

User guide for the catalogoUCsBR – shiny application

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Applications available at:

app_prepare: <https://app-catalogo-ucs-brasil.jbrj.gov.br/prepare>

app_review: <https://app-catalogo-ucs-brasil.jbrj.gov.br/review>

app_publication: <https://app-catalogo-ucs-brasil.jbrj.gov.br/publication>

Package and Application Overview:

The catalogoUCsBR package — developed in R and as a Shiny application — facilitates the creation of comprehensive plant checklists for Brazilian Protected Areas through several data refinement processes. Key functions include combining herbarium records into a desired format, removing duplicates across databases, extracting information on accepted species names, enabling taxonomic revision with digitized images and labels from herbarium collections, and publishing the plant species list in the *Catálogo de Plantas das Unidades de Conservação do Brasil* (<https://catalogo-ucs-brasil.jbrj.gov.br/>). The application follows an easy workflow divided into three key steps: *app_prepare*, *app_review*, and *app_publication*. The dataset for the *Parque Nacional do Descobrimento*, Bahia, Brazil, was used as an example, with detailed instructions

provided in this user manual (files available below). The data is also available within the R package.

Manual for Download Data:

Portuguese: https://app-catalogo-ucs-brasil.jbrj.gov.br//Manual_de_Download_Dados_catalogoUCsBR_portugues.pdf

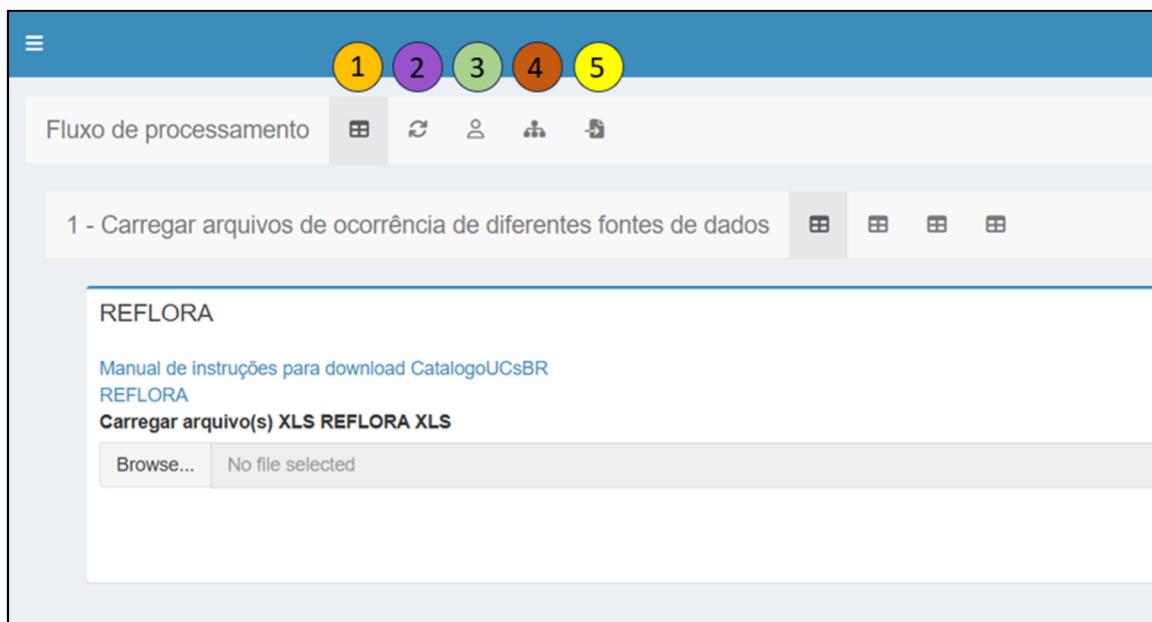
English: https://app-catalogo-ucs-brasil.jbrj.gov.br//User_Guide_Data_Download_catalogoUCsBR_english.pdf

GitHub package:

Package can be accessed through GitHub using the following commands:
“remotes::install_github("pablopains/catalogoUCsBR", dependencies = T)”. If remotes is not yet installed, please use the following command before installing catalogoUCsBR:
“install.packages('remotes', dependencies = T)”.

app_prepare

The app_prepare application accepts raw data matrices from databases such as Reflora, Jabot, INCT Herbário Virtual da Flora e dos Fungos, and GBIF. These matrices must include essential information, such as family name, species names, herbarium barcodes, localities, and collector names and numbers. The application is organized into five main steps, each detailed below by numbers and colors, to facilitate the data preparation process.

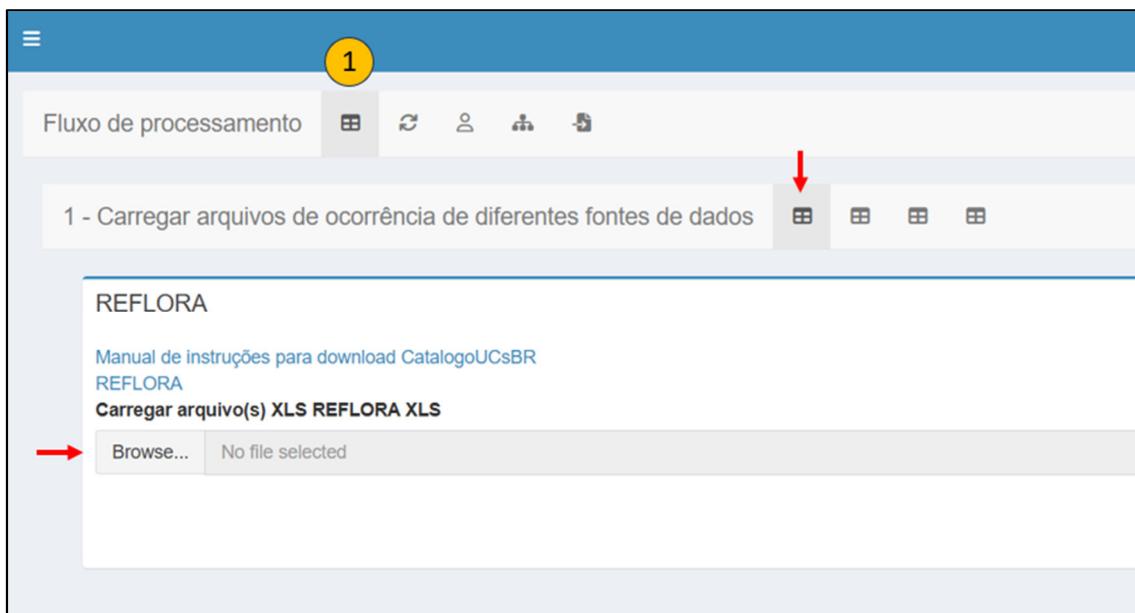


To prepare a species list, you can test the dataset from the 'Parque Nacional do Descobrimento, Bahia, Brazil' as a model, available at:

