



AnnoSys User Guide

Authors: Okka Tschöpe, Wolf-Henning Kusber, Lutz Suhrbier
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Abstract

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AnnoSys is an Annotation System and Repository implemented to annotate biodiversity data respectively virtual specimen data. Currently AnnoSys supports the Biological Collection Access Service (BioCAsE) and the ABCD data schema.

AnnoSys is available on the Internet at <https://annosys.bgbm.fu-berlin.de/AnnoSys/AnnoSys>.

AnnoSys addresses scientists, data users, and curators of nature history collections and serves as a fast, efficient, and sustainable tool for data quality enhancement. The User Guide gives a three-page overview to get started, followed by detailed instructions to users. AnnoSys is regularly updated.

Screenshots might therefore differ slightly from those given in this guide. The AnnoSys team can be contacted via annosys@bgbm.org. AnnoSys (<https://annosys.bgbm.fu-berlin.de/>) is funded by the German Research Foundation (DFG, Project number BE 2283/4-1).



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Quick Start

This is a quick User Guide to AnnoSys. For more detailed instructions and documentation please go to chapter [User Instructions](#).

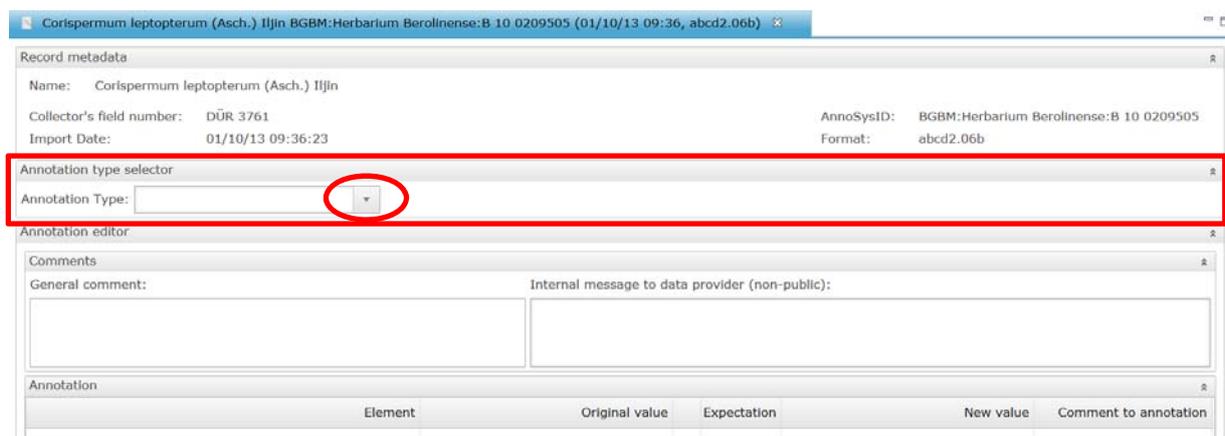


Coming to AnnoSys from a portal – What do I do?

When coming from a biodiversity data portal (e.g. EDIT Specimen and Observation Explorer for Taxonomists, <http://search.biocase.org/edit> or Herbarium Berolinense, Virtual Herbarium, <http://ww2.bgbm.org/herbarium/default.cfm>) after you have clicked the “Add annotation” or “Annotate specimen” button there, you will see the AnnoSys interface.

» [Add annotation](#)  [Annotate specimen](#) 

Here, the name and ID of the record as well as the import data and the data schema are displayed in the blue highlighted header. The fields below this header display the record metadata, the annotation type selector and the **annotation editor**. This is the part of the interface you will work with to actually conduct annotations.



The screenshot shows the AnnoSys interface for a record titled "Corispermum leptopterum (Asch.) Iljin BGBM:Herbarium Berolinense:B 10 0209505 (01/10/13 09:36, abcd2.06b)". The interface is divided into several sections:

- Record metadata:** Displays the record name, collector's field number (DÜR 3761), import date (01/10/13 09:36:23), AnnoSysID (BGBM:Herbarium Berolinense:B 10 0209505), and format (abcd2.06b).
- Annotation type selector:** A dropdown menu where the user can select an annotation type. This section is highlighted with a red box, and the dropdown arrow is circled in red.
- Annotation editor:** Contains two text input fields: "General comment:" and "Internal message to data provider (non-public):".
- Annotation table:** A table with columns for "Element", "Original value", "Expectation", "New value", and "Comment to annotation".

Fig. 1: AnnoSys interface view when coming from a portal after having clicked the “annotate specimen” link there.



Annotation Type Selector – what is it?

The annotation type describes the topic an annotation refers to, i.e. whether the annotation refers to the scientific name, the gathering event, the type status, storage locality of duplicates, etc.



In order to conduct an annotation you have to choose an annotation type, first.

Once you have selected the appropriate annotation type, you are prompted to log in. If you are not registered, yet, you have to do so to receive annotation rights.



How to enter annotations

After you have successfully logged in and selected an annotation type, the corresponding record data elements are displayed in the **Annotation** window with their original values. You can now enter new values (i.e. annotations) into the “**New value**” column, either by typing in the new value or, for some fields, by selecting a value from a drop down menu. You might comment each value e.g. by a reference or an argument.

If you wish to make a general comment to the specimen, you can use the **Comments** window. Here, you can either make a public comment (“General comment”) which will be saved and made visible for subsequent users, or you can send a non-public, internal message to the data provider. If you don’t want to use the general comments function, you can minimise it by clicking the **double arrows** in the top right corner of the window.

The screenshot shows the AnnoSys user interface. At the top, there is an 'Annotation type selector' window with a dropdown menu set to 'Determination'. Below it is the 'Annotation editor' window, which is highlighted with a red border. Inside the 'Annotation editor' window, there is a 'Comments' window with two text input fields: 'General comment:' and 'Internal message to data provider (non-public):'. The 'Internal message' field has a red circle around a double arrow icon in its top right corner. Below the 'Comments' window is the 'Annotation' window, which contains a table with the following columns: 'Element', 'Original value', 'Expectation', 'New value', and 'Comment to annotation'. The 'New value' column is highlighted with a red box. The table contains three rows of data:

Element	Original value	Expectation	New value	Comment to annotation
det./rev./conf				
Higher taxon name	CORNACEAE			
Higher taxon rank	familia			
Full scientific name	Cornus alba L.			

Fig. 2: Comments window and Annotation window of the AnnoSys user interface.

To enter a specific comment to the annotated value in the Annotation window, you can use the column “Comment to annotation”.



How to save and publish annotations

To save and publish your annotation click the “Save & Publish” button in the top left corner or use the CTRL-S keyboard shortcut. Your annotation is now stored in the system and visible to all users.

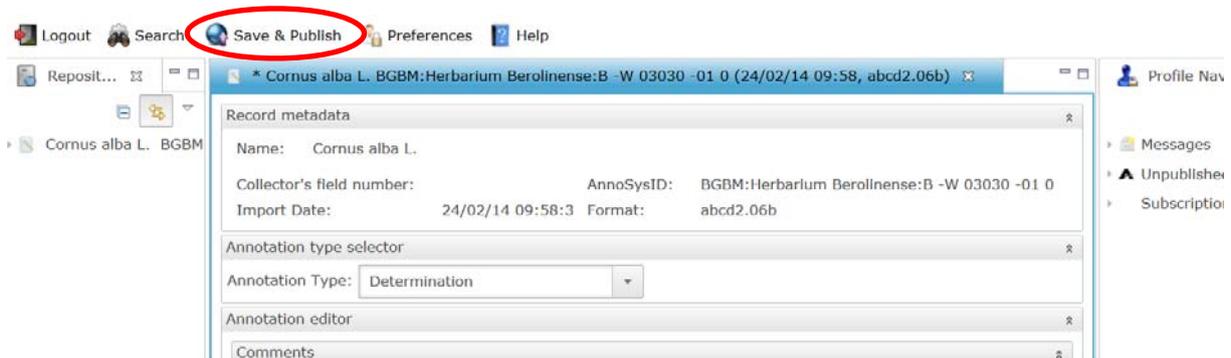


Fig. 3: Saving and publishing your annotation.

Logout

After you have finished your work log out by using the “Logout” button in the top left corner.

Detailed User Instructions

Introduction

The AnnoSys interface allows researchers to produce and search for annotations. If a record has been annotated, annotation and original record are stored together in the annotation data repository and are accessible through the AnnoSys user interface. A message service informs curators and scientists specifically interested in a subset of data about new annotations. Changed or augmented records can be made available to aggregators such as BioCASE by means of a BioCASE provider.

On the basis of the W3C Open Annotation Data Model, web services like SPARQL or Linked Open Data provide third party applications for the access or exchange of annotation context data.

AnnoSys is based on the XML-standard ABCD (Berendsohn 2005-) and uses the RDF-based Open Annotation Core Data Model (<http://www.openannotation.org/spec/core/>) to store and exchange annotations.

AnnoSys Workflow

The general AnnoSys workflow is that of a user visiting a data portal to access records (1). When wishing to annotate a record, the user enters the annotation system and, after log in (2), conducts the annotation (3). The annotation is then saved on the annotation server together with the original record, both elements are connected via an unique AnnoSysId (4). The annotated version as well as the original record is then displayed to subsequent users on the data portal.

It is also possible to search for annotations via the annotation system, using specific criteria (e.g. a taxonomic group or a country) (5). After an annotation has been conducted, a message system informs the collection manager about the changes in the record as well as users, who subscribed to the information service (6). The collection manager can then decide, whether he/she wants to adopt the annotation in his local database and publish a curation annotation within AnnoSys (7).

