

**CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE**

Institute of Tropics and Subtropics



**Cataloguing of living plant collection of ITS  
CULS Prague and databasing the collection  
data**

by

**LUKÁŠ DUCHOŇ**

**2008**

## **Certification**

I, Lukáš Duchoň, declare that this thesis, submitted in partial fulfilment of the requirements for the M.Sc. degree, at the Institute of Tropics and Subtropics of the Czech University of Life Sciences Prague, is wholly my own work unless otherwise referenced or acknowledged.

20. April 2008

Lukáš Duchoň

© Copyright by LUKÁŠ DUCHOŇ

2008

## **Acknowledgment**

I would like to thank my thesis advisor, Ing. Zbyněk Polesný, Ph.D. (Department of Crop Sciences and Agroforestry, Institute of Tropics and Subtropics, Czech University of Life Sciences Prague) for his thoughtful suggestions and guidance on the substantive aspects of this work.

My thanks go also to Ing. Zdeněk Hlaváč (manager of the greenhouses of Institute of Tropics and Subtropics) for his help in the practical part of the thesis and to Ing. Petra Hlásná Čepková, Ph.D. (Department of Crop Sciences and Agroforestry, Institute of Tropics and Subtropics, Czech University of Life Sciences Prague) for her help in the case of the *Citrus* species identification.

## Abstract

Living plant collection of The Institute of Tropics and Subtropics (ITS), Czech University of Life Sciences Prague, is the unique collection focused on tropical and subtropical useful plants. The main aims of this theses were inventarization, taxonomic revision and establishing of functional data storing system for plant monitoring. Final list of species grown in the collection is full filled by data such as botanical family, English (vernacular (English) name, geographical origin and classification to commodity group according to Economic Botany Data Collection Standard. The collection holds in total 848 taxons classified into 136 families. The collection holds many *Citrus* species and their landraces which wasn't until this time clearly identified. Accordingly, the taxonomic identification of 41 *Citrus* spp. accessions and the concept of their descriptors is provided in this thesis. Recommendations for plant cataloguing system and concept of data storing are also discussed.

**Key words:** living plant collection, ITS, taxonomic revision, cataloguing, tropical plants

## Abstrakt

Rostlinná sbírka Institutu Tropů a Subtropů (ITS), patřící pod Českou Zemědělskou Univerzitu v Praze, je největší sbírkou zaměřenou na užitkové rostliny tropů a subtropů v České republice. Hlavními cíly práce byla inventarizace, taxonomická revize a vytvoření funkčního systému pro uchování dat a monitoring sbírky. V rámci inventarizace druhů bylo identifikováno 848 taxonů ze 136 čeledí. Soupis identifikovaných druhů zahrnuje údaje o zařazení do čeledi, anglický název druhu, geografický původ a zařazení do komoditní skupiny podle Economic Botany Data Collection Standard. Sbíрка zahrnuje také rozsáhlou kolekci citrusů, jejíž druhové a odrůdové složení bylo zjištěno v rámci této práce. Bylo identifikováno 41 rostlin prokazatelně náležející k rodu *Citrus* a byly navrženy deskriptory pro jejich identifikaci. Výsledkem práce je návrh katalogizačního systému a koncept uchovávání dat v databázové podobě ve studované sbírce.

**Klíčová slova:** rostlinná sbírka, ITS, taxonomická revize, katalogizace, tropické rostliny

# Content

|  |    |
|--|----|
| Content .....  | 1  |
| Foreword .....   | 3  |
| 1. STUDY BACKGROUND .....  | 5  |
| 1.1 Living plant collections .....                                       | 5  |
| 1.1.1 Living plant collection divided by BGCI.....                       | 5  |
| 1.2.1.1 Thematic collections.....  | 6  |
| 1.2.1.2 Conservation collections.....                                    | 9  |
| 1.1.2 Living plant collection divided by Economic botany approaches..... | 9  |
| 1.2 Botanic gardens .....  | 10 |
| Botanic garden definition .....  | 10 |
| Criteria of a botanic garden .....                                       | 10 |
| Role of botanic garden .....   | 11 |
| History of botanical gardens.....  | 11 |
| 1.3 Plant monitoring system .....  | 14 |
| 1.3.1 Accessioning .....   | 14 |
| 1.3.2 Labeling .....   | 15 |
| 1.3.3 Mapping .....  | 16 |
| 1.3.4 De-accessioning.....   | 17 |
| 2. Objectives .....  | 18 |
| 3. Methodology.....  | 19 |
| 4. Results and discussion.....   | 20 |
| 4.1 Characteristics of the collection .....                              | 20 |
| 4.1.1 The tropical greenhouse (TGH).....                                 | 20 |
| 4.1.2 The subtropical greenhouse (SGH) .....                             | 21 |
| 4.1.3 The table greenhouse (TABGH) .....                                 | 21 |
| 4.1.4 The Lysimeter greenhouse (LGH).....                                | 21 |
| 4.1.5 The outdoor collection (OD) .....                                  | 22 |
| 4.1.6 The index seminum (IS).....  | 22 |
| 4.2 Plant monitoring system .....  | 23 |
| 4.2.1 Accession report .....   | 23 |
| 4.2.2 Labells.....   | 26 |

|       |                                  |    |
|-------|----------------------------------|----|
| 4.2.3 | Monitoring and data keeping..... | 28 |
| 4.3   | Collection data .....            | 30 |
| 5.    | Conclusion .....                 | 39 |
|       | References .....                 | 40 |
|       | Appendices                       |    |

## Foreword

Plants are universally recognized as a vital part of the world's biological diversity and an essential resource for the planet. In addition to the small number of crop plants used for basic food and fibres, many thousands of wild plants have great economic and cultural importance and potential, providing food, medicine, fuel, clothing and shelter for vast numbers of people throughout the world.

Plants play a key role in maintaining the planet's basic environmental balance and ecosystem stability and provide an important component of the habitats for the world's animal life (Convention on Biological Diversity, 2002)

At present, a complete inventory of the plants of the world has not been assembled, but it is estimated that the total number of vascular plant species may be of the order of 300,000 (currently about 270,000 which may increase 10-20% by 2010). Some 900,000 scientific names are known for these 270,000 species. But it is clear that from this number are between 60,000 to 100,000 plant species threatened worldwide. (BGCI, 1987)

Plants are endangered by a combination of factors such as over-collecting, unsustainable agriculture and forestry practices, urbanization, pollution, land use changes, and the spread of invasive alien species and climate change. The fact is that many are in danger of extinction.

The disappearance of such vital and large amounts of biodiversity sets one of the greatest challenges for the world community: to halt the destruction of the plant diversity that is so essential to meet the present and future needs of humankind. (BGCI, 2007)

Over 60,000 species have been evaluated for conservation status according to internationally accepted criteria, of which 34,000 are classified as globally threatened with extinction. In addition, many countries have assessed the conservation status of their own floras. (Bermejo, 1998)

It is estimated that currently, some 60 % of threatened plant species is accessible in *ex-situ* collections. Over 10,000 threatened species are maintained in living collections (botanic gardens, seed banks, and tissue culture collections), representing 30% of known threatened species. (Bermejo, 1998)

There are botanic gardens and arboreta in 148 countries worldwide and they maintain more than 4 million living plant collections. Amongst their collections are representatives of more than 80,000 species, almost one third of the known vascular plant species of the world. There are a total of 142 million herbarium specimens in botanic garden herbaria and 6.13 million accessions in their living collections. (BGCI, 2007)

In current times, the living plant collections are becoming key players in the conservation of plants.

In my MSc. thesis I analyse the current status of the living plant collection of the Institute of Tropics and Subtropics, CULS Prague, its floristic composition, and I try to suggest the optimal system for catalogization of this unique collection.



## 1. STUDY BACKGROUND

Natural history collections are essential to biodiversity research, as they are the fundamental underpinnings of all biological information. (Chavan, 2003) Collections have always contained a wealth of data: genetic and phylogenetic information stored as an inherent part of the samples of organisms themselves, and biogeographical, ecological, and biographical information stored in the labels that are affixed on them. (Lane, 1996)

Originally, natural history collections made it possible for their viewers to have some notion, of the biota and artifacts of distant places that they themselves could not visit. Today, the roles of natural history collections, as is often stated in the literature, are two-fold: research and education. (Lane, 1996)

### 1.1 Living plant collections

A living plant collection is a group of plants grown for a defined purpose. Such a collection can be displayed either on its own, or as part of a more general garden collection. Botanic gardens maintain collections of plants. (BGCI, 1998)

Growing a particular group of plants can focus the expertise and resources need to support those plants, can meet the needs for research and develop, and help with interpretation and outreach. (BGCI.org)

#### 1.1.1 Living plant collection divided by BGCI

Plant collections in a botanic garden can be divided by Leadly (Leadly, 1998) into:

- **Ornamental plantings** (e.g. bedding schemes or potted plants) ;
- **Structural** (architectural) **plant elements of the garden** (e.g. hedges, topiary trees, parterres, windbreaks or trees used for shade) ;
- **Thematic collections**, which are used for educational and scientific purposes, or for public display;
- **Conservation collections** (e.g. medicinal plants, fruit trees or a family generic group, or plants listed in a national Red Data Book or scheduled for protection by national or international authorities). In this group belong subgroups such as Systematic collections, Economic and crop plant,

Collection based on habitat types, Collection based on geographical origin and Display garden collections.

### 1.2.1.1 Thematic collections

Thematic collections can be conveniently divided into several categories (see below) although there will often be an overlap between these categories. The theme depends on the purposes of the collection and how the choice is interpreted. For instance, a collection of native aromatic plants could be collected and displayed for many different purposes to show: perfume plants, the habitat (e.g. dry Mediterranean habitat), taxonomic variation (e.g. the family *Labiatae* or the genus *Origanum* or *Lavandula*). (Leadley, 1998)

#### Systematic collections

A systematic or taxonomic collection is one that includes plants that are closely related, often assembled to demonstrate plant evolution and systematic order. Systematic collections have been widely used for education, reference or research. Such collections can be based on a taxon at any level, for instance a class (*Pteridophyta*), an order (*Rosales*, *Ericales*), a family (*Palmae*, *Cactaceae*), a genus (*Citrus*, *Nothofagus*, *Saxifraga*) or a species (*Rosa* species, hybrids and cultivars).

#### Economic and crop plants

Collections of economic and crop plants, including plants of ethnobotanical interest, may be developed by a botanic garden as a thematic collection and can be important for display and education. Such collections also represent a reservoir of material for actual or potential economic use, or conservation purposes. Examples of such collections held by botanic gardens around the world include:

- fruit trees and their wild relatives;
- crop plants from several regions of the world, such as cereals;
- species of value for amenity horticulture or as ornamentals;
- textile plants;
- oil plants;
- timbers;

- cork;
- resin yielding plants;
- plants used for industrial cellulose production;
- grasses, and forage plants;
- wild relatives of crops;
- underutilized or neglected crops;
- local and traditional economic plant varieties and land races;
- medicinal plants;
- plants that are important for local use (e.g. for basket making, for tools used in cooking, fishing and agriculture);
- perfume, essential oil and cosmetic plants;
- spice and flavouring plants;
- dyeing and tanning;
- plants for bonsai;
- systematic collections of important economic plant groups such as conifers or legumes
- temperate and tropical timber trees;
- ornamental trees.

### Collection based on habitat types

A number of botanic gardens have developed thematic collections with a common ecological origin, or ones that represent a particular vegetation type/habitat or a related habitat/life form. Some of these gardens or collections are laid out to mimic or resemble natural habitats. Ecological or vegetation types are displayed in rock or stone gardens, water gardens, deserts, rainforests, meadows, grassland, weed collections etc. These often include the related life forms or common habits of the plants that occur in such vegetation types e.g. alpine, aquatics, succulents, weeds etc. Some examples are:

- the laurel forest (jardín Botánico Canario “Viera y Clavijo”, Canary Island, Spain);
- the serpentine vegetation (Jardín Botánico Nacional de Cuba, Havana, Cuba);
- prairie (Chicago Botanic Garden, U.S.A.);

- the Limestone Mound growing British calcicole species (Cambridge University Botanic Garden, U.K.);
- marsh, dune, woodland and rocky outcrops displaying native species (Botanischer Garten der Universität Bonn, Germany).

Some gardens are created within an important natural habitat and have a mission to manage or restore the natural vegetation types associated with their garden or with satellite gardens. Several Australian botanic gardens have been established to conserve native vegetation and the flora they contain.

### Collection based on geographical origin

Some thematic collections are created on a phytogeographical basis, such as collections from particular regions of the world (e.g. plants from South Africa, the Macaronesian region (the Canary Islands, Madeira, and the Azores), plants from the Sierra Nevada, arctic plants, Mediterranean plants etc. Some phytogeographical collections are of native plants grown and displayed by botanic gardens in their own country.

### Display garden collections

Some thematic collections focus on the creation of displays of plants of interest to the public for decoration and for education. Some examples are:

- colour gardens (e.g. the white garden, Chicago botanic garden, U.S.A.);
- aromatic or scent gardens;
- winter gardens;
- rose gardens;
- herbaceous, ornamental and flowering tree and shrub gardens;
- gardens demonstrating particular horticultural methods such as trained and pruned fruit trees;
- gardens demonstrating plants of particular use in horticulture, such as for hedging and ground cover;
- children's gardens;
- historical gardens, demonstrating plants and gardens of former times;
- vegetable, kitchen and food plant gardens;

- first aid and medicinal plant gardens;
- model demonstration gardens.

### 1.2.1.2 Conservation collections

Conservation collections in botanic gardens may comprise single taxon collections or collections of several taxa. They may be grown in special conservation areas, such as a field genebank, experimental area, or can be integrated into the garden's collections for other purposes, such as display, education and amenity.

The aim of a conservation collection should be to conserve and propagate genetic material of rare and endangered species with the ultimate goal of ensuring the long-term survival of such genetic material in the wild. These collections may be used to contribute to species recovery programmes. Conservation collections are usually complemented with a parallel research programme.

### 1.1.2 Living plant collection divided by Economic botany approaches

Another system of collection division should be the system by Bermejo. (Bermejo, 1998)

- **Cultivated species of agricultural, food or industrial interest** – primary attention paid to collections involving species on nutritional or industrial interest (oil, fibres, etc.).
- **Cultivated species of forest, medicinal or aromatic interest** – secondary attention paid to species of forest (timber or other forest resources) or medicinal interest (including aromas, species and essences).
- **Uncultivated species of nutrition interest** – species that are promising, extracted or of ethnobotanical interest, wild relatives, neglected or marginal crops.
- **Wild relatives of cultivated species** – wild relatives understood not as the taxa closet to the cultivated species or varieties but as collections of taxa of the same genus as the cultivated species.
- **Species cultivated exclusively for ornamental purposes** – perhaps the most common type of germoplasm collection held, particularly in the more traditional botanic gardens.

- **Plants of the ethnobotanical interest** – uncultivated and of no nutritional interest (wild medicines and dyes).
- **Indigenous threatened species** – especially where covered by specific conservation programmes and where taxonomy suggests potential for the genetic enhancement of cultivated species or for the identification of new resources of economic interest.

## 1.2 Botanic gardens

### Botanic garden definition

According to BGCI (Botanic Gardens Conservation International) botanic gardens are: “Institutions holding documented collections of living plants for the purposes of scientific research, conservation, display and education.”(BGCI, 2007)

### Criteria of a botanic garden

The following is a list of criteria that may be met in part or whole by any institution that is considered to be a botanic garden (Leadlay. 1998):

- A reasonable degree of permanence
- An underlying scientific basis for the collections
- Proper documentation of the collections, including wild origin
- Monitoring of the plants in the collections
- Adequate labeling of the plants
- Open to the public
- Communication of information to other gardens, institutions and the public
- Exchange of seed or other materials with other botanic gardens, arboreta or research institutions
- Undertaking of scientific or technical research on plants in the collections
- Maintenance of research programs in plant taxonomy in associated herbaria.

### **Role of botanic garden**

Botanic gardens have had a changing role throughout history, beginning often as medicinal gardens for the study and cultivation of plants with healing properties and going through many phases including of course as pleasure gardens. But the fact that their collections are more or less scientific means they are continually adapting and serving the needs of their societies in evolving ways as new challenges face those societies. (BGCI, 2007)

Botanic gardens have collectively accumulated centuries of resources and expertise that now means they play a key role in plant conservation. Many of these activities contribute to ex situ conservation, but botanic gardens also play an important role in in situ conservation.

*Ex situ* conservation is the conservation and maintenance of samples of living organisms outside their natural habitat, in the form of whole plants, seed, pollen, vegetative propagules, and tissue or cell cultures. Ex situ collections are for example (living collections, seed banks, pollen, vegetative propagules, and tissue or cell cultures)

*In situ* conservation is the conservation of species diversity within normal and natural habitats and ecosystems. Because our natural systems face many threats, conserving them is not easy, and must use many techniques. This includes the development, designation, and management of protected areas, tackling alien invasive, habitat restoration and re-creation, and working with communities to promote sustainable plant use and land management. (BGCI, 2007)

*In situ* conservation approaches include on-farm conservation, home gardens, national parks and nature reserves. (Bioversity International, 2008)

It is important that *ex situ* and *in situ* conservation are designed and practiced to reinforce and complement each other. For example, the collections of botanic gardens can provide a source of material for habitat restoration. (BGCI, 2007)

### **History of botanical gardens**

Gardens and the cultivation of plants have been around for thousands of years with the first examples dating to around 3000 years ago in ancient Egypt and Mesopotamia. The Romans were also keen gardeners and they were also aware of the medicinal properties of plants. Following on from the Romans in identifying the

medicinal properties of plants were the monks. They also used the beauty of plants and flowers as a celebration of god. The first of these monastic gardens was created in the 8th century. These gardens were the pre-cursor to the physic gardens that appeared in the 16th century.

The first of these physic gardens was the garden of the University of Pisa which was created by Luca Ghini in 1543. Following this other Italian universities followed suit and gardens were created in Padova (1545). Fig. 1

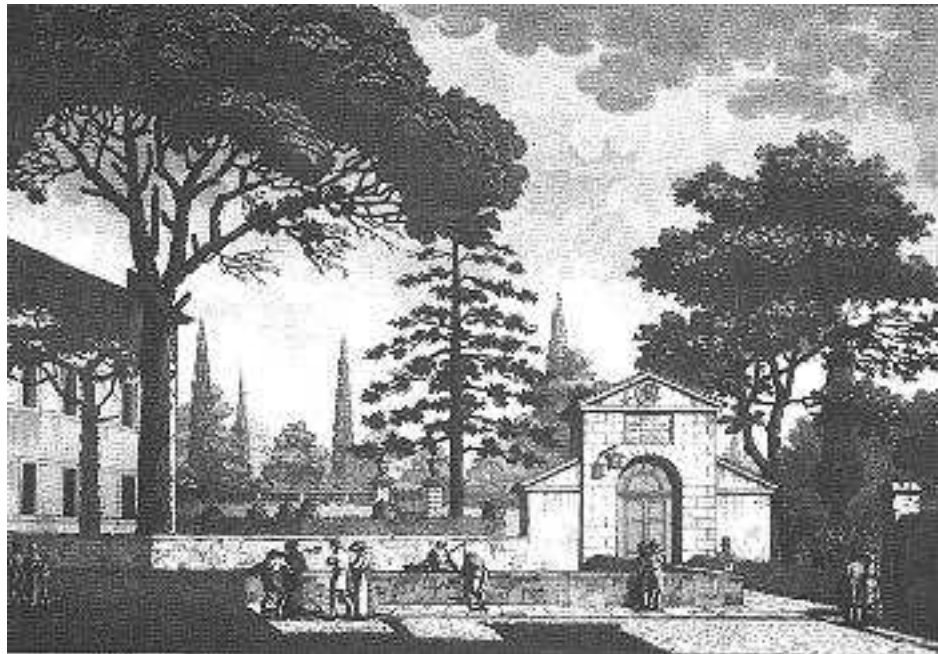


Fig. 1: Historical garden in Padova (Anonymous, 2007)

These gardens were purely for the academic study of medicinal plants. By the 16th Century these medicinal gardens had spread to universities and apothecaries throughout central Europe such as Cologne and Prague. The University of Oxford botanic garden was the first garden established in the United Kingdom in 1621. Gardens such as the Royal Botanic Gardens, Kew and the Real Jardín Botánico de Madrid established during the 16th and 17th century were set up to try and cultivate new species that were being brought back from expeditions to the tropics. During the 19th and 20th century municipal and civic gardens were created throughout Europe and the British Commonwealth (e.g. Missouri botanic garden). In the last 30 years botanic gardens have seen a revival as scientific institutions due to the emergence of the conservation movement. They are now seen as very important due to their



existing collections and the scientific knowledge they possess in the propagation of plant species.

Provisional estimates show that 700 botanic gardens - 47% of the total 1,490 (Tab. 1) - hold plant germplasm collections. Of these, 120 have collections of agricultural interest (mainly cultivated species of interest for food or industry, in addition to collections of wild stock of species used by humankind for nutrition or as a source of oils or fibres). Another 170 gardens have significant collections of medicinals or forest plants (timber, paper, pulp, cork). The remaining 410 are botanic gardens also involved in conservation but whose germplasm collections are either exclusively ornamental or else based essentially on endangered native flora. The remaining 800 or so botanic gardens may hold a wide selection of plant biodiversity, in some cases exceeding 10 000 taxa under cultivation, but fail to maintain thematic collections with the minimal attention needed for cultivated germplasm (sufficient number of individuals, identification of geographic source). This assumption is based on the lack of precision in the gardens' reports on the taxonomic or biological nature of their collections, and more specifically on the absence of registration procedures, specific conservation objectives, infrastructure or interlinks age with scientific programmes and information on provenance. (Bermejo, 1998)

**Tab. 1: Interested facts about collections in the world (BGCI, 2007)**

|   |                  |
|---|------------------|
| Possible total number of species in the world                   | 300,000          |
| Possible number of plant species threatened worldwide           | 60,000 – 100,000 |
| Amount of land surface covered by protected areas               | 10%              |
| Number of species evaluated for conservation status             | 60,000           |
| N. of species classified as globally threatened with extinction | 34,000           |
| Number of threatened species maintained in living collections   | 10,000           |
| Number of BGs in the world                                      | 1,490            |
| N. of living plant collections maintained in BGs and arboreta   | 4 million        |
| Number of herbaria specimens in BG herbaria                     | 142 million      |
| Number of accessions in the living collections of BGs           | 6,13 million     |

### 1.3 Plant monitoring system

It is necessary to monitor the plants from the moment they arrive in the garden and maintain records even after the plant has died, been lost, given away or discarded. A plant record system is essential for managing a living plant collection so that a curator is able to locate a plant in the garden and source all of the information held about it. This is achieved through accessioning, labeling, mapping and monitoring the development of the plant in the garden. (BGCI; 1998)

#### 1.3.1 Accessioning

Accessioning is the process by which a plant becomes a permanent part of the living collections, and more specifically a part of the plant records. (Laedlay, 1998)

At the accession stage, all the information about the origin of the plant is recorded. Each plant should be assigned a unique accession or inventory number. Accession information is the primary or basic data normally available together with the seed or plant which comes into the garden. Fig 2

- accession number (reference number);
- scientific name;
- common name (english name);
- date obtained;
- location of the plant in the collection;
- source (field collected or obtained from another institution or propagated from current collection).

As part of each accession's documentation, a herbarium specimen should be prepared whenever possible. This specimen should be deposited in the garden herbarium or in another associated herbarium.

If the accession does not have a name it should be identified as soon as possible. At a practical level, a temporary may be assigned giving its family or generic affinities.

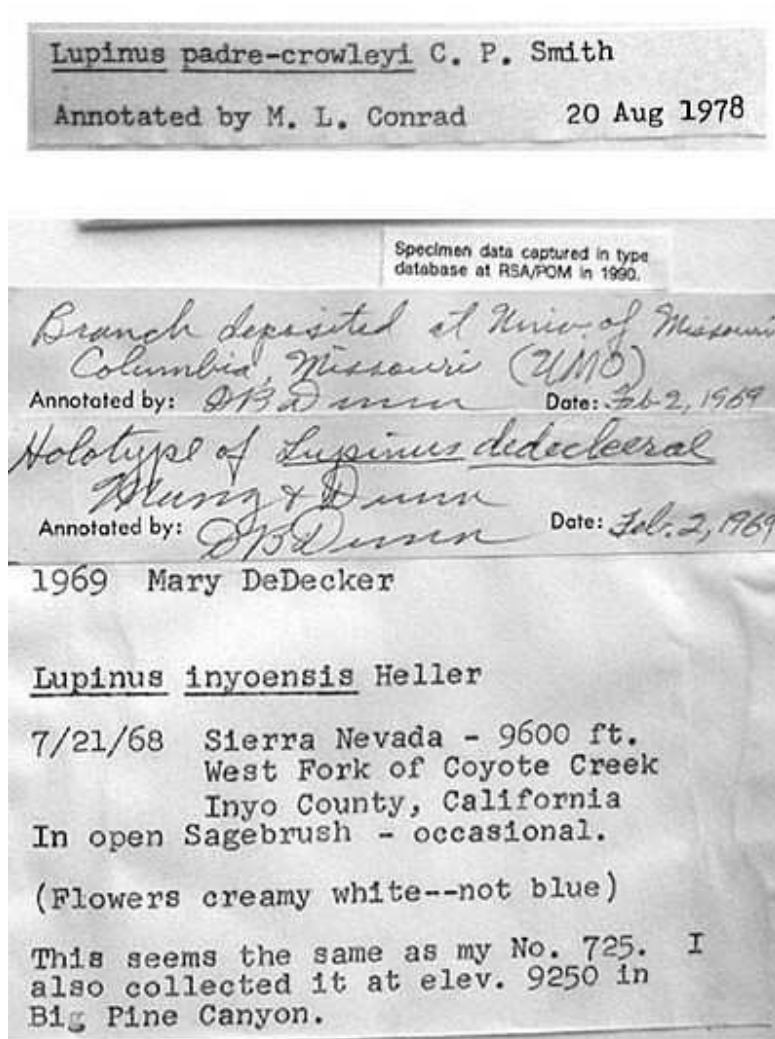


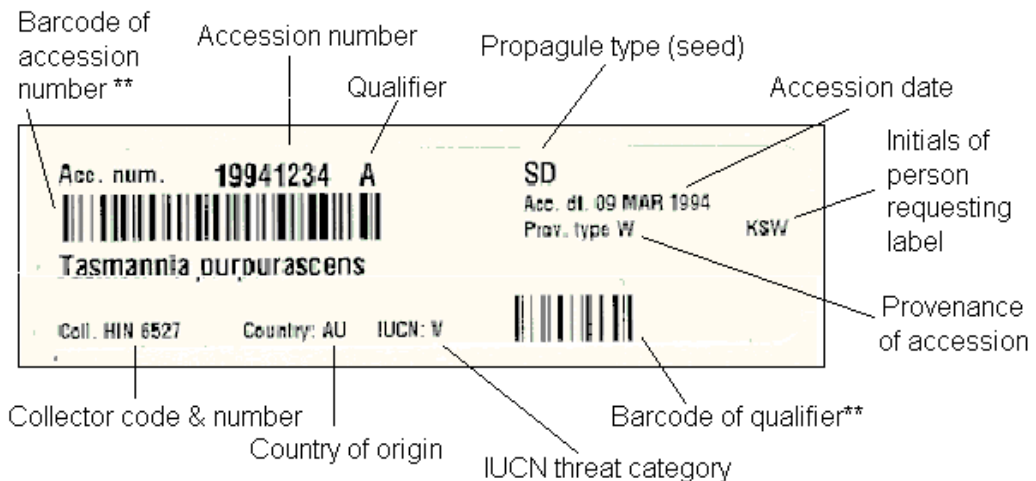
Fig. 2: Very simple example of Accession report (Blakely, 2003)

### 1.3.2 Labeling

Having accessioned the material, it is very important to keep the link between the plants accession record and the plant in the garden by means of labels. Each plant or batch of plants should at all times have a label on which the accession number and name are the key information about the plant. (Leadlay, 1998)

There are several levels of labeling. A primary label (or nursery label) is the label a cutting or sown seed is marked with, often a sowing date is added. When ready for public display a secondary label is produced which may show information useful to the general public, such as a scientific name, common name (English name), botanical family, origin etc. Fig. 3

### Royal Botanic Garden Edinburgh Barcoded Plant Label\*



\* The above label is an example of one used by the Royal Botanic Garden Edinburgh and generated directly from *BG-BASE*; users of *BG-BASE* can specify their own label formats containing whatever data they require (additional programming will be necessary)

\*\* Barcodes of accession number and qualifier printed on separate lines to facilitate accurate scanning with hand-held data loggers

Fig. 3: Example of very high level of labeling from Royal Botanic Garden Edinburgh (O'Neal, 2004)

### 1.3.3 Mapping

Garden locations can be coded and maps drawn (Fig. 4) with coordinate to specify the location of each plant. Such maps showing the location of individual or groups of plants is often prepared as part of the design development stage of designing a botanic garden. Maps may also be digitized for storage on computer. If the preparation of a map is not possible in the early stages, a list of accessions at each coded location should be maintained. (Leadlay, 1998)

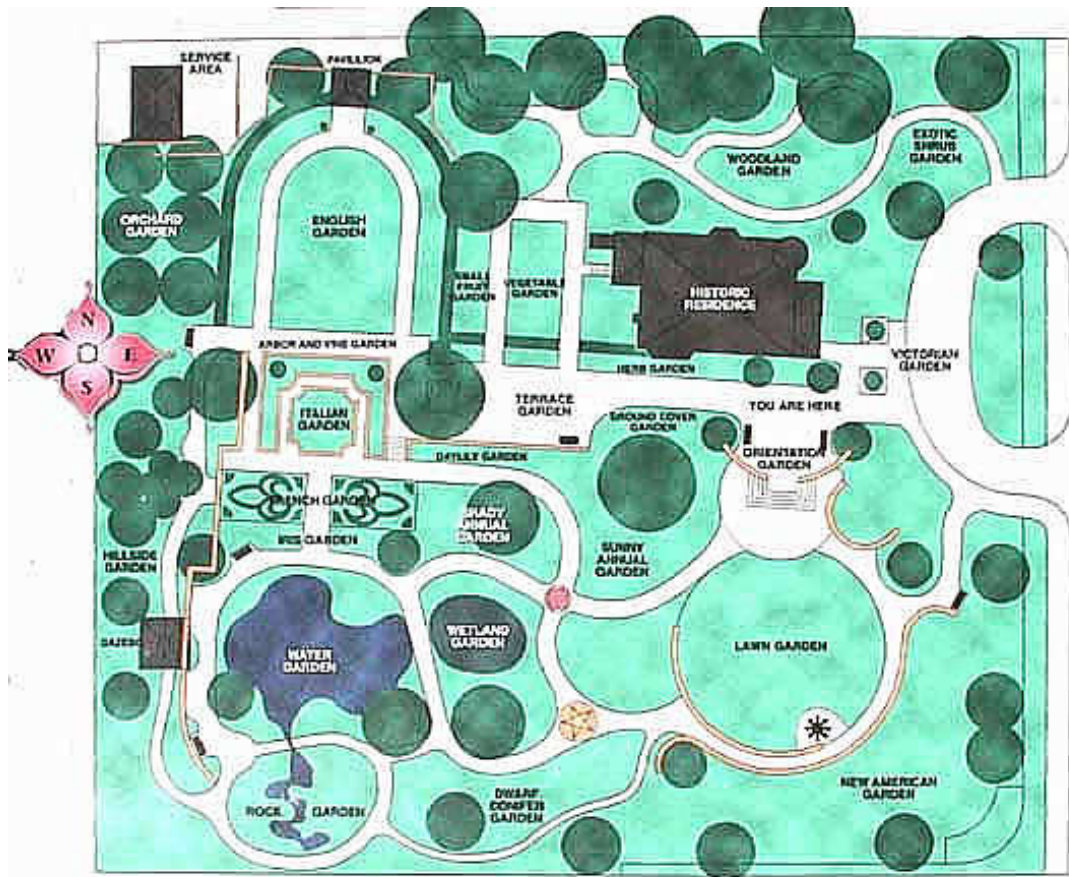


Fig. 4: Example of garden map with plant group locations (Young, 2008)

### 1.3.4 De-accessioning

De-accessioning in the strict sense is the process of amending the records of plants removed from the garden and not the actual disposal of plants. It is very useful to keep a record of the fact that a plant was once in the collection and whether it was given away and to whom or why it died, (to what other gardens did it go – can we get more stock if we need to?) and whether it was propagated etc. Sometimes plants, which were thought to be dead, were in fact overlooked, dormant, or mislabeled. (Leadlay, 1998)

## 2. Objectives

The living plant collection of ITS CULS Prague was established in 1970, like a special collection of tropical and subtropical plants with agriculture interest. Creates imaginary triangle of Prague botanical gardens together with Botanical Garden of Carles University and the Prague Botanic Garden in Trója.