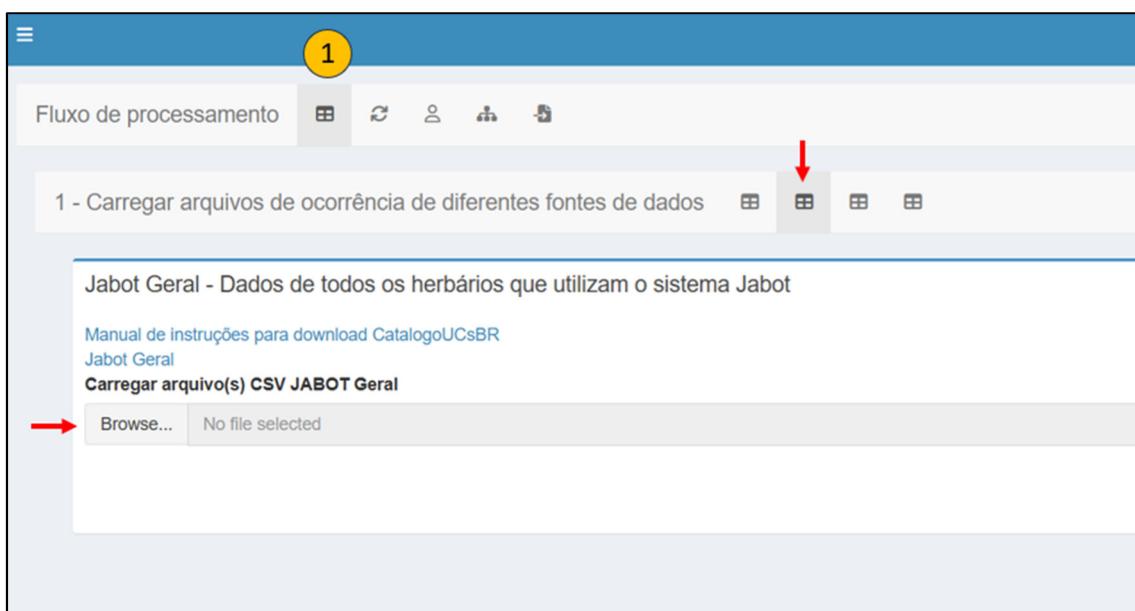
https://github.com/pablopains/catalogoUCsBR/raw/refs/heads/main/PN_Descobrimento/app_prepare_PN_Descobrimento_Reserva_Brasil_Holanda_REFLORA_JABOT_Species_Link.zip

Step 1. Upload virtual herbarium data.

1.1. REFLORA



1.2. JABOT



1.3. INCT Virtual da Flora e dos Fungos

Fluxo de processamento

1

1 - Carregar arquivos de ocorrência de diferentes fontes de dados

SpeciesLink - Ocorrências de plantas

Manual de instruções para download CatalogoUCsBR

SpeciesLink

Carregar arquivo(s) TXT SpeciesLink

Browse... No file selected

Download

1.4. GBIF

Fluxo de processamento

1

1 - Carregar arquivos de ocorrência de diferentes fontes de dados

Arquivos .TXT, em formato Darwin Core, com ocorrência de espécies.

Manual de instruções para download CatalogoUCsBR

GBIF

Carregar arquivo(s) TXT GBIF

Browse... No file selected

Download

Step 2. Standardize and join records

The screenshot shows a software interface titled 'Fluxo de processamento' with a purple circle containing the number '2' at the top right. Below it, the title '2 - Padronizar e unir ocorrências no formato Darwin Core' is displayed. Underneath, there's a section labeled 'Registros padronizados' with a 'Padronizar e unir ocorrências' button. A red arrow points to the 'Baixar' button. The table below shows one entry: 'reflora=ALCB00060703 reflora'. The table has columns: Ctrl_occurrenceID, Ctrl_bibliographicCitation, Ctrl_downloadAsSynonym, Ctrl_scientificNameSearched, Ctrl_scientificNameReference, and Ctrl_acceptedNameUsage.

2.1. Download standardized data.

This screenshot is identical to the one above, showing the 'Fluxo de processamento' interface with the '2 - Padronizar e unir ocorrências no formato Darwin Core' step. A red arrow points to the 'Baixar' button. The table below shows one entry: 'reflora=ALCB00060703 reflora'. The table has columns: Ctrl_occurrenceID, Ctrl_bibliographicCitation, Ctrl_downloadAsSynonym, Ctrl_scientificNameSearched, Ctrl_scientificNameReference, and Ctrl_acceptedNameUsage.

2.2. Upload the csv file in Darwin Core format.

2 - Padronizar e unir ocorrências no formato Darwin Corre

Carregar arquivo CSV de ocorrências já padronizado formato Darwin Corre

Browse... Catalogo_Plantas_UCs_Brasil - Join_occurrence_Darwin_Corre_Terms.csv

Upload complete

Show 10 entries Search:

Ctrl_occurrenceID	Ctrl_bibliographicCitation	Ctrl_downloadAsSynonym	Ctrl_scientificNameSearched	Ctrl_scientificNameReference	Ctrl_acceptedNameUsage
1	jabot=RB-RB00416826	jabot			

Step 3. Standardize the surname of the primary collector. Click on “Obtain the standardized surname of the primary collector”.

