INTERACTIVE TAXONOMIC KEY FOR IDENTIFICATION OF URBAN TREES IN BELO HORIZONTE, MINAS GERAIS, BRAZIL

Flávia Faria, Ariadne Lopes & João Renato Stehmann
INTRODUCTION

The Natural History Museum and Botanical Garden of the Federal University of Minas Gerais (MHNJB/UFMG) has a 60 hectare forest reserve, where 30 trees species are used in urban forestry in Belo Horizonte (Minas Gerais, Brazil) can be found.
INTRODUCTION

The urban trees have great importance for the urban ecosystem and the quality of human life. For many people in the big cities, the only interaction with plant species occurs through the contact with the urban trees.
The aim of this activity is to promote the interest and the enchantment of the general public for plants as well as to encourage teachers to use the teaching material of the project with their students, encouraging them to know and to value our natural heritage.
HOW TO MAKE A TAXONOMY INTERACTIVE KEY

Taxonomic Interactive Key

- a taxonomic group (family, a genus) or any group (trees, yellow flowers etc...)
- morphological information, diagrams and pictures of these species
- vouchers, schematic drawings, photographys, glossary

Insert data Xper³
How to Make a Taxonomic Interactive Key

Taxonomic identification key of urban trees of the MHNJB/UFMG

Survey of the literature
- Localizing of the specimens
- Knowledge base construction
- Preparation of herbarium specimens
- Construction of the dicotomic key

Survey urban tree
- Vegetative morphological information
- Illustrations of the vegetative characters
- Images
RESULTS

- An interactive key for 30 species of Belo Horizonte urban trees;
- Development of teaching material to be used in workshops.
RESULTS

- An interactive key for 30 species of Belo Horizonte urban trees;
- Development of teaching material to be used in workshops.

**ILLUSTRATED GLOSSARY**

**DIVISION OF THE BLADE**

- SIMPLE LEAF: The leaf blade is not divided into leaflets (Fig. 1).
- COMPOUND LEAF: The leaf blade is divided into several small parts, known as leaflets (Fig. 2).
- CILIATED LEAF: The leaf has two lobes equally rounded (Fig. 3).
- ENTIRE LEAF: The leaf does not have any division (Fig. 4).

**TYPES OF SIMPLE LEAVES**

- Fig. 1 – Simple
- Fig. 2 – Compound
- Fig. 3 – Ciliated
- Fig. 4 – Entire

**VENATION**

- Fig. 5 – Parallel
- Fig. 6 – Parallel-convergent

**PHYLLOTAXY**

- Fig. 7 – Opposite
- Fig. 8 – Alternate

**TYPES OF COMPOUND LEAVES**

- Fig. 9 – Pinnae
- Fig. 10 – Pinnate

**LEAFLET SHAPE**

- Fig. 11 – Ovate
- Fig. 12 – Lanceolate

**TYPES OF COMPOUND LEAVES**

- Fig. 13 – Pinnate
- Fig. 14 – Pinnate

- PINNATE LEAF: The leaf is divided into leaflets that are attached along an extension of the stem (Fig. 9).
- PALMATLEAF: More than two leaflets are attached on the upper end of the petiole, coming from the same point (Fig. 13).
- ELLIPTICAL SHAPE: Elliptic-shaped leaflets. The length is twice the width (Fig. 11).
- LANCEOLATE SHAPE: Lance-shaped leaflets. The length is twice or three times the large width (Fig. 12).
- PINNATE LEAF: More than two leaflets are attached on the upper end of the petiole, coming from the same point (Fig. 14).
- BIPINNATE LEAF: The leaf is divided into leaflets that are attached along an extension of the stem (Fig. 15).
RESULTS

Interactive Taxonomic Key for Identification of Urban Trees in Belo Horizonte, Minas Gerais, Brazil

Baeha variipilata (Orchid tree) – Fabaceae

Celtis auriculata (Goli tree) – Ulmaceae

Sapium tenuifolium (African tulip tree) – Euphorbiaceae

Bauhinia purpurea (Glory tree) – Leguminosae

Mucuna pruriens (Orange fern) – Fabaceae
RESULTS
RESULTS
RESULTS

- 5 workshops were realized (50 participants).
CONSIDERATIONS

- The interactive key is a good and simple strategy to learn about the plants;

- Xper² is a powerful tool for editing and managing taxonomic descriptions. Freely download your Windows™, Mac™ or Linux version in French, English or Spanish.
CONSIDERATIONS

- This can be an itinerant activity, since internet signal exists;

- People have demonstrated a big interest in the activity. They have related that the workshop has contributed for their knowledge;

- Some participants have complained about the short time of the workshop (2 hours). For this reason we intend to transform it in a basic course of introduction to plant identification.
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TUTORIAL XPER³

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My Knowledge Bases

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<th>Owner(s)</th>
<th>Editor(s)</th>
<th>Viewer(s)</th>
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<td>Árvores urbanas do Museu de História Natural e Jardim Botânico da UFMG</td>
<td>Ariadne Lopes</td>
<td>João Stehmann</td>
<td>Flávia Faria, Gustavo Jardim</td>
</tr>
</tbody>
</table>