By its orientation and number of tropical and subtropical species with agricultural interest is unique in the Czech Republic.

To date the plant documentation is hold in paper form, is still incomplete and there are still taxons without labels. For the representation and educational purposes of the collection it is important to know exact floristic composition, and to establish functional database system including accession reports for each taxon and improve the labeling system in accordance with internationally recognized standards.

The objectives of this thesis were inventarization, taxonomic revision and establishment of functional data storing system for collection monitoring.

### 3. Methodology

This study was undertaken in several stages.

Data collection directly from the greenhouses, outdoor collection and index seminum. Almost all the plants in the collection were labeled with scientific name of the species and some of them, mainly in the tropical and subtropical greenhouse have on the label also the basic information about geographical origin and botanical family name. Helpful was also bachelor theses (Nováková, 2007) describing the floristic composition in tropical, subtropical and table greenhouses of the collection.

Data verifying, using the international botanical databases for revision of the scientific names in accordance with current botanical nomenclature. For this purpose the IPNI (International Plant Names Index) database and Mansfeld's World Database of Agricultural and Horticultural Crops were used. For the identification of the *Citrus* species IPGRI Descriptor for Citrus (IPGRI, 1999) and international databases Citrus pages and Citrus variety collection.

Identifying of English (vernacular name), geographical origin and commodity group. Some of the plants (10% of the collection) have these types of information on the label, but in the same case was necessary to verify all the data again. Plants English names were verified using the Elsevier's Dictionary of Botany (Macura, 1993) and the Plants For A Future database. For identification of the geographical origin, all of the mentioned databases were used. For the categorization of the commodity groups of plants the first level of Economic Botany Data Collection Standard was used (Cook, 1995).

The data were processed in the MS Excel where data about all the taxons, scientific name, family, vernacular names, geographical origin and affiliation to commodity group are shown. The photographic documentation of the most of the species were acquired and added into the database.

## 4. Results and discussion

### 4.1 Characteristics of the collection

The collection is focused on tropical and subtropical useful plants. It is divided into several sections such as collection greenhouses, grower greenhouses, greenhouses for annual crop species cultivation and outdoor exposition. (Tab. 2) Greenhouses are divided according to the temperature requirements of plant species. The main part of collection is based on food plants, technical plants, tonic and medicinal plants. The greenhouses are dedicated for education of the students of botany and special crop production. The total area of the collection is 2070m<sup>2</sup> from which outdoor collection spread out 1000 m<sup>2</sup>.

#### 4.1.1 The tropical greenhouse (TGH)

Collection of tropical plants is focused on area 250 m<sup>2</sup>. In this greenhouse is actually grown 131 taxon of tropical plant divided into 61 families. Its one of the most important greenhouses in the collection, and because of that is mostly shown to visitors or to media like a representative part of the collection. On the other hand in this time the greenhouse becomes to be small for the plants inside. The species such as *Banana* spp., *Carrica* spp. etc. which in the natural condition are reaching much more than 6 meters which is the roof of this greenhouse need to be cut each year. Also the narrows between the plants are too strait. But until the time of reconstruction of this greenhouse probably the situation will be not better. The collection also contain many others species which should be placed in the tropical conditions, but because of absence of free place in here they are now stored in pots in the table greenhouse.

Student and visitors can found inside well known species such as Coconut palm, Papaya, Para rubber tree, Coca tree, Bitter cassava, Sisal agave, Ceylon cinnamon, Patchouli, Bananas, Sugar cane, Arabian and Robusta coffee, Guarana, Cacao tree, Cola nut tree and many others. The full list of the species is available in the appendix. (Fig. Appendices 1)



#### 4.1.2 The subtropical greenhouse (SGH)

The second greenhouse which is open for public is smaller than the tropical one. The area is 150 m<sup>2</sup> and also the conditions are different. The average temperature during the winter period range between 5 and 10°C, because of plants condition needs. Structurally is also different than the tropical one. Plants are situated into two lines with the narrow corridor between. In this greenhouse is grown only 30 species from 20 families, but we can find here typical subtropical species such as Olive tree, Pomegranate, Fig tree, Tee tree, Mediterranean mandarin, Lemons, Lychee, True bay and Rosemary. The full list of the species is available in the appendix. The map of current taxon division in the subtropical greenhouse is also available in the appendix. (Fig. Appendices 4)

#### 4.1.3 The table greenhouse (TABGH)

The table greenhouse usually is not open for public. Serves like a storage greenhouse with plants in pots. Its main functions are preparation of plant material for researches, for student thesis and like storage place for plants which have not yet the fixed position in the collection. Some plants are also breeding in here and then selling. The total area of this greenhouse is 187 m<sup>2</sup> and the temperature in the winter time is kept in the same temperature like in the tropical greenhouse, 18 to 20°C. Total amount of taxons is in this greenhouse 263 dividing into 85 families. The full list of the species is available in the appendices.

#### 4.1.4 The Lysimeter greenhouse (LGH)

The lysimeter greenhouse is very small storage place, 100 m<sup>2</sup>, which serve for storing and breeding *Citrus* spp. and some other species from family *Rutaceae*. The plant living collection of ITS includes large number of *Citrus* spp. but mostly with uncertain origin and not clear scientific name. One of the aims of my thesis was to verify the present data of species and with the help of Descriptor of *Citrus* (IPGRI, 1999) determine the correct scientific name. During the work was necessary to pick up the ripen fruits, full-grown leaves, determine the presence of seed. Then put through the research the pulp of the fruit, exactly by the manual. During the research was detected 33 *Citrus* spp. Complete list with the species is available in the

appendix together with example of Citrus descriptor which was made during my thesis and will serve for easier orientation in Citrus spp. collection.

#### 4.1.5 The outdoor collection (OD)

The outdoor collection represents mainly the European and Asian medicinal, aromatical and ornamental plants. The collection includes 158 plant species divided into 37 families. This collection represents species like Oregano, Lavender, Saffron, Sage, Fennel, Absinthe Wormwood and Hyssop. Complete list of the species is available in the appendices.

#### 4.1.6 The index seminum (IS)

Index Seminum represents the list of seeds offered for exchange to Botanical Gardens and Institutes. This seeds are collected from the plants growing in the collection. Some of the seeds collected are reseeded in polycarbonate greenhouses and serve like a source for another production. Also when the plants are growing, they are one of the essential parts of the living collection. Plants from index seminum are each year offered to other institution in the framework of interinstitution exchange. Institute of Tropics and Subtropics is each year providing new index seminum. The complete index seminum for year 2007 is available in the attachment.

**Tab. 2: Important facts about the parts of collection in numbers**

| Collection part        | N. of species | N. of families | Total area               |
|------------------------|---------------|----------------|--------------------------|
| Tropical greenhouse    | 131           | 61             | 250 m <sup>2</sup>       |
| Subtropical greenhouse | 30            | 20             | 150 m <sup>2</sup>       |
| Table greenhouse       | 263           | 85             | 187 m <sup>2</sup>       |
| Lysimeter greenhouse   | 37            | 2              | 100 m <sup>2</sup>       |
| Outdoor collection     | 158           | 37             | 1000 m <sup>2</sup>      |
| Index seminum          | 388           | 65             | no area                  |
| <b>Total number</b>    | <b>848</b>    | <b>136</b>     | <b>2070m<sup>2</sup></b> |

## **4.2 Plant monitoring system**

### **4.2.1 Accession report**

In general the ITS plant living collection have absence of quality documentation. During more than 40 years of collection existence, large number of taxons was collected, but unfortunately until this days we have only very poor notes about the plants which were imported. It exist paper documentation about the plants in collection, but the conditions are not responds to the quality of the collection. The documents are incomplete, some taxon growing in the collection are not included in this papers and we dont know the exact number of the species. If the information about the plant exists, usually the basic data such a name of collector, origin and date of submission into the collection are missing. Unfortunately is almost impossible to found this information about the plants which are in the collection many years, this valuable data are probably lost for ever. During the last years some notes about the plants importing mainly from Peru and Vietnam where ITS now doing its projects are available, but its necesarry to established fixed rools of data storing for the future. One of the outputs of my thesis is very easy concept of steps which can lead this collection. This form in computer database or paper form, known like accession report can help for sustainable development of the collection data informations. Due the scanning of these tipes of documentation of other botanical istitution I put together the form which is optimalsed for ITS living plant collections needs. (Tab. 3)

**Tab. 3: Accession report for ITS**

Accession no.:

(full filled by curator of botanic garden)

## ACCESSION REPORT

**Scientific Name of Taxon:**

**Participating Institution:**

**Name of collector:**

**Date:**

---

**Source (check one only):**

Field collected (if yes, complete Field Collection Data Sheed)

In-house propagation (if yes, complete Propagation Data Sheed)

Received from another institution

Name of institution:

Contact person:

Contact:

Their accessions:

Other (specify)

**FIELD COLLECTION DATA SHEED**

|  |             |           |
|--|-------------|-----------|
| Genus  | Species     | Collector |
| Collected part   | Subsp. etc. | Date      |
| Number of parts  | GPS         | Altitude  |
| Location description (including country, region, etc.) |             |           |

---

**PROPAGATION DATA SHEED**

|             |            |             |
|-------------|------------|-------------|
| Genus       | Species    | Acc. number |
| Subsp. etc. | Propagator | Date        |

**Propagation material**

- seed
- cutting
- root cutting
- scion
- bud
- spores
- tissue culture
- air layer
- other

**Site info**

- green house
- shade house
- open space
- other

**Seed preparation****CLEANING**

- dry strained
- wet strained
- fungicide
- other

**STORAGE**

- dried
- stored
- how long
- what conditions

**Seed or cutting techniques**

- hot water soaking
- cold water soaking
- scarify
- chemicals
- hormone
- fungicide
- inoculant
- other

#### 4.2.2 Labells

The current situation in the collection offers very simple type of labelling. Each plant have the plastic identifier tag (Fig.5 and 6) placed in the soil in front of the tree. This seems to be quit sufficient, but in fact, the labels are very small and in the vegetation is time to time not so easy to find this label, or recognize exatly to which plant its belong. Also the labels are with exception of taxons in tropical and subtropical greenhouse hand writing, which is also not so suitable. For recording of the dates on the label was not used proper marker and the legend are often blur or hardly identifiable. Even the direction of labels, which is vertical, is not a lucky solution. Another disadvantage of these labels is its size. Because of it, often it is not on them enough place for whole and correct verancular name, which the essencial information for all visitors and students is.



Fig. 5: Unsuitable plastic label



Fig. 6: Improved plastic label used in collection

In the tropical and subtropical greenhouse, which are open for public, were during the existation of the collection placed new labels (Fig. 7) almost for all taxons. These labels offer the information such scientific name, name of family and origin of the taxon. They are more soffistiated, made from hard plastic material which resists longer time without bigger demeges. The text is groowe on the label, so its permanet and easy readable, also is bigger and placed horizontaly. Little dissegvantage is the calor. White tags with green texture are reflex and not suitable for photographing.



Fig. 7: Good example of label in the collection

In the comparison with other institutions which hold botanical collection or botanical gardens, I am still missing in here some usefull information for visitors or even for employees of the greenhouses. So I decided to design new type of labels suitable for this collection. (Fig. 8) the new label should be easy visible and tolerant for making photograpic documentation. The best will be the combination of black label with white groowing. Obviosly should be horizontaly placed. Recommended content is the family name, scientific name, vernacular (English) name, origin and accession number. The knowledge of vernacular name should help student to found more information about the taxon, and presence of accession number can halp with orientation in the collection. In appendices is also available Fig. Appendices 3, example of possible labeling for education purposes.

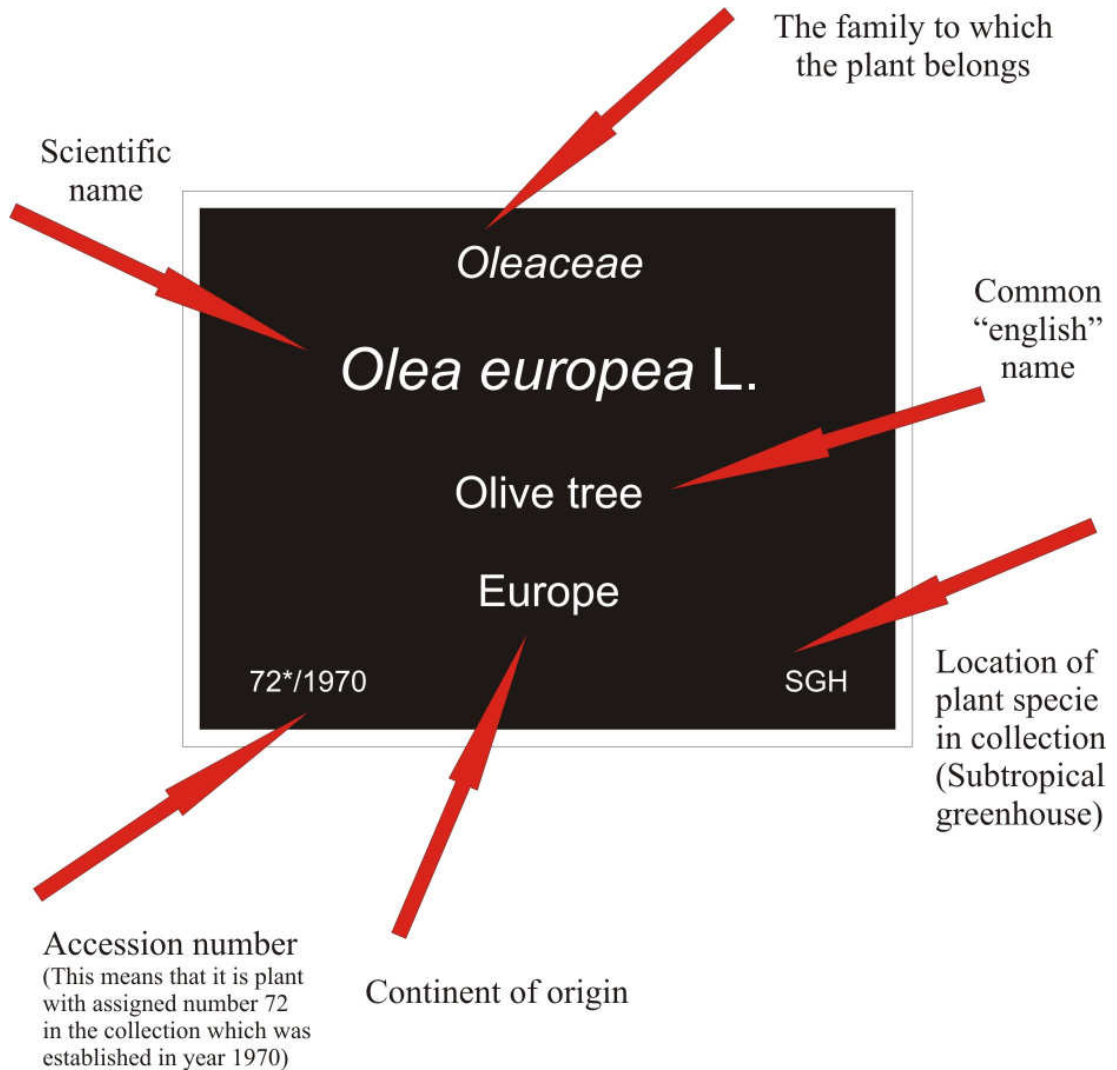


Fig. 8: Concept of new design for ITS collection

#### 4.2.3 Monitoring and data keeping

How I mentioned in the chapter 4.2.1 the situation in data storing and monitoring of plants moved in the collection is not optimal. The collection urgently needs systematic leading. It's essential to have under the control all the plants in greenhouses, outdoor collection and index seminum. Each unit needs to be marked with special code, which will be linked with, and no other plant will ever have the same. Even in the case that the original plant will die, or will be removed from the collection from other reason. In the case of annual species, which are planting each year and than from the seeds replanting again is the situation absolutely identical. On my opinion the way how to keep the collection in order is writing accession reports for each new taxon, annual species and new plant developed from



## RESULTS AND DISCUSSION

original plants. This report should be stored for ever in the database. Even after the dead of the plan the information from the report are important and need to be kept.

In the case of new coming species is the situation quite simple. Each unit will be added in the collection directly with the accession report, which will be full filled by collector, replanter or other responsible person (Ex. If the plant is coming from other institution, the curator of the collection will take care about it.) Then the curator of the ITS collection will immediately assign to the plant accession number a will save report into the database. For now is sufficient simply database made in Excel (Fig. 9) or Access for example. Highly recommended for the future is some databases programs such as Taxis 3.5. Will be also interested have the online database, for direct full filling of accession reports by collectors.

|     | A                | B  | C               | D        | E                   | F                  | G        |
|-----|------------------|--|-----------------|----------|---------------------|--------------------|----------|
| 1   | Family           | Latin name   | Origin          | Location | Uses                | English name       |          |
| 342 |                  | <i>Vigna unguiculata</i> (L.) Walp. ssp. unguiculata | no origin       | IS       | food                | Jerusalem Pea      |          |
| 343 | Fagaceae         | <i>Quercus</i> L.                                    |                 | TABGH    |                     | Oak                |          |
| 344 | Flacourtiaceae   | <i>Dovyalis caffra</i> Sim                           | S Africa        | TABGH    | food                | Digaan's apple     |          |
| 345 |                  | <i>Flacourtia indica</i> Merr.                       | Madagascar      | TGH      | food                | Madagascar plum    |          |
| 346 | Gentianaceae     | <i>Gentiana tibetica</i> King ex Hook.f.             | Asia            | OD       | medicines           | Tibetan Gentian    | IS       |
| 347 | Geraniaceae      | <i>Pelargonium odoratissimum</i> L./ L'Hér.          | Africa          | SGH      | environmental uses  | Nutmeg pelargonium |          |
| 348 | Grossulariaceae  | <i>Ribes rubrum</i> L.                               | W Europe        | IS       | food                | Red Currant        |          |
| 349 |                  | <i>Ribes vulgare</i> Lam. 'Album'                    | no origin       | IS       | food                | Red Currant        |          |
| 350 | Guttiferae       | <i>Garcinia xanthochymus</i> Hook f.                 |                 | IS       |                     |                    |          |
| 351 | Hypericaceae     | <i>Hypericum perforatum</i> L.                       | Europe          | IS       | medicines           | St. John's Wort    |          |
| 352 | Chenopodiaceae   | <i>Chenopodium ambrosioides</i> L.                   | Mexico          | IS       | materials, food ad. | Mexican Tea        |          |
| 353 |                  | <i>Chenopodium quinoa</i> Willd.                     | S America       | IS       | food                | Quinoa             |          |
| 354 | Chrysobalanaceae | <i>Chryzobalanus icaco</i> L.                        | C and S America | TGH      | food                | Pigeon plum        | TABGH    |
| 355 | Chusiaceae       | <i>Hypericum hirsutum</i> L.                         | Europe          | OD       | medicines           | Hypericum          |          |
| 356 | Iridaceae        | <i>Belamcanda chinensis</i> DC.                      | India           | TGH      | medicines           | Blackberry lily    | TABGH,IS |
| 357 |                  | <i>Crocus sativus</i> L.                             | S Europe        | OD       | food additives      | Saffron            |          |
| 358 |                  | <i>Iris sanguinea</i> Donn                           | E Asia          | OD       | medicines           | Snow Queen         | IS       |
| 359 |                  | <i>Neomarica gracilis</i> Sprague                    |                 | TGH      | environmental uses  | Apostle plant      |          |
| 360 | Juglandaceae     | <i>Cyclocarya paliurus</i> (Batalin) Iljinsk.        |                 | TABGH    | medicines           |                    |          |
| 361 | Labiaceae        | <i>Rosmarinus officinalis</i> L.                     | Mediterran      | SGH      | food additives      | Rosemary           |          |
| 362 | Lamiaceae        | <i>Hyssopus officinalis</i> L.                       | Mediterran      | OD       | medicines           | Hyssop             | IS       |
| 363 |                  | <i>Hyssopus officinalis</i> L. ssp. "aristatus"      | no origin       | OD       | materials           | Hyssop             |          |
| 364 |                  | <i>Hyssopus officinalis</i> L. var. "alba"           | no origin       | OD       | medicines           | Hyssop             | IS       |
| 365 |                  | <i>Lavandula angustifolia</i> Mill.                  | Mediterran      | OD       | medicines, mat.     | English Lavander   | IS       |
| 366 |                  | <i>Lavandula officinalis</i> Chaix                   | Mediterran      | OD       | medicines, mat.     | Lavender           | IS       |
| 367 |                  | <i>Lavandula vera</i> DC.                            | Mediterran      | OD       | medicines, mat.     | Lavender           |          |

Fig. 9: Example of MS Excel list of the species in the collection

The situation with the plants which are in the collection for long time and we don't have the necessary data is complicated. Probably will be needfull to determine the special codes for these plants. One of the possible resolutions I am offering in the table of accession number. (Fig. 10)

**Fig. 10: Simply project for accessioning**

|                         |   |
|-------------------------|---|
| <b>72*/1970<br/>SGH</b> | Its mean that is one of the original plant from the collection. We don't have exact information about the time when the plant was assign in collection. We added artificial number 72, because before we don't have the correct information in 71 cases. The symbol * shows that this plant has uncertain origin. The plant is located in subtropical greenhouse. |
| <b>03/2008 OD</b>       | In this case we have new plant. We have information about the origin etc. (Accession report). Is the third plant added into the collection in year 2008 and is located in outdoor collection.   |

### 4.3 Collection data

The final list of taxon composition in the collection of ITS, was made by putting all the single greenhouses, outdoor collection and index seminum data lists together. This list is alphabetically organized by family names. Inside of the families the taxons are also organized in alphabetical order by botanical names. Each one species is in the list represented only ones, even if this taxon is more time in the collection. That makes the different in the total number of taxons in the final list and the sum of all greenhouses and outdoor collections together. Except the botanical names and family, the final list contains also the vernacular names, origins of the taxons and type of uses.

The collection content 848 taxons divided into 136 families (Tab. Appendices 1) in appendixes. Among most principal families belong *Lamiaceae* with 65 taxons, *Poaceae* with 62, *Fabaceae* 61 and *Rutaceae* 60. In the case of family *Fabaceae*, where the situation of nomenclature isn't still uniform, I decided to file other species from *Leguminosae* into *Fabaceae* family too. All families from the collection of ITS with the frequency of representation of taxons are displayed in Tab. 3.

**Tab. 3: Families with frequency of representing taxa from ITS collection**

|                         |    |                         |    |                       |    |                         |    |
|-------------------------|----|-------------------------|----|-----------------------|----|-------------------------|----|
| <i>Acanthaceae</i>      | 2  | <i>Caryophyllaceae</i>  | 2  | <i>Iridaceae</i>      | 4  | <i>Proteaceae</i>       | 3  |
| <i>Actinidiaceae</i>    | 3  | <i>Celastraceae</i>     | 1  | <i>Juglandaceae</i>   | 1  | <i>Punicaceae</i>       | 1  |
| <i>Agavaceae</i>        | 2  | <i>Clusiaceae</i>       | 5  | <i>Labiaceae</i>      | 1  | <i>Ranunculaceae</i>    | 12 |
| <i>Alliaceae</i>        | 6  | <i>Combretaceae</i>     | 2  | <i>Lamiaceae</i>      | 65 | <i>Resedaceae</i>       | 6  |
| <i>Amaranthaceae</i>    | 13 | <i>Commelinaceae</i>    | 1  | <i>Lauraceae</i>      | 8  | <i>Rhamnaceae</i>       | 3  |
| <i>Amarillidaceae</i>   | 1  | <i>Convallariaceae</i>  | 1  | <i>Liliaceae</i>      | 4  | <i>Rhizophoraceae</i>   | 2  |
| <i>Amaryllidaceae</i>   | 1  | <i>Convolvulaceae</i>   | 3  | <i>Loganiaceae</i>    | 1  | <i>Rosaceae</i>         | 8  |
| <i>Anacardiaceae</i>    | 7  | <i>Cornaceae</i>        | 1  | <i>Lythraceae</i>     | 1  | <i>Rubiaceae</i>        | 14 |
| <i>Annonaceae</i>       | 7  | <i>Costaceae</i>        | 2  | <i>Malpighiaceae</i>  | 2  | <i>Ruscaceae</i>        | 1  |
| <i>Anthericaceae</i>    | 1  | <i>Crassulaceae</i>     | 3  | <i>Malvaceae</i>      | 14 | <i>Rutaceae</i>         | 60 |
| <i>Apiaceae</i>         | 12 | <i>Cucurbitaceae</i>    | 17 | <i>Marantaceae</i>    | 5  | <i>Sapindaceae</i>      | 7  |
| <i>Apocynaceae</i>      | 5  | <i>Cycadaceae</i>       | 2  | <i>Meliaceae</i>      | 4  | <i>Sapotaceae</i>       | 7  |
| <i>Araceae</i>          | 12 | <i>Cyperaceae</i>       | 3  | <i>Moraceae</i>       | 5  | <i>Saururaceae</i>      | 1  |
| <i>Araliaceae</i>       | 6  | <i>Davalliaceae</i>     | 1  | <i>Musaceae</i>       | 8  | <i>Saxifragaceae</i>    | 1  |
| <i>Arecaceae</i>        | 23 | <i>Dioscoreaceae</i>    | 6  | <i>Myrtaceae</i>      | 34 | <i>Scrophulariaceae</i> | 26 |
| <i>Aristolochiaceae</i> | 1  | <i>Dracaenaceae</i>     | 4  | <i>Oenotheraceae</i>  | 1  | <i>Schisandraceae</i>   | 1  |
| <i>Asclepiadaceae</i>   | 1  | <i>Dryopteridaceae</i>  | 2  | <i>Ochnaceae</i>      | 1  | <i>Simmondsiaceae</i>   | 1  |
| <i>Asparagaceae</i>     | 1  | <i>Ebenaceae</i>        | 2  | <i>Oleaceae</i>       | 1  | <i>Solanaceae</i>       | 43 |
| <i>Aspleniaceae</i>     | 1  | <i>Elaeagnaceae</i>     | 3  | <i>Oleandraceae</i>   | 1  | <i>Sterculiaceae</i>    | 5  |
| <i>Asteraceae</i>       | 45 | <i>Ephedraceae</i>      | 1  | <i>Onagraceae</i>     | 1  | <i>Strelitziaceae</i>   | 3  |
| <i>Basellaceae</i>      | 3  | <i>Ericaceae</i>        | 1  | <i>Orchideaceae</i>   | 1  | <i>Theaceae</i>         | 2  |
| <i>Begoniaceae</i>      | 1  | <i>Erythroxylaceae</i>  | 1  | <i>Oxalidaceae</i>    | 2  | <i>Tiliaceae</i>        | 1  |
| <i>Bignoniaceae</i>     | 3  | <i>Eucommiaceae</i>     | 1  | <i>Paeoniaceae</i>    | 3  | <i>Tropaeolaceae</i>    | 1  |
| <i>Bixaceae</i>         | 2  | <i>Euphorbiaceae</i>    | 18 | <i>Papaveraceae</i>   | 5  | <i>Umbelliferae</i>     | 1  |
| <i>Bombacaceae</i>      | 7  | <i>Fabaceae</i>         | 61 | <i>Passifloraceae</i> | 5  | <i>Urticaceae</i>       | 3  |
| <i>Boraginaceae</i>     | 2  | <i>Fagaceae</i>         | 1  | <i>Pinaceae</i>       | 1  | <i>Valerianaceae</i>    | 1  |
| <i>Brassicaceae</i>     | 8  | <i>Flacourtiaceae</i>   | 2  | <i>Piperaceae</i>     | 5  | <i>Verbenaceae</i>      | 8  |
| <i>Bromeliaceae</i>     | 2  | <i>Gentianaceae</i>     | 1  | <i>Pittosporaceae</i> | 1  | <i>Vitaceae</i>         | 3  |
| <i>Cactaceae</i>        | 4  | <i>Geraniaceae</i>      | 1  | <i>Plantaginaceae</i> | 2  | <i>Zingiberaceae</i>    | 9  |
| <i>Campanulaceae</i>    | 3  | <i>Grossulariaceae</i>  | 2  | <i>Plumbaginaceae</i> | 1  | <i>Zygophyllaceae</i>   | 1  |
| <i>Cannabaceae</i>      | 4  | <i>Guttiferae</i>       | 1  | <i>Poaceae</i>        | 62 |                         |    |
| <i>Cannaceae</i>        | 2  | <i>Hypericaceae</i>     | 1  | <i>Podocarpaceae</i>  | 1  |                         |    |
| <i>Capparaceae</i>      | 2  | <i>Chenopodiaceae</i>   | 2  | <i>Polemoniaceae</i>  | 1  |                         |    |
| <i>Caprifoliaceae</i>   | 2  | <i>Chrysobalanaceae</i> | 1  | <i>Polygonaceae</i>   | 5  |                         |    |
| <i>Caricaceae</i>       | 2  | <i>Chusiaceae</i>       | 1  | <i>Portulacaceae</i>  | 1  |                         |    |

Very interested is to have a look on the collection from the side of origin. Of course is not possible to make any summarization by the countries or other small areas. Even in small case of plants we know directly the location of the origin. More common are the information about the continent of the origin, so I decided also use this system of classification. Among the most representative continents belongs with 30,9 % Asia, 27,4 % America and 26,7 % Europe. Following Africa with 9,5 % and Australia 5,5 %. (Fig. 11) In the case of Americas and Asia is the situation quite clear and understandable. These two continents have the largest tropical forests and also the subtropical regions reach giant areas. The ITS is in these zones for many years

making different types of project and is participating in the researches. No wonder than the collection is basically made by the plants from these regions. In the case of high number of European species is important to mention that the situation is caused by presence of large collection of European medicinal and aromatic plant in the outdoor collection.