3 - Padronizar o sobrenome do colecionador principal

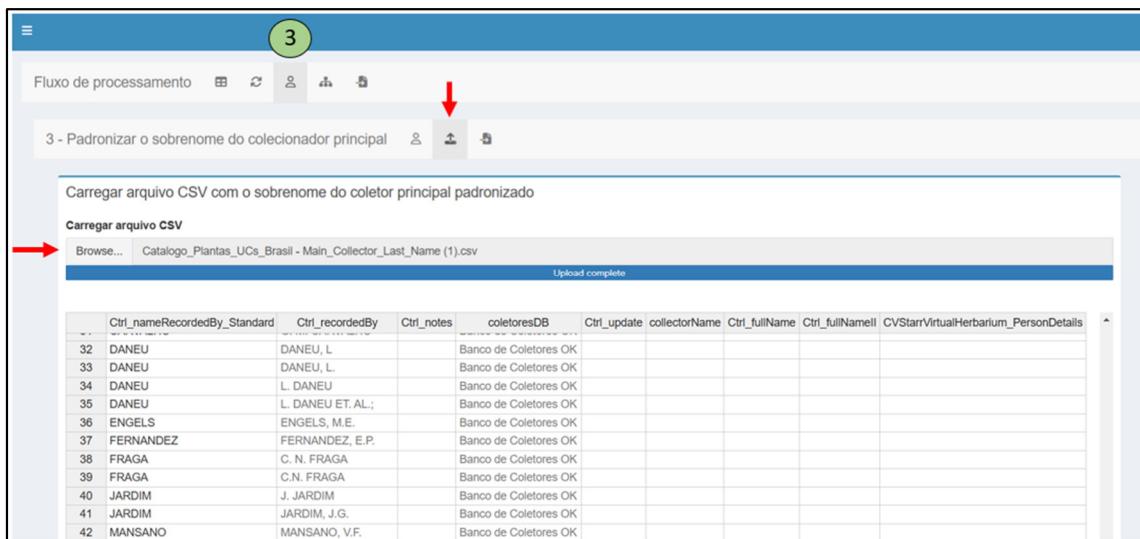
Obter o sobrenome do coletor principal

► Obter o sobrenome do coletor principal padronizado

Baixar

Ctrl_nameRecordedBy_Standard	Ctrl_recordedBy	Ctrl_notes	coletoresDB	Ctrl_update	collectorName	Ctrl_fullName	Ctrl_fullNameII	CVStarrVirtualHerbarium_PersonDetails
1 AMORIM	A.M.AMORIM							
2 BARBOSA	N.C. BARBOSA							
3 CARVALHO	G.M. CARVALHO							
4 DANEU	L. DANEU ET. AL.							
5 DANTAS	DANTAS, P.Q.							
6 DANTAS	DANTAS, TS							
7 FALCAO	FALCÃO, M.J.							
8 FARIA	FARIA, ALA							
9 FERNANDEZ	E.P. FERNANDEZ							
10 FERREIRA-ALVES	FERREIRA-ALVES, R.							
11 HINOSHITA	HINOSHITA, L.K.R.							
12 JOHN	L. JOHN							

3.1. Upload csv file with the standardized surname of the primary collector.



Carregar arquivo CSV com o sobrenome do coletor principal padronizado

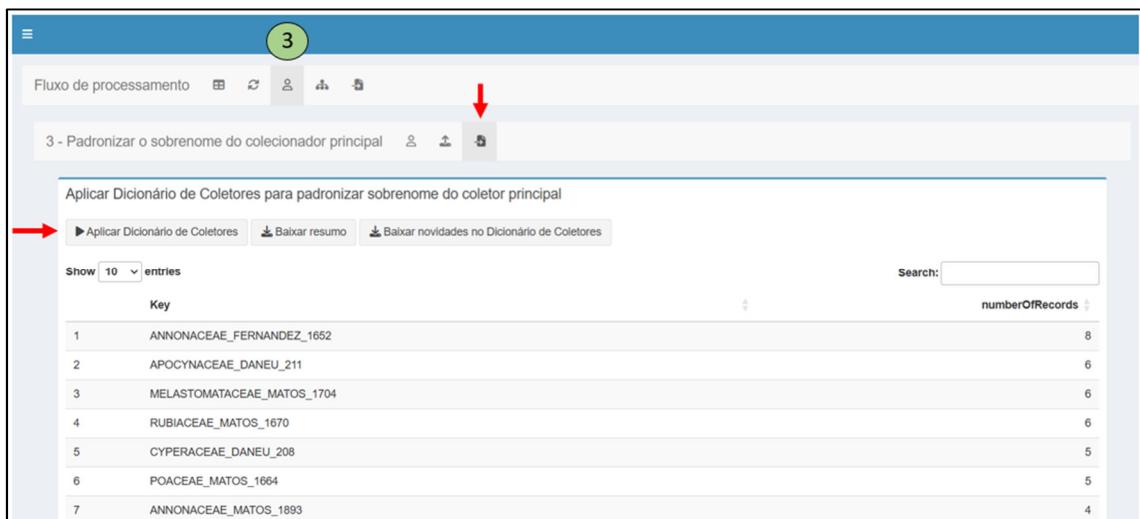
Carregar arquivo CSV

Browse... Catalogo_Plantas_UCs_Brasil - Main_Collector_Last_Name (1).csv

Upload complete

Ctrl_nameRecordedBy_Standard	Ctrl_recordedBy	Ctrl_notes	coletoresDB	Ctrl_update	collectorName	Ctrl.FullName	Ctrl.FullName1	CVStarVirtualHerbarium_PersonDetails
32 DANEU	DANEU, L.		Banco de Coletores OK					
33 DANEU	DANEU, L.		Banco de Coletores OK					
34 DANEU	L. DANEU		Banco de Coletores OK					
35 DANEU	L. DANEU ET. AL.;		Banco de Coletores OK					
36 ENGELS	ENGELS, M.E.		Banco de Coletores OK					
37 FERNANDEZ	FERNANDEZ, E.P.		Banco de Coletores OK					
38 FRAGA	C. N. FRAGA		Banco de Coletores OK					
39 FRAGA	C.N. FRAGA		Banco de Coletores OK					
40 JARDIM	J. JARDIM		Banco de Coletores OK					
41 JARDIM	JARDIM, J.G.		Banco de Coletores OK					
42 MANSANO	MANSANO, V.F.		Banco de Coletores OK					

