# MGIS.Net User's manual

Version 4.0 for Windows

## Musa Germplasm

## Information System Database

MusaNet – July 2019

Bioversity – July 2019

Revision History

| Name | Date | Reason For Changes | Version |
|---|---|---|---|
| Max Ruas | 24/04/2017 | Original document | 1.0 |
| | 09/06/2017 | Edited version | 1.1 |
| | 16/04/2018 | Addition of chapters:<br>Editing an accession and Editing a collection<br>Update of chapter:<br>Exchange with MusaTab | 1.2 |
| | 31/08/2018 | Edited version | 1.3 |
| | 04/07/2019 | Update of chapter:<br>Exchange with MusaTab due to changes on format of the file for exchange of data between MGIS.Net and MusaTab<br>Update of Annex 02:<br>To reflect the refactoring of MusaTab code and improve coherence in the naming of JSON variables. | 1.4 |

# TABLE OF CONTENTS

# INTRODUCTION

MGIS.Net is a Windows© application developed under the financing of Roots, Tubers and Bananas (RTB) CGIAR Research Program (CRP).

MGIS.Net contains the functions required for the following operations:

- Recording collection information
- Recording Passport, characterization and agronomic data of accessions held in *Musa* collections
- Entering/consulting data and photos on accessions
- Exchanging data with MusaTab
- Use of the *Musa spp*. descriptors

## 1. SYSTEM REQUIREMENTS

The minimum requirement to run the application is a personal computer running a Windows© Operating System from version 7. The application needs 350 Mb of free spaces to install.

## 2. INSTALLATION OF MGIS.NET

The software is available from the MGIS website at the following address: https://www.crop-diversity.org/mgis/softwares. To install, simply download the archive, unzip it and click on the setup file. Once installed, a new icon appears in your list of applications. You can also request the package from Bioversity International, Parc Scientifique Agropolis II, 1990 boulevard de la Lironde, 34397 Montpellier cedex 5, France (telephone +33 (0)467611302).

## 3. EXECUTION OF MGIS.NET

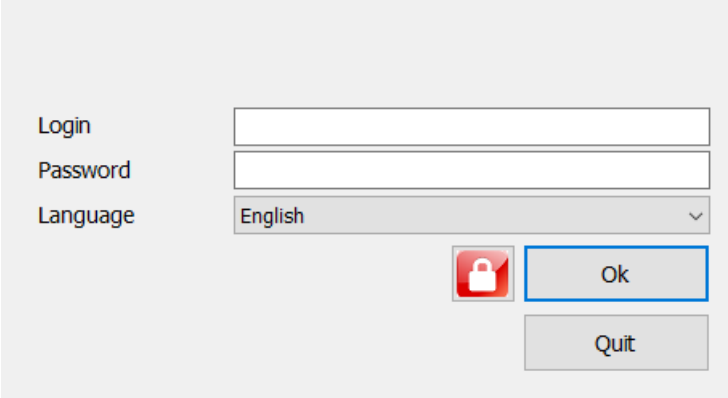
Once the application is installed on your computer, an MGIS icon is created in the start menu. Click on the icon to launch the application.

# SOFTWARE ORGANIZATION

## 1. LOGIN SCREEN

Once launched, a temporary screen displaying rotating bananas appears,

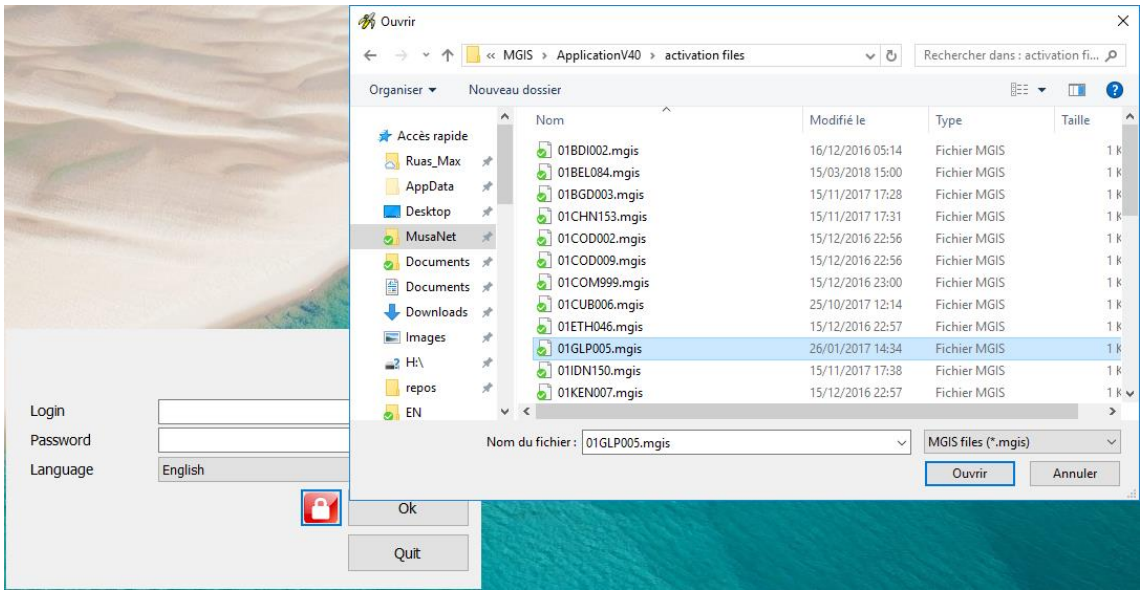

followed by the following login screen:



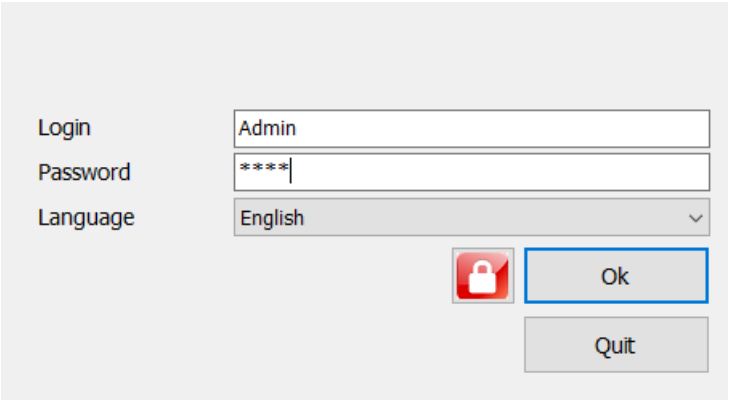

To work with the collection of your data you will need an activation file. An activation file has an *.mgis* extension. This file is provided to you by the MGIS database manager. If you don't have an activation file you can still use the application by entering **GUEST** in the login field and by keeping the Password field empty. Click on the *Ok* button to open MGIS.Net. With the **GUEST** account you will be able to visualize the data from the MGIS participating partners' collections.

## 2. ACTIVATION

If you have received an activation file you should first click on the button with the padlock. An open file dialog box will appear. Select the folder where you have stored the activation file.



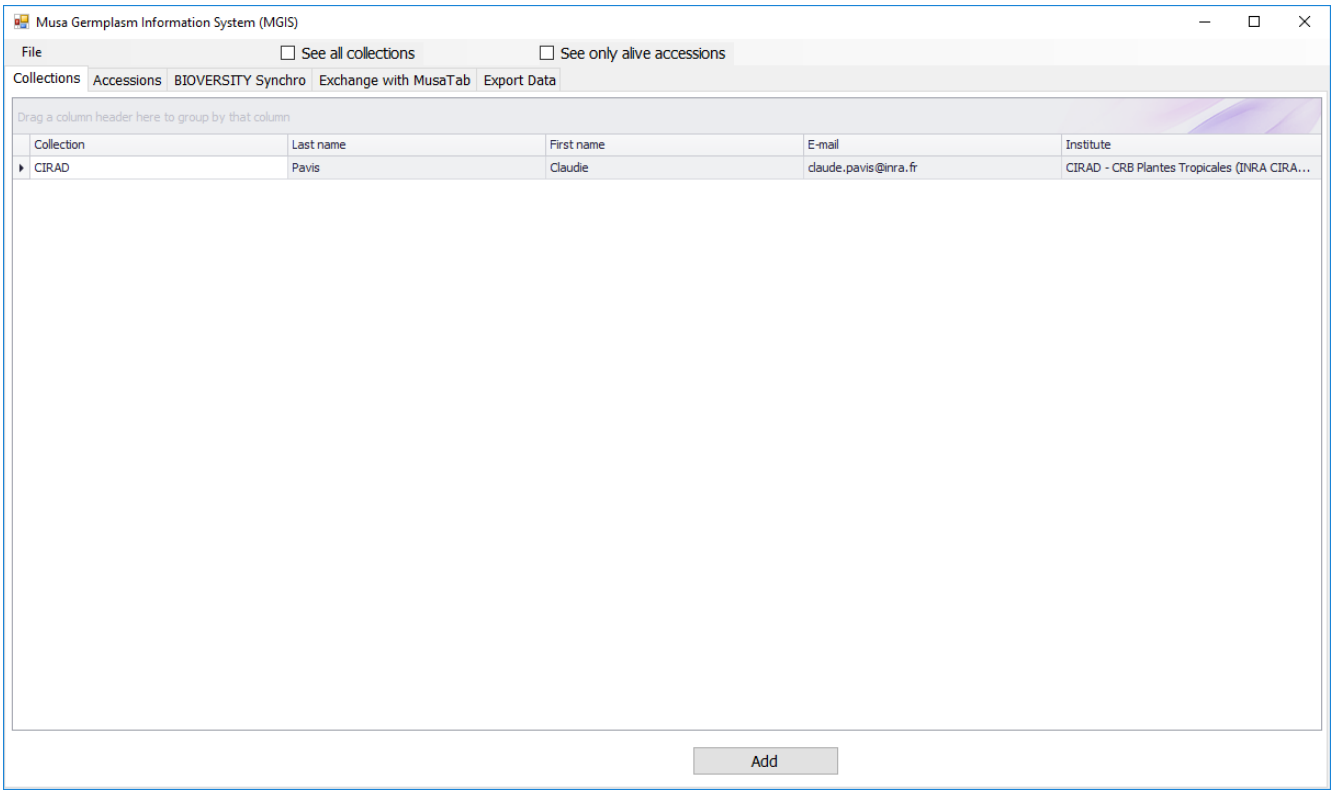

Once the *.mgis* file is selected, click on the open button to activate MGIS.Net. The MGIS manager will have sent you the Login and password specific to your collection. Type them in the corresponding fields and click on the *Ok* button.




MGIS.Net allows you to insert and edit the data of the collection you are in charge of. The activation file grants you an administrative role **ONLY** on the data of your collection. You will be able to see the data from other partners' collections of MGIS but you won't be able to modify them.

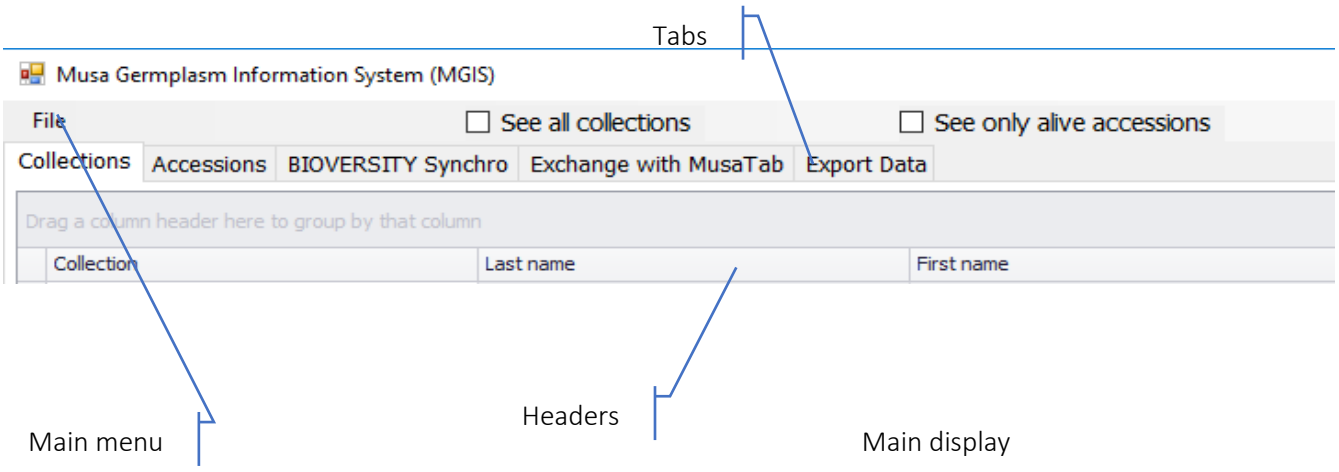
## 3. MAIN SCREEN

Once you have clicked on the *Ok* button of the login window, you will see the following window:

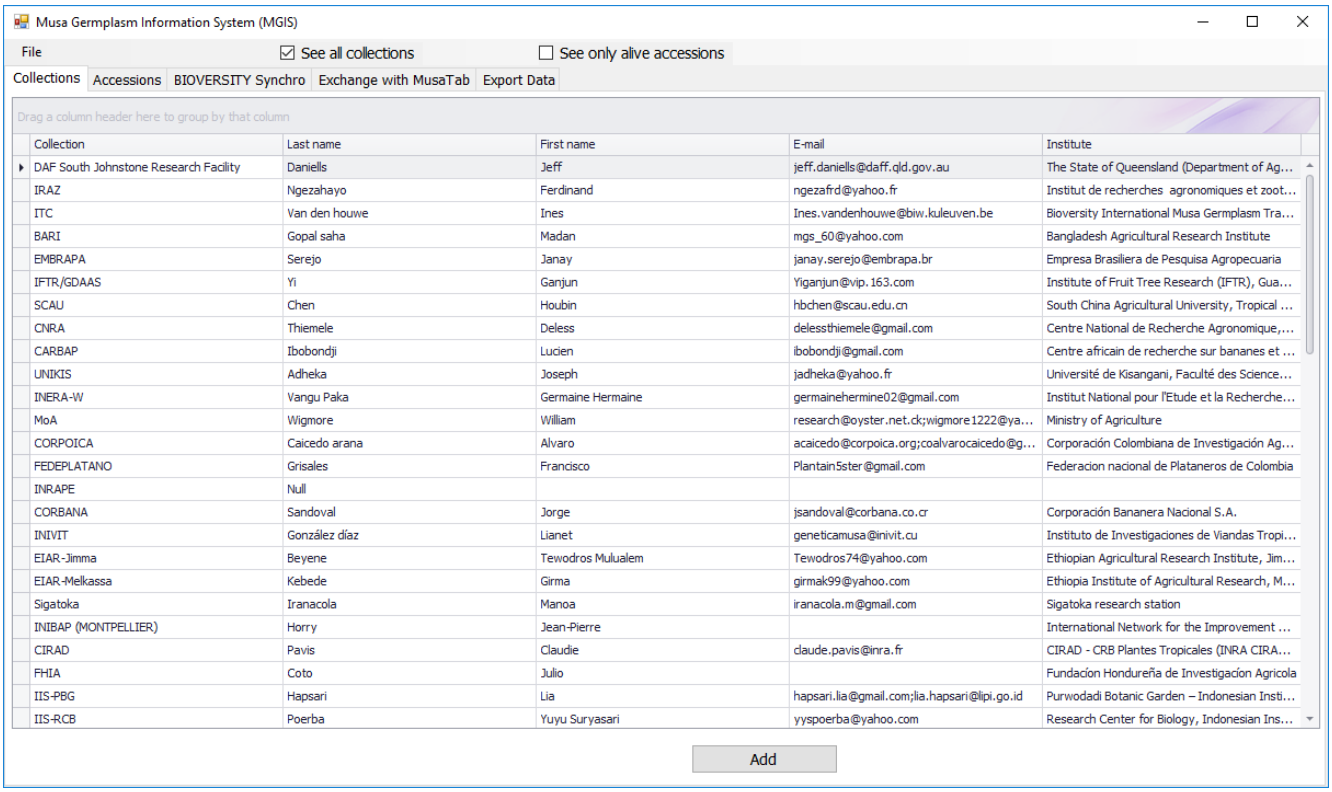



The main window is composed of 5 tabs to navigate within a dataset or for performing specific tasks. By default the collection visible is the collection you are managing. To display the content of a tab you just have to click on the name of the tab.

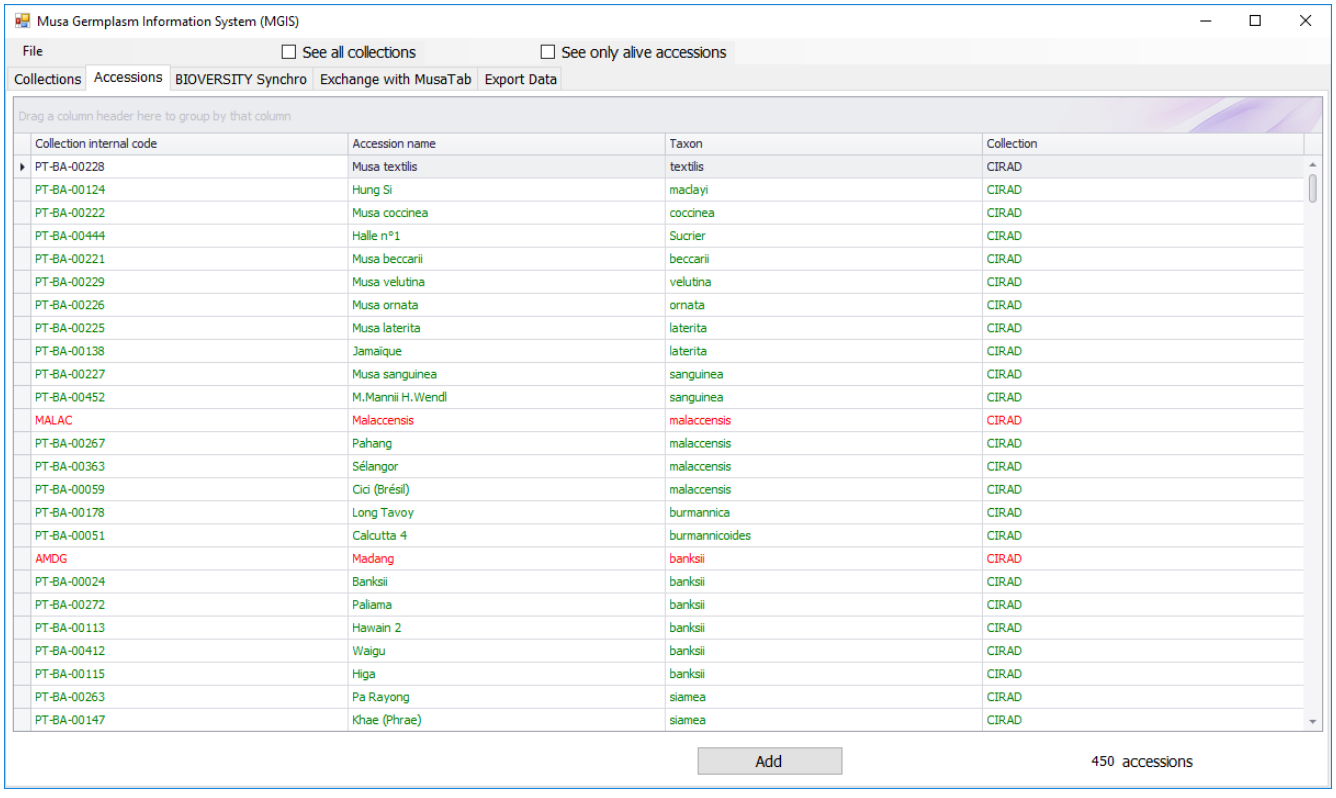
*Description of the main interface:*



If you want to see other participating MGIS partners' collections, check the **see all collections** tick box on the top of the window.

