

Computerisation in the Botanic Gardens of the Netherlands and Belgium

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Computerization of Collection Data by Botanical Gardens in
The Netherlands and Belgium

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1. Introduction

In April 1979 a report was published, i.e. "Definitief Rapport Computer Commissie" (Dutch language) presenting the general outlines for a Computer Databank with standardized information about the collections of the Belgian and Dutch Botanical Gardens.

The main purpose of the report was to provide a framework for these Gardens that would enable them to register the data on their plant collections in a uniform way. This was necessary for a future purpose: the joint storage and processing of plant collection data in a common Computer Databank.

Although each Garden has its own computerized plant administration, the central databank will play an important role in the specialization projects in the Netherlands and in the future also on an international level. These potentialities are discussed by DE JONG (1984) and VAN VLIET (1984).

Each Garden could choose, depending on personnel and financial facilities, the moment to contribute their data to this central databank for the registration of their collections. However, from the moment of publication of the 1979 report each Garden agreed to use the new index card and the codes outlined in this report, which will be discussed later.

In this sequel to that earlier report, we have assumed that the reader is sufficiently familiar with the general methods by which a given set of data can be compiled and manipulated with a computer.

Computerization of an extensive card index of a plant collection has initially some disadvantages.

- The major disadvantage is that the 'classical' card index must be maintained concurrent with the database as long as all collection data are not completely filed in the computer.
- The input of all the data requires extra time, money and manpower.
- The input and updating of the computer databank requires a high level of accuracy.

However, the advantages of a completed computerization are great.

- The most varied data of the living plant collections or parts of it can be made available upon request to any person or authority quickly and in any desired format.
- The preparation of the annual seedlist becomes a simple procedure.

- The computer databank can and will play an important role in the tuning of the plant collections in the Dutch Botanical Gardens, for which proposals are made in the report of the Botanical Gardens Committee of the Royal Netherlands Academy of Sciences (1982); (See also DE JONG, VAN VLIET & WIJNANDS, 1982).
- With the coupling of special equipment to the computer it becomes possible to manufacture plant labels for the garden in a simple way.

2. General Methodology

At the time when the 1979 report was prepared, data input into computers by punchcards was a common method. At present typing or screen terminals are used nearly exclusively, which allows direct filing and manipulating of the plant collection data.

When setting up our system the limitations of punchcards were taken into account (e.g. the limit of only 80 symbols per card). The design of the new common index card (Fig. 1) was also based on this limitation. The data codings are described below and are where necessary adapted to the new situation of filing data via terminals, which allows for more possibilities.

Part A of the index card contains accession number, plant name and author.

Part B of the index card contains the predetermined codes on specific positions.

Part C of the index card contains additional information related to certain codes and further other relevant information deemed necessary by each garden.

The information on the A-part (name) and B-part (codes) will be used for the composition of the national collection survey. Therefore, it is not allowed to use codes other than those marked with * in Chapter 5: Sections and Codes.

One is, however, for its own use free to add new codes or other codes than the non-marked ones, as long as they are different from the ones described in Chapter 5.

A direct approach to the database by way of a screen terminal enables the presentation of the complete set of data on a given plant on the screen in the format of the traditional index card. Mutations and additional information can thus be added at the proper position. Appropriate printing facilities enable the presentation of the output data in a readable form (e.g. to accompany exchange material).

If enough memory space is available, plants which have disappeared from the collection do not necessarily have to be removed from the database. It is possible to retrieve collections without those plants, which have a special code on position 58 (Dead).

When necessary those plants removed from the collection can be stored on a separate magnetic tape or disk.

3. Computerization in The Netherlands

The Botanical Gardens of The Netherlands hardly have freedom of choice with regard to the type of computer they want to use. Filing and manipulation of the complete database of a given plant collection requires a large memory and for this reason a small personal computer cannot be considered for the time being. One has to use the big computers in the Computer Centres at the Universities.

The policy of the Ministry of Education, the Ministry of Agriculture & Fisheries and of the individual Universities to sustain a great diversity has led to the situation in which the Dutch Botanical Gardens have to deal with several types of computers, computer languages and database systems.

For the production of the combined national plant collection listing this diversity will cause only minor problems by using a special outputfile to which the selected data can be transcribed to the computer that is chosen to service the central database.

The diverse approaches, used in the Botanical Gardens of Leiden, Nijmegen, Utrecht and Wageningen, will be discussed briefly in this chapter.

3.1 Leiden

In Leiden one uses an AMDAHL V7/8 computer (operating system OS/VS 2 with VSAM-file system).