3.2. Click on “Apply collector dictionary” to standardize the surname of the primary collector.



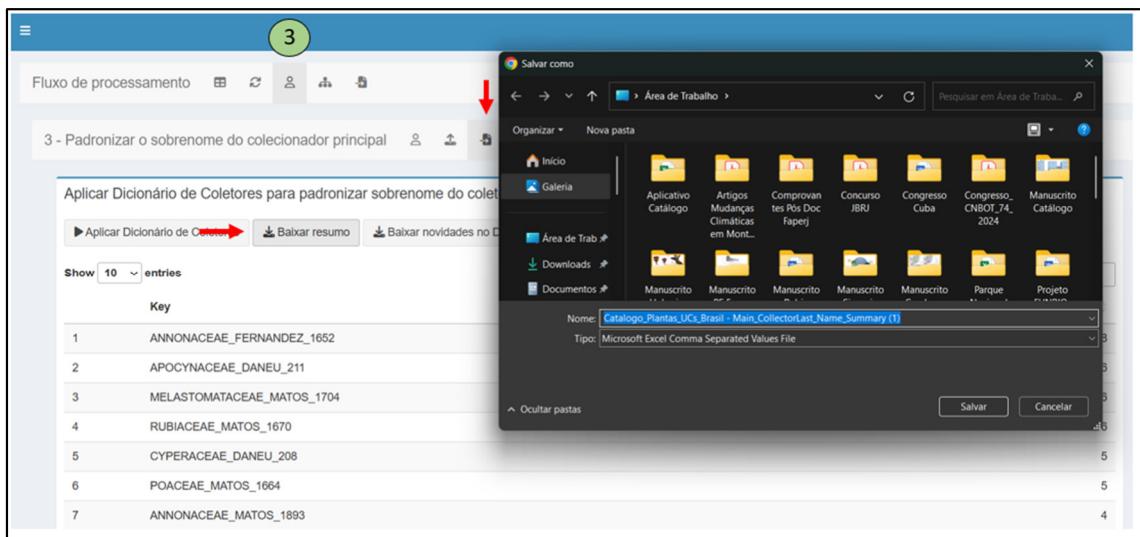
Aplicar Dicionário de Coletores para padronizar sobrenome do coletor principal

► Aplicar Dicionário de Coletores Baixar resumo Baixar novidades no Dicionário de Coletores

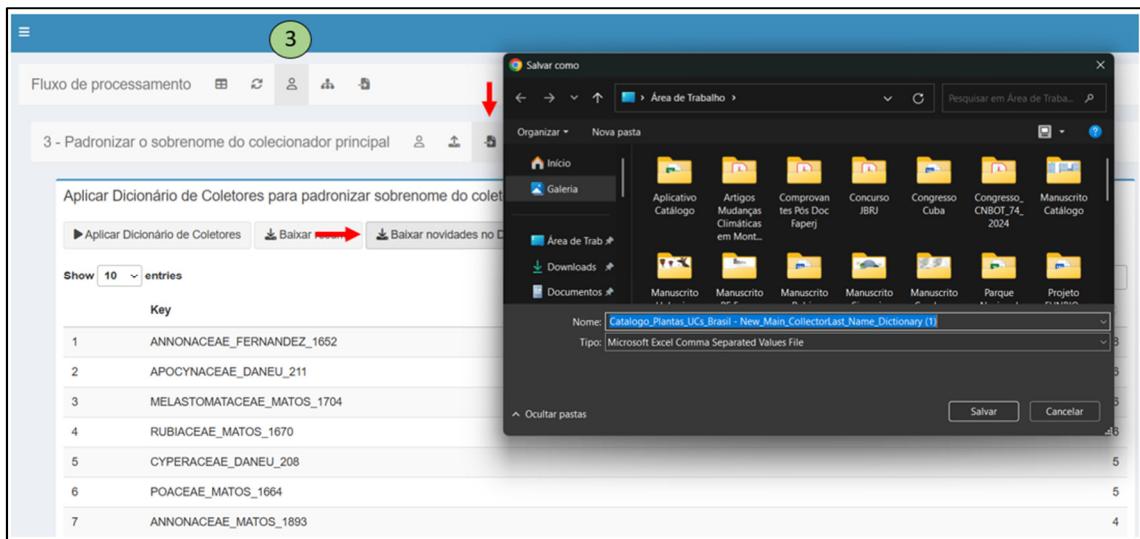
Show 10 entries

Key	number of Records
1 ANNONACEAE_FERNANDEZ_1652	8
2 APOCYNACEAE_DANEU_211	6
3 MELASTOMATACEAE_MATOS_1704	6
4 RUBIACEAE_MATOS_1670	6
5 CYPERACEAE_DANEU_208	5
6 POACEAE_MATOS_1664	5
7 ANNONACEAE_MATOS_1893	4

3.4. Click on “Download Summary”.



3.3. Click on “Download updates in the collector dictionary”.



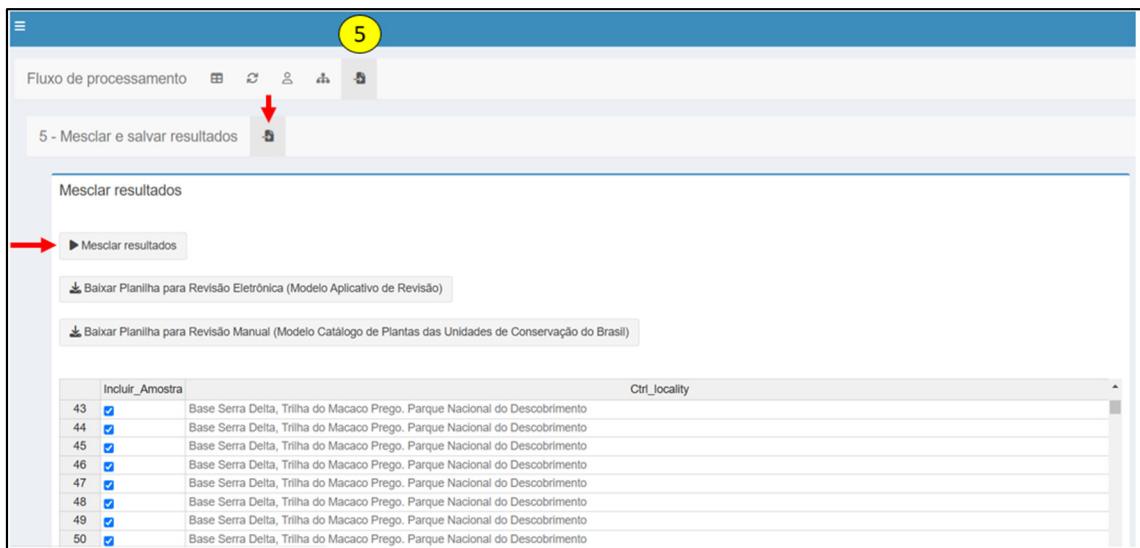
Step 4. Click on “Load species names from the Flora and Funga of Brazil”.

The screenshot shows a software interface titled 'Fluxo de processamento'. A large orange circle with the number '4' is at the top center. Below it, a section is titled '4 - Verifique os nomes das espécies'. A red arrow points to a button labeled 'Carregar nomes das espécies de Flora e Funga do Brasil'. The interface includes fields for 'Family' (set to 'Tudo'), 'Nível taxonómico' (set to 'ESPECIE'), and 'Status taxonómico' (set to 'NOME_ACEITO'). There are dropdown menus for 'Show' (set to '10 entries') and 'Search'. A table below lists one entry: ID 1, AcceptedNameUsageID 264, scientificName 'Adiscanthus fusciflorus Ducke', and namePublishedIn 'Arch. Jard. Bot. Rio de Janeiro 3: 187 1922'.