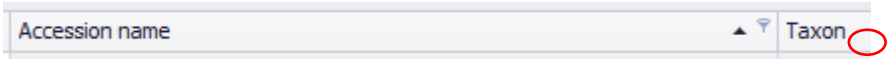



A click on the second tab named **Accessions** lists the accessions managed by your collection.

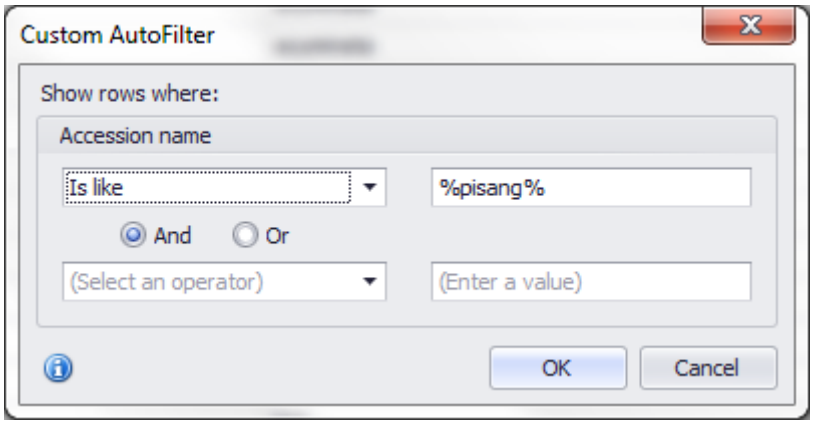


Once you click on a column header, it will sort the list in ascending order. A second click will sort the list in descending order. The focus will remain on the elements selected in the list. You will notice that the position of the scrolling bar on right side of the window will move accordingly.

If you move the mouse over a column header, a filter icon will appear.

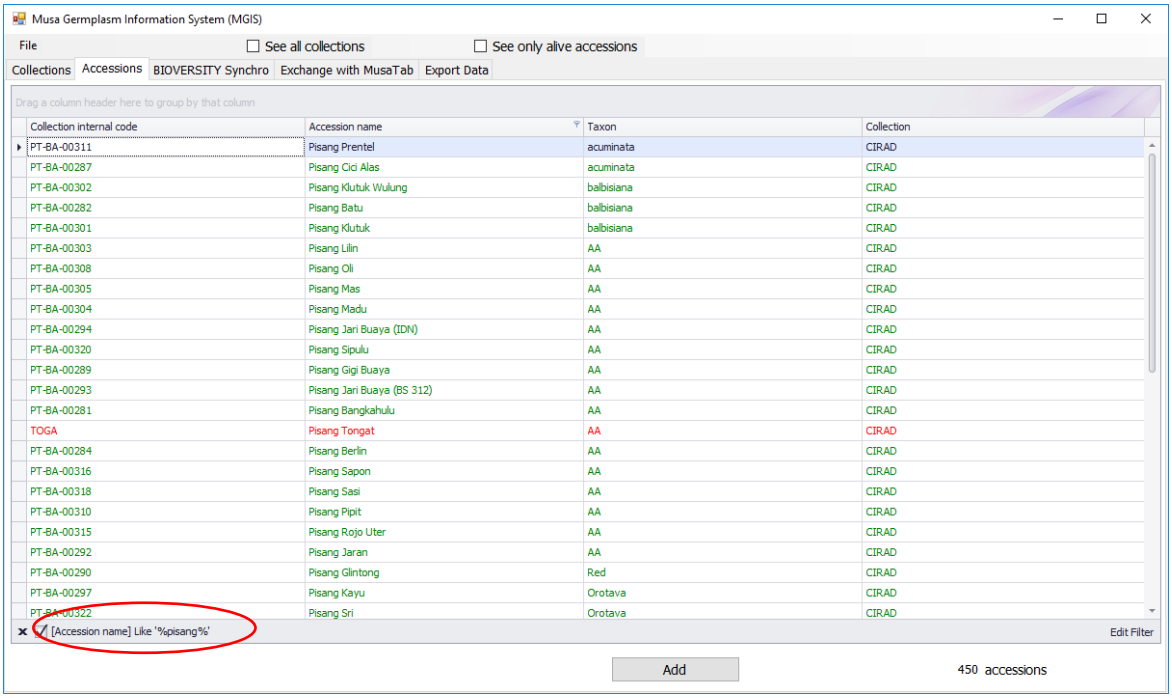



If you click on this filter icon, you will see the complete list of the data linked to this column. The first element of the list is named **custom**. Click on **custom** to be able to perform your own filter; a popup window will appear to define the criteria.



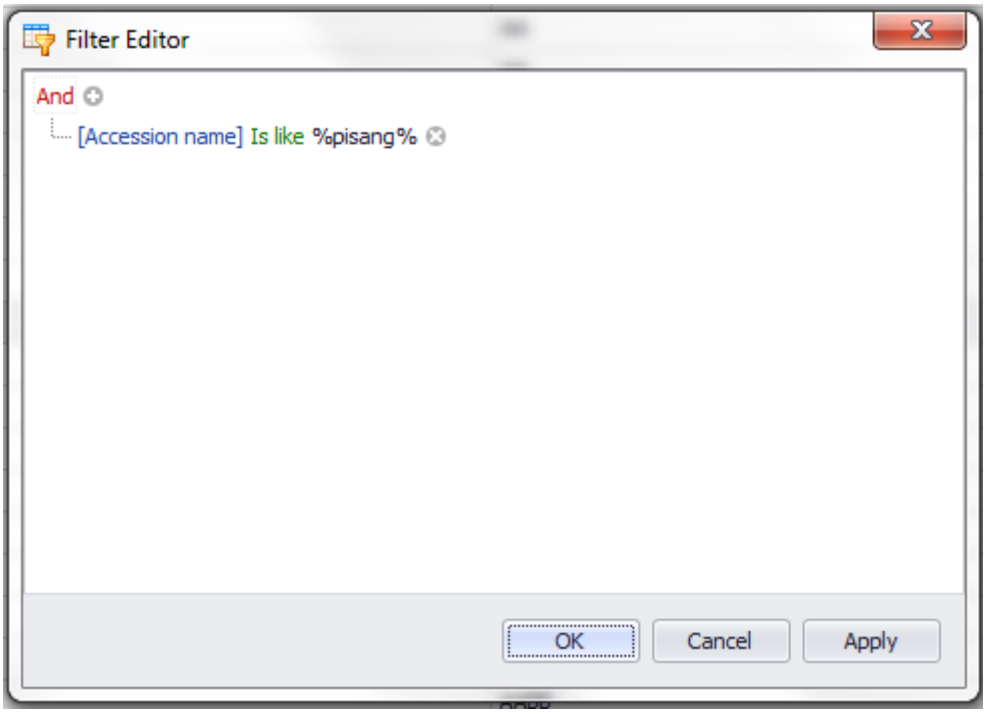

Select the criteria and click on the Ok button to filter your records. The result for the above filter of the accession name is like '%pisang%' and the results are the following:

You will notice that the filter applied to the grid is mentioned at the bottom of the grid.




It is still possible to remove or edit the filter. To remove the filter, click on the cross next to the filter on the left side of the grid. To edit the filter, click on the **Edit Filter** text positioned on the right side of the grid.

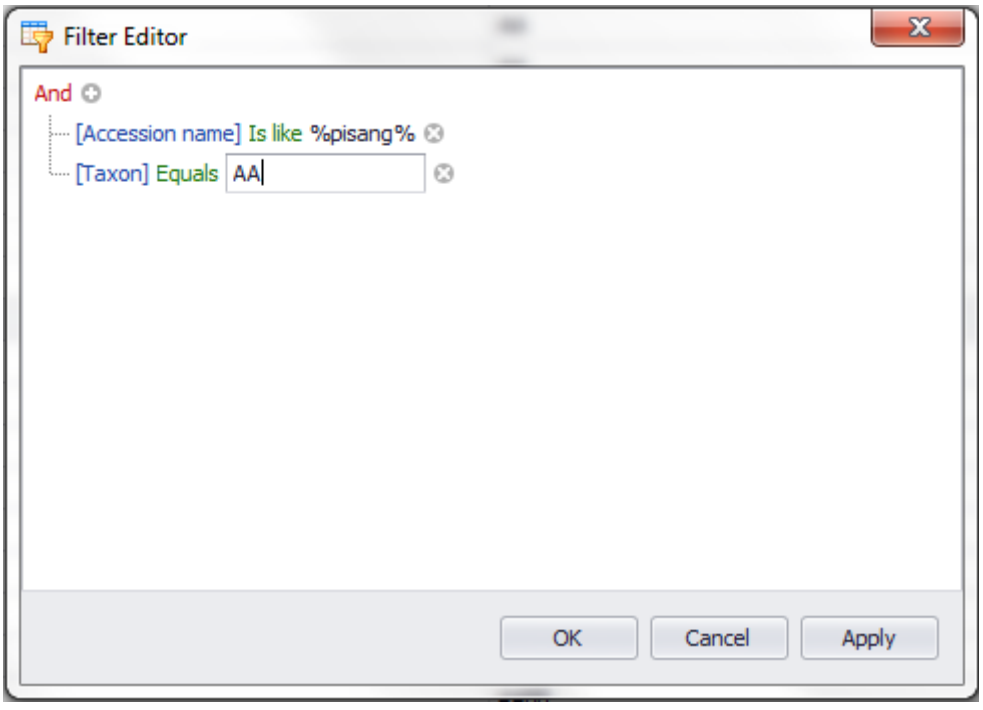
By clicking on the **Edit filter** the following window will popup:



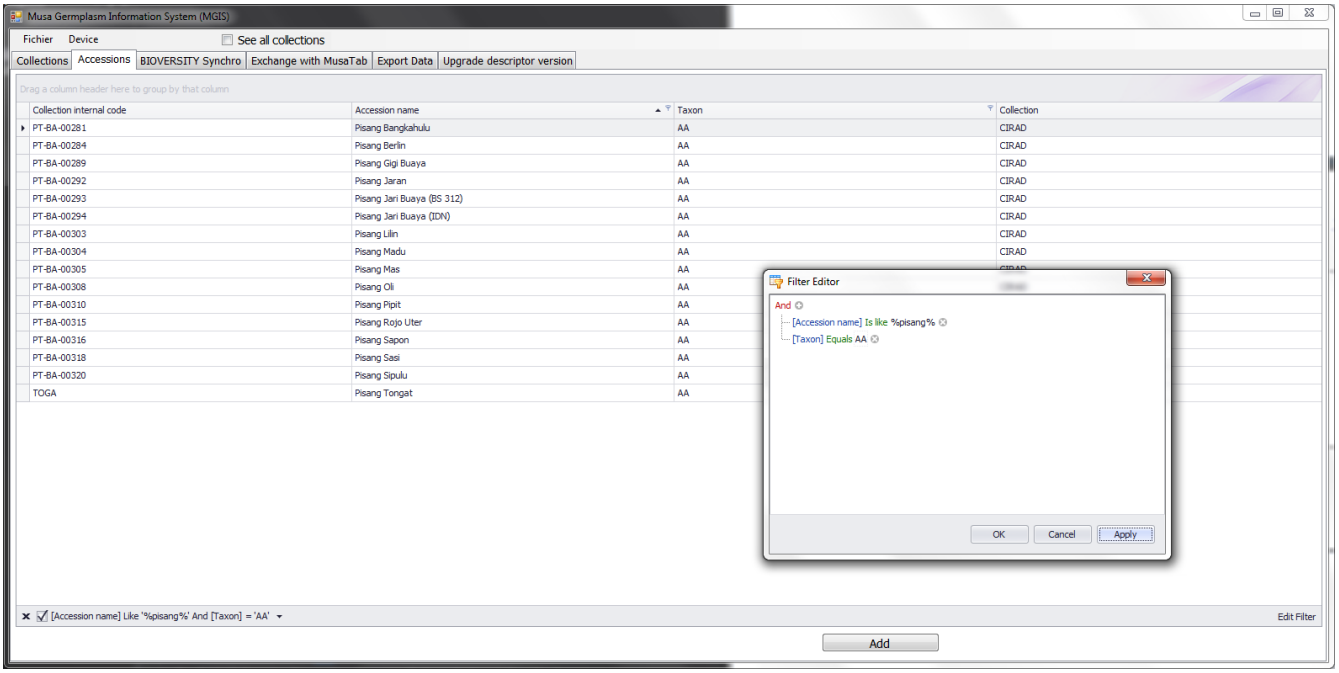

All of the elements in the main window are clickable.
If you click on the And you can switch to **Or** operator
If you click on the white plus sign next to the And you can add an extra clause.

If you click on the [Accession name] text you will be able to select another column.
By clicking on the Is like text you will change the operator.
If you click on the %pisang% text you will be able to modify it.
If you click on the white cross you will delete the filter.

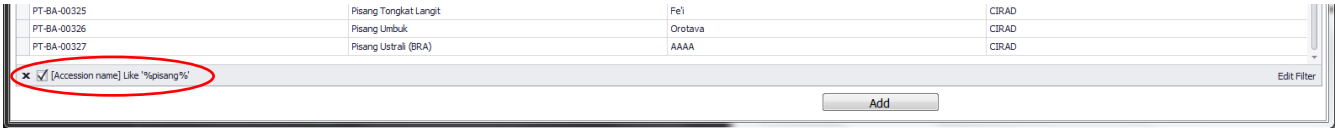
The following screenshot shows what happened when I clicked on the white plus sign. I added a filter on the Taxon.



Once the *Apply* button is clicked the grid is filtered as shown below.

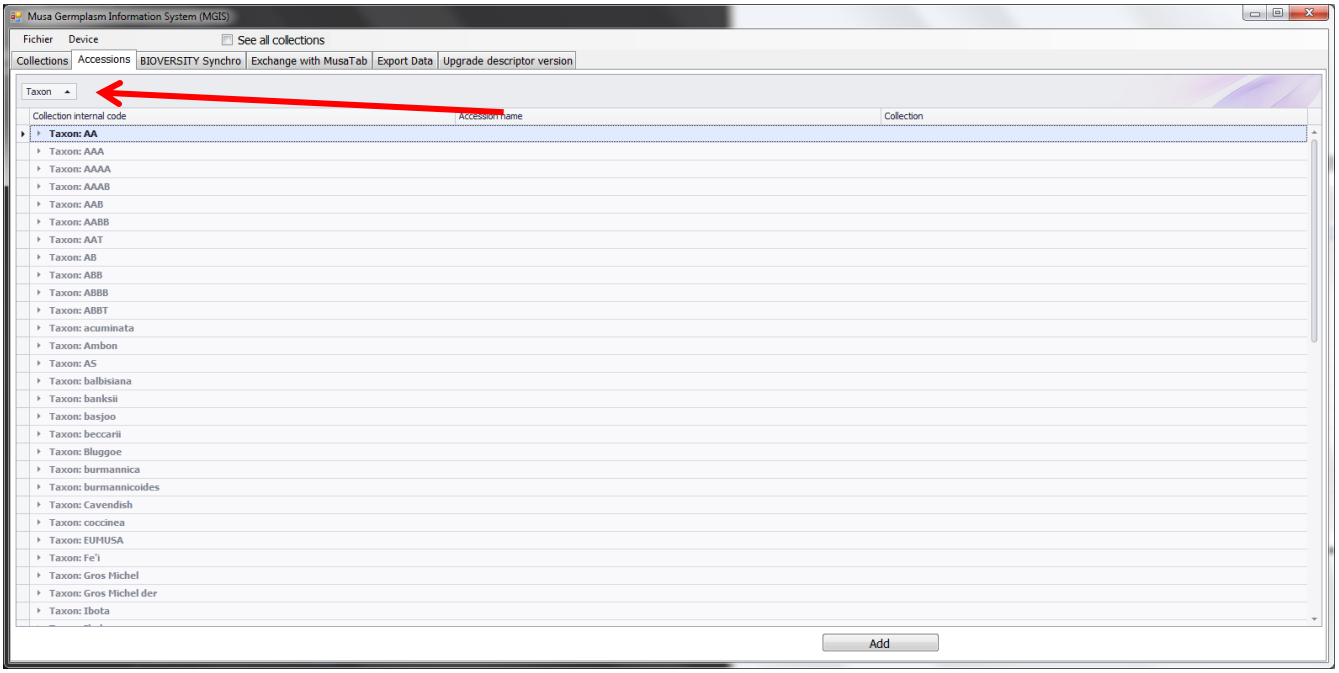



You will notice that the text of the filter on the left side of the grid has changed.



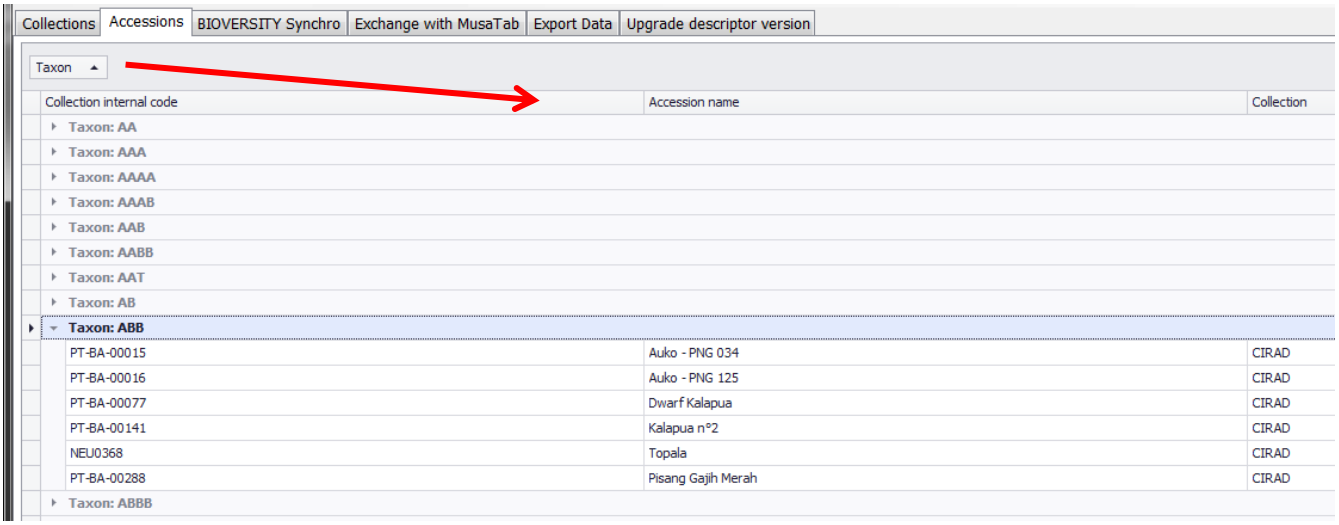

### *Grouping the records*

It is possible to group the records. The best and only way to do it on the accession tab is to use the **Taxon.** To do this click and hold the **Taxon** column header and move it to the band on top of the column header.



Once the header has been moved, the display of the grid changes to reflect the grouping by Taxon as you can see below. You will notice that the column Taxon has disappeared.