Or Create Knowledge Base
**Tabebuia rosealba**

**Definition**

- **Name**: Tabebuia rosealba
- **Alternative name**: White trumpet tree

**Detail**

Tabebuia rosealba (Ridl.) Matos || Family: Bignoniaceae || Common names: White trumpet tree, white ipê, Cerrado's ipê. || The Tabebuia rosealba's tree can reach up to 15 meters tall. This tree has white to light pink flowers arranged in inflorescences. The fruit is a large and woody capsule, which has innumerable winged seeds. || Occurrence: It is native to Brazil, occurring in São Paulo’s north, Minas Gerais, Mato Grosso do Sul and Goiás. || Phenology: It starts flowering from August-October when the tree does not have leaves. The fruits mature in October until November’s end.
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Urban Trees in Belo Horizonte, Minas...

- **Tabebuia rosea**
  - **Alternative name:** White trumpet tree
  - **Definition:**
    - **Name:** Tabebuia rosea
    - **Description:**
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- **Additional items:**
  - Melia azedarach
  - Litchi chinensis
  - Ceiba speciosa
  - Spathodea campanulata
  - Bauhinia variegata
  - Sapindus saponaria
  - Tibouchina granulosa
  - Lantana glutobacarpa
  - Tecoma stans
  - Syzygium cumini
  - Delonix regia
  - Lagerstroemia speciosa
  - Jacaranda mimosifolia
  - Handroanthus impetiginosus
  - Peltophorum dubium
  - Cordia superba

- **Actions:**
  - Add a new item
Urban Trees in Belo Horizonte, Minas...

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**Images:**
- Folha
- Árvore
- Flor
- Fruto
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Descriptors: external morphological characteristics of the leaf
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Urban Trees in Belo Horizonte, Minas Gerais

11 Descriptors

Types of compound leaf

Tip of the leaf/leaflet
The tip or apex is one of the three distinct regions of a leaf blade. It is the part of the lamina farthest removed from the point of attachment of the leaf to the stem.

30 Remaining taxa

- Melia azedarach
- Libidibia ferrea var. leiostachya
- Ceiba speciosa
- Spathodea campanulata
- Bauhinia variegata
- Sapindus saponaria
- Tibouchina granulosa
- Lafontea glyptocarpa
- Tecoma stans
- Syzygium cumini
- Delonix regia
- Lagerstroemia speciosa
- Tabebuia rosea
6. **Tip of the leaf/leaflet**

The tip or apex is one of the three distinct regions of a leaf blade. It is the part of the lamina farthest removed from the point of attachment of the leaf to the stem.
Start the identification with any descriptor.
Types of compound leaf

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Urban Trees in Belo Horizonte, Minas...

11 Descriptors

Types of compound leaf

- Odd-pinnate (4)
- Even-pinnate (6)
- Odd-bipinnate (3)

30 Remaining taxa
- Melia azedarach
- Libidibia ferrea var. leiochachya
- Calba speciosa
- Spathodea campanulata
- Bauhinia variegata
- Sapindus saponaria
- Tibouchina granulosa
- Lafoensia glyptocarpa
- Tecoma stans
- Syzygium cumini
- Delonix regia
- Lagerstroemia speciosa
- Tabebuia rosea
- Jacaranda mimosifolia
Select one of the states
Submit the chosen state

Submit
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**Urban Trees in Belo Horizonte, Minas Gerais**

### 4 Remaining taxa

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<tbody>
<tr>
<td><em>Spathodea campanulata</em></td>
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<td><em>Schizolobium parahyba</em></td>
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<td><em>Gansepinus pulcherrima</em></td>
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<td><em>Ganylea urens</em></td>
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<td><em>Rosystana oleracea</em></td>
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<td><em>Samanea inopinata</em></td>
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<td><em>Leucaena leucocephala</em></td>
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<td><em>Senna multijuga</em></td>
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<td><em>Senna macrocaphora</em></td>
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<td><em>Giliae birchulidiana</em></td>
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<td><em>Eucalyptus tereticornis</em></td>
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**Shape of the leaf/leaflet**
It refers to what the shape of the leaf looks like.
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Click on Descriptors to continue the identification.
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Cancel the state that you have selected previously.
Choose another state
Click on Change!
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Caryota urens Jacq. || Family: Arecaceae || Common names: Solitary fishtail palm, toddy palm, wine palm. It is a palm tree that can reach up to 30 m tall. The ultimate leaflets have a characteristic shape, somewhat like the tail of a fish, leading to the popular English name of fishtail palm. This species has a globose fruit, red to black in color, with one seed. || Occurrence: It is a native palm tree to the tropical area from Southeast Asia (India, Burma, Sri Lanka & Malaysia). || Phenology: Flowering starts for the first time around 13 years of age and produces several inflorescences every year.
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Click on Reset and Restart
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ACKNOWLEDGEMENTS

- BGCI and MBG supporting Flávia Faria;
- BGCI Congress organization;
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