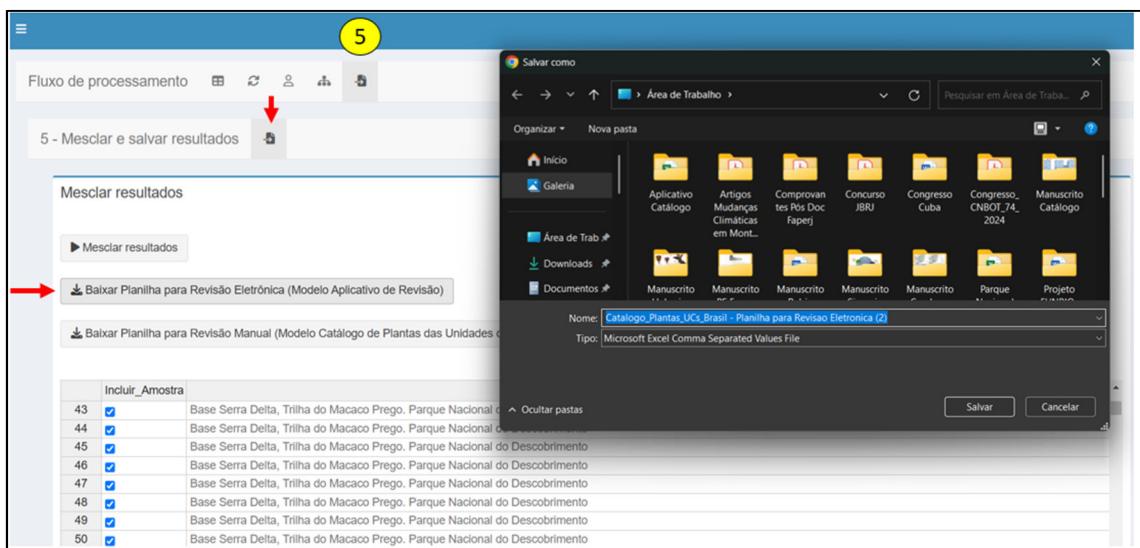
4.1. Click on “Apply taxonomic alignment” and then “download”.

This screenshot shows the same software interface as above, but the 'Aplicar alinhamento taxonómico' section is now active. A red arrow points to the 'Aplicar alinhamento taxonómico' button. The 'FloraFungaBrasil' dropdown is set to 'FloraFungaBrasil'. The 'Ctrl_occurrenceID' column shows 'jabot=RB:RB00416826' and the 'Ctrl_acceptedNameUsage' column shows 'jabot'.

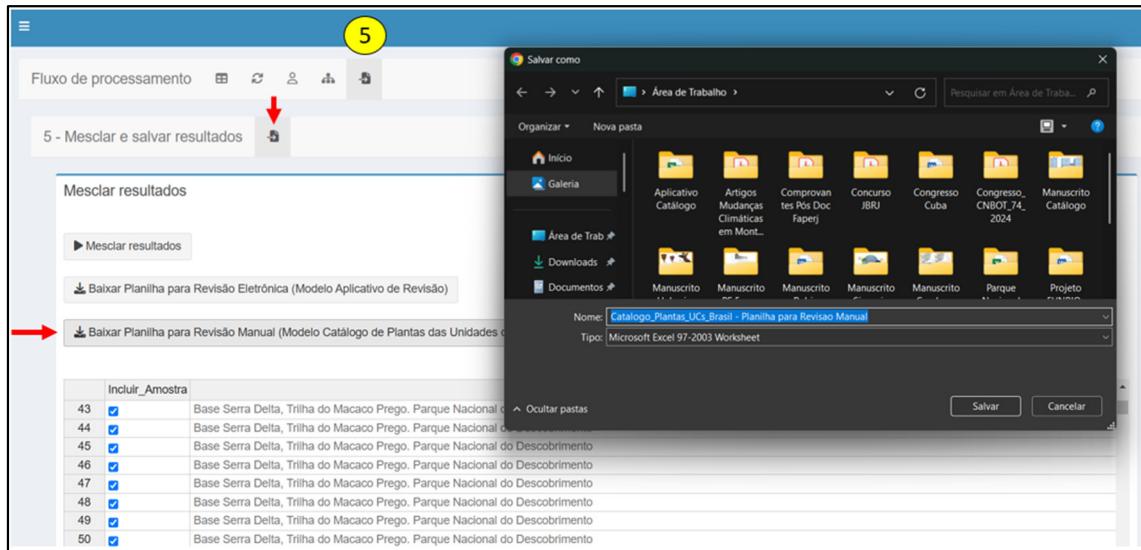
Step 5. Click on “Merge data”.