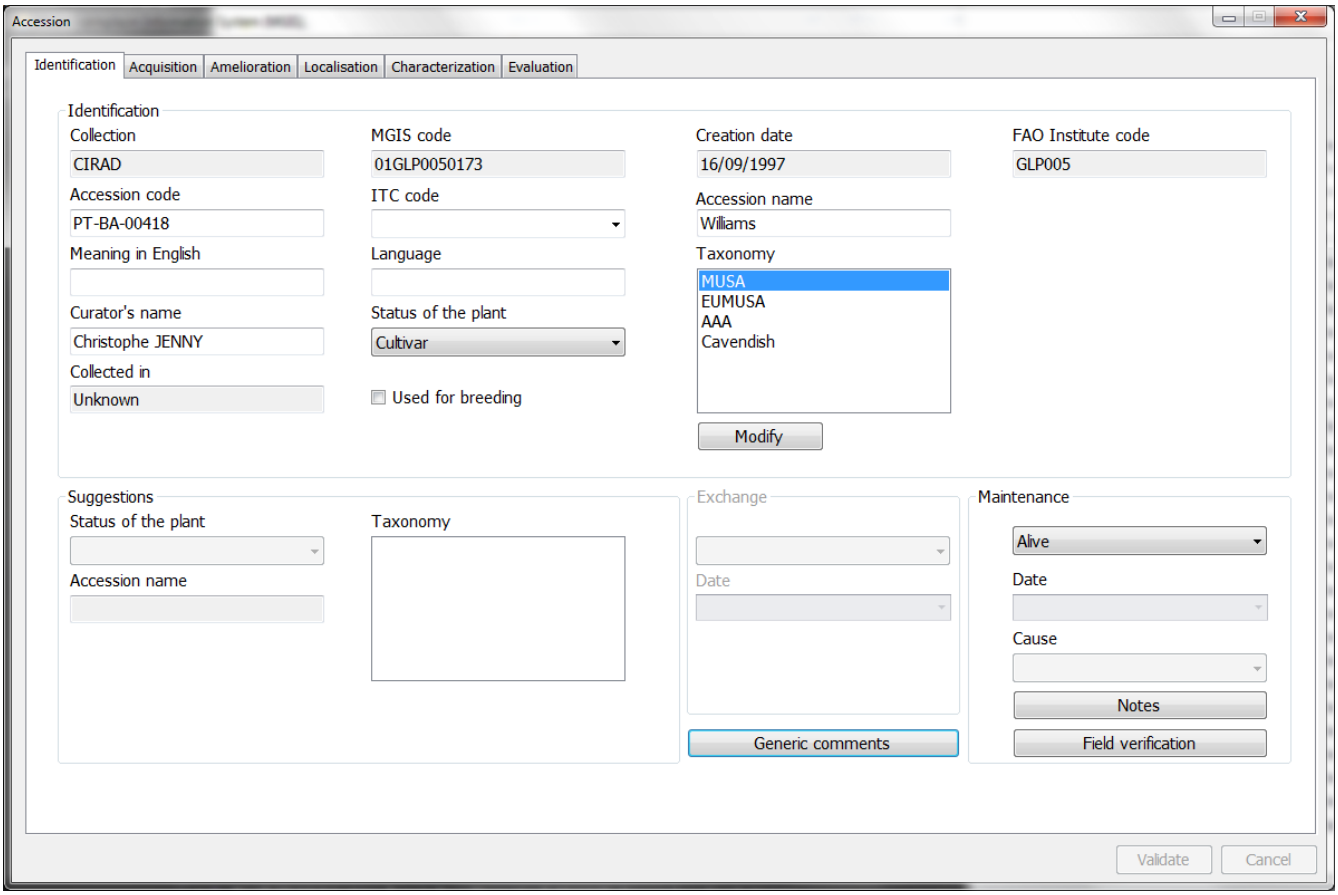
By clicking on the black arrow next to the Taxon group you will display the list of accessions pertaining to this taxon. In the example below we display the ABB accessions.




To come back to the original grid, just click and hold the **Taxon** button and drag it to the column header. You will notice that it is possible to organize the columns differently.

## 4. EDITING AN ACCESSION

If you double click on one row of an accession, you will open a window that will allow you to edit the data of this accession from passport, characterization, evaluation data or any other data related to the accession.

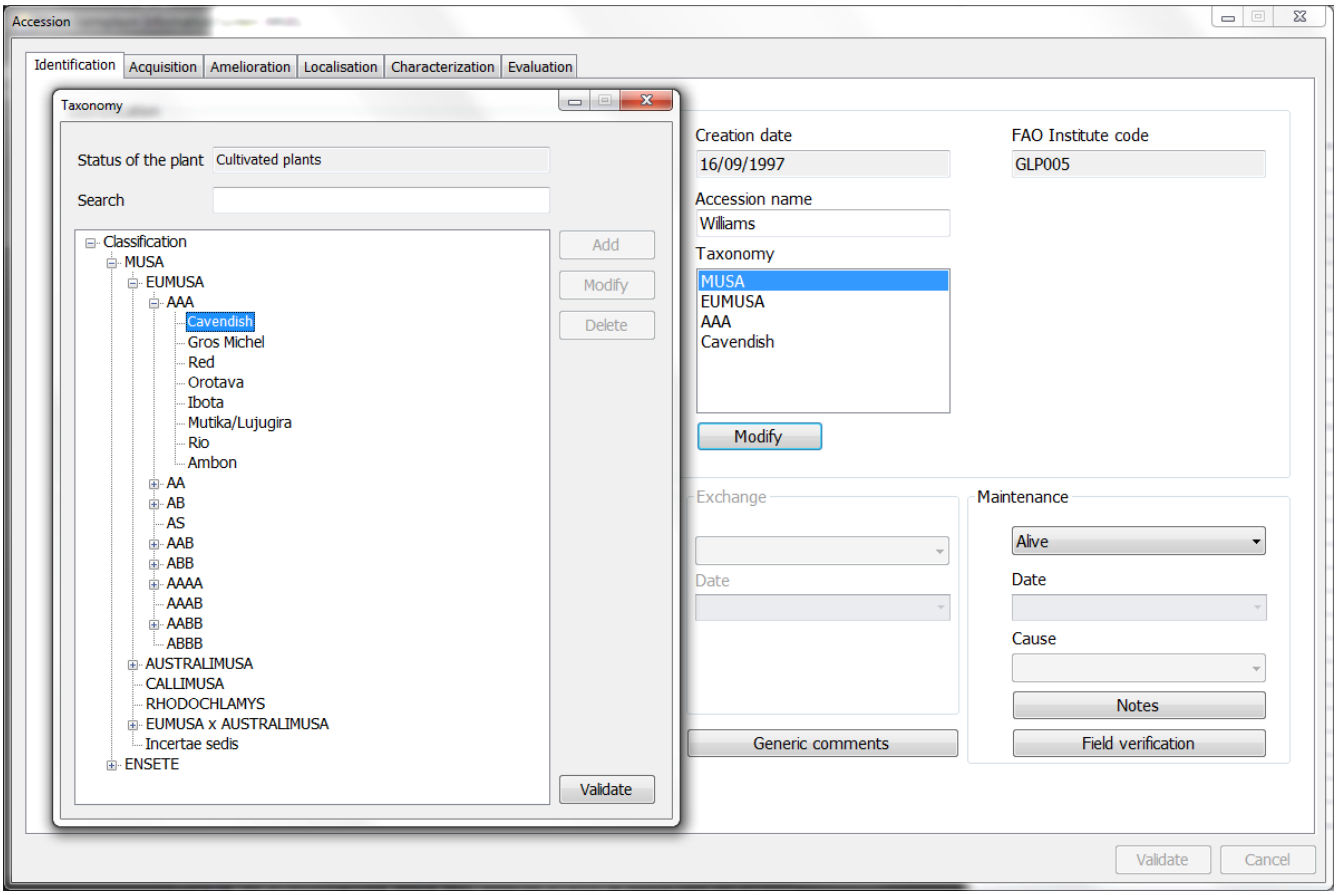



This first tab called Identification allows you to edit the first level of passport data. Once you have started to modify data on a tab you will need to validate or cancel your edit to be able to select another tab. When you close the window the system will ask you about saving or discarding your changes. If you have modified the data in different tabs it will be hard to remember changes and thus save them. The grey textboxes are data that you cannot edit.

# A. IDENTIFICATION TAB

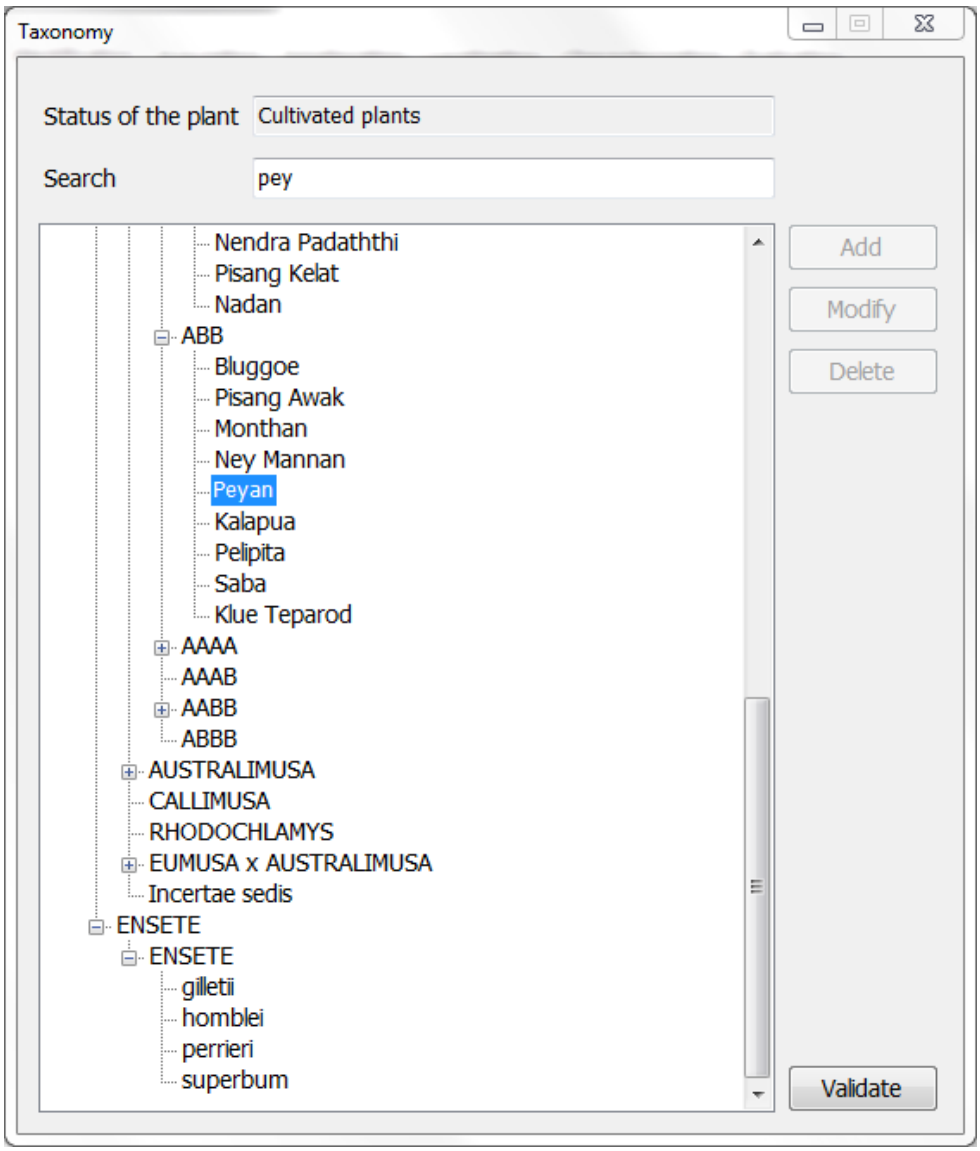
## 1) EDITING TAXONOMY

Note: When you click on modify taxonomy, the taxonomy displayed will be associated to the status of the plant. Meaning that in our case with a status of plant set to cultivar you will see only the taxonomy associated to this status, meaning that you won't be able to select wild species or species in the taxonomy screen. If you want to switch from cultivar to wild or vice versa you first need to select the corresponding status in the dropdown list for status of the plant.



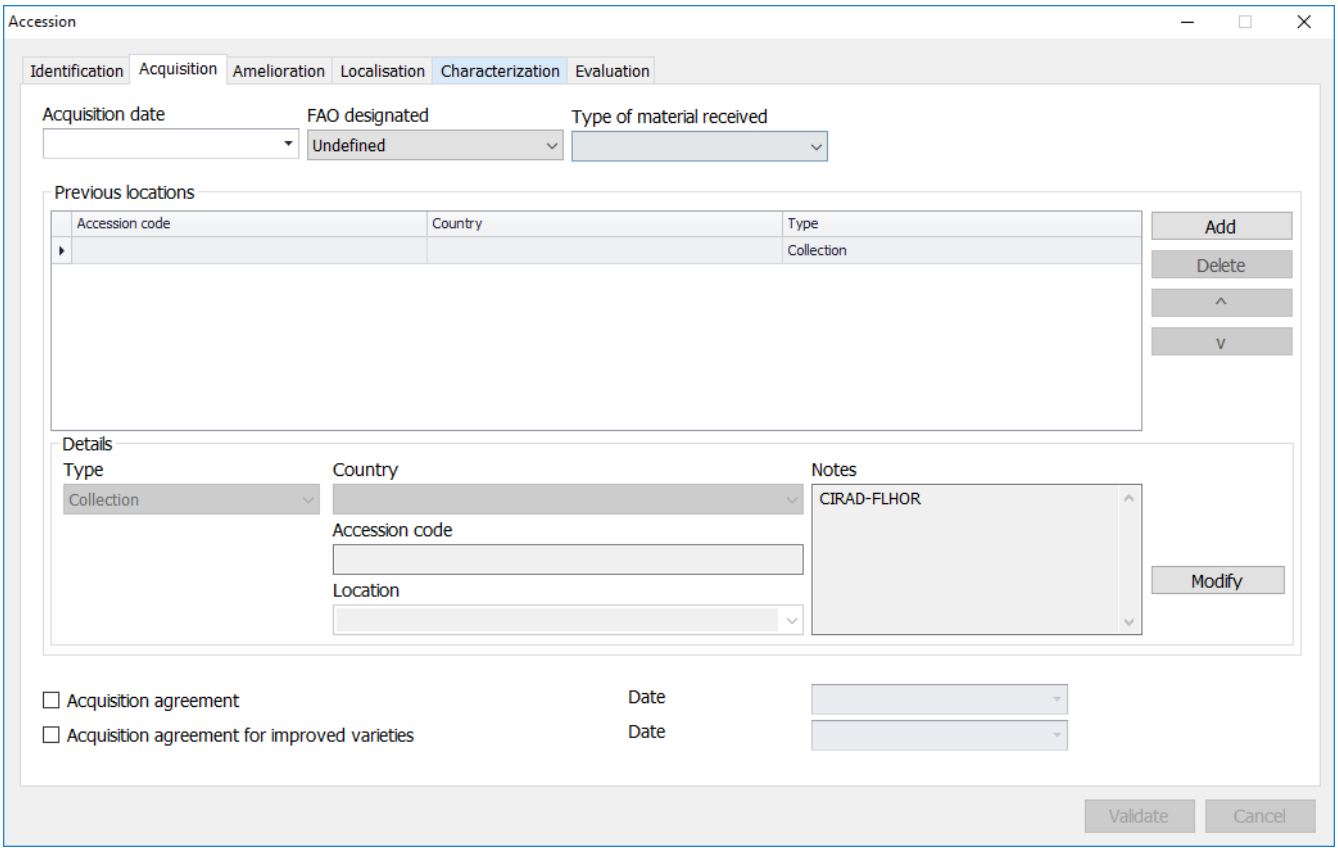

As you can see above, when the taxonomy screen appears the level corresponding to the current taxonomy of this application is highlighted in blue (in this example, Cavendish). It is possible to select a different classification. You can see the different groups or subgroups available. If you click on the plus button the tree will open, showing the lower level of known taxonomy for the current level.

You can also perform a search by typing the name of the taxon you are looking for. In the example below this is done by typing the three first letter of the taxon.



## B. ACQUISITION TAB

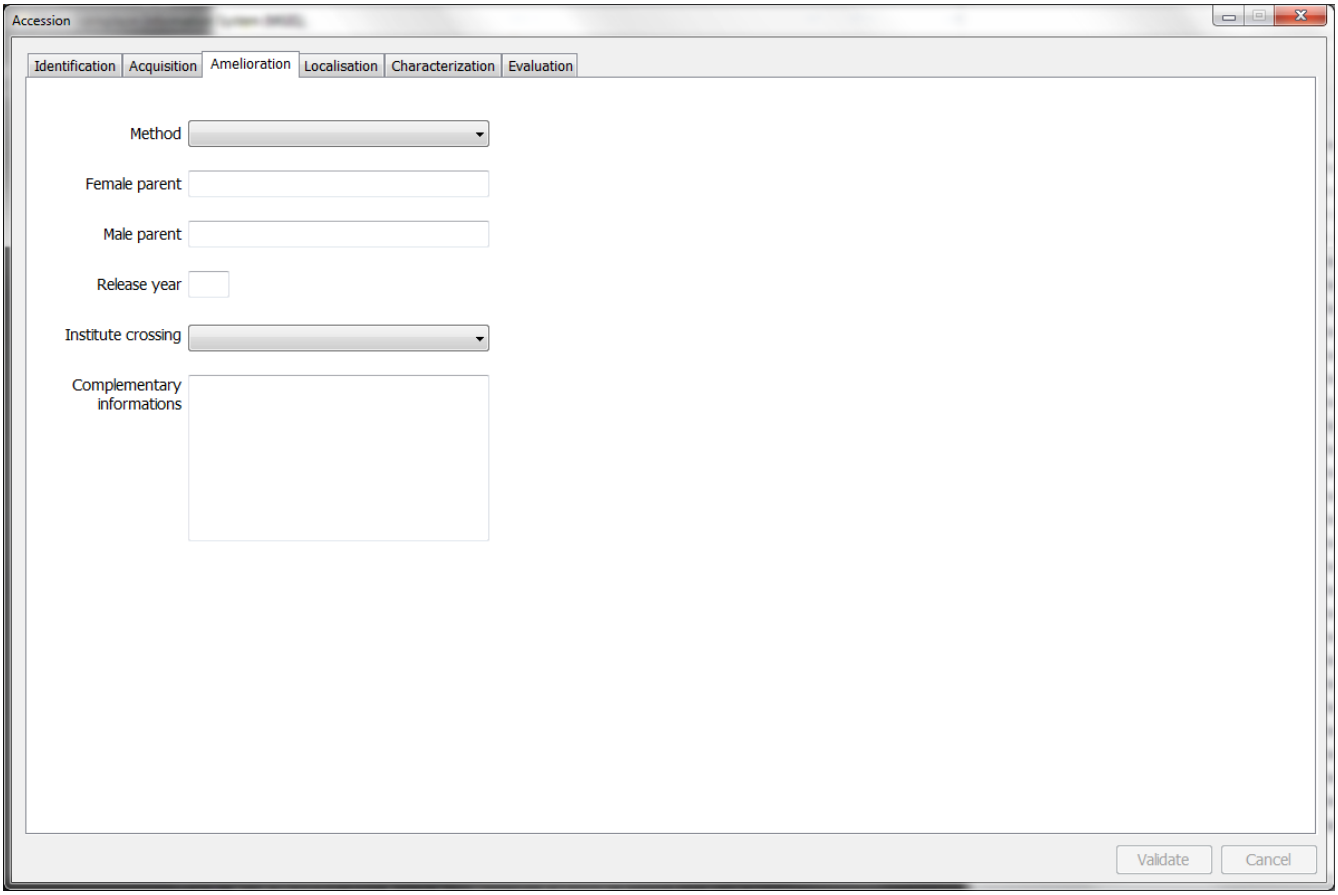
From this tab you will be able to see and edit the information related to the acquisition of your germplasm. The donor information such as type of donor (i.e. Collection, Collecting mission, Unknown and other). It is possible to record a history of the movement of the germplasm: several previous locations that will be ordered from current donor of the germplasm to the collection you are managing as well as previous holder of the accession (when known by the donor).




