# Ghini Documentation

*Versão 1.0.x*

**Mario Frasca**

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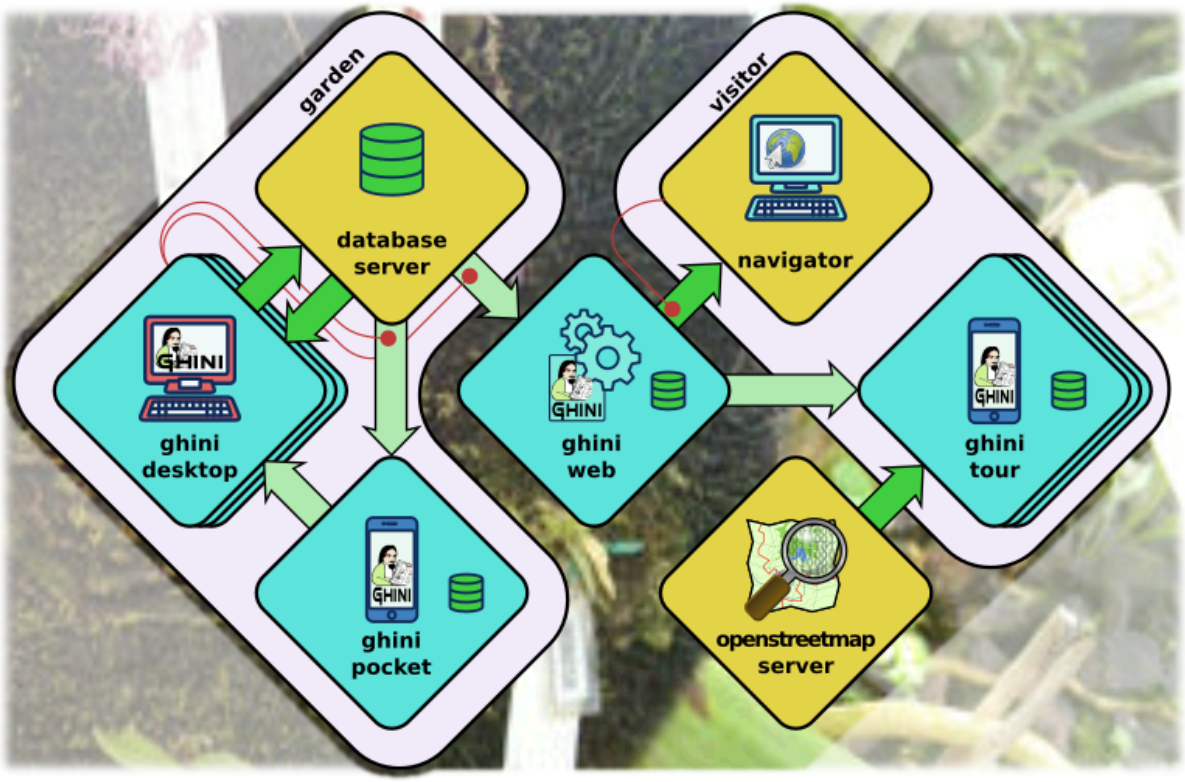
# Conteúdo

Ghini é uma app para gestão de coleções de amostras botânicas para criar um banco de dados pesquisável de registos de planta.

- **ghini.desktop** lets you create and query a database representing objects and events in your plant collection.
- **ghini.web** publishes highlights from your database on the web.
- **ghini.pocket** puts a snapshot of your database in your handheld device.
- **ghini.tour** assists garden visitors with a map and spoken virtual panels.




The bulk of this documentation focuses on ghini.desktop. One final chapter presents the rest of the Ghini family: *ghini.pocket*, *ghini.web*, *ghini.tour*, and the *data streams between software components*.

All Ghini software is open and free. Our standalone software is released under the GNU Public License. Our client-server software follows the GNU Affero Public License.

# CAPÍTULO 1

# Statements

## 1.1 Objetivos e destaques do Ghini

Deve usar este software? Esta pergunta é para você responder. Confiamos em que se gira uma coleção botânica, irá encontrar Ghini excessivamente útil e esperamos que esta página irá convencê-lo sobre isso.

Esta página mostra como o software Ghini atende às necessidades de um jardim botânico.

If you already know, and all you want is to do something practical, just install the software, then check our user-contributed recipes.

### 1.1.1 Botanic Garden

De acordo com a Wikipedia, »um jardim botânico é um jardim dedicado à recolha, cultivo e exposição de uma vasta gama de plantas marcadas com seus nomes botânicos« e ainda de acordo com a Wikipedia, »um jardim é um espaço planejado, normalmente ao ar livre, reservado para a exposição, cultivo e apreciação de plantas e outras formas de natureza.«

Então dentro de um jardim botânico temos tanto o espaço físico, o jardim, como sua dinámica, as actividades a que dedica-se ao jardim, atividades que nos faz chamam o jardim um jardim botânico.

### 1.1.2 Jardim botânico de Software

No outro extremo do nosso raciocínio, temos a app programa Ghini e novamente citando a Wikipédia,» uma aplicação programa é um programa de computador projetado para executar

Fig. 1: **the physical garden**

Fig. 2: **coleção relacionadas com actividades no jardim**

um grupo de coordenação de funções, tarefas ou atividades em benefício do utilizador«, ou, em suma,» projetado para ajudar as pessoas a exercer uma atividade «.

Dados e algoritmos dentro Ghini foram concebidos para representar o espaço físico e a dinâmica de um jardim botânico.

Fig. 3: **estrutura de banco de dados** do Ghini

In the above figure, a simplified view on the database, the highlighted blocks are those relative to objects you definitely need insert in the database.

We distinguish three main sections in the database. Start reading the graph from the right hand side, with the relevant **Taxonomy** information, then step to administering your **Collection**, and finally consider the physical **Garden**.

O elemento central em ponto de vista do Ghini é o `Accession`. Seguir suas ligações a outros objetos de banco de dados permite-nos compreender melhor a estrutura:

**Accession links Planting to Species**

> An `Accession` represents the action of receiving this specific plant material in the garden. As such, `Accession` is an abstract concept, it links physical living `Plantings` —groups of plants placed each at a `Location` in the garden— to the corresponding `Species`. It is not the same as an acquisition from a source, because in a single acquisition you can access material of more than one species. In other words: a single aquisition can embark multiple accessions. An `Accession` has zero or more `Plantings` associated to it (0..n), and it is at all times connected to exactly 1 `Species`. Each `Planting` belongs to exactly one `Accession`, each `Species` may have multiple `Accessions` relating to it.
>
> Um `Accession` fica no banco de dados, mesmo se todos seus Plantings do tem sido removidos, vendido, ou morreram. Identificar a `Species` de `Accession` consistentemente conecta todos os seus `Plantings` para o `Species`.

**Accession at the base of the history of your plants**

> `Propagations` e `Contacts` fornecem material vegetal para o jardim; Esta informação é opcional e coletores de menores podem preferir deixar isto de lado. Um julgamento `Propagation` pode ser vencido, na maioria das vezes que ele irá resultar em exatamente uma accesão, mas pode também produzir táxons ligeiramente diferentes, então o banco de dados permite a zero ou mais `Accession` por `Propagation` (0..n). Também um "contato " pode fornecer zero ou mais `Accession` (0..n).

**Accession and Verification opinions**

> Especialistas podem formular sua opinião sobre a `Species` ao qual pertence um `Accession`, fornecendo uma `Verification`, assiná-lo, e afirmando o nível aplicável de confiança.

**Accessing your own Propagations**

Se um `Accession` foi obtido no berçário jardim de uma propagação " sucesso ", os links de `Propagation` a `Accession` e todos os seus Plantings do " " para um único pai `Planting`, a semente ou o pai vegetativo.

Mesmo após a explicação acima, novos utilizadores geralmente ainda perguntar por que eles precisam passar através de um ecrã de `Accession`, enquanto que todos querem é inserir uma "planta " na coleção e outra vez: o que é este «accession» coisa afinal? A maioria das discussões na net não tornar o conceito mais claro. Um dos nossos utilizadores deu um exemplo que estou feliz de incluir na documentação do Ghini.

**Caso de uso**

1. No início de 2007, temos cinco mudas de * Heliconia Longá * (uma planta " espécie ") do nosso vizinho (a fonte " contato "). Desde que foi a primeira aquisição do ano, demos o nome deles 2007.0001 (demos-lhes um código único exclusivo `Accession`, com quantidade 5) e nós plantamo-los todos juntos num "local " como um único plantio " ", também com a quantidade de 5.
2. No momento da escrita, nove anos mais tarde, `Accession` 2007.0001 6 distintos `Plantings`, cada uma num diferente `Location` no nosso jardim, obteve vegetativamente (assexuadamente) de 5 plantas originais. A nossa única intervenção foi dividir, mover e claro, escrevendo esta informação no banco de dados. Quantidade total da planta é acima de 40.
3. "Plantings novos " obtidos por (assistida) sexual `Propagation` Venha em nosso banco de dados sob diferentes códigos de `Accession`, onde nosso jardim é a fonte de " contato " e nós sabemos qual dos nossos plantios " " é o pai de semente.

os três casos acima traduzem em várias histórias curtas de uso:

1. ativar o menu Inserir → accesão, verificar a veracidade e correção da `Species` *Heliconia longa*, especificar a quantidade inicial de `Accession`; Adicione sua `Plant` no `Location` desejado.
2. Editar `Planting` para corrigir a quantidade de plantas vivas — repeti-lo sempre que necessário.
3. Editar `Planting` para dividi-lo em separado `Location` — isso produz uma `Planting` do diferente sob o mesmo `Accession`.
4. Edite `Planting` para adicionar uma `Propagation` (semente).
5. Edite `Planting` para atualizar o estado de `Propagation`.
6. ativar o menu Inserir → de accesão para associar uma accesão a um processo bem sucedido de `Propagation`; Adicione a plantação do no "local " desejado.

Em particular a capacidade de dividir uma plantação do em vários diferentes `Location` e de manter todas as uniformemente associado a uma `Species`, ou a possibilidade de manter informações sobre `Plantings` que foram removidos da coleção, ajudar a justificar a presença do nível de abstração de `Accession`.

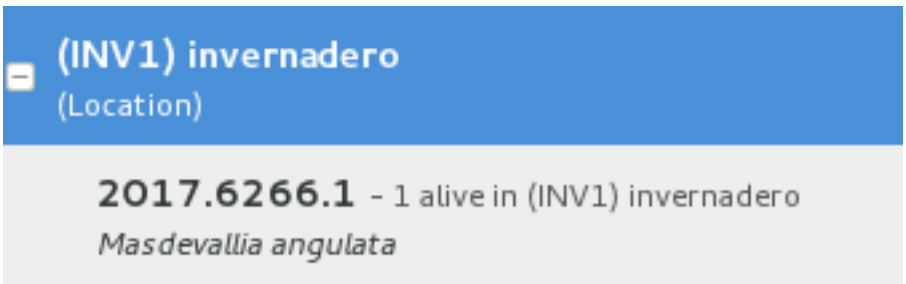
### 1.1.3 Hypersimplified view

People using Ghini only sporadically may prefer ignoring the database structure and look at it as two nested sequences of objects, each element of the sequence being necessary to add element at the next level.

In order to get down to an Accession, you will need four levels, as in this example:


A quite complete set of Families and Genera are inserted in your database at the moment Ghini initializes it. So all you need is adding Species and Accessions, in this order.

When placing a physical Plant (relative to an Accession) somewhere in the garden, you need to describe this «somewhere» digitally, as a Location in the garden.

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### 1.1.4 Highlights

Não-assim-breve lista de destaques, significado para aguçar o apetite.

#### informações taxonômicas

When you first start Ghini, and connect to a database, Ghini will initialize the database not only with all tables it needs to run, but it will also populate the taxon tables for ranks family and

genus, using the data from the "RBG Kew's Family and Genera list from Vascular Plant Families and Genera compiled by R. K. Brummitt and published by the Royal Botanic Gardens, Kew in 1992". In 2015 we have reviewed the data regarding the Orchidaceae, using "Tropicos, botanical information system at the Missouri Botanical Garden - www.tropicos.org" as a source.

### A importar dados...

Ghini permitirá que importe quaisquer dados que pôr num formato intermediário json. O que importar completará o que já tem no banco de dados. Se precisar de ajuda, pode pedir Ghini profissional para ajudá-lo a transformar os seus dados em formato json intermediário do Ghini.

### synonyms

Ghini permitirá que define sinónimos para espécies, géneros, famílias. Também esta informação pode ser representada no formato json intermediário e ser importada num banco de dados existente Ghini.

### científico responsável

Ghini implementa o conceito de `Accession`, intermediário entre a planta física (ou um grupo respectivos) e o táxon abstrato. Cada accesão pode associar as mesmas plantas de diferentes táxons, se dois taxonomistas não concordam com a identificação: cada taxonomista pode ter sua opinião e não é necessário substituir o trabalho um do outro. Todas as verificações podem ser encontradas em banco de dados, com carimbo e assinatura.

### ajuda a identificação off-line

Ghini permite que você associar imagens às instalações físicas, isso pode ajudar a reconhecer a planta, no caso de um adesivo é perdido, ou identificação taxonômica de ajuda se um taxonomista não está disponível em todos os tempos.

### exportações e relatórios

Ghini permitirá que você exporta um relatório em qualquer formato textual que você precisa. Ele usa um mecanismo de modelagem poderosa chamado "mako", que permitirá que você exportar os dados em uma seleção para qualquer formato que você precisa. Uma vez instalado, alguns exemplos estão disponíveis no subdiretório de mako.

### anotar sua informação

Você pode associar notas plantas, accesões, espécie,... Notas podem ser categorizadas e usadas em pesquisas ou relatórios.

### jardim ou herbário

Gestão dos locais de planta.

### história do banco de dados

Todas as alterações no banco de dados é armazenado no banco de dados, como registro da história. Todas as alterações são "assinadas" e hora marcada. Ghini torna mais fácil para recuperar a lista de todas as alterações no último dia de trabalho ou semana, ou em qualquer período específico no passado.

### pesquisa simples e poderosa

Ghini permite que você procure o banco de dados usando palavras-chave simples, por exemplo: o nome do local ou um nome de gênero ou você pode escrever consultas mais complexas, que não alcançam a complexidade do SQL, mas permitem um nível decente de detalhe localizando seus dados.

### independente de banco de dados

Ghini is not a database management system, so it does not reinvent the wheel. It works storing its data in a SQL database, and it will connect to any database management system which accepts a SQLAlchemy connector. This means any reasonably modern database system and includes MySQL, PostgreSQL, Oracle. It can also work with sqlite, which, for single user purposes is quite sufficient and efficient. If you connect Ghini to a real database system, you can consider making the database part of a LAMP system (Linux-Apache-MySQL-Php) and include your live data on your institution web site.

### independente de idioma

The program was born in English and all its technical and user documentation is first written in that language. Both technical and user documentation use `gettext`, an advanced tool for semi-automatic translation.

The program has been translated and can be used in various other languages, including Spanish (97%), French (82%), Portuguese (71%), to name some Southern American languages, as well as Ukrainian (100%) and Czech (71%).

Translation of documentation goes a bit slower, with only Ukrainian, Spanish and Italian at more than 50%.

### independente de plataforma

Instalar o Ghini em Windows é um processo fácil e linear, não vai demorar mais de 10 minutos. Ghini nasceu em Linux e instalá-lo no Ubuntu, Fedora ou Debian é consequentemente ainda mais fácil. MacOSX a ser baseado em unix, é possível executar com êxito o procedimento

de instalação do Linux em qualquer computador recente da Apple, após algumas etapas de preparação.

#### facilmente atualizado

O processo de instalação irá produzir uma instalação atualizável, onde atualizá-lo levará menos de um minuto. Dependendo da quantidade de feedback que recebemos, nós produziremos atualizações todos os dias ou uma vez em quando.

#### unidade testada

Ghini é continuamente e unidade testado extensivamente, algo que faz regressão de funcionalidade perto de impossível. Cada atualização é automaticamente qualidade verificada, sobre o serviço de integração contínua de Travis. Integração de TravisCI com a plataforma github tornará difícil para nós divulgar nada que possui uma única falha unidade de teste.

A maioria das alterações e adições tornamos, vêm com um teste de unidade extra, que define o comportamento e fará qualquer alteração indesejada facilmente visível.

#### customizable/extensible

Ghini é extensível através de plugins e pode ser personalizado para atender às necessidades da instituição.

## 1.2 Missão e visão

Aqui afirmamos quem somos, o que nós pensamos do nosso trabalho, que você pode esperar deste projeto.

### 1.2.1 Quem está por trás de Ghini

Ghini is a small set of programs, meant to let collection managers manage their collection also digitally.

Ghini was born back in 2004 as Bauble, at the Belize Botanical Garden. It was later adapted to the needs of a few more gardens. Brett Adams, the original programmer, made this software a commons, by releasing it under a GPL license.

After years of stagnation Mario Frasca revived the project, and rebranded it as Ghini in honour of Luca Ghini, founder of the first European botanic garden and herbarium. Mario Frasca started advocating, travelling, distributing, developing, expanding, redefining, documenting it, and it is now Mario Frasca writing this, looking for users, requesting feedback.

Behind Ghini there's not only one developer, but a small but growing global users community.

Translations are provided by volunteers who mostly stay behind the scenes, translating missing terms or sentences, and disappearing again.

Para tornar as coisas mais claras quando falamos de Ghini, mas deve—e, neste documento, vamos—indicar se é Ghini(software), ou Ghini(o povo), a menos que, obviamente, queremos dizer ambas as coisas.

### 1.2.2 Missão

Our goal as Ghini Software is to provide free software, of proven quality, and to let anybody install it if they feel like it. We also aim at facilitating access to functional knowledge, in the form of documentation or by laying the contact among users or between users and software professionals.

All our sources, software and documentation, are open and free, and we welcome and stimulate people to use and to contribute. To facilitate community forming, all our platforms can be consulted without registration. Registration is obviously required if you want to contribute.

Ghini welcomes the formation of groups of users, bundling forces to define and finance further development, and we welcome developers contributing software, from any corner in the world, and we stimulate and help them comply with the high quality requirements, before we accept the contributed code in the software sources.

### 1.2.3 Visão

A visão serve para indicar o caminho a seguir e projeta uma imagem futura do que nós queremos a nossa organização seja, de forma realista e atraente. Serve como motivação porque ele visualiza o desafio e a direção das mudanças necessárias a fim de crescer e prosperar.

- até o ano 2020
- ponto de referência
- comunidade
- desenvolvimento
- integração com o portal da web
- informação geográfica

# CAPÍTULO 2

# Instalando o Ghini

## 2.1 Installation

Ghini.desktop é um programa multi-plataforma e ele será executado em máquinas unix, como GNU/Linux e MacOSX, assim como no Windows.

**one-liner for hurried users.**

> Linux users just download and run the installation script. You may read the documentation later.
>
> Windows users in a real hurry don't the instructions and use a recent Windows installer. You do not miss any functional feature, but you have less chances to contribute to development.
>
> Mac users are never in a hurry, are they?

Ghini é mantida por algumas pessoas, que se concentram no reforço de suas partes funcionais, mais não tanto na escrita de instaladores chiques. Em vez de vários instaladores nativos oferecemos um procedimento de instalação único multi-plataforma. Isto tem algumas grandes vantagens que você vai aprender a apreciar a medida que vamos.

A instalação é baseada num script em execução.

- The GNU/Linux script takes care of everything, from dependecies to installation for users in the `ghini` group.
- O script do Windows precisa que primeiro instalar um par de coisas.
- No MacOSX, usamos o mesmo script, como no GNU/Linux. Desde que o OSX não tem nenhum gestor de pacotes padrão, podemos instalar um e usá-lo antes de começar o

script.

Nosso procedimento de instalação, você vai acabar com Ghini executando dentro de um ambiente virtual de Python, todas as dependências do Python instalado localmente, não entrar em conflito com qualquer outro programa Python, você pode ter em seu sistema.

São dependências que não se encaixam num ambiente virtual de Python: Python, virtualenv, GTK e PyGTK. A instalação deles varia por plataforma.

Se você mais tarde decidir remover Ghini, você simplesmente remover o ambiente virtual, que é um diretório, com todo o seu conteúdo.

### 2.1.1 Instalar no GNU/Linux

Open a shell terminal window, and follow the following instructions.

1. Download the *devinstall.sh* script:

   devinstall.sh

2. Invoke the script from a terminal window, starting at the directory where you downloaded it, like this:

   ```
   bash ./devinstall.sh
   ```

   The script will produce quite some output, which you can safely ignore.

   **global installation**

   When almost ready, the installation script will ask you for your password. This lets it create a `ghini` user group, initialise it to just yourself, make the just created `ghini` script available to the whole `ghini` user group.

   If feeling paranoid, you can safely not give your password and interrupt the script there.

   Possibly the main advantage of a global installation is being able to find Ghini in the application menus of your graphic environment.

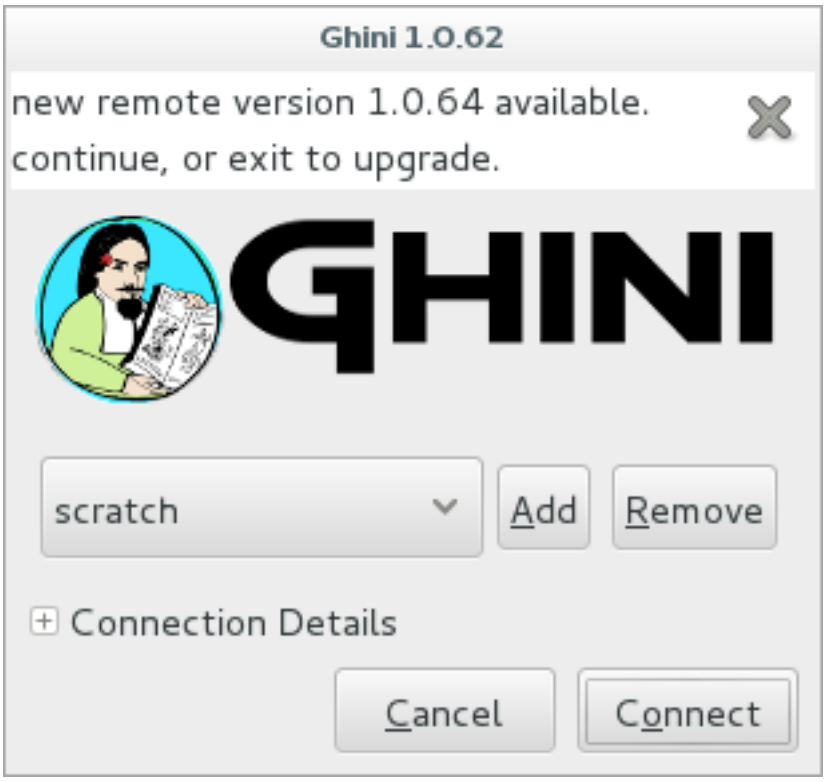
3. You can now start ghini by invoking the `ghini` script:

   ```
   ghini
   ```

   1. You use the same `ghini` script to update ghini to the latest released production patch:

      ```
      ~/bin/ghini -u
      ```

      This is what you would do when ghini shows you something like this:




2. Users of the global installation will also type `ghini` to invoke the program, but they will get to a different script, located in `/usr/local/bin`. This globally available `ghini` script cannot be used to update a ghini installation.

3. Again the same `ghini` script lets you install the optional database connectors: option `-p` is for PostgreSQL, option `-m` is for MySQL/MariaDB, but you can also install both at the same time:

```
~/bin/ghini -pm
```

   Please beware: you might need solve dependencies. How to do so, depends on which GNU/Linux flavour you are using. Check with your distribution documentation.

4. You can also use the `ghini` script to switch to a different production line. At the moment `1.0` is the stable one, but you can select `1.1` if you want to help us with its development:

```
~/bin/ghini -s 1.1
```

**beginner's note**

Para executar um script, primeiro certifique-se que você anote o nome do diretório para que você tenha baixado o script, em seguida, abrir uma janela de terminal e em que janela você digite "bash" seguido por um espaço e o nome completo do script incluindo o nome do diretório e bateu na tecla enter.

**technical note**

You can study the script to see what steps if runs for you.

In short it will install dependencies which can't be satisfied in a virtual environment, then it will create a virtual environment named `ghide`, use git to download the sources to a directory named `~/Local/github/Ghini/ghini.desktop`, and connect this git checkout to the `ghini-1.0` branch (this you can consider a production line), it then builds ghini, downloading all remaining dependencies in the virtual environment, and finally it creates the `ghini` startup script.

If you have `sudo` permissions, it will be placed in `/usr/local/bin`, otherwise in your `~/bin` folder.

#### Next...

*Connecting to a database*.

### 2.1.2 Instalação no MacOSX

Being macOS a unix environment, most things will work the same as on GNU/Linux (sort of).

Em primeiro lugar, precisa de coisas que são parte integrante de um ambiente unix, mas que faltam num mac de prateleira:

1. ferramentas de desenvolvedores: xcode. Verifique a página da wikipedia para a versão suportada no seu mac.
2. Gestor de pacotes: homebrew (tigerbrew para versões mais antigas do OSX).

**Installation on older macOS.**

Every time we tested, we could only solve all dependencies on the two or three most recent macOS versions. In April 2015 this excluded macOS 10.6 and older. In September 2017 this excluded macOS 10.8 and older. We never had a problem with the lastest macOS.

The problem lies with homebrew and some of the packages we rely on. The message you have to fear looks like this:

```
Do not report this issue to Homebrew/brew or Homebrew/core!
```

The only solution I can offer is: please update your system.

On the bright side, if at any time in the past you did install ghini.desktop on your older and now unsupported macOS, you will always be able to update ghini.desktop to the latest version.

---

With the above installed, open a terminal window and run:

```
brew doctor
```

Certifique-se de que você compreende os problemas que relata e corrigi-los. PyGTK precisará xquartz e cerveja não vai resolver a dependência automaticamente. Instale o xquartz usando poção ou a maneira que você prefere:

```
brew install Caskroom/cask/xquartz
```

em seguida, instale as dependências restantes:

```
brew install git
brew install pygtk  # takes time and installs all dependencies
```

Siga todas as instruções sobre como ativar o que você instalou.

In particular, make sure you read and understand all reports starting with `If you need to have this software`.

You will need at least the following four lines in your `~/.bash_profile`:

```
export LC_ALL=en_US.UTF-8
export LANG=en_US.UTF-8
export PATH="/usr/local/opt/gettext/bin:$PATH"
export PATH="/usr/local/opt/python/libexec/bin:$PATH"
```

Activate the profile by sourcing it:

```
. ~/.bash_profile
```

Antes de correr " devinstall.sh " como no GNU/Linux, nós ainda precisamos instalar alguns pacotes python, globalmente. Fazer isso:

```
sudo -H pip install virtualenv lxml
```

O resto é como em uma máquina unix normal. Leia as instruções acima de GNU/Linux, segui-los, aproveite.

As an optional aesthetical step, consider packaging your `~/bin/ghini` script in a platypus application bundle. The `images` directory contains a 128×128 icon.

### Next...

*Connecting to a database*.

### 2.1.3 Instalação no Windows

As etapas descritas aqui instruem-lo sobre como instalar o Git, Gtk, Python, e conectores do banco de dados do python. Com este ambiente corretamente configurado, o procedimento de instalação Ghini corre como no GNU/Linux. As etapas finais são novamente Windows específicos.

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**Nota:** Ghini has been tested with and is known to work on W-XP, W-7 up to W-10. Although it should work fine on other versions Windows it has not been thoroughly tested.