5.1. Download file for electronic review (template from the catalogoUCsBR application).



5.2. Download file for manual review (template from the Catalog website).

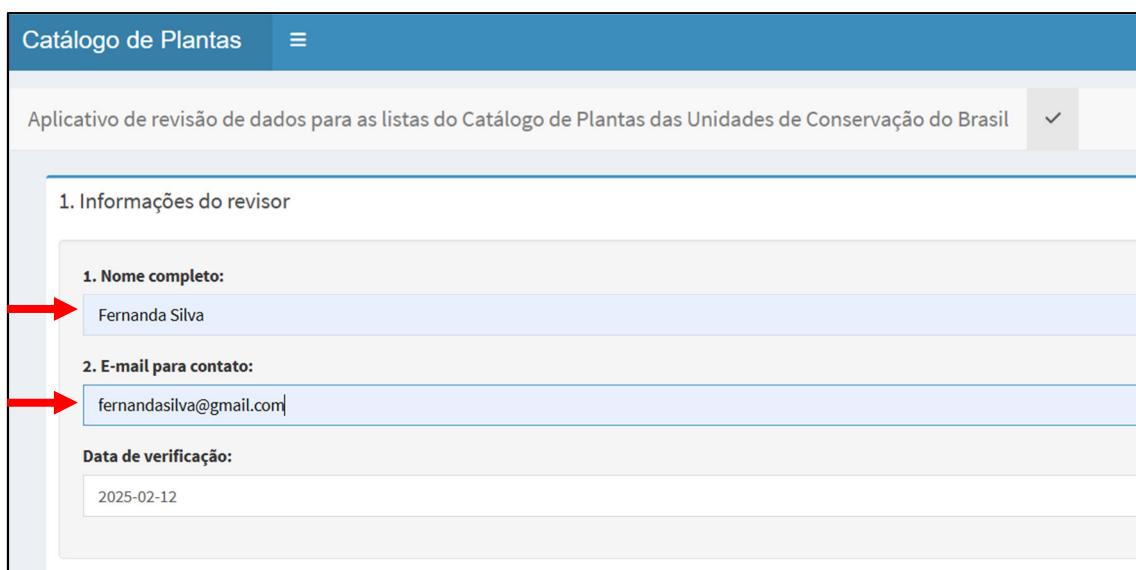


app_review

The app_review uses the preliminary list generated in app_prepare for experts to review and confirm taxa identification. Experts upload the list, select the family to review, and choose one voucher per species to confirm or update its taxonomic identification using specimen images and herbarium labels. The selected vouchers are saved as the representative species for the chosen PA, and at the end of the review, all selected vouchers (accepted species names) are saved and exported by the reviewed family.

To review a species list, you can test the dataset from the 'Parque Nacional do Descobrimento, Bahia, Brazil' as a model, available at:
https://github.com/pablopains/catalogoUCsBR/raw/refs/heads/main/PN_Descobrimento/app_review_Catalogo_Plantas_UCs_Brasil%20-%20Planilha%20para%20Revisao%20Eletronica.zip

Step 1. Reviewer Information. Add full name and email.



Catálogo de Plantas

Aplicativo de revisão de dados para as listas do Catálogo de Plantas das Unidades de Conservação do Brasil

1. Informações do revisor

1. Nome completo:

2. E-mail para contato:

Data de verificação:

2025-02-12

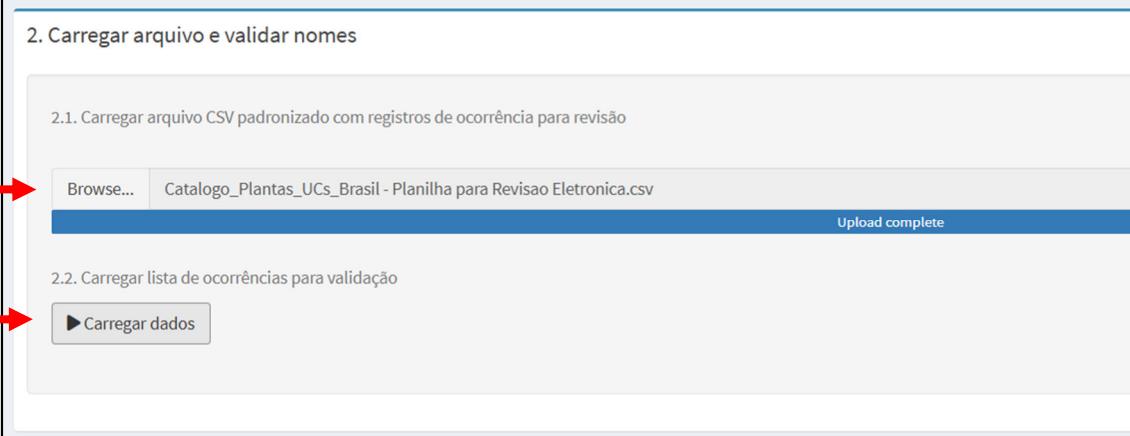
Step 2. Upload csv file and click on “Load Data”.

2. Carregar arquivo e validar nomes

2.1. Carregar arquivo CSV padronizado com registros de ocorrência para revisão

Catalogo_Plantas_UCs_Brasil - Planilha para Revisao Eletronica.csv Upload complete

2.2. Carregar lista de ocorrências para validação



Step 3. Select family name to review.

3. Selecionar família

Escolha uma família:

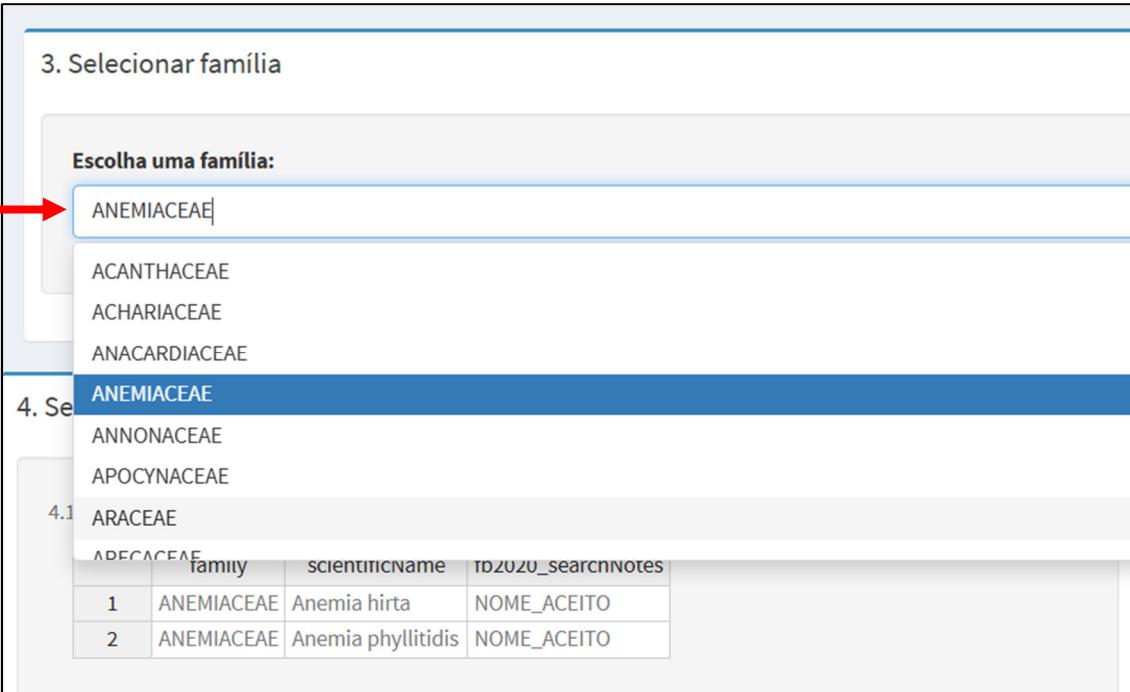
ANEMIACEAE

ACANTHACEAE
ACHARIACEAE
ANACARDIACEAE
ANEMIACEAE
ANNONACEAE
APOCYNACEAE

4. Se

4.1 ARACEAE

family	scientificname	TD2020_searchnotes	
1	ANEMIACEAE	Anemia hirta	NOME_ACEITO
2	ANEMIACEAE	Anemia phyllitidis	NOME_ACEITO