In this example the accession was donated by CIRAD_FLHOR with no additional information on accession code.

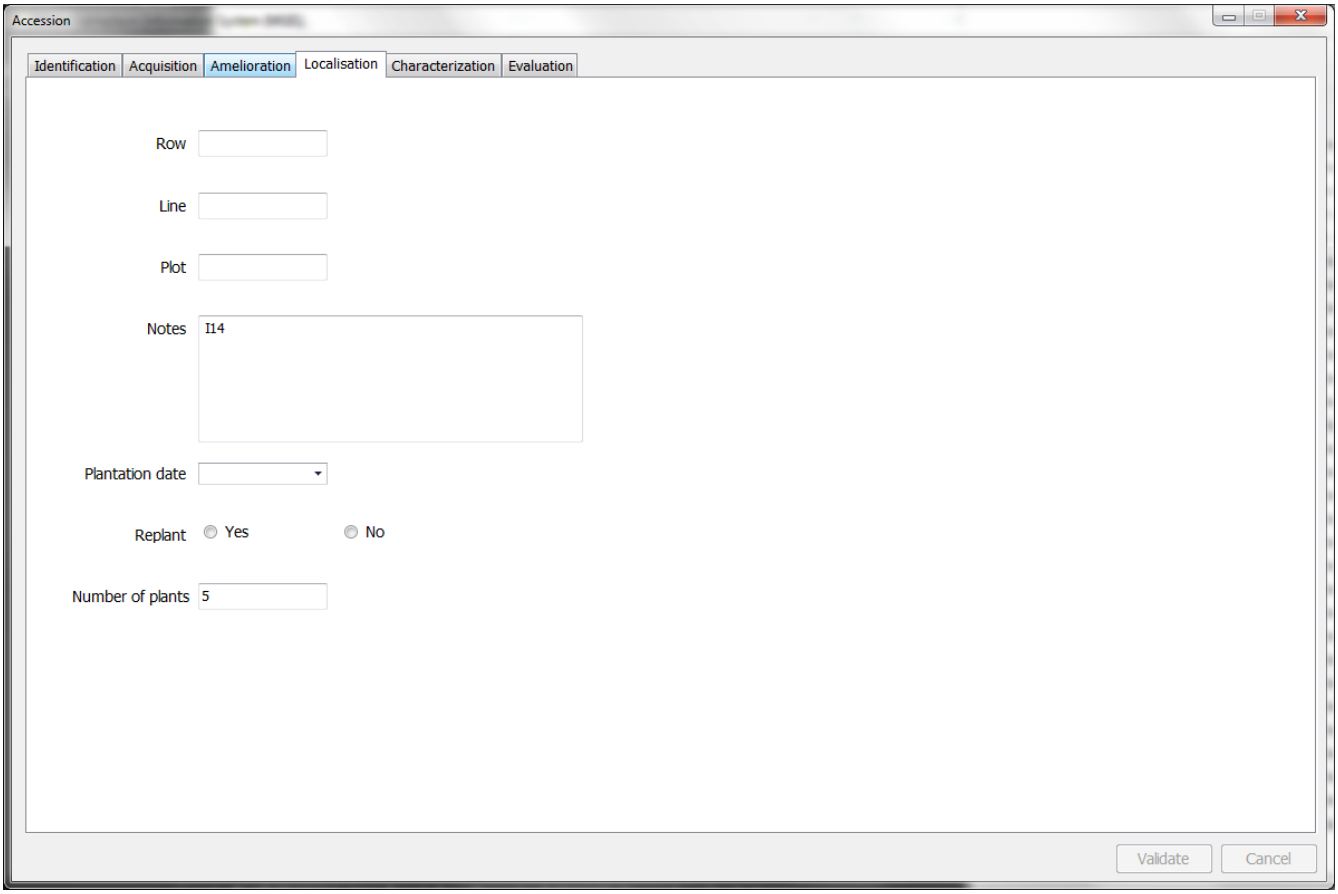
## C. AMELIORATION TAB

From this tab you will be able to define, for improved/breeding material, the method used to develop this material as well as the parents and the institute where the improvement/breeding was done.



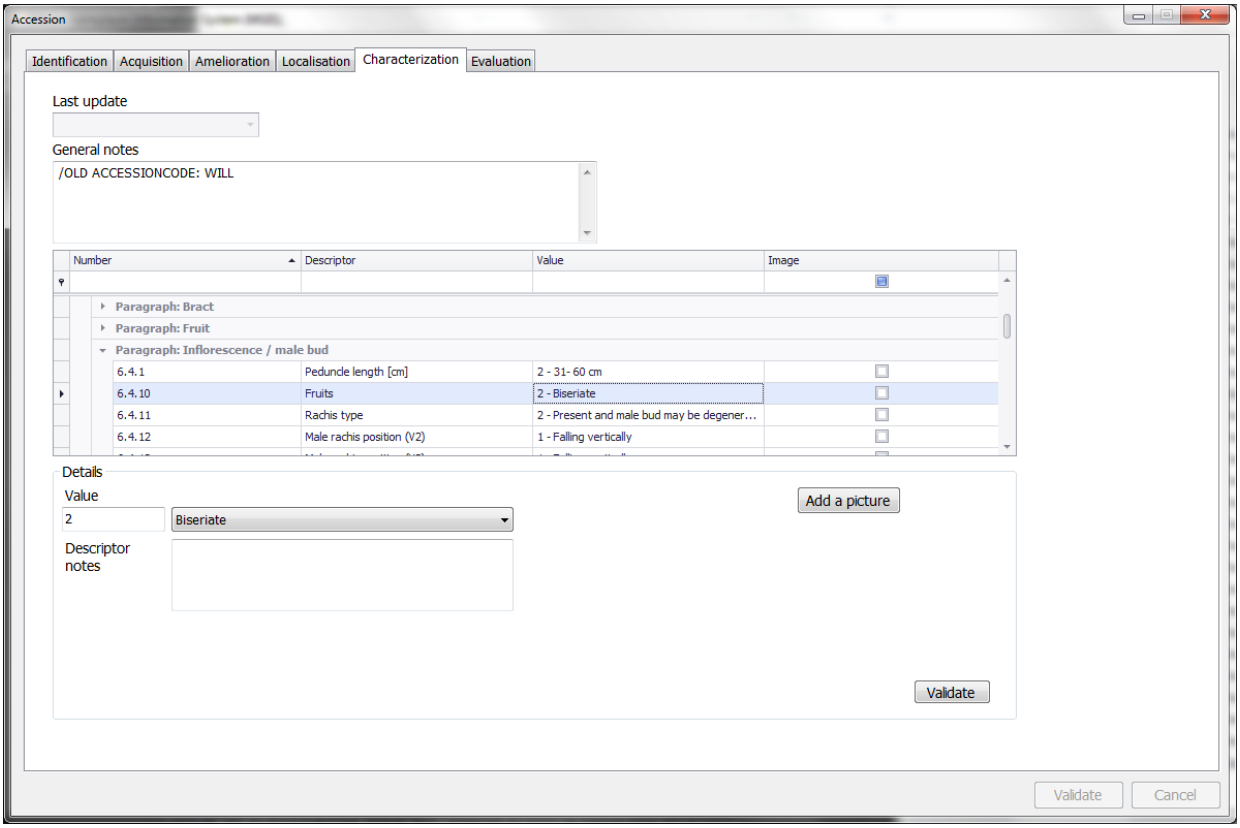
## D. LOCALISATION TAB

From this tab it is possible to set the physical address of the accession in the collection with row, line and plot information as well as plantation date and number of plants maintained for this accession. This number of plants will be used for characterizing material in the field with MusaTab.

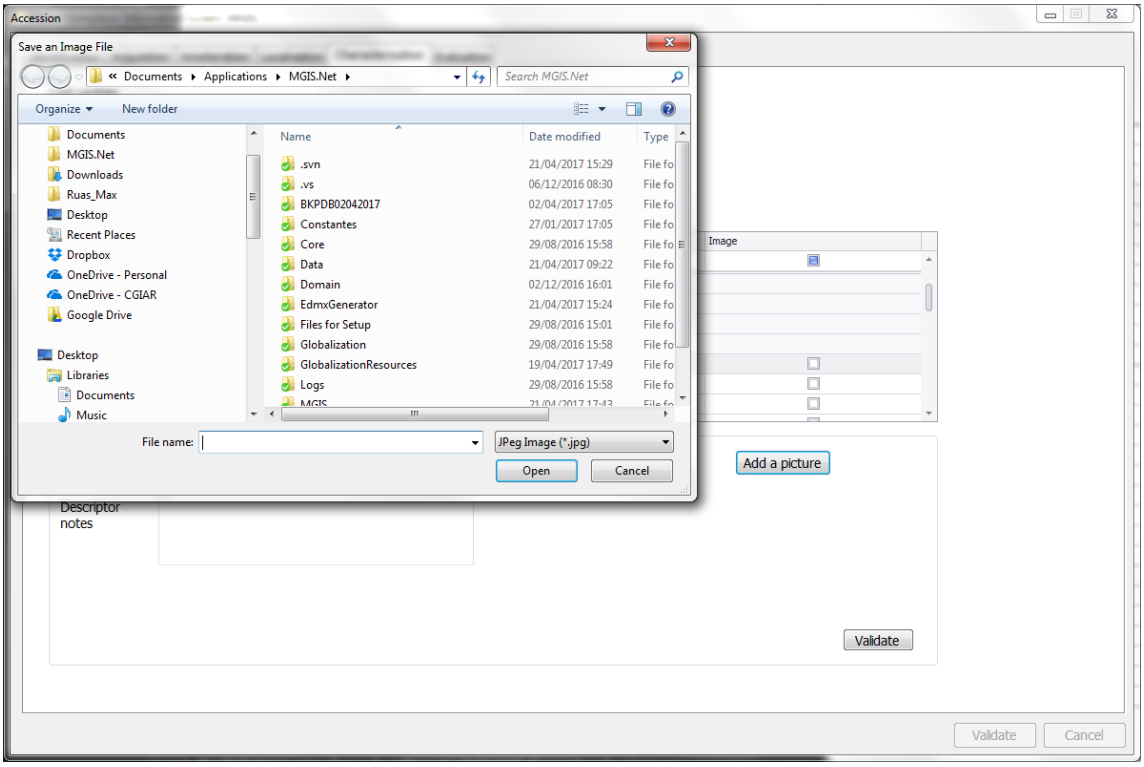


## E. CHARACTERIZATION TAB

From this tab you can access and edit the characterization data of this accession.

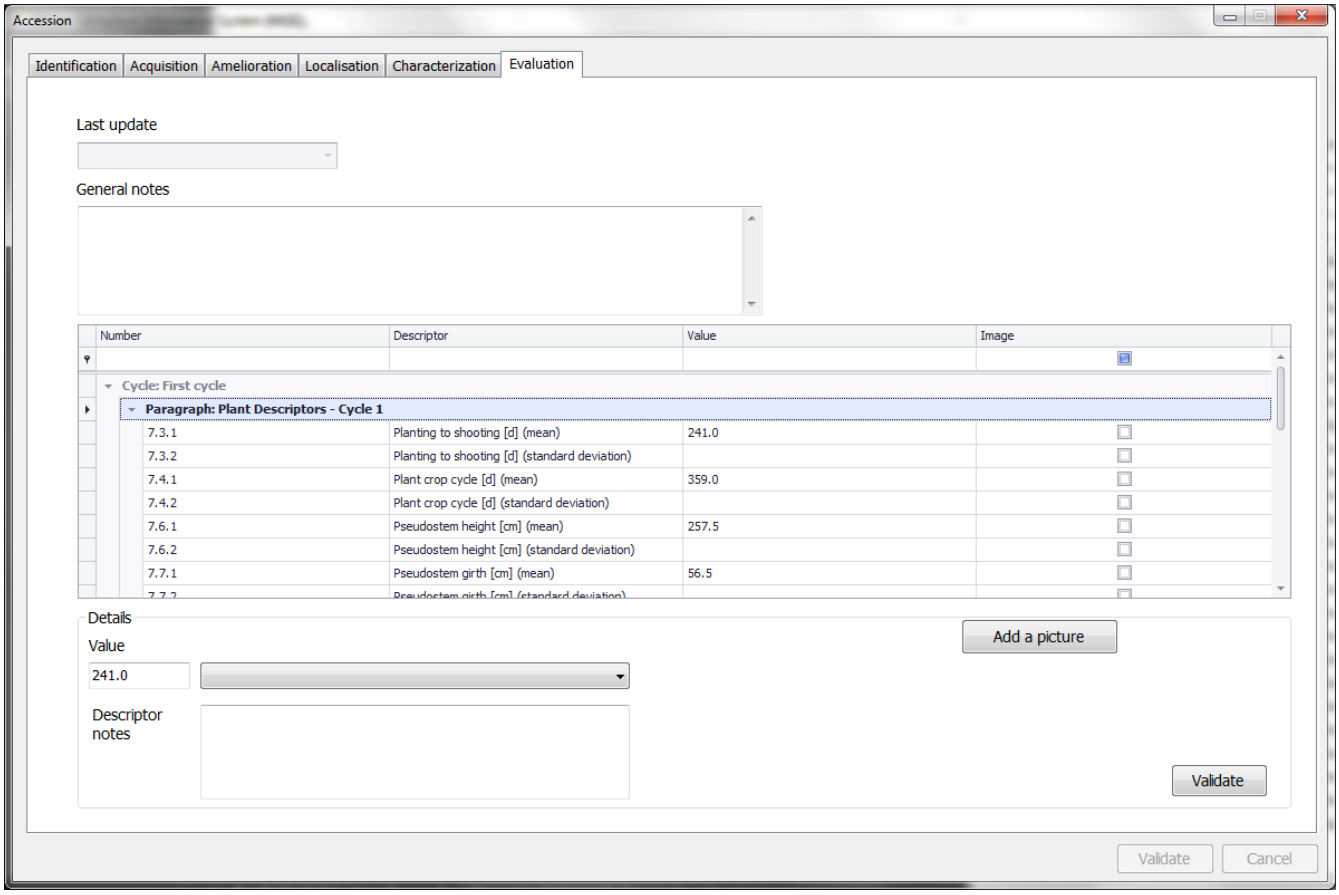



It is possible to attach a photo to a descriptor by clicking on the add picture button. In this case a dialog box will popup to help you to select the photo.



## F. EVALUATION TAB

From this tab you can access and edit the information related to evaluation data of the accession.

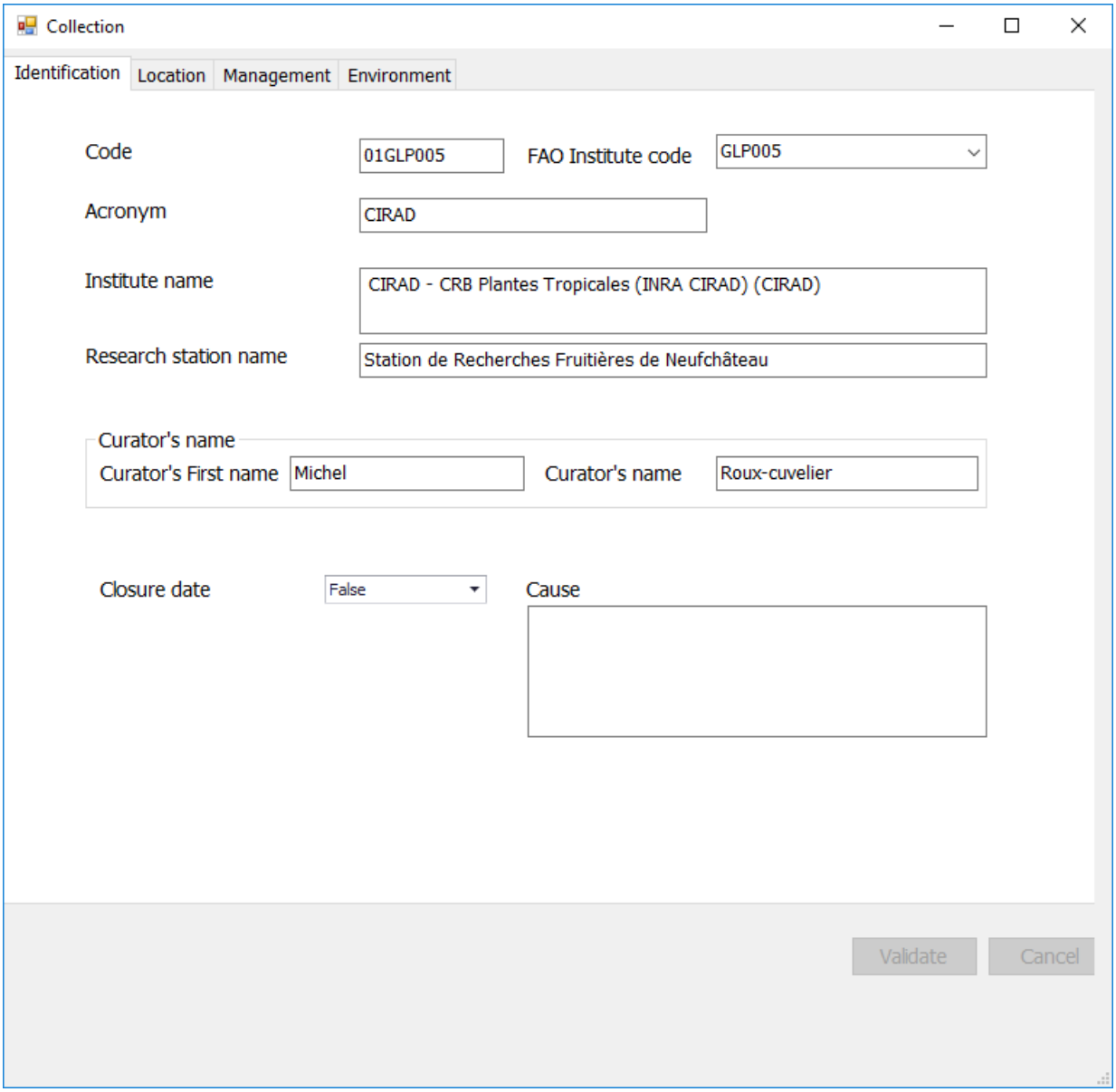


# 5. EDITING A COLLECTION

If you double click on the row of your collection you will open a window that will allow you to edit the data of your collection.