Input is done on a writing or a screen terminal using a special question and answer program (Appendix 1). Every 20 - 21 indexcards are filed in special memory blocks with sequential line numbering (Appendix 2) with one line for each item, two for the area description and a reserve of 20 for the other data.

This method for correction and addition of data is somewhat cumbersome but allows a quick start for the build-up of the database. The more so since in this initial phase of transfer from a traditional index to a computerized one, the classical card index must be maintained as a concurrent system.

Corrections and additions are fed into the database with a special program CORR.

Interactive retrieval - a direct approach to the data of an individual plant in the database (the traditional index card) - is now being made operational in APL. The

data will thus be presented in index card format on the screen terminal.

RETRIEVE is a batch retrieval in PL/I. By way of a series of questions the following requirements are determined: the required part of the database (taxon, garden, complete collection); the sequence of the data (location, source, taxonomy); and the required codes that must accompany each selected plant.

The lists thus provided are filed in a PDP 11/14 computer with text editing unit.

It is also intended to create a special file in the PDP or AMDAHL where the complete collection of the Garden will be accessible, but not manipulatory, for any terminal connection.

Leiden also handles the administration of the plants in the experimental garden of the Department of Pharmacology, the Bromeliads of Elijdorp Zoo, Rotterdam and the Orchids of the Botanical Garden of the Free University, Amsterdam.

3.2 Nijmegen

Already in 1968 Nijmegen started filing plant collection data in a computer database with the aim to compose the annual seedlist in a simple and fast way. From 1979 onwards this database has been transformed into a complete database containing the whole collection of plants, with the data more or less according to the report of the "Computer Commissie Botanische Tuinen".

The database has been set up large enough so as to contain all the desired information from which almost any desired output can be acquired.

The most important output is still the seedlist which is composed by "marking" on the terminal the plant names of which seeds can be offered in a particular year.

To insert or update plant data one can use either a writing or screen terminal via a question and answer program. (Appendix 3).

An extensive manual is available (Dutch Language).

3.3 Utrecht

BOTASYS is an automation system for storage and manipulation of collection data for the Dutch Botanical Gardens (TOLEDO 1980, 1983). This proposal is a contribution of UTRECHT/ACCU to the Belgian and Dutch Gardens.

In July 1982 the system became fully operational at Utrecht under the name BOTAUTR (= Database name). The system is based on the program SIR, which stands for Scientific Information Retrieval System.

Till now BOTAUTR contains only the A and B records of the Utrecht collection (about 30 000). Storage of other collections (e.g. Delft = BOTADEL) may be expected.

The database is available as a permanent file (RANDOM on magnetic disk), so that it is possible to consult or update the data at any given moment on a terminal. By way of a question and answer program the data are accessed interactively (Appendix 4).

The database is protected by an accountnumber (account ACCU) and one or more passwords. It is also possible to grant special write or read authority.

The database is copied after each use (e.g. daily). This safe method of filing is necessary. BOTAUTR is also updated periodically and kept in a fireproof safe.

By way of twelve different retrievals it is possible to obtain an arrangement of selfchosen selection criteria. Since one can sort the data on any inserted position, BOTASYS offers countless possibilities for a National Database.

A more extensive manual is available on request. (Dutch Language)

3.4 Wageningen

'HORTUS', (= Horticultural Online Registration, Tracing and Updating System), is a codasyl database for the registration of the plant collection of the Botanical Gardens Wageningen. The database set-up uses DECDFMS combined with FORTRAN.

HORTUS includes also the plant collections of the Succulentarium located in Flevohof, of Arboretum Poort Pulten at De Lutte and of the Department of Forestry of the Agricultural University. The plant collections of the

Department of Plant Taxonomy are in 'PLATAX', a database identical to HORTUS.

Anybody with access to the DEC 1091 of the Agricultural University can read the database. Manipulation of the database is restricted to the staff of the Botanical Gardens.

The data of the plants are filed in such a way that a given plant can be traced by its accession number, its location in the Gardens or by its full name (or parts of it).

There are various alternatives for the output of plant data in a specific format, e.o. allowing for the future connection of engraving equipment for preparing plant labels.

Input of data is done on a screen terminal, manually (a question and answer program) or automatically (input of files with a special format), so that data from other gardens can be copied quite simply. (Appendix 5)

Initially, there were separate databases for living and dead plants. In the latest version these bases have been combined. However retrieval of the latter can take place only after the command "DEAD" has been given. Advantage: a quicker transfer from living to dead and, eventually vice versa, as well as immediate access to the data on the dead plants.