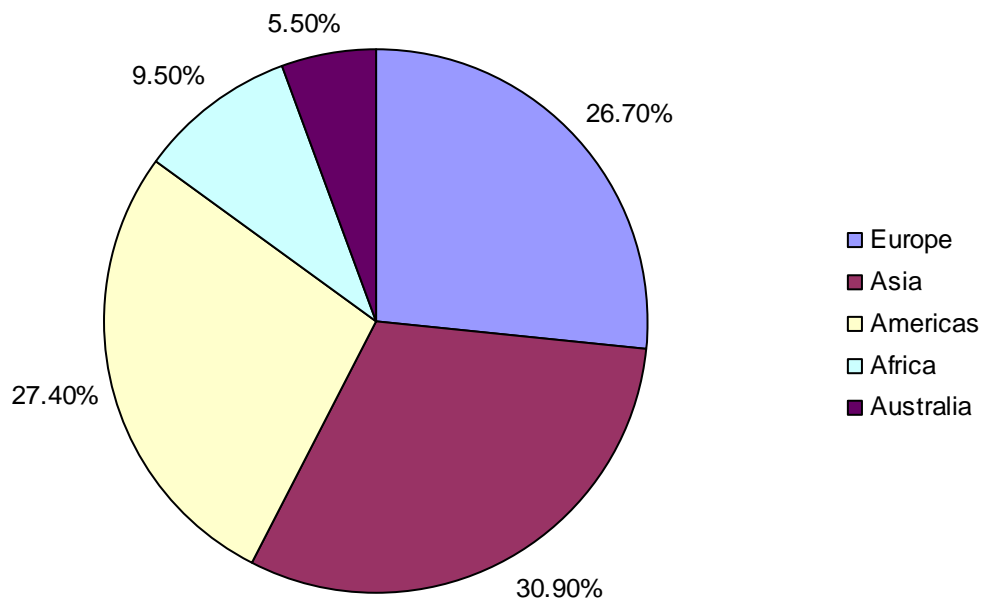


Fig. 11: Species geographical origin in the plant living collection

For comparison we can see the Fig. 12 which represents division of origin frequency in the greenhouse part of ITS collection. We can see the degradation of the frequency in the case of European species from the value 26,7% to 5,2%. This difference in the frequency increases the percentage representation of the Asian and American species.

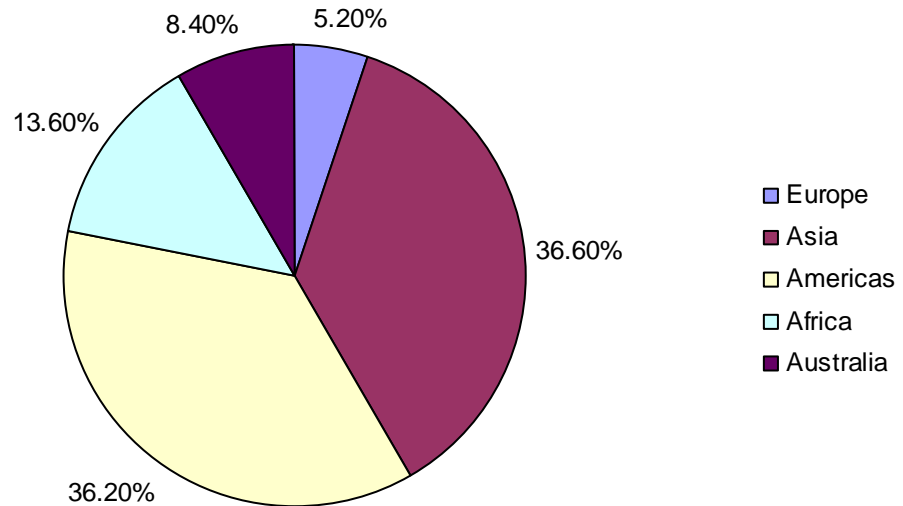


Fig. 12: Geographical origin of the species grown in the greenhouses

Interested information should be that 127 species from total number in the collection are varieties or cultivar of species. These ones were not included in the statistic of origins as well as plants with uncertain origin.

Another interested point of view is division of the collection by way of use. Many people know the plants because of that characteristic and the visitors are usually recognizing the plants with commercial use such a fruits, vegetables, spices etc. There are many possibilities of categorization by uses I decided to choose the 1.level of EBDCS (Economic Botany Data Collection Standard) system.

- **Food** (food, including beverages, for humans only)
- **Food Additives** (processing agents and other additive ingredients which are used in food preparation)
- **Animal food** (forage and fodder for vertebrate animals only)
- **Bee plants** (pollen or nectar sources for honey production. This has been separated from section of Invertebrate food to this importance particularly within developing countries)

- **Invertebrate food** (only plants eaten by invertebrates useful to humans, such as silkworms, insects and edible grubs, are covered here)
- **Materials** (woods, fibres, cork, cane, tannins, latex, resins, gums, waxes, oils, lipids, etc. and their derived products)
- **Fuels** (wood, charcoal, petroleum substitutes, fuel alcohols etc. – have been separated from section of materials because of their importance)
- **Social uses** (plants used for special purposes, which are not definable as food or medicines, for instance masticatories, smoking materials, narcotics, hallucinogens and psychoactive drugs, contraceptives and abortifacients and plants with ritual or religious significance)
- **Vertebrate poisons** (plants which are poisonous to vertebrate, both accidentally and usefully, e.g. for hunting and fishing)
- **Non-vertebrate** (both accidental and useful poisons (e.g. molluscicides, herbicides, insecticides) to non-vertebrate animals, plants, bacteria and fungi, are included.)
- **Medicines** (both human and veterinary)
- **Environmental uses** (examples include intercrops and nurse crops, ornamentals, barrier hedges, shade plants, windbreaks, soil improvers, plants for revegetation and erosion control, waste water purifiers, indicators of the presence of metals, pollution, or underground water)
- **Gene sources** (wild relatives of major crops which may possess traits or qualities, such as disease resistance, cold hardiness etc., of value in breeding programmes).

Of course many of the plant are multipurpose, that's mean that are producing more than one useful item. In these cases I choose the most important way of use and after that was the taxon dedicated in the proper group. Some plants which have unrecognized main type of use or we don't know exactly uses are not included in the statistic. Detailed information is shown in the Tab. 4.

**Tab. 4: Division of taxons in dependence of commodity group**

| <b>Comodity group</b>                  | <b>Representation of taxons in groups</b> | <b>No. of taxons in commodity groups</b> |
|--|---|--|
| <b>Food</b>                            | 31,90%                                    | 271                                      |
| <b>Food Additives</b>                  | 7,60%                                     | 65                                       |
| <b>Animal food</b>                     | 1,20%                                     | 10                                       |
| <b>Bee plants</b>                      | 0,10%                                     | 1  |
| <b>Invertebrate food</b>               | 0%  | 0  |
| <b>Materials</b>                       | 8,10%                                     | 69                                       |
| <b>Fuels</b>                           | 0%  | 0  |
| <b>Social uses</b>                     | 2,90%                                     | 25                                       |
| <b>Vertebrate poisons</b>              | 0%  | 0  |
| <b>Non-vertebrate</b>                  | 0%  | 0  |
| <b>Medicines</b>                       | 16,90%                                    | 143                                      |
| <b>Environmental uses</b>              | 12,40%                                    | 105                                      |
| <b>Gene sources</b>                    | 0%  | 0  |
| <b>No origin (cultivar, varieties)</b> | 18,90%                                    | 159                                      |

Another integral part of this thesis was scanning of situation in Lysimetric greenhouse, where mainly *Citrus* spp. are, but mostly with uncertain origin and not clear scientific name. So I decided to verify the present data of species and with the help of Descriptor of Citrus (IPGRI, 1999) determine the correct scientific name. During the work was necessary to pick up the ripen fruits, full-grown leaves, determine the presence of seed. Than put through the research the pulp of the fruit, exactly by the manual. During the research was detected 41 *Citrus* spp. Tab. 5. As a result Descriptor of Citrus was framed. In Fig. 13 we can see the example list of the *Citrus unshiu* cv. 'Kawano' and whole Descriptor is available in appendices. (Fig. Appendices 2)

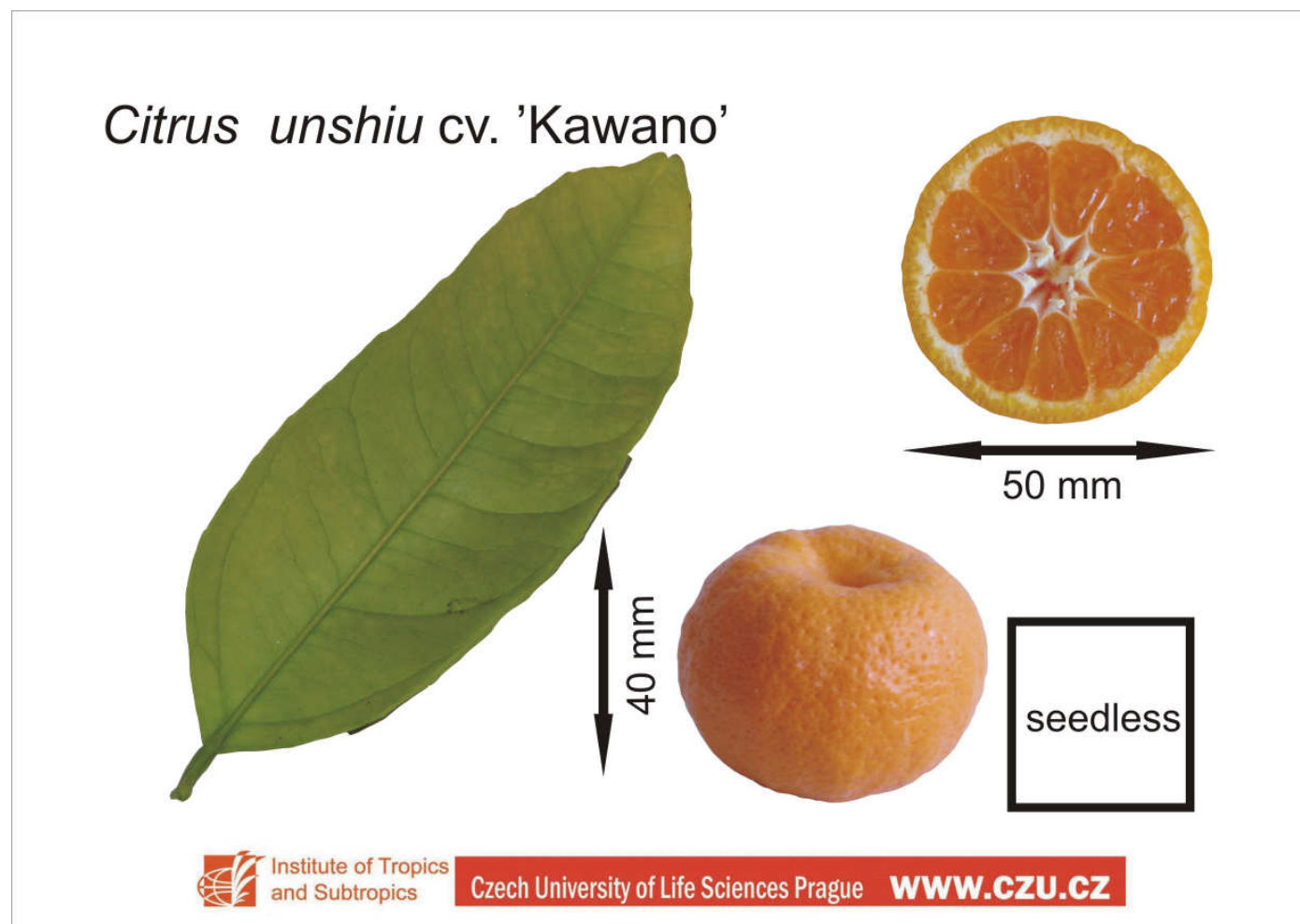
Tab. 5: *Citrus* ssp. collection

| Latin name   | Origin               | Location | Uses | English name                |
|--|----------------------|----------|------|-----------------------------|
| <i>Citrus aurantium</i> L.                                 | Indochina            | TGH      | food | Seville orange              |
| <i>Citrus deliciosa</i> Ten.                               | Mediterranean region | LGH      | food | Mediterranean mandarin      |
| <i>Citrus grandis</i> cv. 'Mato Buntan'                    | cultivar             | LGH      | food | Mato Buntan Pomelo          |
| <i>Citrus grandis</i> Osbeck                               | SE Asia              | TGH      | food | Pummelo                     |
| <i>Citrus leiocarpa</i> Hort. ex Tanaka                    |                      | LGH      | food |                             |
| <i>Citrus limon</i> cv. 'Eureka'                           | cultivar             | LGH      | food | Eureka lemon                |
| <i>Citrus limon</i> cv. 'Lisbon'                           | cultivar             | LGH      | food | Portuguese lemon            |
| <i>Citrus limon</i> cv. 'Lunario'                          | cultivar             | LGH      | food |                             |
| <i>Citrus limon</i> var. 'Meyerii'                         | variety              | LGH      | food | Meyer lemon                 |
| <i>Citrus limonia</i> Osbeck                               | India                | TGH      | food | Chine limon                 |
| <i>Citrus meyeri</i> Tan.                                  | China                | SGH      | food | Meyer lemon                 |
| <i>Citrus paradisi</i> cv. 'Duncan'                        | cultivar             | LGH      | food | Duncan grapefruit           |
| <i>Citrus paradisi</i> cv. 'Marsh'                         | cultivar             | LGH      | food | Marsh (seedless) grapefruit |
| <i>Citrus paradisi</i> cv. 'Thomson'                       | cultivar             | LGH      | food | Thomson grapefruit          |
| <i>Citrus pyriformis</i> Hassk.                            | hybrid               | LGH      | food | Ponderosa lemon             |
| <i>Citrus reshni</i> Hort. ex Tanaka                       | India                | LGH      | food |                             |
| <i>Citrus reticulata</i> cv. 'Dancy'                       | cultivar             | LGH      | food | Dancy tangerine             |
| <i>Citrus reticulata</i> Nova                              | hybrid               | LGH      | food | Nova mandarine              |
| <i>Citrus reticulata</i> Osceola                           | hybrid               | LGH      | food | Osceola mandarine           |
| <i>Citrus reticulata</i> Robinson                          | hybrid               | LGH      | food | Robinson mandarine          |
| <i>Citrus sinensis</i> /L./ Osbeck cv. 'Verna'             | cultivar             | SGH      | food | Chine lemon                 |
| <i>Citrus sinensis</i> /L./ Osbeck. cv. 'Hamlin'           | cultivar             | SGH      | food | Chine lemon                 |
| <i>Citrus sinensis</i> /L./ Osbeck. cv. 'Valencia'         | cultivar             | SGH      | food | Chine lemon                 |
| <i>Citrus sinensis</i> /L./ Osbeck. cv. 'Washington navel' | cultivar             | SGH      | food | Chine lemon                 |
| <i>Citrus sinensis</i> cv. 'Cutter Valencia'               | cultivar             | LGH      | food | Cutter Valencia Orange      |
| <i>Citrus sinensis</i> cv. 'Fisher Navel'                  | cultivar             | LGH      | food | Fisher Navel Orange         |
| <i>Citrus sinensis</i> cv. 'Hamlin'                        | cultivar             | LGH      | food | Hamlin orange               |
| <i>Citrus sinensis</i> cv. 'Newhall Nuclear Navel'         | cultivar             | LGH      | food | Newhall Navel Orange        |



|  |          |     |           |                            |
|--|----------|-----|-----------|----------------------------|
| <i>Citrus sinensis</i> cv. 'Olinda Valencia' | cultivar | LGH | food      | Olinda Valencia orange     |
| <i>Citrus sinensis</i> cv. 'Shamouti'        | cultivar | LGH | food      | Palestine orange           |
| <i>Citrus sinensis</i> cv. 'Taroco'          | cultivar | LGH | food      | Tarococo deep blood orange |
| <i>Citrus sinensis</i> cv. 'Thomson Navel'   | cultivar | LGH | food      | Thomson navel orange       |
| <i>Citrus sinensis</i> cv. 'Valencia'        | cultivar | LGH | food      | Valencia orange            |
| <i>Citrus sinensis</i> cv. Parson Brown      | cultivar | LGH | food      |                            |
| <i>Citrus sunki</i> Hort. ex Tanaka          | China    | LGH | food      |                            |
| <i>Citrus tangerina</i> Tan.                 | Japan    | SGH | materials | Tangerine                  |
| <i>Citrus unshiu</i> cv. 'Kawano'            | cultivar | LGH | food      | Kawano satsuma             |
| <i>Citrus unshiu</i> cv. 'Kuno'              | cultivar | LGH | food      | Kuno satsuma               |
| <i>Citrus unshiu</i> cv. 'Owari'             | cultivar | LGH | food      | Owari satsuma              |
| <i>Citrus unshiu</i> cv. 'Silverhill'        | cultivar | LGH | food      | Silverhill satsuma         |
| <i>Citrus unshiu</i> Marc.                   | Japan    | SGH | food      | Satsuma mandarin           |

Fig. 13: Example of Citrus descriptor of ITS *Citrus unshiu* cv. 'Kawano'



## 5. Conclusion

In frame of this work, we have identified 848 plant species, divided in 136 families, which are hold in plant living collection of Institute of Tropics and Subtropics, Czech University of Live Sciences Prague. This inventarisation is an important step of collection data keeping. Due the MS Excel database and proposal of accession reports will be possible to hold the collection in actual conditions, directly add or take off new data. Also orientation in the collection for education purposes is now simplified.

Fundamental step for Descriptor of Citruses of ITS was laid in, by formation of first 13 cards with the information about *Citrus* spp. Another 41 *Citrus* spp. were determined such a part of plant living collection.

According to the project of labeling, using of new system of labels will be discussed with the management of the collection. In the case of interest, new system of labeling will be installed. These labels will involve valid scientific name, family, vernacular name and origin for better orientation of students, pedagogical staff and visitors. Accession number and information about position in the collection, which will serve for simplification of work for employees, will be parts of labels too.

The taxonomic revision and botanical inventory is the stepping stone for the possible joining of the collection to the conservation programmes in the future.

## References

Anonymous, The Botanic Garden of Padova, 2007, Botanic garden, University of Padova, Available [online] URL: <http://www.cbft.unipd.it/pdtour/pdpict/garden.jpg> [2007-11-05]

Bermejo, J.E.H.: Information on ex situ collections maintained in botanic gardens, with special emphasis on plant genetic resources for food and agriculture, 1998, FAO Commission on genetic resources for food and agriculture. Available [online] URL: <ftp://ftp.fao.org/ag/cgrfa/BSP/bsp5E.pdf> [2008-03-07]

BGCI, Botanic Gardens Conservation International, 1987 [online], Richmond: Botanical Gardens Conservation International Available [online] URL: [http://www.bgci.org/botanic\\_gardens/definition](http://www.bgci.org/botanic_gardens/definition) [2007-11-16]

Biodiversity International: Available [online] URL: <http://www.biodiversityinternational.org> [2007-01-16]

Blakely, L.: DeDecker's Lupine, *Lupinus padre-crowleyi* C. P. Smith (*Fabaceae*), 2003, People Behind the Names of Eastern Sierra Native Plants. Available [online] URL: <http://www.csupomona.edu/~larryblakely/whoname/ldd-type.jpg> [2007-11-05]

Chavan, V., Krishnan, S.: 2003, Natural history collections: A call for national information infrastructure. *Current science*, vol. 84,, no. 1: 34-42

Citrus pages: Available [online] URL: <http://users.kymp.net/citruspages/> [2008-01-05]

Citrus variety collection: Available [online] URL: <http://www.citrusvariety.ucr.edu> [2008-01-05]

Convention on Biological Diversity: Conference of the Parties (COP), April 19, 2002 [online]. Hague: Global Strategy for Plant Conservation. Available [online] URL: <http://www.bgci.org/policy/gspc/> [2008-01-07]

Cook, F.E.M.: Economic Botany Data Collection Standard, (1995), Royal Botanic Gardens, Kew, U.K., ISBN 0947643710

## REFERENCES

- IPGRI, Descriptor of Citrus, 1999, Rome: International Plant Genetic Resources Institute. Available [online] URL: <http://www.cgiar.org/ipgri/> [2008-01-24]
- IPNI, International Plant Names Index, 2005. Available [online] URL: <http://www.ipni.org/> [2008-01-05]
- Lane, M.A.: 1996, Role of Natural History Collections. *Ann. Missouri Bot. Gard.* 83: 536-545
- Leadlay, E., Greene, J.: 1998. *The Darwin Technical Manual for Botanical Gardens*, Botanic Gardens Convention International, London, U.K., 136 pp, ISBN 0952027506)
- Macura, P.: 1993. *Elsevier's Dictionary of Botany*, Elsevier Science Publishers B.V., Netherlands, ISBN 0444417877
- Mansfeld's World Database of Agricultural and Horticultural Crops: Available URL: <http://mansfeld.ipk-gatersleben.de/> [2008-01-05]
- O'Neal, M.J.: BG-Base, Collections Management Software, 2004, Royal Botanic Garden of Edinburgh. Available [online] URL: <http://rbg-web2.rbge.org.uk/bg-base/barbar.gif> [2007-11-05]
- PFAF, Plants For A Future. Available [online] URL: <http://www.pfaf.org/> [2008-01-05]
- Young, J., Garden map, 2008, Allen Centennial Gardens. Wisconsin, U.S. Available [online] URL: [http://www.horticulture.wisc.edu/allencentennialgardens/images/Garden\\_Map.jpg](http://www.horticulture.wisc.edu/allencentennialgardens/images/Garden_Map.jpg) [2008-4-05]

## Appendices

**Tab. Appendices 1: Floristic composition of plant living collection of ITS**

| Family        | Latin name   | Origin          | Location | Uses               | English name                  |
|---------------|--|-----------------|----------|--------------------|-------------------------------|
| Acanthaceae   | <i>Acanthus mollis</i> Riedl ex Nees                           | SW Europe       | OD       | environmental uses | Spiny Acanthus                |
|               | <i>Barleria lupulina</i> Lindl.                                | SE Asia         | TABGH    | medicines          | Philippine violet             |
| Actinidiaceae | <i>Actinidia deliciosa</i> (A.Chev.)C.F.Liang et A.R. Ferguson | China           | SGH      | food               | Kiwifruit, Chinese gooseberry |
|               | <i>Actinidia kolomikta</i> (Maxim.) Maxim.                     | E Asia          | IS       | food               | Kolomikta actinidia           |
|               | <i>Actinidia polygama</i> Franch.                              | E Asia          | IS       | food               | Silvervine actinidia          |
| Agavaceae     | <i>Agave sisalana</i> Perrine ex Engelm.                       | Mexico          | TGH      | materials          | Sisal agave                   |
|               | <i>Yucca glauca</i> Nutt.                                      | C and N America | SGH      | materials          | Soapwell                      |
| Alliaceae     | <i>Allium jajlae</i> Vved.                                     |                 | IS       |                    |                               |
|               | <i>Allium ledebourianum</i> Roem. et Schult.                   | E Asia          | IS       | food additives     |                               |
|               | <i>Allium ledebourianum</i> Schult.f.                          | E Asia          | OD       | environmental uses | Ornamental onion              |
|               | <i>Allium rotundum</i> L. subsp. "jajlae"                      | S Europe        | OD       | food additives     |                               |
|               | <i>Allium schoenoprasum</i> L.                                 | Europe          | OD       | food additives     | Chives                        |
|               | <i>Allium sibiricum</i> L.                                     | E Asia          | IS       | food additives     |                               |
| Amaranthaceae | <i>Amaranthus atropurpureus</i> Roxb.                          |                 | IS       |                    |                               |
|               | <i>Amaranthus aureus</i> F. Dietr.                             |                 | IS       |                    |                               |
|               | <i>Amaranthus caudatus</i> L.                                  | T. America      | IS       | food               | Love Lies Bleeding            |
|               | <i>Amaranthus caudatus</i> L. var. 'Pendulinus'                | no origin       | IS       | food               | Love Lies Bleeding            |
|               | <i>Amaranthus cruentus</i> L. var. 'Ficha'                     | no origin       | IS       | food               | Purple Amaranth               |
|               | <i>Amaranthus cruentus</i> L.                                  | T. America      | IS       | food               | Purple Amaranth               |

## APPENDICES

| Family         | Latin name                               | Origin          | Location | Uses               | English name        |
|----------------|--|-----------------|----------|--------------------|---------------------|
|                | <i>Amaranthus graecizans</i> L.          | N America       | IS       | food               | Spreading Pigweed   |
|                | <i>Amaranthus hybridus</i> L.            | S Europe        | IS       | food               | Rough Pigweed       |
|                | <i>Amaranthus hypochondriacus</i> L.     | SN America      | IS       | food, medicines    | Prince's Feather    |
|                | <i>Amaranthus melancholicus</i> L.       |                 | IS       |                    |                     |
|                | <i>Amaranthus paniculatus</i> L.         |                 | IS       |                    |                     |
|                | <i>Amaranthus retroflexus</i> L.         | T. America      | IS       | environmental uses |                     |
|                | <i>Amaranthus tricolor</i> L.            | T. Asia         | IS       | food               | Chinese Spinach     |
| Amarillidaceae | <i>Crinum x poweli</i>                   | no origin       | TGH      | environmental uses | Powell's swamp lily |
| Amaryllidaceae | <i>Agave fourcroydes</i> Lem.            | Mexico          | TABGH    | materials          | Yucatan sisal       |
| Anacardiaceae  | <i>Anacardium occidentale</i> L.         | NE Brazil       | TGH      | food               | Cashew tree         |
|                | <i>Mangifera indica</i> L.               | NE India        | TGH      | food               | Common mango        |
|                | <i>Mangifera indica</i> L. var. 'Maya'   | no origin       | TABGH    | food               | Common mango        |
|                | <i>Pistacia chinensis</i> Bunge          | China           | TGH      | environmental uses | Chinese pistache    |
|                | <i>Rhus chinensis</i> Mill.              | E Asia          | TABGH    | environmental uses | Chinese sumac       |
|                | <i>Spondias cytherea</i> Sonn.           | S and SE Asia   | TABGH    | food               | Great hog plum      |
|                | <i>Spondias mombin</i> L.                | C and S America | TABGH    | food               | Thorny hog plum     |
| Annonaceae     | <i>Annona cherimolia</i> Mill.           | Peru, Ecuador   | SGH      | food               | Cherimoya           |
|                | <i>Annona lutescens</i> Saff.            | S America       | TGH      | food               | Custard apple       |
|                | <i>Annona muricata</i> L.                | C and S America | TGH      | food               | Soursop             |
|                | <i>Annona reticulata</i> L.              | India           | TGH      | food               | Bullock's heart     |
|                | <i>Annona squamosa</i> Vell.             | S America       | TGH      | food               | Sugar apple         |
|                | <i>Cananga odorata</i> Hook.f. & Thomson | SE Asia         | TGH      | materials          | Ylang-ylang         |
|                | <i>Rollinia mucosa</i> Baill.            |                 | TABGH    | materials, food    | Wild sugar apple    |
| Anthericaceae  | <i>Anemarrhena asphodeloides</i> Bunge   | E Asia          | OD       |                    | Zhi Mu              |