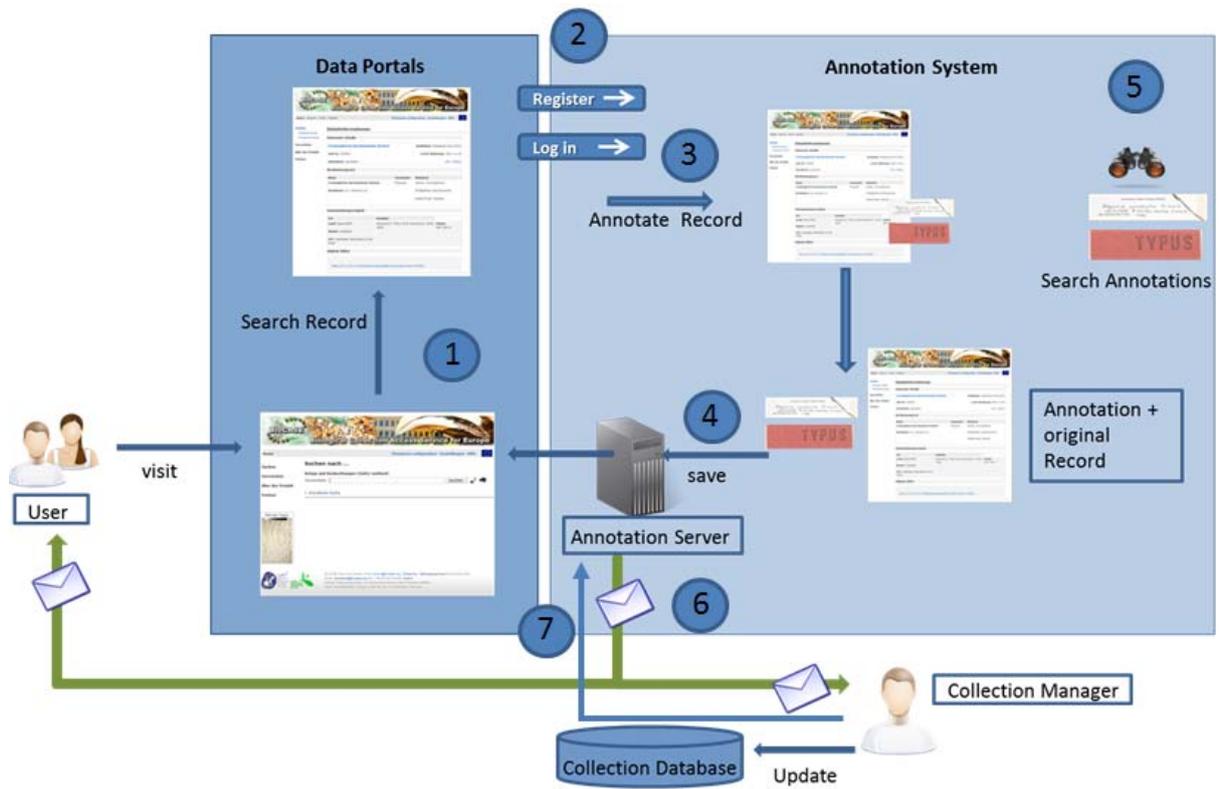


Fig. 4: AnnoSys workflow (based on Tschöpe et al. 2013).

Entering AnnoSys

You reach AnnoSys either via the URL <https://annosys.bgbm.fu-berlin.de/AnnoSys/AnnoSys> or coming from a record in a portal.

If you are using the URL to enter AnnoSys, you will see the AnnoSys search screen. See chapter [Search](#) to learn how to use the search function.

The screenshot displays the AnnoSys search interface. At the top, there is a navigation bar with icons for Logout, Search, Preview & Publish, Preferences, and Subscrip. Below this is a search bar with the text "Search for annotations". The main search area is divided into two sections: "Search filter" and "Annotation type".

Search filter

Family	<input type="text"/>
Genus	<input type="text"/>
Species	<input type="text" value="Corynephorus canescens"/>
Collector's number	<input type="text"/>
Institution code	<input type="text"/>
Collection code	<input type="text" value="Herbarium berlinense"/>
Catalog number	<input type="text"/>
Collector name	<input type="text"/>
Identified by	<input type="text"/>
Annotator	<input type="text"/>

Annotation type

<input type="checkbox"/> Determination	<input type="checkbox"/> Storage locality of duplicates	<input type="checkbox"/> Gathering
<input type="checkbox"/> Nomenclatural type	<input type="checkbox"/> Sequence	<input type="checkbox"/> Other
<input type="checkbox"/> Record basis	<input type="checkbox"/> Scientific name	

Search

Search Results

search for: Annotations

› Corynephorus canescens (L.) P.Beauv. (1 annotations)

Fig. 5: AnnoSys search interface.

When coming from a portal after you have clicked the “annotate specimen” respectively “Add a new annotation” button there, you will see the AnnoSys interface displaying the name and

triple-Id (institution code, dataset Id/collection code, catalogue number/record Id) of the record as well as the import data and the data schema in the blue highlighted header.

The fields below this header display the record metadata, the annotation type selector and the annotation editor.

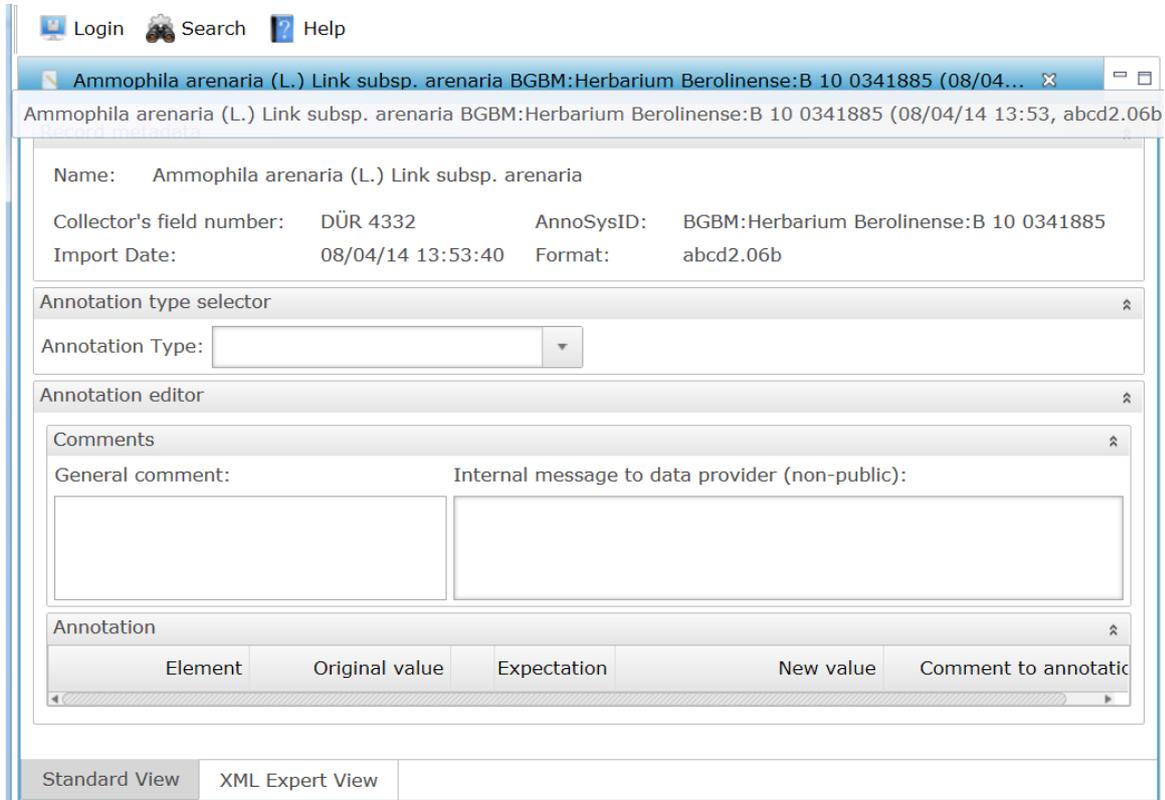


Fig. 6: AnnoSys interface view when coming from a portal after having clicked the “annotate specimen” link there.

Language Selection

AnnoSys offers two languages for its interfaces: English and German. The language depends on your browser settings: if your browser language is set to German, so will be the AnnoSys interface, otherwise it will be in English.

Data Input into the AnnoSys-System

Login

To start working with the *AnnoSys* you first have to log in with your personalised user account.

You can do so by either clicking the “System login” button in the top left corner. (The individual icons of the main toolbar in the header are explained in chapter “[Header – Main Toolbar](#)”) ...

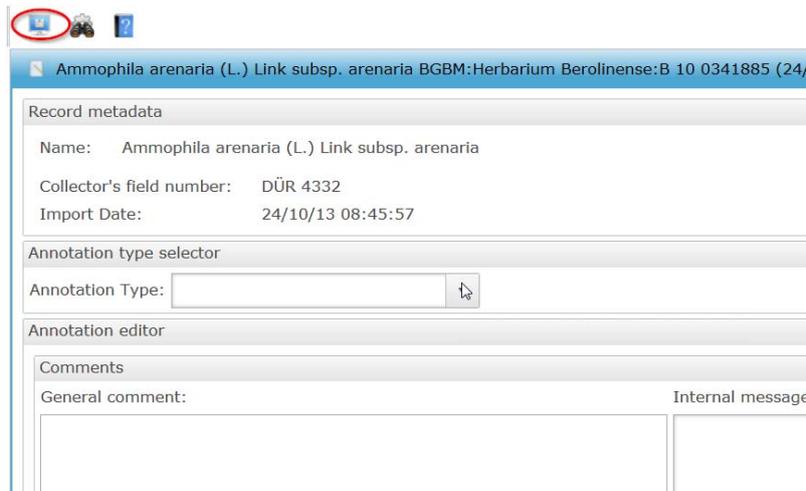


Fig. 7: AnnoSys interface login button.

... or by choosing an annotation type from the annotation type selector by clicking the small black arrow and selecting an annotation type from the drop down menu.