All information on any plant is filed in HORTUS, so the separate card index is no longer updated.

A part D with cytological data on the accession is in preparation.

A more extensive manual is available on request (Dutch Language).

4. Computerization Elsewhere

4.1 OGILVIE (1983)

Ogilvie gives an extensive survey of, and commentary on the diverse methods used by botanical gardens for the administration of their living collections.

Information on the traditional card indexes can also be found in ARNKLIT (1978), with a French summary in Bulletin des Jardins Botaniques de France 17 (1981).

BRENAN & AL. (1975) report elaborately on the application of computers in botanical collections.

From Ogilvie's report only the remarks on computerized systems are discussed here.

4.1.1 Plant Sciences Data Center

This is a database containing the information on the living plants from 42 North American Botanical Gardens and Arboreta, each participating on a voluntary basis. Participants bring their records into this system for a minimal annual fee.

Of the standardised card the original is sent to PSDC, a copy is kept in the card index of the garden.

Data included are: name, accession number, location in the garden, source, herbarium and a few other data.

The database is available on microfiche: Master Inventory Of Botanical Taxa, The American Horticultural Society, 1979.

Not so elaborate as the Dutch system.

4.1.2 Woody Plant Catalogue

Kew and the National Trust for England and Wales have started a program to include all trees in England in a database.

Beginning with conifers, those in Kew, Wakehurst and 50 other gardens are presently registered. Each plant carries an elaborate set of coded information.

A problem is, of course the fact that many Trust Gardens lack the possibilities and also often the willingness to provide the data (and accompanying identification).

4.1.3 Kew

A similar project is also carried out by Kew Gardens.

On page 124 Ogilvie mentions that Kew intends to change its reference system completely. Information obtained from Mr. Beyer of Kew Gardens, however, indicates that her remark is somewhat misleading.

What will happen is that Kew will transfer its database from the mainframe of the Ministry of Agriculture and Fisheries to a smaller computer operated within Kew. After this is completed, other important data (on collection and ecology) will then be added to the database by way of keyboard and screen.

The first volume of a computerized collection list has recently been published (Catalogue of Living Plant Collections, Part 1, march 1984).

4.1.4 The Dutch/Belgian Databank

As one of the disadvantages of the Dutch/Belgian Data Bank Ogilvie mentions the emphasis on specialised detailed data, where she would prefer General Information only.

Apparently Ogilvie is not aware of the great advantages of such a detailed system for use in the individual garden, focussing her attention too much to our end goal, the National Database.

She also overlooks the fact that the National Database will be based on a limited selection of data present in the individual databases.

Her comments on the realization of such databases by different computer systems and the diversity of activities in this respect by the various Botanical Gardens rather reflects reality than criticism on the Dutch/Belgian system. (See 2. General Methodology)

4.1.5 Edinburgh

Here one has concentrated on a database in which each plant is accompanied by a limited amount of data referring to a more elaborate index. The results of this system are familiar as can be seen from the recent Catalogue of Plants.

Utrecht and Wageningen will also produce a computer Catalogue of Plants.

4.2 Finland

Not included in Ogilvie's report is the computerization by Botanical Gardens in Finland.

There, in principle, a system is set up which is intended for use by all Finnish Botanical Gardens. However, several of them have difficulties in obtaining the necessary finances. Presently, only Kuopio is operational, probably soon to be followed by Turku. Originally it was intended that all gardens should use the same computer for their databases, but the on-line telephone connections appeared to be too costly.

Kuopio uses a PDP 34 computer, MUMPS for language and a program called File Manager, derived from a Public Domain program package, originally designed for large hospital databases.

It is a flexible system, allowing access to various fields of input. In general, all data on a specific plant are brought into the database, but no special codes are defined for a common use.

More detailed information can be obtained from Dr. J. Oksanen, Botanical Garden of Kuopio, Finland.

A user's manual in Finnish is in preparation.

5. Sections and Codes

N.B. Codes marked with * are fixed and cannot be changed or used in another meaning.

Part A and B:

Essential data to be used by the garden itself or for exchange and co-ordination purposes.

Part A

A 1 Part IdentificationA 2-10 Accession number

The accession number consists of year of entry (2 positions) plus number and/or letter codes which may include specific garden codes (together 7 positions maximally).

A 11-80 Plant Name and Author
Complete plant name including author.