Step 4. Select specimen / Confirm or assign new identification

4.1. Select a species name to review

4. Selecionar espécime / Confirmar ou atribuir nova identificação

4.1. Lista de espécies

	family	scientificName	fb2020_searchNotes
1	ANEMIACEAE	Anemia hirta	NOME_ACEITO
2	ANEMIACEAE	Anemia phyllitidis	NOME_ACEITO

4.2.1. Check the specimen samples.

4.2. Amostras da espécie

	Chave_Para_Agrupar_Duplicatas	typeStatus
1	SCHIZAECACEAE_MATOS_1951	<input type="checkbox"/>
2	ANEMIACEAE_LABIAK_8980	<input type="checkbox"/>

Justifique, para alteração de família ou na impossibilidade de verificar todos os vouchers da espécie.

Informe a razão:

Não se aplica

4.2.2. If applicable, provide justification if unable to verify the vouchers of the species.

4.2. Amostras da espécie

Chave_Para_Agrupar_Duplicatas	typeStatus
1 SCHIZAEACEAE_MATOS_1951	<input type="checkbox"/>
2 ANEMIACEAE_LABIAK_8980	<input type="checkbox"/>

Justifique, para alteração de família ou na impossibilidade de verificar todos os vouchers da espécie.

Informe a razão:

Não se aplica

Se for o caso, escolha uma espécie de outra família

Escolha uma outra família:

Não se aplica

Red arrow points to the dropdown menu under 'Informe a razão' with the option 'Não se aplica' selected.

4.2.3. If necessary, change the family name or the species name.

Justifique, para alteração de família ou na impossibilidade de verificar todos os vouchers da espécie.

Informe a razão:

Não se aplica

Se for o caso, escolha uma espécie de outra família

Escolha uma outra família:

ACANTHACEAE
ACANTHOCERATACEAE
ACAROSPORACEAE
ACAULOSPORACEAE
ACHARIACEAE
ACHATOCARPACEAE

Red arrow points to the dropdown menu under 'Escolha uma outra família' with the option 'ACANTHACEAE' selected.

4.3. Click on the “image link” to confirm identification. Choose one voucher per species from the sample duplicates.

4.3. Escolher um voucher, por espécie, entre as duplicatas da amostra

link 1 slink=CEPEC:127079

	Ctrl_voucherAmostra	scientificName	fb2020_scientificName	scientificName_verified	family_verified
1156	<input checked="" type="checkbox"/>	Anemia hirta	Anemia hirta (L.) Sw.	Anemia hirta (L.) Sw.	ANEMIACEAE

4.4. Select one scientific name to confirm or assign new identification. Save the selected species name.

4.4. Selecionar nome científico para confirmar ou atribuir nova identificação

Anemia hirta (L.) Sw.

Amostra(s) já selecionada(s) para esta espécie:

SCHIZAEACEAE_MATOS_1951

Salvar alteração

Step 5. Check all revised selected specimens.

5. Baixar resultados

Amostras verificadas

	UC	Grupos	Família	Gênero	Espécie	Autor	Táxon.completo..segundo.Flora...Funga.do.Brasil.	Barcode
1			ANEMIACEAE	Anemia	hirta	(L.) Sw.	ANEMIACEAE Anemia hirta (L.) Sw.	CEPEC:127079
2			ANEMIACEAE	Anemia	phyllitidis	(L.) Sw.	ANEMIACEAE Anemia phyllitidis (L.) Sw.	CEPEC:60033

5.1. Download the revised data using the template from the Catalog website

5. Baixar resultados

Amostras verificadas

	UC	Grupos	Família	Gênero	Espécie	Autor	Táxon.completo..segundo.
1			ANEMIACEAE	Anemia	hirta	(L.) Sw.	ANEMIACEAE Anemia hirta (L.) Sw.
2			ANEMIACEAE	Anemia	phyllitidis	(L.) Sw.	ANEMIACEAE Anemia phyllitidis (L.) Sw.

Amostras não verificadas

	vazio
1	vazio

Salvar como

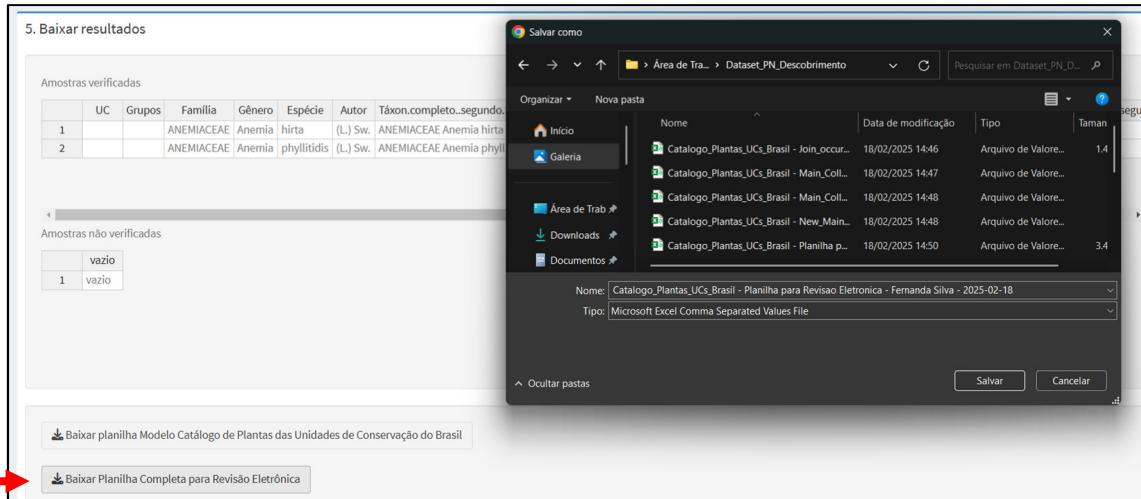
Nome: Catalogo_Plantas_UCs_Brasil - Planilha Modelo - Fernanda Silva - 2025-02-18

Tipo: Microsoft Excel 97-2003 Worksheet

Baixar planilha Modelo Catálogo de Plantas das Unidades de Conservação do Brasil

Baixar Planilha Completa para Revisão Eletrônica

5.2. Download the complete data file.



app_publication

After the taxonomic revisions by experts in the app_review, the accepted species names were added to the final plant checklist through the app_publication, organized family by family, with overlapping vouchers noted. In cases of overlap, the curator selects the voucher representing the species. The final checklist was then published in the *Catálogo de Plantas das Unidades de Conservação do Brasil*, available online at <https://catalogo-ucs-brasil.jbrj.gov.br/areas.php>

To publish a species list, you can test the dataset from the 'Parque Nacional do Descobrimento, Bahia, Brazil' as a model, available at:

https://github.com/pablopains/catalogoUCsBR/raw/refs/heads/main/PN_Descobrimento/app_publication_Planilha_COMPLETA_Catalogo_de_Plantas_UCs_Brasil.zip

Step 1. Information about the Protected Area (PA). Insert the name of the PA and upload csv files for revised families.