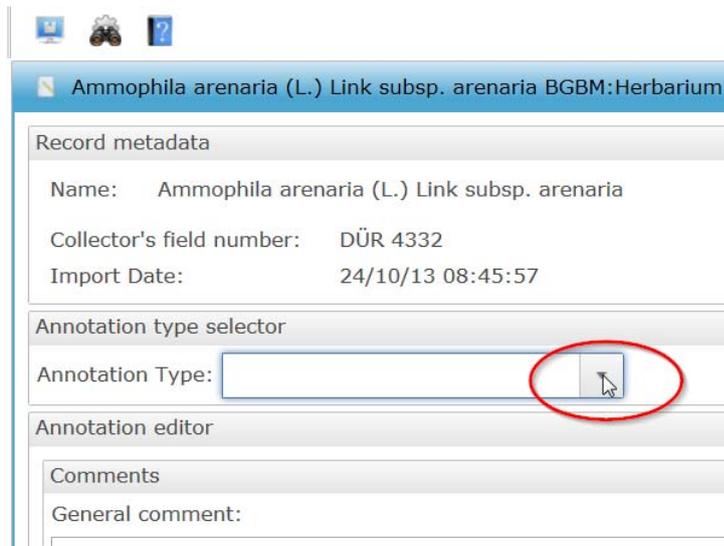


Fig. 8: Selecting an annotation type.

You will then be prompted to enter your username and password.

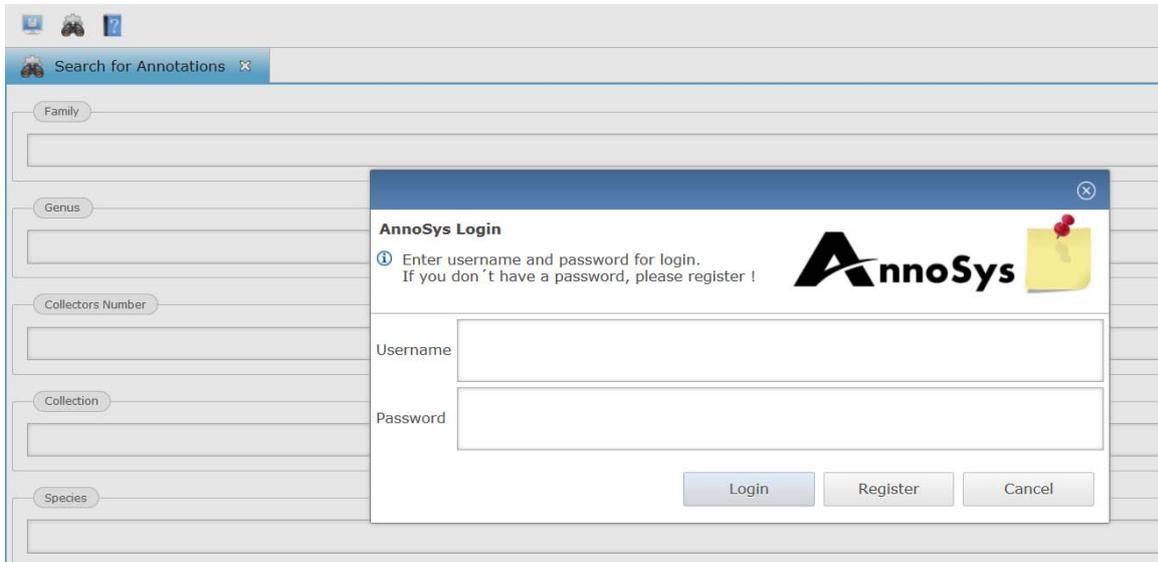


Fig. 9: Login dialogue.

Registration

If you do not have a user name and a password yet, type a user name and password of your choice into the login box and click on the button “register”.

A new window “Registration” appears and you are prompted to give your clear name (first name and family name), e-mail, institution, username (user id, not publically available) and password. This information is mandatory to receive annotation rights and will be checked. Confirm your acceptance of the AnnoSys terms of use by clicking the box. Click “register” to finish your registration.

Registration

i All *fields are mandatory fields

AnnoSys

Name* Anne Annotate

Email* anne@annotate.de

Institution Institution

Username* Anne

Password*

Password (Verifikation)*

I confirm reading and acceptance of the AnnoSys Terms of Use.

Register Cancel

Fig. 10: Registration form.

After having clicked on the „Register“ button you will see the AnnoSys Login dialogue again. You can now type in your username and password and click the “register” button.

AnnoSys Login

i Enter username and password for login.
If you don't have a password, please register !

AnnoSys

Username Anne

Password

Login Register Cancel

Fig. 11: Login dialogue

After you have logged in successfully, the AnnoSys interface to conduct annotations appears.

User Interface

The AnnoSys user interface is divided into three columns. The middle, main column consists of several windows.

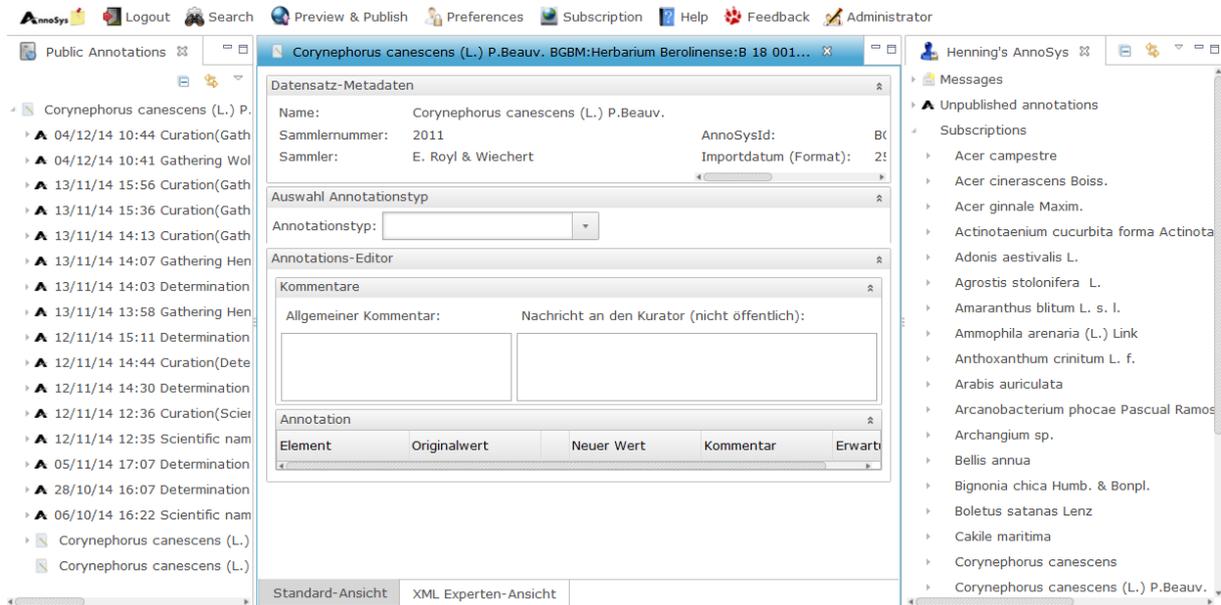


Fig. 12: AnnoSys interface with three columns.

Header – Main Toolbar

The toolbar in the header serves for direct selection of functions (Login, Search, Help, Logout, Save & Publish, Preferences) by selecting an icon with the mouse.

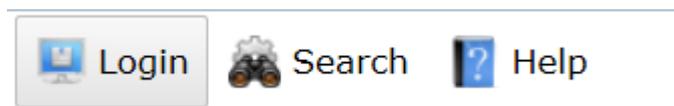


Fig. 13: Toolbar before logging in.

Depending on whether you are logged in or not, the icons in the header change.

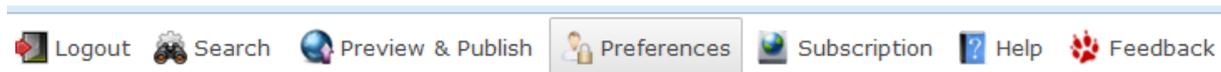


Fig. 14: Toolbar after you are logged in.

Table 1 gives you the function of each icon:

Table 1: Icon functions of the main toolbar

 Login	<p>Opens the <u>Login</u>-dialogue. If you want to annotate a record, you need to register once and login with your personal password and user name.</p>
 Search	<p>Opens the <u>Search</u>-dialogue which allows querying annotations using specific criteria.</p>
 Preview & Publish	<p>Saves and publishes your annotation. After you have clicked this button your annotation will be stored and visible to subsequent users.</p>
 Preferences	<p>Opens the Preferences Window. Here, you can choose your preferred mail language and decide whether you want <i>AnnoSys</i> to always restore all open windows and annotations you worked on in your last session.</p>
 Subscription	<p>Opens the <u>Subscription</u> dialogue. Here, you can subscribe to an information service about a specific taxon, institute, collection, object ID or gathering country.</p>
 Help	<p>Opens the AnnoSys User Guide.</p>
 Feedback ...	<p>Give feedback to the AnnoSys development team using your AnnoSys login.</p>
 Logout	<p>Logs you out.</p>

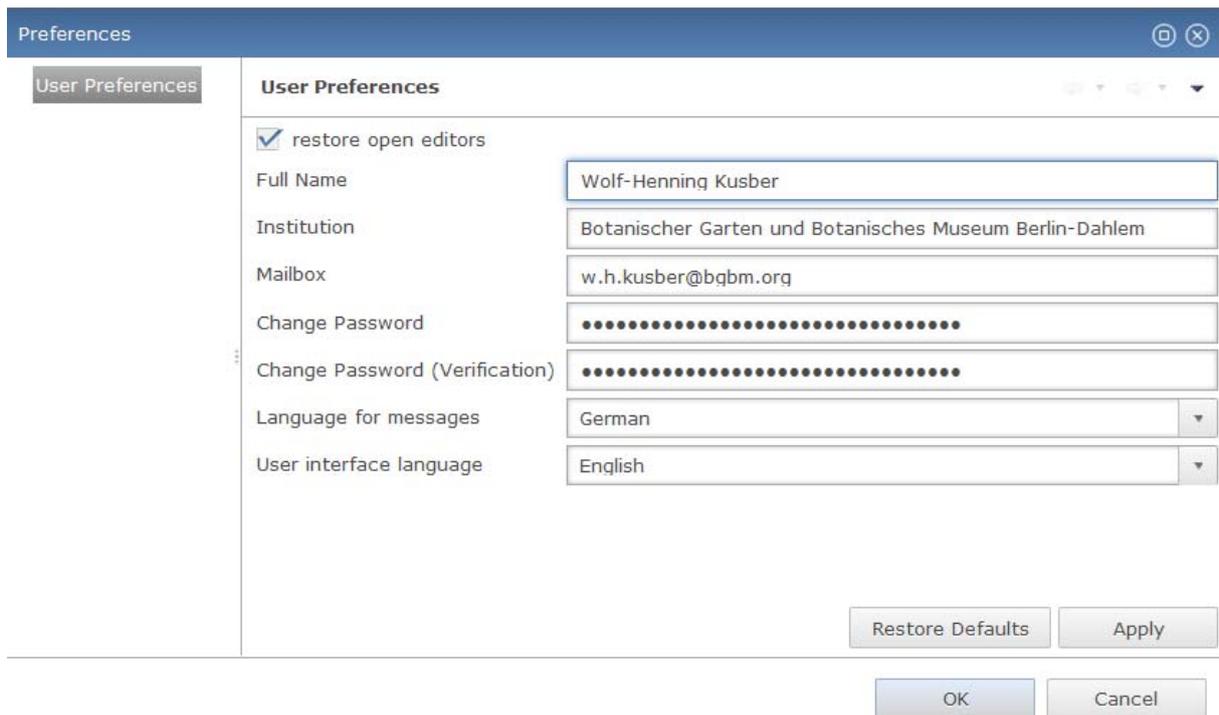


Fig. 15: Preferences window (language for messages and user interface can be chosen independently).