Part B

B 1 Part IdentificationB 2-10 Accession number

* B 11-13 Garden
A three letter code for each participating Garden:
Amsterdam, University of Amsterdam = AMD
Amsterdam, Free University = AMV

Antwerp	= AWH
Brussels (Meise)	= BRU
Delft	= DEL
Ghent	= GEN
Groningen	= GRO
Leiden	= LEI
Pharmacology	= LEF
Bulbophyllum Jongejan	= LEP
Blijdorp Zoo, Rotterdam	= BLI
Nijmegen	= NIJ
Utrecht	= UTR
Wageningen	= WAG
Arboretum Poort Bulten	= LUT
Succulentarium Flevohof	= BID

* B 14-19

Family

The family name is indicated by the first six letters of the family name. For the incidental duplicates another abbreviation is chosen and presented as a fixed code in this listing. (See Appendix 6.)

Family subdivision is according to STOPPERS (1982); the families of ferns follow CRABBE, JERMY & MICKEL, (1975), treating their subfamilies of Aspleniaceae and Davalliaceae as proper families.

Differences of opinion will be discussed and a compromise code determined which is then included as a fixed code to be used by every garden.

* B 20-21

Main groups

For each group a two letter code is used.

Algae = AL
 Mycophyta = MY
 Bryophyta = BR
 Pteridophyta sensu lato = PT (including Psilotaceae and Equisetaceae)
 Spermatophyta-Gymnospermae = GY
 Spermatophyta-Angiospermae-Dicotyledonae = DI
 Spermatophyta-Angiospermae-Monocotyledonae = MO

* B 22

Verification

- I = Identified. Name of the person who made the identification and further remarks are on part C.
 V = Verified (Re-identified)
 R = Revision; plant from research collection, identified by revisor.

* B 23

Provenance

- E = Plant or seed directly from a known natural source (Kew Code)
 N = Vegetatively propagated from a plant of wild origin (Kew Code)
 S = Indirectly from the wild i.e. seed set in cultivation of plants from a known natural source (not necessarily F1 generation) (Kew Code).
 G = Plant or seed from other Gardens or Institutions; not from wild origin
 Further information on location, with or without a description of the habitat and name of garden, institution or persons are named in part C.
 H = Plant from special origin (BID only; a collection of various donated private collections)
 K = Plant from a nursery
 O = Cultivar, directly from introducer
 U = Provenance Unknown

* B 24

Seed and/or Gene Bank

- S = present in seed bank: under controlled circumstances.
 G = present in gene bank: either in seed bank or as vegetatively propagated plants for agricultural or industrial use.
 B = present in S and G (Both)

Further information on place, registration number of respectively seed or gene bank can be found in part C.

* B 25

Exchange of plantmaterial

G = Mostly available for exchange as seeds or spores (Generative).

V = Ibidem, but as bulbs, corms, cuttings, etc. (Vegetative).

B = Both

B 26-35

Collector and Collector's Number

Coded or abbreviated name of collector and corresponding field number.

* B 36

Sex

In particular of importance for unisexual plants like Cycads.

M = Male

F = Female

H = Hermaphrodite (not necessary to use since most plants are like this)

S = Sterile

B = Monoecious

D = Dioecious

A = Both female and male specimens present (All)

* B 37-44

Origin

Initially it was the intention to use a code to indicate the distribution range of the species concerned. For this purpose the coded system of the Herbaria of Kew and Utrecht was used, with some alterations (HOOG, 1979). Presently, however, it is used as a code to indicate the origin of the specimen. Still the Kew codes are used together with various additions depending upon the wishes of the individual Gardens.

All codes are centrally registered in Leiden and are obligatory for each Garden. When used as origin code, the code is preceded by O of Origin.

N.B. The explanation in part C of the index card concerns the natural distribution range of the plant.
Collection data of the plant are to be found at Collected (26-35, also part C).

B 45-52 Location

Here a code can be used for the location of the plant in the garden, following the free choice of each Garden.

* B 53

Status of the plant (Conservation rating)

- A = Species named in the Red Data Book of the IUCN.
- B = Species named in the list of rare and threatened plants in Europe
- C = Species named in the list of plants protected by law in The Netherlands.
- D = Species named in the list of plants protected by law in Belgium.
- E = Endangered
- F = Species named in part I of the Atlas of the Dutch Flora
- G = Species named in part II of the Atlas of the Dutch Flora
- I = Indeterminate
- K = Insufficiently known
- L = Species named in Appendix I of CITES
- M = Species named in Appendix II of CITES
- N = Species named in Appendix III of CITES
- O = Out of danger
- P = Species of distribution type F in the Atlas of the Flora of Belgium and Luxemburg.
- Q = Species of distribution types D & E in the Atlas of the Flora of Belgium and Luxemburg.
- R = Rare