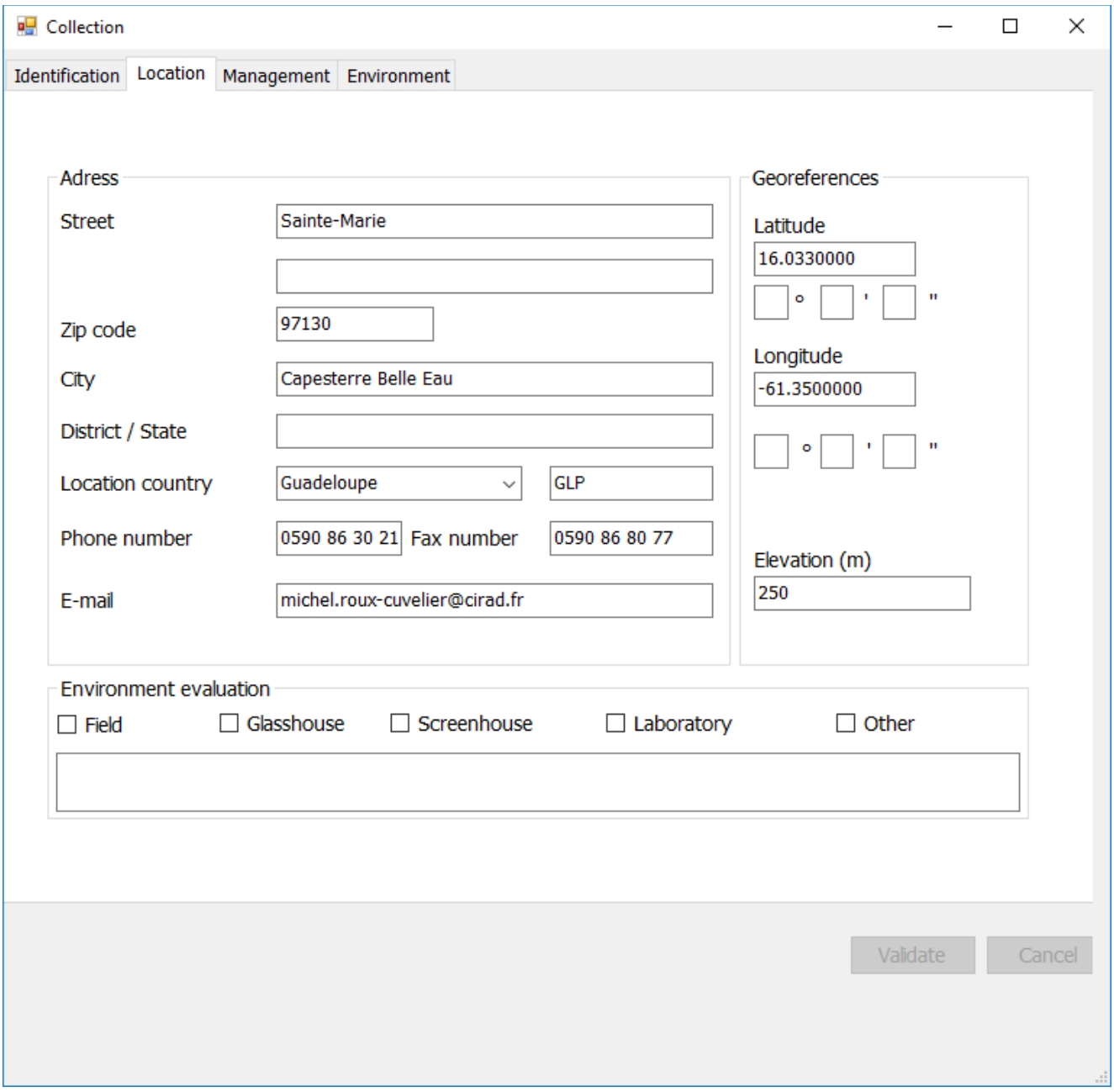
## A. IDENTIFICATION TAB

From this tab you have access to the main information related to your collection such as institute name, curator's name.



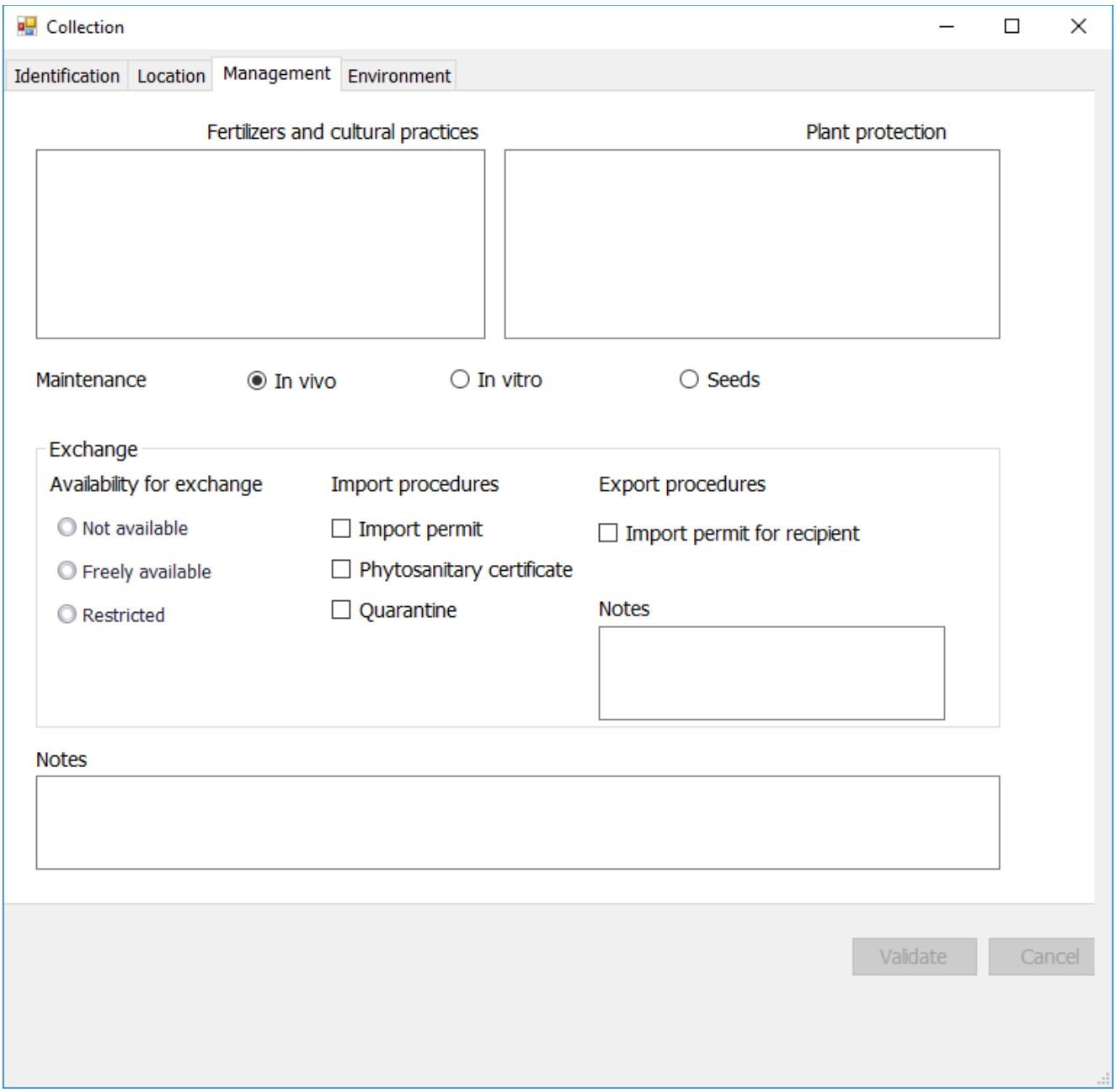
## B. LOCATION TAB

This tab allows you to edit physical address and other administrative information related to the station, as well as geo localisation and information on how evaluations are performed in this collection.



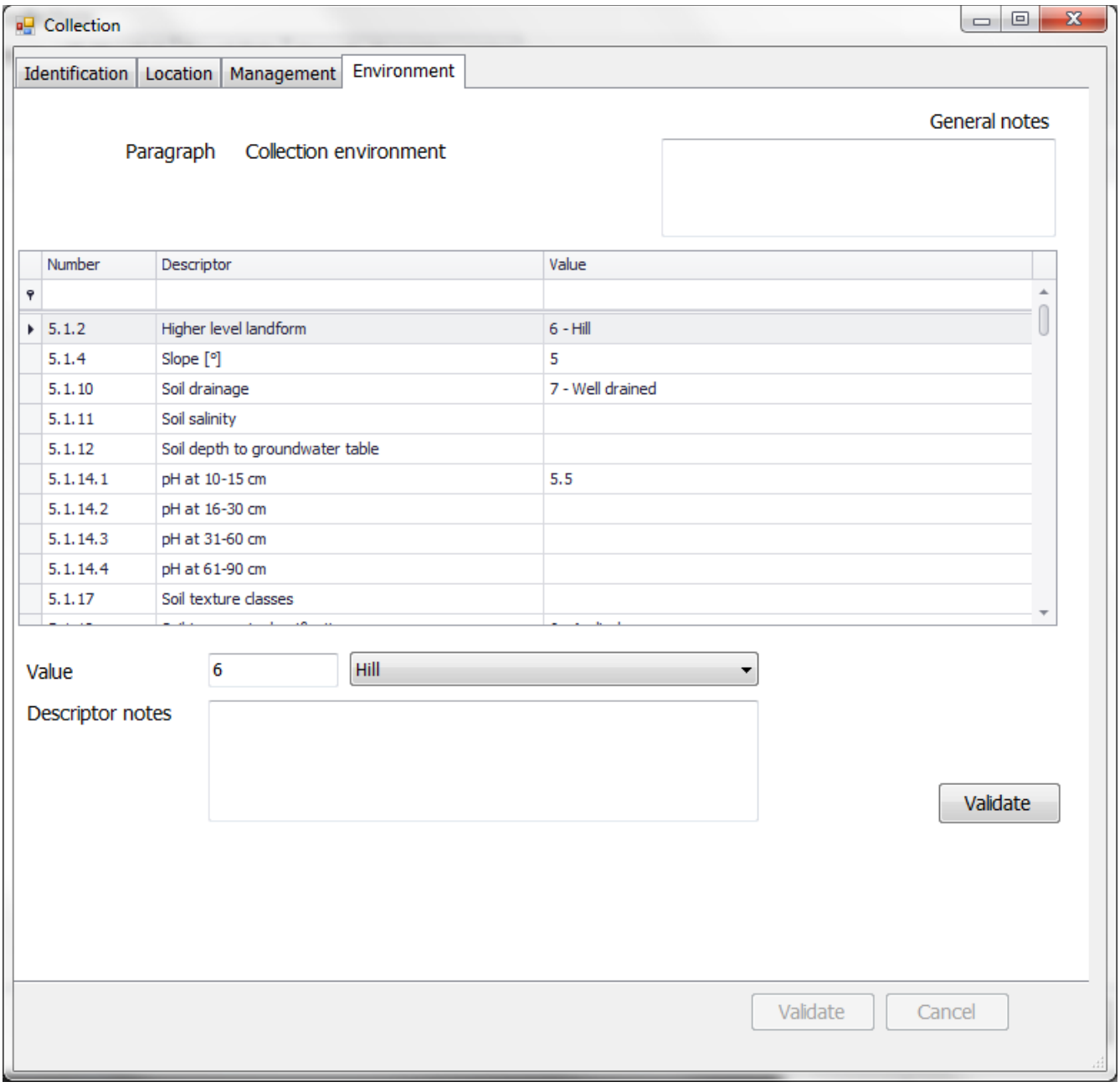
## C. MANAGEMENT TAB

This tab gives information related to the management practices at the collection, e.g. how accessions are maintained and any additional information that can be kept in the notes field.



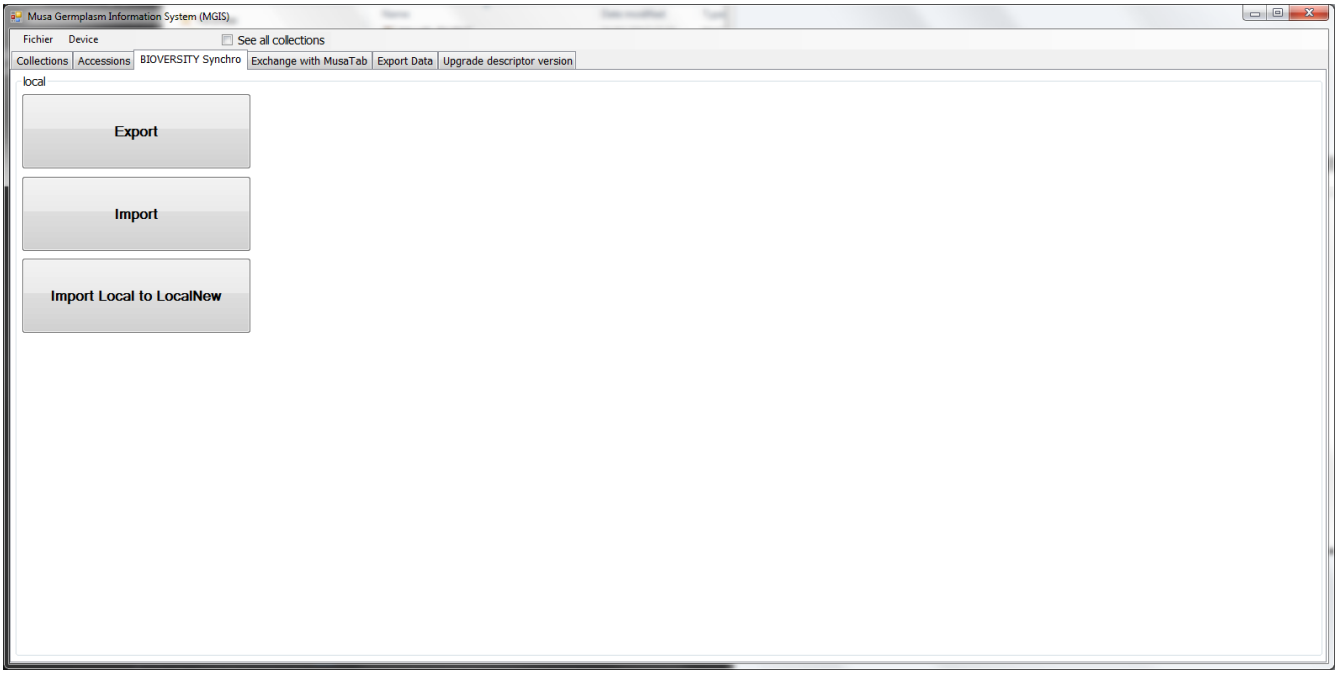
## D. ENVIRONMENT TAB

This tab uses environmental descriptors to capture physical environmental data of the collection such as temperature and rainfall in addition to soil PH, slope etc.



# 6. SYNCHRONIZATION

The synchronization is a tool to send updated data from a collection to Bioversity and also to receive updated data from Bioversity to your local database.



# 7. EXCHANGE WITH MUSATAB

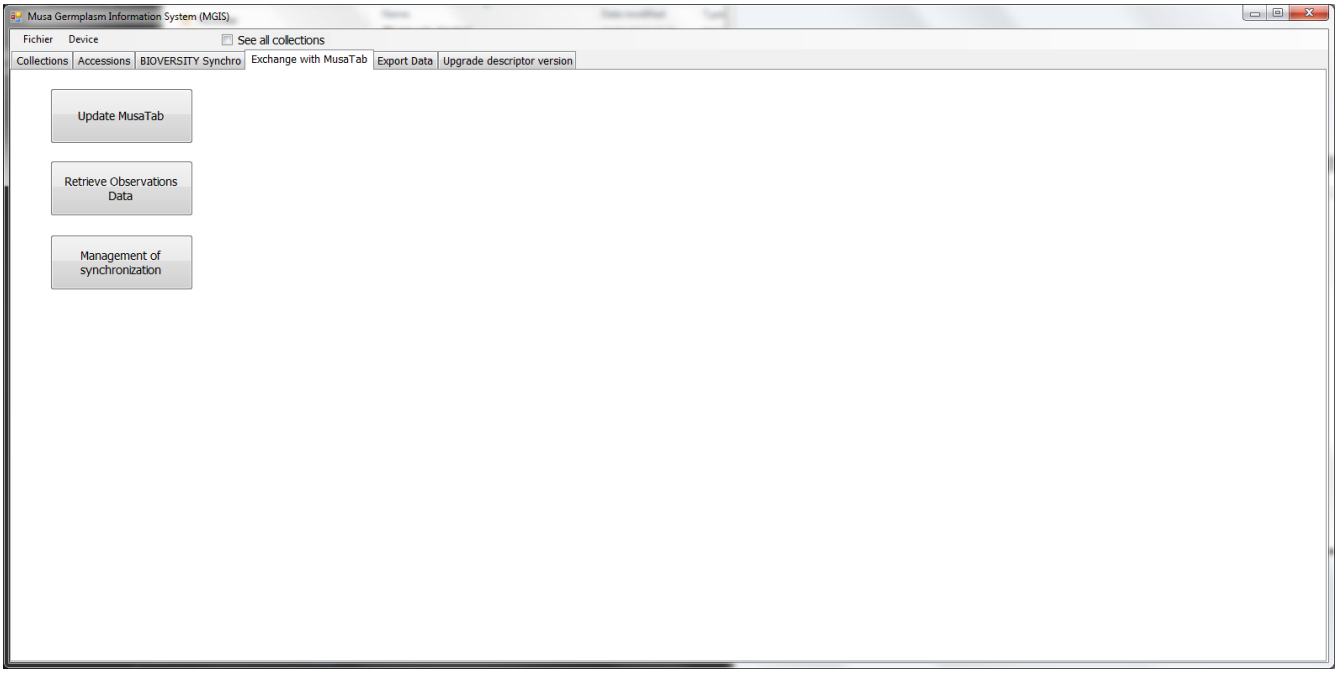
This tab will allow you to generate the files required by MusaTab to perform observations in the field. The application will help you to select the accessions you want to work with, to define which cycle you are curently observing as well as the number of plants observed by cycle and by accession. You will be able to select the descriptors you want to observe. The files will be automatically copied to the connected tablet using a USB cable.

From this table it will be also possible to import into your database the observations made in the field using MusaTab. Again, the transfer will be done using a USB cable.

The first button labeled **Update MusaTab** is the button that will start the creation of files and their export to the tablet.

The second button labelled **Retrieve Observations Data** will start the import of data recorded in MusaTab.

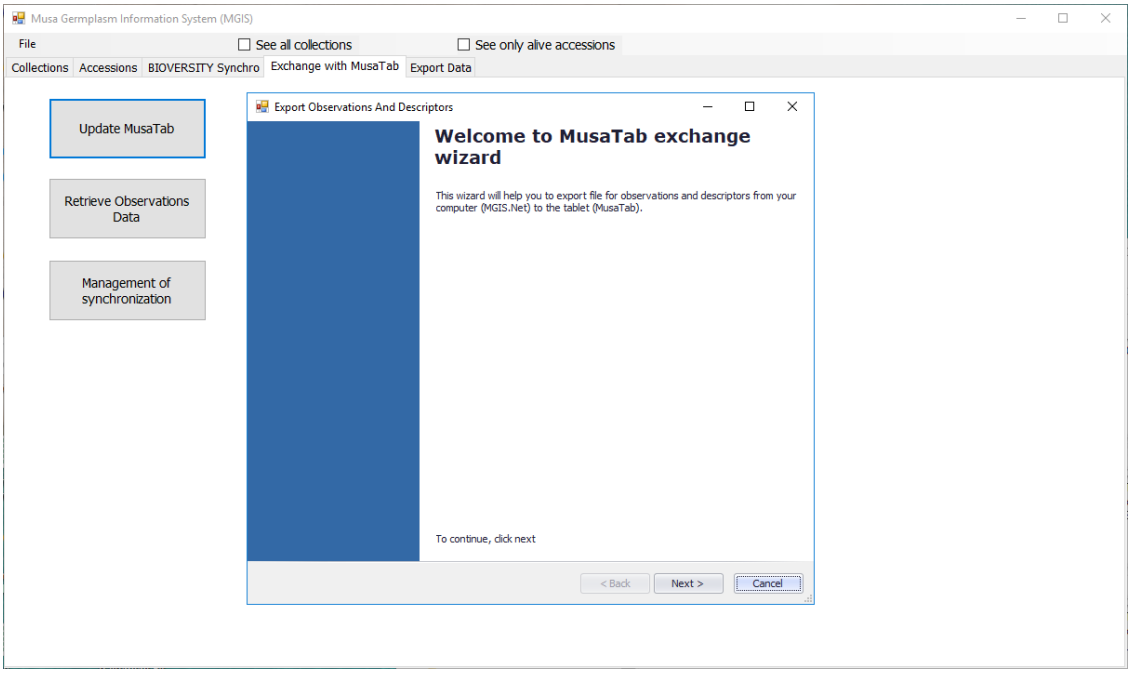
The third button labelled **Managament of synchronization** is for working with previously imported data recorded in MusaTab.