## APPENDICES

| Family                                      | Latin name   | Origin                        | Location        | Uses                 | English name          |
|---|--|-------------------------------|-----------------|----------------------|-----------------------|
| Apiaceae                                    | <i>Angelica archangelica</i> L.                    | Europe                        | IS              | food, medicines      | Garden angelica       |
|   | <i>Centella asiatica</i> (L.) Urb.                 | Asia                          | TABGH           | food                 | Asiatic pennywort     |
|   | <i>Eryngium bromeliaefolium</i> Delar.             |                               | IS              |                      |                       |
|   | <i>Eryngium planum</i> Lindl.                      | E Europe                      | OD              | medicines            | Plains Eryngo         |
|   | <i>Ferulla assa-foetida</i> Martyn                 | Asia                          | OD              | medicines            | Asafoetida            |
|   | <i>Foeniculum vulgare</i> Mill.                    | S Europe                      | OD              | food additives       | Fennel                |
|   | <i>Foeniculum vulgare</i> Mill. var. 'Pinale'      | no origin                     | IS              | food additives       | Fennel                |
|   | <i>Levisticum officinale</i> Koch.                 | Europe                        | IS              | food additives, med. | Garden lovage         |
|   | <i>Ligusticum lucidum</i> Mill.                    |                               | OD              |                      |                       |
|   | <i>Molopospermum</i> Koch                          |                               | TABGH           |                      |                       |
|   | <i>Petroselinum hortense</i> Hoffm.                | C and S Europe                | IS              | food additives, med. | Common garden Parsley |
|   | <i>Sium sisarum</i> L.                             | E Europe                      | IS              | food additives       | Skirret water parsnip |
|   | Apocynaceae  | <i>Allamanda catharica</i> L. | C and S America | TGH                  | environmental uses    |
| <i>Carissa macrocarpa</i> A.DC.             |  |                               | TABGH           | food                 | Natal plum            |
| <i>Plumeria</i> L.                          |  | C and S America               | TABGH           | environmental uses   | Frangipani            |
| <i>Thevetia peruviana</i> Merr.             |  | C America                     | TABGH           | environmental uses   | Yellow oleander       |
| <i>Voacanga africana</i> Stapf ex S.Elliot. |  |                               | TABGH           |                      |                       |
| Araceae                                     | <i>Aglaonema</i> Schott                            |                               | TGH             |                      | Aglaonema             |
|   | <i>Alocasia macrorrhiza</i> Schott                 | Sri Lanka                     | TGH             | food                 | Alocasia              |
|   | <i>Anthurium andraeanum</i> Linden var. "nathalie" | no origin                     | TGH             | environmental uses   | Anthurium             |
|   | <i>Caladium zamiiifolium</i> Lodd.                 |                               | TABGH           |                      |                       |
|   | <i>Colocasia esculenta</i> (L.) Schott             | SE Asia                       | TABGH           | food                 | Taro                  |
|   | <i>Dracontium lorentense</i> K. Krause             | Colombia                      | TABGH           | medicines            |                       |
|   | <i>Monstera deliciosa</i> Liebm.                   | C America                     | TABGH           | materials            | Cheese plant          |



## APPENDICES

| Family            | Latin name   | Origin                      | Location | Uses                 | English name       |
|-------------------|--|-----------------------------|----------|----------------------|--------------------|
|                   | <i>Philodendron</i> Schott                               | S America                   | TGH      | environmental uses   | Philodendron       |
|                   | <i>Syngonium</i> Schott                                  | C and S America.            | TGH      | environmental uses   |                    |
|                   | <i>Xanthosoma nigrum</i> ( Vell. ) Stellfeld             | S America                   | TGH      | food                 | Cocoyam            |
|                   | <i>Xanthosoma sagittifolium</i> (L.) Schott.             | S America                   | TGH      | food                 | New cocoyam        |
|                   | <i>Zamioculcas zamiifolia</i> Engl.                      | E Africa                    | TABGH    | environmental uses   |                    |
| <i>Araliaceae</i> | <i>Aralia spinosa</i> L.                                 | N America                   | IS       | food additives       | Hercule's Club     |
|                   | <i>Aralia x balfouriana</i> Hort. ex André               | no origin                   | TABGH    | environmental uses   | Balfour aralia     |
|                   | <i>Dendropanax trifidus</i> (Thunb.) Makino ex Hara      |                             | TABGH    |                      |                    |
|                   | <i>Eleutherococcus senticosus</i> Maxim.                 | E Asia                      | IS       | medicines            | Siberian Ginseng   |
|                   | <i>Hedera</i> L..  |                             | TGH      |                      | Ivy                |
|                   | <i>Polyscias fruticosa</i> Harms                         | SE Asia                     | TABGH    | environmental uses   | Ming aralia        |
| <i>Arecaceae</i>  | <i>Areca</i> L.  |                             | TABGH    |                      | Areca palm         |
|                   | <i>Areca triandra</i> Roxb.                              | SE Asia                     | TABGH    | social uses, en.uses | Wild areca palm    |
|                   | <i>Archontophoenix cunninghamii</i> H. Wendl. & Drude    | Australia                   | TABGH    |                      | Bangalow           |
|                   | <i>Bactris gasipaes</i> Kunth                            | S America                   | TABGH    | food                 | Peach palm         |
|                   | <i>Brahea armata</i> S. Watson                           | N Mexico                    | TABGH    | environmental uses   | Mexican blue palm  |
|                   | <i>Brahea edulis</i> H. Wendl. ex S. Watson              | Guadalupe Island.           | TABGH    | materials, en.uses   | Guadalupe erythea  |
|                   | <i>Butia eriospatha</i> Becc.                            | Brazil                      | TABGH    |                      | Wooly jelly palm   |
|                   | <i>Cocos nucifera</i> L.                                 | Pacific                     | TGH      | food                 | Coconut palm       |
|                   | <i>Dypsis lutescens</i> (H. Wendl.) Beentje & J. Dransf. | Madagascar                  | TABGH    | environmental uses   | Golden yellow palm |
|                   | <i>Elaeis guineensis</i> Jacq                            | W and C Africa              | TABGH    | food                 | African oil palm   |
|                   | <i>Howea belmoreana</i> Becc.                            | Australia (Howe Island)     | TABGH    | environmental uses   | Belmore palm       |
|                   | <i>Howea forsteriana</i> Becc.                           | Australia (Solomon Islands) | TABGH    | materials            | Sentry palm        |
|                   | <i>Chamaerops humilis</i> L.                             | Mediterranean               | TABGH    | environmental uses   | European fan palm  |

## APPENDICES

| Family           | Latin name   | Origin                    | Location | Uses               | English name            |
|------------------|--|---------------------------|----------|--------------------|-------------------------|
|                  | <i>Jubaea chilensis</i> Baill.                               | Chile                     | TABGH    | food               | Honey palm              |
|                  | <i>Livistona chinensis</i> R.Br.                             | E Asia                    | TABGH    | environmental uses | Chinese fan palm        |
|                  | <i>Phoenix pusilla</i> Lour.                                 | Sri Lanka                 | TABGH    | materials          | Ceylon date palm        |
|                  | <i>Roystonea regia</i> O.F.Cook                              | Cuba                      | TABGH    | multipurpose       | Cuban royal palm        |
|                  | <i>Sabal blackburniana</i> Glazebr.                          |                           | TABGH    |                    | Black-burn palmetto     |
|                  | <i>Sabal longipedunculata</i> Hort. Ex Gentil                |                           | TABGH    |                    |                         |
|                  | <i>Sabal minor</i> (Jacq.) Pers.                             | SE United States          | TABGH    | environmental uses | Dwarf palmetto          |
|                  | <i>Sabal palmetto</i> (Walter) Lodd. ex Schult. & Schult. f. | SE United States, Antiles | TABGH    | food               | Cabbage palmetto        |
|                  | <i>Trachycarpus fortunei</i> H. Wend.                        | China                     | TABGH    | multipurpose       | Chinese windmill palm   |
|                  | <i>Washingtonia filifera</i> (Linden ex André) H. Wendl.     | SE United States, Mexico  | TABGH    | environmental uses | California fan palm     |
| Aristolochiaceae | <i>Aristolochia debilis</i> Siebold & Zucc.                  | Temp. Asia                | TABGH    | medicines          | Tian xian teng          |
| Asclepiadaceae   | <i>Asclepias curassavica</i> L.                              | S. America                | TABGH    | medicines          | West Indian ipecacuanha |
| Asparagaceae     | <i>Asparagus officinalis</i> L.                              | W Europe                  | OD       | food               | Asparagus               |
| Aspleniaceae     | <i>Asplenium</i> L.  |                           | TGH      | environmental uses | Spleenwort              |
| Asteraceae       | <i>Achillea filipendulina</i> Lam.                           |                           | IS       |                    |                         |
|                  | <i>Achillea millefolium</i> L.                               | Europe                    | OD       | medicines          | Common yarrow           |
|                  | <i>Arctium lappa</i> Wild.                                   | Europe                    | IS       | medicines, food    | Great burdock           |
|                  | <i>Artemisia abrotanum</i> L.                                | S Europe                  | OD       | medicines          | Oldman Wormwood         |
|                  | <i>Artemisia absinthium</i> L.                               | Europe                    | OD       | medicines          | Absinthe Wormwood       |
|                  | <i>Aster</i> L.  |                           | TGH      | environmental uses | Aster                   |
|                  | <i>Aster mongolicus</i> Franch.                              |                           | IS       |                    |                         |
|                  | <i>Baccharis halimifolia</i> L.                              | SE USA                    | TABGH    | environmental uses | Eastern baccharis       |
|                  | <i>Balsamita major</i> Desf.                                 | Europe                    | OD       | materials          | Costmary                |
|                  | <i>Bidens pilosa</i> L.                                      | New Zealand               | IS       | food additives     | Beggar's Ticks          |

## APPENDICES

| Family | Latin name  | Origin          | Location | Uses                | English name           |
|--------|---|-----------------|----------|---------------------|------------------------|
|        | <i>Calendula officinalis</i> L.                         | S Europe        | IS       | medicines           | Pot Marigold           |
|        | <i>Carthamus lanatus</i> L.                             |                 | IS       |                     |                        |
|        | <i>Carthamus tinctorius</i> L.                          |                 | IS       |                     |                        |
|        | <i>Centaurea macrocephala</i> Puschk. ex Willd.         |                 | IS       |                     |                        |
|        | <i>Cosmos bipinatus</i> Cav.                            |                 | IS       |                     |                        |
|        | <i>Cynara</i> L.  | Mediterranean   | TABGH    | food                |                        |
|        | <i>Cynara scolymus</i> L.                               |                 | IS       | medicines, food     | Globe Artichoke        |
|        | <i>Echinacea angustifolia</i> DC.                       | N America       | OD       | medicines           | Purple Coneflowers     |
|        | <i>Echinacea pallida</i> (Nutt.) Nutt.                  | N America       | OD       | medicines           | Pale Purple Coneflower |
|        | <i>Echinacea purpurea</i> Moench.                       | N America       | IS       | medicines           | Echinacea              |
|        | <i>Gaillardia x grandiflora</i> Hort.                   | no origin       | OD       | environmental uses  | Blanket flower         |
|        | <i>Grindelia robusta</i> Nutt.                          | California      | TABGH    | medicines           | Shore gumweed          |
|        | <i>Gynura japonica</i> (Thunb.) Juel                    | China and Japan | TABGH    | medicines           |                        |
|        | <i>Chrysanthemum coronarium</i> L. 'Tunf Hao'           | S Europe        | IS       | food additives      | Chop-Suey Greens       |
|        | <i>Chrysanthemum parthenium</i> (L.) Pers.              | SE Europe       | OD       | medicines           | Feverfew               |
|        | <i>Inula helenium</i> L.                                | SE Europe       | IS       | medicines, food ad. | Elecampane             |
|        | <i>Leuzea centauroides</i> (L.) Holub                   | Europe          | OD       | environmental uses  |                        |
|        | <i>Leuzea cynaroides</i> (C.Sm.) Font Quer ex G. López  |                 | OD       |                     |                        |
|        | <i>Leuzea rhapontica</i> (L.) Holub                     | Europe          | OD       | medicines           |                        |
|        | <i>Leuzea rhapontica</i> (L.) Holub ssp. "helenifolium" | no origin       | OD       | medicines           |                        |
|        | <i>Madia sativa</i> Molina                              | S America       | IS       | food                | Chile Tarweed          |
|        | <i>Matricaria chamomilla</i> L.                         | Europe          | OD       | medicines           | German Chamomile       |
|        | <i>Polymnia connata</i> S.F.Blake                       |                 | TABGH    | environmental uses  | Scorpion's tail        |
|        | <i>Rhaponticum scariosum</i> Lam.                       | Europe          | OD       |                     |                        |

## APPENDICES

| Family              | Latin name   | Origin                  | Location | Uses               | English name       |
|---------------------|--|-------------------------|----------|--------------------|--------------------|
|                     | <i>Rudbeckia hirta</i> L.                          | N America               | IS       | environmental uses | Black Eyed Susan   |
|                     | <i>Rudbeckia laciniata</i> L.                      | N America               | OD       | environmental uses | Cutleaf Coneflower |
|                     | <i>Rudbeckia maxima</i> Nutt.                      | N America               | OD       | environmental uses | Great coneflower   |
|                     | <i>Rudbeckia subtomentosa</i> Purch                | N America               | OD       | environmental uses | Sweet coneflower   |
|                     | <i>Rudbeckia triloba</i> L.                        | N America               | OD       | environmental uses | Brown-eyed Susan   |
|                     | <i>Senecio bicolor</i> Viv.                        | S Europe                | IS       | environmental uses | Cineraria          |
|                     | <i>Silybum marianum</i> (L.) Gaertn.               | Mediterran              | IS       | medicines          | Milk Thistle       |
|                     | <i>Smallanthus sonchifolius</i> ( Poepp. ) H. Rob. | S America               | TABGH    | food               | Yacon              |
|                     | <i>Stevia rebaudiana</i> Bertoni                   | S America               | IS       | food additives     | Stevia             |
|                     | <i>Tanacetum balsamita</i> L.                      | Europe                  | IS       | environmental uses | Alecost            |
|                     | <i>Tanacetum vulgare</i> L.                        | Europe                  | IS       | environmental uses | Tansy              |
| <i>Basellaceae</i>  | <i>Anredera cordifolia</i> (Ten.) Steenis          | C and S America         | TABGH    | food, en.uses      | Basell potatoes    |
|                     | <i>Basella alba</i> L.                             | E Asia                  | IS       | food               | Indian Spinach     |
|                     | <i>Basella alba</i> L. var. <i>rubra</i>           | no origin               | IS       | food               | Indian Spinach     |
| <i>Begoniaceae</i>  | <i>Begonia</i> L.                                  |                         | TABGH    | environmental uses | Begonia            |
| <i>Bignoniaceae</i> | <i>Crescentia</i> L.                               | C and S America         | TABGH    |                    | Calabash tree      |
|                     | <i>Macfadyena unguis - cati</i> (L.) A.H. Gentry   | C and S America         | TABGH    | medicines          | Catclawvine        |
|                     | <i>Parmentiera edulis</i> DC.                      | C America               | TGH      | food               | Candle Tree        |
| <i>Bixaceae</i>     | <i>Bixa orellana</i> L.                            | C and S America         | TABGH    | materials, en.uses | Annatto tree       |
|                     | <i>Spathodea</i> P.Beauv.                          | Trop. Africa            | TABGH    | environmental uses | African tulip tree |
| <i>Bombacaceae</i>  | <i>Adansonia digitata</i> L.                       | Trop. Africa            | TABGH    | multipurpose       | Baobab             |
|                     | <i>Bombax affine</i> Ducke                         | S America               | TGH      |                    | Wild chestnut      |
|                     | <i>Bombax</i> sp.                                  | SE Asia                 | TGH      |                    | Bombax             |
|                     | <i>Ceiba pentandra</i> (L.) Gaertn.                | Trop. America, W Africa | TABGH    | materials, food    | Kapok ceiba        |

## APPENDICES

| Family               | Latin name                                    | Origin          | Location | Uses               | English name        |
|----------------------|---|-----------------|----------|--------------------|---------------------|
|                      | <i>Durio zibethinus</i> Murr.                 | Indonesia       | TABGH    | food, medicines    | Common durian       |
|                      | <i>Pachira affinis</i> Decne.                 |                 | TGH      |                    |                     |
|                      | <i>Phyllostachys</i> Torr.                    | Central China   | TGH      |                    | Phyllostachys       |
| <i>Boraginaceae</i>  | <i>Anchusa officinalis</i> Thunb.             | Europe          | OD       | food               | Common bugloss      |
|                      | <i>Borago officinalis</i> L.                  | C Europe        | IS       | food aditives      | Borage              |
| <i>Brassicaceae</i>  | <i>Arabis alpina</i> L.                       | Europe          | OD       | environmental uses | Alpine rock-cress   |
|                      | <i>Brassica juncea</i> Coss.                  | N Europe        | IS       | food               | Brown Mustard       |
|                      | <i>Brassica juncea</i> Coss. 'Huasino'        | no origin       | IS       | food               | Brown Mustard       |
|                      | <i>Brassica juncea</i> Coss. 'Miike Savoy'    | no origin       | IS       | food               | Brown Mustard       |
|                      | <i>Brassica pekinensis</i> Skeels             | no origin       | IS       | food               | Chinese Cabbage     |
|                      | <i>Crambe abyssinica</i> Hochst.              | N. Africa       | IS       | environmental uses | Abyssinian Kale     |
|                      | <i>Crambe cordifolia</i> Steven               | W Asia          | OD       | food               | Giant Babies Breath |
|                      | <i>Eruca sativa</i> Mill.                     | Mediterran      | IS       | food additives     | Rocket              |
| <i>Bromeliaceae</i>  | <i>Ananas comosus</i> (L.) Merr.              | Amazon basin    | TGH      | food               | Pineapple           |
|                      | <i>Vriesea</i> Lindl.                         | S America       | TABGH    | environmental uses |                     |
| <i>Cactaceae</i>     | <i>Hylocereus undatus</i> (Haw) Britt. & Rose | C America       | TGH      | food               | Red pitaya          |
|                      | <i>Lophophora williamsii</i> J.M.Coult.       | SW USA, Mexico  | TABGH    | social uses        | Peyote              |
|                      | <i>Phyllocactus</i> Link                      |                 | TGH      |                    | Leaf cactus         |
|                      | <i>Selenicereus</i> Britton & Rose            | C and S America | TGH      |                    | Moonlight cacti     |
| <i>Campanulaceae</i> | <i>Campanula rapunculoides</i> L.             | Europe          | OD       | food               | Creeping Bellflower |
|                      | <i>Codonopsis pilosula</i> Nannf.             | NE Asia         | OD       | medicines          | Poor man's ginseng  |
|                      | <i>Platycodon grandiflorum</i> A.DC.          | Asia            | OD       | environmental uses | Chinese bellflower  |
| <i>Cannabaceae</i>   | <i>Cannabis indica</i> Lam.                   | C Asia          | TABGH    | medicines          | Hemp                |
|                      | <i>Cannabis sativa</i> L.                     | W. Asia         | IS       | medicines          | Hemp                |

## APPENDICES

| Family                 | Latin name                                  | Origin          | Location | Uses               | English name         |
|------------------------|---|-----------------|----------|--------------------|----------------------|
|                        | <i>Cannabis sativa</i> L. 'Duck Foot'       | no origin       | IS       | medicines          | Hemp                 |
|                        | <i>Cannabis sativa</i> L. 'Manitoba Poison' | no origin       | IS       | medicines          | Hemp                 |
| <i>Cannaceae</i>       | <i>Canna edulis</i> Ker-Gawl.               | S America       | IS       | food               | Achira               |
|                        | <i>Canna indica</i> L.                      | S America       | TGH      | food               | Indian canna         |
| <i>Capparaceae</i>     | <i>Capparis coriacea</i> Burch. ex DC.      |                 | TGH      | medicines          | Capper               |
|                        | <i>Capparis spinosa</i> L.                  | N Africa        | SGH      | food               | Common capers        |
| <i>Caprifoliaceae</i>  | <i>Lonicera altaica</i> Pall.               |                 | OD       |                    |                      |
|                        | <i>Lonicera japonica</i> Andr.              | E. Asia         | IS       | medicines          | Japanese Honeysuckle |
| <i>Caricaceae</i>      | <i>Carica papaya</i> L.                     | C America       | TGH      | food               | Papaya               |
|                        | <i>Carica pentagona</i> Heliborn            | Equdor          | SGH      | food               | Babaco               |
| <i>Caryophyllaceae</i> | <i>Gypsophila paniculata</i> L.             | Europe          | OD       | medicines          | Baby's-breath        |
|                        | <i>Saponaria officinalis</i> L.             | Europe          | OD       | medicines          | Soapwort             |
| <i>Celastraceae</i>    | <i>Catha edulis</i> Forsk. Ex Endl          | Africa          | SGH      | social uses        | Arabian tea          |
| <i>Clusiaceae</i>      | <i>Calophyllum</i> L.                       |                 | TGH      |                    | Beauty leaf          |
|                        | <i>Garcinia</i> L.                          | Asia            | TABGH    | food               |                      |
|                        | <i>Garcinia xanthochymus</i> Hook.f.        | SE Asia         | TGH      | food               | Gamboge              |
|                        | <i>Hypericum olympicum</i> L.               |                 | OD       |                    |                      |
|                        | <i>Hypericum perforatum</i> L.              | Europe          | OD       | medicines          | St John's wort       |
| <i>Combretaceae</i>    | <i>Terminalia catappa</i> L.                | W Pacific       | TABGH    | multipurpose       | Tropical almond      |
|                        | <i>Terminalia chebula</i> Retz.             | SE Asia         | TABGH    | multipurpose       | Chebula terminalia   |
| <i>Commelinaceae</i>   | <i>Tradescantia fluminensis</i> Velloso     | S America       | TGH      | environmental uses | Green wandering Jew  |
| <i>Convallariaceae</i> | <i>Convallaria majalis</i> L.               | Europe          | OD       | environmental uses | Lily of the Valley   |
| <i>Convolvulaceae</i>  | <i>Ipomoea aquatica</i> Forssk.             | W Africa        | TABGH    | food               | Water convolvulus    |
|                        | <i>Ipomoea batatas</i> Burm.                | C and S America | TGH      | food               | Sweet potato         |

## APPENDICES

| Family        | Latin name   | Origin          | Location | Uses               | English name     |
|---------------|--|-----------------|----------|--------------------|------------------|
|               | <i>Quamoclit lobata</i> House                        |                 | IS       |                    |                  |
| Cornaceae     | <i>Cornus mas</i> L.                                 | Europe          | IS       | food               | Cornelian Cherry |
| Costaceae     | <i>Costus dubius</i> K.Schum.                        |                 | TGH      |                    |                  |
|               | <i>Costus speciosus</i> Sm.                          |                 | IS       |                    |                  |
| Crassulaceae  | <i>Rhodiola arctica</i> Boriss.                      |                 | OD       | medicines          | Golden Root      |
|               | <i>Rhodiola rosea</i> L.                             | N Europe        | OD       | medicines          | Golden Root      |
|               | <i>Sedum kirilowii</i> Regel                         | Asia            | OD       | environmental uses | Roseroot         |
| Cucurbitaceae | <i>Atheranthera</i> Mast.                            |                 | TGH      |                    |                  |
|               | <i>Benincasa hispida</i> Coqn.                       | T. Asia         | IS       | food               | Wax Gourd        |
|               | <i>Cucumis ficifolius</i> A. Rich.                   |                 | IS       |                    |                  |
|               | <i>Cucumis metuliferus</i> E. Mey 'Kiwano'           | no origin       | IS       | food               | Horned Cucumber  |
|               | <i>Cucumis sativus</i> L.                            | E Indies        | IS       | food               | Cucumber         |
|               | <i>Cucurbita mixta</i> Pangalo                       | C America       | IS       | food               | Cushaw Pumpkin   |
|               | <i>Cucurbita pepo</i> L.                             | C America       | IS       | food               | Pumpkin          |
|               | <i>Cyclanthera pedata</i> Schrad.                    | C and S America | IS       | food               | Achoccha         |
|               | <i>Echinocystis lobata</i> Torr & Gray               | N America       | IS       | environmental uses | Wild Cucumber    |
|               | <i>Lagenaria siceraria</i> Standl.                   | Asia            | IS       | food               | Bottle Gourd     |
|               | <i>Luffa acutangula</i> Rox                          |                 | IS       |                    |                  |
|               | <i>Luffa aegyptiaca</i> Mill.                        |                 | IS       |                    |                  |
|               | <i>Luffa cylindrical</i> M. Roem.                    |                 | IS       |                    |                  |
|               | <i>Momordica balsamina</i> L.                        |                 | IS       |                    |                  |
|               | <i>Momordica cochinchinensis</i> (Lour.) Spreng.     | Vietnam         | TGH      | medicines          | Baby Jackfruit   |
|               | <i>Momordica charantia</i> L.                        |                 | IS       |                    |                  |
|               | <i>Trichosanthes kirilowii</i> var. 'Japonica' Maxim | no origin       | TABGH    | medicines          |                  |

## APPENDICES

| Family                 | Latin name                                  | Origin                     | Location | Uses               | English name           |
|------------------------|---|----------------------------|----------|--------------------|------------------------|
| <i>Cycadaceae</i>      | <i>Cycas revoluta</i> Thunb.                | SE Asia                    | TGH      | environmental uses | False sago             |
|                        | <i>Cycas rumphii</i> Miq.                   | SE Asia                    | TABGH    | environmental uses | Sago                   |
| <i>Cyperaceae</i>      | <i>Cyperus esculentus</i> L.                | Madagascar                 | TGH      |                    | Flat sedge             |
|                        | <i>Cyperus</i> L.                           |                            | TABGH    |                    | Cyperus                |
|                        | <i>Scirpus</i> L.                           |                            | TABGH    |                    | Bulrush                |
| <i>Davalliaceae</i>    | <i>Davallia</i> Sm.                         |                            | TABGH    |                    | Hare's-foot fern       |
| <i>Dioscoreaceae</i>   | <i>Dioscorea batatas</i> Decne.             | Asia, Indonesia            | TABGH    | food               | Chinese yam            |
|                        | <i>Dioscorea bulbifera</i> L.               | Trop. Asia                 | TABGH    | medicines, food    | Bulbil yam             |
|                        | <i>Dioscorea bulbifera</i> L.               | T. Asia                    | TGH      | food               | Air potato             |
|                        | <i>Dioscorea bulbifera</i> L. var. "sativa" | no origin                  | TGH      | food               | Air potato             |
|                        | <i>Dioscorea composita</i> Hemsl.           |                            | TABGH    |                    |                        |
|                        | <i>Dioscorea macrostachya</i> Benth.        | S Mexico to Panama         | TABGH    | social uses        | Mexican yam            |
| <i>Dracaenaceae</i>    | <i>Beaucarnea</i> Lem.                      | Mexico, Belizend Guatemala | TABGH    |                    |                        |
|                        | <i>Dracaena draco</i> L.                    | Macaronesia                | TABGH    | animal food, med.  | Dragon dracaena        |
|                        | <i>Dracaena</i> Vand. ex L.                 | Africa                     | TGH      |                    | Dracaena               |
|                        | <i>Sansevieria trifasciata</i> Prain        | W Africa                   | TGH      | environmental uses | Mother-in-law's tongue |
| <i>Dryopteridaceae</i> | <i>Cyrtomium falcatum</i> ( L.f.) C. Presl  | Polynesia                  | TGH      | environmental uses | House holy fern        |
|                        | <i>Cyrtomium</i> Presl.                     | Asia, Pacific Ocean        | TABGH    |                    |                        |
| <i>Ebenaceae</i>       | <i>Diospyros kaki</i> L.                    | China, Japan               | SGH      | food               | Kaki persimmon         |
|                        | <i>Diospyros whyteana</i> (Hiern ) F.White  | Trop. Africa               | TABGH    | social uses        | Wild coffee            |
| <i>Elaeagnaceae</i>    | <i>Eleagnus</i> Hill                        |                            | TABGH    |                    | Eleagnus               |
|                        | <i>Eleagnus latifolia</i> Hill              | Vietnam                    | TGH      |                    | Oleaster               |
|                        | <i>Hippophae rhamnoides</i> L.              | Europe                     | IS       | medicines, food    | Sea Buckthorn          |
| <i>Ephedraceae</i>     | <i>Ephedra distachya</i> L.                 | S Europe                   | OD       | medicines          | Jointfir               |