- S = Species of distribution types A, B & C
in the Atlas of the Flora of Belgium and
Luxemburg.
V = Vulnerable
X = Extinct

* B 54

Herbarium

- A = Alcohol material of plant
B = Plant in Garden carpologicum and
(Garden) herbarium
C = Plant in Garden carpologicum
D = Plant in Garden herbarium and
alcohol material of plant
E = Alcohol and dried material in
Rijksherbarium Leiden
H = Plant in (Garden) herbarium
R = Dried material in Rijksherbarium
Leiden
S = Alcohol material in Rijksherbarium
Leiden

Herbarium and carpologicum number etc.
are mentioned in part C.

* B 55

Illustrations

- A = Slide & line drawing & photograph
B = Slide & photograph
C = Photograph & line drawing
I = Other types of illustration
P = Photograph
S = Slide
T = Line drawing
Z = Slide & line drawing

Record numbers are named elsewhere.

* B 56

Seed Collection

Accession number and further information is given elsewhere.

- F = Plant grown from spores in phytotron
(mainly Leiden and Utrecht)
S = Seeds present in seed collection

* B 57

Evaluation

- E = Economically important species
H = Horticulturally important species
M = Parent plant (Mother) of important clone
P = Pharmacologically important species
R = Plant is patented; exchange of material not allowed
T = Living type specimen
V = Valuable specimen in Belgium and The Netherlands

* B 58

Dead or Otherwise Discarded

- D = Dead
G = Given away
H = Used for herbarium
I = Plant has been given back
original accession number after identification (WAG)
O = Other
S = Stolen
T = Discarded

* B 59

Tolerance

Concerns the tolerance in the local situation.

- C = Cover against moisture and/or frost necessary
F = Frost damage possible
G = Greenhouse
H = Completely hardy
O = Orangerie

- * B 60-61 Habitus
- A = Annual
 - B = Biennial
 - C = Perennial Bulb
 - D = Perennial, dying off above ground
 - E = Perennial, evergreen
 - F = Monocarpic
 - G = Evergreen shrub
 - H = Semi-woody
 - I = Deciduous shrub
 - K = Tree, deciduous, up to 10 m high
 - L = Tree, evergreen, up to 10 m high
 - M = Tree, deciduous, 10-20 m high
 - N = Tree, evergreen, 10-20 m high
 - P = Tree, deciduous, 20-40 m high
 - Q = Tree, evergreen, 20-40 m high
 - R = Rambler
 - S = Succulent
 - T = Epiphytic
 - V = Monopodial orchid
 - W = Water plant
 - X = Parasitic
 - Y = Sympodial orchid

For triple combinations a code
has yet to be established.

- * B 62-63 Synonym, Common name or Literature
- C = Common name available, mentioned
in part C
 - D = Dutch name has to be mentioned
on plant label
 - L = Important literature mentioned
in part C
 - O = On the space for Other Data of
part C relevant information
is available
 - S = Synonym is mentioned in part C

B 64-65 Labelling
Codes for types of labels, according
to the free choice of each garden.

B 66-80 Reserve
All further positions are free
for use by each Garden.

Part C:
Specification of codes and possible other
information, dependent on the Garden.

Part D:
Cytological data: Wageningen

6. Literature

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A	2-10 Accession Number	11-80 Plant Name & Author												
B	2-10 Accession Number	11-13 Garden												
14-19 Family														
37-44 Range		45-52 Location	53 Conn.	54 Herb.	55 Hl.	56 EC	57 Ev.	58 Dead	59 Tol.	60-61 Hab.	62-63 Syn.	64-65 Label	66-72 Specimen Nr.	
C Range		(37-44)												
D	Herbarium	(54)	Illustration				(56)	Seed Collection			(56)	Seed Bank		(24)
E	Source													
F	Verified													
G	Collected													
Synonyms/Common Name/Literature		(23)										(24)		
Habitat/Other Data												(22)	(26-35)	(62-63)

Appendix 1; Input run Leiden

GEEF NAAM EN AUTEUR
 BULBOPHYLLUM WHITFORDII ROLFE
 NU DE "B-KAART"
 ACC. NUMB. FAMILY. GR. VER. PROV. COLL. & NR. SEX. RANGE LOCATION CONS. HERB.