## A. UPDATE MUSATAB

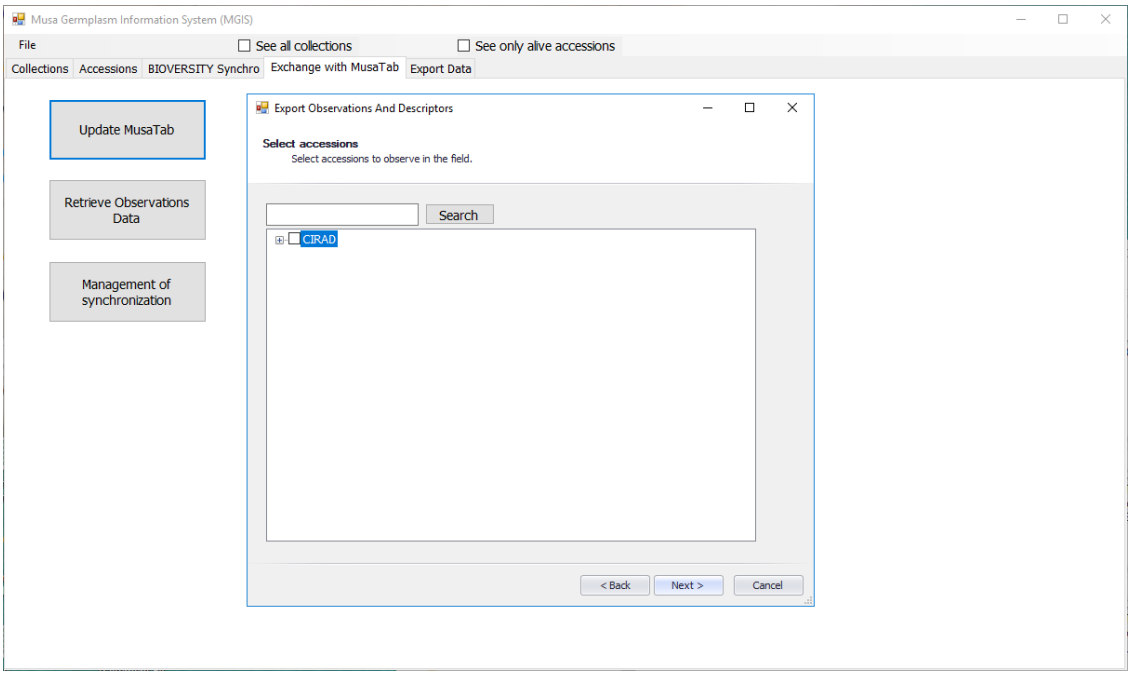
By clicking on this button you will create the files to work with MusaTab. This button launches a wizard, which will help you to select the accessions you want to work with as well as the descriptors you want to observe. At the end of the wizard the files will be automatically copied on the tablet in the correct folder. You will then have to launch the synchronization in MusaTab. We will mention it later in this document but please also refer to the MusaTab Users' document.

This is the first window of the wizard.

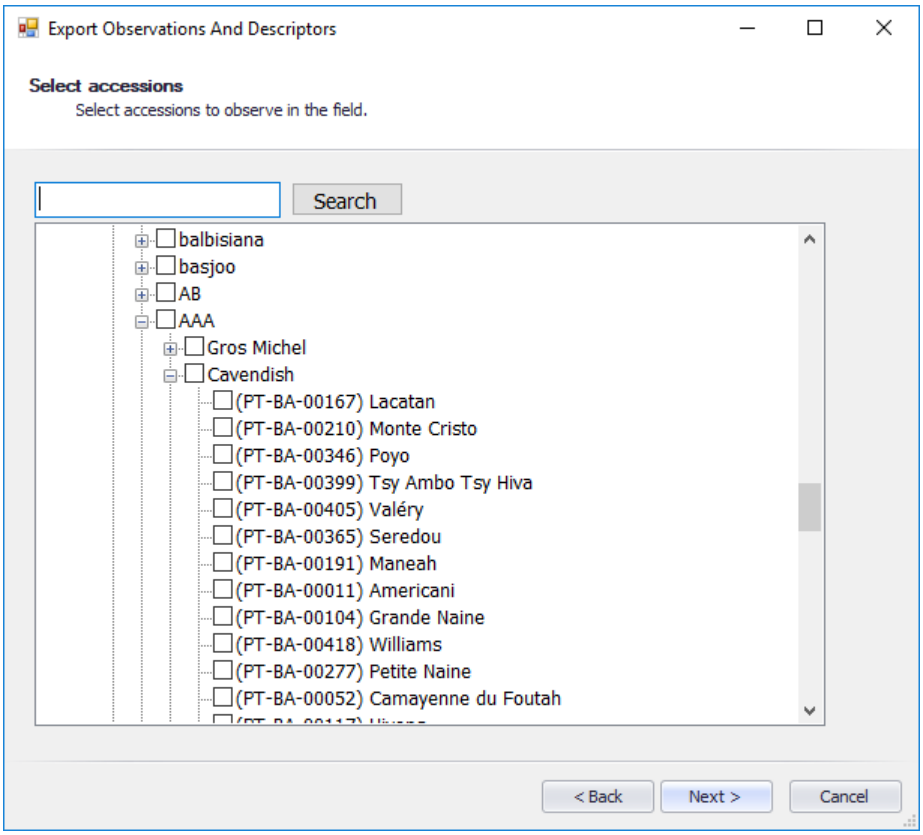



Click on the next button to select the accessions you plan to work with.

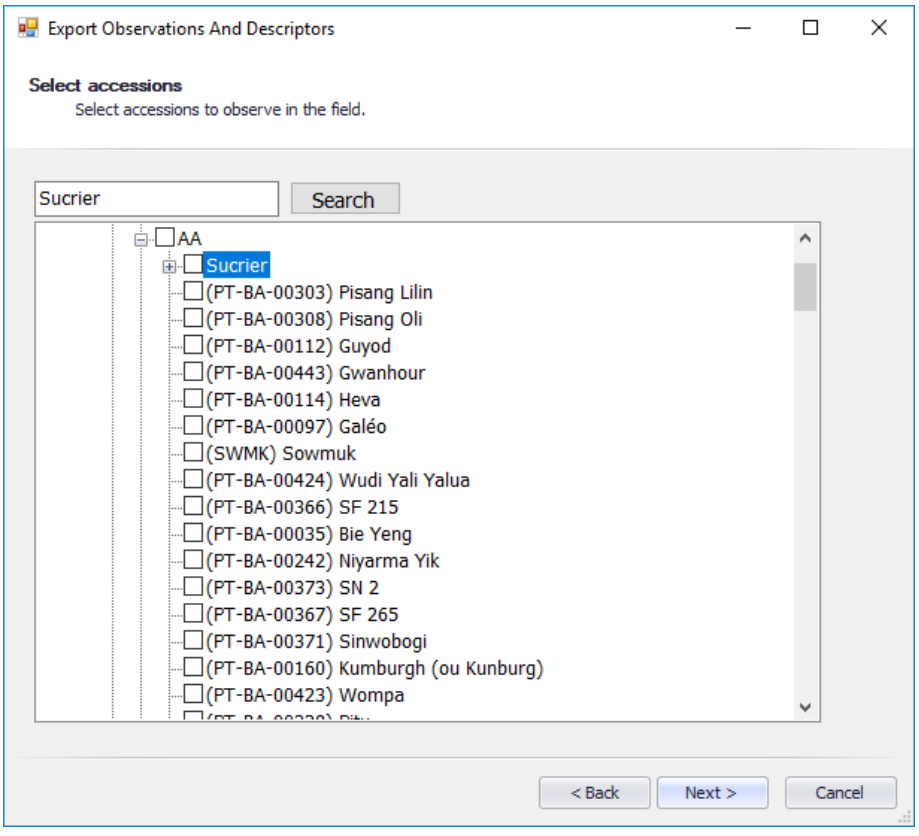
Below is the window for selecting the accessions:



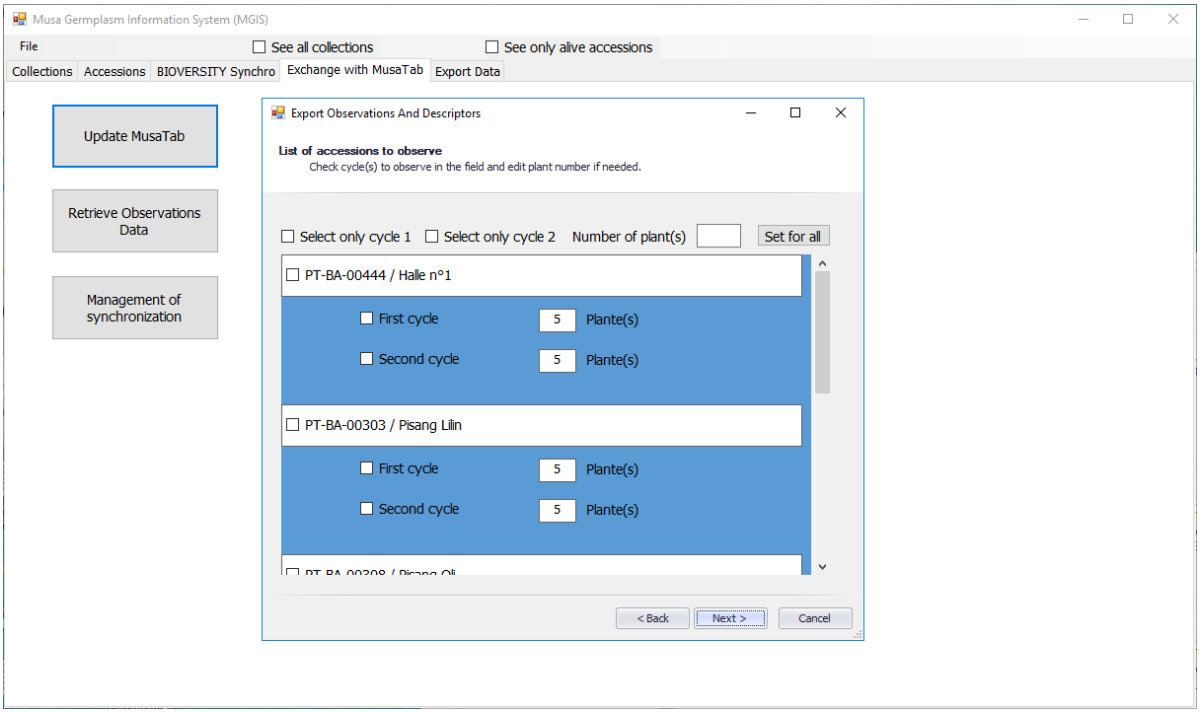

Click on the plus sign to open the tree. Click the tickbox left of the accession name to select the accession. Once you have selected the accession, click on the next button.



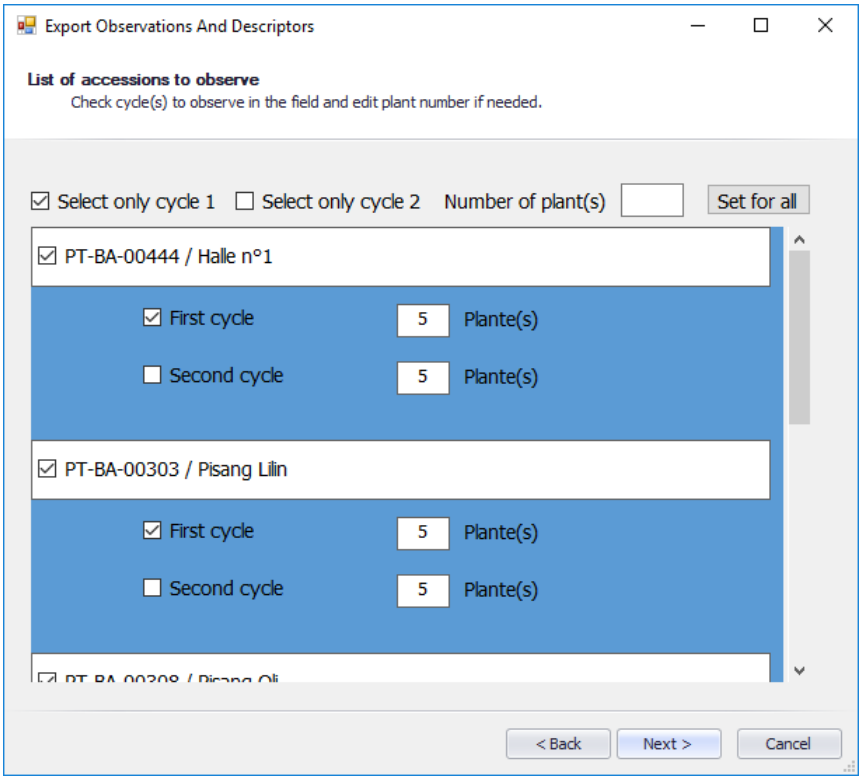

You can also perform a search in the list of accessions by entering the name of an accession or a species/group or subspecies/subgroup in the textbox on left side of the Search button. In the example below the search was on Sucrier. If found in the list you will be positionned on the occurrence found.



The next window will ask you to decide which cycle you want to score and the number of plants per accession you want to observe. By default the number of plants is the number set for each accession.

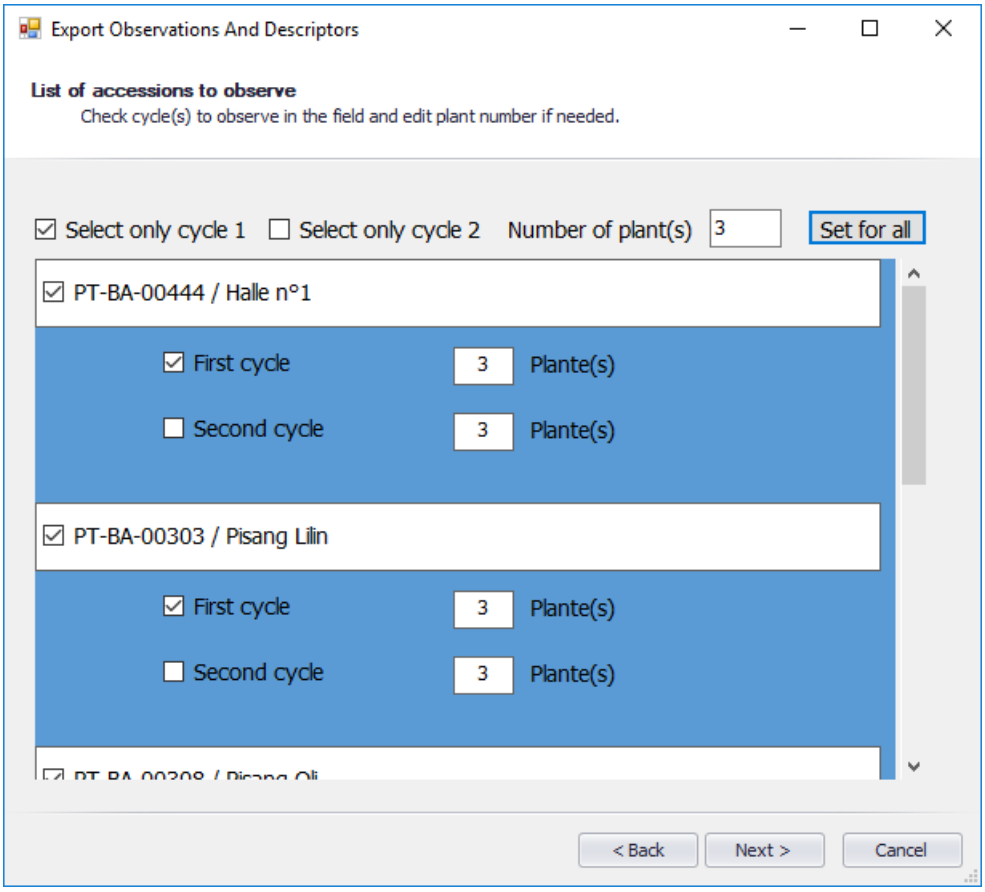



By default no cycle is set you can decide to score all accesions for only cycle 1 by ticking the checbox on left side of the Select only cycle 1 label.as it is presented in the example below. Do the same if you want to score the cycle 2 as well. Untick the checkbox to unselect.



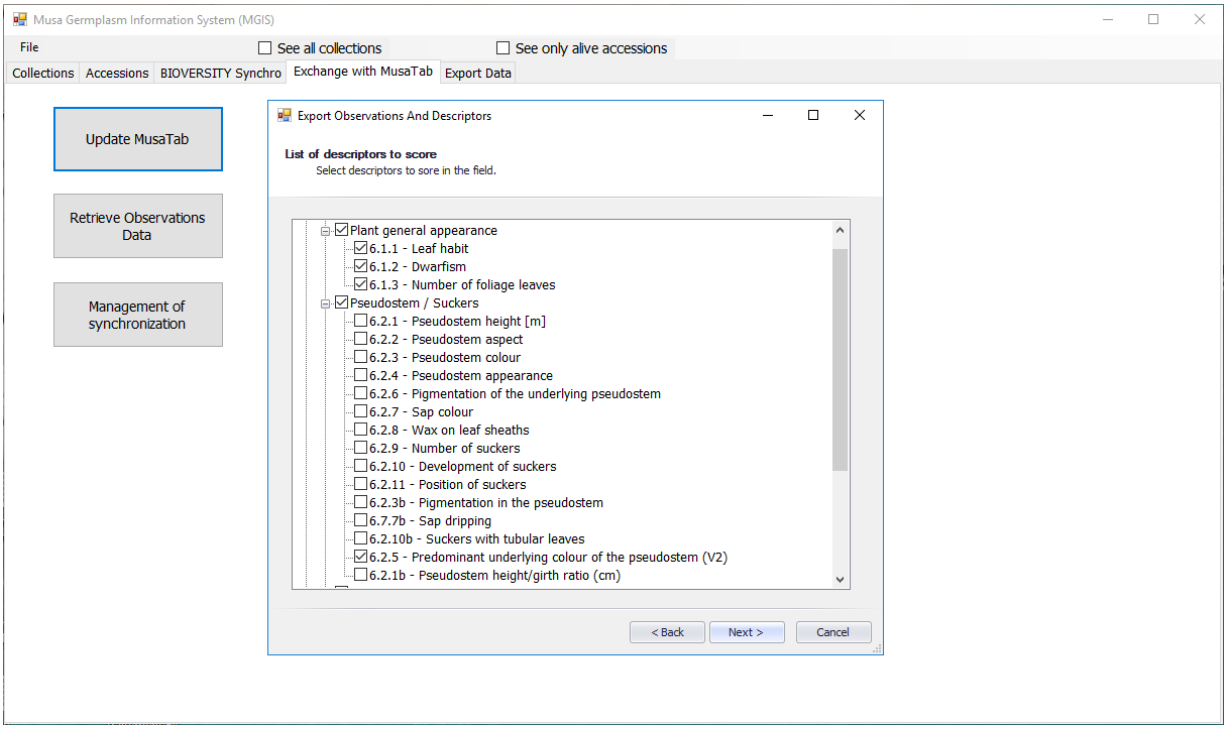

It is also possible to check manually cycle for each accessions of the list. Use the scoll bar on the right of the accessions lists to perform the task for each accession selected.

