M.ANGUSTILOBA (TORR.) MUELL.ARG.
KENOYER L.A.
C 142
NO
31

M.SP.
PRINGLE C.G.
2243
NO
24

MICH

M.ANGUSTILOBA
HERMANN F.J.
13695
NO
34

MEXICO
TAMAULIPAS
MICH
M.ANGUSTILOBA (TORR.) MUELL.ARG.
BARTLETT H.H.
10613
NO
35
13695
NO
33
TEX
M.ANGUSTILOBA (TORR.) MUELL.ARG.
LESUEUR H.
246
88370
38
M.WALKERAE CROIZAT
CRUTCHFIELD J. ET JOHNSTON M.C.
5523
186634
40
5572 A
186345
29
5784 E
ILLEG.
42
GRAHAM J. ET JOHNSTON M.C.
4721 A
174836
43
JOHNSTON M.C.
5363 A
179951
30
UNKNOWN
UNKNOWN
F
JATROPHA
SCHOTT A.
52
280989
16
42502
17
NY
M.WALKERAE CROIZAT
SCHOTT A.
S.N.
NO
14
15

USA

TEXAS

A

M.WALKERAE CROTAT
PARKS H.B.
S.N.
NO
22
23

MO

M.CARTHAGINENSIS (JACQ.) MUELL.
WORNOCK R.H. ET BARKLEY F.A.
147
1272285
18

NO

M.WALKERAE CROTAT
ROGERS D.J.
522
NO
25

UC

M.CARTHAGINENSIS (JACQ.) MUELL.ARG.
WORNOCK R.H. ET BARKLEY F.A.
147
869189
19

US

M.WALKERAE CROTAT
WORNOCK R.H. ET BARKLEY F.A.
147
1887761
20