843530 ORCHID MO I E R 1674 06D300 K) S
 ILL. SC. EV. DEADTOL. SYN. LABELS SPECIES NR. SPECCODE

S C 24187 SESTO

GEEF RANGE:
 FILIPPIJNEN
 GEEF HERBARIUM:
 CARPOLOGICA RIJKSHERBARIUM
 GEEF ILLUSTRATION:
 COLOURSLIDES
 GEEF SEED COLLECTION:

GEEF SOURCE:
 RIDSDALE, RH
 GEEF VERIFIED:
 J. VERMEULEN, RH, 9/84
 GEEF COLLECTED:
 PALAWAN, LIMESTONE KARST, ST. PAULSBAY
 GEEF SYNONIEM:

GEEF COMMON NAME:

GEEF LITERATURE:

GEEF OTHER DATA:
 RH, LIGHTBROWN, PSB AND LVS MEDIUM GREEN, PED, PALE GREEN, OCHRE TOWARDS THE
 TIP, FL, OCHRE, MED, SEP, WITH C, 14 BORDEAUX LINES, LAT, SEP, WITH 12 SUCH
 LINES, PETALS CUNEATE TOWARDS THE TIP, AND WITH 8 SUCH LINES, LIPS SOMEWHAT
 SUFFUSED WITH THE SAME COLOUR, COLUMN YELLOW, ANTHOR WITH A CREAM CREST.
 +++SECTION SESTOCHILUS+++

121)3840028
122)ABULBOPHYLLUM PURPUREORACHIS DE WILD.
123)B840028 LEIORCHIDNOINXYLOS 1230 010B060 K 9 ZZ N 23966 MEGAC
124)RW-EN C-TROP. AFRIKA
125)
126)H
127)I
128)Z
129)SWAG 83698B.
130)VJV 1/84.
131)CGABON.
132)O
133)N
134)L
135)D

Appendix 2; Part Memoryfile, Leiden

Appendix 3; Nijmegen, Dutch language program

HET DISKBESTAND IS PLNTBEST.DATA.

WAT WILT U GAAN DOEN?

00. STOPPEN ZONDER SORT KONTROLE EN BACKUP,
ZODAT U OP EEN LATER TIJDSTIP WEER VERDER KUNT GAAN
MET HETZELFDE BESTAND.

01. NIEUWE PLANTEN TOEVOEGEN,

02. BESTAANDE PLANTEN WIJZIGEN OF VERWIJDEREN,

03. AANGEVEN OF DE PLANT IN DE ZAADLIJST MOET,

04. ZAADLIJST TEKENS VAN HET DISKBESTAND AFHALEN,

05. HET DISKBESTAND OP TAPE DUMPEN,

06. KONTROLELIJST PRINTEN VAN HET DISKBESTAND,

07. DE ZAADLIJST PRINTEN VANAF HET DISKBESTAND,

08. 15 ZADEN 15 MAAL PRINTEN,

09. OP FAMILIENAAM ZOEKEN IN DISKBESTAND.

10. OP PLANTNUMMER ZOEKEN IN HET DISKBESTAND.

01,02,03,04,05,06,07,08,09,10 OF 00 INTIKKEN :01

NIEUWE PLANTEN TOEVOEGEN DUS.

U624001.LIBR.MASTER

RESEQUENCING INCLUDED RECORDS? ENTER YES OR NO -

yes

DATA SET U624001.PLNTINV.PLI CREATED.

THE MODULE JUST COPIED IS NOT OUTSTANDING DUE TO "READONLY" SPECIFIED.

PLANTNUMMER:844750010

PLANTNAAM:solanum mammosum L.

HERKOMSTKODE:U

HERKOMST:B.T. Leiden

FAMILIE:Solanaceae

HOOFDGRROEP:Angiospermae-Dicotyledonae

NOG KORRIGEREN? (J/N):j

EDIT:c familie /naceae/naceae/

EDIT:1

PLANTNUMMER: 844750010

PLANTNAAM: SOLANUM MAMMOSUM L.

HERKODE: U

HERKOMST: B.T. LEIDEN

FAMILIE: SOLANACEAE

HOOFDGRROEP: ANGIOSPERMAE-DICOTYLEDONAE

EDIT: /

MEER? (J/N):n

BENT U KLAAR MET MUTEREN OF WILT U HIERNA NOG MEER WIJZIGINGEN

IN HET BESTAND AANBRENGEN?