The number of plants to score can be edited for each accession in this screen or set for all accessions by using the textbox on left side of the set for all button. In the example below the number was set to 3 and once the button Set for all is clicked the field content is updated.



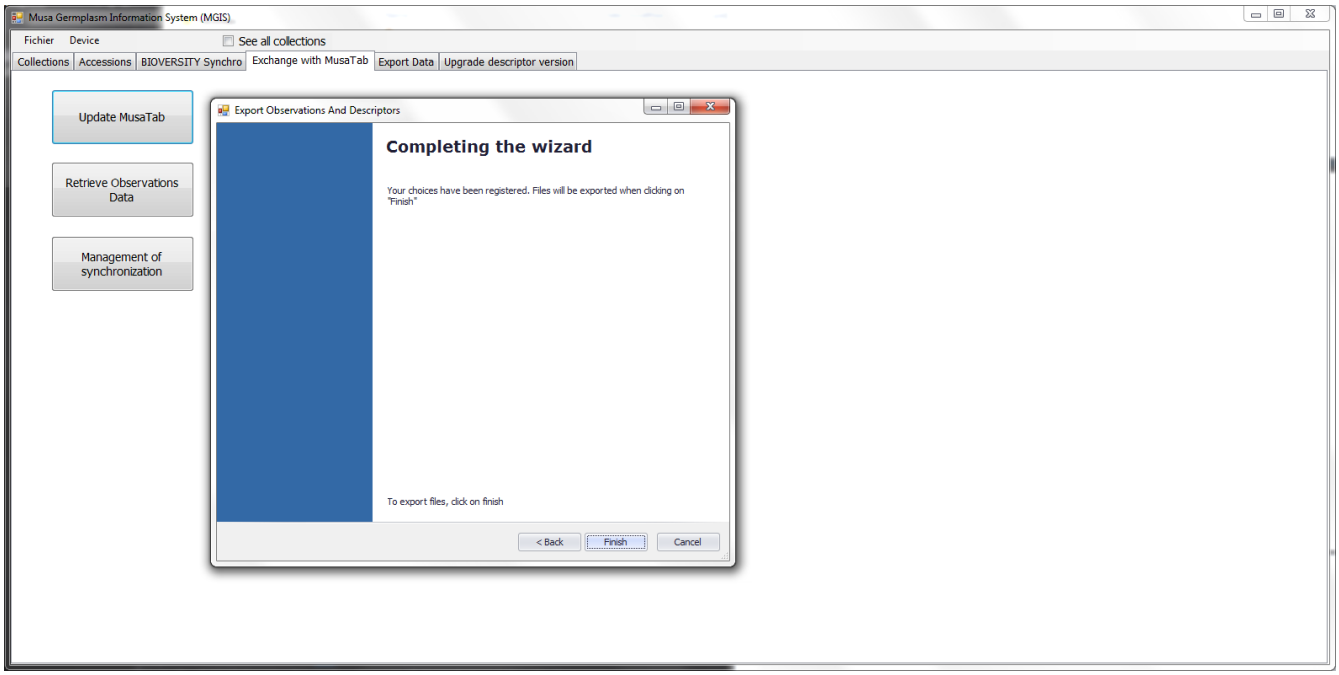
Once this activity is completed click on the next button.

Below is the window to select the descriptors you want to observe in the field.

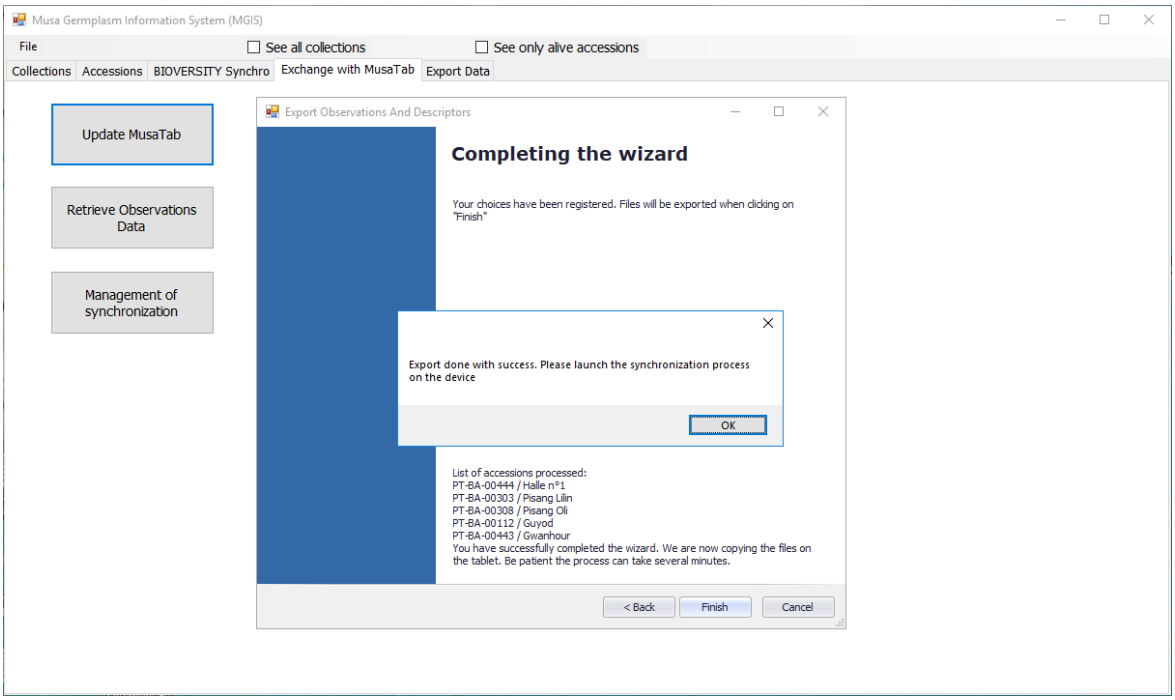



Click on the plus sign to open the tree. Click the tickbox on left side of the descriptor name to select the descriptor. Once you are ok with the list of descriptors click on the next button.

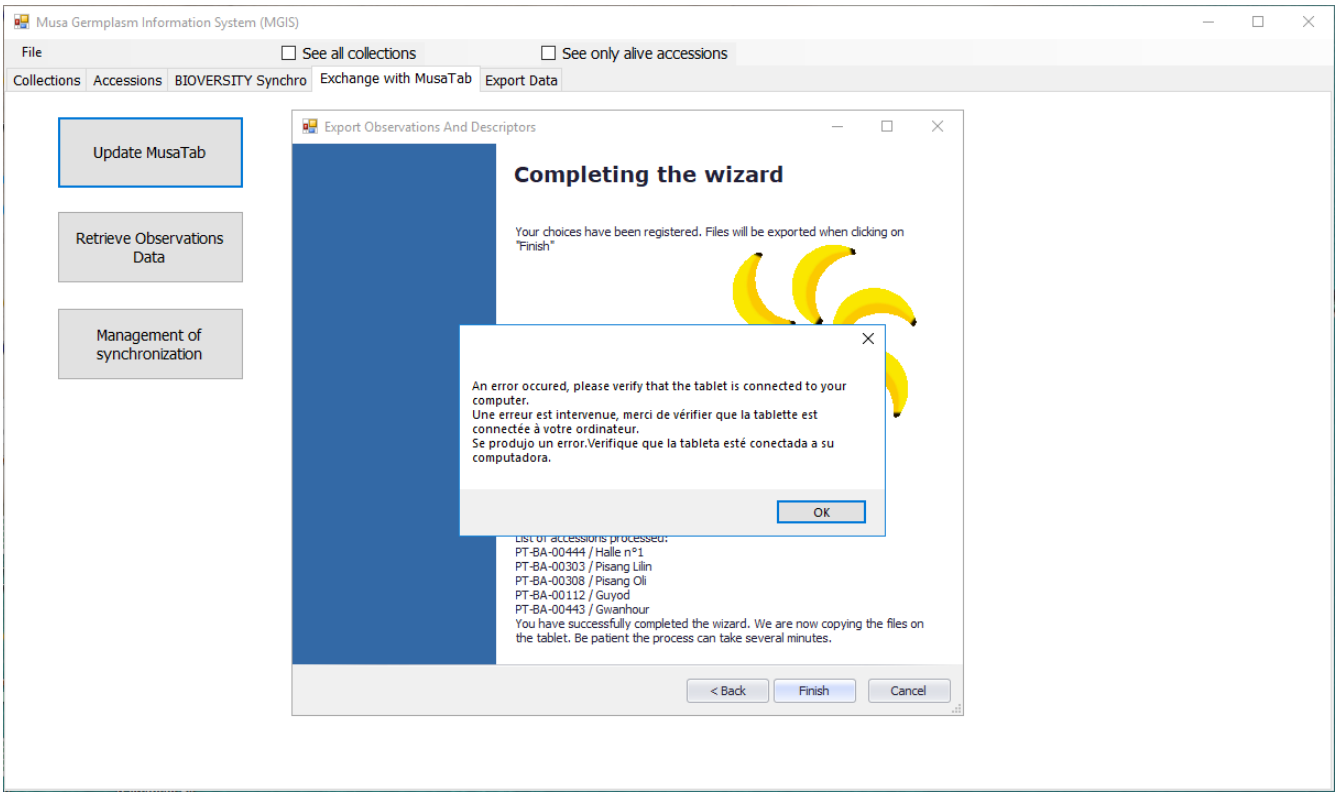
This is the last window of the wizard, but you can still modify the accessions ot the descriptors list by clicking on the Back button. If everything is fine just click on the next button.




After a while the following message of success might appear.

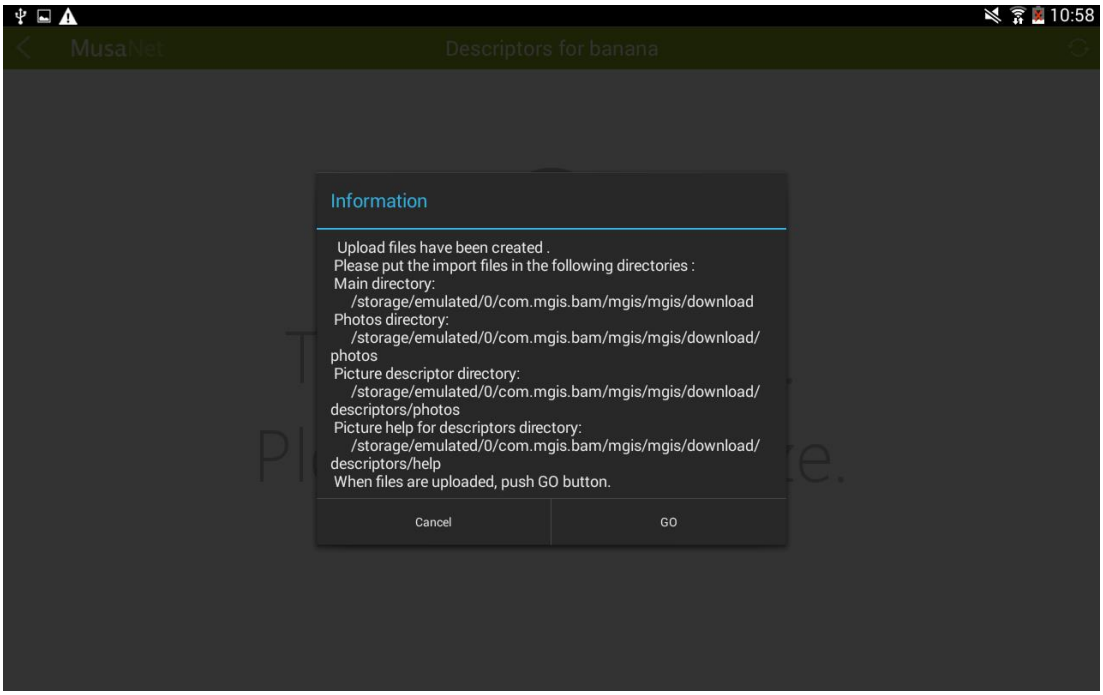


If you forget to connect your tablet or another USB drive is connected to the computer an error can occur. In this




case you will be informed about the error asking you to connect a tablet.

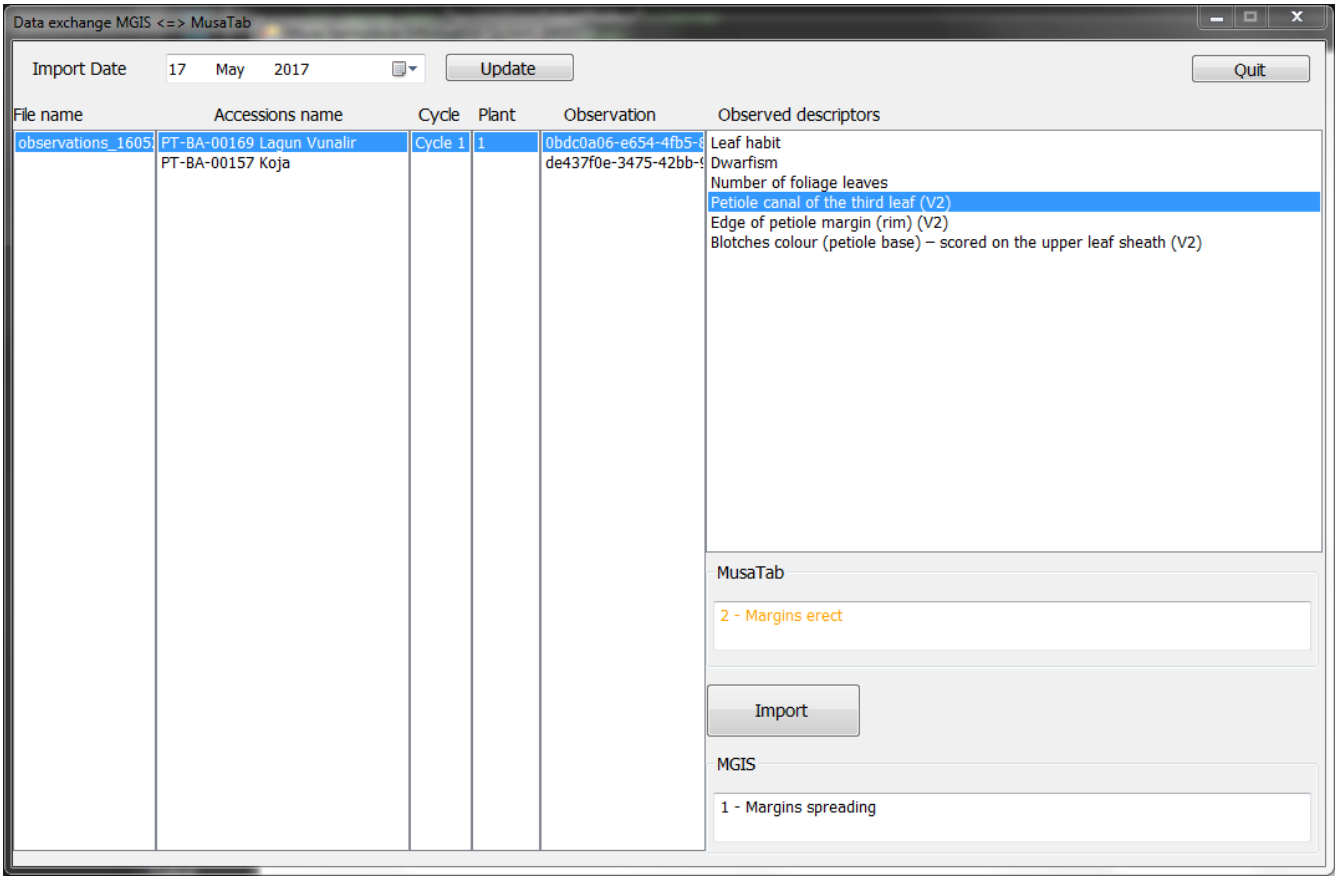
Now open MusaTab on your tablet and launch the synchronization. The synchronization is started from the tablet by clicking the circled arrow on top right of the main page. A popup window will appear (see the screenshot below).




Once this is done, click Go. The observations will be archived and MusaTab will use the latest accessions and descriptors list you uploaded to MusaTab and thus resetting the application. Next the following window will appear.

## B. RETRIEVE OBSERVATIONS DATA

The next window displays the observations data recorded through MusaTab.




The window displays the observations made on the plants per accession made with MusaTab. The list of descriptors that has been scored appears to the right.

You first need to select the accession, then the cycle, then the plant and lastly the observation. Once selected, you can click on the different descriptors to view the observation (or non-observation) scored in the field which is displayed in the MusaTab text box below the descriptors list. The content of MGIS is displayed in the MGIS text box.

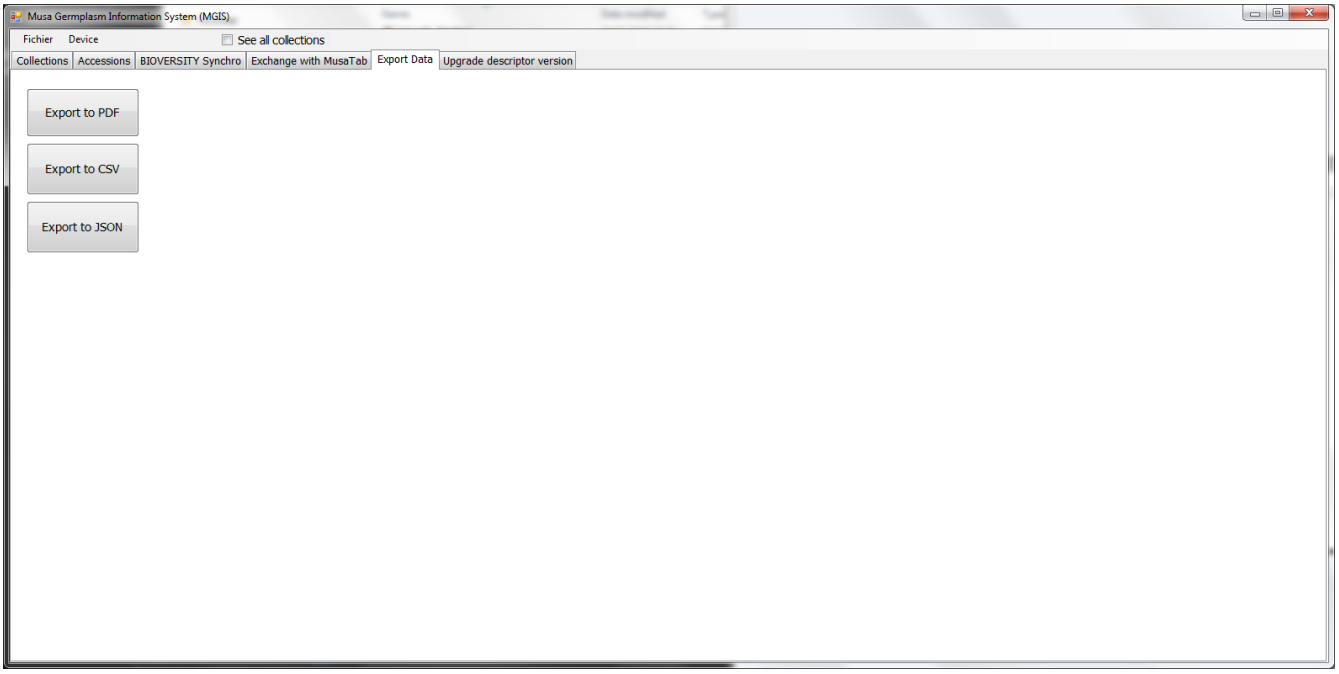
If you want to import the value of one specific descriptor into MGIS: select the descriptor, be sure that you are on the right accession and click on the **Import** button.