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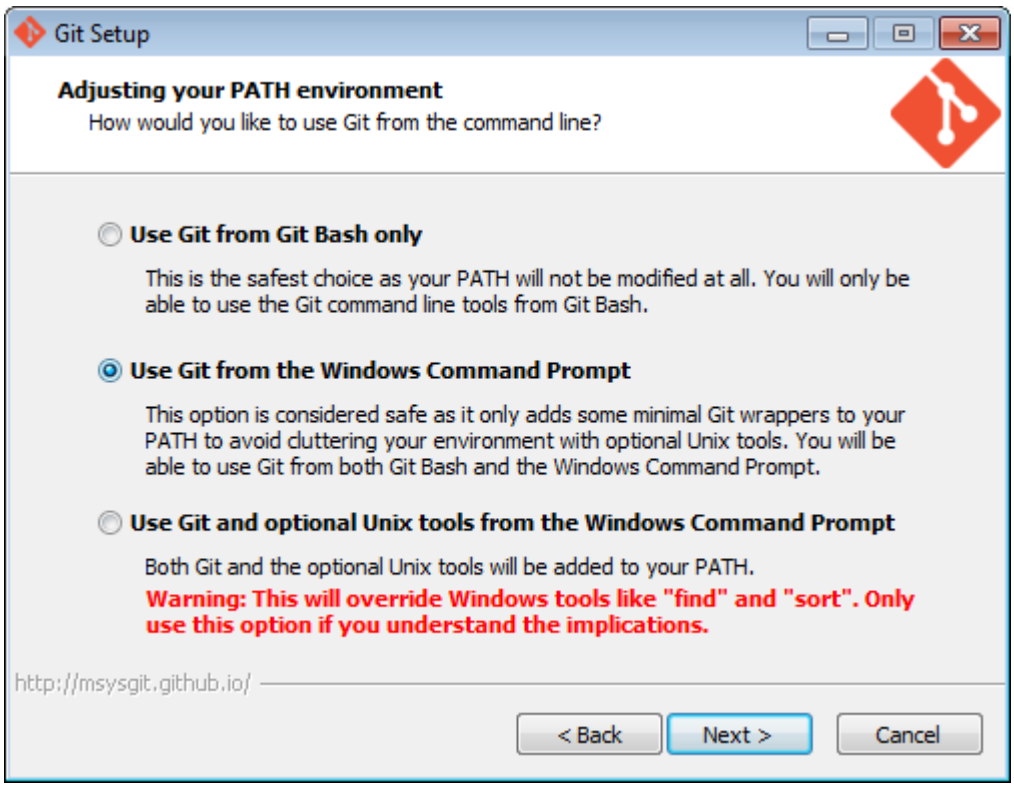
Os passos de instalação no Windows:

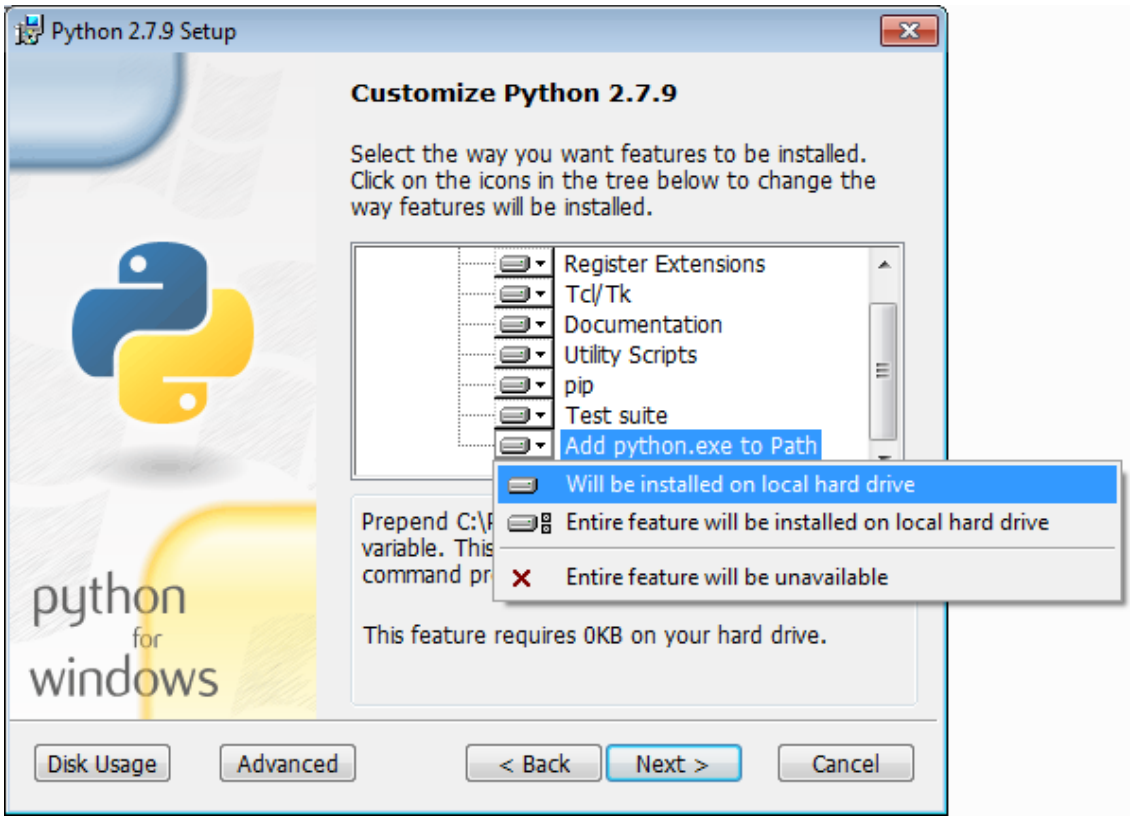
1. download and install `git` (comes with a unix-like `sh` and includes `vi`). Grab it from the Git download area.

   todas as opções padrão estão bem, exceto que precisamos git ser executável no prompt de comando:



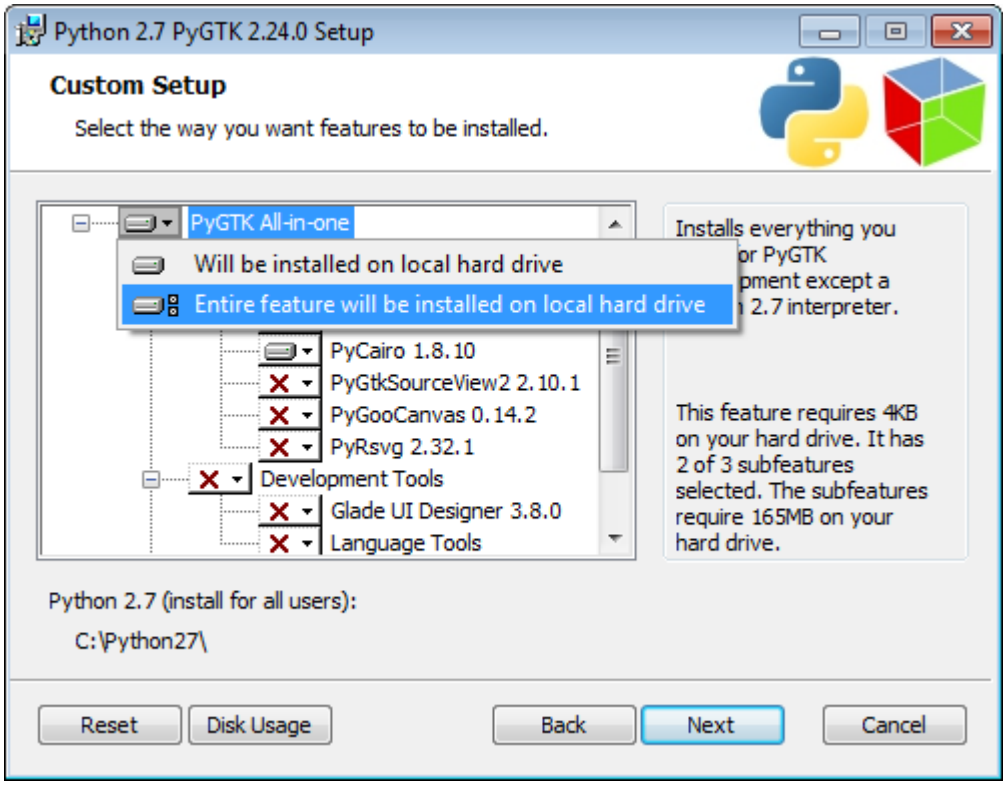

2. download and install Python 2.x (32bit). Grab it from the Python official site.

   When installing Python, do put Python in the PATH:




3. download `pygtk` from the official source. (this requires 32bit python). be sure you download the «all in one» version.

   Make a complete install, selecting everything:




4. (Possibly necessary, maybe superfluous) install lxml, you can grab this from the pypi

archives

Lembre-se de que você precisa da versão de 32 bits, para o Python 2.7.

5. (definitely optional) download and install a database connector other than `sqlite3`.

   If you plan using PostgreSQL, the best Windows binary library for Python is psycopg and is Made in Italy.

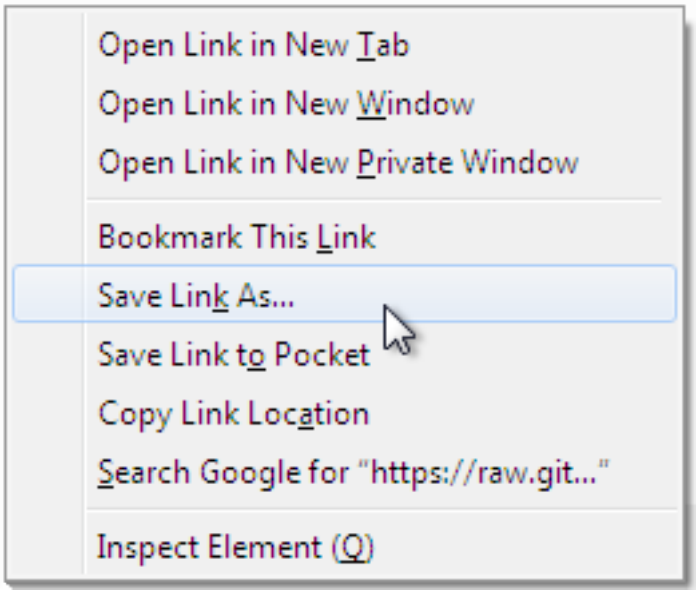
6. **REBOOT**

   Ei, isso é Windows, você precisa reiniciar para que as alterações entrem em vigor!

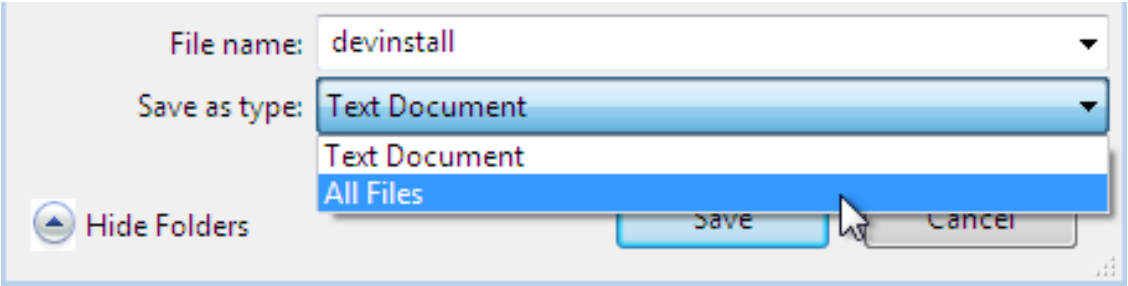
7. We're done with the dependecies, now we can download and run the batch file:

   devinstall.bat

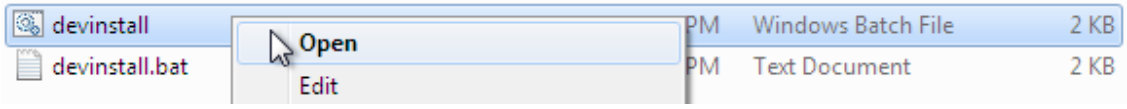
   Please don't just follow the above link. Instead: right click, save link as...



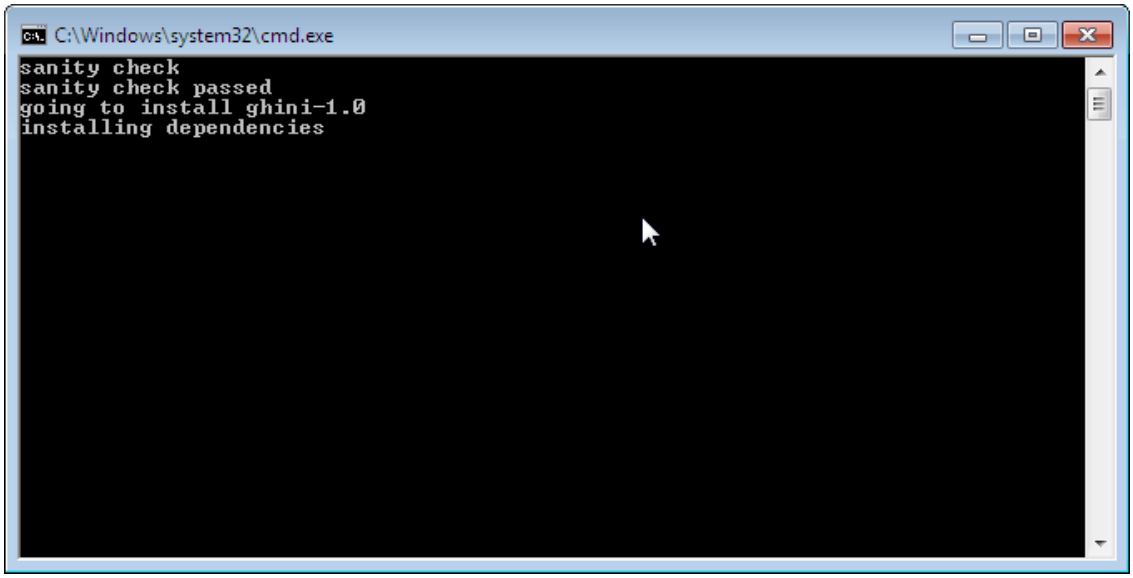

Also make sure you don't let Windows convert the script to a text document.




Now **Open** the script to run it. Please note: in the below image, we have saved the file twice, once letting Windows convert it to a text document, and again as a Windows Batch File. Opening the batch file will run the script. Opening the text document will show you the code of the batch file, which isn't going to lead us anywhere.



If you installed everything as described here, the first thing you should see when you start the installation script is a window like this, and your computer will be busy during a couple of minutes, showing you what it is doing.



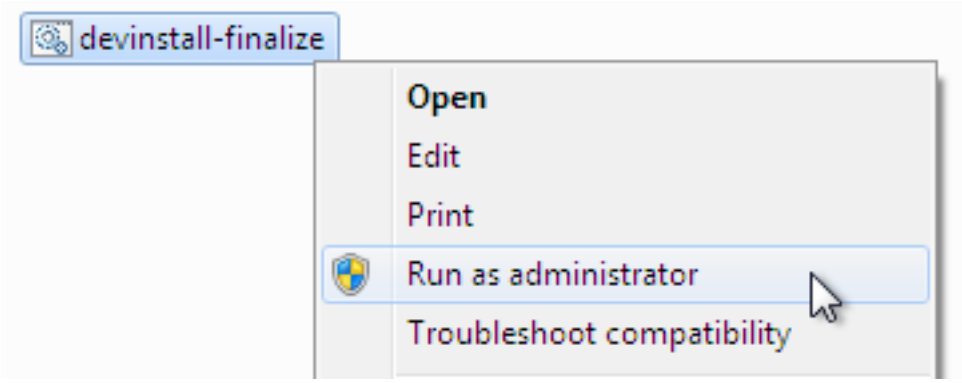

Running `devinstall.bat` will pull the `ghini.desktop` repository from github to your home directory, under `Local\github\Ghini`, checkout the `ghini-1.0` production line, create a virtual environment and install ghini into it.

You can also run `devinstall.bat` passing it as argument the numerical part of the production line you want to follow.

This is the last installation step that depends, heavily, on a working internet connection.

The operation can take several minutes to complete, depending on the speed of your internet connection.

8. a última etapa de instalação cria o grupo Ghini e atalhos no Menu Iniciar do Windows, para todos os utilizadores. Para fazer isso, você precisa executar um script com direitos administrativos. O script é chamado " devinstall-finalize.bat ", ele está certo em sua pasta de início e foi criado na etapa anterior.




Clique com o botão direito do rato nele, selecione executar como administrador, confirme que deseja que ele faça alterações no seu computador. Essas alterações estão apenas no Menu Iniciar: crie o grupo Ghini, coloque o atalho Ghini.

9. download the batch file, it will help you staying up-to-date:

   ghini-update.bat

   If you are on a recent Ghini installation, each time you start the program, Ghini will check on the development site and alert you of any newer ghini release within your chosen production line.

   Any time you want to update your installation, just run the `ghini-update.bat` script, it will hardly take one minute.

   How to save a batch file, and how to run it: check the the quite detailed instructions given for `devinstall.bat`.

If you need to generate PDF reports, you can use the XLS based report generator and you will need to download and install Apache FOP. After extracting the FOP archive you will need to include the directory you extracted to in your PATH.

If you choose for PostScript reports, you can use the Mako based report generator and there are no further dependencies.

#### Next...

*Connecting to a database*.

### 2.1.4 Installing on Android

`ghini.desktop` is a desktop program, obviously you don't install it on a handheld device, but we do offer the option, for your Android phone or tablet, to install `ghini.pocket`.

`ghini.pocket` is a small data viewer, it comes handy if you want to have a quick idea of a plant species, its source, and date it entered the garden, just by scanning a plant label.

Installation is as easy as it can be: just look for it in Google Play, and install it.

Export the data from `ghini.desktop` to pocket format, copy it to your device, enjoy.

# CAPÍTULO 3

# User's Guide

## 3.1 Initial Configuration

After a successful installation, more complex organizations will need configure their database, and configure Ghini according to their database configuration. This page focuses on this task. If you don't know what this is about, please do read the part relative to SQLite.

### 3.1.1 Should you SQLite?

Is this the first time you use Ghini, are you going to work in a stand-alone setting, you have not the faintest idea how to manage a database management system? If you answered yes to any of the previous, you probably better stick with SQLite, the easy, fast, zero-administration file-based database.

With SQLite, you do not need any preparation and you can continue with *connecting*.

On the other hand, if you want to connect more than one bauble workstation to the same database, or if you want to make your data available for other clients, as could be a web server in a LAMP setting, you should consider keeping your database in a database management system like PostgreSQL or MySQL/MariaDB, both supported by Ghini.

When connecting to a database server as one of the above, you have to manually do the following: Create at least one user; Create your database; Give at least one user full permissions on your database; If you plan having more database users: Give one of your users the `CREATEROLE` privilege; Consider the user with the `CREATEROLE` privilege as a super-user, not meant to handle data directly; Keep your super-user credentials in a very safe place.

When this is done, Ghini will be able to proceed, creating the tables and importing the default data set. The process is database-dependent and it falls beyond the scope of this manual.

If you already got the chills or sick at your stomach, no need to worry, just stick with SQLite, you do not miss on features nor performance.

**Some more hints if you need PostgreSQL**

Start simple, don't do all at the same time. Review the online manual, or download and study the offline version.

As said above, create a database, a user, make this user the owner of the database, decide whether you're going to need multiple users, and preferably reserve a user for database and normal user creation. This super-user should be your only user with `CREATEROLE` privilege.

All normal users will need all privileges on all tables and sequences, something you can do from the *Tools→Users* menu. If you have any difficulty, please open an issue about it.

Connect using the `psql` interactive terminal. Create a `~/.pgpass` file (read more about it in the manual), tweak your `pg_hba.conf` and `postgresql.conf` files, until you can connect using the command:

```
psql <mydb> --username <myuser> --no-password --host
↪<mydbhost>
```

With the above setup, connecting from ghini will be an obvious task.

### 3.1.2 Connecting to a database

When you start Ghini the first thing that comes up is the connection dialog.

Quite obviously, if this is the first time you start Ghini, you have no connections yet and Ghini will alert you about it.


This alert will show at first activation and also in the future if your connections list becomes empty. As it says: click on **Add** to create your first connection.


Just insert a name for your connection, something meaningful you associate with the collection to be represented in the database (for example: "my home garden"), and click on **OK**. You will be back to the previous screen, but your connection name will be selected and the Connection Details will have expanded.


**specify the connection details**

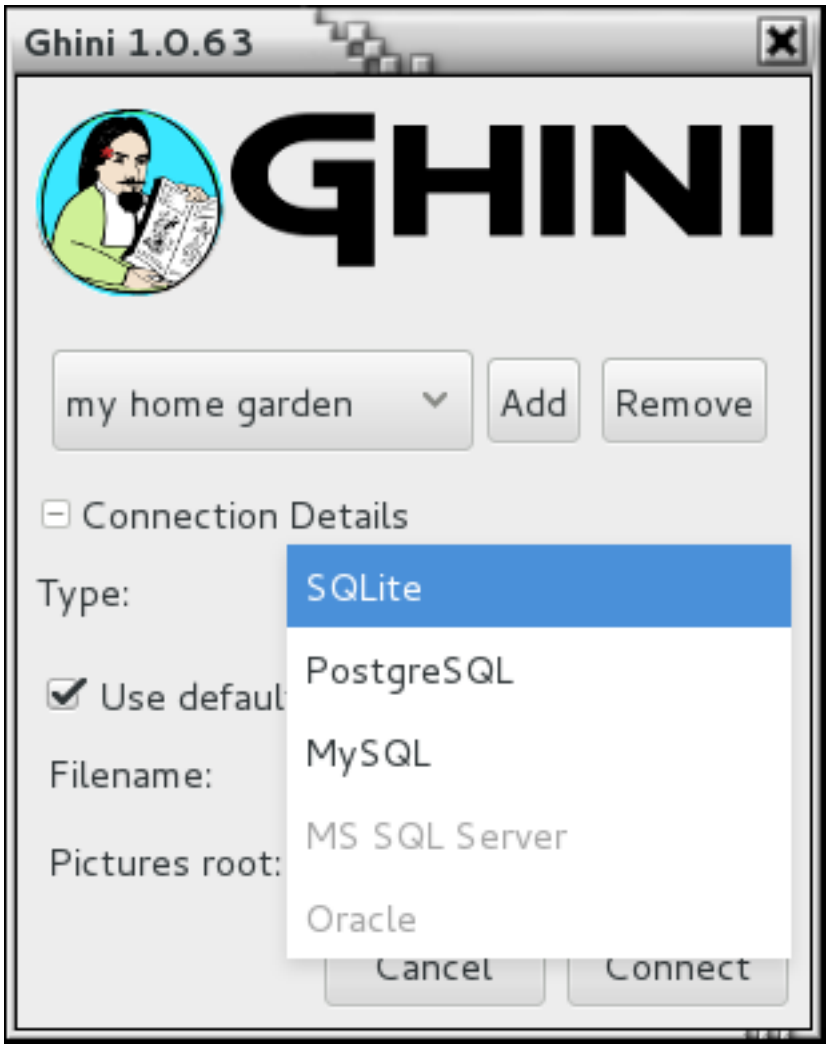
If you do not know what to do here, Ghini will help you stay safe. Activate the **Use default locations** check box and create your first connection by clicking on **Connect**.

You may safely skip the remainder of this section for the time being and continue reading to the following section.

**fine-tune the connection details**

By default Ghini uses the file-based SQLite database. During the installation process you had the choice (and you still have after installation), to add database connectors other than the default SQLite.

In this example, Ghini can connect to SQLite, PostgreSQL and MySQL, but no connector is available for Oracle or MS SQL Server.




If you use SQLite, all you really need specify is the connection name. If you let Ghini use the default filename then Ghini creates a database file with the same name as the connection and `.db` extension, and a pictures folder with the same name and no extension, both in `~/.bauble` on Linux/MacOSX or in `AppData\Roaming\Bauble` on Windows.

Still with SQLite, you might have received or downloaded a bauble database, and you want to connect to it. In this case you do not let Ghini use the default filename, but you browse in your computer to the location where you saved the Ghini SQLite database file.

If you use a different database connector, the dialog box will look different and it will offer you the option to fine tune all parameters needed to connect to the database of your choice.

If you are connecting to an existing database you can continue to *Edição e inserção de dados* and subsequently searching-in-ghini, otherwise read on to the following section on initializing a database for Ghini.

If you plan to associate pictures to plants, specify also the *pictures root* folder. The meaning of this is explained in further detail at *Pictures* in *Edição e inserção de dados*.

---

**A sample SQLite database**

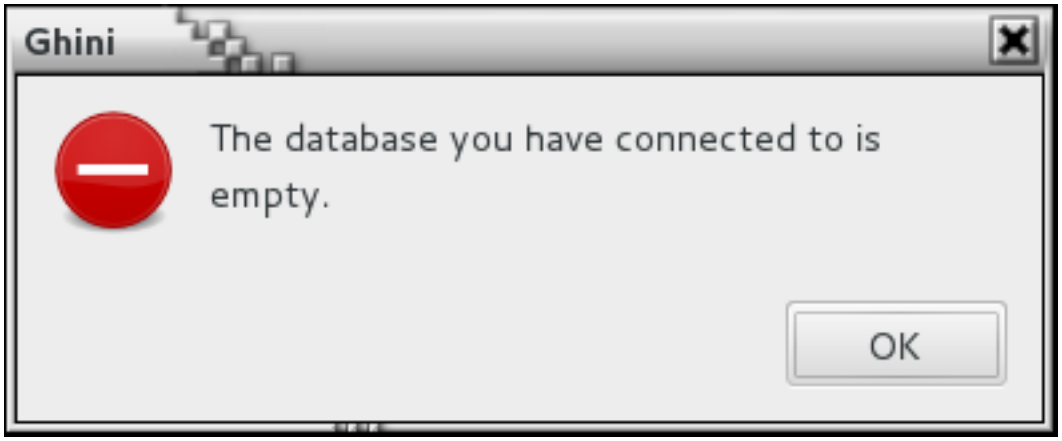
Indeed we have a sample database, from our pilot garden «El Cuchubo», in Mom-

pox, Colombia. We have a zipped sample database for ghini-1.0.

Download and unzip it to the location of your choice, then start Ghini, create a connection named possibly `cuchubo`, or `sample`, and edit the Connection Details. Keep the connection type at the default SQLite, but instead of using the default locations, make sure that Filename points to your unpacked `cuchubo.db` file.

### 3.1.3 Initialize a database

First time you open a connection to a database which had never been seen by Ghini before, Ghini will first display an alert:




immediately followed by a question:


Be careful when manually specifying the connection parameters: the values you have entered may refer to an existing database, not intended for use with Ghini. By letting Ghini initialize a database, the database will be emptied and all of its content be lost.

If you are sure you want to create a database at this connection then select «Yes». Ghini will then start creating the database tables and importing the default data. This can take a minute or two so while all of the default data is imported into the database so be patient.

Once your database has been created, configured, initialized, you are ready to start *Edição e inserção de dados* and subsequently *A pesquisa em Ghini*.

## 3.2 A pesquisa em Ghini

Pesquisa permite-lhe visualizar, navegar e criar relatórios a partir de seus dados. Você pode executar pesquisas digitando as consultas na entrada principal da busca ou usando o construtor de consultas para criar as consultas para você. Os resultados de pesquisas Ghini estão listados na janela principal.

### 3.2.1 Estratégias de Pesquisa

Ghini oferece quatro estratégias de busca distintas:

- por valor — em todos os domínios;
- por expressão — em alguns campos implícitos num domínio explícito;
- por consulta — num domínio;
- por nome binomial — pesquisa somente o domínio de espécies.

Todas as estratégias de pesquisa — com a notável excepção da pesquisa nome binomial — não diferenciam maiusculas de minúsculas.

#### Pesquisa por Valor

Pesquisar por valor é a maneira mais simples para pesquisar. Entra uma ou mais cadeias de caracteres e ver o que corresponde. O resultado inclui objetos de qualquer tipo (domínio) onde um ou mais dos seus campos contêm uma, ou mais das cadeias de pesquisa.

Você não especifica o domínio de pesquisa, todos estão incluídos, nem você indica quais dos campos você deseja corresponder, isso está implícito no domínio de pesquisa.

A tabela a seguir ajuda a entender os resultados e orienta a formulação de suas pesquisas.

| Visão geral dos domínios de pesquisa | | |
|---|---|---|
| nome e atalhos | campo | tipo de resultado |
| family, fam | epithet (family) | `Family` |
| genus, gen | epithet (genus) | `Genus` |
| species, sp | epithet (sp) × | `Species` |
| vernacular, common, vern | nome | `Species` |
| geography, geo | nome | `Geography` |
| accession, acc | code | `Accession` |
| planting, plant | code × | `Plant` |
| location, loc | code, name | `Location` |
| contact, person, org, source | nome | `Contact` |
| collection, col, coll | locale | `Collection` |
| tag, tags | nome | `Tag` |

Exemplos de busca pelo valor seria: Maxillaria, Acanth, 2008.1234, 2003.2.1, Índica.

A menos que use explicitamente aspas, os espaços separam pesquisar cadeia de caracteres. Por exemplo, se pesquisar por `bloco 10`, então Ghini irá procurar as secuências `bloco` e `10` e retornar todos os resultados que correspondam a qualquer destas secuências. Se deseja pesquisar para `bloco 10` como uma sequência inteira, em seguida, deve citar a sequência de caracteres como `'bloco 10'`.