Changing column sizes

The width of the columns can be changed (to do so, position the mouse in the grey area between the left and the middle column, or the middle and the right column, respectively, and drag the window bigger, while pressing the left mouse button).

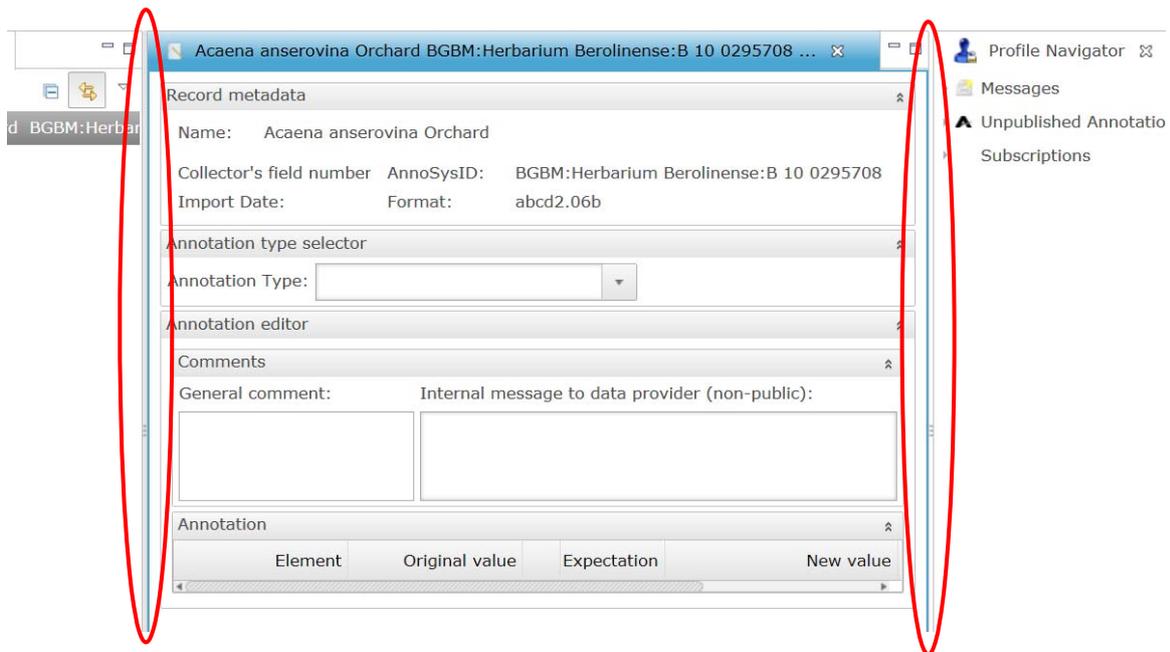


Fig. 16: How to expand the middle column by dragging.

By clicking on the “Maximise” icon you get the full screen view of the middle column with the annotation editor.



Fig. 17: How to expand the middle column and the annotation editor to full screen size.

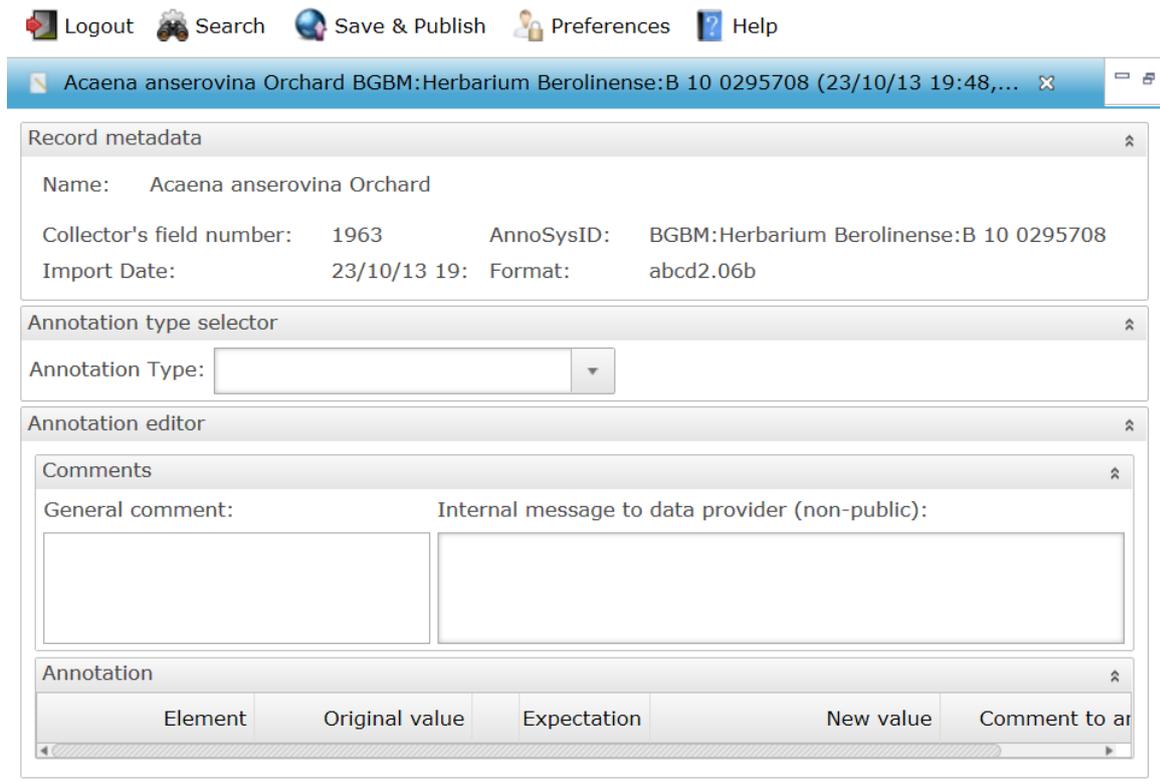


Fig. 18: Full screen annotation editor.

To restore the default interface, click the “restore” button in the top right corner (Fig. 19).

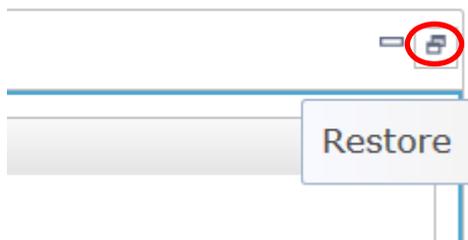


Fig. 19: How to restore the default interface.

The windows can be collapsed or expanded as you like. (To do so click on the double arrows of the window titles with the grey background.

If you still have problems viewing content of the different columns use the “Strg” and “+”/”-“ key of your keyboard.

The Left Column: Annotations

Here, the selected record is displayed together with a list of already existing annotations (marked with the **A**) referring to the record.

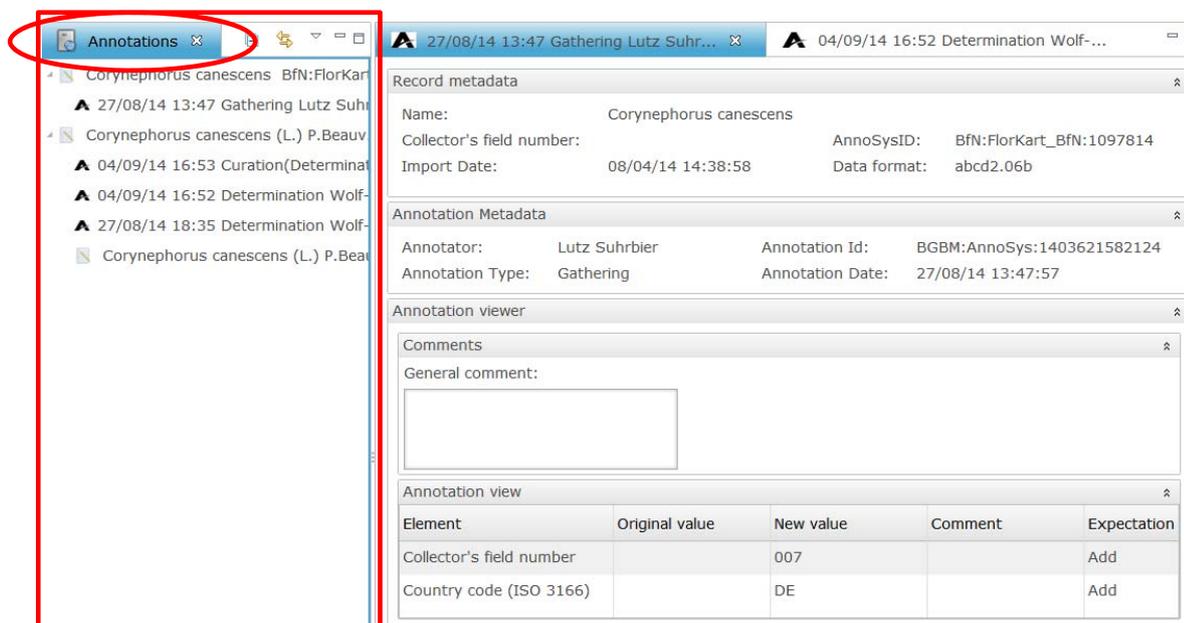


Fig. 20: Left column displaying open records and annotations.