They are no summaries of the different observations made on each plant of an accession. It is up to you to decide which observation will update MGIS records for this specific accession.

MGIS manages accession level information. That means that the data observed and collected for several plants of one accession are not saved in the database. Only the value of one descriptor of one plant of an accession is recorded in the database. Also MGIS does not keep records of the different values observed over time for an accession: the latest observation replaces the previous one.

## 8. EXPORT DATA

This tab will allow you to export the data of your collection in three different formats.




This button will generate a PDF file for each accession of the collection. The PDF is named the same name of the accession. The PDF contains the Passport Data and the characterization Data.

### A. EXPORT TO CSV

This button will generate a CSV file containing the passport Data of all the accessions of the collection.

### B. EXPORT TO JSON

This button generates a JSON file containing the passport Data and the characterization data of the collection for MusaID.

# ANNEXES

*ANNEX 01*

# ORGANISATION OF THE MGIS FOLDER

ANNEX 02

# EXCHANGE FORMAT

## 1. Introduction

This document aims to frame the data exchanges between the mobile applications MusaTab and MGIS.Net. The modalities of the exchanges and their format are described in order to guarantee a coherent operation between the different applications. For the sake of compatibility, all photos must be provided in jpg or png format.

## 2. Synchronization

The synchronization between a tablet and a PC is done by wired link (USB). The PC and the tablet must have direct access to a shared directory on the tablet to allow the exchange of information via this directory (deposit / recovery of data file and photos).

The shared directory must be on the tablet because it has no direct access to the PC in the USB connection. Archiving of data is recommended at the MGIS application level to avoid possible data loss. This archiving must be done on the PC.

The setting of the tablet (access permission of the PC to the memory card of the tablet) is done for each of the tablets by each user.

### Organisation of the synchronization folder

The tree on the shared directory should be:

\ : Root of the shared folder. Theoretically, no files should be copied here

\upload\ : Deposit folder for information (i.e. observations) from the tablet during synchronization process. At the root of this folder, only the file containing the information on observations done is present. This file is named « observations_DDMMYYYY_HHMMSS.json » where: DDMMYYYY is replaced by the synchronization date and HHMMSS is replaced by the synchronization time.

\upload\photos\ : Folder where the photos from the tablet (i.e. photos taken during observations) are copied during synchronization process. The name of the photo file should be the same as the file name recorded in the observations synchronization file.

\download\ : Deposit folder of information sent to the tablet. Only the synchronization files should be present in this folder.

accessions.json : This file contains the list of accessions to upload into the mobile application. For each accession, the cycles, the plants and the observations (if they exist) are included.

descriptors.json : This file contains the list of descriptors with their information. This file might be present only if you want to synchronize the descriptors list.

\download\photos\ : Folder in which to copy the photos corresponding to the previous observations. The name of the photo file should be the same as the file name recorded in the observations synchronization file (observations.json).

\download\descriptors\photos\ : Deposit folder of photos of descriptors. The name of the photo file should be the same as the file name recorded in the descriptors synchronization file (descriptors.json).

\download\descriptors\help\ : Deposit folder of photos used for the help on descriptors. The name of the photo file should be the same as the file name recorded in the descriptors synchronization file (descriptors.json).

### Synchronization

The synchronization is triggered from the tablet via the button provided for this purpose on the main screen (tiles).

During synchronization, the synchronization file is generated based on the data in the tablet. This generated file is then deposited on the directory provided for this purpose, as well as all the photos linked to the observations (copy).

After this first step is complete, a screen appears. This screen displays a message similar to: "The synchronization between the tablet and the PC is complete. Please start the synchronization on the PC and select the perimeter to make available to the tablet. Once these operations are completed, you can click on 'Continue' ".

A "Continue" button is available on this screen. This button starts the process of importing the information available in the "\ download \" directory. On this same screen, a cancel button is available to stop synchronization processing.

During this phase (pending confirmation), the user must perform the necessary operations on MGIS in order to:

- integrate the data provided by the tablet
- make the data and photos available to the mobile application.

Ideally, this phase should also allow users to archive and empty the \ upload directory for future synchronizations.

The process of importing the PC to the tablet verifies the presence of the observation.json file. If necessary, this process downloads the contents of the observation photos directory and then browses the formatted observations file as shown below.

In a second step, the process verifies the presence of the descriptors.json file and performs the appropriate operations of downloading the photos and updating the data of the descriptors.

Due to the inability to communicate between the PC and the tablet in a wired connection (impossibility of setting up Webservices), the triggering of the actions of synchronization must be done manually.

At the end of a successful synchronization operation, the shared directory is completely emptied to avoid cluttering the tablet unnecessarily. Therefore a backup of the data imported from the tablet to the PC during this operation is recommended.

## 3. Exchange formats

The exchanges are made via text files in JSON format (http://www.json.org/). Exchanges can be validated by tools available online (for example: http://jsonlint.com/, http://jsonviewer.stack.hu/, etc.)

The format of each required files is described in the paragraphs below.

The formats described take into account case and emphasis.

## Accessions

This exchange format is unidirectional and it is only used for synchronisation from PC to Tablet. This file must contain the whole accessions you plan to work with. MusaTab imports everything, erasing the previous accessions list. This file is named observations.json.

### Format

The JSON format of accessions is as follow:

```
[ {
        "idAccession": <TEXT>,
        "accessionName": <TEXT>,
        "accessionLocation": <TEXT>,
        "accessionClassification": <TEXT>,
        "accessionNumber": <TEXT>,
        "accessionPlantingDate": <TEXT>,
        "cycles": [
                {
                "idCycle": <INTEGER>,
                "cycleNumber": <TEXT>,
                "cycleTitle": <TEXT>,
                "plants": [
                        {
                        "idPlant": <INTEGER>,
                        "plantNumber": <TEXT>,
                        "observations": [ ]
                        }, …
                ]
                }, …
        ]
}, … ]
```

### Detail of the format

The proposed format shows only one accession. It is obviously possible to manage several accessions with this exchange format.

idAccession : It allows the identification of the accession. This identifier might be unique in the whole database

accessionName : Name of the accession. This name is displayed on the Tile of MusaTab.

accessionLocation : Coordinate X (row), Y(line) of the accession in the field.

accessionClassification : Taxonomic classification of the accession (lowest level known).

accessionNumber : Accession number of the accession.

accessionPlantingDate : Planting Date of the accession.

#### *Cycles*

idCycle : Allows the identification of the current cycle. This identifier is a number. By default, only 2 cycles are required for a complete observation of a plant. Nevertheless, MusaTab can manage more cycles.

cycleNumber : Number of the cycle.

cycleTitle : Label of the cycle displayed on the tile of the cycle.

#### *Plants*

idPlant : Allows the identification of the plant observed within a cycle and for an accession. It is then possible to have different number of plants depending on the cycle (case of lost or eliminated plants between several cycles).

plantNumber : Number of the plant. This number is displayed on the tile of the plant.

Observations: An array that will be filled during synchronization process with the value of each descriptor observed.

### example

[{"idAccession":" 01GLP005_63 ","accessionName":" PT-BA-00303 / Pisang Lilin ","accessionLocation":"__","accessionClassification":"AA","accessionNumber":"PT-BA- 00303 ","accessionPlantingDate":"","cycles":[{"idCycle":1, "cycleNumber":1,"cycleTitle":"First cycle","plants":[{"idPlant":45,"plantNumber":"plant 1","observations":[]},{"idPlant":46,"plantNumber":"plant 2","observations":[]},{"idPlant":47,"plantNumber":"plant 3","observations":[]},{"idPlant":48,"plantNumber":"plant 4","observations":[]},{"idPlant":49,"plantNumber":"plant 5","observations":[]}]}]}]

## Descriptors

This exchange format is unidirectional and it is only used for synchronisation from PC to Tablet. This file must contain the whole descriptors you plan to work with. MusaTab imports everything, erasing the previous descriptors list. This file is named descriptors.json.

### Format

The JSON format of descriptors is as follow:

```
[ {
        "idDescriptor": <INTEGER>,
        "descriptorRevisionNumber": <TEXT>,
        "descriptorOrder": <TEXT>,
        "descriptorTitle": <TEXT>,
        "descriptorLabel": <TEXT>,
        "descriptorType": <INTEGER>,
        "descriptorVersion": <TEXT>,
        "help":
                {
                        "descriptorLabelHelp": <TEXT>,
                        "descriptorPictureHelp": <TEXT>
                },
                "details": [
                                {
                                "idDescriptordetail": <INTEGER>,
                                "descriptordetailLabel": <TEXT>,
                                "descriptordetailPicture": <TEXT>
                                }, …
                        ]
} , … ]
```

### Detail of the format

This format of exchange is a table allowing one to list the whole descriptors required for an observation. The format described here is only one occurrence of the table.

idDescriptor : Identifier of the descriptor. This identifier is provided by MGIS database in order to guarantee the integrity of the database. This identifier is used for the synchronisation of observations and must be unique in the database.

descriptorRevisionNumber: This is the revision number of the descriptor according to the descriptor booklet.

descriptorOrder : This code provided by MGIS database concatenates the id of the paragraph and the order number of the descriptor within the paragraph. This code also allows users to order the descriptors on MusaTab.

descriptorTitle : This item contains the short title of a descriptor. This title is displayed in the descriptors list in the record observation screen.

descriptorLabel : This item describes the help for scoring a descriptor. The descriptor label is displayed on the record observation screen. This descriptorLabel can be empty.

descriptorType : This item defines the type of descriptor : descriptor with multiple choice or with direct entry. The possible types are as follow: 1 = multiple choice / 2 = data entry. In the case of multiple choice, the available options are described in the associated table “detail”. If the value differs from 1 or 2, the descriptor is not taken into account during synchronization.

descriptorVersion : Version of the descriptor.

### *Help*

descriptorLabelHelp : This item allows users to fill in the descriptor help. This item is not mandatory.

descriptorPictureHelp : This item allows users to specify the path of the image associated to the descriptor help. This item is not mandatory.

### *Details*

This array lists the different choices and corresponding photo available for the selected descriptor.

idDescriptordetail : This item stores the coded value of one modality. This id must be unique within the descriptor.

descriptordetailLabel : This item corresponds to the label displayed in the list of choice available for a descriptor. When this item is absent or empty, no choice is proposed on the interface to the user.

descriptordetailPicture : This item allows users to store the name of the photo displayed on the record observation screen. The photo names are normalized. They follow the descriptor revision number in which the dots are replaced by an underscore e.g. for descriptor 6.1.1 modality 1 the photo will be named 6_1_1_1.jpg/png.

### example

[{"idDescriptor":4000001,"descriptorRevisionNumber":"6.1.1","descriptorOrder":"001001","descriptorTitle":"6.1.1 : Leaf habit","descriptorLabel":null,"descriptorType":1,"descriptorVersion":"1","help":{"descriptorLabelHelp":"","descriptorPictureHelp":"6_1_1.png"},"details":[{"idDescriptordetail":1,"descriptordetailLabel":"Erected","descriptordetailPicture":"6_1_1_1.png"},{"idDescriptordetail":2,"descriptordetailLabel":"Intermediate","descriptordetailPicture":"6_1_1_2.png"},{"idDescriptordetail":3,"descriptordetailLabel":"Drooping","descriptordetailPicture":"6_1_1_3.png"}]}]

## Observations

This exchange format is two-way and can be generated by MusaTab (Upload synchronization) or imported (in case of synchronization of existing observations in MGIS). This file is named observations_DDMMYYYY_HHMMSS.json when synchronization is performed.

### Format

The JSON format of the observations is as follows:

```
[{
        "idAccession": <INTEGER>,
        "accessionName": <TEXT>,
        "accessionNumber": <TEXT>,
        "accessionLocation": <TEXT>,
        "accessionClassification": <TEXT>,
        "accessionNumber": <TEXT>,
        "accessionPlantingDate": <TEXT>
        "cycles": [
                {
                "idCycle": <INTEGER>,
                "cycleNumber": <TEXT>,
                "cycleTitle": <TEXT>,
                "plants": [
                        {
                        "idPlant": <INTEGER>,
                        "plantNumber": <TEXT>,
                        "observations": [
                                {
                                "idObservation": <TEXT>,
                                "observationDate": <TEXT>,
                                "observerFirstName": <TEXT>,
                                "observerLastName": <TEXT>,
                                "observerPosition": <TEXT>
                                "details": [
                                        {
                                        "idDescriptor": <INTEGER>,
                                        "descriptorVersion": <TEXT>,
                                        "idDescriptordetail": <INTEGER>,
                                        "observationdetailLabel": <TEXT>,
                                        "observationdetailNote": <TEXT>,
                                        "observationdetailPhoto": <TEXT>
                                        }, …
                                ]
                                }, …
                                ]
                        }, …
                        ]
                }
        ]
}, … ]
```

### Detail of the format

#### *Accessions*

The proposed format shows only one accession. It is obviously possible to manage several accessions with this exchange format.

idAccession : It allows the identification of the accession. This identifier must be unique in the whole database

accessionName : Name of the accession. This name is displayed on the Tile of MusaTab.

accessionLocation : Coordinate X (row), Y(line) of the accession in the field.

accessionClassification : Taxonomic classification of the accession.

accessionNumber : AccessionNumber of the accession.

accessionPlantingDate : Planting Date of the accession.

### *Cycles*

idCycle : Allows the identification of the current cycle. This identifier is a number. By default, only 2 cycles are required for a complete observation of a plant. Nevertheless, MusaTab can manage more cycles.

cycleNumber : Number of the cycle.

cycleTitle : Label of the cycle displayed on the tile of the cycle.

### *Plants*

It is then possible to have different numbers of plants depending on the cycle (case of lost or eliminated plants between several cycles).

idPlant : Allows users to identify the plant observed within a cycle and for an accession.

plantNumber : Plant number of the plant. This number is displayed on the tile of the plant.

### *Observations*

Observation : This array lists all the observations of a plant for a given cycle and for an accession. Each record of an observation generates a new item in the table in order to conserve the history of all modifications.

idObservation : Identifier of the current observation. This identifier is unique and randomly generated by MusaTab during the observation. The format of this unique identifier is as follows: xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx where each character is replaced by an alphanumeric character.

observationDate : The date is ISO 8601 format (YYYY-MM-DDTHH:mm:ssZ where Z corresponds to the time zone using the following format « +XX :XX ») indicates the date/hour of the last update of the observation.

observerFirstName : First name of the person who did the observation.

observerLastName : Last name of the person who did the observation.

observerPosition : Position of the person who did the observation.

### *Details*

Detail : This array lists the whole observation linked to all the descriptors of the observation. It is composed of the id of the descriptor, the value selected or entered as well as the notes and photos taken.

idDescriptor : Identifier of the current descriptor. This identifier is provided by the MGIS database in order to ensure the integrity of the data.

descriptorVersion : Version of the descriptor.

idDescriptordetail : Identifier of the observation for the current descriptor. This identifier corresponds to a value of the modality of the descriptor. In the case of a free entry, this field is empty.

observationdetailLabel : In the case of a data entry this is where the value is stored. In the case of descriptor with multiple choices, the field is empty.

observationdetailNote : This field contains the note taken by the user for the given descriptor. This note is under text format and can contain multiple lines. In this case the line feed is replaced by the characters « \n ». If no note has been recorded the field is empty.

observationdetailPhoto : This field contains the file name of the photo attached to the descriptor. In the absence of photos the field is empty. The format of the file name is as follows:

<idAccession>_<idCycle>_<idPlant>_<idDescriptors>.jpg

### Examples

In this example we made the following two assumptions:

1. Three accessions, one cycle, five plants
2. Nine descriptors are available on MusaTab

[{"idAccession":"01GLP005_63","accessionName":"PT-BA-00303 / Pisang Lilin","accessionLocation":"__","accessionClassification":"AA","accessionNumber":"PT-BA-00303","accessionPlantingDate":"","cycles":[{"idCycle":1,"cycleNumber":1,"cycleTitle":"First cycle","plants":[{"idPlant":45,"plantNumber":"plant 1","observations":[{"idObservation":"5b3ca9db-db7a-4952-8642-52b3d9918a30","observationDate":"2019-05-17 09:53:09 +00:00","observerFirstName":"m","observerLastName":"r","observerPosition":"b","details":[{"idDescriptor":4000001,"descriptorVersion":"1","idDescriptordetail":1,"observationdetailLabel":"","observationdetailNote":"test","observationdetailPhoto":""},{"idDescriptor":4030001,"descriptorVersion":"1","idDescriptordetail":1,"observationdetailLabel":"","observationdetailNote":"","observationdetailPhoto":""},{"idDescriptor":4010001,"descriptorVersion":"1","idDescriptordetail":2,"observationdetailLabel":"","observationdetailNote":"","observationdetailPhoto":""},{"idDescriptor":4060001,"descriptorVersion":"1","idDescriptordetail":2,"observationdetailLabel":"","observationdetailNote":"","observationdetailPhoto":""},{"idDescriptor":4100001,"descriptorVersion":"1","idDescriptordetail":2,"observationdetailLabel":"","observationdetailNote":"","observationdetailPhoto":""},{"idDescriptor":4020001,"descriptorVersion":"1","idDescriptordetail":3,"observationdetailLabel":"","observationdetailNote":"","observationdetailPhoto":""},{"idDescriptor":4080001,"descriptorVersion":"2","idDescriptordetail":3,"observationdetailLabel":"","observationdetailNote":"","observationdetailPhoto":""},{"idDescriptor":4130001,"descriptorVersion":"1","idDescriptordetail":3,"observationdetailLabel":"","observationdetailNote":"","observationdetailPhoto":""},{"idDescriptor":4120001,"descriptorVersion":"2","idDescriptordetail":5,"observationdetailLabel":"","observationdetailNote":"","observationdetailPhoto":""}]}]},{"idPlant":46,"plantNumber":"plant 2","observations":[]},{"idPlant":47,"plantNumber":"plant 3","observations":[]},{"idPlant":48,"plantNumber":"plant 4","observations":[]},{"idPlant":49,"plantNumber":"plant 5","observations":[]}]}]},{"idAccession":"01GLP005_64","accessionName":"PT-BA-00308 / Pisang Oli","accessionLocation":"__","accessionClassification":"AA","accessionNumber":"PT-BA-00308","accessionPlantingDate":"","cycles":[{"idCycle":2,"cycleNumber":1,"cycleTitle":"First cycle","plants":[{"idPlant":50,"plantNumber":"plant 1","observations":[]},{"idPlant":51,"plantNumber":"plant 2","observations":[]},{"idPlant":52,"plantNumber":"plant 3","observations":[]},{"idPlant":53,"plantNumber":"plant 4","observations":[]},{"idPlant":54,"plantNumber":"plant 5","observations":[]}]}]},{"idAccession":"01GLP005_66","accessionName":"PT-BA-00112 / Guyod","accessionLocation":"__","accessionClassification":"AA","accessionNumber":"PT-BA-00112","accessionPlantingDate":"","cycles":[{"idCycle":3,"cycleNumber":1,"cycleTitle":"First cycle","plants":[{"idPlant":55,"plantNumber":"plant 1","observations":[]},{"idPlant":56,"plantNumber":"plant 2","observations":[]},{"idPlant":57,"plantNumber":"plant 3","observations":[]},{"idPlant":58,"plantNumber":"plant 4","observations":[]},{"idPlant":59,"plantNumber":"plant 5","observations":[]}]}]}]

# *Index*

## *A*



## *C*