## APPENDICES

| Family                 | Latin name  | Origin               | Location | Uses                | English name       |
|------------------------|---|----------------------|----------|---------------------|--------------------|
| <i>Ericaceae</i>       | <i>Arbutus unedo</i> L.                                   | Mediterranean region | TGH      | environmental uses  | Strawberry tree    |
| <i>Erythroxylaceae</i> | <i>Erythroxylum coca</i> Lam.                             | Bolivia to S Peru    | TGH      | medicines           | Coca tree          |
| <i>Eucommiaceae</i>    | <i>Eucommia ulmoides</i> Oliver                           | China                | OD       | materials, med.     | Gutta-percha tree  |
| <i>Euphorbiaceae</i>   | <i>Aleurites</i> Forst.                                   |                      | TABGH    |                     |                    |
|                        | <i>Antidesma bunius</i> Spreng.                           | SE Asia              | TGH      | food, material      | Chinese laurel     |
|                        | <i>Codiaeum variegatum</i> Blume                          |                      | TABGH    | environmental uses  | Garden croton      |
|                        | <i>Croton</i> L.  |                      | TGH      |                     | Croton             |
|                        | <i>Euphorbia lathyris</i> L.                              | Europe               | IS       | medicines           | Caper Spurge       |
|                        | <i>Hevea brasiliensis</i> (Willd. ex A. Juss.) Müll. Arg. | S America            | TGH      | materials           | Para rubber tree   |
|                        | <i>Jatropha podagrica</i> Hook.                           |                      | TABGH    | environmental uses  | Guatemalan-rhubarb |
|                        | <i>Manihot esculenta</i> Crantz                           | Brazil               | TABGH    | food                | Common cassava     |
|                        | <i>Manihot utilissima</i> Pohl                            | S America            | TGH      | food                | Bitter cassava     |
|                        | <i>Phyllanthus arbuscula</i> J.F.Gmel.                    |                      | TABGH    |                     |                    |
|                        | <i>Phyllanthus grandifolius</i> L.                        |                      | IS       |                     |                    |
|                        | <i>Phyllanthus juglandifolius</i> Willd.                  | Carribic             | TABGH    |                     | Gamo de costa      |
|                        | <i>Phyllanthus reticulatus</i> Poir.                      | Asia                 | TABGH    | medicines           | Potato bush        |
|                        | <i>Plukenetia</i> L.                                      | Africa               | TABGH    |                     |                    |
|                        | <i>Plukenetia volubilis</i> L.                            | S America            | TABGH    | food, animal food   | Sacha Inche        |
|                        | <i>Ricinus communis</i> L.                                | Africa               | IS       | materials, med.     | Castor-Oil Plant   |
|                        | <i>Ricinus communis</i> L. var. <i>purpurea</i>           | Africa               | IS       | materials, med.     | Castor-Oil Plant   |
|                        | <i>Tithymalus lathyris</i> Hill                           |                      | IS       |                     |                    |
| <i>Fabaceae</i>        | <i>Abrus precatorius</i> L.                               |                      | TABGH    | materials, soc.uses | Indian liquorice   |
|                        | <i>Acacia farnesiana</i> (L.) Willd.                      | C and S America      | TABGH    | mutlipurpose        | Sweet acacia       |
|                        | <i>Acacia floribunda</i> Willd.                           | Australia            | TABGH    | environmental uses  | Grossamer Wattle   |

## APPENDICES

| Family | Latin name   | Origin               | Location | Uses                 | English name        |
|--------|--|----------------------|----------|----------------------|---------------------|
|        | <i>Acacia hostilis</i> Mart.                               | Mexico               | TABGH    |                      |                     |
|        | <i>Acacia sphaerocephala</i> Cham. & Schtdl.               | Mexico               | TABGH    | bee plants, en.uses  | Mexican mimosa      |
|        | <i>Brownea coccinea</i> Jacq.                              | S America            | TGH      | environmental uses   | Scarlet flame-bean  |
|        | <i>Cajanus cajan</i> (L.) Millsp.                          | India                | TABGH    | animal food          | Pigeon pea,         |
|        | <i>Ceratonia siliqua</i> L.                                | Mediterranean        | TABGH    | multipurpose         | Carob bean          |
|        | <i>Colophospermum mopane</i> (J.Kirk ex Benth.) J. Léonard | Trop. S Africa       | TABGH    | animal food, fuel w. | Balsam tree         |
|        | <i>Delonix regia</i> Raf.                                  | Madagascar           | TABGH    | environmental uses   | Flame-of-the-forest |
|        | <i>Erythrina crista - galli</i> L.                         | S America            | TABGH    | environmental uses   | Cockspur coral bean |
|        | <i>Erythrina herbacea</i> L.                               | SE USA, Mexico       | TABGH    | medicines            | Cardinal-spear      |
|        | <i>Astragalus glycyphyllos</i> L.                          | Europe               | OD       | environmental uses   | Wild liquorice      |
|        | <i>Astragalus purpureos</i> Lam.                           | Europe               | OD       | environmental uses   | Milk-vetch          |
|        | <i>Inga edulis</i> Mart.                                   | Trop. S America      | TABGH    | food, animal food    | Icecream bean       |
|        | <i>Leucaena leucocephala</i> (Lam.) de Wit                 | C and S America      | TABGH    | food, animal food    | Horse tamarind      |
|        | <i>Mimosa pudica</i> Mill.                                 | Brazil               | TABGH    | an. food, en.uses    | Shame plant         |
|        | <i>Mucuna</i> Adans.                                       |                      | TABGH    |                      | Mucuna              |
|        | <i>Pueraria montana</i> (Lour.) Merr.                      | Asia                 | TABGH    | environmental uses   | Kudzu bean          |
|        | <i>Sophora velutina</i> Lindl.                             | Tropical Asia        | TABGH    |                      |                     |
|        | <i>Tamarindus indica</i> L.                                | E Africa, Madagascar | TABGH    | food                 | Tamarind            |
|        | <i>Cicer arietinum</i> L.                                  | Asia                 | IS       | food                 | Chick Pea           |
|        | <i>Glycine max</i> (L.)Merr.                               | E. Asia              | IS       | food                 | Soya Bean           |
|        | <i>Glycine max</i> (L.)Merr. var. 'Lutea'                  | no origin            | IS       | food                 | Soya Bean           |
|        | <i>Glycine max</i> (L.)Merr. var. 'Nigra'                  | no origin            | IS       | food                 | Soya Bean           |
|        | <i>Glycine max</i> (L.)Merr. 'Aida'                        | no origin            | IS       | food                 | Soya Bean           |
|        | <i>Glycine max</i> (L.)Merr. 'Brunea'                      | no origin            | IS       | food                 | Soya Bean           |

## APPENDICES

| Family | Latin name                                    | Origin        | Location | Uses           | English name      |
|--------|---|---------------|----------|----------------|-------------------|
|        | <i>Glycine max</i> (L.)Merr. 'Meaple Eros'    | no origin     | IS       | food           | Soya Bean         |
|        | <i>Glycine max</i> (L.)Merr. 'Merrillfiskely' | no origin     | IS       | food           | Soya Bean         |
|        | <i>Glycine soja</i> Sieb. et Zucc.            | E. Asia       | IS       | food           | Wild Soya Bean    |
|        | <i>Glycyrrhiza glabra</i> L.                  | Mediterranean | OD       | food additives | Selle Liquorice   |
|        | <i>Glycyrrhiza pallidiflora</i> Maxim.        | W Asia        | TABGH    | medicines      |                   |
|        | <i>Glycyrrhiza uralensis</i> Fisch. Ex DC.    | E Asia        | OD       | medicines      | Chinese Liquorice |
|        | <i>Lablab niger</i> Medik.                    |               | IS       | food           | Hyacinth Bean     |
|        | <i>Lablab purpureus</i> (L.)Sweet             |               | IS       | food           | Hyacinth Bean     |
|        | <i>Lathyrus sativus</i> L.                    | S Europe      | IS       | food           | Chickling Pea     |
|        | <i>Lupinus albus</i> L.                       | S Europe      | IS       | food           | White Lupin       |
|        | <i>Phaseolus coccineus</i> L.                 | Mexico        | IS       | food           | Runner Bean       |
|        | <i>Phaseolus coccineus</i> L. 'Alba'          | no origin     | IS       | food           | Runner Bean       |
|        | <i>Phaseolus coccineus</i> L. 'Albo-Roseus'   | no origin     | IS       | food           | Runner Bean       |
|        | <i>Phaseolus coccineus</i> L. 'Capuchina'     | no origin     | IS       | food           | Runner Bean       |
|        | <i>Phaseolus coccineus</i> L. 'Painted Red'   | no origin     | IS       | food           | Runner Bean       |
|        | <i>Phaseolus lunatus</i> L. var. <i>nigra</i> | no origin     | IS       | food           | Lima Bean         |
|        | <i>Phaseolus lunatus</i> L. 'Zebrina'         | no origin     | IS       | food           | Lima Bean         |
|        | <i>Phaseolus ricciardianus</i> Tenore         |               | IS       |                |                   |
|        | <i>Phaseolus vulgaris</i> L. 'Caffer'         | no origin     | IS       | food           | French Bean       |
|        | <i>Phaseolus vulgaris</i> L. 'Nanus'          | no origin     | IS       | food           | French Bean       |
|        | <i>Pisum sativum</i> L.                       |               | IS       |                | Garden Pea        |
|        | <i>Sophora ser. flavescentes</i> P.C. Tsoong  |               | IS       |                |                   |
|        | <i>Trigonella foenum-graecum</i> L.           |               | IS       |                |                   |
|        | <i>Vicia faba</i> L.                          |               | IS       | food           | Bean              |

## APPENDICES

| Family           | Latin name   | Origin          | Location | Uses                | English name       |
|------------------|--|-----------------|----------|---------------------|--------------------|
|                  | <i>Vicia faba</i> L. 'Equina'                          |                 | IS       | food                | Horsebean          |
|                  | <i>Vicia faba</i> L. 'Minor'                           |                 | IS       | food                | Broad Bean         |
|                  | <i>Vigna angularis</i> (Wild.) Ohwi et Ohashi          |                 | IS       |                     |                    |
|                  | <i>Vigna mungo</i> L.                                  |                 | IS       |                     |                    |
|                  | <i>Vigna mungo</i> L. var. alba                        |                 | IS       |                     |                    |
|                  | <i>Vigna sinensis</i> L.                               |                 | IS       |                     |                    |
|                  | <i>Vigna unguiculata</i> (L.) Walp.                    | S. Asia         | IS       | food                | Jerusalem Pea      |
|                  | <i>Vigna unguiculata</i> (L.) Walp. ssp. cylindrica    | no origin       | IS       | food                | Jerusalem Pea      |
|                  | <i>Vigna unguiculata</i> (L.) Walp. ssp. sesquipedalis | no origin       | IS       | food                | Jerusalem Pea      |
|                  | <i>Vigna unguiculata</i> (L.) Walp. ssp. unguiculata   | no origin       | IS       | food                | Jerusalem Pea      |
| Fagaceae         | <i>Quercus</i> L.                                      |                 | TABGH    |                     | Oak                |
| Flacourtiaceae   | <i>Dovyalis caffra</i> Sim                             | S Africa        | TABGH    | food                | Digaan's apple     |
|                  | <i>Flacourtia indica</i> Merr.                         | Madagascar      | TGH      | food                | Madagascar plum    |
| Gentianaceae     | <i>Gentiana tibetica</i> King ex Hook.f.               | Asia            | OD       | medicines           | Tibetan Gentian    |
| Geraniaceae      | <i>Pelargonium odoratissimum</i> /L./ L'Hér.           | Africa          | SGH      | environmental uses  | Nutmeg pelargonium |
| Grossulariaceae  | <i>Ribes rubrum</i> L.                                 | W Europe        | IS       | food                | Red Currant        |
|                  | <i>Ribes vulgare</i> Lam. 'Album'                      | no origin       | IS       | food                | Red Currant        |
| Guttiferae       | <i>Garcinia xanthochymus</i> Hook f.                   |                 | IS       |                     |                    |
| Hypericaceae     | <i>Hypericum perforatum</i> L.                         | Europe          | IS       | medicines           | St. John's Wort    |
| Chenopodiaceae   | <i>Chenopodium ambrosioides</i> L.                     | Mexico          | IS       | materials, food ad. | Mexican Tea        |
|                  | <i>Chenopodium quinoa</i> Willd.                       | S America       | IS       | food                | Quinoa             |
| Chrysobalanaceae | <i>Chryzobalanus icaco</i> L.                          | C and S America | TGH      | food                | Pigeon plum        |
| Chusiaceae       | <i>Hypericum hirsutum</i> L.                           | Europe          | OD       | medicines           | Hypericum          |
| Iridaceae        | <i>Belamcanda chinensis</i> DC.                        | India           | TGH      | medicines           | Blackberry lily    |

## APPENDICES

| Family       | Latin name                                      | Origin         | Location | Uses                 | English name      |
|--------------|---|----------------|----------|----------------------|-------------------|
|              | <i>Crocus sativus</i> L.                        | S Europe       | OD       | food additives       | Saffron           |
|              | <i>Iris sanguinea</i> Donn                      | E Asia         | OD       | medicines            | Snow Queen        |
|              | <i>Neomarica gracilis</i> Sprague               |                | TGH      | environmental uses   | Apostle plant     |
| Juglandaceae | <i>Cyclocarya paliurus</i> (Batalin) Iljinsk.   |                | TABGH    | medicines            |                   |
| Labiaceae    | <i>Rosmarinus officinalis</i> L.                | Mediterran     | SGH      | food additives       | Rosemary          |
| Lamiaceae    | <i>Hyssopus officinalis</i> L.                  | Mediterran     | OD       | medicines            | Hyssop            |
|              | <i>Hyssopus officinalis</i> L. ssp. "aristatus" | no origin      | OD       | materials            | Hyssop            |
|              | <i>Hyssopus officinalis</i> L. var. "alba"      | no origin      | OD       | medicines            | Hyssop            |
|              | <i>Lavandula angustifolia</i> Mill.             | Mediterran     | OD       | medicines, mat.      | English Lavander  |
|              | <i>Lavandula officinalis</i> Chaix              | Mediterran     | OD       | medicines, mat.      | Lavender          |
|              | <i>Lavandula vera</i> DC.                       | Mediterran     | OD       | medicines, mat.      | Lavender          |
|              | <i>Leonurus cardiaca</i> L. ssp. "intermedium"  | no origin      | OD       | medicines            | Wilde Melisse     |
|              | <i>Majorana hortensis</i> Moench.               | N. Africa      | IS       | food additives, med. | Sweet Marjoram    |
|              | <i>Marrubium incanum</i> Desr.                  | Europe, Asia   | OD       |                      | Horehound         |
|              | <i>Melissa officinalis</i> L.                   | C and S Europe | OD       | medicines, mat.      | Lemon balm        |
|              | <i>Mentha aquatica</i> L.                       | Europe         | IS       | food aditives, med.  | Water Mint        |
|              | <i>Mentha longifolia</i> Host                   | C and S Europe | OD       | medicines, food ad.  | Horse Mint        |
|              | <i>Mentha piperita</i> L.                       | hybrid         | OD       | medicines, food ad.  | Peppermint        |
|              | <i>Mentha spicata</i> L.                        | C Europe       | IS       | medicines, food ad.  | Spearmint         |
|              | <i>Mentha suaveolens</i> Ehrh.                  | S and W Europe | IS       | medicines, food ad.  | Round-Leaved Mint |
|              | <i>Monarda didyma</i> L.                        | N America      | OD       | environmental uses   | Scarlet beebalm   |
|              | <i>Nepeta cataria</i> L.                        | Europe         | OD       | medicines            | True Catnip       |
|              | <i>Nepeta grandiflora</i> Lapeyr                |                | OD       | medicines            | Giant Catmint     |
|              | <i>Nepeta mussini</i> Spreng. Ex Henck.         |                | OD       |                      | Lavender Catmint  |

## APPENDICES

| Family | Latin name  | Origin       | Location | Uses                 | English name   |
|--------|---|--------------|----------|----------------------|----------------|
|        | <i>Nepeta nuda</i> L.                               |              | OD       | materials            | Anne's Choice  |
|        | <i>Nepeta parnassica</i> Heldr. & Sart.             |              | OD       | materials            | Catmint        |
|        | <i>Ocimum basilicum</i> L.                          | T. Asia      | IS       | food additives, med. | Sweet Basil    |
|        | <i>Ocimum basilicum</i> L. 'Grant Vert'             | no origin    | IS       | food additives, med. | Sweet Basil    |
|        | <i>Ocimum basilicum</i> L. 'Lactucaefolium'         | no origin    | IS       | food additives, med. | Sweet Basil    |
|        | <i>Ocimum basilicum</i> L. 'Kardinal'               | no origin    | IS       | food additives, med. | Sweet Basil    |
|        | <i>Ocimum basilicum</i> L. 'Purple Opal'            | no origin    | IS       | food additives, med. | Sweet Basil    |
|        | <i>Ocimum basilicum</i> L. 'Opal'                   | no origin    | IS       | food additives, med. | Sweet Basil    |
|        | <i>Ocimum basilicum</i> L. var. 'Purpurea Metalica' | no origin    | IS       | food additives, med. | Sweet Basil    |
|        | <i>Ocimum basilicum</i> L. var. 'Citriodorum'       | no origin    | IS       | food additives, med. | Sweet Basil    |
|        | <i>Ocimum basilicum</i> L. var. 'Piperita'          | no origin    | IS       | food additives, med. | Sweet Basil    |
|        | <i>Ocimum canum</i> Sims.                           |              | IS       |                      |                |
|        | <i>Ocimum graveolens</i> A. Braun                   |              | IS       |                      |                |
|        | <i>Ocimum gratissimum</i> L.                        |              | IS       |                      |                |
|        | <i>Ocimum lamiifolium</i> Hochst.                   | Trop. Africa | TABGH    | medicines            |                |
|        | <i>Ocimum sanctum</i> L.                            |              | IS       |                      |                |
|        | <i>Origanum officinale</i> Gueldenst.               |              | OD       |                      |                |
|        | <i>Origanum tyttanthum</i> Gontsch.                 |              | OD       |                      |                |
|        | <i>Origanum vulgare</i> L.                          | Europe       | OD       | food additives       | Oregano        |
|        | <i>Origanum vulgare</i> L. ssp. "hirtum"            | no origin    | OD       | food additives       | Oregano        |
|        | <i>Origanum vulgare</i> L. var. "aureum"            | no origin    | OD       | food additives       | Oregano        |
|        | <i>Perilla frutescens</i> (L.) Britton              | E. Asia      | IS       | food, medicines      | Shiso          |
|        | <i>Phlomis fruticosa</i> L.                         | Mediterran   | IS       | environmnetal uses   | Jerusalem Sage |
|        | <i>Pogostemon cablin</i> Benth.                     | SE Asia      | OD       | materials            | Patchouli      |

## APPENDICES

| Family    | Latin name  | Origin        | Location | Uses                 | English name    |
|-----------|---|---------------|----------|----------------------|-----------------|
|           | <i>Prunella grandiflora</i> Jacq.                         | Europe        | OD       | environmental uses   | Self-Heal       |
|           | <i>Prunella grandiflora</i> (L.)Scholler var. 'Alba'      | no origin     | IS       | environmental uses   | Self-Heal       |
|           | <i>Prunella vulgaris</i> L.                               | Mediterranean | OD       | medicines            | Common selfheal |
|           | <i>Salvia divinorum</i> Epling & Játiva                   | Mexico        | TABGH    | medicines            | Diviner's sage  |
|           | <i>Salvia haematodes</i> L.                               |               | OD       | materials            | Red-veined sage |
|           | <i>Salvia nemorosa</i> Baumq. ex Nyman                    | Europe        | OD       | environmental uses   | May Night Sage  |
|           | <i>Salvia officinalis</i> L.                              | S Europe      | OD       | medicines, food ad.  | Common sage     |
|           | <i>Salvia officinalis</i> L. var. 'Variegata'             | no origin     | OD       | medicines, food ad.  | Common sage     |
|           | <i>Salvia pratensis</i> L.                                | Europe        | OD       | medicines            | Meadow sage     |
|           | <i>Salvia reticulata</i> M.Martens & Galeotti             |               | OD       | medicines            | Sage            |
|           | <i>Salvia sclarea</i> L.                                  | S Europe      | OD       | materials            | Clary sage      |
|           | <i>Salvia viridis</i> L.                                  | S Europe      | OD       | medicines            | Painted sage    |
|           | <i>Satureja hortensis</i> L.                              | SE Europe     | TGH      | food additives, med. | Summer Savory   |
|           | <i>Satureja montana</i> L.                                | Mediterranean | OD       | medicines, food      | Winter Savory   |
|           | <i>Scutellaria altissima</i> A.Ham.                       | Europe        | OD       | environmental uses   | Tall Skullcap   |
|           | <i>Scutellaria baicalensis</i> Georgi                     | E. Asia       | IS       | medicines            | Baikal Skullcap |
|           | <i>Scutellaria pontica</i> K.Koch                         |               | IS       |                      |                 |
|           | <i>Scutellaria rubicunda</i> Willd.                       |               | OD       | environmental uses   | Skullcap        |
|           | <i>Sideritis syriaca</i> Pall. Ex M.Bieb.                 | Mediterranean | OD       | medicines            | Mountain tea    |
|           | <i>Stachys officinalis</i> Franch. var. 'Rosea supedra'   | Europe        | OD       | medicines            | Purple betony   |
|           | <i>Thymus vulgaris</i> L.                                 | S Europe      | OD       | medicines, food ad.  | Thyme           |
|           | <i>Thymus x citriodorus</i> (Pers.) Schreb. var. 'Aureus' | no origin     | OD       | medicines, food ad.  | Lemon thyme     |
| Lauraceae | <i>Camphora officinalis</i> Stend.                        |               | TGH      | food additives       | Camphor tree    |
|           | <i>Cinnamomum camphora</i> (L.) J. S. Presl               | E Asia        | TGH      | food                 | Camphor tree    |

## APPENDICES

| Family               | Latin name                                      | Origin           | Location | Uses               | English name          |
|----------------------|---|------------------|----------|--------------------|-----------------------|
|                      | <i>Cinnamomum verum</i> J.Presl                 | Sri Lanka        | TABGH    | food additives     | Ceylon cinnamon       |
|                      | <i>Cinnamomum verum</i> J.Presl                 | India, Sri Lanka | TGH      | food additives     | Ceylon cinnamon       |
|                      | <i>Laurus nobilis</i> L.                        | Mediterran       | SGH      | food additives     | True bay              |
|                      | <i>Persea americana</i> Mill.                   | Mexico           | TABGH    | food               | Avocado               |
|                      | <i>Persea americana</i> Mill.                   | Mexico           | TGH      | food               | Avocado               |
|                      | <i>Persea americana</i> var. 'Abchazski Waldin' | no origin        | TGH      | food               | Avocado               |
| <i>Liliaceae</i>     | <i>Asparagus falcatus</i> L.                    | Mediterranean    | TABGH    | environmental uses | Sicklethorn           |
|                      | <i>Asparagus umbellatus</i> Link                | Macaronesia      | TABGH    |                    |                       |
|                      | <i>Ophiopogon jaburan</i> Lodd.                 | Japan            | TGH      | environmental uses | White lily turf       |
|                      | <i>Phormium tenax</i> Forst.                    | New Zealand      | SGH      | materials          | New Zealand flax      |
| <i>Loganiaceae</i>   | <i>Strychnos spinosa</i> Lam.                   | Trop. Africa     | TABGH    | food, materials    | Kaffir orange         |
| <i>Lythraceae</i>    | <i>Lawsonia inermis</i> L.                      | E Africa         | TABGH    | materials          | Henna                 |
| <i>Malpighiaceae</i> | <i>Malpighia glabra</i> L.                      | Antilles         | TABGH    | food               | Barbados cherry       |
|                      | <i>Malpighia</i> L.                             | C America        | TGH      |                    | Malpighia             |
| <i>Malvaceae</i>     | <i>Abutilon</i> Mill.                           |                  | TABGH    | medicines          | Abutilon              |
|                      | <i>Abutilon theophrastii</i> Medik.             |                  | IS       |                    |                       |
|                      | <i>Alcea rosea</i> L.                           |                  | IS       |                    |                       |
|                      | <i>Alcea x litwinowii</i> (Iljin) Iljin         |                  | OD       |                    |                       |
|                      | <i>Althaea rosea</i> Cav.                       | Europe           | OD       | environmental uses | Hollyhock             |
|                      | <i>Gossypium arboreum</i> L.                    | India            | TABGH    | materials          | Asiatic tree cotton   |
|                      | <i>Gossypium barbadense</i> L.                  | Peru             | TABGH    | materials          | South American cotton |
|                      | <i>Gossypium herbaceum</i> L.                   | S Africa         | TABGH    | materials          | Levant cotton         |
|                      | <i>Hibiscus cannabinus</i> L.                   | Asia             | IS       | materials, food    | Kenaf                 |
|                      | <i>Hibiscus esculentus</i> L.                   |                  | IS       | materials, food    | Okra                  |



## APPENDICES

| Family             | Latin name                              | Origin              | Location | Uses               | English name      |
|--------------------|---|---------------------|----------|--------------------|-------------------|
|                    | <i>Hibiscus</i> L.                      |                     | TABGH    | environmental uses | Hibiscus          |
|                    | <i>Hibiscus subdarifa</i>               |                     | IS       |                    |                   |
|                    | <i>Hibiscus syriacus</i> L.             | E Asia              | IS       | materials, food    | Rose Of Sharon    |
|                    | <i>Sida rhombifolia</i> L.              |                     | IS       |                    |                   |
| <i>Marantaceae</i> | <i>Calathea</i> G.Mey.                  | C and S America     | TABGH    | environmental uses | Calathea          |
|                    | <i>Ctenanthe</i> Eichl.                 | Brazil              | TABGH    | environmental uses | Ctenanthe         |
|                    | <i>Ctenanthe</i> Eichl.                 | Brazil              | TGH      | environmental uses | Ctenanthe         |
|                    | <i>Maranta arundinacea</i> L.           | N America           | TGH      | environmental uses | Bermuda arrowroot |
|                    | <i>Maranta</i> L.                       |                     | TGH      | environmental uses | Arrowroot         |
| <i>Meliaceae</i>   | <i>Aglaia</i> spp.                      |                     | TGH      | materials          | Aglaia            |
|                    | <i>Cedrela odorata</i> L.               | C America           | TABGH    | multipurpose trees | Cigar box cedar   |
|                    | <i>Melia azedarach</i> L.               | India, China        | TABGH    | multipurpose trees | Pride of India    |
|                    | <i>Swietenia macrophylla</i> King       | Trop. America       | TABGH    | multipurpose trees | Honduras mahogany |
| <i>Moraceae</i>    | <i>Artocarpus</i> Forst.                | SE Asia             | TABGH    | food               | Breadfruit tree   |
|                    | <i>Ficus benghalensis</i> L.            | India, Benghlades   | TABGH    | materials, en.uses | Bengal fig        |
|                    | <i>Ficus carica</i> L.                  | SW Asia to NW India | SGH      | food               | Common fig        |
|                    | <i>Ficus natalensis</i> Krauss ex Engl. | Africa              | TABGH    |                    |                   |
|                    | <i>Treculia</i> Decne. ex Trécul        |                     | TABGH    |                    | Treculia          |
| <i>Musaceae</i>    | <i>Musa</i> L.                          | SE Asia             | TABGH    | food               | Banana            |
|                    | <i>Musa acuminata</i> Colla             | India, SE Asia      | TABGH    | food               | Chinese banana    |
|                    | <i>Musa cavendishi</i> Lamb.ex Paxt.    | SE Asia             | TGH      | food               | Chinese banana    |
|                    | <i>Musa</i> L. "Gros Michel"            | no origin           | TGH      | food               | Cavendish banana  |
|                    | <i>Musa</i> L. "Iholena red"            | no origin           | TGH      | food               | Banana            |
|                    | <i>Musa</i> L. "Puerto Rican Dwarf"     | no origin           | TGH      | food               | Banana            |

## APPENDICES

| Family    | Latin name                              | Origin                 | Location | Uses               | English name                |
|-----------|---|------------------------|----------|--------------------|-----------------------------|
|           | <i>Musa L. "Raiapuri"</i>               | no origin              | TGH      | food               | Banana                      |
|           | <i>Musa sapientum L.</i>                | SE Asia                | TGH      | food               | Common banana               |
|           | <i>Musa textilis Nee</i>                | Philippines, Indonesia | TGH      | food               | Abaca banana                |
| Myrtaceae | <i>Acca sellowiana (O.Berg) Burret</i>  | SE Brazil, Uruguay     | SGH      | food               | Feijoa                      |
|           | <i>Callistemon citrinus Skeels</i>      | New South Wales        | TABGH    |                    | Bottle - brush              |
|           | <i>Callistemon coccineus F. Muell.</i>  | Australia              | TABGH    |                    |                             |
|           | <i>Callistemon glaucus Sweet</i>        | Australia              | TABGH    | environmental uses | Albany bottle brush         |
|           | <i>Callistemon linearis Sweet</i>       |                        | TABGH    | environmental uses | Narrow-leafed bottle brush  |
|           | <i>Callistemon phoeniceum Lindl.</i>    | Australia              | TABGH    | environmental uses | Pink bottle brush tree      |
|           | <i>Callistemon pinifolius Sweet</i>     | Australia              | TABGH    | environmental uses | Pine leaf bottle brush      |
|           | <i>Callistemon rugulosus (Link) DC.</i> | Australia              | TABGH    | environmental uses | Scarlet bottle brush        |
|           | <i>Callistemon salignus Sweet</i>       | Australia              | TABGH    | environmental uses | White bottle brush          |
|           | <i>Callistemon violaceus Lindl.</i>     | Australia              | TABGH    | environmental uses | Purple bottle brush         |
|           | <i>Callistemon viridiflorus Sweet</i>   | Australia              | TABGH    | environmental uses | Green flowered bottle brush |
|           | <i>Eucalyptus camaldulensis Dehnh.</i>  | Australia              | TABGH    | materials          | Spotted gum                 |
|           | <i>Eucalyptus citriodora Hook.</i>      | Australia              | TABGH    | materials          | Broad - leaved peppermint   |
|           | <i>Eucalyptus globulus Labill.</i>      | SE Australia           | TGH      | materials          | Tasmanian blue eucalyptus   |
|           | <i>Eucalyptus L'Hér.</i>                | Australia              | TABGH    | materials          | Eucalyptus                  |
|           | <i>Eugenia aquea Burm.f.</i>            | India                  | TGH      | food               | Water apple                 |
|           | <i>Eugenia jambos L.</i>                | SE Asia                | TGH      |                    |                             |
|           | <i>Eugenia L.</i>                       |                        | TABGH    |                    |                             |
|           | <i>Eugenia malaccensis L.</i>           | SE Asia                | TGH      | food               | Malay apple                 |
|           | <i>Eugenia myrtifolia Cambess.</i>      |                        | TGH      |                    |                             |
|           | <i>Eugenia uniflora L.</i>              | S America              | TGH      | food               | Surinam cherry              |