To see details of an already existing annotation, click on it. The annotation will then be highlighted in the annotation list and displayed in the middle column. To go back to the record, click on the species' name above the list of annotations.

The annotation displayed in the middle column is always the one highlighted in the list of annotations in the left column. To close an annotation in the middle column, click on the cross in the top right corner.

If you open several records, they will all be displayed in the repository navigator. To close records click on the red cross in the tab next to the species name in the middle window (Fig. 21).

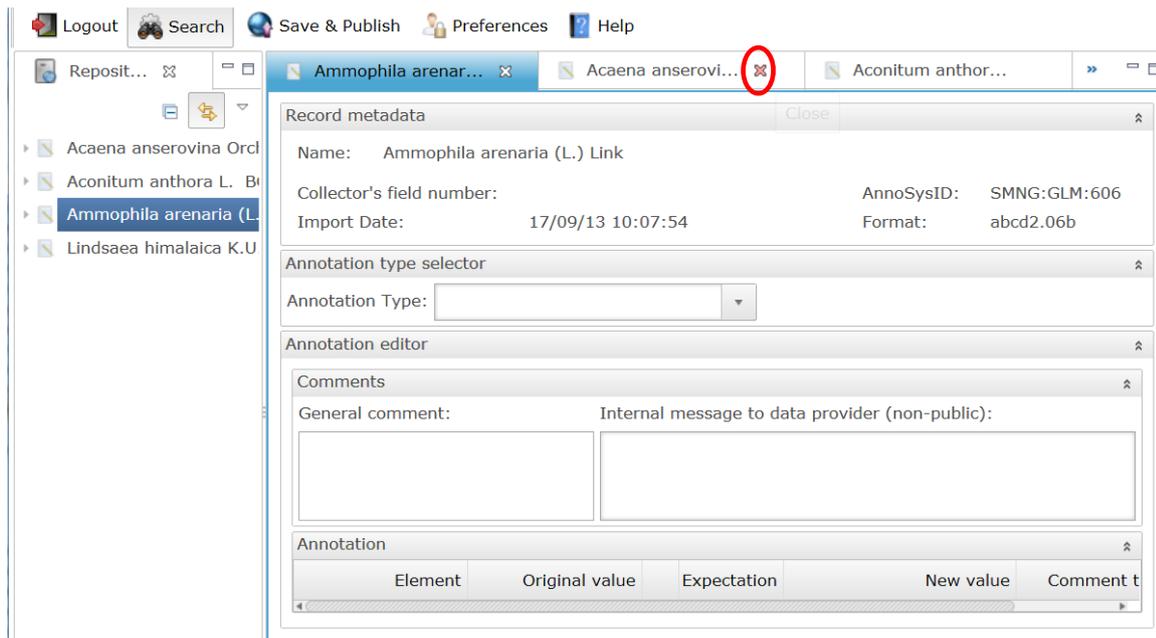


Fig. 21: Repository Navigator displaying several records with annotations.

History

If a record to which annotations have been made via *AnnoSys* is altered in the original database of a data provider (i.e. if the data provider adds or deletes information to or from a record, for example adding new multimedia objects or adopting annotations), *AnnoSys* recognises these changes and will import the new version of this record. The old version(s) and all annotations referring to it are displayed in the history of this record (Fig. 22), the latest version being displayed at the top of the list.

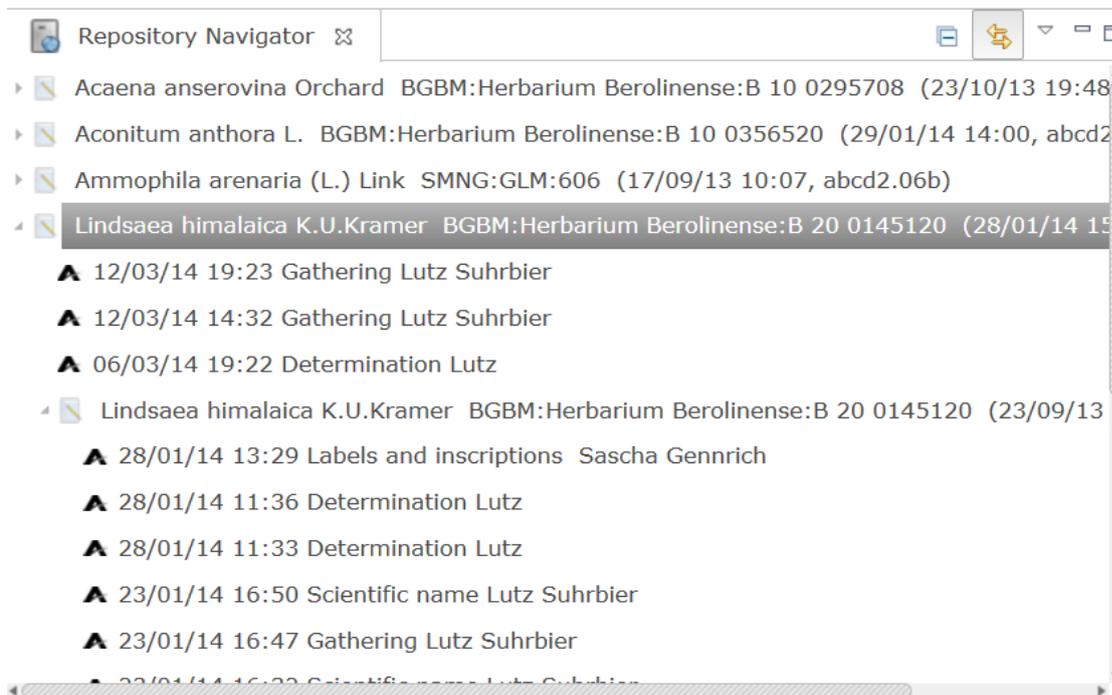


Fig. 22: History of annotations for *Lindsaea himalaica* including 2 versions of the original record and their corresponding annotations. The latest version is always displayed at the top of the list.

It is not possible to annotate older versions of a record. If you click on an old version of a record in the history, a window will open informing you that an updated version of this record exists in the repository. You can then decide whether you wish to annotate the current version or to examine the historic version.

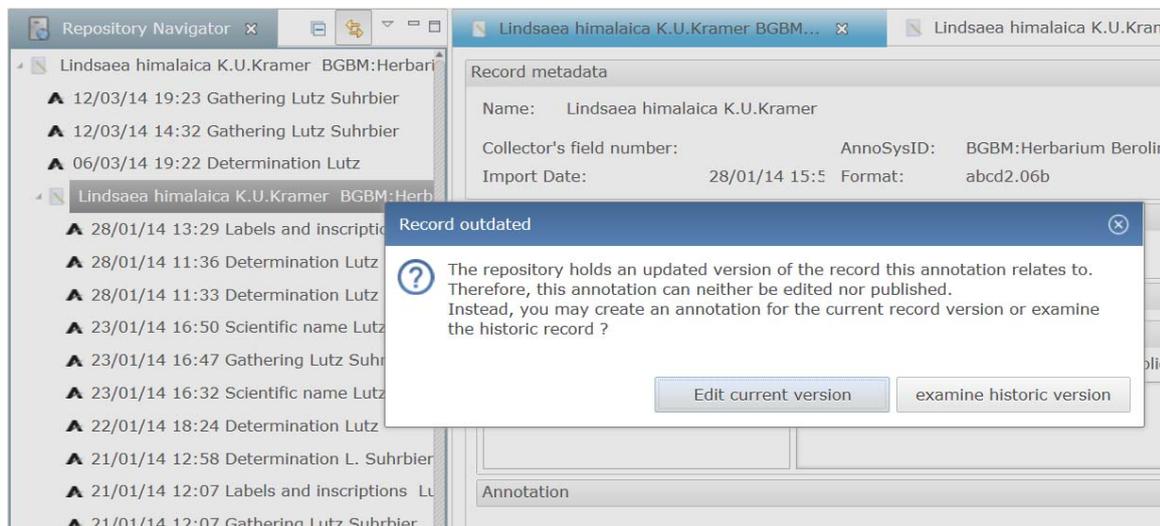


Fig. 23: Dialogue opening when clicking on a historic version of a record.

“Examine historic version”

When you click “Examine historic version” you can view the historic version of the record either in the standard view – in this case you have to select an annotation type to see the data- or in the “XML-Expert view” – in this case you have to click on the small triangle left of “DataSets” to expand the XML-tree or use the “Select element”-function to find specific data.

“Annotate current version”

When you click “annotate current version” the standard view with the annotation type selector and the annotation editor opens and you can make your annotations.

The Right Column: “My AnnoSys”, profile navigator

Here, you find three headers: Messages, Unpublished Annotations and Subscriptions.

If you do not wish to use the Profile Navigator you can minimize it by clicking the Minimize button (

- ✦ Cyclotella Grunow
 - Object ID => CIM 523
 - Institute => CIM IRB
 - Collection => CIM Algal Culture Collection
- ✦ Dataset Name: Herbarium Berolinense
 - Collection => Herbarium Berolinense

Fig. 25) or double-click on *Messages*.

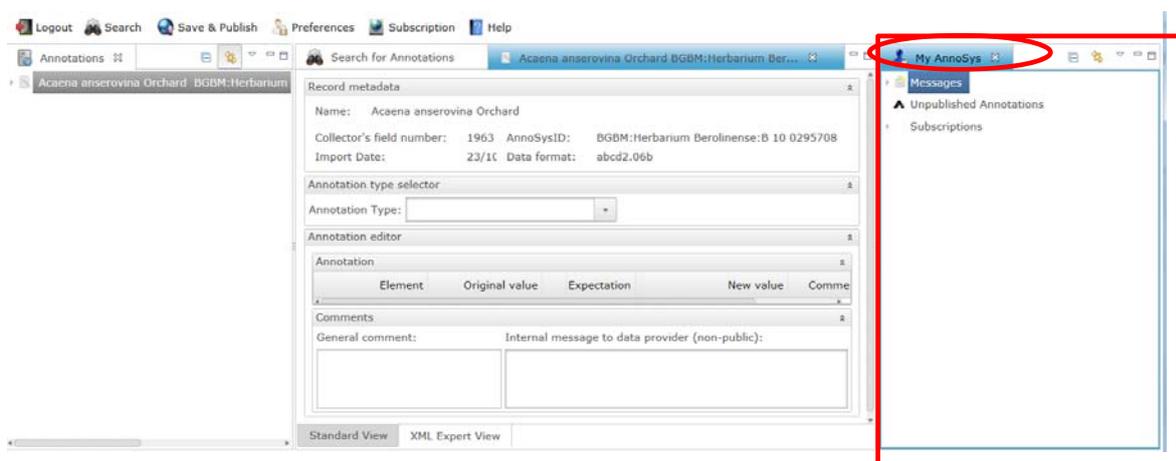


Fig. 24: Right column with the Profile Navigator.