---

**× Chaves primárias compostas**

Um epíteto de **espécies** significa pouco, sem o correspondente gênero, da mesma forma, um código **planta** é exclusivo apenas dentro da accesão ao qual ele pertence. Na terminologia de teoria de banco de dados, epíteto e o código não são suficientes para formar uma **chave primária** pela, respectivamente, espécie e planta. Nestes domínios, precisamos de uma **chave primária composta**.

Pesquisar por valor permite que você procure por **plantas** pelo seu código de plantação completo, que inclui o código de accesão. Tomados em conjunto, o código de accesão e código de plantio fornecem uma **chave primária composta** para plantas. Para **espécies**, nós introduzimos a busca binomial, descrita abaixo.

---

### Pesquisa por Expressão

Searching with expression gives you a little more control over what you are searching for. You narrow the search down to a specific domain, the software defines which fields to search within the domain you specified.

Uma expressão é construído como `<domain> <operador> <valor>`. Por exemplo, a pesquisa: `gen=Maxillaria` vai retornar todos os gêneros que correspondem ao nome Maxillaria. Neste caso, o domínio é `gen`, o operador = e o valor é `Maxillaria`.

A tabela acima, de visão geral de domínio de pesquisa, diz os nomes dos domínios de pesquisa, e, por domínio de busca, quais campos são pesquisados.

The search string `loc like block%` would return all the Locations for which name or code start with «block». In this case the domain is `loc` (a shorthand for `location`), the operator is `like` (this comes from SQL and allows for «fuzzy» searching), the value is `block%`, the implicitly matched fields are `name` and `code`. The percent sign is used as a wild card so if you search for `block%` then it searches for all values that start with `block`. If you search for `%10` it searches for all values that end in `10`. The string `%ck%10` would search for all value that contain `ck` and end in `10`.

---

**Quando uma consulta leva uma eternidade para completar**

Você dá uma consulta, isso demora algum tempo para calcular, e o resultado contém exageradamente muitas entradas. Isso acontece quando você pretende usar uma estratégia, mas suas cordas não formam uma expressão válida. Neste caso, Ghini reverterá para *busca por valor*. Por exemplo, a sequência `gen lik maxillaria` irá procurar a cadeia de caracteres `gen`, `lik` e `maxillaria`, retornando tudo o que corresponde a pelo menos um dos três critérios.

---

### Pesquisar binomial

You can also perform a search in the database if you know the species, just by placing a few initial letters of genus and species epithets in the search engine, correctly capitalized, i.e.: **Genus epithet** with one leading capital letter, **Species epithet** all lowercase.

Desta forma você pode realizar a pesquisa `So ha`.

Estas seriam as iniciais de *Solanum hayesii*, ou do *Solanum havanense*.

Pesquisar binomial vem para compensar a utilidade limitada da pesquisa acima pela expressão ao tentar procurar uma espécie.

It is the correct capitalization **Xxxx xxxx** that informs the software of your intention to perform a binomial search. The software's second guess will be a search by value, which will possibly result in far more matches than you had expected.

O pedido semelhante `so ha` retornará, em uma instalação nova, mais de 3000 objetos, começando na Família «Acalyp(**ha**)ceae», terminando em a Geografia «Western (**So**)uth América».

### Procura por Consulta

Queries allow the most control over searching. With queries you can search across relations, specific columns, combine search criteria using boolean operators like `and`, `or`, `not` (and their shorthands `&&`, `||`, `!`), enclose them in parentheses, and more.

Please contact the authors if you want more information, or if you volunteer to document this more thoroughly. In the meanwhile you may start familiarizing yourself with the core structure of Ghini's database.

Fig. 1: **estrutura de banco de dados** do Ghini

A few examples:

- plantings of family Fabaceae in location Block 10:

```
plant WHERE accession.species.genus.family.epithet=Fabaceae AND␣
↪location.description="Block 10"
```

- locations that contain no plants:

```
location WHERE plants = Empty
```

- accessions associated to a species of known binomial name (e.g.: Mangifera indica):

```
accession WHERE species.genus.epithet=Mangifera AND species.
↪epithet=indica
```

- accessions we propagated in the year 2016:

```
accession WHERE plants.propagations._created BETWEEN␣
↪|datetime|2016,1,1| AND |datetime|2017,1,1|
```

- accessions we modified in the last three days:

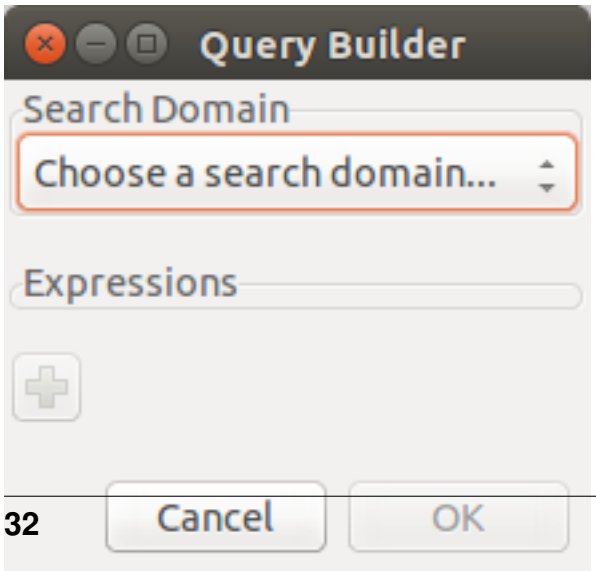
```
accession WHERE _last_updated>|datetime|-3|
```

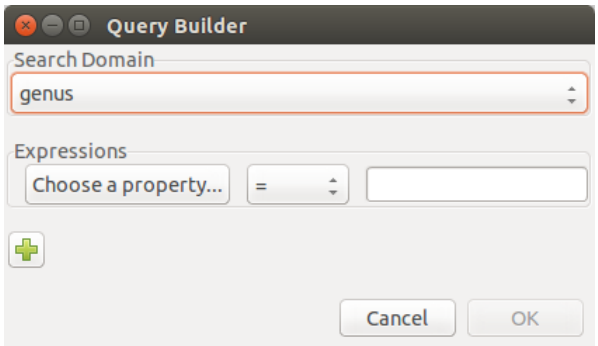
Searching with queries requires some knowledge of a little syntax and an idea of the extensive Ghini database table structure. Both you acquire with practice, and with the help of the Query Builder.

### 3.2.2 The Query Builder

Ghini offers a Query Builder, that helps you build complex search queries through a point and click interface. To open the Query Builder click the icon to the left of the search entry or select *Tools→Query Builder* from the menu.

A window will show up, which will lead you through all steps necessary to construct a correct query that is understood by Ghini's Query Search Strategy.




First of all you indicate the search domain, this will allow the Query Builder complete its

graphical user interface, then you add as many logical clauses as you need, connecting them with a `and` or `or` binary operator.

Each clause is formed of three parts: a property that can be reached from the starting search domain, a comparison operator that you select from the drop-down list, a value that you can either type or select from the list of valid values for the field.

Add as many search properties as you need, by clicking on the plus sign. Select and/or next to the property name to choose how the clauses will be combined in the search query.

When you are done building your query click OK to perform the search.

At this point the Query Builder writes the query in the search entry, and executes it. You may now edit the string as if you had typed it yourself. Notice how the left hand side values are interpreted by the query builder and enclosed in single quotes if recognized as strings, left alone if they look like numbers or the two reserved words `None` and `Empty`. You may edit the query and insert quotes if you need them, eg if you need to literally look for the string `Empty`.

`None` is the value of an empty field. It is not the same as the zero lenght string `''` nor the numeric `0` nor the boolean `False` nor the set `Empty`, it indicates that the field has no value at all.

`Empty` is the empty set. Being it a set, it can be matched against sets (eg: plants of an accession, or accessions of a species), not against elements (eg: quantity of a plant or description of a location). However, the Query Builder does not let you choose a left hand side value stopping at a set, it expects you to select a field. Choose just any field: at the moment of producing the query, when the Query Builder meets a clause with right hand side value the literal string `Empty`, it will drop the field name and let you compare the set on the left with `Empty` on the right.

We have no literals `False` and `True`. These are typed values, and the Query Builder does not know how to produce them. Instead of `False` type `0`, and instead of `True` type `1`.

### 3.2.3 Query Grammar

For those who don't fear a bit of formal precision, the following BNF code gives you a rather precise idea of the grammar implemented by the Query Search Strategy. Some grammatical categories are informally defined; any missing ones are left to your fertile imagination; literals are included in single quotes; the grammar is mostly case insensitive, unless otherwise stated:

```
query ::= domain 'WHERE' expression

domain ::= #( one of our search domains )
expression ::= signed_clause
```

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(continuação da página anterior)

```
              | signed_clause 'AND' expression
              | signed_clause 'OR' expression
              ;
signed_clause ::= clause
                | 'NOT' clause  #( not available in Query Builder)
                ;
clause ::= field_name binop value  #( available in Query Builder)
         | field_name set_binop value_list
         | aggregated binop value
         | field_name 'BETWEEN' value 'AND' value
         | '(' expression ')'
         ;
field_name ::= #( path to reach a database field or connected table␣
↪)
aggregated ::= aggregating_func '(' field_name ')'
aggregating_func ::= 'SUM'
                   | 'MIN'
                   | 'MAX'
                   | 'COUNT'
                   ;
value ::= typed_value
        | numeric_value
        | none_token
        | empty_token
        | string_value
        ;
typed_value ::= '|' type_name '|' value_list '|'
numeric_value ::== #( just a number )
none_token ::= 'None'    #( case sensitive )
empty_token ::= 'Empty'  #( case sensitive )
string_value = quoted_string | unquoted_string

type_name ::= 'datetime' | 'bool' ;  #( only ones for the time␣
↪being )
quoted_string ::= '"' unquoted_string '"'
unquoted_string ::=  #( alphanumeric and more )

value_list ::= value ',' value_list
             | value
             ;
binop ::= '='
        | '=='
        | '!='
        | '<>'
        | '<'
        | '<='
        | '>'
        | '>='
        | 'LIKE'
```

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```
        | 'CONTAINS'
        ;
set_binop ::= 'IN'
```

Please be aware that Ghini's Query language is quite a bit more complex than what the Query Builder can produce: Queries you can build with the Query Builder form a proper subset of the queries recognized by the software:

```
query ::= domain 'WHERE' expression

domain ::= #( one of our search domains )
expression ::= clause
             | clause 'AND' expression
             | clause 'OR' expression
             ;
clause ::= field_name binop value
         ;
field_name ::= #( path to reach a database field or connected table␣
↪)
value ::= numeric_value
        | string_value
        ;
numeric_value ::== #( just a number )
string_value = quoted_string | unquoted_string ;

quoted_string ::= '"' unquoted_string '"'
unquoted_string ::=  #( alphanumeric and more )

binop ::= '='
        | '=='
        | '!='
        | '<>'
        | '<'
        | '<='
        | '>'
        | '>='
        | 'LIKE'
        | 'CONTAINS'
        ;
```

## 3.3 Edição e inserção de dados

A principal forma que podemos adicionar ou alterar informações em Ghini é usando os editores. Cada tipo de base de dados tem seu próprio editor. Por exemplo, há um editor de família, um editor do género, um editor de accesão, etc.

Para criar um novo registro clique na *Insert* menu na barra de menu e selecione o tipo de registro seu gostaria de criar. Isso abre um novo editor em branco para o tipo.

Para editar um registo existente no banco de dados botão direito do rato num item nos resultados de pesquisa e selecione: menuselection: "Editar" no menu pop-up. Isso abre um editor que permite que altere os valores no registo que selecionou.

A maioria dos tipos também tem filhos que você pode adicionar, clique com o botão direito no pai e selecionando «Add??? ... «no menu de contexto. Por exemplo, uma família tem filhos de género: você pode adicionar um género para uma família, clique com o botão direito em uma família e selecionando «Add genus».

### 3.3.1 Observações

Quase todos os editores em Ghini têm um * notas * guia que deve funcionar o mesmo independentemente de qual editor você está usando.

Se você digitar um endereço da web em uma nota, em seguida, o link aparece nas ligações quando o item está edição é selecionado nos resultados da pesquisa.

Pode consultar as notas para um item no banco de dados usando a caixa de notas na parte inferior do ecrã. A caixa de notas são insensíveis se o item selecionado não tem nenhum notas.

### 3.3.2 Família

O editor de família permite que você adicionar ou alterar uma família botânica.

A * família * campo sobre o editor permite que você altere o epíteto da família. A família de campo é obrigatório.

O * qualificador * campo permite que você altere o qualificador de família. O valor pode ser * lato sensu *, * sensu stricto *, ou nada.

*Synonyms* allow you to add other families that are synonyms with the family you are currently editing. To add a new synonyms type in a family name in the entry. You must select a family name from the list of completions. Once you have selected a family name that you want to add as a synonym click on the Add button next to the synonym list and the software adds the selected synonym to the list. To remove a synonym, select the synonym from the list and click on the Remove button.

Para cancelar as alterações sem salvar, em seguida, clique na * cancelar * botão.

Para salvar a família, você está trabalhando e clique em * Okey *.

Para salvar a família, você está trabalhando em e adiciona um género para ele em seguida, clique na * Adicionar géneros * botão.

Para adicionar outro familiar quando tiver terminado edição atual clique no * próximo * botão na parte inferior. Isso salva da família atual e abre um novo editor de família em branco.

### 3.3.3 Género

O editor do género permite que você adicionar ou alterar um género botânico.

A * família * campo no editor do género permite que você escolha a família para o gênero. Quando você começar a tipo um nome de família mostrará uma lista de famílias para escolher. O nome da família já deve existir no banco de dados antes de você pode defini-la como a família para o gênero.

O * género * campo permite que você defina o gênero para esta entrada.

O campo *autor* permite que você defina o nome ou a abreviatura do autor para o gênero.

*Synonyms* allow you to add other genera that are synonyms with the genus you are currently editing. To add a new synonyms type in a genus name in the entry. You must select a genus name from the list of completions. Once you have selected a genus name that you want to add as a synonym click on the Add button next to the synonym list and it will add the selected synonym to the list. To remove a synonym select the synonym from the list and click on the Remove button.

Para cancelar as alterações sem salvar, em seguida, clique na * cancelar * botão.

Para salvar o gênero que está trabalhando, em seguida, clique *Okey*.

Para salvar o gênero que está trabalhando em e adiciona-lhe uma espécie clique na * Adicionar espécie * botão.

Para adicionar outro género, quando tiver terminado de editar o atual um clique no * próximo * botão na parte inferior. Isto irá salvar o gênero atual e abrir um novo editor de género em branco.

### 3.3.4 Species/Taxon

Por razões históricas, chamados uma *species*, mas por isso queremos dizer um *táxon* na categoria *species* ou inferior. Representa um nome exclusivo no banco de dados. O editor de espécies permite construir o nome, bem como associar o táxon como sua distribuição, sinônimos e outras informações de metadados.

O *infra-específico* no editor de espécies permite-lhe especificar o *táxon* mais do que no posto de *espécies*.

Para cancelar as alterações sem salvar, em seguida, clique na * cancelar * botão.

Para salvar as espécies que está a trabalhar, em seguida, clique * * Okey.

Para salvar a espécie, você está a trabalhar e adiciona uma accesão ao em seguida, clique na * botão Adicionar accesão *.

Para adicionar uma outra espécie, quando tiver terminado de editar o atual um clique no * próximo * botão na parte inferior. Isto irá salvar a espécie atual e abrir um novo editor de espécie em branco.

### 3.3.5 Accessions

O editor de accesão nos permite adicionar uma accesão a uma espécie. Ghini uma accesão representa um grupo de plantas ou clones que são do mesmo táxon, são da mesma propágulo

tipo (ou tratamento), receberam-se da mesma fonte, foram recebidas ao mesmo tempo.

Choose the Taxon name, add one if you forgot to do that in advance.

You may note uncertainty in identification by adding an identification qualifier, at the proper rank, so you can for example have a plant initially identified as *Iris* cf. *florentina* by choosing *Iris florentina* in the taxon name, identification qualifier "cf.", qualified rank "species".

Type the Accession ID, preferably also the Quantity received.

#### Fonte de accesão

The source of the accessions lets you add more information about where this accession came from. Select a Contact from the drop-down list, or choose «Garden Propagation», which is placed as a default first item in the list of contacts.

A Garden Propagation is the result of successful Propagation.

When accessing material from a Garden Propagation, you would initially leave the first tab alone (General) and start from the second tab (Source). Select as Contact «Garden Propagation», indicate which plant is the parent plant and choose among the still not completely accessed propagations the one you intend to add as an accession in your database.

Once you select a propagation, the software will set several fields in the General tab, which you can now review. The Taxon (maybe you managed to obtain something slightly different than the parent plant). The Initial quantity (in case not all plants go in the same accession). The Type of Material, inferred from the propagation type.

### 3.3.6 Planta

Uma "planta " no banco de dados Ghini descreve uma planta individual em sua coleção. Uma planta pertence a uma accesão, e tem uma localização específica.

#### Creating multiple plants

Você pode criar múltiplas plantas usando intervalos na entrada do código. Isto só é permitido quando a criação de novas plantas e não é possível ao editar plantas existentes no banco de dados.

Por exemplo o intervalo, 3-5 irá criar planta com código 3, 4,5. Faixa de 1,4-7,25 criará plantas com códigos 1,4,5,6,7,25.

Quando você inserir o intervalo na entrada de código de planta a entrada ficará azul para indicar que você está criando agora várias plantas. Todos os campos são definidos durante o modo este serão copiados para todas as plantas que são criadas.

### Pictures

Just as almost all objects in the Ghini database can have *Notes* associated to them, Plants and Species can also have *Pictures*: next to the tab for Notes, the Plant and the Species editors contain an extra tab called «Pictures». You can associate as many pictures as you might need to a plant and to a species object.

Quando você associar uma imagem de uma planta, o ficheiro é copiado na * fotos * pasta e uma miniatura (500 x 500) é gerado e copiado na pasta "Miniaturas" dentro da pasta imagens.

A partir de 1.0.62-Ghini, fotos não são mantidas no banco de dados. Para garantir fotos estão disponíveis em todos os terminais onde tenha instalado e configurado Ghini, pode usar uma unidade de rede, ou um serviço como o Tresorit ou o Dropbox de compartilhamento de ficheiro.

Lembre-se de que tenha configurado a pasta raiz de fotos quando especificou os detalhes da sua conexão de banco de dados. Novamente, certifique-se que a pasta de raiz de fotos é compartilhada com o seu serviço de escolha de compartilhamento de ficheiros.

When a Plant or a Species in the current selection is highlighted, its pictures are displayed in the pictures pane, the pane left of the information pane. When an Accession in the selection is highlighted, any picture associated to the plants in the highlighted accession are displayed in the pictures pane.

In Ghini-1.0, pictures are special notes, with category «<picture>», and text the path to the file, relative to the pictures root folder. In the Notes tab, Picture notes will show as normal notes, and you can edit them without limitations.

A Plant is a physical object, so you associate to it pictures taken of that individual plant, taken at any relevant development stage of the plant, possibly helping its identification.

Species are abstract objects, so you would associate to it pictures showing the characteristic elements of the species, so it makes sense to associate a flora illustration to it. You can also do that by reference: go to the Notes tab, add a note and specify as category «<picture>», then in the text field you type the URL for the illustration of your choice.

## 3.3.7 Locations

O editor de localização

### danger zone

O editor de local contém uma secção inicialmente oculta chamada * zona de perigo *. Os widgets contidos nesta secção permitem que o utilizador mesclar o local atual num local diferente, permitindo que o utilizador corrija erros de ortografia ou implementar mudanças políticas.

## 3.4 Lidando com material de propagação

Ghini oferece a possibilidade de associar a ensaios de material de propagação de plantas e documentar seus tratamentos e resultados. Tratamentos são parte integrante da descrição de uma teste de propagação. Se um teste de propagação for bem-sucedida, Ghini permite associá-lo a uma nova accesão. Você só pode associar uma accesão a um processo de propagação.

Aqui descrevemos como usar esta parte da interface.

### 3.4.1 Criando uma propagação

Uma propagação (julgamento) é obtida a partir de uma planta. Ghini reflecte-o em sua interface: selecione uma planta, abrir o Editor de planta nele, ative a guia de propagação, clique em Adicionar.

Quando você fazer o acima, você recebe uma janela do Editor de propagação. Ghini não considera ensaios de propagação como entidades independentes. Como resultado, Ghini trata o Editor de propagação como uma janela de editor especial, que só pode chegar a partir do Editor de planta.

Para uma nova propagação, você selecione o tipo de propagação (isso se torna uma propriedade imutável de propagação), em seguida, inserir os dados, descrevendo-o.

Você será capaz de editar os dados de propagação através do mesmo caminho: selecione uma planta, abra o Editor de planta, identificar a propagação que você deseja editar, clique no botão Editar correspondente. Você será capaz de editar todas as propriedades de uma julgamento, exceto seu tipo de propagação existente.

No caso de uma propagação da semente julgamento, você tem um pai de pólen e um pai de semente. Você deve sempre associar o julgamento de propagação para o pai de semente.

---

**Nota:** Ghini-1.0 você especificar da planta-mãe pólen no «Notes» de campo, enquanto Ghini-1.1 tem um campo (relação) para isso. De acordo com ITF2, pode haver casos em ensaios de propagação de sementes onde não se sabe qual planta desempenha qual papel. Novamente, em Ghini-1.0, você deve usar uma nota para indicar que se este for o caso, Ghini-1.1 tem um campo (booleano) indicando, se for esse o caso.

---

### 3.4.2 Usando uma propagação

Um julgamento de propagação pode ser bem sucedido e resultar em uma nova accesão.

Ghini ajuda a refletir isso no banco de dados: criar uma nova accesão, imediatamente alterne para a guia fonte e selecione «Garden Propagation» no campo de contato (reconhecidamente um tanto enganadora).

Comece a digitar o número da planta e para que você selecione, irá aparecer uma lista de plantas correspondentes com ensaios de propagação.

Selecione a planta, e a lista de ensaios de propagação acessados e acessado será exibido na metade inferior da janela.

Selecione um julgamento de propagação ainda acessado na lista e clique em Okey para concluir a operação.

Usando os dados a partir do julgamento de propagação, Ghini conclui que alguns dos campos na guia Geral: nome do táxon, tipo de material e possivelmente de proveniência. Você será capaz de editar estes campos, mas por favor, note que o software não impedirá a introdução conceituais inconsistências em seu banco de dados.

Você pode associar um julgamento de propagação para único accesão.

## 3.5 Tagging

Tagging is an easy way to give context to an object or create a collection of object that you want to recall later.

The power in this tagging action is that you can share this selection with colleagues, who can act on it, without the need to redo all your collecting work.

For example if you need to print accession labels of otherwise unrelated plants, you can group the objects by tagging them with the string «relabel». You or one of your colleagues can then select «relabel» from the tags menu, the search view will show all the objects you tagged, and performing a report will act on the tagged objects.

Tagging acts on the active selection, that is the items in the search results which you have selected.

Please remember: you can select all result rows by pressing `Ctrl-A`, you can deselect everything by pressing `Ctrl-Shift-A`, you can toggle tagging of a single row by `Ctrl-Mouse click` on it.

Once you have an active selection, tagging can be done in two ways:

### 3.5.1 dialog box tagging

Press `Ctrl-T` or select *Tag→Tag Selection* from the menu, this activates a window where you can create new tags and apply any existing tag to the selection.

The tag window is composed of three parts:

1. The upper part mentions the list of objects in your active selection. This is the list of object of which you are editing the tags;
2. The middle part has a list of all available tags, with a checkbox that you can activate for applying the tag to or removing the tag from the selection;
3. The lower part only holds a link to new tag creation, and the Ok button for closing the dialog box.

If, when opening the tag dialog box, the active selection holds multiple items, then only the tags that are common to all the selected items will have a check next to it. Tags that only apply to a proper subset of the active selection will show with an "undecided" status. Tags that don't apply to any object in the active selection will show blank.

The most recently created tag, or the most recently selected tag becomes the active tag, and it shows with a check next to it in the tags menu.

### 3.5.2 windowless tagging

Once you have an active tag, pressing `Ctrl-Y` applies the active tag to all objects in the active selection. `Ctrl-Shift-Y` removes the active tag from all objects in the active selection.

## 3.6 Geração de Relatórios

A database without exporting facilities is of little use. Ghini lets you export your data in table format (open them in your spreadsheet editor of choice), as labels (to be printed or engraved), as html pages or pdf or postscript documents.

### 3.6.1 The Report Tool

You activate the Report Tool from the main menu: *Tools→Report*. The Report Tools acts on a selection, so first select something, then start the Report Tool.

---

**Report on the whole collection.**

> To produce a report on your whole plant collection, a shortcut would be from the home screen, to click on the `Families: in use` cell.
>
> If your focus is more on the garden location than on taxonomy and accessions, you would click on the `Locations: total` cell.

---

Reports are produced by a report engine, making use of a report template. Ghini relies upon two different report engines (Mako & XSL), and offers several report templates, meant as usable examples.

Choose the report you need, specify parameters if required, and produce the report. Ghini will open the report in the associated application.

Configuring report templates, that's a task for who installs and configures ghini at your institution. Basically, you create a template name, indicating the report engine and specifying the template. Configured templates are static, once configured you are not expected to alter them. Only the special `**scratch**` template can be modified on the fly.

The remainder of this page provides technical information and links regarding the formatter engines, and gives hints on writing report templates. Writing templates comes very close to

writing a computer program, and that's beyond the scope of this manual, but we have hints that will definitely be useful to the interested reader.

### 3.6.2 Usando o formatador de relatório Mako

O formatador de relatório Mako usa a linguagem de modelo Mako para gerar relatórios. Mais informações sobre Mako e sua linguagem podem ser encontradas em makotemplates.org.

O sistema de modelagem de Mako já deve estar instalado no seu computador se Ghini é instalado.

Criar relatórios com Mako é semelhante da maneira que você poderia criar uma página da web de um modelo. É muito mais simples que o XSL Formatter(see below) e deve ser relativamente fácil de criar um modelo para qualquer pessoa com um pouco mais de experiência em programação.

O gerador de modelo usará a mesma extensão de ficheiro como o modelo que deve indicar o tipo de saída do modelo com criar. Por exemplo, para gerar uma página HTML de seu template você deve nomear o modelo algo como "report.html". Se o modelo irá gerar um ficheiro de valor separado por vírgula você devia nomear o modelo "report.csv".

O modelo receberá uma variável chamada "valores", que irão conter a lista de valores na pesquisa atual.

O tipo de cada valor em "valores" será o mesmo que o domínio de busca usado na consulta de pesquisa. Para obter mais informações sobre domínios de pesquisa consulte: ref: "pesquisa-domínios".

Se a consulta não tem um domínio de pesquisa, então os valores podem ser de um tipo diferente e o modelo de Mako deve preparado para lidar com eles.

### 3.6.3 Usando o formatador de relatório XSL

O formatador de relatório XSL requer um XSL para processador PDF para converter os dados num ficheiro PDF. Apache FOP é um processador livre e de código aberto XSL -> PDF e é recomendado.

If using Linux, Apache FOP should be installable using your package manager. On Debian/Ubuntu it is installable as `fop` in Synaptic or using the following command:

```
apt-get install fop
```

#### Installing Apache FOP on Windows

You have two options for installing FOP on Windows. The easiest way is to download the prebuilt ApacheFOP-0.95-1-setup.exe installer.

Alternatively you can download the archive. After extracting the archive you must add the directory you extracted the archive to to your PATH environment variable.

## 3.7 Importar e Exportar Dados

Embora Ghini pode ser estendida através de plugins para suporte alternativa importação e exportação de formatos, por predefinição pode apenas importar e exportar ficheiros de valores separados por vírgula ou CSV.

Há algum apoio para exportar para o acesso de dados de coleções biológicas é limitado.

Também há suporte limitado para exportar para um formato XML que reflete mais ou menos exatamente as tabelas e a linha do banco de dados.

Exportação de ABCD e XML não será coberto aqui.

**Aviso:** Importação de ficheiros provavelmente irá destruir quaisquer dados que tem no banco de dados, então certifique-se fazer backup dos seus dados.

### 3.7.1 Importar de CSV

Em geral, é melhor apenas importar ficheiros CSV em Ghini que anteriormente foram exportados de Ghini. É possível importar qualquer ficheiro CSV, mas isso é mais avançado que este documento irá cobrir.

Para importar ficheiro CSV para selecionar Ghini: menuselection: "Ferramentas–> exportação–> valores separados por vírgula" do menu.

Depois de clicar OK na caixa de diálogo que pergunta se tem certeza que sabe o que está a fazer um seletor de ficheiros será aberta. No seletor de ficheiros, selecione os ficheiros que deseja importar.

### 3.7.2 Exportação para CSV

Para exportar os dados Ghini para Selecione CSV: menuselection: "Ferramentas–> exportação–> valores separados por vírgula" do menu.

Esta ferramenta irá pedir para selecionar um diretório para exportar os dados CSV. Todas as tabelas em Ghini serão exportadas para ficheiros em tablename.txt o formato onde tablename é o nome da tabela onde os dados foram exportados de.

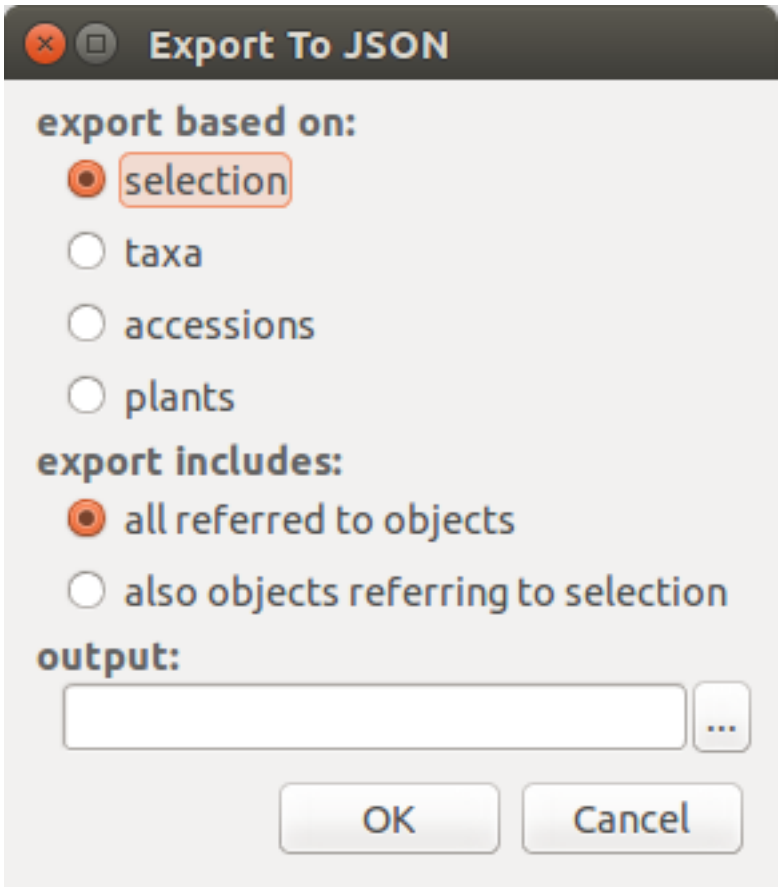
### 3.7.3 Importação do JSON

Este é * o * caminho para importar dados para um banco de dados existente, sem destruir o conteúdo anterior. Um exemplo típico dessa funcionalidade poderia ser a importar a sua coleção digital num banco de dados Ghini fresco, apenas inicializado. Converter um banco de dados em formato de intercâmbio de json bauble está além do escopo deste manual, por favor contactar um dos autores se precisar de mais ajuda.

Usando o formato de intercâmbio de json Ghini, você pode importar os dados que você tiver exportado de uma instalação diferente do Ghini.

### 3.7.4 Exportando para JSON

Este recurso ainda está em desenvolvimento.




Quando você ativar esta ferramenta de exportação, você é dado a opção para especificar o que exportar. Você pode usar a seleção atual para limitar o intervalo de exportação, ou você pode começar com o conteúdo completo de um domínio, a ser escolhido entre espécies, a accesão, a planta.

Exportando * espécies * só exportará a informação taxonômica completa em seu banco de dados. * Accesão * exportará todas suas accesões, além disso, toda a informação taxonômica refere-se: unreferred de táxons não serão exportados. * Planta * exportará todos os que vivem plantas (algumas accesão não pode ser incluído), todos referidos locais e táxons.

### 3.7.5 Importing from a Generic Database

This functionality is the object of issue #127, for which we have no generic solution yet.

If you're interested in importing data from some flat file (e.g.: Excel spreadsheet) or from any database, contact the developers.

### 3.7.6 Importing a Pictures Collection

We can consider a collection of plant pictures as a particular form of botanical database, in which each picture is clearly associated with one specific plant.

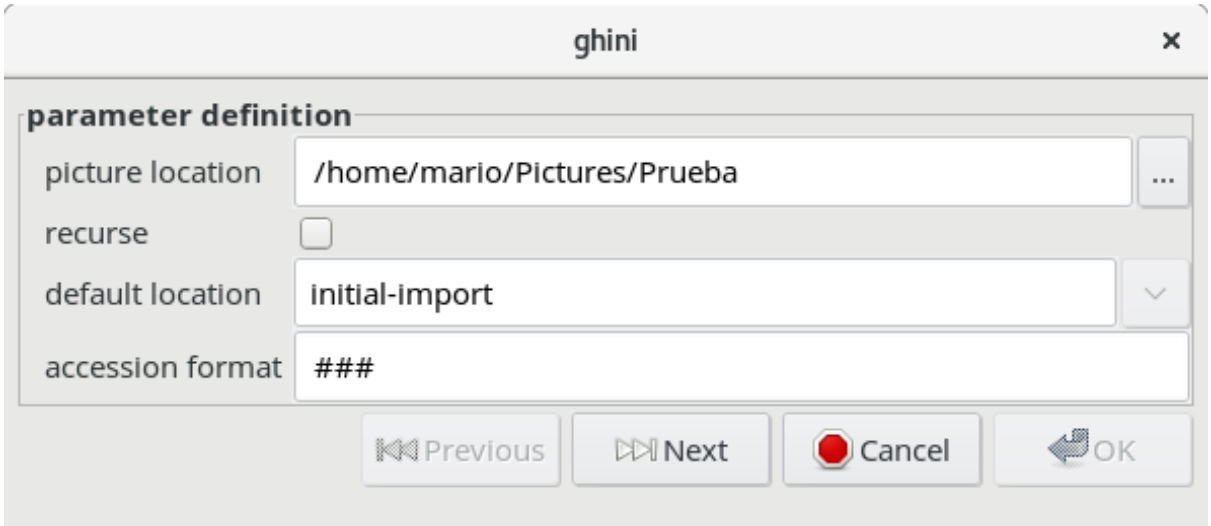
Even without using a photo collection software, you can associate pictures to accessions by following one and the same clear rule when naming picture files.

For example, `2018.0020.1 (4) Epidendrum.jpg` would be the name of the fourth picture for plant number 1 within accession 2018.0020, identified to rank genus as an Epidendrum.

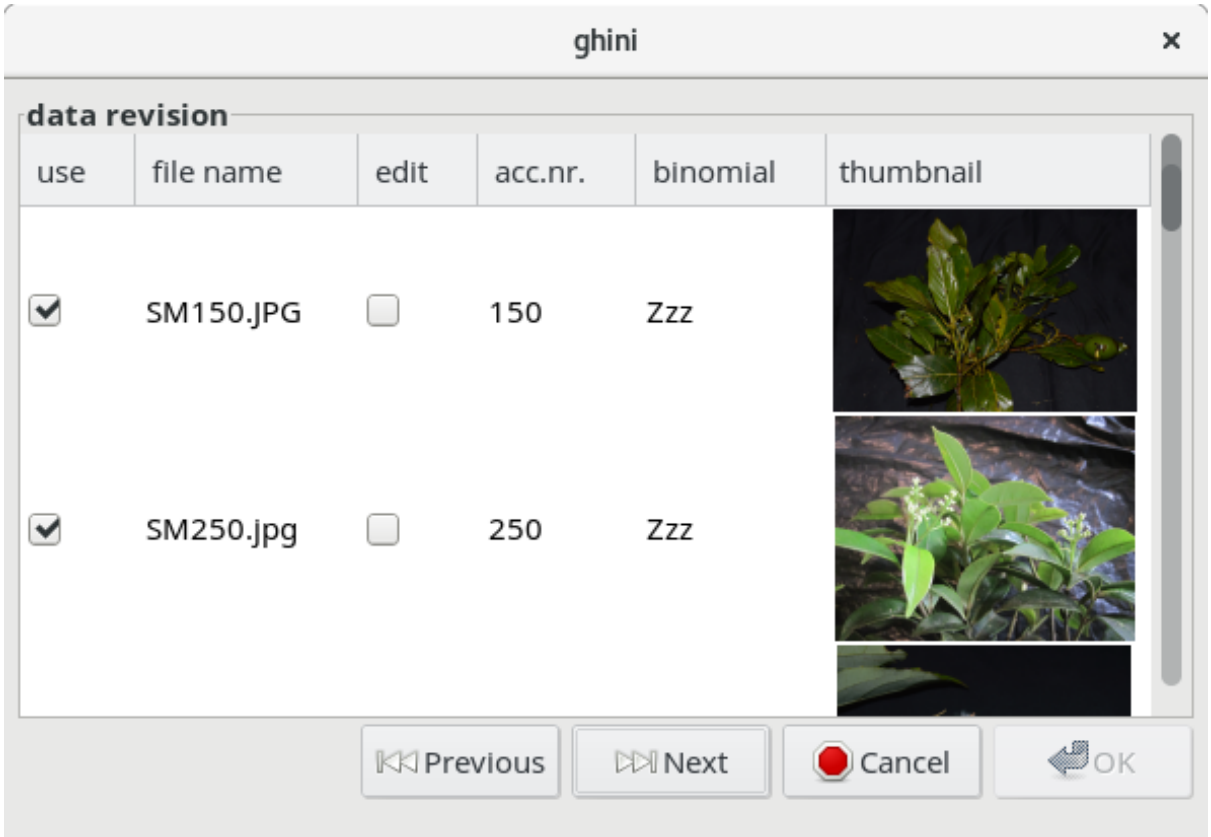
The *Tools→Import→Pictures* functionality here described is meant for importing an ordered collection of plant pictures either to initialize a ghini database, or for periodically adding to it.

Use *Tools→Import→Pictures* to activate this import tool. Import goes in several steps: parameter definition; data revision and confirmation; the import step proper; finally review the import log. At the first two steps you can confirm the data and go to the next step by clicking on the `next` button, or you can go back to the previous step by clicking on the `prev` button. Once the import is done and you're reviewing the log, you can only either confirm —or abort— the whole transaction.

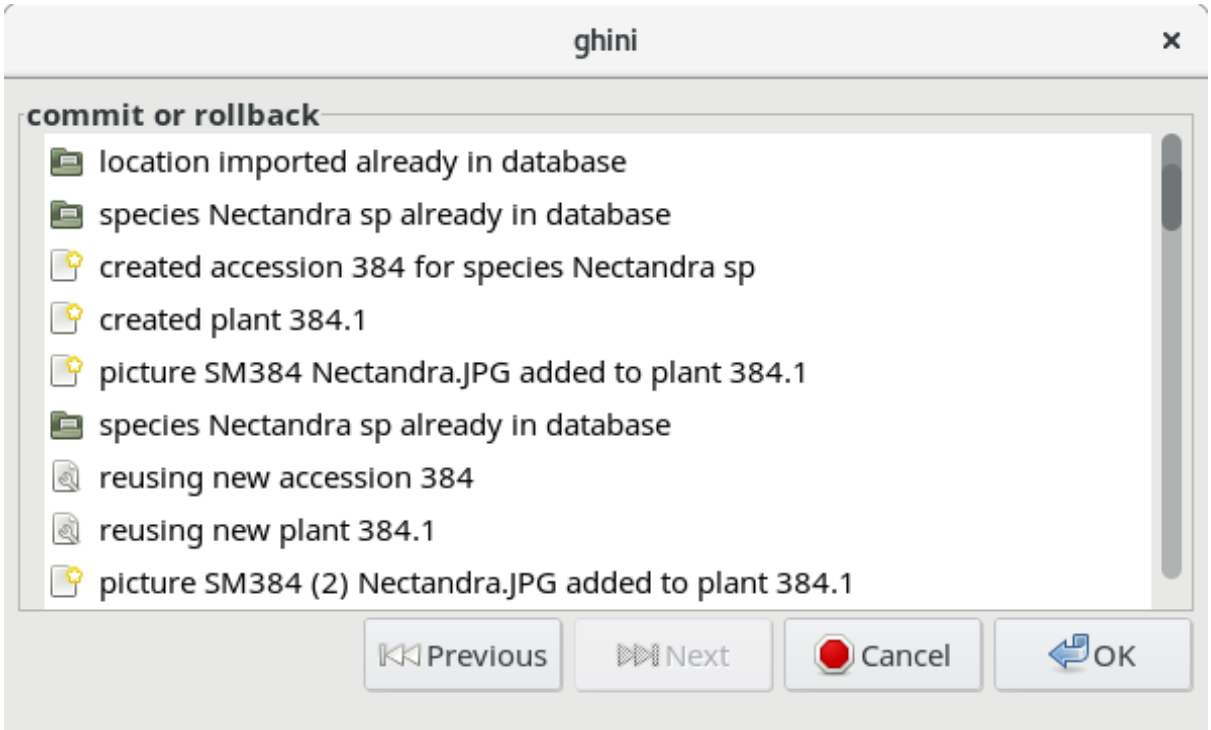
In the «parameter definition» pane you: select the directory from which you intend to import pictures; indicate whether to import pictures recursively; select or create a location which will be used as default location for new plants; inform the tool about the rule you've been following when naming picture files.




In the «data revision» pane you are shown a table with as many rows as the pictures you are importing. Each row holds as much information as the tool managed to extract from the picture name. You can review the information, correct or confirm, and indicate whether or not the row should be imported.




In the final «commit or rollback» pane you read the logs relative to your data import, and decide whether to keep them (commit them to the database), or undo them (rollback the transaction).




When the Picture Collection importer creates or updates objects, it also sets a Note that you can use for selecting the objects involved in the import, and for reviewing if needed.

## 3.8 Managing Users

**Nota:** The Ghini users plugin is only available on PostgreSQL based databases.

The Ghini Users Plugin will allow you to create and manage the permissions of users for your Ghini database.

You must log in to your database as a user with `CREATEROLE` privilege in order to manage other users.

### 3.8.1 Creating Users

To create a new user...

### 3.8.2 Permissões

Ghini allows read, write and execute permissions.

# CAPÍTULO 4

# Cookbook

## 4.1 Contributed recipes collection

This page presents lists of use cases. If you're looking for straight, practical information, you are at the right place. If you prefer a thorough presentation of the software and database structure, check the section software for botanical gardens

All material here has been contributed by gardens using the software and sharing their experiences back to the user community.

The authors of the software wish to thank all dearly.

### 4.1.1 Quito Botanical Garden

At the JBQ, Quito Botanical Garden, we have adopted the Ghini software in April 2015. Since that time, we have accumulated experience with the program, and we are ourselves in need to document it, in order to secure the knowledge to the institution. We are happy to share it.

#### Technical

- We work on GNU/Linux, a platform that many users don't master, and our database is inside of a remote database management system. This implies steps that are not obvious to the casual end user.

  **How to start a program**

To start a program given its name, hit the  key next to Alt, or click on  , then start typing the name of the program, in our case "Ghini" or just click on the program symbol  , appearing near the left margin of your display.

---

---

**Database server**

We chose for a centralised PostgreSQL database server. This way we are protected from concurrent conflicting changes, and all changes are simultaneously available on all ghini clients. We did need to outsource database server management.

---

---

**adding a new user**

Ghini keeps track of the user performing all sort of edits to the database, and at the garden, apart from the stable users, we have all sorts of temporary users writing to the database, that we decided we would let Ghini help us keep track of database events.

Since we work using PostgreSQL, the users that Ghini stores in the database history are the database users, not the system users.

Each user knows their own password, and only knows that one. Our superuser, responsible for the database content, also has the `bauble` fictional user password, which we only only use to create other users.

We do not use account names like `voluntario`, because such accounts do not help us associate the name to the person.

---

---

**— adding a new system user (linux/osx)**

Adding a system user is not strictly necessary, as ghini does not use it in the logs, however, adding a system user allows for separation of preferences, configured connections, search history. On some of our systems we have a single shared account with several configured connections, on other systems we have one account per user.

On systems with one account per user, our users have a single configured connection, and we hold the database password in the `/home/<account>/.pgpass` file. This file is only readable for the `<account>` owner.

On systems with a shared account, the user must select their own connection and type the corresponding password.

These are the steps to add system users:

```
sudo -k; sudo adduser test
sudo adduser test adm; sudo adduser test sudo
sudo adduser test sambashare; sudo adduser test ghini
```

**— adding a new database user**

Ghini has a very minimal interface to user management, it only works with postgresql and it very much lacks maintainance. We have opened issues that will allow us use it, for the time being we use the `create-role.sh` script:

```
#!/bin/bash
USER=$1
PASSWD=$2
shift 2
cat <<EOF | psql bauble -U bauble $@
create role $USER with login password '$PASSWD';
alter role $USER with login password '$PASSWD';
grant all privileges on all tables in schema public to
↪$USER;
grant all privileges on all sequences in schema public␣
↪to $USER;
grant all privileges on all functions in schema public␣
↪to $USER;
EOF
```

The redundant `alter role` following the `create role` lets us apply the same script also for correcting existing accounts.

Our ghini database is called `bauble`, and `bauble` is also the name of our database super user, the only user with `CREATEROLE` privilege.

For example, the following invocation would create the user `willem` with password `orange`, on the `bauble` database hosted at 192.168.5.6:

```
./create-role.sh willem orange -h 192.168.5.6
```

- Understanding when to update

**Updating the system**

Ubuntu updates are a lot lighter and easier than with Windows. So whenever the system suggests an update, we let it do that. Generally, there's no need to wait during the update nor to reboot after it's done.

**Updating ghini**

The first window presented by Ghini looks like this. Normally, you don't need do anything in this window, just press enter and get into the main program screen.


Occasionally, at the top of the screen an information text will appear, telling you that a newer version is available on-line.

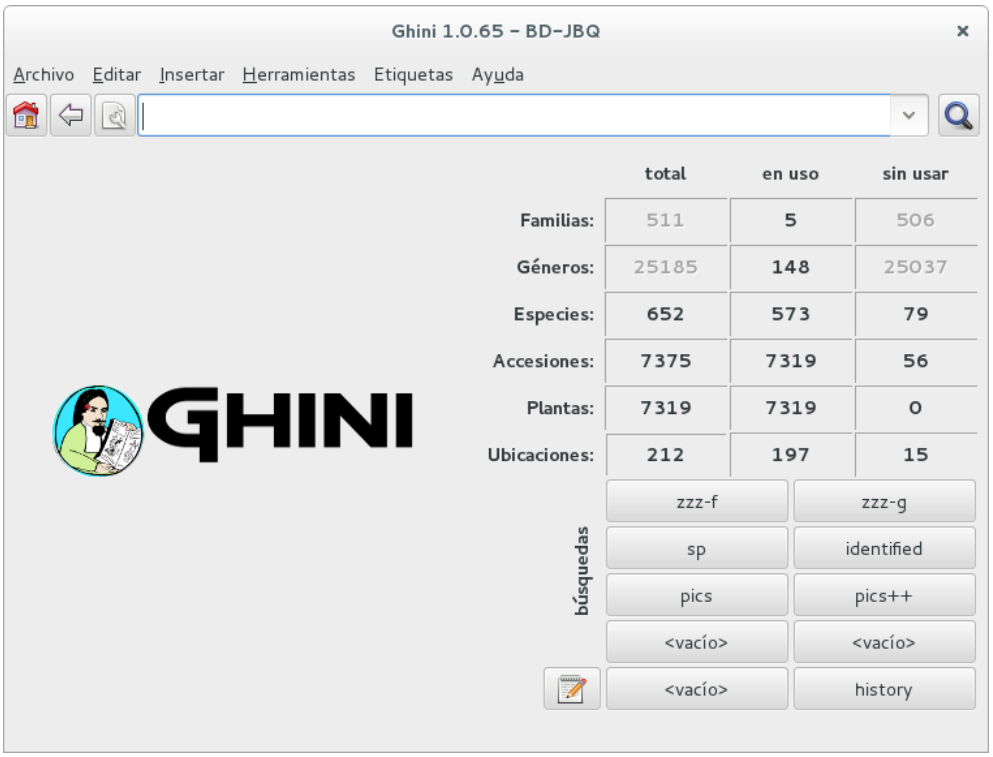

The update procedure is simple, and it depends on the operating system you use, we're not explaining here again.

It is generally a good idea updating the software. If in doubt, contact the author, or write to the group.

- understanding ghini initial screen

**Complete screen**

At the moment of writing, our initial screen looked like this:




Apart from the main application menu, Ghini offers three special interface sections with information and tools to explore the database.

### Numeric overview

The table in the right half of the screen presents a summary of all the registered plants can be observed. Each entry printed in bold is a link to the query selecting the corresponding objects.

| | total | in use | unused |
|---|---|---|---|
| Families: | 511 | 7 | 504 |
| Genera: | 25394 | 158 | 25236 |
| Species: | 637 | 623 | 14 |
| Accessions: | 7722 | 7675 | 47 |
| Plants: | 7676 | 7676 | 0 |
| Locations: | 170 | 163 | 7 |

### Stored queries

The lower half of the right hand side contains a set of stored queries. While you can edit them to your liking, our hints include selecting those accessions that have not been identified at rank species. And one for the database history.


---

**Query and action buttons**

At the top of this screen you can find the field in which you would enter your searches.

- With the  button, in the form of a house, you can return from your searches to the main screen.
- With the  button, in the form of an arrow, you can return to your last search.
- With the  button, in the form of a gear, you can start the «Query Builder», which helps you compose complex searches in a simple, graphical way.

---

- We often have volunteers who only work at the garden for a very short time. It was with them in mind that we have developed a hyper-simplified view on the ghini database structure.

---

**Details**

The two figures here show all that our temporary collaborators need to know.

| Taxonomy & Collection | Garden |
|---|---|
| **Orchidaceae** (Family)<br>**Masdevallia** Orchidaceae<br>***Masdevallia angulata*** Rchb.f. Orchidaceae<br>**2017.6266** - 0 plant groups in 0 location(s) *Masdevallia angulata* | **(INV1) invernadero** (Location)<br>**2017.6266.1** - 1 alive in (INV1) invernadero *Masdevallia angulata* |

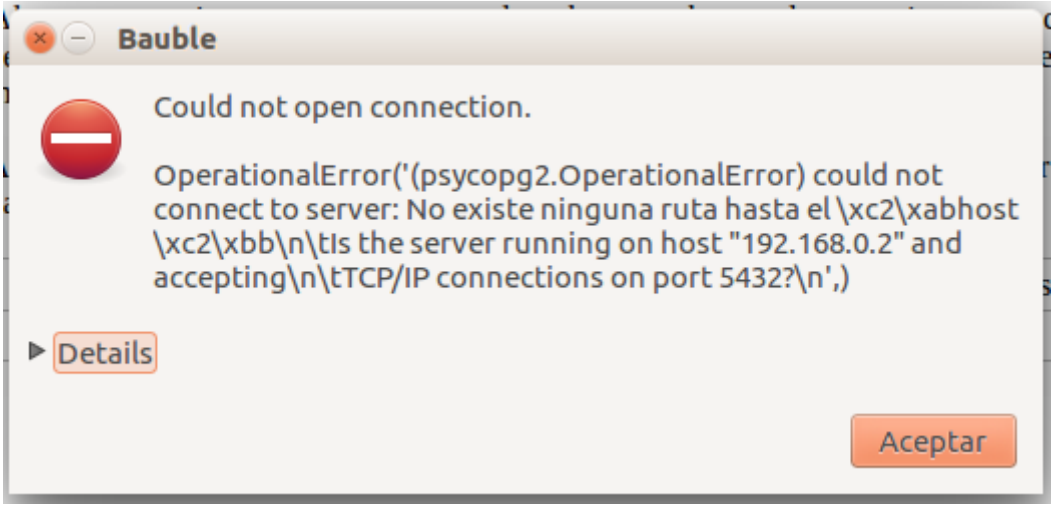
---

- At times, the program gives error messages. 

, retry, or report to the developers.

**Network problems**

In order to work, the program needs a stable network connection to the database server. It can happen: you start the program, and it can't connect to our database server. You would then get a rather explicit but very badly typeset error message.

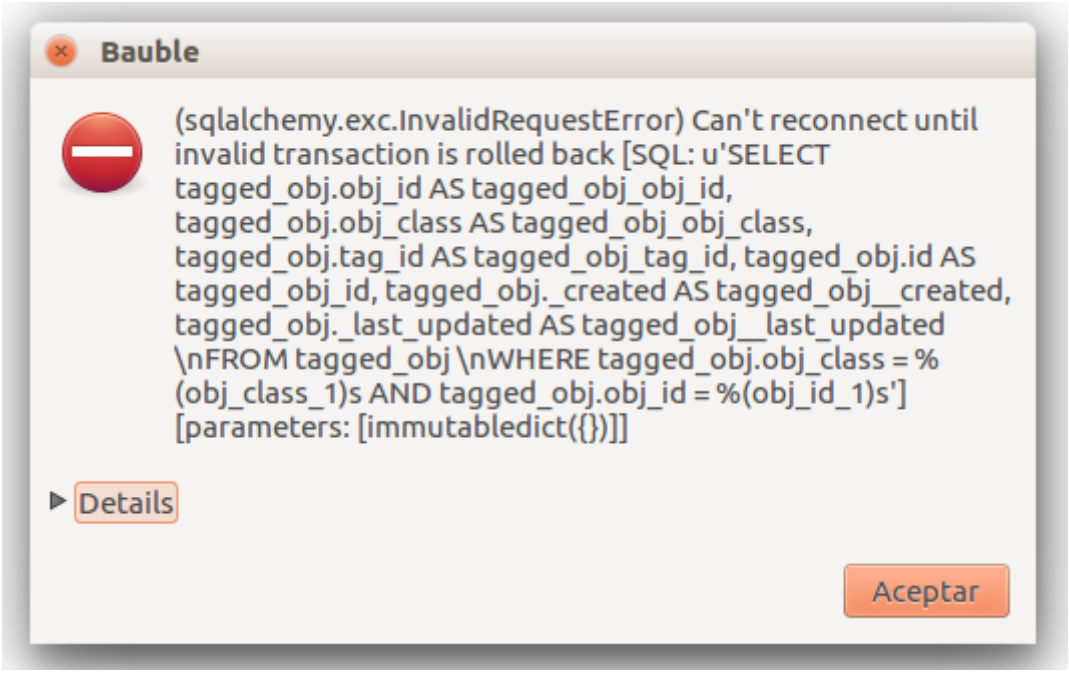



Just ignore it and try again.

**Search fails with error**

Sometimes and without any apparent cause, a search will not run successfully, and a window with an error message will be displayed. In this case you only have to try to perform the same search again.

An example of such an error message:



**Search does not return something I just inserted**

Accession codes starting with zero and composed of just numbers, as for example `016489` are considered by the software as numbers, so if you don't enclose the search string in quotes, any leading 0 will be stripped and the value will not be found.

Try again, but enclose your search string in single or double quotes.

| Number on the label | corresponding search |
|---|---|
| 16489 | "016489" |

Please note: when you look for a Plant code, not an Accession, the leading zero becomes optional, so in the above example it's maybe easier to type `16489.1`.

- A serious situation happened once, and we absolutely want to prevent it from happening again: a user deleted a genus, with everything that was below it, species and accessions, and synonyms.

**Solving it with user permissions**

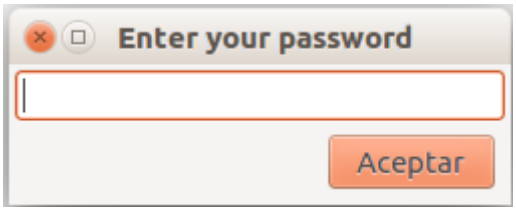
We propose to have different connection profiles, associated to different database users, each user with all needed permissions.

**Full permission (BD-JBQ)** Only qualified personnel get this kind of access.

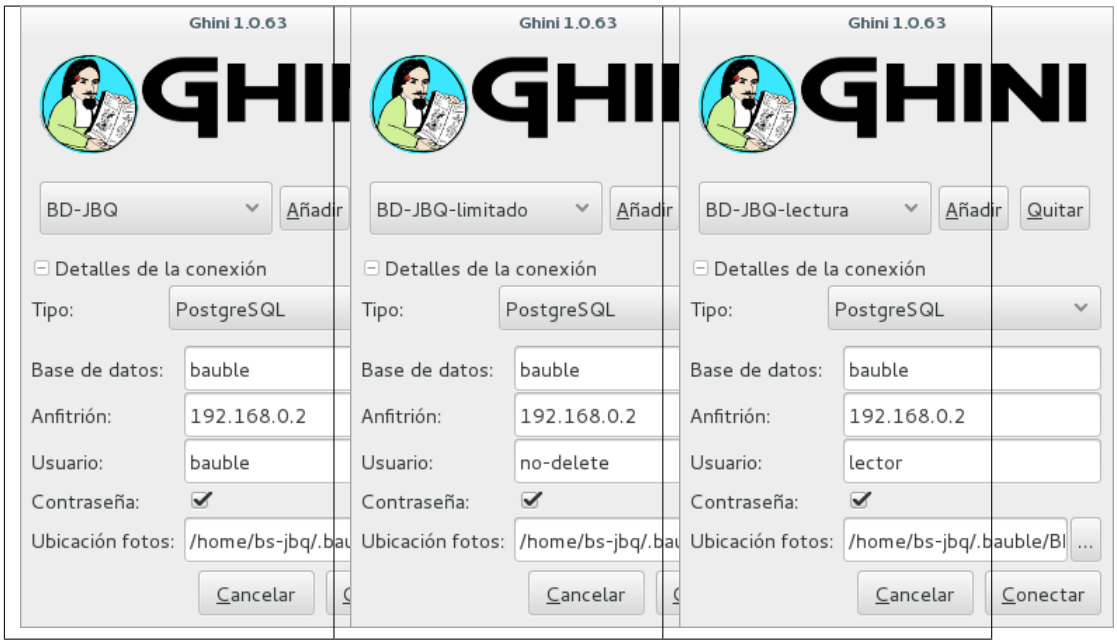
**Insert and update (BD-JBQ-limitado)** We use this one for those users who come help us for a limited time, and who did not get a complete introduction to database concepts. It is meant to prevent costly mistakes.

**Read only (BD-JBQ-lectura)** it can be shared with anyone visiting the garden

You select the connection at start-up, and the software asks you for the password corresponding to the connection you selected.




If you want to review the details of the connection, click on the next to "Connection Details", it will change to , and the connection window will be displayed as one of the following:




As you can see, we are connecting to the same database server, each connection uses the same database on the server, but with different user.

**Thinking further about it**

On the other hand, we are questioning if it is at all appropriate, letting any user delete something at such high level as a family, or a genus, or, for that matters, of anything connected to accessions in the collection.

The ghini way to question the software features, is by opening a corresponding issue.

- When contacting the developers, they will definitely ask for technical information, or at least to see a screen-shot. Help them help you.

**Taking a screen-shot**

On Linux there are three ways to create a screen-shot, all involve hitting the "PrtSc" key. The most practical one is possibly hitting the "PrtSc" key in combination with Ctrl and Shift. This will start an interactive screen copy tool. You select a rectangle and the area is copied in the clipboard. Paste it in the email you're writing, or in the chat line where the developers are trying to help you.

**Where are the logs**

Ghini continuously saves a very informative log file, in the `~/.bauble/bauble.log` file. Don't bother opening it, just send it over. It contains

loads of technical information.

**Continuous unmanned alerting**

An other option is to activate the sentry handler. It will notify our sentry server of any serious situations in the software. If you registered, the developers will know how to contact you if necessary.

To the healthy paranoid: we're not monitoring what you're doing, we're monitoring how our software works. You can always opt out.

You activate the Sentry handler in the `:prefs` page: look for the row with name `bauble.use_sentry_handler`, if the value is not what you wish, double click on the line and it will change to the other value.

## Taxonomy

- Introduction

**Orchidaceae taxonomic complexity**

At the JBQ, we work most of all with orchids, family Orchidaceae, one of the largest plant families, with no less than 850 genera, organized —according to Dressler— in approximately 70 subtribes, 22 tribes, 5 subfamilies. How we represent this information is not obvious and needs be explained.

The taxonomy of the Orchidaceae family is continuously being reviewed. Genera get added, refused, reorganized, recognized as synonyms, some taxonomists prefer grouping species or genera in a new way, others split them again and differently, botanists of different nationalities may have different views on the matter. All this sounds very complex and specialistic, but it's part of our daily routine, and it can all be stored in our Ghini database.

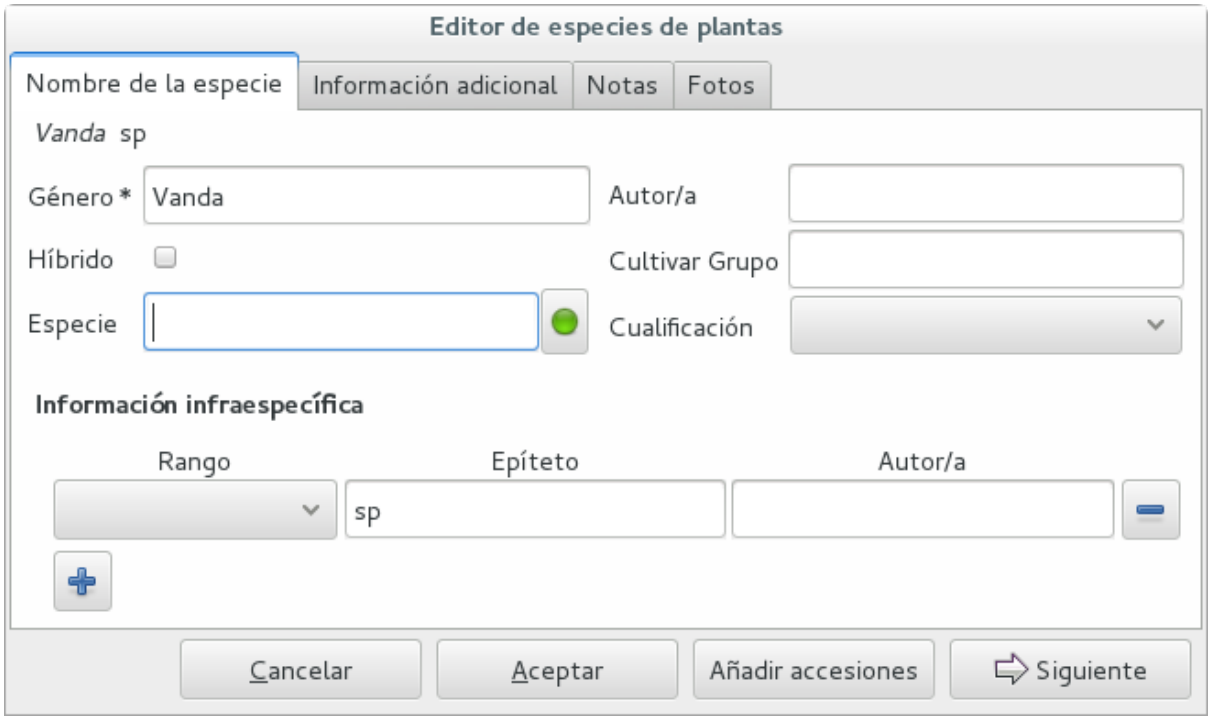
- Identifying at rank Genus, or Family

**At rank genus**

Ghini-1.0 prescribes that an accession is identified at rank species, in all cases. The current maintainer acknowledges that this is a mistake, coming from the early Bauble days, and which Ghini-1.0 has in common with other botanic software. Until this is fixed, we rely on established practices.

If an accession is identified at rank genus, we add a fictive species in that genus, we don't specify its species epithet (we don't know that) and we add an unranked epithet in the infraspecific information section, like this:

When displayed in a search result, it shows like this:




**At rank family**

If an accession is only identified at rank family, we need a fictive genus, to which we can add the fictive species. Since our garden is primarily focusing on Orchidaceae, we use the very short name **Zzz** for the fictive genus within the family, like this:

The current maintainer suggests to use the prefix **Zzz-** and behind the prefix to write the family name, possibly removing the trailing **e**. Removal of the trailing **e** is useful in order not to get results that include genus names when you as for stuff ending in **aceae**.

Apart from the aforementioned **Zzz** genus in the Orchidaceae family, we follow this suggested practice, so for example our collection would include *Zzz-cactacea* or *Zzz-bromeliacea*.

Remember: our **Zzz** genus is a fictive genus in the **Orchidaceae** family, do not use it as unspecified genus in other families.

- Identifying at a rank that is not allowed by the software (eg: Subtribe, or Subfamily)

**At rank subtribe**

We sometimes can't identify a taxon at rank genus, but we do manage to be more precise than just «it's an orchid». Quite often we are able to indicate the

subtribe, this is useful when you want to produce hybrids.

The software does not let us store ranks which are intermediate between family and genus, so we need to invent something, and this is what we do:

We insert a fictive genus, naming it as the subtribe, prefixing it with "Zzx-", like in this example:

This Zzx-Laeliinae is some genus in the Laeliinae subtribe.

In order to be able to select genera by subtribe, we also add a note to the Zzx-Laeliinae fictive genus as well as for all real genera in that subtribe, note category subtribus, note value the subtribe name.

This allows for queries like:

```
genus where notes.note=Laeliinae
```

We are very much looking forward to seeing that issue-9 solved!

**At rank subfamily, tribe**

Just as we reserved the prefix Zzx- for subtribe, we reserve the prefixes Zzy- for tribe, Zzw- for subfamily.

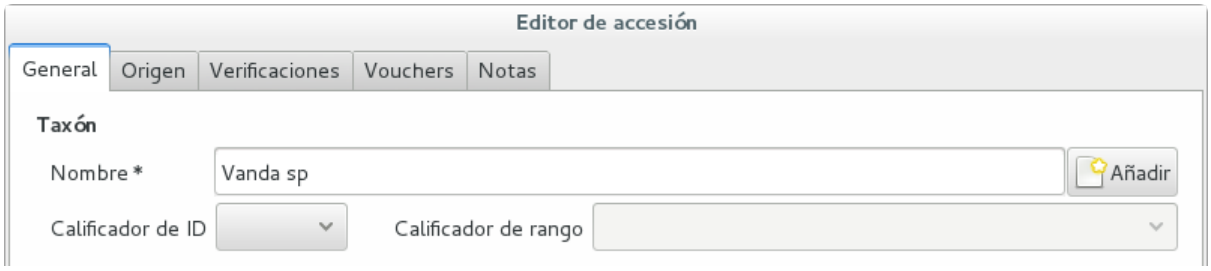
In particular, the subfamily information is relevant, because there are subfamilies within the Orchidaceae family which are not further separated.

- Editing the Accession identification - the Species details

**Placeholder species for individual accessions**

Scenario one describes the identification of a single accession, which had been associated to a «generic», placeholder species, something like "*Zzz* sp" or "*Vanda* sp";

In this case, when the plant species becomes known, we change the association in the accession, selecting a different species.

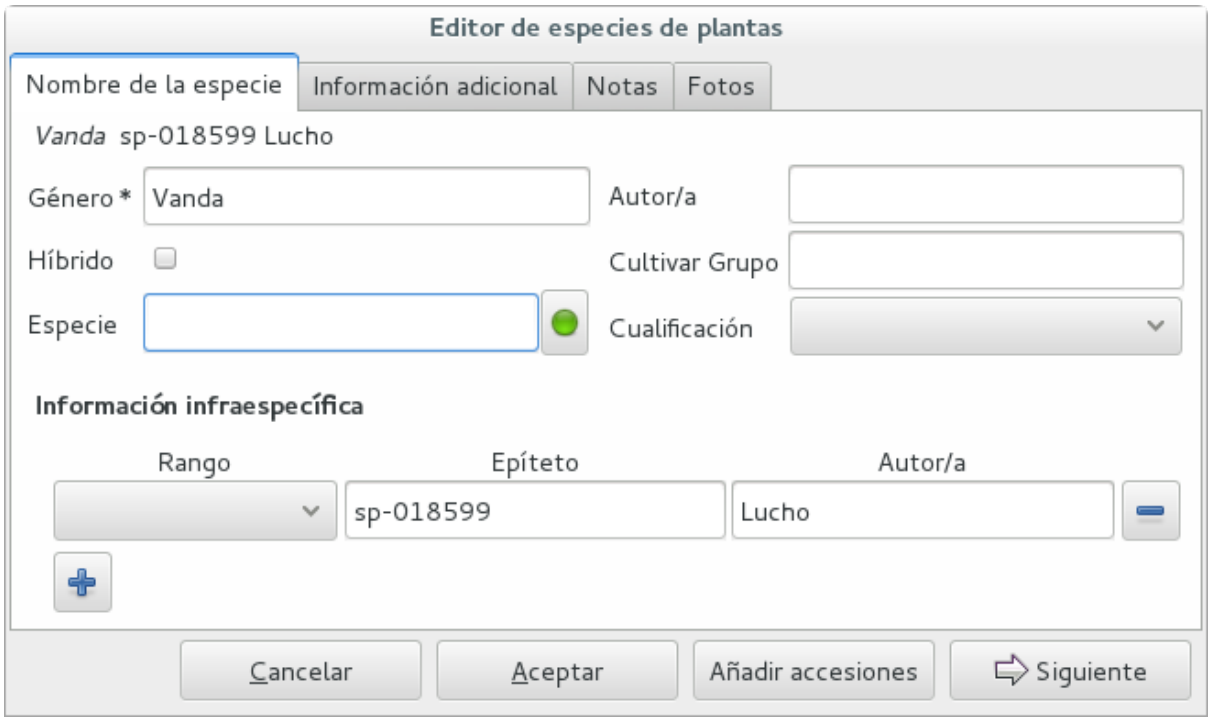



We do not edit the species, because there might be totally unrelated accessions connected to the same placeholder species.

**Unknown species for multiple accessions**

A different case is when we have a whole batch of accessions, all obviously the same species, but we haven't been able to identify it. In this case, we associate the accessions with an incompletely specified species, something like "*Zzz* sp-59", preferably adding the taxonomist's name, who made the association.

A species like "*Vanda* sp-018599" is not a placeholder species, it is a very concrete species, which we haven't yet identified.




In this case, when the species gets identified (and it could even be a species nova), we directly edit the species, so all accessions that refer to it get the change.

- A new plants is relative to a species not yet in our collection.

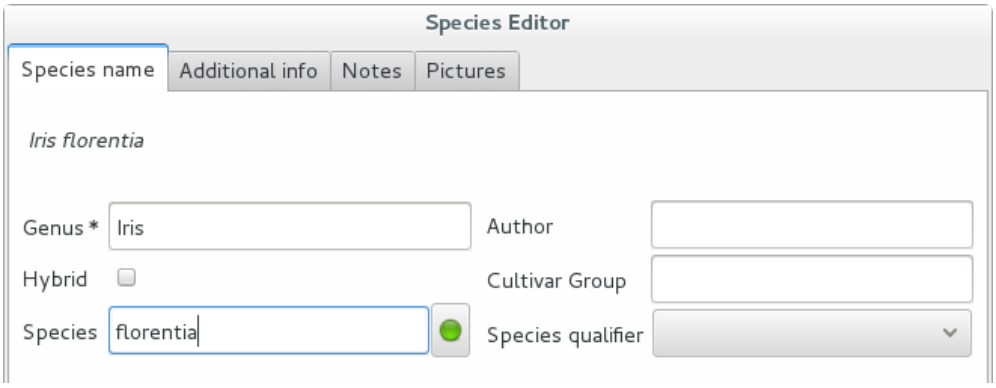
**Last minute species**

We start this from the Accession window and it's very simple, just click on the + next to the species name, we get into the Species window.

- Adding a species and using online taxonomic services

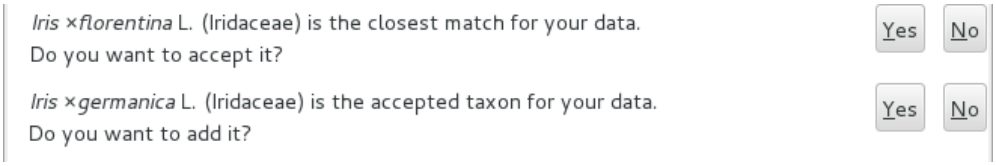
**Adding a new species — the plant list.**

We start the obvious way: type the genus epithet, possibly select it from the completion list, then type the species epithet, or at least your best guess.

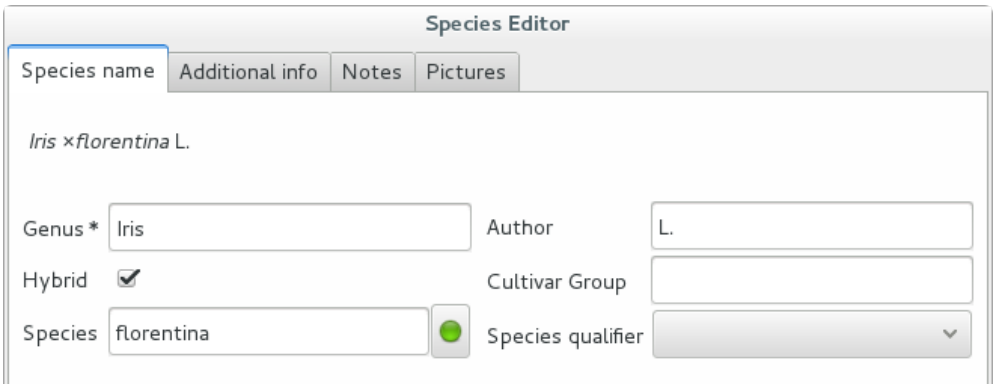



Next to the species epithet field there's a small button,  , which connects us to the plant list. Click on it, a message area appears at the top of the window.


Depending on the speed of your internet connection, but also on how close your best guess is to a correct published name, the top area will change to something like this:




Accept the hint and it will be as if you had typed the data yourself.




---

**Reviewing a whole selection — TNRS.**

This is described in the manual, it's extremely useful, don't forget about it.

---

## Let the database fit the garden

- A never-ending task is reviewing what we have in the garden and have it match what we have in the database.

**Initial status and variable resources**

When we adopted ghini, we imported into it all that was properly described in a filemaker database. That database focused solely on Orchids and even so it was far from complete. In practice, we still meet labeled plants in the garden which have never been inserted in the database.

From time to time, we manage to get resources to review the garden, comparing it to the collection in the database, and the main activity is to insert accession codes to the database, take pictures of the plant in question, and note its location, all tasks that are described in the remainder of this section.

The small Android app ghini.pocket was added to the Ghini family while a Ghini programmer was here in Quito. It helps us take a snapshot of the database in our pocket while walking in the garden, but it also allows for a very swift inventory procedure.

**Inventory procedure**

We start ghini.pocket, we write down the name of the location where we will be conducting the inventory, for example (INV 1) for greenhouse 1. We enter (type or scan if the plant has bar code or QR code) the accession code and we look it up in ghini.pocket.

A side effect of performing the search is that ghini.pocket writes the date with time, location and the code looked for in a text file that can later be imported into the database.

For a greenhouse with around 1000 plants our estimates suggest you will need two days, working at relaxed pace, from 8:00 am to 5:00 pm.

After having imported the file generated by ghini.pocket, it is easy to reveal which plants are missing. For example: If we did the inventory of the INV3 from 4 to 5 September, this is the corresponding search:

```
plant where location.code = 'INV3' and not notes.note␣
↪like '2017090%'
```

All of these plants can be marked as dead, or lost, according to garden policy.

**Visualizing the need of taxonomic attention**

Our protocol includes one more detail intended to visually highlight plants that need the attention of a taxonomist.


A plant that only appears in our data base identified at family level or that wasn't yet the database receives a visual signal (e.g.: a wooden or plastic stick, for ice cream or french fries), to highlight that it is not identified. In this way the taxonomist in charge, when making a tour of the greenhouse can quickly spot them and possibly proceed to add their identification in the database.

- Naming convention in garden locations

**Details**

| code | description |
|---|---|
| CAC-B *x* | Reserved to cactus plants next to the orchids exposition glasshouses. |
| CRV: | Nepenthaceae exibition |
| IC-*xx*: | orquidearios de calor en el jardín (1A a 9C son lugares especificos entre del orquideario) |
| IF-xx: | orquidearios de frío en el jardín (1A a 5I son lugares específicos dentro del orquideario) |
| INV1: | invernadero 1 (calor) |
| INV2: | invernadero 2 (frío) |
| INV3: | invernadero 3 (calor) |

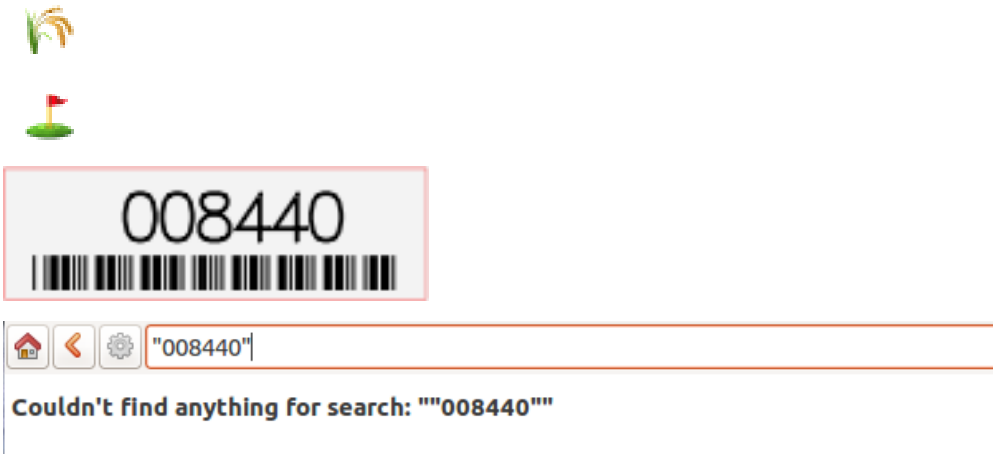
- Adding an Accession for a Plant

Obviously we keep increasing our collection, with plants coming from commercial sources, or collected from the wild, more rarely coming from expeditions to remote areas of our country, or we receive plants which were illegally collected.

Sometimes we have to add plants to the digital collection, just because we have them physically, found in the garden, with or without its label, but without their digital counterpart.

**Existing plant, found in the garden with its own label**

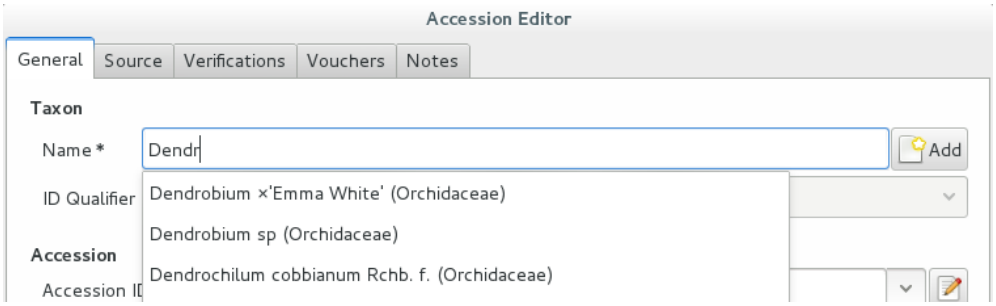
This activity starts with a plant, which was found at a specific garden location, an accession label, and the knowledge that the accession code is not in the database.




For this example, let's assume we are going to insert this information in the database.

| Accession | Species | Location |
|---|---|---|
| 008440 | *Dendrobium* ×"Emma White" | Invernadero 1 (calor) |

We go straight into the Accession Editor, start typing the species name in the corresponding field. Luckily, the species was already in the database, otherwise we would use the **Add** button next to the entry field.




We select the correct species, and we fill in a couple more fields, leaving the rest to the default values:

| Accession ID | Type of Material | Quantity | Provenance |
|---|---|---|---|
| 008440 | Planta | 1 | Unknown |

After this, we continue to the Plant editor, by clicking on **Add Plants**.

We do not fill in the Accession's «**Intended Locations**», because we don't know what was the original intention when the plant was first acquired.

In the Plant Editor, we insert the Quantity and the Location. And we're done.

The plant is now part of the database:


**New accession: plant just entering the garden**

This activity starts with a new Plant, just acquired from a known Source, a plant label, and an intended Location in the garden.

We mostly do the same as for the case that a plant is found in the garden, there are two differences: (1) we know the source of the plant; (2) acquiring this plant was a planned action, and we intend to place it at a specific location in the garden.

Again, we go straight into the Accession Editor, start typing the species and we either select if from the completion list or we add it on the fly.

| Accession ID | Type of Material | Quantity | Source |
|---|---|---|---|
| 033724 | Planta | 1 | specified |

After this, we continue to the Plant editor, by clicking on **Add Plants**.

In the Plant Editor, we insert the Quantity and the Location.

Please note that the plant may be initially placed in a greenhouse, before it reaches its intended location in the garden.

**Existing plant, found in the garden without its label**

When this happens, we can't be sure the plant had never been in the collection, so we act as if we were re-labeling the plant. This is discussed in the next section, but we fall back to the case of a new accession.

- When we physically associate a label to a plant, there's always the chance that something happens either to the plant (it may die) or to the label (it may become unreadable), or to the association (they may be separated). We have software-aided protocols for these events.

**We find a dead plant**

Whenever a plant is found dead, we collect its label and put it in a box next to the main data insertion terminal, the box is marked "dead plants".

Definitely at least once a week, the box is emptied and the database is updated with this information.

Dead plants aren't *removed* from the database, they stay there but get a **quantity** zero. If the cause of death is known, this is also written in the database.

Please once again remember that a **Plant** is not an **Accession** and please remember we do not remove objects from the database, we just add to their history.

Insert the complete plant code (something like `012345.1`, or `2017.0001.3`, and you don't need leading zeros nor quotes), right click on the corresponding row, and click on **edit**. change the quantity to 0, fill in the reason and preferably also the date of change.

If you need add any details about the plant death, please use a **note**, and re-use the note category «death_cause».

Plants with **quantity** zero are shown with a different colour in the results view. This helps distinguish them from live plants.

**We find a plant without a label**

We can't be sure the plant had ever been in the collection or not. We assume it had, and that its label was lost.

Losing a plant label is unfortunate, but it just sometimes happens. What we do is to put a new label to the plant, and to clearly state that the label is a replacement of an original one.

We then handle the case as if it was a new accession, plus we add a note to the accession, category "label", text "relabeled".

- Keeping track of different sources of plant material

**What different sources we can have**

In this botanical garden, we receive plants from different types of origin. It could be from expeditions (plants coming from nature, collected with legal permission from MAE - Ecuadorian Environment Ministry), donated plants mostly coming as gifts from collectors or orchid commercialization enterprises, purchased, or confiscated plants (usually coming from MAE raids around the country).

**If the plant comes from a wild source**

The accession editor offers the option «origin» option. When a plant is traceable to a wild source, we can specified its specific origin. We want to comply

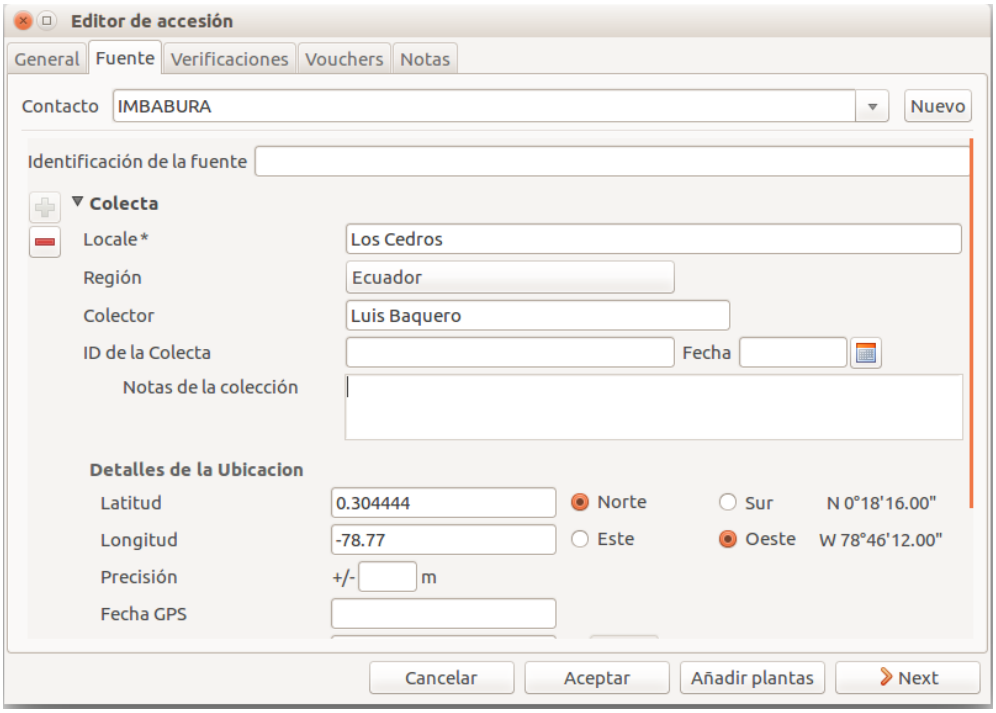
with ITF2, and ghini-1.0 only partly respects that standard. The ITF2 complying options are:

- Wild: Accession of wild source.
- Cultivated: Propagule(s) from a wild source plant.
- Not Wild: Accession not traceable to a wild source.
- Insufficient data

In the case of a donated plant, it is better to put detail information just as a note in the plant accession; in the case of a plant with an unknown origin, we select the Insufficient data option.

### Using the source tab in the accession editor

In this section we can create or use a contact, our source of plant material. It could be from an expedition to a collecting place, and in this case we would specify the region and the expedition name, or could be the name of the person or enterprise donating a specific batch of plants.




Once you choose or create the contact information, this section deploys more options, here you can specify the region, where you can choose the country of origin, and a specific location within the region, georeferencing information (including the GPS data), habitat description collector name. For the last one, I recommend also to write the specific date next to the collector name (eg. Luis Baquero 11/10/2016).

**Donated, bought or confiscated plants**

However useful for expeditions or for donors where the main information is geographic, this source tab is not very practical in our remaining cases: we handle three more categories: confiscated, purchased and donated, for these categories the options available in the source tab do not apply: too much information and not to the point.

In these cases, we add a set of notes, according to the case.

**— Donated plants**

If the plant was donated by individual, we add the individual among our contacts and specify it as source, then we add the notes:

| category | text |
|---|---|
| source-type | gift |
| source-detail | Contribución científica al JBQ |

**— Bought plants**

If the plant was bought, we add the previous owner among our contacts and specify it as source, then we add the notes:

| category | text |
|---|---|
| source-type | purchase |
| source-detail | optional, free text |
| factura | the invoice number |

**— Confiscated plants**

If the plant was confiscated, we add the previous owner among our contacts and specify it as source, then we add the notes:

| category | text |
|---|---|
| source-type | confiscated |
| source-detail | possibly, legal details, law number . . . |

- Producing or reproducing labels

**Refreshing plant labels**

Sometimes we refresh the labels, for example all that is in a greenhouse, or maybe just a set of plants because their labels risk becoming unreadable.

In the first case it's easy selecting all plants in the Location, we just type the location name, or give the search `location like <location name>`.

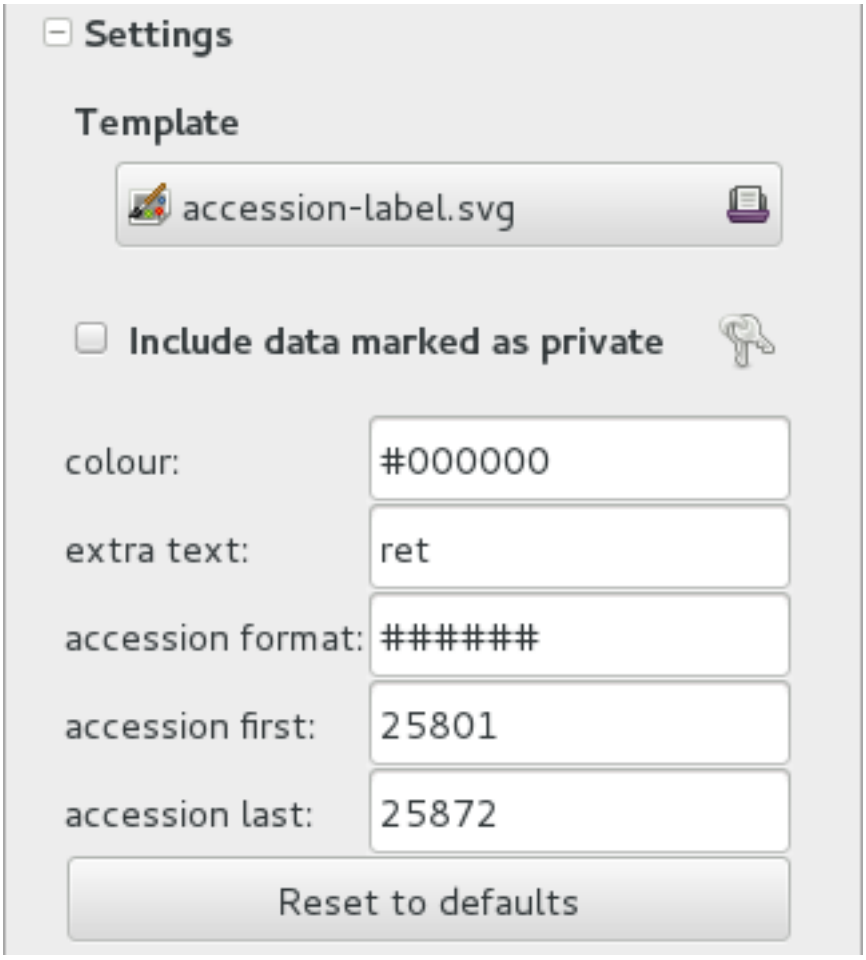
The second case it's a bit trickier. What we do is to create a temporary **Tag**, and use it to tag all plants that were found in need for a new label.

Given the selection, we start the report tool, using the mako `accession-label.svg` template. We reset its options to default values, and since we're using a simple printer, we set the colour to `black` instead of `blue`, which is meant for engraving.

---

**Preparing labels for non-database plants**

To prepare the batch of 72 labels, we use a mako report template, named `accession-label.svg`. This template accepts parameters, this is an example that would produce labels from 025801 all the way to 025872.




Labels come for us in two flavours: (1) either new plants just being acquired by the garden; (2) or plants in the garden, found without a label. We distinguish the two cases by adding a "ret" extra text for relabeled plants.

We keep two boxes with labels of the two types, ready to be used.

- Our garden has two exposition greenhouses, and several warm and cold greenhouses where we keep the largest part of our collection. Plants are moved to the exposition when flowering and back to the «warehouse» when less interesting for the exposition. For each plant in our collection we need to know its current locations and history of movements.

**Planned action**

The action starts by moving the plants around, and collecting the plant code either on paper, or in our mobile app, if we had one.

We then go to the desktop terminal and revise all plants one by one changing their location in the database. It is important that the date of the location change is correctly memorized, because this tells us how long a plant stays in the exposition.

If we had a mobile app, we would just upload the info to the server and we would be done.

**Ex-post correction**

While revising the garden, we find a plant at a location that is not what the database says. We update the database information.

For example, the plant belonging to accession "012142", species "*Acineta* sp", was found in "Invernadero 1", while the database says it is in "ICAlm3".

All we do is find the Plant in the database and update its information. We do not change anything in the initial Accession information, just the current Plant information.

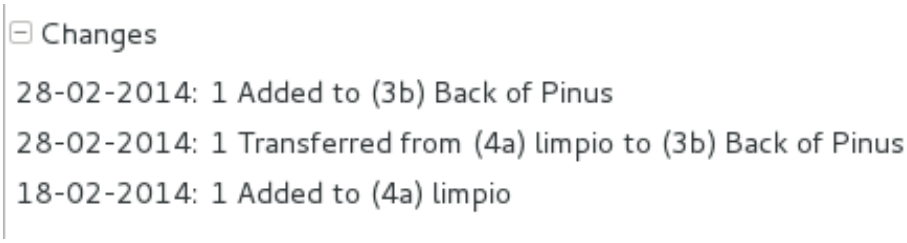
We type the accession code in the search entry field, with quotes, hit enter. The search results now shows the accession, and it tells us how many plants belong to it. Click on the squared **+** in the results row, so we now also see a row for the plant belonging to the accession.

Right click on the Plant row, the three options will show: "Edit, Split, Delete", select Edit, you land in the Plant Editor.

Just correct the Location field, and click on OK.

The InfoBox contains information about the last change to the object:


For plants, even more interesting, it builds a history of changes, list that includes Location changes, or Quantity changes.




- As plants enter the flowering stage, we can review their identification directly, or we take pictures of details of the flower, hoping that a visiting specialist could help completing the identification.

**Adding pictures**

We are practicing with ODK Collect, a small program running on hand-held android devices. Ghini's use of ODK Collect hasn't yet frozen to a best practice. Do have a look at the corresponding issue on github.

- Regularly, we need producing reports about our collection that the Ecuadorian Environment Ministry (MAE) requires and that justify the very existence of the garden.

**Producing reports**

Each year the botanic garden has to submit a report (annual report of management and maintenance of orchids collection) complying to the requirements of the Ecuadorian Ministry of the Environment.

To this end, we start selecting the plants we have to include in the report. It might be all acquisition in the past year:

```
accession where _created between |datetime|2017,1,1|␣
↪and |datetime|2018,1,1|
```

or all plants within a location, or all plants belonging to a species, or just everything (but this will take time):

```
plant where location = 'abc'
plant where accession.species.epithet='muricata' and
↪accession.species.genus.epithet='Annona'
plant like %
```

Having selected the database objects which we want in the report, we start the report tool, which acts on the selection.

## Searching the database

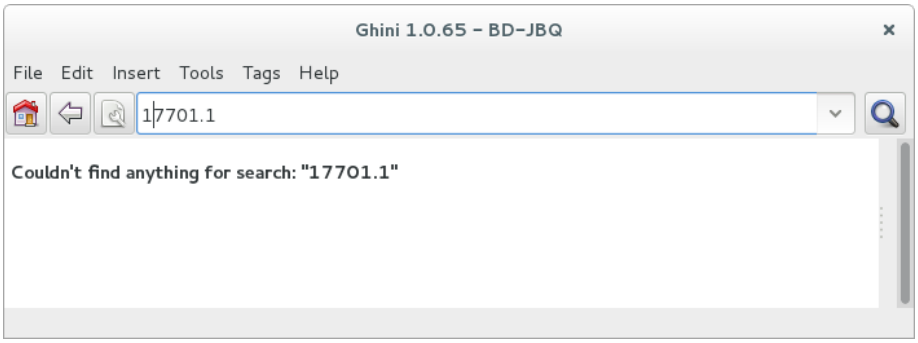
You search the database in order to edit the data further, or because you want to produce a report. Anyway you start with typing something in the search field

and you hope to see your result in the search result view.

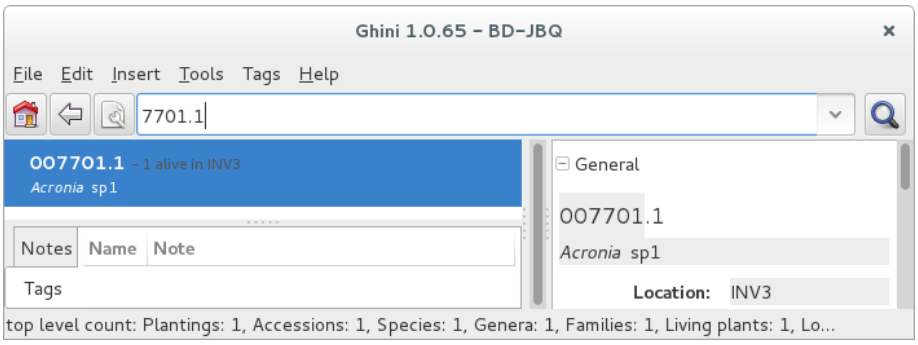
**Search in order to edit (plant or accession)**

When searching in order to edit, you want to be very specific, and select as few objects as possible. The most fine-tuned search is the one based on plant number: you know the code, you get one object.

If your plant is not there, the screen would look like this:



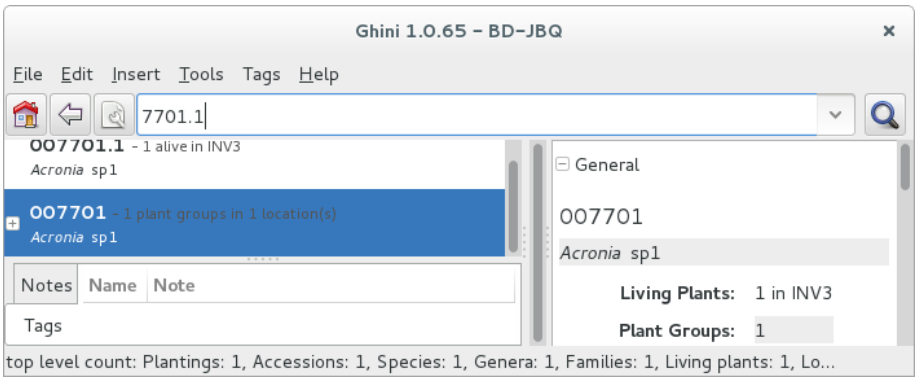

Other example, plant `007701.1` is in the database:




All fields with a darker background in the infobox on the right hand side are hyperlinks to other objects in the database. Clicking on them will

either replace the text in the search field and execute the query, or will simply add the object to the results.

Clicking on the accession does the latter.




We now have both Plant or Accession in the search result view and we can now edit either or both.

### Search in order to report

When searching in order to create a report, you want to be both specific (you don't want to report about irrelevant objects) and broad (you don't want to report about a single object).

Sometimes the report itself suggests the query, as for example: all plants in greenhouse 3; or: all plants belonging to endangered species (we store this information in a note associated to the species); or: all plants added to the collection this year;

```
plant where location.code = INV3
plant where accession.species.notes.note="endangered
↪"
plant where accession._created > |datetime|2017,1,1|
```

Otherwise a flexible way to achieve this is to work with **Tags**.

### Using Tags as enhanced searching

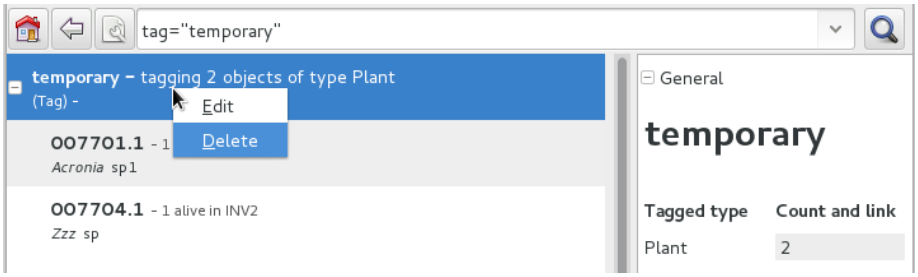
Sometimes we have to take the same action on objects of the same type, but we don't manage to quickly think of a search query that would group all that we need and exclude all we do not need.

This is one possible use of **Tags**. We start with a selection, we tag all objects in the selection under a new temporary tag. Let's say we call it «temporary».

We continue searching and adding objects to the temporary tag until the tag identifies all that we need.

Finally from the Tags menu we select the one we just created (in our example this corresponds to the search `tag="temporary"`) and we can invoke the report.

When we're done with a temporary tag, there's no point in leaving it around, so we just delete it.




**Be aware of the available search strategies**

This is nicely documented, «più non dimandare» and read the docs.

### 4.1.2 using ghini for a seed database

We keep getting involved in groups focusing on endagered plant seeds. They want to note down when seeds come in, but also when they go out to people that order the seed.

In ghini, we keep speaking of ›Plants‹, ›Locations‹, while such user groups focus on ›Seeds‹ and ›Jars‹ and ›Drawers‹ and ›Boxes‹ and ›Envelopes‹. So people wonder whether ghini could be adapted to their use case, or for directions on how to develop their own database.

**Does ghini need being adapted for such a seed database?**

no it doesn't need any adaptation, it's just that you need to read some of its terms differently.

the taxonomy part is just taxonomy, plant species information, no need to explain that, no way to interpret it otherwise.

›Accessions‹ and ›Plants‹, you know what an ›Accession‹ is, but since you're consistently handling ›Plants‹ still only in seed form, the Wikipedia explanation of an accession sounds like this: it is a seed or group of seeds that are of the same taxon, are of the same propagule type (or treatment), were received from the same source, were received at the same time.

If you hold seeds in jars, or in other sort of containers that is able to hold hundreds of seeds, please make sure that a jar contains seeds of just one accession, as above described: same taxon, same treatment, same source, same time.

Each one of your ›Jars‹ of seeds is in ghini speak a ›Plant‹, and the amount of seeds in the ›Jar‹ is the ›Plant‹ ›quantity‹. An ›Envelope‹ is just the same as a ›Jar‹: a

container of seeds from the same ›Accession‹, just presumably smaller.

A ›Box‹ (where you keep several ›Envelopes‹) or a ›Drawer‹ (where you keep several ›Jars‹) are in ghini speak a ›Location‹.

Since a ›Jar‹ or an ›Envelope‹ contains seeds from an ›Accession‹, you will clearly label it with its ›Accession‹ code (and trailing ›Plant‹ number). You might write the amount of seeds, too, but this would be repeating information from the database, and repeating information introduces an inconsistency risk factor.

### How do I handle receiving a batch of seeds?

**Nota:** When we receive seeds, we either collect them ourselves, or we receive it from an other seed collector. We handle receiving them possibly on the spot, or with a small delay. Even when handled together with several other batches of seeds we received, each batch keeps its individuality.

We want to be later able to find back, for example, how many seeds we still have from a specific batch, or when we last received seeds from a specific source.

As long as you put this information in the database, as long as you follow the same convention when doing so, you will be able to write and execute such queries using ghini.

One possibility, the one described here, is based on ›Notes‹. (Ghini does not, as yet, implement the concept «Acquisition». There is an issue related to the Acquisition and Donation objects, but we haven't quite formalized things yet.)

You surely already use codes to identify a batch of seeds entering the seed bank. Just copy this code in a ›Note‹, category "received", to each ›Accession‹ in the received batch. This will let you select the ›Accessions‹ by the query:

```
accession where notes[category='received'].note='<your code>
↪'
```

Use the "Source" tab if you think so, it offers space for indicating an external source, or an expedition. When receiving from an external source, you can specify the code internal to their organization. This will be useful when requesting an extra batch.

### How do I handle sending seeds?

what you physically do is to grab the desired amount of seeds of the indicated species from a jar, put it in an envelope and send it. what you do from a point of view of the database is exactly the same, but precisely described in a protocol:

- Use the database to identify the ›Jar‹ containing the desired amount of the right seeds.

- remove that amount of seeds from the ›Jar‹ (decrement the quantity),
- put the seeds in an ›Envelope‹ (yes, that's a database object).
- send the envelope (but keep it in the database).

this in short.

---

**When I send seeds, it's not just one bag, how does ghini help me keeping things together?**

There's two levels of keeping things together: one is while you're preparing the sending, and then for later reference.

While preparing the sending, we advise you use a temporary ›Tag‹ on the objects being edited.

For later reference, you will have common ›Note‹ texts, to identify received and sent batches.

---

**Can you give a complete example?**

Right. Quite fair. Let's see...

Say you were requested to deliver 50 seeds of Parnassia palustris, 30 of Gentiana pneumonanthe, 80 of Fritillaria meleagris, and 30 of Hypericum pulchrum.

**step 1**

The first step is to check the quantities you have in house, and if you do have enough, where you have them. You do this per requested species:

```
accession where species.genus.epithet=Parnassia and species.
↪epithet=palustris and sum(plants.quantity)>0
```

Expand in the results pane the ›Accession‹ from which you want to grab the seeds, so you see the corresponding ›Jars‹, highlight one, and tag it with a new ›Tag‹. To do this the first time, go through the steps, just once, of creating a new ›Tag‹. The new tag becomes the active tag, and subsequent tagging will be speedier. I would call the tag ›sending‹, but that's only for ease of exposition and further completely irrelevant.

Repeat the task for Gentiana pneumonanthe, Fritillaria meleagris, Hypericum pulchrum:

```
accession where species.genus.epithet=Gentiana and species.
↪epithet=pneumonanthe and sum(plants.quantity)>0
accession where species.genus.epithet=Fritillaria and␣
↪species.epithet=meleagris and sum(plants.quantity)>0
accession where species.genus.epithet=Hypericum and species.
↪epithet=pulchrum and sum(plants.quantity)>0
```

Again highilight the accession from which you can grab seeds, and hit Ctrl-Y (this tags the highighted row with the active tag). Don't worry if nothing seems to happen when you hit Ctrl-Y, this is a silent operation.

**step 2**

Now we prepare to go to the seeds bank, with the envelopes we want to fill.

Select the ›sending‹ ›Tag‹ from the tags menu, this will bring back in the results pane all the tagged ›Plants‹ (›Jars‹ or ›Envelopes‹), and will tell you in which ›Location‹ (›Drawer‹ or ›Box‹) they are to be found. Write this information on each of your physical envelopes. Write also the ›Species‹ name, and the quantity you can provide.

Walk now to your seeds bank and, for each of the envelopes you just prepared, open the ›Location‹, grab the ›Plant‹, extract the correct amount of seeds, put them in your physical envelope.

And back to the database!

**step 3**

If nobody used your workstation, you still have the Tag in the results pane, and it's expanded so you see all the individual plants you tagged.

One by one, you have to ›split‹ the plant. This is a standard operation that you activate by right-clicking on the plant.

A plant editor window comes in view, in "split mode".

Splitting a plant lets you create a database image of the plant group you just physically created, eg: it lets you subtract 30 items from the Gentiana pneumonanthe plant (group number one, that is the one in the jar), and create a new plant group for the same accession. A good practice would be to specify as ›Location‹ for this new plant the "out box", that is, the envelope is on its way to leave the garden.

Don't forget to delete the temporary "sending" ›Tag‹.

**step 4**

Final step, it represents the physical step of sending the envelope, possibly together with several other envelopes, in a single sending, which should have a code.

Just as you did when you received a batch of plants, you work with notes, this time the category is "sent", and the note text is whatever you normally do to identify a sending. So suppose you're doing a second sending to Pino in 2018, you add the note to each of the newly created envelopes: category "sent", text: "2018-pino-002".

When you finally do send the envelopes, these stop being part of your collection. You still want to know that they have existed, but you do not want to count them among the seeds that are available to you.

Bring back all the plants in the sending "2018-pino-002":

```
plant where notes[category='sent'].note = '2018-pino-002'
```

You now need to edit them one by one, mark the ›quantity‹ to zero, and optionally specify the reason of the change, which would be ›given away‹, and the recipient is already specified in the "sent" ›Note‹.

This last operation could be automated, we're thinking of it, it would become a script, acting on a selection. Stay tuned.

# CAPÍTULO 5

# Administração

## 5.1 Administração da base de dados

Se você estiver usando um DBMS real para manter seus dados botânicos, então você precisa fazer alguma coisa sobre administração de banco de dados. Enquanto a administração de banco de dados é muito além do escopo deste documento, fazemos nossos utilizadores cientes disso.

### 5.1.1 SQLite

SQLite não é o que se poderia considerar um SGBD: cada banco de dados do SQLite é somente um ficheiro. Faça cópias de segurança e tudo ficará bem. Se você não sabe onde procurar pelos ficheiros dos seus bancos de dados, considere que, por padrão, o Ghini coloca os seus dados no diretório `~/.bauble/`.

No Windows é em algum lugar em seu diretório `AppData`, provavelmente em `AppData\Roaming\Bauble`. Tenha em mente que o Windows faz seu melhor para esconder a estrutura de diretório `AppData` para utilizadores normais.

A maneira mais rápida para abri-lo é com o gestor de ficheiros: digite `%APPDATA%` e aperte enter.

### 5.1.2 MySQL

Please refer to the official documentation.

Backing up and restoring databases is described in breadth and depth starting at this page.

### 5.1.3 PostgreSQL

Please refer to the official documentation. A very thorough discussion of your backup options starts at chapter 24.

## 5.2 Ghini configuração

Ghini usa um ficheiro de configuração para armazenar valores através de invocações. Este ficheiro está associado a uma conta de utilizador e cada utilizador terá o seu próprio ficheiro de configuração.

Para revisar o conteúdo do ficheiro de configuração do Ghini, digite `:prefs` na área de entrada de texto onde você normalmente digite suas pesquisas, em seguida, pressione enter.

Normalmente não é necessário ajustar o ficheiro de configuração, mas você pode fazê-lo com um programa de editor de texto normal. O ficheiro de configuração Ghini está no local padrão para bancos de dados SQLite.

## 5.3 Relatando erros

Você deve observar algo inesperado no comportamento do Ghini, por favor, considere a apresentação de um problema no sitio do desenvolvimento do Ghini.

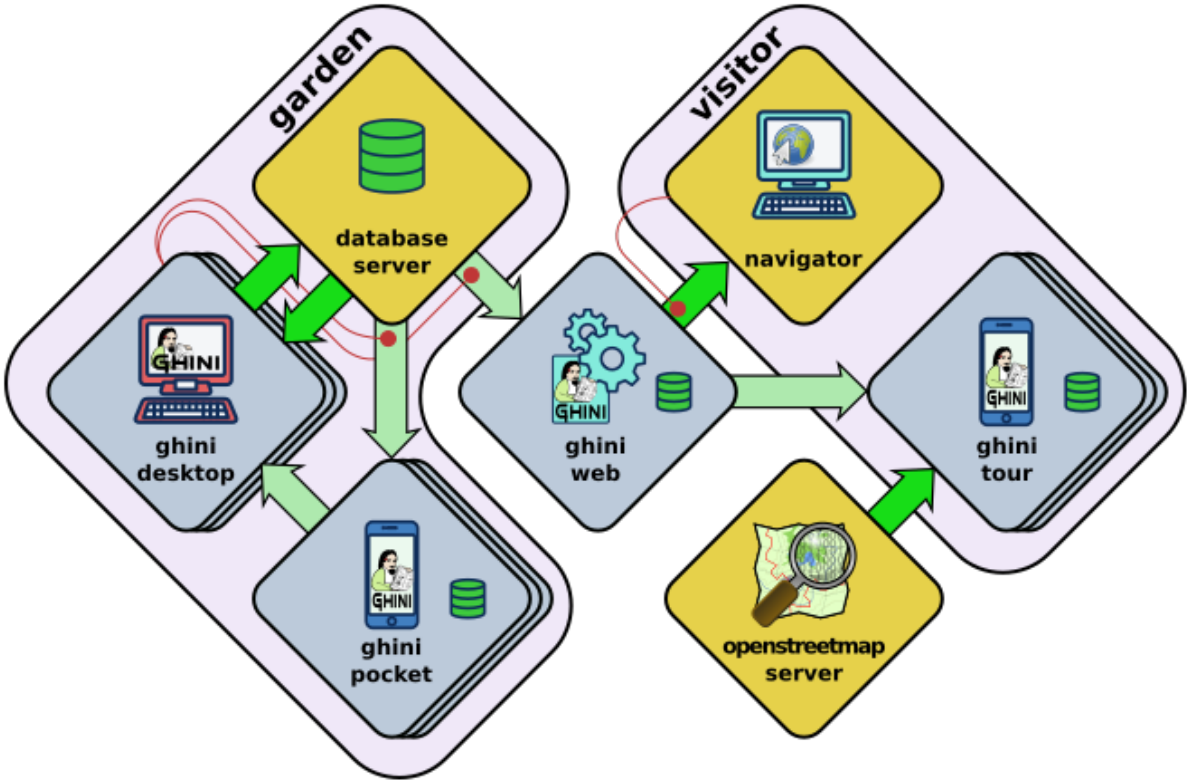
O sitio pelo desenvolvimento do Ghini pode ser acessado através do menu ajuda.

CAPÍTULO 6

# Ghini Family

## 6.1 the Ghini family

Let's start by recalling the composition of the Ghini family, as shown in the diagram:




You have learned how to use ghini.desktop, here we introduce the other members of the family, and their interaction.

### 6.1.1 ghini.pocket

ghini.pocket is an Android app which you can install from the play store. ghini.pocket is definitely the tool you will use most, next to ghini.desktop.

With ghini.pocket you always have the latest snapshot of your database with you.

Type an accession number, or scan its barcode or QR label, and you know:

- the identification of the plant,
- whether it already has pictures,
- when it entered the garden and
- from which source.

Apart as a quick data viewer, you can use ghini.pocket for...

**data correction**

If by your judgement, some of the information is incorrect, or if the plant is flowering and you want to immediately take a picture and store it in the database, you do not need take notes on paper, nor follow convolute procedures: ghini.pocket lets you write your corrections in a log file, take pictures associated to the plant, and you will import this information straight into the database, with further minimal user intervention.

**inventory review**

The initial idea on which we based ghini.pocket is still one of its functionalities: inventory review.

Using ghini.pocket, reviewing the inventory of a greenhouse, in particular if you have QR codes on plant labels, goes as fast as you can walk: simply enter the location code of your greenhouse, reset the log, then one by one scan the plant codes of the plants in the greenhouse. No further data collection action is required.

When you're done, import the log in ghini.desktop. The procedure available in ghini.desktop includes adding unknown but labelled plants in the database, marking as lost/dead all plants that the database reports as alive and present in the inventoried location, but were not found during the inventory.

**taxonomic support**

As a bonus, ghini.pocket contains a phonetic genus search, and a quite complete database of botanic taxa with rank between order and genus, including tribes, and synonymies.

check further *data streams between software components*.

### 6.1.2 ghini.web

ghini.web is a web server, written in nodejs.

Its most visible part runs at http://gardens.ghini.me and shows as a map of the world, where you browse gardens and search their published collection.

It also serves configuration data to ghini.tour instances.

check further *data streams between software components*.

### 6.1.3 ghini.tour

ghini.tour is an Android app which you can install from the play store.

People visiting your garden will install ghini.tour on their phone or tablet, enjoy having a map of the garden, knowing where they are, and will be able to listen to audio files that you have placed as virtual information panels in strategic spots in your garden.

**world view**

at startup, you see the world and gardens. select a garden, and enter.

**garden view**

when viewing at garden level, you see panels. select a panel, and listen.

check further *data streams between software components*.

### 6.1.4 data streams between software components

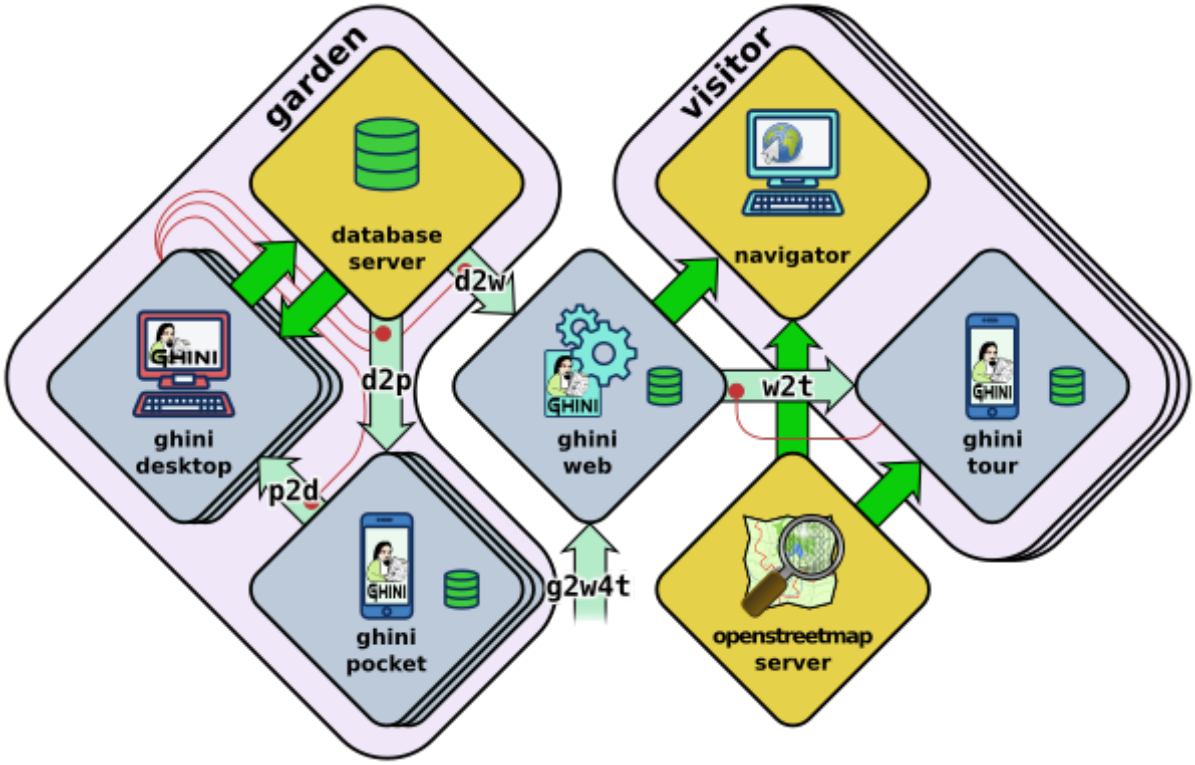
**Nota:** This section contains technical information for database managers and software developers.


In the diagram showing the composition of the Ghini family, the alert reader noticed how different arrows representing different data flows, had different colours: some are deep green, some have a lighter tint.

Deeper green streams are constant flows of data, representing the core activity of a component, eg: the interaction between ghini.desktop and its database server, or your internet browser and ghini.web.

Lighter green streams are import/export actions, initiated by the user at the command panel of ghini.desktop, or in the ghini.tour settings page.

This is the same graph, in which all import data streams have been given an identifier.




**d2p: copy a snapshot of the desktop database to ghini.pocket**

- export the desktop database to a pocket snapshot
- copy the snapshot to the handheld device

ghini.pocket integrates closely with ghini.desktop, and it's not a tool for the casual nor the external user. One task of your garden database manager is to regularly copy an updated database snapshot to your Android device.

We advise enabling USB debugging on the device. In perspective, this will allow ghini.desktop writing directily into the ghini.pocket device.

Export the file from ghini.desktop, call the file pocket.db, copy it to the phone:

```
adb -d push /tmp/pocket.db /sdcard/Android/data/me.ghini.
↪pocket/files/
```

The above location is valid even if your phone does not have a memory card.

Other options include bluetooth, or whatever other way you normally use to copy regular files into your Android device.

**p2d: import from the ghini.pocket log file and pictures into the central database**

even if we're still calling it "inventory log", ghini.pocket's log contains more than just inventory corrections.

- produce a log on the handheld device
- import the log in the desktop database

first of all, copy the collected information from ghini.pocket into your computer:

```
export DIR=/some/directory/on/your/computer
adb -d pull /sdcard/Android/data/me.ghini.pocket/files/
↪searches.txt $DIR
adb -d pull -a /sdcard/Android/data/me.ghini.pocket/files/
↪Pictures $DIR
```

then use ghini.desktop to import this information into your database.

**d2w: send a selection of your garden data to ghini.web**

Offer a selection of your garden data to a central ghini.web site, so online virtual visitors can browse it. This includes plant identification and their geographic location.

content of this flow:

- garden: coords, name, zoom level (for initial view)
- plants: coords, identification, zoom level (for visibility)
- species: binomial, phonetic approximation

**g2w: add geographic non-botanic data to ghini.web**

- Write geographic information about non-botanic data (ie: point of interest within the garden, required by ghini.tour) in the central ghini.web site.

  content of this flow:

  - virtual panels: coords, title, audio file
  - photos: coords, title, picture

  virtual panels don't necessarily have an associated photo, photos don't necessarily have an associated audio file.

---

**w2t: importing locations and POIs from ghini.web to tour**

content of this flow:

- Garden (coords, name, zoom level)
- Points of Interest (coords, title, audio file, photo)

---

# CAPÍTULO 7

# Ghini Development

## 7.1 Manual do desenvolvedor

If you ran the `devinstall` installation instructions, you have downloaded the sources, connected to the github repository. You are in the ideal situation to start looking into the software, understand how it works, contribute to ghini.desktop's development.

### 7.1.1 Helping Ghini development

Se você quiser contribuir para Ghini, você pode fazer isso de várias maneiras diferentes:

- Usar o software, observe as coisas que você não gosta, abrir uma questão para cada um deles. Um desenvolvedor irá reagir mais cedo do que imagina.
- Se você tem uma ideia de o que falta no software, mas não posso formalizar completamente em questões distintas, você poderia considerar a contratação de um profissional. Esta é a melhor maneira de fazer com que algo aconteça rapidamente na Ghini. Verifique se o desenvolvedor abre questões e publica sua contribuição no github.
- Traduzir! Qualquer ajuda com traduções serão bem-vindas, então faça-o! Você pode fazer isso sem instalar nada no seu computador, usando o serviço de tradução on-line oferecidos pela http://hosted.weblate.org/
- bifurque o repositório escolha um tema, resolva-lo, abra uma solicitação de tração. Consulte o *bug resolver o fluxo de trabalho* abaixo.

Se você ainda não instalou o Ghini e quero dar uma olhada em sua história de código, você pode abrir nossa página de projeto do github e ver tudo o que está acontecendo ao redor Ghini desde a sua criação como Bauble, volta no ano de 2004.

If you install the software according to the `devinstall` instructions, you have the whole history in your local git clone.

### 7.1.2 Fonte do software, versões, ramos

Se quiser uma versão particular do Ghini, podemos liberar e manter versões como ramos. Deve `git checkout` o ramo correspondente à versão da sua escolha.

#### linha de produção

Nomes de ramo para Ghini estável (produção) versões são do formulário `ghini-x. y` (por exemplo: ghini-1.0); nomes do ramo onde Ghini versões de teste são publicadas são da forma `ghini-x. y-dev` (por exemplo: ghini-1.0-dev).

### 7.1.3 Fluxo de trabalho de desenvolvimento

Nosso fluxo de trabalho é empenhar-se continuamente para o ramo de teste, para muitas vezes, empurrá-los para o github, deixar travis-ci e coveralls.io verificar a qualidade dos ramos testes pressionados, finalmente, de vez em quando, para mesclar o ramo de teste para a versão correspondente.

Quando se trabalha em questões maiores, que parecem demorar mais uns dias, eu poderia abrir uma filial associada à questão. Não faço isto muitas vezes.

#### questões mais importantes

Quando enfrenta uma única questão maior, criar uma marca de ramificação na ponta de uma linha de desenvolvimento principal (por exemplo: `ghini-1.0-dev`) e siga o fluxo de trabalho descrito no

https://git-scm.com/book/en/v2/Git-Branching-Basic-Branching-and-Merging

em suma

```
git up
git checkout -b issue-xxxx
git push origin issue-xxxx
```

Trabalho no ramo novo temporário. Quando estiver pronto, vá para o github, mesclar o ramo com a linha de desenvolvimento principal do qual você ramificada, resolver conflitos, sempre que necessário, apagar o ramo temporário.

Quando estiver pronto para publicação, mescle a linha de desenvolvimento em linha de produção correspondente.

### 7.1.4 Atualizando o conjunto de cadeias de caracteres traduzíveis

Por vezes, durante o processo de atualização do software, vai ser adicionando ou modificando cordas nas fontes python, na documentação, nas fontes glade. A maioria das nossas cadeias são traduzíveis e são oferecidas ao weblate para as pessoas a contribuir, sob a forma de vários ficheiros `po`.

Um "po " é principalmente composta por pares de porções de texto, original e Tradução e é específico para um idioma de destino. Quando um tradutor acrescenta uma tradução em weblate, isso atinge o nosso repositório no github. Quando um programador adiciona uma cadeia de caracteres ao software, atinge o weblate como «to ser translated».

Weblate hospeda o Ghini projeto. Dentro deste projeto temos componentes, cada uma das quais corresponde a um ramo de um repositório no github. Cada componente aceita traduções em várias línguas.

| component | repository | branch |
|---|---|---|
| Desktop 1.0 | ghini.desktop | ghini-1.0-dev |
| Desktop 3.1 | ghini.desktop | ghini-3.1-dev |
| Documentation 1.0 | ghini.desktop-docs.i18n | ghini-1.0-dev |
| Documentation 3.1 | ghini.desktop-docs.i18n | ghini-3.1-dev |
| Web 1.2 | ghini.web | master |
| Pocket | ghini.pocket | master |
| Tour | ghini.tour | master |

Para atualizar os ficheiros `po` relativo ao * software *, define o diretório de trabalho para a raiz do seu check-out de * ghini.desktop* e executar o script:

```
./scripts/i18n.sh
```

Para atualizar os ficheiros `po` relativo à * documentação *, define o diretório de trabalho para a raiz do seu check-out de *ghini.desktop-docs.i18n*, e execute o script:

```
./doc/runme.sh
```

Quando executar qualquer um dos scripts acima mencionadas, as hipóteses são de precisa cometer *todo* os ficheiros `po` no projeto. Pode querer rever as alterações antes de confirmá-las para o repositório. Isso é mais importante quando você executar uma correção marginal para uma cadeia de caracteres, como remover um erro de digitação.

Something that happens: running into a conflict. Solving conflicts is not difficult once you know how to do that. First of all, add weblate as remote:

```
git remote add weblate-doc10 https://hosted.weblate.org/git/ghini/
↪documentation-10/
```

Then make sure we are in the correct repository, on the correct branch, update the remote, merge with it:

```
git checkout ghini-1.0-dev
git remote update
git merge weblate-doc10/ghini-1.0-dev
```

Nossa documentação na readthedocs tem uma versão original em inglês e várias traduções. Basta seguir a Descrição da localização, não há nada que nós mesmos inventamos aqui.

Readthedocs verifica do projeto * idioma * configuração e invoca o `sphinx-intl` para produzir a documentação formatada na língua-alvo. Com a configuração padrão — que não alteramos — `sphinx-intl` espera um ficheiro de `po` por documento de origem, nomeado como o documento de origem, e que todos eles residem no diretório `local / $(LANG) /LC_MESSAGES/`.

Por outro lado, Weblate (nós mesmos) prefere um ficheiro único `po` por idioma e mantém-los todos no mesmo diretório `/po`, assim como fazemos para o projeto de software: `/po/$ (LANG) po`.

Em ordem para não repetir informações e deixar ambos sistemas trabalham seu caminho natural, temos dois conjuntos de links simbólicos (git homenageia-los).

Para resumir: quando um ficheiro na documentação é atualizado, o `runme.sh` script será:

1. Copie os ficheiros de `rst` do software à documentação;
2. criar um novo ficheiro de `pot` para cada um dos ficheiros de documentação;
3. mesclar todos os ficheiros `pot` num "doc.pot ";
4. usar o `doc.pot` atualizado para atualizar todos os ficheiros `doc.po` (um por idioma);
5. Crie todos os links simbólicos:
   a. aqueles esperados pelo "sphinx-intl `em` /local/$ (LANG) /LC_MESSAGES/ "
   b. aqueles usados pelo weblate em "/po/$ (LANG) po "

Definitivamente poderíamos escrever o acima num Makefile, ou melhor ainda, incluí-lo em "/doc/Makefile ". Quem sabe, talvez o faremos.

### 7.1.5 Producing the docs locally

The above description is about how we help external sites produce our documentation so that it is online for all to see. But what if you want to have the documentation locally, for example if you want to edit and review before pushing your commits to the cloud?

In order to run sphinx locally, you need to install it **within** the same virtual environment as ghini, and to install it there, you need to have a sphinx version whose dependencies don not conflict with ghini.desktop's dependecies.

What we do to keep this in order?

We state this extra dependency in the `setup.py` file, as an `extras_require` entry. Create and activate the virtual environment, then run `easy_install ghini.desktop[docs]`. This gets you the sphinx version as declared in the `setup.py` file.

If all you want is the html documentation built locally, run `./setup.py install docs`. For more options, enter the `doc` directory and run `make`.

### 7.1.6 Which way do the translated strings reach our users?

A new translator asked the question, adding: »Is this an automated process from Weblate –> GIT –> Ghini Desktop installed on users computers, or does this require manual steps?

The aswer is that the whole interaction is quite complex, and it depends on the component.

When you install `ghini.desktop` or one of the Android apps, the installation doesn't assume a specific run-time language: a user can change their language configuration any time. So what we do is to install the software in English together with a translation table from English to whatever else.

At run-time the GUI libraries (Android or GTK) know where to look for the translation strings. These translation tables are generated during the installation or upgrade process, based on the strings you see on Weblate.

The path followed by translations is: You edit strings on Weblate, Weblate keeps accumulating them until you are done, or you don't interact with Weblate for a longer while; Weblate pushes the strings to github, directly into the development line `ghini-1.0-dev`; I see them and I might blindly trust or prefer to review them, maybe I look them up in wikipedia or get them translated back to Italian, Spanish or English by some automatic translation service; sometimes I need to solve conflicts arising because of changed context, not too often fortunately. As said, this lands in the development line `ghini-1.0-dev`, which I regularly publish to the production line `ghini-1.0`, and this is the moment when the new translations finally make it to the distributed software.

Users will notice a *new version available* warning and can decide to ignore it, or to update.

For `ghini.pocket`, it is similar, but the notification is handled by the Android system. We publish on the Play Store, and depending on your settings, your phone will update the software automatically, or only notify you, or do nothing. It depends on how you configured automatic updates.

For `ghini.web`, we haven't yet defined how to distribute it.

For ghini's documentation, it's completely automatic, and all is handled by readthedocs.org.

### 7.1.7 Adicionando testes de unidade faltando

Se você está interessado em contribuir para o desenvolvimento de Ghini, uma boa maneira de fazê-lo seria nos ajudar a encontrar e escrever os testes de unidade faltando.

Uma função bem testada é aquele cujo comportamento não pode mudar sem quebrar pelo menos um teste de unidade.

Todos concordamos que em teoria teoria e prática combinam perfeitamente e que um primeiro escreve os testes, em seguida, implementa a função. Na prática, no entanto, prática não corresponde a teoria e estamos escrevendo testes depois de escrever e publicar até as funções.

Esta secção descreve o processo de adição de testes unitários para "bauble.plugins.plants.family.remove_callback ".

### O que testar

Primeiro de tudo, abra o índice do relatório de cobertura e escolher um ficheiro com baixa cobertura.

Para este exemplo, execute em outubro de 2015, pousamos na "bauble.plugins.plants.family ", em 33%.

https://coveralls.io/builds/3741152/source?filename=bauble%2Fplugins%2Fplants%2Ffamily.py

As duas primeiras funções que precisam de testes, `edit_callback` e `add_genera_callback`, incluem a criação e ativação de um objeto depender de uma caixa de diálogo personalizada. Nós deveríamos realmente primeiro escrever testes de unidade para essa classe, depois volte aqui.

A função seguinte, `remove_callback`, também ativa um par de caixas de diálogo e mensagem, mas sob a forma de chamar uma função, solicitando a entrada do utilizador através de caixas de Sim-não-okey. Essas funções podemos facilmente substituir com uma função de gozar com o comportamento.

### Funcionamento

Então, tendo decidido o que descrevem no teste de unidade, olhamos para o código e vemos que é necessário discriminar alguns casos:

**parâmetro correção**

- a lista das famílias não tem nenhum elemento.
- a lista das famílias tem mais de um elemento.
- a lista das famílias tem exatamente um elemento.

**cascade**

- a família não tem nenhum gêneros
- a família tem um ou mais gêneros

**confirm**

- o utilizador confirma a exclusão
- o utilizador não confirma a exclusão

**deleting**

- Tudo vai bem quando a exclusão da família
- Há algum erro ao excluir a família

Eu decido só incidirá sobre o **cascata** e o **confirmar** aspectos. Duas perguntas binárias: 4 casos.

### onde colocar os testes

Localize o script de teste e escolher a classe onde colocar os testes de unidade extra.

https://coveralls.io/builds/3741152/source?filename=bauble%2Fplugins%2Fplants%2Ftest.py#L273

---

**what about skipped tests**

Classe `FamilyTests` contém um teste saltado, implementá-lo vai ser um pouco de trabalho porque precisamos reescrever a FamilyEditorPresenter, separá-lo do FamilyEditorView e reconsiderar o que fazer com a classe FamilyEditor, que eu acho que deve ser removido e substituído com uma única função.

---

### escrevendo os testes

Após o último teste na classe FamilyTests, adicionar os quatro casos que quero descrever, e garantir que eles falham, e desde que eu sou preguiçoso, eu escrevo o código mais compacto sei para gerar um erro:

```
def test_remove_callback_no_genera_no_confirm(self):
    1/0

def test_remove_callback_no_genera_confirm(self):
    1/0

def test_remove_callback_with_genera_no_confirm(self):
    1/0

def test_remove_callback_with_genera_confirm(self):
    1/0
```

### Um teste, passo a passo

Vamos começar com o primeiro caso de teste.

Ao escrever testes, eu geralmente seguem o padrão:

- $T_0$ (condição inicial),
- action,
- $T_1$ (testar o resultado da ação dada as condições iniciais)

---

**what's in a name — unit tests**

> Há uma razão por que testes de unidade são chamados de testes de unidade. Por favor, nunca teste duas ações num teste.

Então, vamos descrever $T_0$ para o primeiro teste, um banco de dados mantém uma família sem gêneros:

```
def test_remove_callback_no_genera_no_confirm(self):
    f5 = Family(family=u'Arecaceae')
    self.session.add(f5)
    self.session.flush()
```

Não queremos a função que está a ser testada para invocar a função interativa "utils.yes_no_dialog ", queremos `remove_callback` para invocar uma função de substituição não-interativo. Conseguimos isso simplesmente por fazer ponto `utils.yes_no_dialog` para uma expressão de `lambda` que, assim como a função original e interativa, aceita um parâmetro e retorna um valor booleano. Neste caso: `falso`:

```
def test_remove_callback_no_genera_no_confirm(self):
    # T_0
    f5 = Family(family=u'Arecaceae')
    self.session.add(f5)
    self.session.flush()

    # action
    utils.yes_no_dialog = lambda x: False
    from bauble.plugins.plants.family import remove_callback
    remove_callback(f5)
```

Em seguida, testamos o resultado.

Bem, não só queremos testar ou não o objeto Arecaceae foi apagado também devemos testar o valor retornado por "remove_callback ", e se `yes_no_dialog` e `message_details_dialog` foram invocados ou não.

Uma expressão de `lambda` não é suficiente para isso. Fazemos algo aparentemente mais complexo, o que tornará a vida mais fácil.

Vamos primeiro definir uma função bastante genérica:

```
def mockfunc(msg=None, name=None, caller=None, result=None):
    caller.invoked.append((name, msg))
    return result
```

e vamos comer `parcial` do `functools` módulo padrão, parcialmente aplicar o acima `mockfunc`, deixando apenas `msg` não for especificado, e usar esta aplicação parcial, que é uma função que aceita um parâmetro e retornar um valor, para substituir as duas funções no "utils ". A função de teste agora se parece com isto:

```
def test_remove_callback_no_genera_no_confirm(self):
    # T_0
```

(continues on next page)

(continuação da página anterior)

```
    f5 = Family(family=u'Arecaceae')
    self.session.add(f5)
    self.session.flush()
    self.invoked = []

    # action
    utils.yes_no_dialog = partial(
        mockfunc, name='yes_no_dialog', caller=self, result=False)
    utils.message_details_dialog = partial(
        mockfunc, name='message_details_dialog', caller=self)
    from bauble.plugins.plants.family import remove_callback
    result = remove_callback([f5])
    self.session.flush()
```

A secção de teste verifica que `message_details_dialog` não foi invocado, que foi chamado `yes_no_dialog`, com o parâmetro mensagem correta, que Arecaceae ainda está lá:

```
# effect
self.assertFalse('message_details_dialog' in
                 [f for (f, m) in self.invoked])
self.assertTrue(('yes_no_dialog', u'Are you sure you want to '
                 'remove the family <i>Arecaceae</i>?')
                in self.invoked)
self.assertEquals(result, None)
q = self.session.query(Family).filter_by(family=u"Arecaceae")
matching = q.all()
self.assertEquals(matching, [f5])
```

### E assim por diante.

> "há dois tipos de pessoas, aqueles que completam o que começam e assim por diante"

Próximo teste é quase o mesmo, com a diferença que o `utils.yes_no_dialog` deve retornar `True` (isto conseguirmos especificando `resultado = True` na aplicação parcial do generic `mockfunc`).

Com esta ação, o valor retornado por `remove_callback` deve ser `True`, e não deve haver nenhuma família Arecaceae no banco de dados mais:

```
def test_remove_callback_no_genera_confirm(self):
    # T_0
    f5 = Family(family=u'Arecaceae')
    self.session.add(f5)
    self.session.flush()
    self.invoked = []

    # action
```

(continues on next page)

(continuação da página anterior)

```
    utils.yes_no_dialog = partial(
        mockfunc, name='yes_no_dialog', caller=self, result=True)
    utils.message_details_dialog = partial(
        mockfunc, name='message_details_dialog', caller=self)
    from bauble.plugins.plants.family import remove_callback
    result = remove_callback([f5])
    self.session.flush()

    # effect
    self.assertFalse('message_details_dialog' in
                     [f for (f, m) in self.invoked])
    self.assertTrue(('yes_no_dialog', u'Are you sure you want to '
                     'remove the family <i>Arecaceae</i>?')
                    in self.invoked)
    self.assertEquals(result, True)
    q = self.session.query(Family).filter_by(family=u"Arecaceae")
    matching = q.all()
    self.assertEquals(matching, [])
```

Dê uma olhada no 734f5bb9feffc2f4bd22578fcee1802c8682ca83 de confirmação para as outras duas funções de teste.

### Log de teste

Nossos objetos de `bauble.test.BaubleTestCase` usam manipuladores de classe `bauble.test.MockLoggingHandler`. Cada vez que um teste de unidade individual é iniciado, o método `setUp` irá criar um manipulador de novo e associá-lo para o agente de log de raiz. O método `tearDown` se encarrega de removê-lo.

Você pode verificar a presença de mensagens de log específico em "self.handler.messages ". `mensagens` são um dicionário, inicialmente vazio, com dois níveis de indexação. Primeiro o nome do agente de log emitir o registro registro, então o nome do nível do registro de log. As chaves são criadas quando necessário. Valores de manter listas de mensagens, formatadas de acordo com o formatador você associar ao manipulador, padronizando a `log.Formatter("%(message)s")`.

Você explicitamente pode esvaziar as mensagens coletadas invocando `self.handler.clear()`.

### Resumindo tudo

De vez em quando você deseja ativar a classe de teste que você está trabalhando no:

```
nosetests bauble/plugins/plants/test.py:FamilyTests
```

E no final do processo que você deseja atualizar as estatísticas:

```
./scripts/update-coverage.sh
```

### 7.1.8 Estrutura da interface de utilizador

A interface do utilizador é construída de acordo com o **modelo** — * * vista * * — **apresentador** padrão arquitetural. Para grande parte da interface, **modelo** é um objeto de banco de dados do SQLAlchemy, mas também temos elementos de interface onde não há nenhum modelo de banco de dados correspondente. Em geral:

- O **vista** é descrita como parte de um ficheiro **glade**. Isto deve incluir a chamada de retorno do sinal e associações ListStore-TreeView. Só reutilize a classe base `GenericEditorView` definido em "bauble.editor ". Quando você criar a instância dessa classe genérica, passe-lo o nome do ficheiro **glade** e o nome do elemento raiz, então entregue essa instância para o construtor **presenter**.

  No ficheiro glade, na secção `ação-widgets` fechando a sua descrição de objeto GtkDialog, certifique-se de que cada elemento de `ação-widget` tem um valor válido "resposta ". Uso valores válidos de GtkResponseType, por exemplo:

  - GTK_RESPONSE_OK, -5
  - GTK_RESPONSE_CANCEL, -6
  - GTK_RESPONSE_YES, -8
  - GTK_RESPONSE_NO, -9

  Não há nenhuma maneira fácil de teste de unidade «subclasse» um modo de exibição, então por favor não vistas de subclasse, não há realmente nenhuma necessidade de.

  No ficheiro glade, cada entrada widget deve definir qual manipulador é ativado na qual sinal. Classe genérica do apresentador oferece retornos de chamada genéricos que cobrem os casos mais comuns.

  - GtkEntry (entrada de texto de uma linha) irá lidar com o sinal `changed`, com `on_text_entry_changed` ou `on_unique_text_entry_changed`.
  - GtkTextView: associá-la a um GtkTextBuffer. Para lidar com o sinal `changed` sobre o GtkTextBuffer, nós temos que definir um manipulador que invoca o genérico `on_textbuffer_changed`, a única função para esta função é para transmitir nosso manipulador genérico o nome do atributo de modelo que recebe o troco. Este é um workaroud para um bug não resolvido em GTK.
  - GtkComboBox com textos traduzidos não pode ser facilmente manipulado do ficheiro glade, então nós nem tente. Use o método `init_translatable_combo` da classe genérica `GenericEditorView`, mas por favor, invocá-lo do * *. * * apresentador.

- O **modelo** é só um objeto com atributos. Nessa interação, o **modelo** é apenas um contentor de dados passivo, ele não faz nada mais do que deixar a **apresentador** modificá-lo.
- O que foi feito subclassing **apresentador** define e implementa:

- "widget_to_field_map ", um dicionário associando nomes de widget para nome de atributos do modelo,
- "view_accept_buttons ", a lista de nomes de widget que, se ativado pelo utilizador, significa que o modo de exibição deve ser fechado,
- Tudo o que precisava de retornos de chamada,
- Opcionalmente, ele joga o papel de **modelo**, também.

O **apresentador** atualiza continuamente o **modelo** de acordo com as mudanças na **vista**. Se o **modelo** corresponde a um objeto de banco de dados, o **apresentador** confirma tudo **modelo** atualizações no banco de dados quando o **vista** é encerrada com êxito, ou reverte-los se o **vista** é cancelada. (este comportamento é influenciado pelo parâmetro `do_commit`)

Se o **modelo** é outra coisa, então o **apresentador** vai fazer outra coisa.

---

**Nota:** Um bem-comportado **apresentador** usa a **vista** api para consultar os valores inseridos pelo utilizador ou forçosamente definir estados do widget. Por favor, não aprenda com a prática dos nossos apresentadores de comportamento inadequados, alguns dos quais diretamente manipular campos de "view.widgets ". Ao fazer isso, esses apresentadores nos impede de escrever testes de unidade.

---

A classe base para o apresentador, `GenericEditorPresenter` definido em "bauble.editor ", implementa muitos retornos de chamada genéricos úteis. Há uma classe de `MockView`, que você pode usar ao escrever testes para seus apresentadores.

#### Examples

`Contato` e `ContactPresenter` são implementados seguindo as linhas acima. A exibição é definida no ficheiro `contact.glade`.

Um bom exemplo de padrão de exibição do apresentador (sem modelo) é dado pelo gestor de conexões.

Nós usamos o mesmo padrão arquitetônico para a interação não-banco de dados, definindo o apresentador também como modelo. Fazemos isto, por exemplo, para a caixa de diálogo de exportação JSON. O comando a seguir lhe dará uma lista de instanciações de `GenericEditorView`:

```
grep -nHr -e GenericEditorView\( bauble
```

### 7.1.9 Estendendo Ghini com Plugins

Nearly everything about Ghini is extensible through plugins. Plugins can create tables, define custom searchs, add menu items, create custom commands and more.

Para criar um novo plugin, você deve estender a classe `bauble.pluginmgr.Plugin`.

O plugin `Tag` é um bom exemplo de mínimo, mesmo que o `TagItemGUI` cai fora o padrão arquitetural Model-View-Presenter.

### 7.1.10 Estrutura de plugins

Ghini é um framework para a manipulação de coleções e é distribuído juntamente com um conjunto de plugins fazendo Ghini um gestor de colecções botânicas. Mas Ghini fica um quadro e você poderia em teoria remova todos os plugins vamos distribuir e escrever seus próprios, ou escrever seus próprios plugins que estender ou completar o actual comportamento Ghini.

Uma vez que você selecionou e abriu uma conexão de banco de dados, você pousar na janela de pesquisa. A janela de busca é uma interação entre dois objetos: SearchPresenter (SP) e SearchView (SV).

SV é o que vê, SP detém o estado de programa e manipula as solicitações que expressa através de SV. Manipulando essas solicitações afetam o conteúdo de SV e o estado de programa em SP.

Resultados da pesquisa aparece na parte maior do SV são linhas, objetos que são instâncias de classes registados num plugin.

Cada uma dessas classes deve implementar uma quantidade de funções para comportar-se adequadamente no âmbito Ghini. O quadro Ghini reserva espaço para classes conectáveis.

SP sabe de todas as classes registadas (conectadas em), eles são armazenados num dicionário, associando uma classe para implementação dele do plugin. SV tem um slot (um gtk. Caixa) onde pode adicionar elementos. A qualquer hora, no máximo apenas um elemento na ranhura é visível.

Um plugin define uma ou mais classes de plugin. Um plugin de classe desempenha o papel de um apresentador parcial (pP - plugin apresentador) como ele implementar os retornos de chamada necessários pela exibição parcial do associado encaixe na ranhura (pV - plugin vista), e o padrão MVP é completado pelo apresentador pai (SP), mais uma vez atuando como modelo. Para resumir e concluir:

- SP atua como modelo,
- a exibição parcial do pV é definida num ficheiro glade.
- os retornos de chamada implementados pelo pP são referenciados pelo ficheiro glade.
- um menu de contexto para a linha de SP,
- uma propriedade de crianças.

Quando você registra uma classe de plugin, o SP:

- Adiciona o pV no slot e o torna não-visíveis.
- Adiciona uma instância de pP nas classes plugin registrado.
- diz a pP que o SP é o modelo.
- conecta todos os retornos de chamada de pV para pP.

Quando um elemento em pV desencadeia uma ação em pP, pP pode encaminhar a ação para SP e pode solicitar SP que atualiza o modelo e atualiza a exibição.

Quando o utilizador seleciona uma linha em SP, SP esconde tudo na ranhura conectável mostra apenas o único pV em relação o tipo da linha selecionada e pede o pP para atualizar o pV com tudo o que é relativo a linha selecionada.

Além de definir a visibilidade de vários pV, nada precisa ser desativado ou removido: um pV invisível não pode disparar eventos!

### 7.1.11 Bug, solução de fluxo de trabalho

#### fluxo de trabalho de desenvolvimento normal

- ao usar o software, você notar um problema, ou você ter uma ideia de algo que poderia ser melhor, pensa nisso bom o suficiente para se ter uma ideia muito clara do que realmente é, que você notou. Você abre uma questão e descreve o problema. Alguém pode reagir com dicas.
- Você abre o site de problemas e escolher que quer combater.
- Atribua o problema a mesmo, desta forma que você está informando ao mundo que você tem a intenção de trabalhar nisto. Alguém pode reagir com dicas.
- bifurque, opcionalmente, o repositório na sua conta e de preferência, criar uma ramificação, claramente associada à questão.
- escrever testes de unidade e comprometê-los com sua filial (por favor, não empurre na ausência de testes de unidade para o github, executar `nosetests` localmente primeiro).
- escrever testes de unidade mais (idealmente, os testes de formam a descrição completa do recurso estiver adicionando ou corrigindo).
- Certifica-se de que o recurso que você está adicionando ou corrigindo é realmente completamente descrito pelos testes de unidade que você escreveu.
- Certifique-se que os testes unitários são atômicos, ou seja, que testar variações sobre alterações ao longo de uma única variável. Não dê entrada complexa para testes de unidade ou testes que não cabem num único ecrã (25 linhas de código).
- Escreva o código que faz com que seus testes bem sucedidos.
- Atualize os ficheiros de i18n (executados `./scripts/i18n.sh`).
- sempre que possível, traduza as novas cadeias de caracteres que põe em ficheiros de código ou glade.
- Quando você alterar a cadeia de caracteres, por favor, certifique-se de que antigas traduções me re-acostumar.
- Confirme as alterações.
- Empurre para o github.
- Abra uma solicitação de tração.

#### publicação a produção

please use the `publish.sh` script, in the `scritps` directory. This one takes care of every single step, and produces recognizable commit comments, it publishes the release on pypi, and in perspective it will contain all steps for producing a `deb` file, and a windows executable.

you can also do this by hand:

- Abra o puxar solicitação página usando como base uma linha de produção "ghini-x. y ", em relação ao "ghini-x. y-dev ".
- Certifique-se de que um commit `galo` está incluído nas diferenças.
- é possível mesclar automaticamente os ramos.
- criar a nova solicitação de tração, chamá-lo como «publicar para a linha de produção».
- você possivelmente precisar esperar por travis-ci executar as verificações.
- Mescle as alterações.

don't forget to tell the world about the new release: on facebook, the google group, in any relevant linkedin group, and on our web page.

#### your own fork

If you want to keep your own fork of the project, keep in mind this is full force work in progress, so staying up to date will require some effort from your side.

The best way to keep your own fork is to focus on some specific issue, work relatively quickly, often open pull requests for your work, make sure that you get it accepted. Just follow Ghini's coding style, write unit tests, concise and abundant, and there should be no problem in having your work included in Ghini's upstream.

If your fork got out of sync with Ghini's upstream: read, understand, follow the github guides configuring a remote for a fork and syncing a fork.

#### Encerramento

- Examine este fluxo de trabalho. Considere isto como uma diretriz, a mesmo e aos seus colegas. por favor ajude a torná-lo melhor e a prática de correspondência.

### 7.1.12 Distributing ghini.desktop

#### Python Package Index - PyPI

This is not much mentioned, but we keep ghini.desktop on the Python Package Index, so you could install it by no more than:

```
pip install ghini.desktop
```

There are a couple packages that can't be installed with `pip`, but otherwise that's really all you need to type, and it's platform independent.

Publishing on PyPI is a standard `setup` command:

```
python setup.py sdist --formats zip upload -r pypi
```

### Windows

For building a Windows installer or executable you need a running Windows system. The methods described here has been used successfully on Windows 7, 8 and 10. Windows Vista should also work but has not been tested.

If you are on GNU/Linux, or on OSX, you are not interested in the remainder of this section. None of Ghini's contributors knows how to produce a Windows installer without having a Windows system.

The goal of the present instructions is to help you produce a Windows installer, that is a single executable that you can run on any Windows workstation and that will install a specific version of ghini.desktop. This is achieved with the NSIS script-driven installer authoring tool.

As a side product of the installer production, you will have a massive but relocatable directory, which you can copy to a USB drive and which will let you use the software without needing an installation.

The files and directories relevant to this section:

- `scripts/build-win.bat` — the single batch script to run.
- `setup.py` — implements the NSIS and py2exe commands.
- `scripts/build-multiuser.nsi` — the nsis script, used by the above.
- `nsis/` — contains redistributable NSIS files, put here for conveniency.
- `ghini-runtime/` — built by `py2exe`, used by `nsis`.
- `dist/` — receives the executable installation file.

Most steps are automated in the `build-win.bat` script. Installation of a few tools needs to be done manually:

1. Download and install Git, Python 2.7 and PyGTK.

   This is outlined in the `devinstall`-based installation instructions.

2. Download and install NSIS v3.

3. A **reboot** is recommended.

4. Clone the ghini.desktop repository.

   Use your own fork if you plan contributing patches, or the organization's repository `https://github.com/Ghini/ghini.desktop.git` if you only wish to follow development.

Clone the repository from GitHub to wherever you want to keep it, and checkout a branch. Replace `<path-to-keep-ghini>` with the path of your choice, e.g. `Local\github\Ghini\`. Production branch `ghini-1.0` is recommended as used in the example.

To do this, open a command prompt and type these commands:

```
cd <path-to-keep-ghini>
git clone <ghini.desktop repository URL>
cd ghini.desktop
git checkout ghini-1.0
```

The result of the above is a complete development environment, on Windows, with NSIS. Use it to follow development, or to propose your pull requests, and to build Windows installers.

All subsequent steps are automated in the `scripts\build_win.bat` script. Run it, and after a couple of minutes you should have a new `dist\ghini.desktop-<version>-setup.exe` file, and a working, complete relocatable directory named `ghini-runtime`.

Read the rest if you need details about the way the script works.

---

**The `build_win.bat` script**

A batch file is available that can complete the last few steps. To use it use this command:

```
scripts\build_win.bat
```

`build_win.bat` accepts 2 arguments:

1. `/e` — executable only.

   Produce an executable only, skipping the extra step of building an installer, and will copy `win_gtk.bat` into place.

2. `venv_path` — A path to the location for the virtual environment to use.

   Defaults to `"%HOMEDRIVE%%HOMEPATH%"\.virtualenvs\%CHECKOUT%-exe`, where `CHECKOUT` corresponds to the name of the branch you checked out.

If you want to produce an executable only and use a virtual environment in a folder beside where you have ghini.desktop, you could execute `scripts\build_win.bat /e ..\ghi2exe`

---

**py2exe will not work with eggs**

Building a Windows executable with py2exe requires packages **not** be installed as eggs. There are several methods to accomplish this, including:

- Install using `pip`. The easiest method is to install into a virtual environment that doesn't currently have any modules installed as eggs using `pip install .` as described below. If you do wish to install over the top of an install with eggs (e.g. the environment created by `devinstall.bat`) you can try `pip install -I .` but your mileage may vary.
- By adding:

  ```
  [easy_install]
  zip_ok = False
  ```

  to setup.cfg (or similarly `zip_safe = False` to `setuptools.setup()` in `setup.py`) you can use `python setup.py install` but you will need to download and install Microsoft Visual C++ Compiler for Python 2.7 to get any of the C extensions and will need a fresh virtual environment with no dependent packages installed as eggs.

The included `build-win` script uses the `pip` method.

**installing virtualenv and working with environments**

Install virtualenv, create a virtual environment and activate it.

With only Python 2.7 on your system (where `<path-to-venv>` is the path to where you wish to keep the virtual environment) use:

```
pip install virtualenv
virtualenv --system-site-packages <path-to-venv>
call <path-to-venv>\Scripts\activate.bat
```

On systems where Python 3 is also installed you may need to either call pip and virtualenv with absolute paths, e.g. `C:\Python27\Scripts\pip` or use the Python launcher e.g. `py -2.7 -m pip` (run `python --version` first to check. If you get anything other than version 2.7 you'll need to use one of these methods.)

**Populate the virtual environment**

Install dependencies and ghini.desktop into the virtual environment:

```
pip install psycopg2 Pygments py2exe_py2
pip install .
```

**Compile for Windows**

Build the executable:

```
python setup.py py2exe
```

The `ghini-runtime` folder will now contain a full working copy of the software in a frozen, self contained state.

This folder is what is packaged by NSIS.

This same folder can also be transferred however you like and will work in place. (e.g. placed on a USB flash drive for demonstration purposes or copied manually to `C:\Program Files` with a shortcut created on the desktop). To start ghini.desktop double click `ghini.exe` in explorer (or create a shortcut to it).

**Fixing paths to GTK components.**

If you run the relocatable compiled program, unpackaged, you might occasionally have trouble with the GUI not displaying correctly.

Should this happen, you need to set up paths to the GTK components correctly. You can do this by running the `win_gtk.bat`, from the `ghini-runtime` folder.

You will only need to run this once each time the location of the folder changes. Thereafter `ghini.exe` will run as expected.

**Finally, invoke NSIS**

Build the installer:

```
python setup.py nsis
```

This should leave a file named `ghini.desktop-<version>-setup.exe` in the `dist` folder. This is your Windows installer.

**about the installer**

- Capable of single user or global installs.
- At this point in time ghini.desktop installed this way will not check or or notify you of any updated version. You will need to check yourself.
- Capable of downloading and installing optional extra components:
  - Apache FOP - If you want to use xslt report templates install FOP. FOP requires Java Runtime. If you do not currently have it installed the installer will let you know and offer to open the Oracle web site for you to download and install it from.
  - MS Visual C runtime - You most likely don't need this but if you have any trouble getting ghini.desktop to run try installing the MS Visual C runtime (e.g. rerun the installer and select this component only).

- Can be run silently from the commandline (e.g. for remote deployment) with the following arguments:
  - `/S` for silent;
  - `/AllUser` (when run as administrator) or `/CurrentUser`
  - `/C=[gFC]` to specify components where:

    `g` = Deselect the main ghini.desktop component (useful for adding optional component after an initial install)

    `F` = select Apache FOP

    `C` = select MS Visual C runtime

---

### Debian

Between 2009 and 2010 someone packaged the then already obsolete Bauble 0.9.7 for Debian, and the package was included in Ubuntu. That version is still being distributed, regardless being it impossible to install.

Only recently has Mario Frasca produced a new bauble debian package, for the latest bauble.classic version 1.0.56, and proposed for inclusion in Debian. View it on mentors. This version depends on `fibra`, a package that was never added to Debian and which Mario also has packaged and proposed for inclusion in Debian. Mario has been trying to activate some Debian Developer, to take action. There's not much more we can do, other than wait for a sponsor, and hoping the package will eventually get all the way to Ubuntu.

Once we get in contact with a Debian Sponsor who will review what we publish on mentors, then we will be definitely expected to keep updating the debian package for `ghini.desktop` and `fibra`.

I am not going to explain in a few words the content of several books on Debian packaging. Please choose your sources. For a very compact idea of what you're expected to do, have a look at `scripts/pubish.sh`.

## 7.2 Cartas-modelo

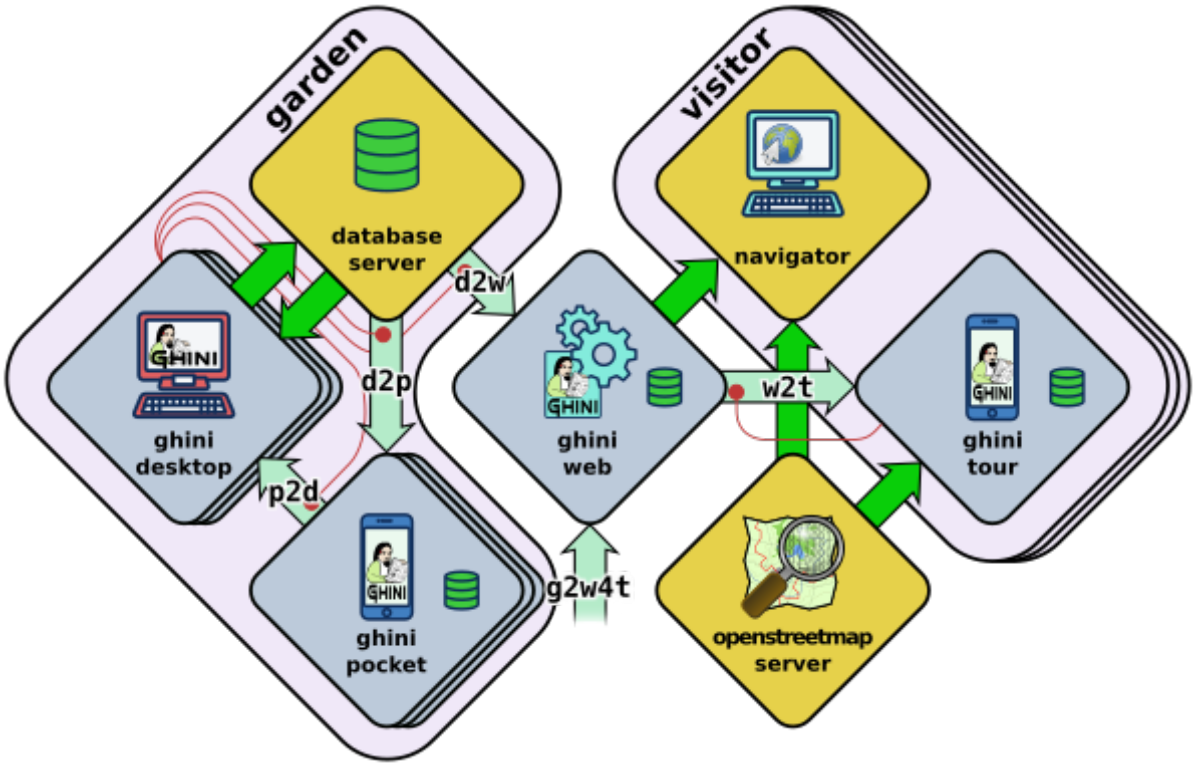
O leitor chegando a esse ponto na documentação provavelmente entendeu que o projeto Ghini é, acima de tudo, um projeto muito aberto e colaborativo.

Aqui nesta página encontra algumas cartas modelo, usadas para dar as boas-vindas a novos utilizadores, carts que pode corrigir, imprimir e ir com elas para um jardim, e propor a adoção do Ghini, ou compartilhar com um grupo dos seus amigos locais, para você poder fazer Ghini se torne um trabalho (voluntário, ou pago) em tempo parcial para você.

### 7.2.1 Dear conservator or scientist,

You are reading Ghini's presentation letter. Ghini is a libre software project on GitHub, focusing on botany. Brought to you by a small community of coders, botanists, translators, and supported by a few institutions around the world, among which, gardens that have adopted it for all their collection management needs.

The Ghini family is a software suite composed of standalone programs, data servers and handheld clients, for data management, and publication:




- Ghini's core, `ghini.desktop`, lets you
  - enter and correct your data
  - navigate its links,
  - produce reports
  - import and or export using several standard or ad-hoc formats
  - review your taxonomy using online sources

  all according best practices suggested by top gardens, formalized in standard formats like ABCD, ITF2, but also as elaborated by our developers, based on the feedback of Ghini users.

  `ghini.desktop` is developed and continously tested on GNU/Linux, but runs equally well on Windows, or OSX. [1]

- `ghini.pocket` is your full time garden companion, an Android app installed from the Play Store,
  - assisting you in collecting or correcting data while in the field,

  - associate pictures to your plants, and verify taxonomic information.
  - Import your collected data into the desktop client when back in the office,

  `ghini.pocket` reduces the time spent in front of your desktop PC to a true minimum.

- `ghini.web` is a web server and a courtesy data hub service, offering you world wide visibility: Export a selection of your data from your desktop database, and handle it for publication to the Ghini project, and we will include it at http://gardens.ghini.me/, at no cost while we're able to do that, or for a guaranteed minimal amount of time if you are able to support our hosting costs. `ghini.web` serves a world map to help locate participating gardens, and within each garden, its contributed georeferenced plants.
- `ghini.tour`, a geographic tour Android app aimed at visitors, using OpenStreetMap as a base map, retrieving its data, gardens and virtual panels, from the web data aggregator `ghini.web`.

All software within the Ghini family is either licensed GNU Public License v2+ or v3+. It is a strong copyleft license. In short, the GPL translates the ethical scientific need to share knowledge, into legal terms. If you want to read more about it, please refer to https://www.gnu.org/licenses/copyleft.html

Ghini's idea about knowledge and software ownership is that software is procedural knowledge and as such, should be made a «commons»: With software as a commons, «libre software» and more specifically «Copylefted software», you not only get the source code, you receive the right to adapt it, and the invitation to study and learn from it, and to share it, both share forward to colleagues, and share back to the source. With proprietary software, you are buying your own ignorance, and with that, your dependency.

This fancy term «copyleft» instead of just «libre software», means the software you received is libre software with one extra freedom, guaranteeing every right you were granted upon receiving the software is never lost.

With copylefted software you are free —actually welcome— to employ local software developers in your neighbourhood to alter the software according to your needs, please do this on GitHub, fork the code, develop just as openly as the common practice within Ghini, and whenever you want, open a pull request so your edits can be considered for inclusion in the main branch. Ghini is mostly continuously unit tested, so before your code is added to the main branch, it should follow our quality guidelines for contributions. With libre software you acquire freedom and contribute to it, something that earns you visibility: Your additions stays yours, you share them back to the community, and will see them completed and made better by others. Having your code added to the main branch simplifies your upgrade procedure.

You can also contribute to the software by helping translate it into your native language. [5]

Some videos are published on YouTube, highlighting some of the software capabilities. [6]

Share back with the community. Several developers have spent cumulatively many thousand hours developing this software, and we're sharing with the community. We hope by this to stimulate a community sentiment in whoever starts using what we have produced.

Thanks for your consideration; please let me know if you have any questions,

In case you're interested in publishing your tree collection on the net, I would be happy to

include your plants, species, coordinates to http://gardens.ghini.me. Georeferenced textual information panels are also very welcome, all offered as a courtesy: We're still defining the offer. The idea behind this is allowing visitors to explore aggregated garden collections, and the current focus is on trees.

A small example: http://gardens.ghini.me/#garden=Jardín%20el%20Cuchubo

Mario Frasca MSc

[1] http://ghini.readthedocs.io/ - http://ghini.github.io/
[2] https://play.google.com/store/apps/details?id=me.ghini.pocket
[3] http://gardens.ghini.me/
[4] https://play.google.com/store/apps/details?id=me.ghini.tour
[5] https://hosted.weblate.org/projects/ghini/#languages
[6] https://www.youtube.com/playlist?list=PLtYRCnAxpinU_8WEDuRlgsYnNVe4J_4kv

### 7.2.2 free botanic data management systems

Many institutions still consider software an investment, an asset that is not to be shared with others, as if it was some economic good that can't be duplicated, like gold.

As of right now, very few copylefted programs exist for botanic data management:

- `ghini.desktop`, born as `bauble.classic` and made a commons by the Belize Botanical Garden. `ghini.desktop` has three more components, a pocket data collecting Android app, a Node.js web server, aggregating data from different gardens and presenting it geographically, again a geographic tour app aimed at visitors using the web data aggregator as its data source. You can find every Ghini component on GitHub: http://github.com/Ghini
- Specify 6 and 7, made a Commons by the Kansas University. A bit complex to set up, very difficult to configure and tricky to update. The institutions I've met who tried it, only the bigger ones, with in-house software management capabilities manage to successfully use it. They use it for very large collections. Specify is extremely generic, it adapts to herbaria, seed collections, but also to collections of eggs, organic material, fossils, preserved dead animals, possibly even viruses, I'm not sure. It is this extreme flexibility that makes its configuration such a complex task. Specify is also on GitHub: https://github.com/specify and is licensed as GPLv2+.
- Botalista, a French/Swiss cooperation, is GPL as far as rumours go. Its development has yet to go public.
- `bauble.web` is an experimental web server by the author of `bauble.classic`. `bauble.classic` has been included into Ghini, to become `ghini.desktop`. Bauble uses a very permissive license, making it libre, but not copylefted. As much as 50% of bauble.web and possibly 30% of ghini.desktop is shared between the two projects. Bauble seems to be stagnating, and has not yet reached a production-ready stage.

- `Taxasoft-BG`, by Eric Gouda, a Dutch botanist, specialist in Bromeliaceae, collection manager at the Utrecht botanical garden. It was Mario Frasca who convinced Eric to publish what he was doing, licensing it under the GPL, but the repository was not updated after 2016, April 13th and Eric forgot to explicitly specify the license. You find it on github: https://github.com/Ejgouda/Taxasoft-BG
- `BG-Recorder`, by the BGCI, runs on Windows, and requires Access. Developed mostly between 1997 and 2003, it has not been maintained ever since and isn't actively distributed by the BGCI. I've not managed to find a download link nor its license statement. It is still mentioned as *the free option* for botanic database management.

Of the above, only `ghini.desktop` satisfies these conditions: Copylefted, available, documented, maintained, easy to install and configure. Moreover: Cross platform and internationalized.

### 7.2.3 Welcome to Ghini/Bauble

Dear new user,

Welcome to Ghini/Bauble.

As the maintainer, I have received your registration for bauble.classic/ghini.desktop, many thanks for taking your time to fill in the form.

I see you are using bauble.classic-1.0.55, whereas 1.0.55 is the last released version of bauble.classic, however, bauble.classic is now unmaintained and superseded by the fully compatible, but slightly aesthetically different ghini.desktop. Install it following the instructions found at http://ghini.rtfd.io

The registration service says you're not yet using the newest Python2 version available. As of 2018-05-01, that is 2.7.15. Using any older version does not necessitate problems, but in case anything strange happens, please update your Python (and PyGTK) before reporting any errors.

Also thank you for enabling the «sentry» errors and warnings handler. With that enabled, Ghini/Bauble will send any error or warning you might encounter to a central server, where a developer will be able to examine it. If the warning was caused by an error in the software, its solution will be present in a subsequent release of the software

If you haven't already, to enable the sentry and warnings handler, open the «:config» page in Ghini and double click on the row «bauble.use_sentry_client».

I hope Ghini already matches your expectations, if this is not the case, the whole Ghini community would be very thankful if you took the time to report your experience with it.

The above is one way to contribute to Ghini's development. Others are: - contribute ideas, writing on the bauble google forum (https://groups.google.com/forum/#!forum/bauble), - contribute documentation, or translations (https://hosted.weblate.org/projects/ghini/), - give private feedback, writing to ghini@anche.no, - rate and discuss Ghini openly, and promote its adoption by other institutions, - open an issue on GitHub (https://github.com/Ghini/ghini.desktop/issues/), - contribute code on GitHub (fork the project on (https://github.com/Ghini/ghini.desktop/), - hire a developer and have a set of GitHub issues solved, per-haps your own - let me include your garden on the still experimental worldmap (http://gardens.ghini.me)

I sincerely hope you will enjoy using this copylefted, libre software

Best regards, Mario Frasca

https://ghini.github.io https://github.com/Ghini/ghini.desktop/issues/

### 7.2.4 Do you want to join Ghini?

**Nota:** I generally send a note similar to the following, to GitHub members who «star» the project, or to WebLate contributors doing more than one line, and at different occasions. If it's from GitHub, and if they stated their geographic location in their profile, I alter the letter by first looking on institutos botánicos if there's any relevant garden in their neighbourhood.

Dear GitHub member, student, colleague, translator, botanist,

Thank you warmly for your interest in the Ghini project!

From your on-line profile on github, I see you're located in Xxxx, is that correct?

If you are indeed in Xxxx, you live very close to gardens Yyyy and Zzzz. Maybe you would consider the following proposition? All would start by contacting the botanical garden there, and get to know what software they use (what it offers, and at which price) and if they're interested in switching to ghini.desktop+pocket+tour+web.

The business model within Ghini is that the software is free and you get it for free, but time is precious and if a garden needs help, they should be ready to contribute. Maybe you already have a full-time job and don't need more things to do, but in case you're interested, or you have friends who would be, I'm sure we can work something out.

Let me know where you stand.

best regards, and again thanks for all your contributed translations.

Mario Frasca

# CAPÍTULO 8

## Apoio Ghini

If you're using Ghini, or if you feel like helping its development anyway, please consider donating.