## APPENDICES

| Family        | Latin name                                 | Origin                 | Location | Uses               | English name            |
|---------------|--|------------------------|----------|--------------------|-------------------------|
|               | <i>Leptospermum scoparium</i> Forst.       | Australia, New Zealand | TABGH    |                    | New Zealand tea tree    |
|               | <i>Melaleuca hypericifolia</i> Sm.         | New South Wales        | TABGH    | environmental uses | Hillock bush            |
|               | <i>Myrtus communis</i> L.                  | S Europe               | IS       | medicines          | Myrtle                  |
|               | <i>Psidium araca</i> Raddi                 |                        | IS       |                    |                         |
|               | <i>Psidium cattleianum</i> Sab.            | Brazil                 | SGH      | food               | Strawberry guava        |
|               | <i>Psidium friedrichsthalianum</i> Nied.   | C America              | TABGH    | food               | Costa Rican guava       |
|               | <i>Psidium guajava</i> L.                  | Trop. America          | SGH      | food               | Common guava            |
|               | <i>Psidium guineense</i> Sw.               | C and S America        | TABGH    | food,medicines     | Guinea guava            |
|               | <i>Psidium longipes</i> (O. Berg) Mc Vaugh | USA, S America         | TABGH    |                    | Mangrove berry          |
|               | <i>Psidium molle</i> Bertol.               |                        | IS       |                    |                         |
|               | <i>Psidium speciosum</i> Diels             | S America              | TABGH    |                    |                         |
|               | <i>Syzygium jambos</i> (L.) Alston         | Malaysia               | TABGH    | food, medicines    | Jambos                  |
|               | <i>Syzygium paniculatum</i> Gaertn.        | Australia              | TABGH    | environmental uses | Australian brush-cherry |
| Oenotheraceae | <i>Oenothera biennis</i> L.                | N America              | IS       | medicines          | Evening Primrose        |
| Ochnaceae     | <i>Ochna kirkii</i> Oliv.                  | SE Africa              | TABGH    |                    | Mickey-mouse plant      |
| Oleaceae      | <i>Olea europaea</i> L.                    | Mediterran             | SGH      | food               | Common olive            |
| Oleandraceae  | <i>Nephrolepis</i> Schott                  |                        | TGH      |                    |                         |
| Onagraceae    | <i>Oenothera biennis</i> L.                | EN America             | OD       | medicines          | Evening star            |
| Orchideaceae  | <i>Vanilla planifolia</i> Andrews          | Mexico                 | TGH      | food additives     | Mexican vanilla         |
| Oxalidaceae   | <i>Averrhoa carambola</i> L.               | SE Asia                | TGH      | food               | Chinese gooseberry      |
|               | <i>Oxalis</i> spp.                         |                        | TGH      |                    | Wood sorrel             |
| Paeoniaceae   | <i>Paeonia delavayi</i> Franch.            | E Asia                 | OD       | medicines          | Tree Peony              |
|               | <i>Paeonia lactiflora</i> Pall.            | E Asia                 | OD       | medicines          | Chinese Peony           |
|               | <i>Paeonia officinalis</i> L.              | Europe                 | OD       | medicines          | Peony                   |

## APPENDICES

| Family                | Latin name                            | Origin            | Location | Uses            | English name               |
|-----------------------|---------------------------------------|-------------------|----------|-----------------|----------------------------|
| <i>Papaveraceae</i>   | <i>Eschscholzia californica</i> Cham. | WN America        | OD       | social uses     | California poppy           |
|                       | <i>Macleaya cordata</i> R.Br.         | E Asia            | OD       | medicines       | Plume poppy                |
|                       | <i>Papaver bracteatum</i> Lindl.      | W Asia            | OD       | social uses     | Oriental poppy             |
|                       | <i>Papaver orientale</i> L.           | W Asia            | OD       |                 | Oriental Poppy             |
|                       | <i>Papaver somniferum</i> L.          | Europe            | IS       | social uses     | Opium Poppy                |
| <i>Passifloraceae</i> | <i>Passiflora alata</i> Curtis        | Brazil            | TGH      | food            | Winged-stem passion flower |
|                       | <i>Passiflora capsularis</i> L.       |                   | IS       |                 |                            |
|                       | <i>Passiflora foetida</i> Vell.       |                   | IS       |                 |                            |
|                       | <i>Passiflora morifolia</i> Mast      |                   | IS       |                 |                            |
|                       | <i>Passiflora quadrangularis</i> L.   | S America         | TGH      | food            | Giant granadilla           |
| <i>Pinaceae</i>       | <i>Abies alba</i> Mill.               | C Europe          | TABGH    | materials       | Silver fir                 |
| <i>Piperaceae</i>     | <i>Piper auritum</i> Kunth            | Mexico, S America | TGH      | food additives  | Vera Cruz pepper           |
|                       | <i>Piper chaba</i> Hunter             | S Asia            | TGH      | medicines       |                            |
|                       | <i>Piper lolot</i> C.DC.              | Vietnam           | TGH      | food additives  | Poivre lolot               |
|                       | <i>Piper longum</i> L.                | India             | TGH      | food additives  | Indian long pepper         |
|                       | <i>Piper nigrum</i> L.                | India             | TGH      | food additives  | Black pepper               |
| <i>Pittosporaceae</i> | <i>Pittosporum</i> Banks ex Sol.      |                   | TABGH    | materials       | Pittosporum                |
| <i>Plantaginaceae</i> | <i>Plantago asiatica</i> L.           | E Asia            | OD       | medicines       | Chinese Plantain           |
|                       | <i>Plantago psyllium</i> DC.          | Europe, Asia      | OD       | medicines       | Sand Plantain              |
| <i>Plumbaginaceae</i> | <i>Limonium tataricum</i> Mill.       |                   | OD       |                 |                            |
| <i>Poaceae</i>        | <i>Arrhenatherum elatius</i> P.Beauv. | N Africa          | TABGH    | animal food     | Tall oat grass             |
|                       | <i>Avena abyssinica</i> Hochst.       | N Africa          | IS       | food, materials | Abyssinian Oat             |
|                       | <i>Avena byzantina</i> K. Koch        | Mediterran        | IS       | food, materials | Red Oat                    |
|                       | <i>Avena fatua</i> L.                 | Europe            | IS       | food            | Wild Oats                  |

## APPENDICES

| Family | Latin name  | Origin          | Location | Uses               | English name           |
|--------|---|-----------------|----------|--------------------|------------------------|
|        | <i>Avena nuda</i> L.                                | S Europe        | IS       | food               | Naked Oat              |
|        | <i>Avena sativa</i> L.                              | N Europe        | IS       | food               | Oats                   |
|        | <i>Avena sativa</i> L. var. 'Aurea'                 | no origin       | IS       | food               | Oats                   |
|        | <i>Avena sativa</i> L. var. 'Nigra'                 | no origin       | IS       | food               | Oats                   |
|        | <i>Bambus</i> J.F.Gmel.                             |                 | TGH      |                    |                        |
|        | <i>Bambusa</i> Schreb.                              |                 | TABGH    | materials          | Bamboo                 |
|        | <i>Coix lacryma - jobi</i> L.                       | E Asia          | IS       | food               | Job's Tears            |
|        | <i>Cynodon dactylon</i> Pers.                       | India           | TABGH    | animal food        | Bermuda grass          |
|        | <i>Digitaria purpurea</i> Swallen var. "alba"       | Africa          | OD       | environmental uses | Crabgrass              |
|        | <i>Echinochloa frumentacea</i> Link                 | no origin       | IS       | food               | Japanese Millet        |
|        | <i>Eleusine coracana</i> Gaertn.                    | SE Asia         | IS       | food               | Finger Millet          |
|        | <i>Eleusine indica</i> Gaertn.                      |                 | IS       | food               | Wire Grass             |
|        | <i>Eragrostis tef</i> (Zuccagni) Troit.             | N Africa        | IS       | food               | Tef                    |
|        | <i>Hordeum vulgare</i> L.                           |                 | IS       | food               | Barley                 |
|        | <i>Hyparrhenia hirta</i> Stapf                      | Africa          | TABGH    | animal food, mat.  | Common thatching grass |
|        | <i>Miscanthus sinensis</i> Anders.                  | E Asia          | IS       | materials          | Eulalia                |
|        | <i>Oryza sativa</i> L.                              | C Asia          | TABGH    | food, animal food  | Upland rice            |
|        | <i>Panicum miliaceum</i> L.                         |                 | IS       |                    |                        |
|        | <i>Panicum miliaceum</i> L. conv. compactum         | no origin       | IS       |                    |                        |
|        | <i>Panicum miliaceum</i> L. conv. effesum           | no origin       | IS       |                    |                        |
|        | <i>Panicum miliaceum</i> L. var. 'Album'            | no origin       | IS       |                    |                        |
|        | <i>Paspalum dilatatum</i> Poir.                     | C and S America | TABGH    | animal food        | Dallis grass           |
|        | <i>Pennisetum americanum</i> Leeke                  | E Asia          | IS       | food               | Pearl Millet           |
|        | <i>Pennisetum americanum</i> Leeke 'Purple Majesty' | no origin       | IS       | food               | Pearl Millet           |

## APPENDICES

| Family | Latin name   | Origin      | Location | Uses | English name   |
|--------|--|-------------|----------|------|----------------|
|        | <i>Phalaris canariensis</i> Brot.                    | Mediterran  | IS       | food | Canary Grass   |
|        | <i>Saccharum officinarum</i> L.                      | New Guinea  | TGH      | food | Sugar cane     |
|        | <i>Setaria italica</i> (L.)P.Beauv.                  | Asia        | IS       | food | Foxtail Millet |
|        | <i>Setaria italica</i> (L.)P.Beauv. conv. maxima     | no origin   | IS       | food | Foxtail Millet |
|        | <i>Setaria italica</i> (L.)P.Beauv. conv. moharia    | no origin   | IS       | food | Foxtail Millet |
|        | <i>Sorghum bicolor</i> (L.)Moench                    |             | IS       | food | Sorghum        |
|        | <i>Sorghum bicolor</i> (L.)Moench var. 'Durra'       | no origin   | IS       | food | Sorghum        |
|        | <i>Sorghum bicolor</i> (L.)Moench var. 'Saccharatum' | no origin   | IS       | food | Sorghum        |
|        | <i>Sorghum bicolor</i> (L.)Moench var. 'Technicum'   | no origin   | IS       | food | Sorghum        |
|        | <i>Sorghum caffrorum</i> Beauv. 'Bosnan'             | no origin   | IS       |      |                |
|        | <i>Sorghum cernuum</i> (Arduino)Host                 |             | IS       |      |                |
|        | <i>Sorghum dochna</i> Forssk.                        |             | IS       |      |                |
|        | <i>Sorghum durra</i> (Forssk.) Stapf 'Early Kalo'    |             | IS       |      |                |
|        | <i>Sorghum halepense</i> (L.)Pers.                   |             | IS       | food | Johnson Grass  |
|        | <i>Sorghum nervosum</i> Chiov.                       |             | IS       |      |                |
|        | <i>Sorghum sudanense</i> (Piper)Stapf                |             | IS       |      |                |
|        | <i>Triticum aestivum</i> L.                          | Middle East | IS       | food | Bread Wheat    |
|        | <i>Triticum compactum</i> Host                       |             | IS       | food | Club Wheat     |
|        | <i>Triticum dicoccon</i> Schrank                     |             | IS       | food | Emmer          |
|        | <i>Triticum durum</i> Desf.                          |             | IS       | food | Durum Wheat    |
|        | <i>Triticum spelta</i> L.                            |             | IS       | food | Spelt Wheat    |
|        | <i>Zea mays</i> L. 'Black Mexican'                   | no origin   | IS       | food | Sweet Corn     |
|        | <i>Zea mays</i> L. 'Corn'                            | no origin   | IS       | food | Sweet Corn     |
|        | <i>Zea mays</i> L. conv. dentiformis 'Pyrodon'       | no origin   | IS       | food | Sweet Corn     |

## APPENDICES

| Family        | Latin name  | Origin                 | Location | Uses                 | English name        |
|---------------|---|------------------------|----------|----------------------|---------------------|
|               | <i>Zea mays</i> L. conv. dentiformis 'Red King'                       | no origin              | IS       | food                 | Sweet Corn          |
|               | <i>Zea mays</i> L. conv. indurata Zhuk. var. alba                     | no origin              | IS       | food                 | Sweet Corn          |
|               | <i>Zea mays</i> L. conv. indurata Zhuk. var. rubra                    | no origin              | IS       | food                 | Sweet Corn          |
|               | <i>Zea mays</i> L. conv. microsperma K. var. oryzoides 'Erdbeermays'  | no origin              | IS       | food                 | Sweet Corn          |
|               | <i>Zea mays</i> L. conv. microsperma Koern. var. oryzoides var. rubra | no origin              | IS       | food                 | Sweet Corn          |
|               | <i>Zea mays</i> L. conv. microsperma Koern. var. oryzoides var. alba  | no origin              | IS       | food                 | Sweet Corn          |
|               | <i>Zea mays</i> L. conv. oryzoides var. alba                          | no origin              | IS       | food                 | Sweet Corn          |
|               | <i>Zea mays</i> L. conv. oryzoides var. rubra                         | no origin              | IS       | food                 | Sweet Corn          |
|               | <i>Zea mays</i> var. japonica   | no origin              | IS       | food                 | Sweet Corn          |
|               | <i>Zea mexicana</i> (Schrad.) Kuntze                                  |                        | IS       |                      |                     |
| Podocarpaceae | <i>Nageia nagi</i> Kuntze   | Temp.Asia              | TABGH    | medicines            | Asian bayberry      |
| Polemoniaceae | <i>Polemonium caeruleum</i> L.  | C Europe               | IS       | medicines            | Jacob's Ladder      |
| Polygonaceae  | <i>Fagopyrum esculentum</i> Moench                                    | C Asia                 | IS       | food, medicines      | Buckwheat           |
|               | <i>Fagopyrum tataricum</i> Gaertn.                                    | E Asia                 | IS       | food                 | Tartarian Buckwheat |
|               | <i>Rheum palmatum</i> L.  | E Asia                 | OD       | medicines, food      | Ornamental Rhubarb  |
|               | <i>Rumex scutatus</i> L.  | Europe                 | OD       | medicines, food      | French Sorrel       |
|               | <i>Rumex stenophyllus</i> Ledeb.                                      | Europe                 | OD       | food                 | Narrowleaf dock     |
| Portulacaceae | <i>Portulaca oleraceae</i>  |                        | IS       |                      |                     |
| Proteaceae    | <i>Grevillea banksii</i> R. Br.                                       | Australia (Queensland) | TABGH    | animal food, bee pl. | Bank's grevillea    |
|               | <i>Macadamia</i> F.Muell.   |                        | TABGH    |                      |                     |
|               | <i>Macadamia integrifolia</i> Maiden & Betche                         | Australia              | SGH      | food                 | Australian bush nut |
| Punicaceae    | <i>Punica granatum</i> L. var. 'nana'                                 | Asia                   | SGH      | food                 | Dwarf pomegranate   |
| Ranunculaceae | <i>Aconitum napellus</i> L.   | Europe                 | OD       | medicines            | Monkshood           |
|               | <i>Anemone rivularis</i> Wall.  | E Asia                 | OD       | medicines            | Wind flower         |

## APPENDICES

| Family                | Latin name                               | Origin          | Location | Uses                | English name         |
|-----------------------|--|-----------------|----------|---------------------|----------------------|
|                       | <i>Aquilegia vulgaris</i> L.             | C and S Europe  | OD       | medicines           | Mc Kanas Giant       |
|                       | <i>Cimicifuga racemosa</i> (L.) Nutt.    | EN America      | OD       | medicines           | Black cohosh         |
|                       | <i>Helleborus argutifolius</i> Viv.      | Europe          | OD       | environmental uses  | Corsican hellebore   |
|                       | <i>Helleborus lividus</i> Ait. ex Curtis | Europe          | OD       | environmental uses  |                      |
|                       | <i>Helleborus niger</i> L.               | SE and C Europe | OD       | environmental uses  | Christmas rose       |
|                       | <i>Helleborus orientalis</i> Lam.        | Europe          | OD       | environmental uses  | Lenten hellebore     |
|                       | <i>Nigella damascena</i> L.              | Mediterranean   | OD       | materials           | Love-in-a-mist       |
|                       | <i>Nigella nigellastrum</i> Willk.       | Europe, Africa  | OD       | environmental uses  |                      |
|                       | <i>Nigella sativa</i> L.                 | N Africa        | OD       | madicines, material | Black Cumin          |
|                       | <i>Thalictrum flavum</i> L.              | Africa          | OD       | environmental uses  | Yellow Meadow-Rue    |
| <i>Resedaceae</i>     | <i>Reseda complicata</i> Bory            | Europe          | OD       | materials           |                      |
|                       | <i>Reseda lutea</i> L.                   | Europe          | OD       | materials           | Wild Mignonette      |
|                       | <i>Reseda luteola</i> L.                 | Europe          | IS       | medicines           | Weld                 |
|                       | <i>Reseda media</i> Lag.                 |                 | IS       |                     |                      |
|                       | <i>Reseda odorata</i> L.                 | N Africa        | OD       | materials           | Common Mignonette    |
|                       | <i>Reseda virgata</i> Bois. & Reut.      | Europe          | OD       | materials           |                      |
| <i>Rhamnaceae</i>     | <i>Berchemia discolor</i> Hemsl.         | Africa          | TABGH    |                     |                      |
|                       | <i>Hovenia dulcis</i> Thunb.             | E Asia          | TABGH    | food, medicines     | Japanese raisin-tree |
|                       | <i>Ziziphus jujuba</i> Mill.             | N China         | TABGH    | food                | Chinese jujube       |
| <i>Rhizophoraceae</i> | <i>Rhizophora conjugata</i> L.           |                 | TABGH    |                     |                      |
|                       | <i>Rhizophora mucronata</i> Lam.         | Trop. Asia      | TABGH    | materials           | Bakau kurap          |
| <i>Rosaceae</i>       | <i>Agrimonia eupatoria</i> L.            | Europe          | OD       | medicines           | Common agrimony      |
|                       | <i>Alchemilla vulgaris</i> L.            | Europe          | OD       |                     | Lady's Mantle        |
|                       | <i>Aronia melanocarpa</i> Britton        | N America       | IS       | food                | Black Chokeberry     |



## APPENDICES

| Family           | Latin name   | Origin                 | Location | Uses               | English name           |
|------------------|--|------------------------|----------|--------------------|------------------------|
|                  | <i>Cydonia oblonga</i> P. Miller                     | Mediterran             | IS       | food               | Quince                 |
|                  | <i>Eriobotrya japonica</i> (Thunb.) Lind.            | C Sichuan              | SGH      | food               | Loquat                 |
|                  | <i>Filipendula vulgaris</i> Moench                   | Europe                 | OD       | medicines, food    | Meadowsweet            |
|                  | <i>Mespilus germanica</i> L.                         | SE Europe              | IS       | food               | Medlar                 |
|                  | <i>Potentilla anserina</i> L.                        | Europe                 | OD       | materials          | Silverweed             |
| <i>Rubiaceae</i> | <i>Calycophyllum spruceanum</i> (Benth.) K. Schum.   | S America              | TABGH    | materials          |                        |
|                  | <i>Coffea arabica</i> L.                             | Ethiopia               | TGH      | social uses        | Arabian coffee         |
|                  | <i>Coffea arabica</i> L. var. 'catara'               | Ethiopia               | TGH      | social uses        | Arabian coffee         |
|                  | <i>Coffea arabica</i> L. var. 'nana'                 | Ethiopia               | TGH      | social uses        | Arabian coffee         |
|                  | <i>Coffea arabica</i> L. var. 'Nana'                 | SW Ethiopia            | TABGH    | social uses        | Arabica coffee         |
|                  | <i>Coffea canephora</i> Pierre ex Froehn.            | Africa                 | TGH      | social uses        | Robusta coffee         |
|                  | <i>C. liberica</i> Bull ex K.Schum. var. 'Dewevrei'  | no origin              | TGH      | social uses        | Excelsa coffee         |
|                  | <i>Coffea liberica</i> Hiern var. 'Dewevrei'         | Trop. Africa           | TABGH    | social uses        | Excelsa coffee         |
|                  | <i>Coffea stenophylla</i> G. Don                     | Africa                 | TGH      | social uses        | Narrow-leaf coffee     |
|                  | <i>Gardenia cornuta</i> Hemsl.                       |                        | TABGH    |                    |                        |
|                  | <i>Gardenia jasminoides</i> Ellis var. 'Grandiflora' | no origin              | TABGH    | environmental uses | Cape-jessamine         |
|                  | <i>Morinda citrifolia</i> L.                         | Queensland - Australia | TABGH    | medicines          | Brimstone tree         |
|                  | <i>Psychotria viridis</i> Ruiz & Pav.                |                        | TABGH    |                    |                        |
| <i>Ruscaceae</i> | <i>Ruscus</i> sp.                                    | SW Europe              | TABGH    |                    |                        |
| <i>Rutaceae</i>  | <i>Aegle marmelos</i> Corrêa                         | India                  | TABGH    | food, materials    | Bael fruit tree        |
|                  | <i>Citrus aurantium</i> L.                           | Indochina              | TGH      | food               | Seville orange         |
|                  | <i>Citrus deliciosa</i> Ten.                         | Mediterranean region   | LGH      | food               | Mediterranean mandarin |
|                  | <i>Citrus grandis</i> cv. 'Mato Buntan'              | cultivar               | LGH      | food               | Mato Buntan Pomelo     |
|                  | <i>Citrus grandis</i> Osbeck                         | SE Asia                | TGH      | food               | Pummelo                |

## APPENDICES

| Family | Latin name   | Origin   | Location | Uses | English name                |
|--------|--|----------|----------|------|-----------------------------|
|        | <i>Citrus leiocarpa</i> Hort. ex Tanaka                |          | LGH      | food |                             |
|        | <i>Citrus limon</i> cv. 'Eureka'                       | cultivar | LGH      | food | Eureka lemon                |
|        | <i>Citrus limon</i> cv. 'Lisbon'                       | cultivar | LGH      | food | Portuguese lemon            |
|        | <i>Citrus limon</i> cv. 'Lunario'                      | cultivar | LGH      | food |                             |
|        | <i>Citrus limon</i> var. 'Meyerii'                     | variety  | LGH      | food | Meyer lemon                 |
|        | <i>Citrus limonia</i> (L.) Osbeck                      | India    | SGH      | food | Rough lemon                 |
|        | <i>Citrus limonia</i> Osbeck                           | India    | TGH      | food | Chine limon                 |
|        | <i>Citrus meyeri</i> Tan.                              | China    | SGH      | food | Meyer lemon                 |
|        | <i>Citrus paradisi</i> cv. 'Duncan'                    | cultivar | LGH      | food | Duncan grapefruit           |
|        | <i>Citrus paradisi</i> cv. 'Marsh'                     | cultivar | LGH      | food | Marsh (seedless) grapefruit |
|        | <i>Citrus paradisi</i> cv. 'Thomson'                   | cultivar | LGH      | food | Thomson grapefruit          |
|        | <i>Citrus pyriformis</i> Hassk.                        | hybrid   | LGH      | food | Ponderosa lemon             |
|        | <i>Citrus reshni</i> Hort. ex Tanaka                   | India    | LGH      | food |                             |
|        | <i>Citrus reticulata</i> cv. 'Dancy'                   | cultivar | LGH      | food | Dancy tangerine             |
|        | <i>Citrus reticulata</i> Nova                          | hybrid   | LGH      | food | Nova mandarine              |
|        | <i>Citrus reticulata</i> Osceola                       | hybrid   | LGH      | food | Osceola mandarine           |
|        | <i>Citrus reticulata</i> Robinson                      | hybrid   | LGH      | food | Robinson mandarine          |
|        | <i>Citrus sinensis</i> /L./ Osbeck cv. 'Verna'         | cultivar | SGH      | food | Chine lemon                 |
|        | <i>Citrus sinensis</i> /L./ Osbeck. cv. 'Hamlin'       | cultivar | SGH      | food | Chine lemon                 |
|        | <i>Citrus sinensis</i> /L./ Osbeck. cv. 'Valencia'     | cultivar | SGH      | food | Chine lemon                 |
|        | <i>C. sinensis</i> /L./ Osbeck. cv. 'Washington navel' | cultivar | SGH      | food | Chine lemon                 |
|        | <i>Citrus sinensis</i> cv. 'Cutter Valencia'           | cultivar | LGH      | food | Cutter Valencia Orange      |
|        | <i>Citrus sinensis</i> cv. 'Fisher Navel'              | cultivar | LGH      | food | Fisher Navel Orange         |
|        | <i>Citrus sinensis</i> cv. 'Hamlin'                    | cultivar | LGH      | food | Hamlin orange               |

## APPENDICES

| Family | Latin name   | Origin     | Location | Uses               | English name               |
|--------|--|------------|----------|--------------------|----------------------------|
|        | <i>Citrus sinensis</i> cv. 'Newhall Nuclear Navel' | cultivar   | LGH      | food               | Newhall Navel Orange       |
|        | <i>Citrus sinensis</i> cv. 'Olinda Valencia'       | cultivar   | LGH      | food               | Olinda Valencia orange     |
|        | <i>Citrus sinensis</i> cv. 'Shamouti'              | cultivar   | LGH      | food               | Palestine orange           |
|        | <i>Citrus sinensis</i> cv. 'Taroco'                | cultivar   | LGH      | food               | Tarococo deep blood orange |
|        | <i>Citrus sinensis</i> cv. 'Thomson Navel'         | cultivar   | LGH      | food               | Thomson navel orange       |
|        | <i>Citrus sinensis</i> cv. 'Valencia'              | cultivar   | LGH      | food               | Valencia orange            |
|        | <i>Citrus sinensis</i> cv. Parson Brown            | cultivar   | LGH      | food               |                            |
|        | <i>Citrus sunki</i> Hort. ex Tanaka                | China      | LGH      | food               |                            |
|        | <i>Citrus tangerina</i> Tan.                       | Japan      | SGH      | materials          | Tangerine                  |
|        | <i>Citrus unshiu</i> cv. 'Kawano'                  | cultivar   | LGH      | food               | Kawano satsuma             |
|        | <i>Citrus unshiu</i> cv. 'Kuno'                    | cultivar   | LGH      | food               | Kuno satsuma               |
|        | <i>Citrus unshiu</i> cv. 'Owari'                   | cultivar   | LGH      | food               | Owari satsuma              |
|        | <i>Citrus unshiu</i> cv. 'Silverhill'              | cultivar   | LGH      | food               | Silverhill satsuma         |
|        | <i>Citrus unshiu</i> Marc.                         | Japan      | SGH      | food               | Satsuma mandarin           |
|        | <i>Fortunella japonica</i> Swingle.                | China      | LGH      | food               | Round Kumquat              |
|        | <i>Fortunella margarita</i> Swingle                | China      | LGH      | food               | Oval Kumquat               |
|        | <i>Fortunella obovata</i> Hort. ex Tanaka          | China      | LGH      | food               | Fukushu kumquat            |
|        | <i>Murraya paniculata</i> (L.) Jack.               | Asia       | TGH      | environmental uses | China box jasmine orange   |
|        | <i>Phellodendron amurense</i> Rupr.                | Russia     | TABGH    | medicines          | Amur cork tree             |
|        | <i>Phellodendron sachalinense</i> Sarg.            | Temp. Asia | TABGH    | environmental uses |                            |
|        | <i>Poncirus trifoliatus</i> Raf.                   |            | IS       |                    |                            |
|        | <i>Ruta corsica</i> DC.                            | S Europe   | OD       | materials          | Corsican Rue               |
|        | <i>Ruta graveolens</i> L.                          | S Europe   | OD       | medicines          | Common Rue                 |
|        | <i>Ruta chalapensis</i> L.                         |            | IS       |                    |                            |