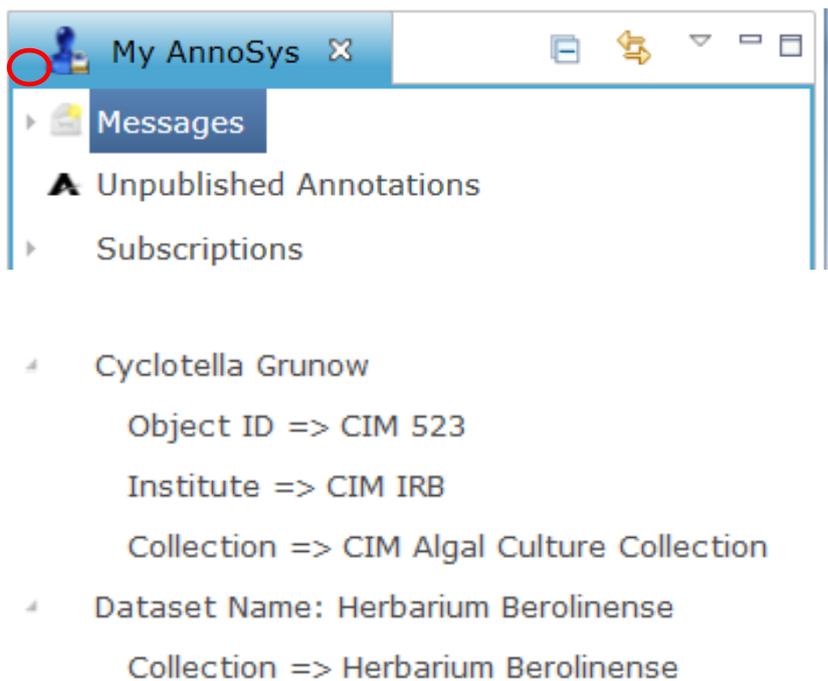


Fig. 25: Detail view of the “My AnnoSys”-section. Triangle to expand list of messages, unpublished annotations and subscriptions (left) and Minimize button (right). Examples: (i) *Cyclotella Grunow*, annotated record, identified by the triple ID (Object ID + Institute ID + Collection ID), (ii) Dataset “Herbarium Berolinense” subscribed via the Subscribe section.

Messages

If you created an annotation, you will receive a message from the AnnoSys system if the status of your annotation has changed, i.e. if a curator has seen your annotation and possibly changed his data base in response.

You will also receive a message, if you have subscribed for a specific taxon or collection, each time somebody annotated the taxon or collection object you subscribed for.

To view your messages, click on the triangle left of the Messages symbol



Fig. 26: Messages displayed after having clicked the triangle. To delete messages right-click and click *Remove*.

To delete a message, right-click on the message and then click “Remove” (Fig. 26).

To delete several or all messages select the specific messages and then right-click and delete.

If you do not want to be informed about annotations any more, go to “[Subscriptions](#)” and delete the subscription there.

Unpublished Annotations

Whenever you start working with the AnnoSys editor and don’t save and submit your work, the annotation will be stored in your Profile Navigator under “Unpublished Annotations”. Thus, your work is not lost if you interrupt your annotation activity before saving or if your internet connection breaks down.

Note, however, that for technical reasons, unpublished annotations are also generated if you select an annotation type or click in a field but don’t enter a new value.

To see your unpublished annotations, double-click “Unpublished Annotations” or click the triangle left of “Unpublished Annotations”. A list of your unpublished annotations will be displayed (Fig. 27).

If you double-click on an annotation of the list it will be displayed in the middle column. You can then either complete the annotation by entering a value and/or a comment and then click the “Save & Publish” button, or you can delete the unpublished annotations.

Deletion of Unpublished Annotations

To delete unpublished annotations you do not wish to publish, right-click on the annotation in the list and then click on “Remove”. To delete several or all unpublished annotations select the specific annotation and then right-click and remove.

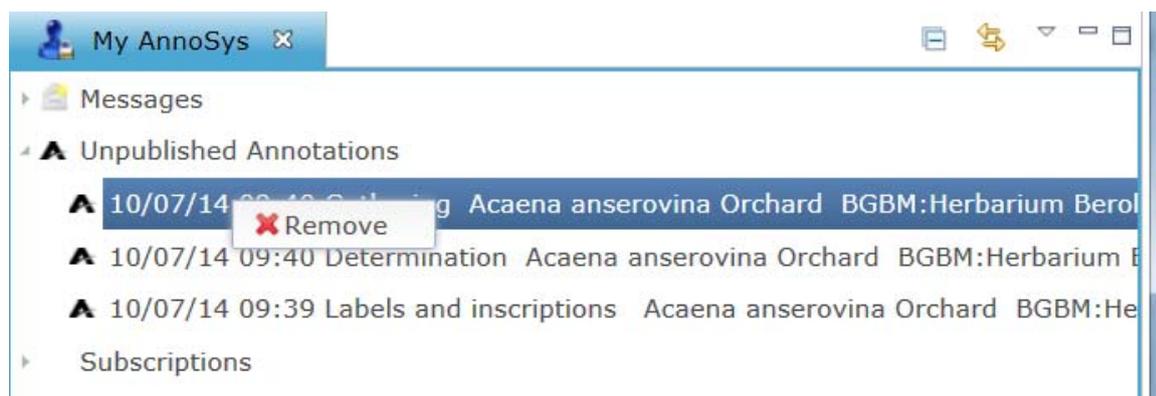


Fig. 27: List of unpublished annotations. To remove an unpublished annotation from the list, right-click on it and click remove.

Subscriptions

Under this header, all your subscriptions are listed. See section “[Subscription function](#)” to learn how to subscribe for a specific taxon or collection.

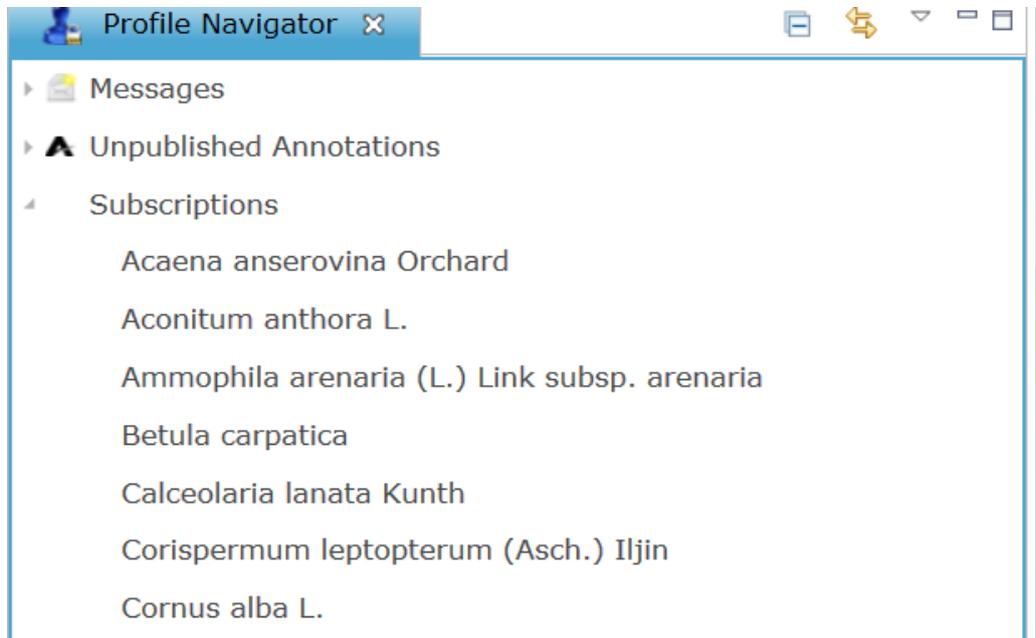


Fig. 28: List of your Subscriptions.

Deletion of Subscriptions

If you wish to delete a subscription, right-click on the name and then click “Remove”.

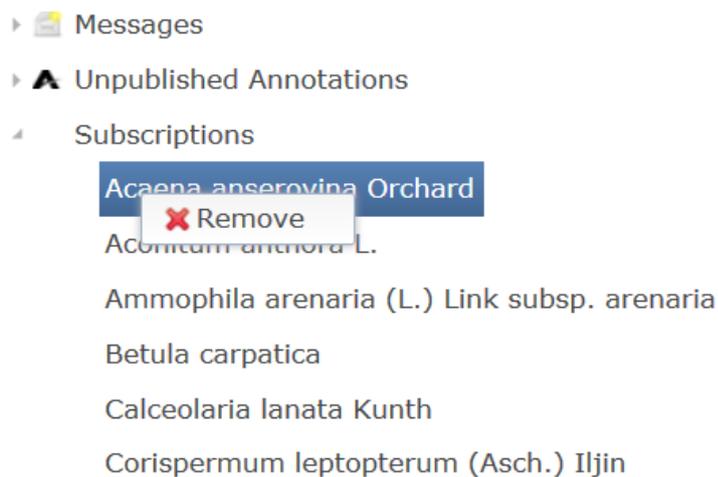


Fig. 29: Deletion of subscriptions.

The Middle Column: Metadata, Annotation type selector and editor

This is your main window for annotating data. It contains the three boxes Record metadata, Annotation type selector, and annotation editor.