INDIEN KLAAR, DAN WORDT HET BESTAND:

1. GESORTEERD OP NUMMER

2. GEKONTROLEERD OP DUBBELE NUMMERS

3. TE DELETEN RECORDS WORDEN WERKELIJK UITGEWIST

4. OP TAPE GEDUMPED

INDIEN KLAAR J INTIKKEN, ANDERS ALLEEN DE RETURN TOETS INDRUKKEN

WILT U TERUG NAAR HET MENU? (J/N):j

FILE PROGRAM NOT FREED, IS NOT ALLOCATED

FILE OUTPUT NOT FREED, IS NOT ALLOCATED

FILE TERMIN NOT FREED, IS NOT ALLOCATED



23/05/84 LOGGED IN AT 08.54.59.
WITH USER-ID EE
EQUIP/PORT 01/ OA

LOGIN CREATE 23/05/84 TODAY IS 23/05/84

AC WOENSDAG 23 MEI. CU
ACADEMISCH COMPUTER CENTRUM UTRECHT
COMMAND- XPRMPT,ON
08.55.10. SIRV2,IA,ID=BOTA

Welcome to SIR/DBMS VERSION 2.1.1.
Good morning.

Database name: BOTAUTR

***** Password:

SIR/DBMS EDITOR READY
KUN MUTATIE
TYPE -N- VOOR NIEUWE RECORDS
-C- VOOR CORRECTIES
-A- VOOR AFVOERINGEN
-D- VOOR DISPLAY
-S- VOOR STOP

:D

TYPE ACC.NR. OF -F-: 75GR00191
MONOCOSTIUS UNIFLORUS (POEPP. EX O.G.PETERS.) MAAS

75GR00191 UTR

FAM GR VER PROV SG EX COLL NR SEX
ZINGIB MO I E B KRESS75-65

ORIGIN LOCATION CONS HERB ILL SC EV DEAD TOL HAB SYN LABEL CROSSNR
017A.500 SWKI H [S V L

OTHER DATA

TYPE ACC.NR. OF -F-: F
TYPE -N- VOOR NIEUWE RECORDS
-C- VOOR CORRECTIES
-A- AFVOERINGEN
-D- DISPLAY
-S- STOP

:A

TYPE ACC.NR. OF -F-: 75GR00191
HELE CASE AFVOEREN? -J/N-: J
CASE IS AFGEVOERD

TYPE ACC.NR. OF -F-: F
 TYPE -N- VOOR NIEUWE RECORDS
 -C- VOOR CORRECTIES
 -A- VOOR AFVOERINGEN
 -D- VOOR DISPLAY
 -S- VOOR STOP

: N

TYPE ACC.NR. OF -F-: 75GRO0191
 NIEUW 1-RECORD
 TAXON: MONOCOSTUS UNIFLORUS (POEPP., EX O.G.Peters.) MAAS
 1-RECORD INGEVOERD
 NIEUW 2-RECORD?
 TYPE LOCATIE OF -F-: SWK1
 TYPE VOLGCODE:
 GRDN: UTR
 FAM: ZINGIB
 CR: MO
 PROV: E
 TYPE VARIABELE OF -F-: VER
 WAARDE: I
 TYPE VARIABELE OF -F-: COLL
 WAARDE: KRESS75-65
 TYPE VARIABELE OF -F-: ORIGIN
 WAARDE: O17A.500
 TYPE VARIABELE OF -F-: HERB
 WAARDE: H
 TYPE VARIABELE OF -F-: ILL
 WAARDE: I
 TYPE VARIABELE OF -F-: SC
 WAARDE: S
 TYPE VARIABELE OF -F-: EV
 WAARDE: V
 TYPE VARIABELE OF -F-: SYN
 WAARDE: L
 TYPE VARIABELE OF -F-: EX
 WAARDE: B
 TYPE VARIABELE OF -F-: F
 2-RECORD is INGEVOERD
 NIEUW 2-RECORD?
 TYPE LOCATIE OF -F-: F
 TYPE ACC.NR. OF -F-: F
 TYPE -N- VOOR NIEUWE RECORDS
 -C- VOOR CORRECTIES
 -A- VOOR AFVOERINGEN
 -D- VOOR DISPLAY
 -S- VOOR STOP

: C

TYPE ACC.NR. OF -F-: 75GRO0191
 TYPE -A- VOOR ACC.NR.
 TYPE -1- VOOR 1-RECORD
 -2- VOOR 2-RECORD
 -S- VOOR STOP

: I

TAXON, OUDE WAARDE:
 : MONOCOSTUS UNIFLORUS (POEPP., EX O.G.PETERS.) MAAS
 NIEUWE WAARDE
 : MONOCOSTUS UNIFLORUS (POEPP. EX O.G.PETERS.) MAAS
 1-RECORD IS GEWIJZIGD
 TYPE -A- VOOR ACC.NR.
 TYPE -1- VOOR 1-RECORD
 -2- VOOR 2-RECORD
 -S- VOOR STOP