## APPENDICES

| Family           | Latin name                                      | Origin                   | Location | Uses                 | English name          |
|------------------|---|--------------------------|----------|----------------------|-----------------------|
|                  | <i>Ruta montana</i> Mill.                       | SE Europe                | OD       | materials            | Mountain rue          |
|                  | <i>Zanthoxylum americanum</i> Mill.             | N America                | TABGH    | food additives       | Common prickly ash    |
|                  | <i>Zanthoxylum nitidum</i> Bunge                | China                    | TABGH    | food additives       | Sichuan pepper        |
|                  | <i>Zanthoxylum piperitum</i> Benn.              | N China, Korea, Japam    | TABGH    | food additives, med. | Japanese prickly ash  |
| Sapindaceae      | <i>Dimocarpus longan</i> Lour.                  | China, India             | TABGH    | food, medicines      | Dragon's eye          |
|                  | <i>Litchi chinensis</i> Sonn.                   | China, Vietnam, Malaysia | TABGH    | food                 | Lychee                |
|                  | <i>Litchi chinensis</i> Sonn.                   | China, Vietnam           | SGH      | food                 | Lychee                |
|                  | <i>Nephelium lappaceum</i> L.                   | India, China             | TABGH    | food, medicines      | Rambootan             |
|                  | <i>Paullinia cupana</i> H.B. & K.               | Brazil                   | TGH      | social uses          | Guarana               |
|                  | <i>Sapindus mukorossi</i> Gaertn.               | India, China             | TABGH    | medicines, mat.      | Soap-nut tree         |
|                  | <i>Sapindus saponaria</i> L.                    | C a S America            | TGH      | medicines            | Southern soapberry    |
| Sapotaceae       | <i>Achras zapota</i> L.                         | C Amerika                | TGH      | food                 | Sapota                |
|                  | <i>Chrysophyllum cainito</i> L.                 | Antilles                 | TABGH    | food, medicines      | Star apple            |
|                  | <i>Chrysophyllum cainito</i> L.                 | C America                | TGH      | food                 | Cainito star apple    |
|                  | <i>Lucuma mammosa</i> C.F.Gaertn.               | C Amerika                | TGH      |                      |                       |
|                  | <i>Malacantha</i> Pierre                        |                          | TABGH    |                      |                       |
|                  | <i>Manilkara zapota</i> (L.) P. Royen           |                          | TABGH    | food, medicines      | Sapodilla             |
|                  | <i>Synsepalum dulcificum</i> Baill.             | W Africa                 | TABGH    | food, food additives | Miraculous berry      |
| Saururaceae      | <i>Houttuynia cordata</i> Thunb.                | S Asia                   | TGH      | food                 | Heart leaf            |
| Saxifragaceae    | <i>Bergenia cordifolia</i> Sternb.              | E Asia                   | OD       | environmental uses   | Heartleaf Bergenia    |
| Scrophulariaceae | <i>Russelia equisetiformis</i> Schltld. & Cham. | Mexico                   | TABGH    | environmental uses   | Coral plant           |
|                  | <i>Tetranema mexicanum</i> Benth.               | Mexico                   | TGH      | environmental uses   | Mexican-foxtglove     |
| Scrophulariaceae | <i>Digitalis ambigua</i> Murr.                  | Europe, Asia             | OD       | medicines            | Large Yellow Foxglove |
|                  | <i>Digitalis ciliata</i> Trautv.                |                          | OD       |                      |                       |

## APPENDICES

| Family         | Latin name                                       | Origin          | Location | Uses               | English name      |
|----------------|--|-----------------|----------|--------------------|-------------------|
|                | <i>Digitalis grandiflora</i> Lam.                | Europe          | OD       | medicines          | Yellow foxglove   |
|                | <i>Digitalis lanata</i> Ehrh.                    | E Europe        | OD       | medicines          | Grecian foxglove  |
|                | <i>Digitalis lutea</i> Sibth. & Sm.              | Europe, Asia    | OD       | medicines          | Yellow Foxglove   |
|                | <i>Digitalis parviflora</i> Jacq.                | Europe          | OD       | medicines          | Spanish Foxglove  |
|                | <i>Digitalis purpurea</i> L.                     | W Europe        | OD       | medicines          | Common Foxglove   |
|                | <i>Digitalis purpurea</i> L. var. 'Alba'         | no origin       | IS       | medicines          | Common Foxglove   |
|                | <i>Digitalis sibirica</i> Lindl.                 | Asia            | OD       | medicines          | Foxgloves         |
|                | <i>Penstemon calycosus</i> Small                 |                 | OD       |                    |                   |
|                | <i>Scrophularia nodosa</i> L.                    | Europe, Asia    | OD       | medicines          | Knotted Figwort   |
|                | <i>Verbascum blattaria</i> L.                    | Europe          | IS       | environmental uses | Moth Mullein      |
|                | <i>Verbascum lychnitis</i> Schultz               | Europe          | OD       | medicines          | White Mullein     |
|                | <i>Verbascum nigrum</i> L.                       | Europe          | OD       | medicines          | Black Mullein     |
|                | <i>Verbascum olympicum</i> Boiss.                | Europe          | OD       | medicines          | Greek Mullein     |
|                | <i>Verbascum phlomoides</i> Russ. Ex Benth.      | S Europe        | OD       | medicines          | Woolly Mullein    |
|                | <i>Verbascum phoeniceum</i> L.                   | Europe          | OD       | social uses        | Purple Mullein    |
|                | <i>Verbascum thapsiforme</i> Schrad.             | C Europe        | OD       | medicines          | Woolly mullein    |
|                | <i>Veronica gentianoides</i> Vahl                |                 | OD       |                    | Gentian Speedwell |
|                | <i>Veronica incana</i> F.W.Schmidt               | Europe          | OD       | environmental uses | Silver Speedwell  |
|                | <i>Veronica longifolia</i> Hoffm.                | NE and C Europe | OD       | environmental uses | Garden Speedwell  |
|                | <i>Veronica orchidea</i> Crantz                  | Europe          | OD       | environmental uses | Gypsyweed         |
|                | <i>Veronica spicata</i> L.                       | Europe, Asia    | OD       | environmental uses | Spiked Speedwell  |
|                | <i>Veronica teucrium</i> L.                      |                 | OD       | environmental uses |                   |
| Schisandraceae | <i>Schisandra chinensis</i> (Turcz.)Baill.       | E Asia          | IS       | food               |                   |
| Simmondsiaceae | <i>Simmondsia chinensis</i> (Link) C.K. Schneid. | Mexico          | TABGH    | materials          | Bushnut           |

## APPENDICES

| Family            | Latin name                                      | Origin        | Location | Uses          | English name   |
|-------------------|---|---------------|----------|---------------|----------------|
| <i>Solanaceae</i> | <i>Atropa frutescens</i> L.                     |               | TABGH    |               |                |
|                   | <i>Capsicum annuum</i> L. 'Conoides'            | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Feuzr Werh'          | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Firerall'            | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Hodoninska'          | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Chameleon'           | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Chips'               | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Jalapeno'            | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Kozí Roh'            | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Longum Sahara'       | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Orange'              | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Piment de Romenay'   | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Puya'                | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum annuum</i> L. 'Pylon Red'           | no origin     | IS       | food aditives | Sweet Pepper   |
|                   | <i>Capsicum baccatum</i> L.                     | S America     | IS       | food aditives | Locoto         |
|                   | <i>Capsicum frutescens</i> L.                   | C America     | TGH      | food aditives | Tabasco pepper |
|                   | <i>Capsicum chinense</i> Jacq.                  |               | IS       |               |                |
|                   | <i>C. chinense</i> Jacq. 'Brasilien Hot Bonnet' | no origin     | IS       |               |                |
|                   | <i>Capsicum pubescens</i> Dun.                  | S America     | IS       | food          | Tree Pepper    |
|                   | <i>Datura fastuosa</i> L.                       | E Asia        | IS       | medicines     | Thorn Apple    |
|                   | <i>Datura ferox</i> L.                          |               | IS       |               |                |
|                   | <i>Datura stramonium</i> L.                     |               | IS       | medicines     | Thorn Apple    |
|                   | <i>Datura stramonium</i> L. 'Tatula'            | no origin     | IS       | medicines     | Thorn Apple    |
|                   | <i>Mandragora officinarum</i> L.                | Mediterranean | TABGH    | medicines     | Mandrake       |

## APPENDICES

| Family               | Latin name                                     | Origin            | Location | Uses               | English name          |
|----------------------|--|-------------------|----------|--------------------|-----------------------|
|                      | <i>Nicotiana landsdorffii</i> Schrank          |                   | IS       |                    |                       |
|                      | <i>Nicotiana longiflora</i> Cav.               |                   | IS       |                    |                       |
|                      | <i>Nicotiana rustica</i> L.                    | S America         | IS       | materials          | Wild Tobacco          |
|                      | <i>Nicotiana tabacum</i> L.                    | S America         | IS       | social uses        | Tobacco               |
|                      | <i>Nicotiana tabacum</i> L. 'Habana'           | no origin         | IS       | social uses        | Tobacco               |
|                      | <i>Nicotiana tabacum</i> L. 'Samsun'           | no origin         | IS       | social uses        | Tobacco               |
|                      | <i>Parmentiera aculeata</i> Seem.              | Mexico, S America | TABGH    | food               | Cuajilote             |
|                      | <i>Physalis angulata</i> L.                    | N America         | IS       | food               | Cutleaf Ground Cherry |
|                      | <i>Physalis ixocarpa</i> Brot. Ex DC.          | N America         | IS       | food               | Tomatillo             |
|                      | <i>Physalis peruviana</i> L.                   | S America         | IS       | food               | Goldenberry           |
|                      | <i>Solanum capsicastrum</i> Schauer            | Brazil            | TGH      | environmental uses | Jerusalem cherry      |
|                      | <i>Solanum mammosum</i> L.                     | Mexico, S America | TABGH    | medicines, en.uses | Pig's-ears            |
|                      | <i>Solanum melongena</i> L.                    |                   | IS       | food               | Aubergine             |
|                      | <i>Solanum melongena</i> L. 'Český raný'       | no origin         | IS       | food               | Aubergine             |
|                      | <i>Solanum nigrum</i> L.                       |                   | IS       | food               | Black Nightshade      |
|                      | <i>Solanum quitoense</i> Lam.                  | Colombia, Ecuador | TABGH    | food               | Naranjilla            |
|                      | <i>Withania coagulans</i> Dunal                | Asia              | TABGH    | medicines          | Indian rennet         |
|                      | <i>Withania riebeckii</i> Schweinf. ex Balf.f. | Yemen             | TABGH    |                    | Socotra orobal        |
|                      | <i>Withania somnifera</i> Dunal                | Australia         | IS       | medicines          | Ashwagandha           |
| <i>Sterculiaceae</i> | <i>Brachychiton rupestris</i> K. Schum.        | Australia         | TABGH    | materials, en.uses | Barrel bottle tree    |
|                      | <i>Cola anomala</i> K. Schum.                  | Cameroon          | TABGH    | social uses        | Bamenda cola          |
|                      | <i>Cola nitida</i> Schott & Endl.              | Africa            | TGH      | social uses        | Cola nut tree         |
|                      | <i>Guazuma crinita</i> Mart.                   | S America         | TABGH    |                    | Bolaina blanca        |
|                      | <i>Theobroma cacao</i> L.                      | Amazon region     | TGH      | social uses        | Cacao                 |

## APPENDICES

| Family                   | Latin name                                      | Origin                             | Location | Uses               | English name          |  |
|--------------------------|---|------------------------------------|----------|--------------------|-----------------------|--|
| Strelitziaceae           | <i>Ravenala madagascariensis</i> J.F.Gmel.      | Madagascar                         | TABGH    | food, materials    | Traveller's palm      |  |
|                          | <i>Strelitzia</i> Ait.                          |                                    | TGH      |                    |                       |  |
|                          | <i>Strelitzia reginae</i> Banks ex Aiton        | S Africa                           | TABGH    | environmental uses |                       |  |
| Theaceae                 | <i>Camellia sinensis</i> /L./ Kuntze            | Indochina                          | SGH      | social uses        | Chinese tea           |  |
|                          | <i>Schima wallichii</i> Choisy var. 'Liakwense' | China, Trop. Asia                  | TABGH    | materials          |                       |  |
| Tiliaceae                | <i>Grewia biloba</i> G. Don                     | Temp. Asia                         | TABGH    | environmental uses |                       |  |
| Tropaeolaceae            | <i>Tropaeolum majus</i> L.                      | S America                          | IS       | food               | Nasturtium            |  |
| Umbelliferae             | <i>Eryngium planum</i> L.                       | E Europe                           | IS       | medicines          |                       |  |
| Urticaceae               | <i>Boehmeria nivea</i> Gandich.                 | China                              | IS       | materials          | Ramia                 |  |
|                          | <i>Boehmeria utilis</i> Gaudich var. 'Nivea'    | no origin                          | TGH      | materials          | Ramia                 |  |
|                          | <i>Pilea</i> Lindl.                             |                                    | TGH      | food               | Clearweed             |  |
| Valerianaceae            | <i>Valeriana officinalis</i> L.                 | Europe                             | OD       | medicines          | Valerin               |  |
| Verbenaceae              | <i>Callicarpa japonica</i> Thunb.               | Japan, China                       | TABGH    | environmental uses | Japanese beauty-berry |  |
|                          | <i>Clerodendrum</i> L.                          |                                    | TABGH    |                    |                       |  |
|                          | <i>Clerodendrum thomsoniae</i> Balf.            | Africa                             | TABGH    | environmental uses | Bleeding glory-bower  |  |
|                          | <i>Gmelina arborea</i> Roxb.                    | India, Sri Lanka                   | TABGH    | materials          | Goomar teak           |  |
|                          | <i>Lantana camara</i> L.                        | C and S America                    | TABGH    | environmental uses | Mountain sage         |  |
|                          | <i>Lippia dulcis</i> Trevir.                    | C America                          | TABGH    | medicines          | Aztec sweetherb       |  |
|                          | <i>Podocarpus macrophyllus</i> (Thunb.) Sweet   | Temp. Asia                         | TABGH    | environmental uses | Big-leaf podocarp     |  |
|                          | <i>Verbena officinalis</i> L.                   | Europe                             | OD       | medicines          | Common Verbena        |  |
|                          | Vitaceae  | <i>Rhoicissus capensis</i> Planch. |          | TABGH              |                       |  |
|                          |   | <i>Vitis capensis</i> Burm.f.      |          | TABGH              |                       |  |
| <i>Vitis vinifera</i> L. |   | Near East                          | LGH      | food               | Vine                  |  |
| Zingiberaceae            | <i>Alpinia officinarum</i> Hance                |                                    | IS       |                    |                       |  |



## APPENDICES

| Family         | Latin name                                | Origin     | Location | Uses                 | English name         |
|----------------|---|------------|----------|----------------------|----------------------|
|                | <i>Alpinia speciosa</i> K. Schum.         | T Asia     | TGH      | materials            |                      |
|                | <i>Costus dubius</i> K.Schum.             |            | TABGH    |                      |                      |
|                | <i>Curcuma longa</i> L.                   | India      | TGH      | medicines            | Common turmeric      |
|                | <i>Eletaria cardamomum</i> Maton          |            | TGH      |                      |                      |
|                | <i>Etilingera elatior</i> (Jack) R.M. Sm. | T Asia     | TGH      | food additives       | Ceylon cardamom      |
|                | <i>Kaempferia galanga</i> L.              | India      | TABGH    | food additives, food | East Indian galangal |
|                | <i>Zingiber officinale</i> Roscoe         | T Asia     | TGH      | food additives       | Common ginger        |
|                | <i>Zingiber zerumbet</i> ( L. ) Sm.       | Trop. Asia | TABGH    | food additives, food | Zerumbet ginger      |
| Zygophyllaceae | <i>Tribulus terrestris</i> L.             | Europe     | IS       | medicines            | Caltrop              |