You can close or minimize the profile Navigator in the right column and minimize the Annotation Navigator in the left column, to enlarge the available space for working with the Annotation Editor.

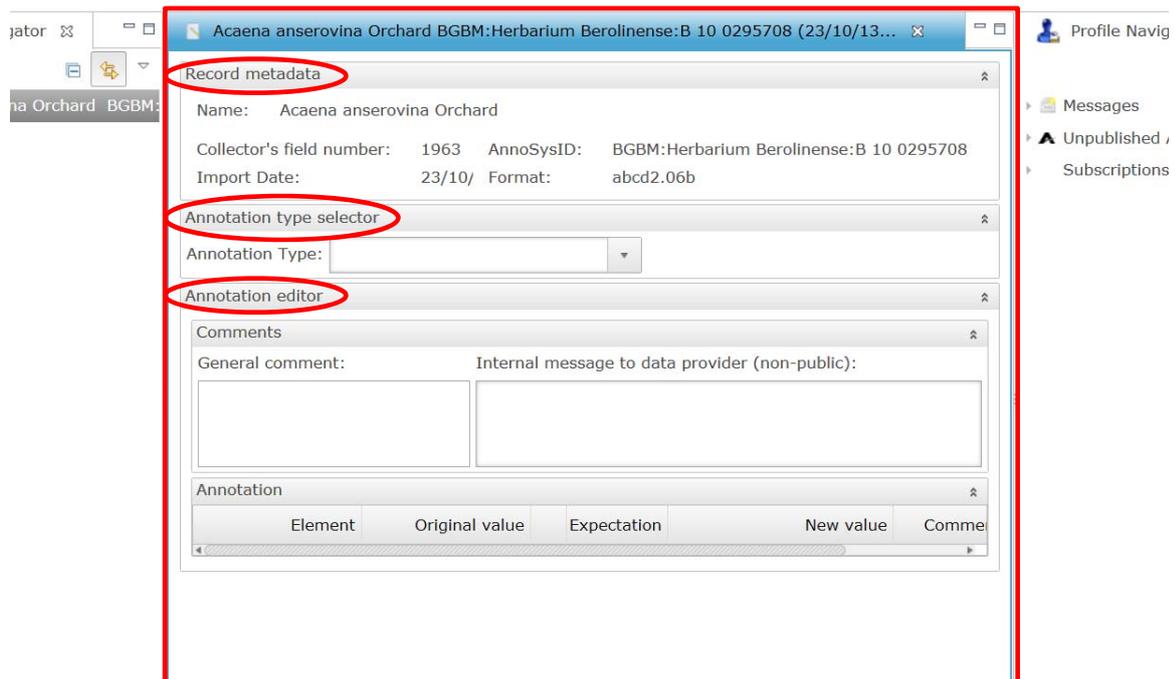


Fig. 30: Middle column with Record metadata, Annotation type selector and Annotation editor.

Record Metadata

This box gives you the meta information about the record, including the scientific name, the collector's number, the AnnoSysID, the import date and the format (e.g. ABCD, DarwinCore) of the underlying XML-Document.

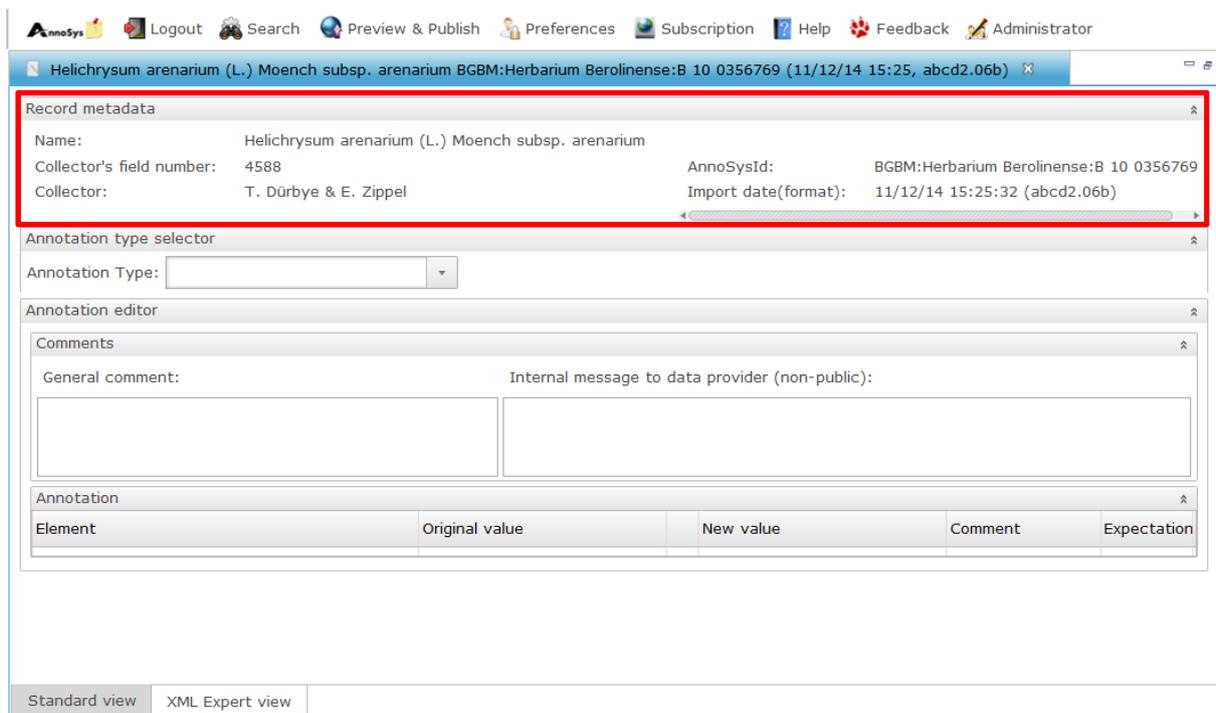


Fig. 31: Record metadata.

Annotation type selector

Use this combo box to select the type of annotation you would like to conduct.

The annotation type describes the topic an annotation refers to, i.e. whether the annotation refers to the determination of a specimen, the gathering event, labels and inscriptions, the nomenclatural type status, the record basis, etc.

If you wish, for example, to annotate the gathering locality details, the collection date or the collector's name, you would choose the annotation type "Gathering" and enter your annotations in the suitable fields there.

General terms of use

By using this AnnoSys website and the content available on and through it, you are agreeing to be bound by these Terms of Use.

Registration

In order to submit or use content on the AnnoSys website or to utilise the AnnoSys services you are required to register to establish an account and a user profile with the AnnoSys.

When registering, a genuine email address, name and institution must be provided. Personal information will be managed in accordance with the AnnoSys Privacy Policy. You will ensure that any registration information you give to the AnnoSys is accurate, correct and up to date.

Contributing or uploading Content

At the time of adding your content you state that users can use the data under the creative commons „Attribution-Share Alike” license.

Using the Content

If you use or download content from the AnnoSys website you agree to acknowledge, reference or attribute the relevant data provider in any derived work that is based on the relevant content.

Posting information

You are responsible for your contributions and you should be aware that your contributions may remain online indefinitely.

Data privacy

When you register or publish content on our web page, we record your name, email address and institution. Your name will be published with any annotation you make. Your email address will not be publicly available or visible for other users.

With respect to data privacy, the agent database, personal profile stores and other system relevant configuration files are stored in a location on the server inaccessible for unauthorised AnnoSys agents or external services.

<https://annosys.bgbm.fu-berlin.de/terms-of-use>

Appendix 2

Table 3 in the Appendix gives you an overview of the available annotation types and the elements they comprise:



In order to conduct an annotation you must choose an annotation type, first.

To do this, click on the small black arrow and choose an annotation type from the drop down menu.

After you have selected an annotation type the corresponding elements will appear in the annotation editor.

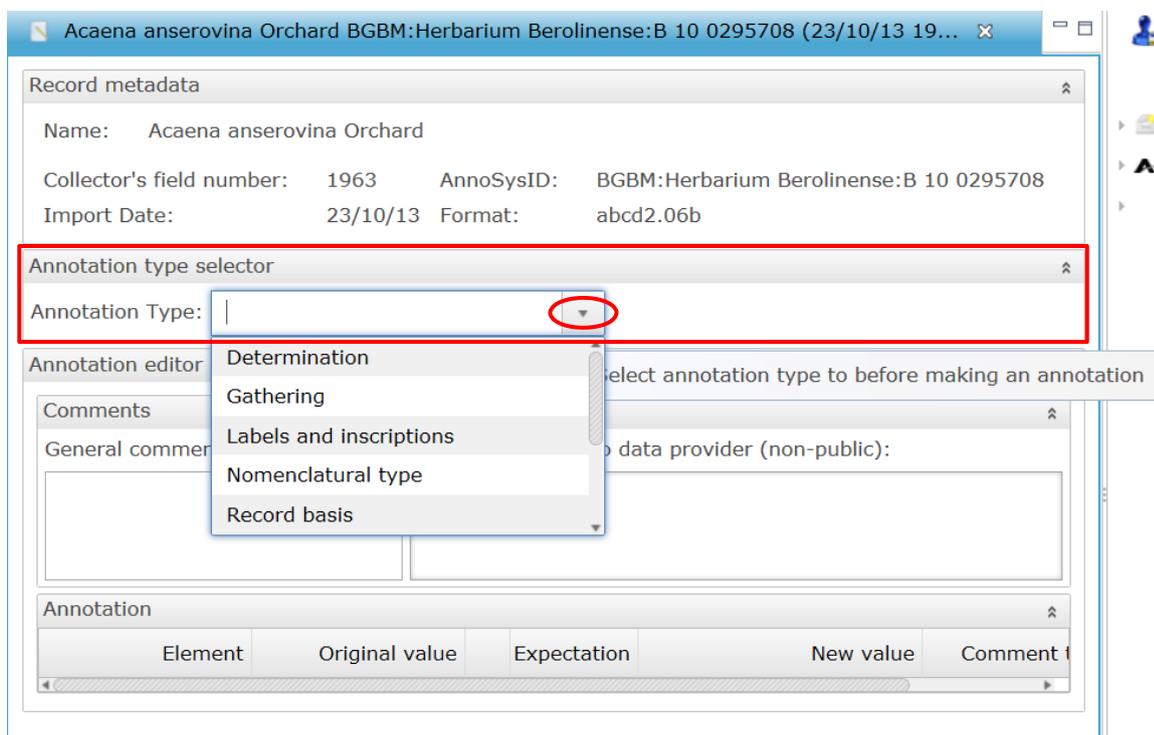


Fig. 32: Annotation type selector.