Catálogo de Plantas

Aplicativo de publicação de dados para as listas do Catálogo de Plantas das Unidades de Conservação do Brasil

1. Informações sobre a unidade de conservação

1.1. Nome da Unidade de conservação

Parque Nacional do Descobrimento

Arquivos revisados por especialistas

1.2. Carregar Arquivos CSVs

Browse... Planilha_COMPLETA_Catalogo_de_Plantas_UCs_Brasil - Fernanda Silva - 2025-02-11 (1).csv

Upload complete

Step 2. Selection of vouchers for publication. Choose one voucher for each species from the unmarked ones.

2. Seleção de vouchers para publicação no Catálogo de Plantas das Unidades de Conservação do Brasil

Escolher um voucher para cada espécie entre os não marcados.

	Incluir_Amostra	Ctrl_family_verified	Ctrl_scientificName_verified	Ctrl_occurrenceID	Ctrl_emailVerificador	Ctrl_verificadoPor	Ctrl_collectionCode	Ctrl_catalogNumber	C
1	<input checked="" type="checkbox"/>	BROMELIACEAE	Aechmea alba Mez	reflora=CEPEC00123965	fernandasilva2@gmail.com	Fernanda Silva	CEPEC	CEPEC00123965	B
2	<input checked="" type="checkbox"/>	BROMELIACEAE	Araecoccus parviflorus (Mart. ex Schult. & Schult. f.) Lindm.	reflora=CEPEC00060059	fernandasilva2@gmail.com	Fernanda Silva	CEPEC	CEPEC00060059	B
3	<input checked="" type="checkbox"/>	BROMELIACEAE	Billbergia iridifolia (Nees & Mart.) Lindl.	reflora=CEPEC00123963	fernandasilva2@gmail.com	Fernanda Silva	CEPEC	CEPEC00123963	B
4	<input checked="" type="checkbox"/>	BROMELIACEAE	Cryptanthus pseudopeltiolatus Philcox	jabot=UPCB:UPCB0081461	fernandasilva2@gmail.com	Fernanda Silva	UPCB	UPCB0081461	B
5	<input checked="" type="checkbox"/>	BROMELIACEAE	Guzmania lingulata (L.) Mez	reflora=CEPEC00123960	fernandasilva2@gmail.com	Fernanda Silva	CEPEC	CEPEC00123960	B
6	<input checked="" type="checkbox"/>	BROMELIACEAE	Tillandsia geminiflora Brongn.	reflora=CEPEC00060068	fernandasilva2@gmail.com	Fernanda Silva	CEPEC	CEPEC00060068	B

Planilha modelo

	sp	categoria.Ameaça.Portaria.443	UC	Grupos	Família	Gênero	Espécie	Autor	Táx
1	Aechmea alba	Parque Nacional do Descobrimento	Angiospermas	BROMELIACEAE	Aechmea	alba	Mez		BROMELIACEAE /
2	Araecoccus parviflorus	Parque Nacional do Descobrimento	Angiospermas	BROMELIACEAE	Araecoccus	parviflorus	(Mart. ex Schult. & Schult. f.) Lindm.		BROMELIACEAE /
3	Billbergia iridifolia	Parque Nacional do Descobrimento	Angiospermas	BROMELIACEAE	Billbergia	iridifolia	(Nees & Mart.) Lindl.		BROMELIACEAE I
4	Cryptanthus pseudopeltiolatus	Parque Nacional do Descobrimento	Angiospermas	BROMELIACEAE	Cryptanthus	pseudopeltiolatus	Philcox		BROMELIACEAE C
5	Guzmania lingulata	Parque Nacional do Descobrimento	Angiospermas	BROMELIACEAE	Guzmania	lingulata	(L.) Mez		BROMELIACEAE C
6	Tillandsia geminiflora	Parque Nacional do Descobrimento	Angiospermas	BROMELIACEAE	Tillandsia	geminiflora	Brongn.		BROMELIACEAE I

Step 3. Check species without voucher indication.

3. Espécies sem indicação de voucher

	Ctrl_family	Ctrl_scientificName	Ctrl_collectionCode	Ctrl_catalogNumber	Ctrl_key_family_recordedBy_recordNumber	Ctrl_emailVerificador	Ctrl_verificadoPor	Ctrl_recordNumber	C
1	ACANTHACEAE	Aphelandra nitida	CEPEC	CEPEC00123955	ACANTHACEAE_MATOS_1624			1624.00	N
2	ACANTHACEAE	Aphelandra nitida	HUEFS	HUEFS00172245	ACANTHACEAE_MATOS_1624			1624.00	N
3	ANACARDIACEAE	Schinus terebinthifolius	CEPEC	CEPEC00127038	ANACARDIACEAE_MATOS_1910			1910.00	N
4	ANNONACEAE	Guatteria australis	RB	RB00738936	ANNONACEAE_MATOS_1925			1925.00	N
5	ANNONACEAE	Guatteria oligocarpa	RB	RB01504904	ANNONACEAE_FERNANDEZ_1651			1651.00	E
6	ANNONACEAE	Guatteria oligocarpa	RB	RB00738881	ANNONACEAE_MATOS_1893			1893.00	N
7	ANNONACEAE	Xylopia frutescens	R	R010094856	ANNONACEAE_FERNANDEZ_1652			1652.00	E
8	ANNONACEAE	Xylopia frutescens	RB	RB01504906	ANNONACEAE_FERNANDEZ_1652			1652.00	E
9	ANNONACEAE	Xylopia frutescens	MBM	MBM00448650	ANNONACEAE_FERNANDEZ_1652			1652.00	F

Step 4. Check specimens with identification issues.

4. Amostras com problemas na identificação

...

Step 5. Download files in the Catalog template, file of specimens with identification issues, and file of specimens without verification.