: S

Appendix 5. Wageningen

After the command MANUAL the following "menu" appears:

Give one of the following sections:

PLANT ACC GAR FAM GR VER PROV SG EX COLL SEX RAN LOC
CONS HERB ILL SC EV DEAD TOL HAB SYN LAB SPECNR

Give READY if you're finished,

- HELP for this helptext,
- PRINT for a general view,
- LOW for lower-case mode and
- UPP for upper-case mode

After inserting above named data in the database, it is possible to insert the data for part C with the command UPDATE MORE. The computer then asks data for:

Range:

Herbarium: Illustration: Seedcollection: Seedbank:

Source:

Verified:

Collected: Date:

Synonyms/Common Name/Literature:

Habitat/Other Data:

each time followed by the question Give REP(lace), ADD or CON(tinue).

It is much more simple to make a file with the following specific format:

```
1--BG20455 Helictotrichon sempervirens "(Villars) Pilger" var
notarisii "(Parl.) Baroni"
2--BG20455WAGGRAMINMOIK D38V
5--BG20455 NL, Leiden, v. Egmond, plant, 1971, as Avena pendu
6--BG20455 G.J.H. Amshoff, 1971/1972
8--BG20455 Syn.:Avena sempervirens hort.
1--BG20208 Stipa gigantea "Link"
2--BG20208WAGGRAMINMOIK D38V
5--BG20208 DE, Klose, plant, 1974
6--BG20208 K.J.W. Hensen, juni 1975
```

Part A is number 1, part B number 2 and part C number 3 to 9.

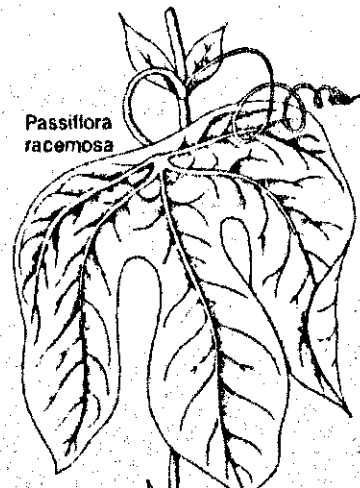
The file is inserted into the database with command INSERT.

Appendix 6. Proposal Family Codes

Only the families of which the first 6 letters are the same are shown.

ACTINI	Actiniaceae	PENPRA	Pentaphragmataceae
ACTIPT	Actiniopteridaceae	PENPYL	Pentaphylacaceae
ASTERA	Asteraceae	PHRYMA	Phrymaceae
ASTRAN	Asteranthaceae	PHRYMT	Phrymataceae
BALNOP	Balanopaceae	PHYLLO	Phyllocladaceae
BALPHO	Balanophoraceae	PHYNOM	Phyllonomaceae
CANNAB	Cannabaceae, Cannabidaceae	PLAGIO	Plagiogyriaceae
CEPHAL	Cephalotaceae	PLAGOP	Plagiopteraceae
CEPHAO	Cephalotaxaceae	POLYGO	Polygonaceae
DIPTEI	Dipteridaceae	POLANT	Polygonanthaceae
DIPTER	Dipterocarpaceae	PTERID	Pteridaceae
ERYPAL	Erythralaceae	PTERPH	Pteridophyllaceae
ERYTHR	Erythroxylaceae	SELGIN	Selaginaceae
HALOIL	Halophilaceae	SELAGI	Selaginellaceae
HALOPH	Halophytaceae	SPHECL	Sphenocleaceae
HIPPOC	Hippocastanaceae	SPHEST	Sphenostemonaceae
HIPCRA	Hippocrateaceae	TETCAR	Tetracarpaeaceae
HYDROA	Hydrocaryaceae	TETRAC	Tetracentraceae
HYDROC	Hydrocharitaceae	TETCHO	Tetrachondraceae
HYCOTY	Hydrocotylaceae	TETMLA	Tetramelaceae
HYMCAR	Hymenocardiaceae	TETMRI	Tetrameristaceae
HYMENO	Hymenophyllaceae	TRICHO	Trichomanaceae
HYMPSI	Hymenophyllopsidaceae	TRICHP	Trichopodaceae
LYTHRC	Lythraceae	XANPHY	Xanthophyllaceae
LYTHRA	Lythraceae	XANRHO	Xanthorrhoeaceae
MEDUGY	Medusagynaceae		
MEDUND	Medusandraceae		

Passiflora racemosa



Passiflora foetida



Passiflora coreacea