Fig. Appendices 2: Descriptor of Citrus ITS

## MANDARINES

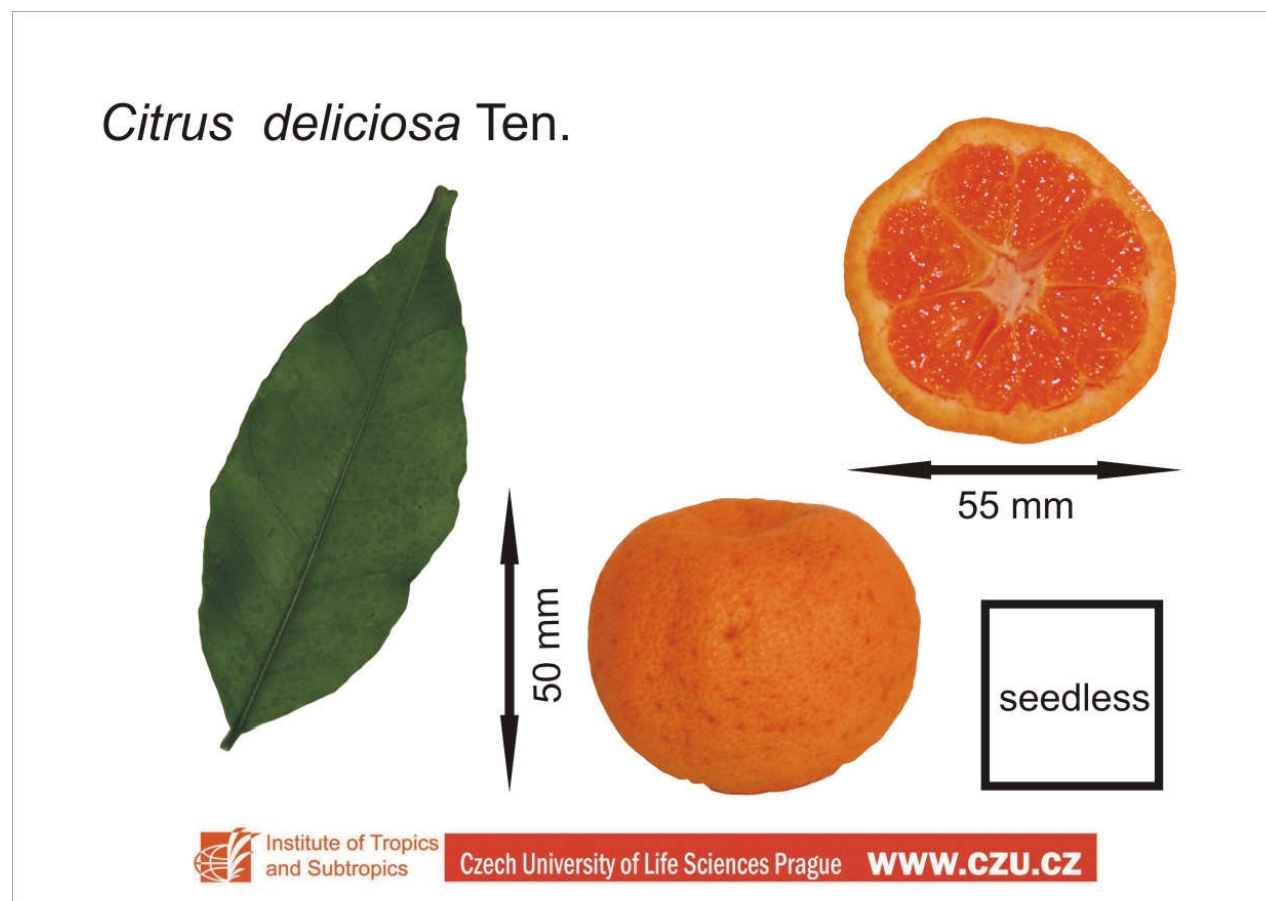


Fig. Appendices 2: continuation

## MANDARINES

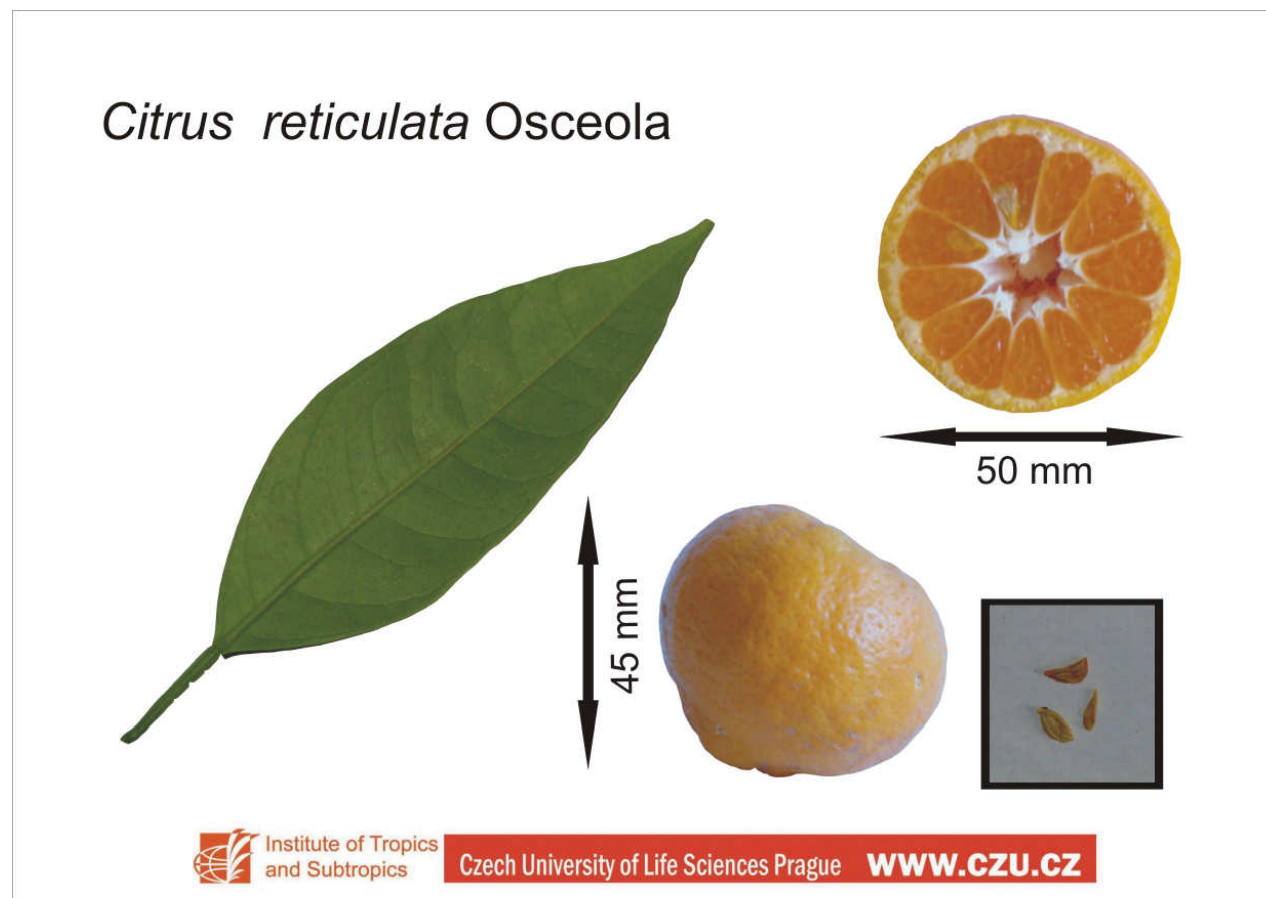


Fig. Appendices 2: continuation

## MANDARINES

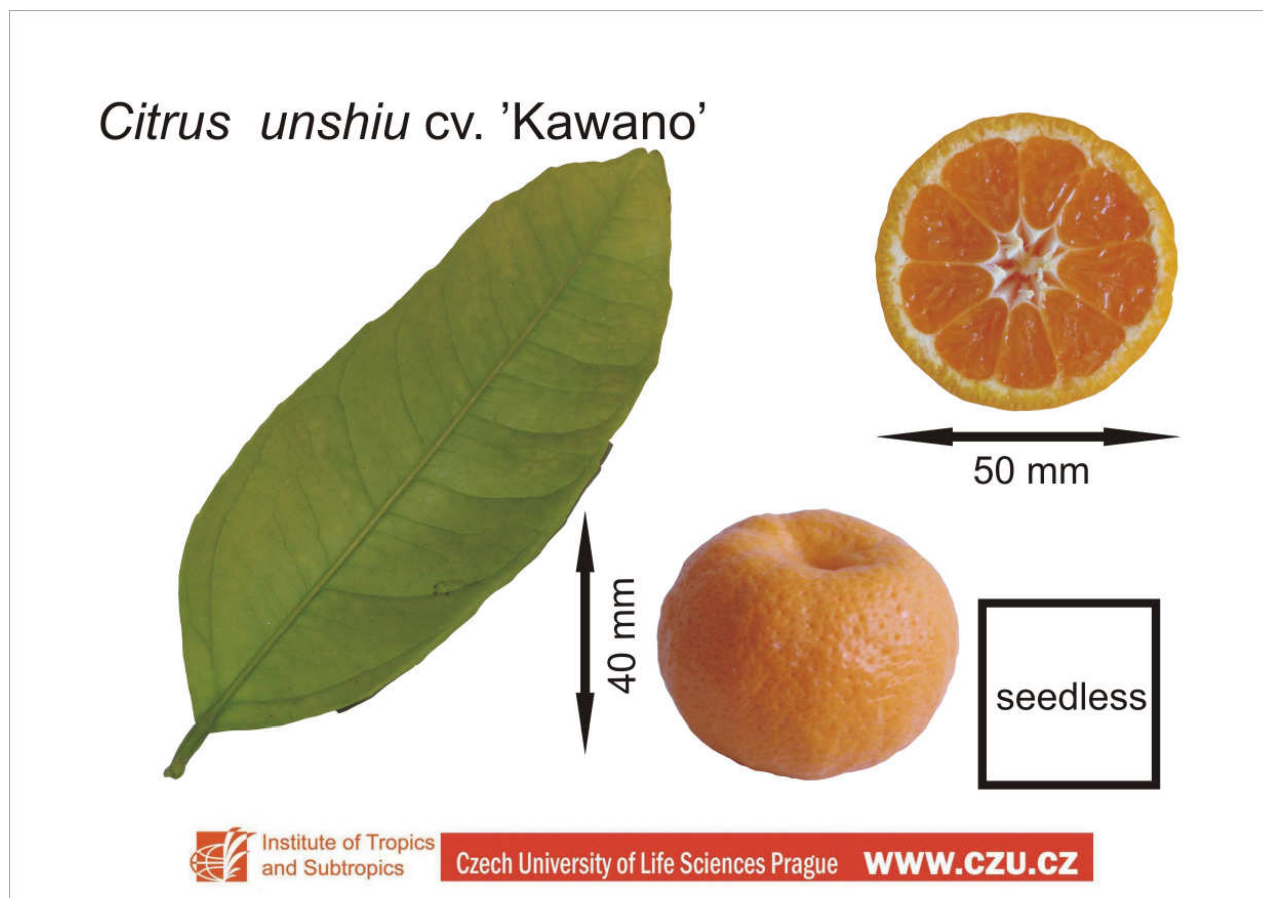


Fig. Appendices 2: continuation

## LEMONS

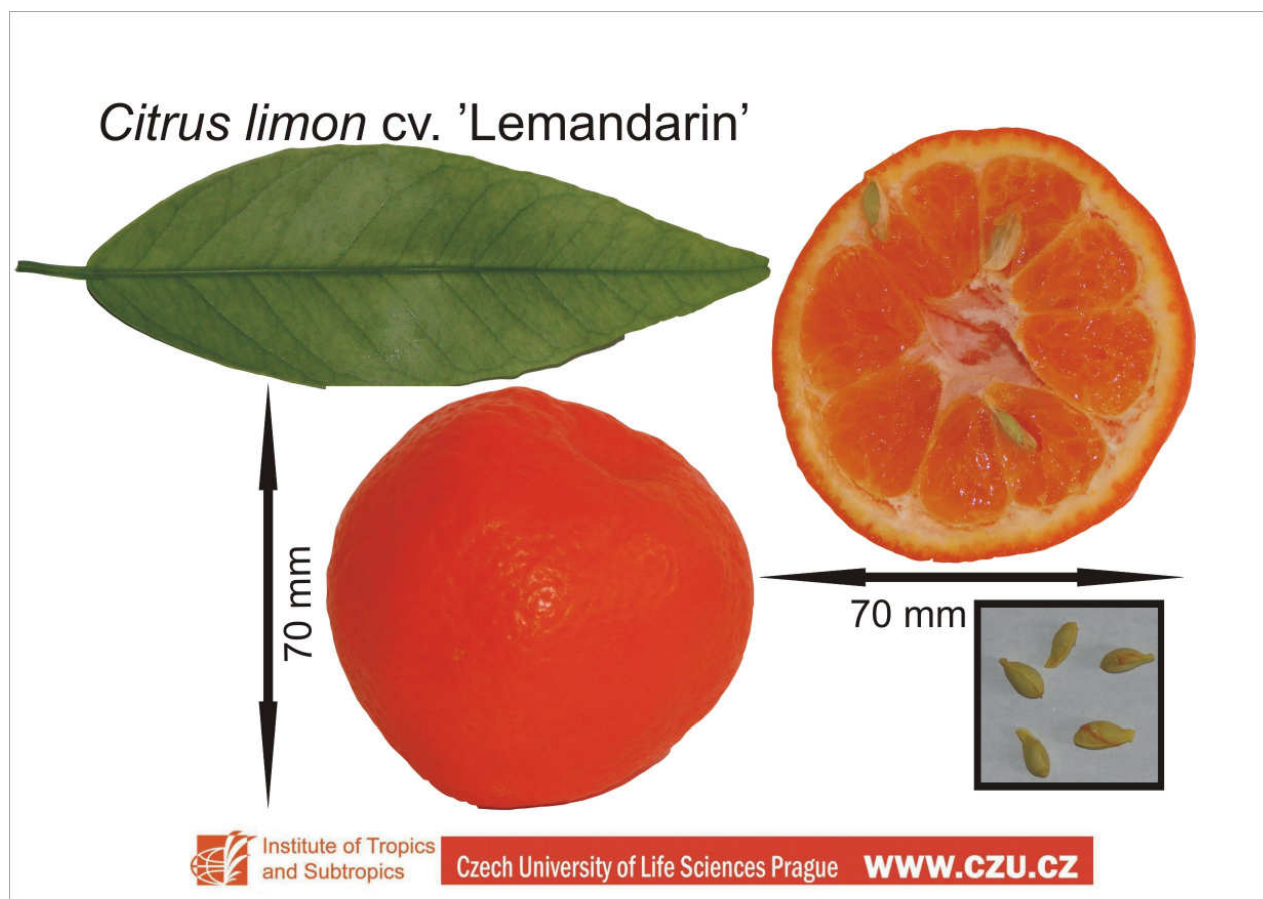


Fig. Appendices 2: continuation

## LEMONS

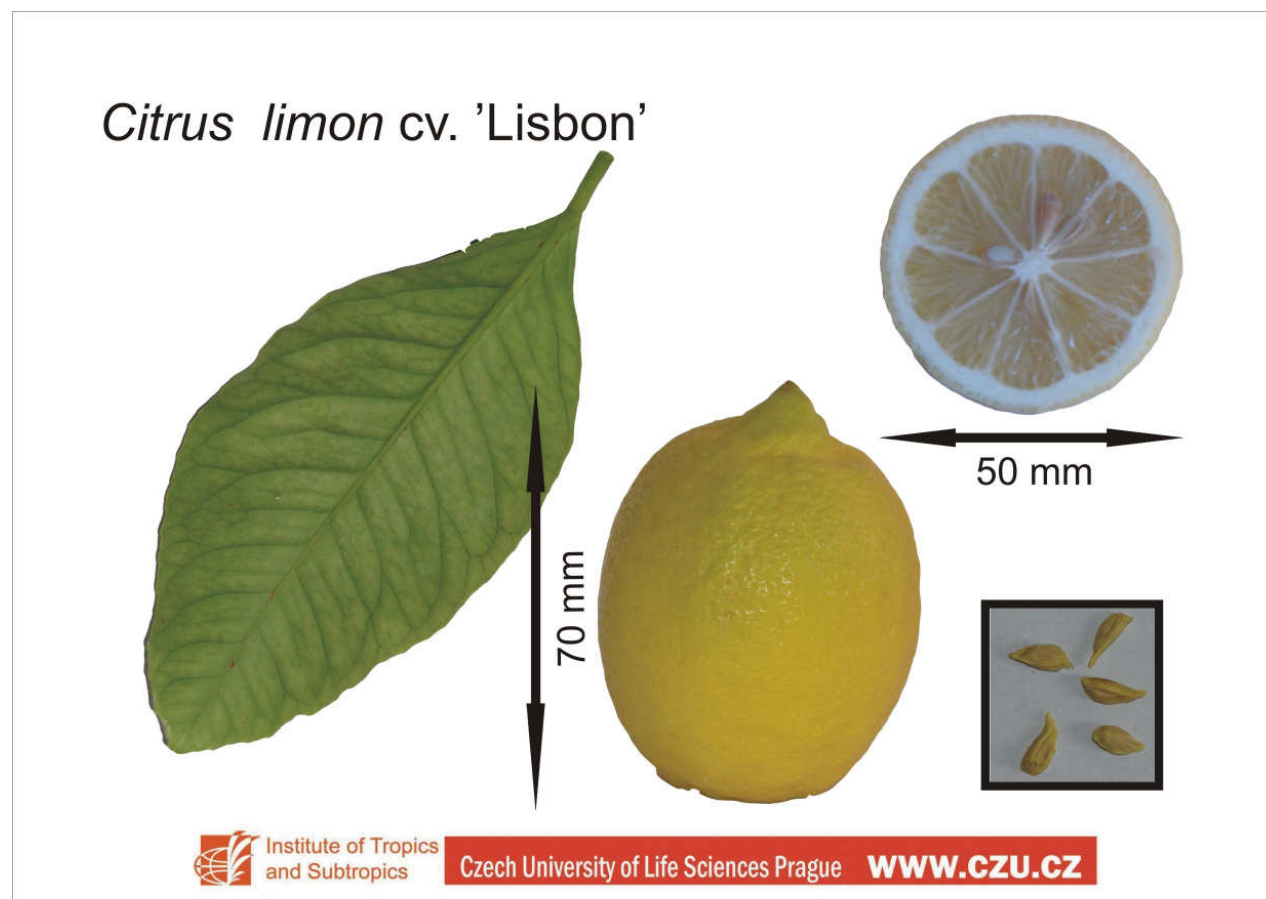


Fig. Appendices 2: continuation

## LEMONS

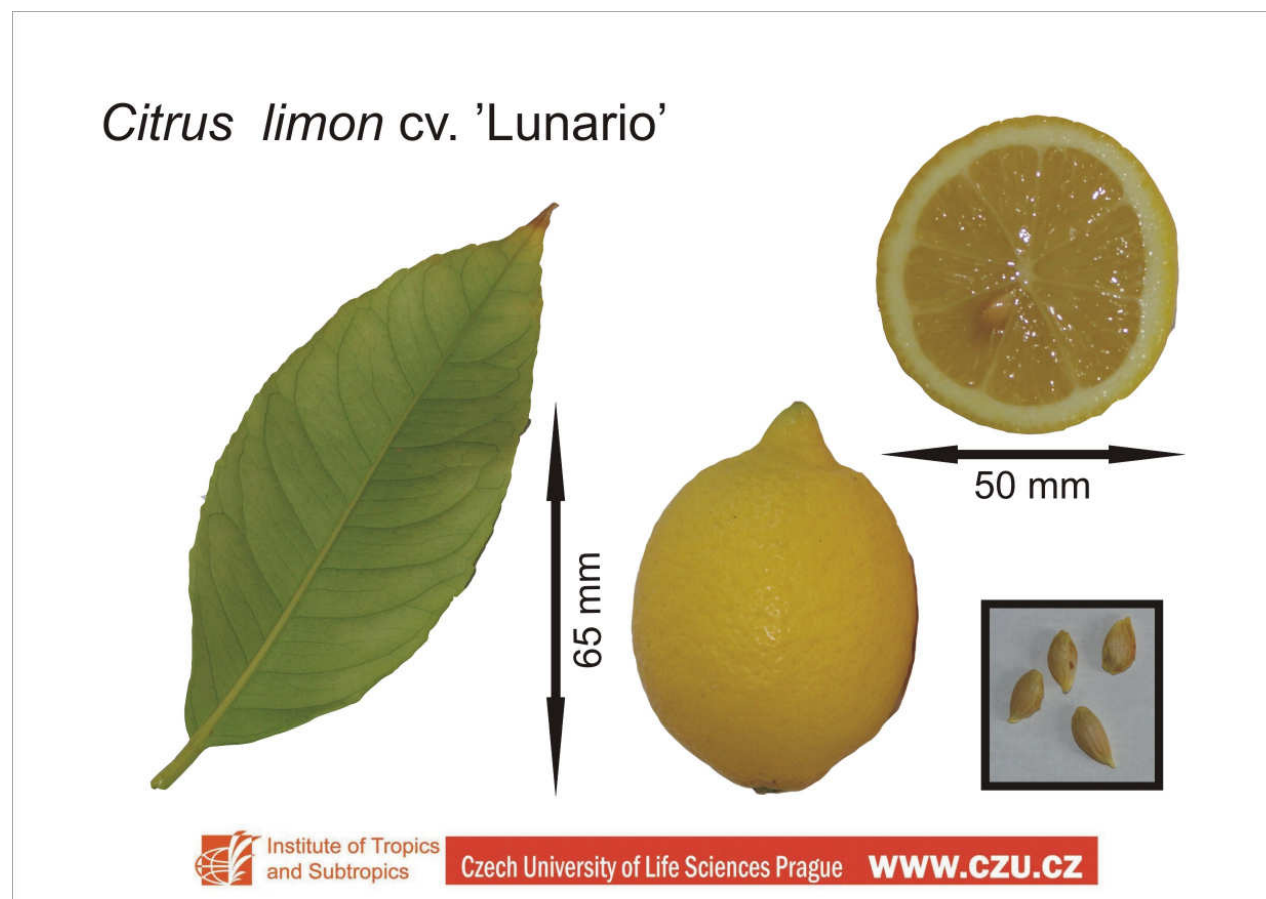


Fig. Appendices 2: continuation

## LEMONS

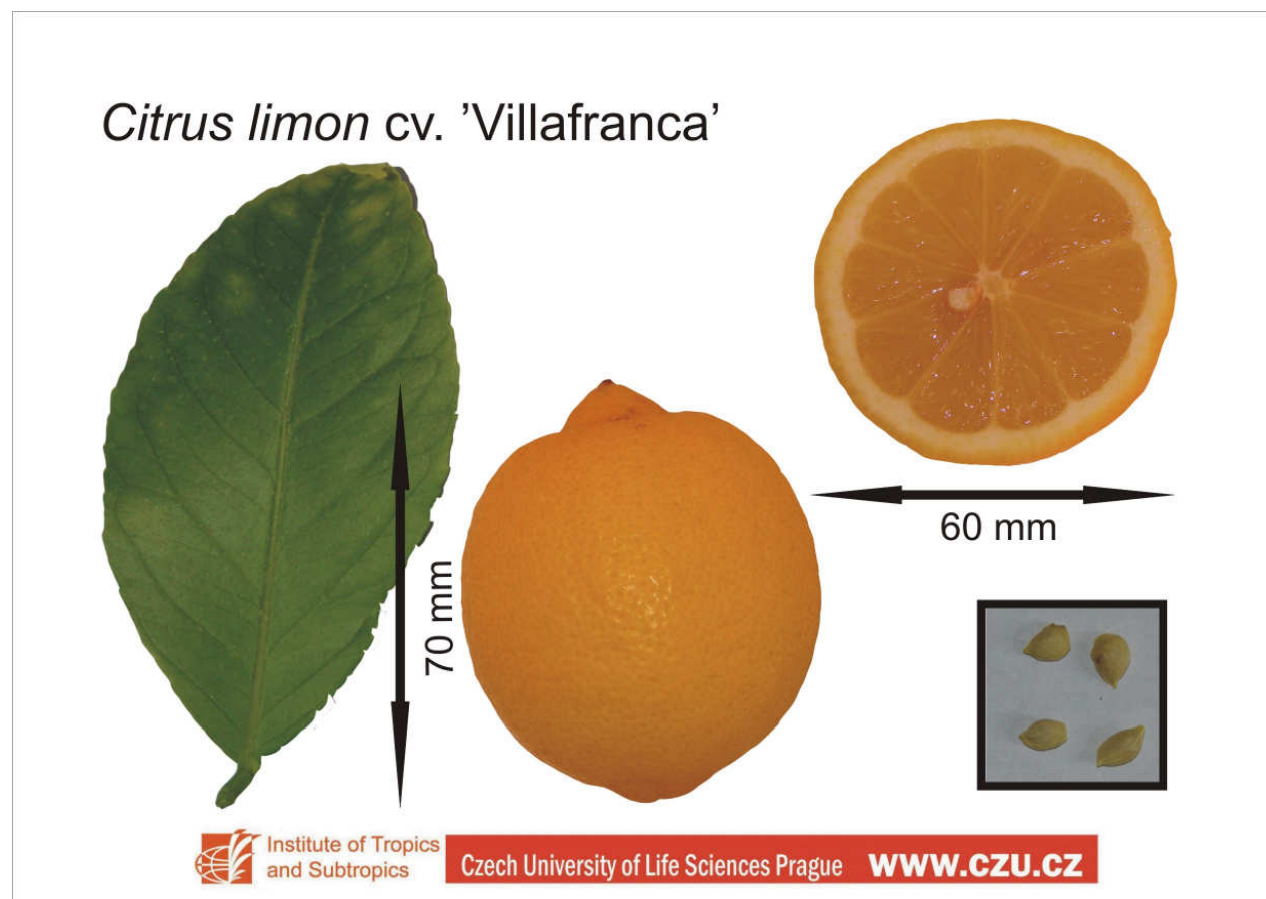




Fig. Appendices 2: continuation

SWEET ORANGES

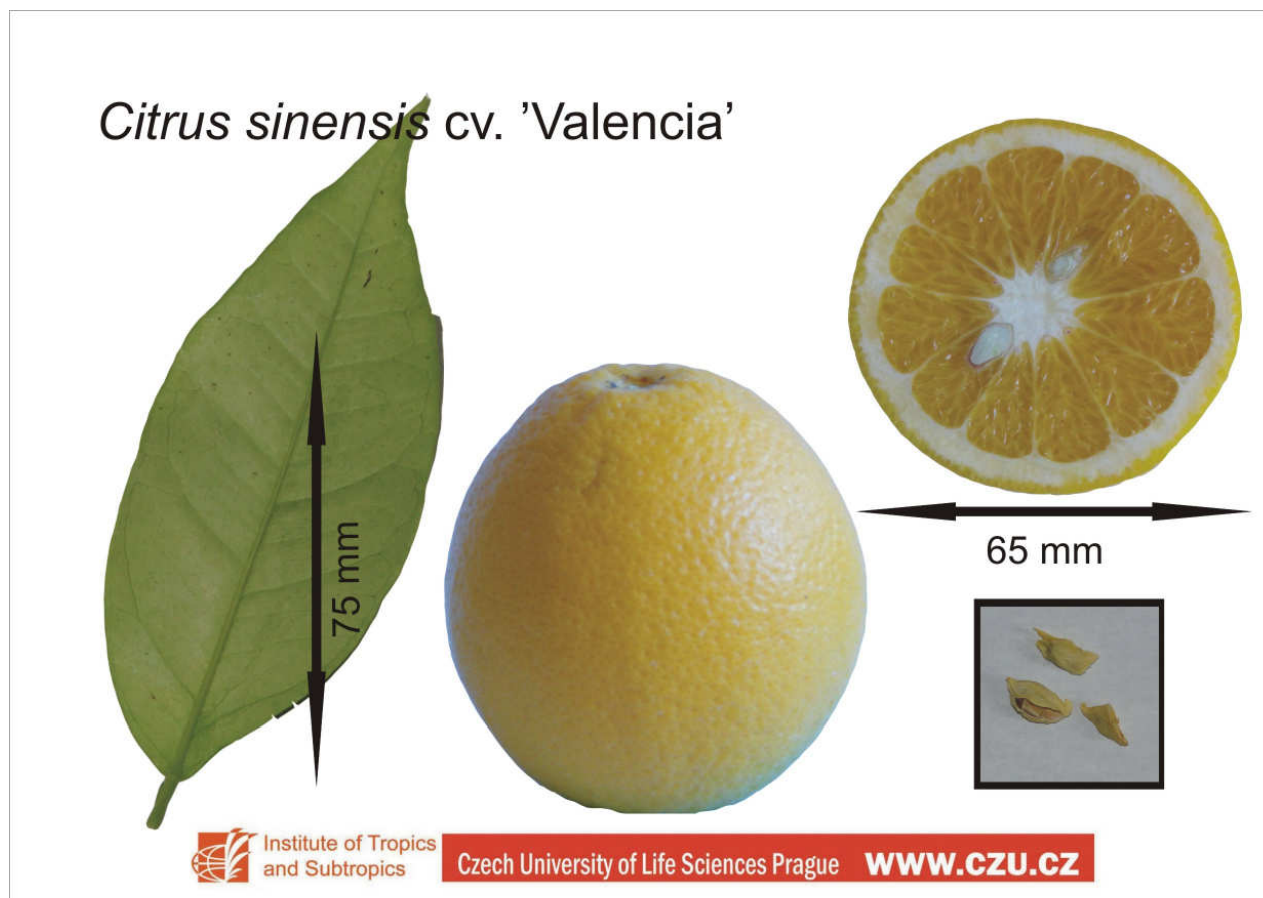


Fig. Appendices 2: continuation

## SWEET ORANGES

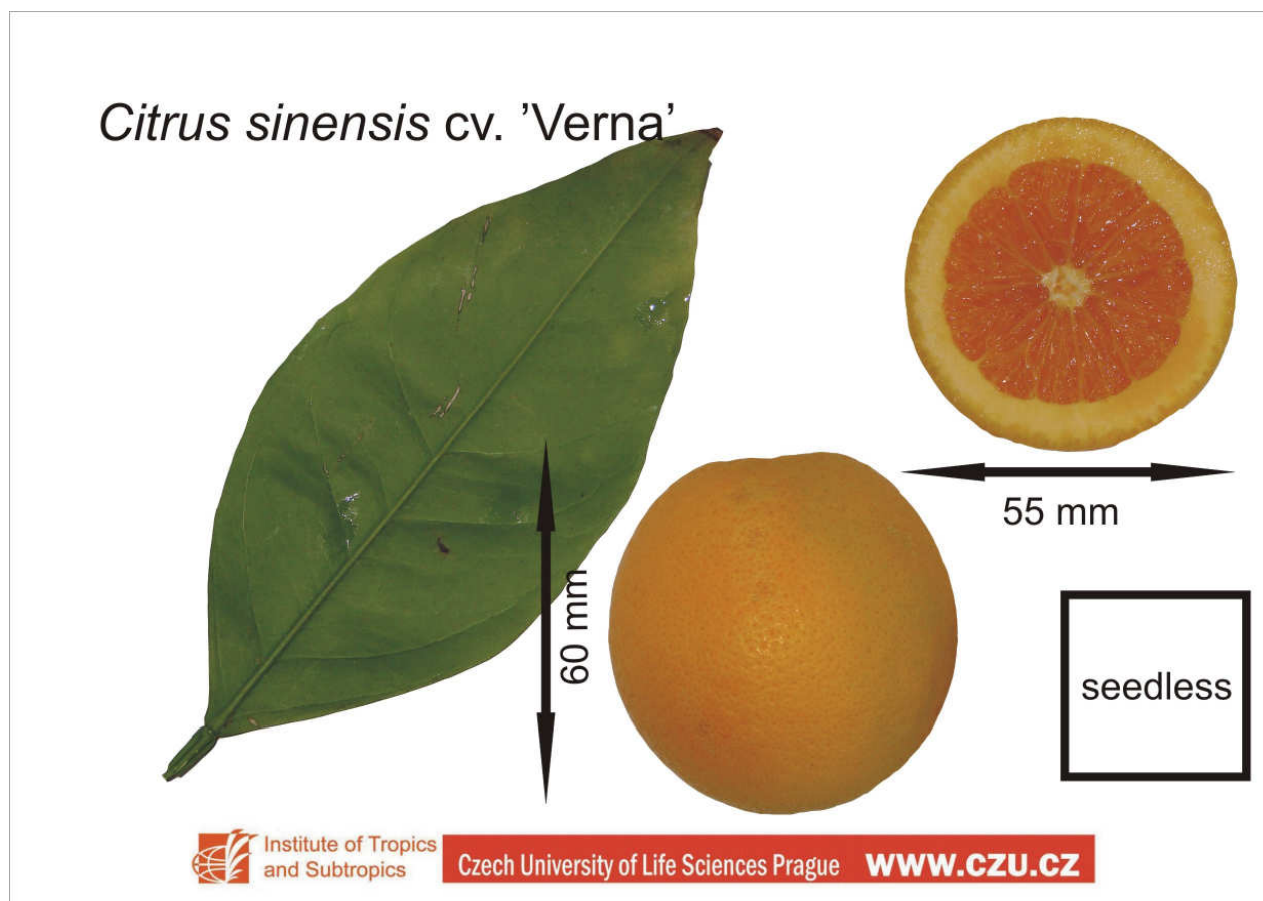


Fig. Appendices 2: continuation

## SWEET ORANGES

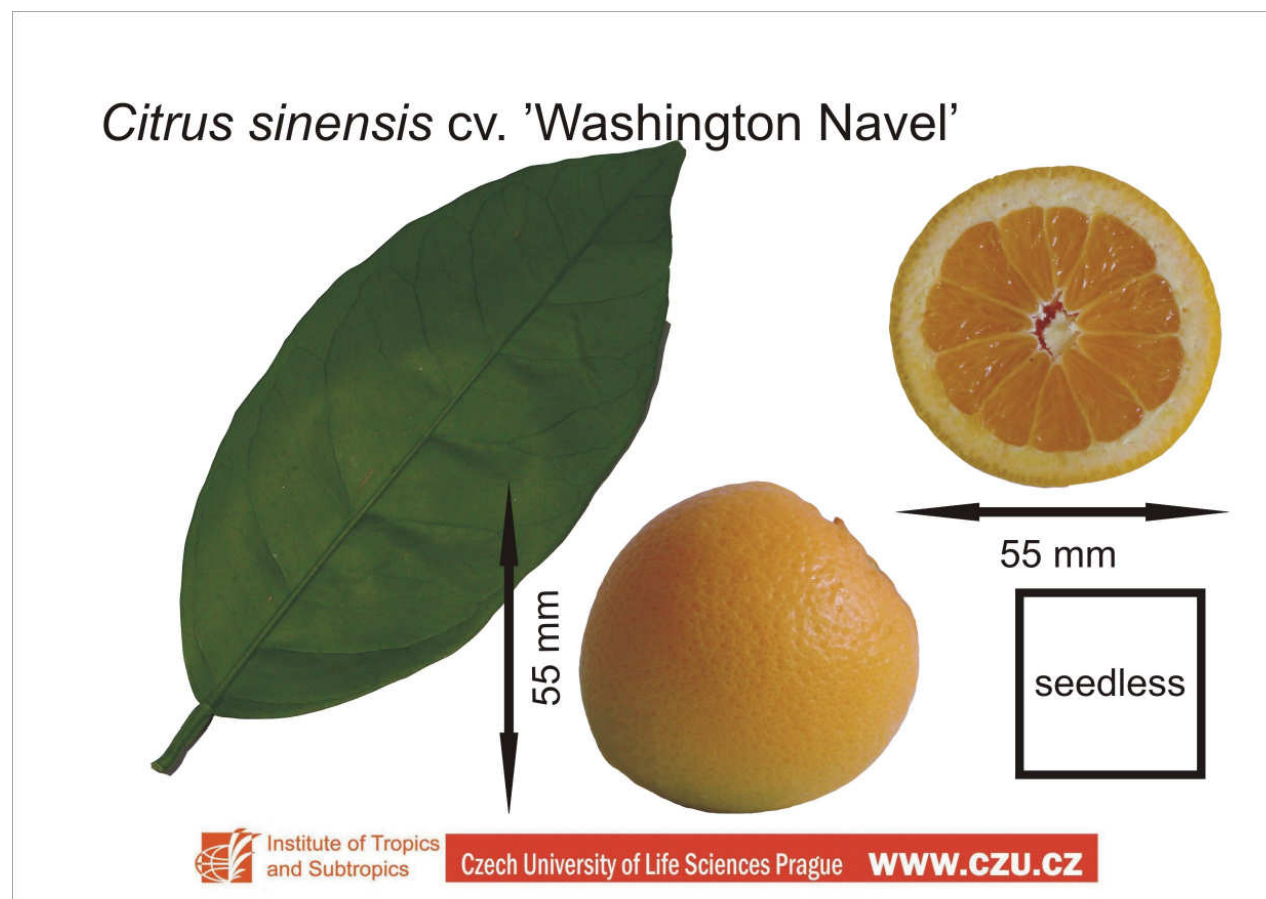


Fig. Appendices 2: continuation

## SWEET ORANGES

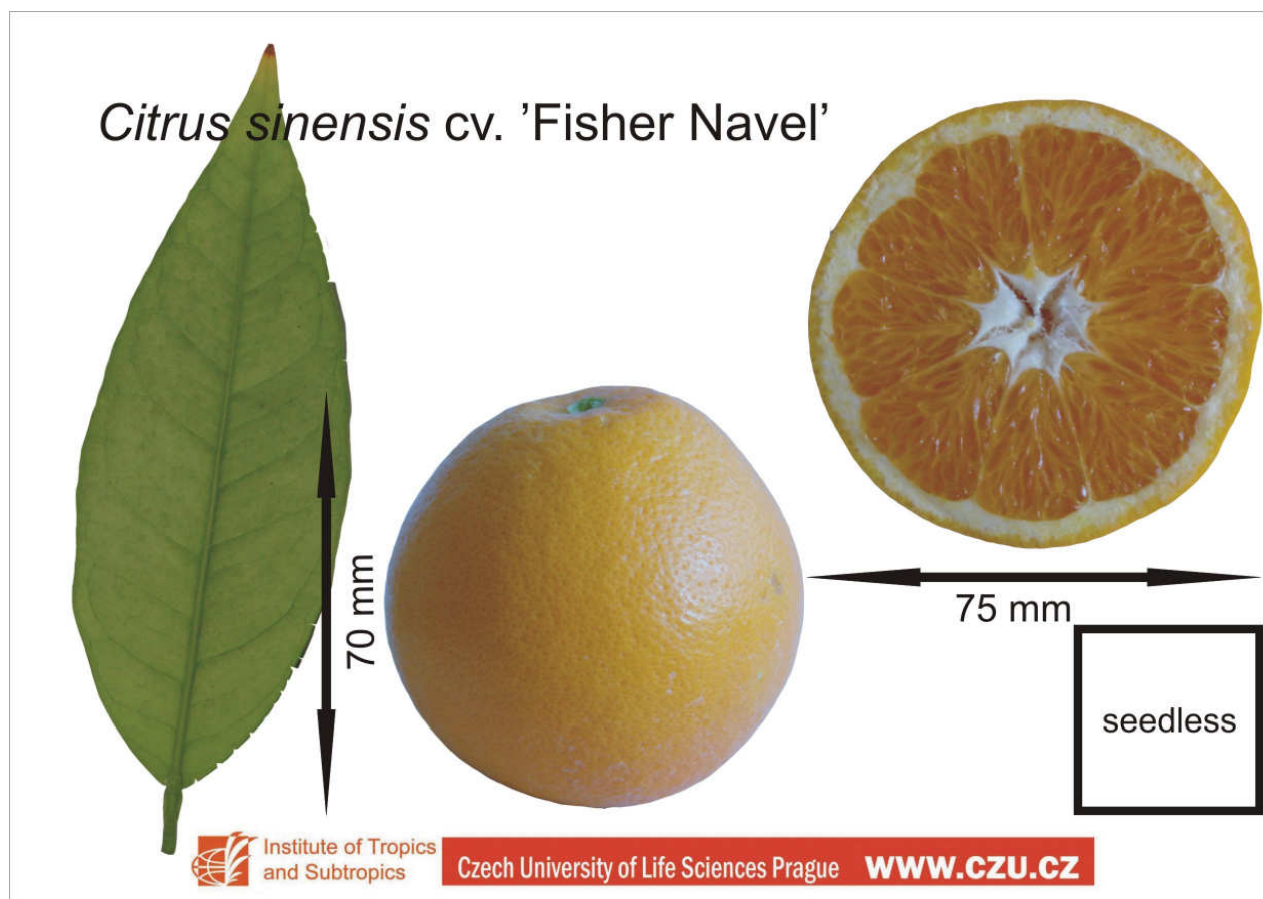


Fig. Appendices 3: Example of possible labelling for education purposes

*Olea europaea* L.





*Oleaceae*

**Accession number:** 13/1982 SGH

**Origin:** Europe – Mediterranean

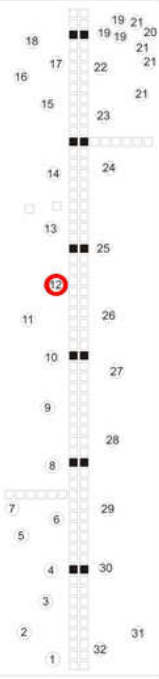
**Description:** The Olive is an evergreen tree or shrub. It is short and squat, and rarely exceeds 8–15 meters in height. The silvery green leaves are oblong in shape, measuring 4–10 cm long and 1–3 cm wide. The trunk is typically gnarled and twisted. The small white flowers, with four-cleft calyx and corolla, two stamens and bifid stigma, are borne generally on the last year's wood, in racemes springing from the axils of the leaves. The fruit is a small drupe 1–2.5 cm long, thinner-fleshed and smaller in wild plants than in orchard cultivars. Olives are harvested at the green stage or left to ripen to a rich purple color (black olive).

**Uses:** The olive has been cultivated since ancient times as a source of olive oil, fine wood, and olives for consumption. The naturally bitter fruit is typically subjected to fermentation or cured with lye or brine to make it more palatable. Green olives and black olives are soaked in a solution of sodium hydroxide and washed thoroughly in water to remove oleuropein, a bitter carbohydrate. Olive leaves are used in medicinal teas.



**Botanical garden of ITS  
CULS Prague**

**Subtropical greenhouse**



- 1. *Punica granatum* L. var. "nana"
- 2. *Catha edulis* Forsk.
- 3. *Litchi chinensis* Sonn.
- 4. *Macadamia integrifolia* Maiden & Betche
- 5. *Actinidia deliciosa* (A. Chev.) C.F. Liang & A.R. Ferguson
- 6. *Laurus nobilis* L.
- 7. *Pelargonium odoratissimum* Soland.
- 8. *Cnicus pentagona* Heilborn
- 9. *Eriobotrya japonica* (Thunb.) Lindl.
- 10. *Annona cherimola* Mill.
- 11.
- 12. *Olea europaea* L.
- 13. *Acacia sellowiana* (O.Berg) Burret
- 14. *Psidium cattleianum* Sabine
- 15. *Diospyros kaki* L.f.
- 16. *Rosmarinus officinalis* L.
- 17. *Psidium guajava* L.
- 18. *Ficus carica* L.
- 19. *Phoenix dactylifera* Forst.
- 20. *Capparis spinosa* L.
- 21. *Yucca glauca* Nutt.
- 22. *Citrus x meyeri*
- 23. *Citrus limonia* Osbeck
- 24. *Citrus sinensis* Osbeck var. "verna"
- 25. *Citrus sinensis* Osbeck var. "Washington navel"
- 26. *Citrus sinensis* Osbeck var. "valencia"
- 27. *Citrus sinensis* Osbeck var. "hamlin"
- 28. *Citrus deliciosa* Ten.
- 29. *Citrus usshibu* Marcov.
- 30. *Citrus tangerina* Tanaka
- 31. *Camellia sinensis* Kuntze
- 32.



**Fig. Appendices 4: The map of current taxon division in the subtropical greenhouse**