Annotation Editor

This box contains a **comment box** and the actual **annotation editor**.

Record metadata

Name: Acaena anserovina Orchard

Collector's field number: 1963 AnnoSysID: BGBM:Herbarium Berlinense:B 10 0295708

Import Date: 23/10/13 Format: abcd2.06b

Annotation type selector

Annotation Type: []

Annotation editor

Comments

General comment: [] Internal message to data provider (non-public): []

Annotation

Element	Original value	Expectation	New value	Comment
[]				

Fig. 33: Annotation editor.

Comments

Place any general comments to the record here.

Internal Message to the data publisher

Send a non-public message to the data publisher here. This message will not be visible on the interface, but will be sent directly to the curator.

Annotation

There are two ways you can annotate a record: The “Standard View” and the “XML Expert View”.

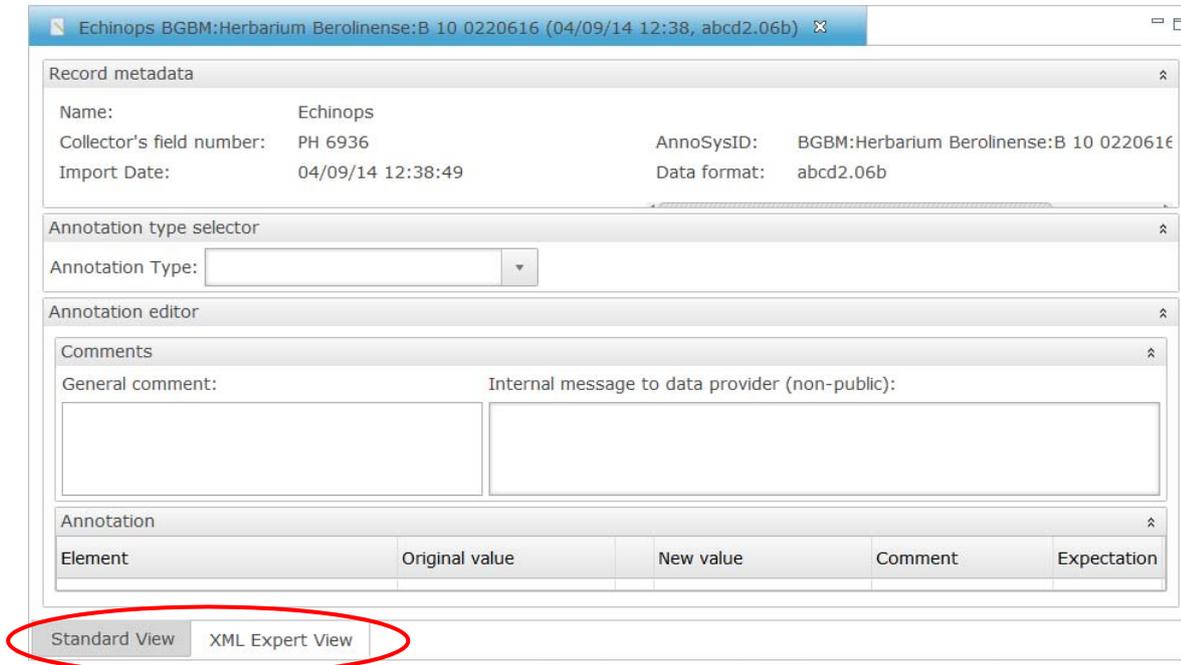


Fig. 34: “Standard View” and “XML Expert View” buttons to choose the appropriate annotation modus.

In the standard view, you find tables of elements with their specific values. To annotate these elements, you enter new values into the corresponding field in the “New value” column. In the section “[Standard View](#)” the annotation procedure when working with the standard view is explained.

Record metadata

Name: Echinops
Collector's field number: PH 6936 AnnoSysID: BGBM:Herbarium Berolinense:B 10 0220616
Import Date: 04/09/14 12:38:49 Data format: abcd2.06b

Annotation type selector
Annotation Type: Gathering

Annotation editor

Comments

General comment: Internal message to data provider (non-public):

Annotation

Element	Original value	New value	Comment
Collector's field number	PH 6936		
Gathering locality (text)	Gov. Al Mahra. eastern flank of the Jabal Sharwayn 10 km W of Qeshn, rocky slopes.		
Country	Yemen		
Country code (ISO 3166)	YE		
Gathering area name	Asia		
Gathering area class	Continent		
Gathering site relation to a different named place			
Gathering site latitude (decimal degrees)	15.3833332062		
Gathering site longitude (decimal degrees)	51.5999984741		

Standard View XML Expert View

Fig. 35: Standard Annotation View.

In the XML Expert View, the underlying XML document is represented as a tree. To annotate (add, delete or correct) a specific element, you can click through the tree to get to the element you want to annotate, or you can use the search function to directly jump to a specific element or add an element to the XML document. See section [XML Expert View](#) for the detailed description of how to use this view.

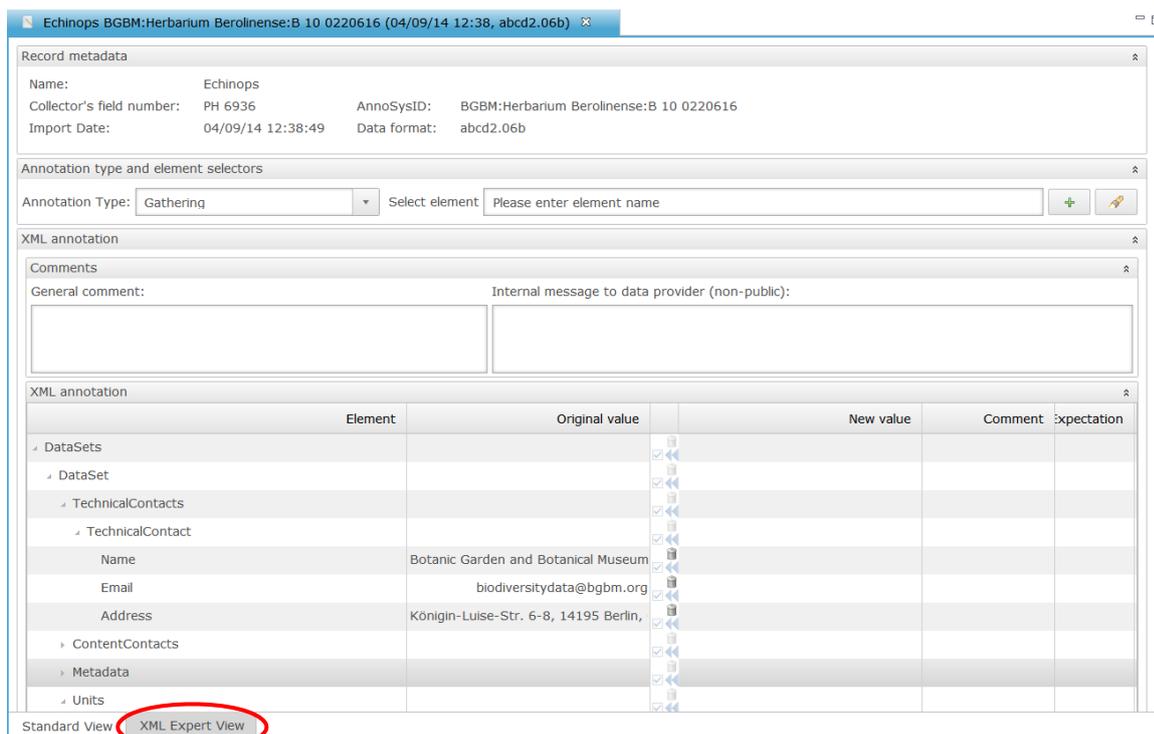


Fig. 36: XML Expert View.



Note! It is not possible to switch between the Standard View and the XML Expert View within one annotation type. If you choose to use the expert modus you may annotate all elements across all annotation types within this view.

Standard View

Making annotations

After you have selected an annotation type the corresponding record data elements are displayed with their original value. You can now enter new values (i.e. annotations) into the “new value” column. You can also enter a specific comment to the annotated value in the column “Comment to annotation”.

Saving annotations

To save and publish your annotation click the “preview and publish button” in the top left corner or use the CTRL-S keyboard shortcut. A preview of your annotation will be displayed. If you are happy with the content as it is displayed, click the “publish” button. Your annotation is now stored in the system and visible to all users. If you wish to change or delete your annotation, click the “cancel” button. You will then be led to the annotation editor and you will be able to edit the annotation.

***unpublished Gathering Okka Tschöpe** ✕

THIS IS A PREVIEW Please review your input and then publish or change your input again.

publish cancel

Record metadata ⤴

Name: Colchicum caucasicum
 Collector's field number: 797 AnnoSysID: BGBM:Herbarium Berolinense:B 10 0127019
 Import Date: 04/09/14 08:38:35 Data format: abcd2.06b

Annotation Metadata ⤴

Annotator: Okka Tschöpe Annotation Id: BGBM:AnnoSys:1409828340906
 Annotation Type: Gathering Annotation Date: unpublished

Annotation viewer ⤴

Comments ⤴

General comment:

Annotation view ⤴

Element	Original value	New value	Comment	Expectation
Gathering locality (text)		Gazi Çiftliği, bei Ankara		Add
Biotope (free text)		steinige Steppe		Add
Start of gathering event (YYYY-MM-DD)		1955-01-23		Add
Date (text)		23.01.1955		Add

Fig. 37: Preview of the annotation.

After you pushed the publish-button, a dialogue opens, if no curator is registered for the respective record. You might inform the content contact (taken from the ABCD metadata). You might also add an additional contact and decide whether to supply the additional person with an internal comment, as displayed beside the click-box, or not (see Fig. 38).

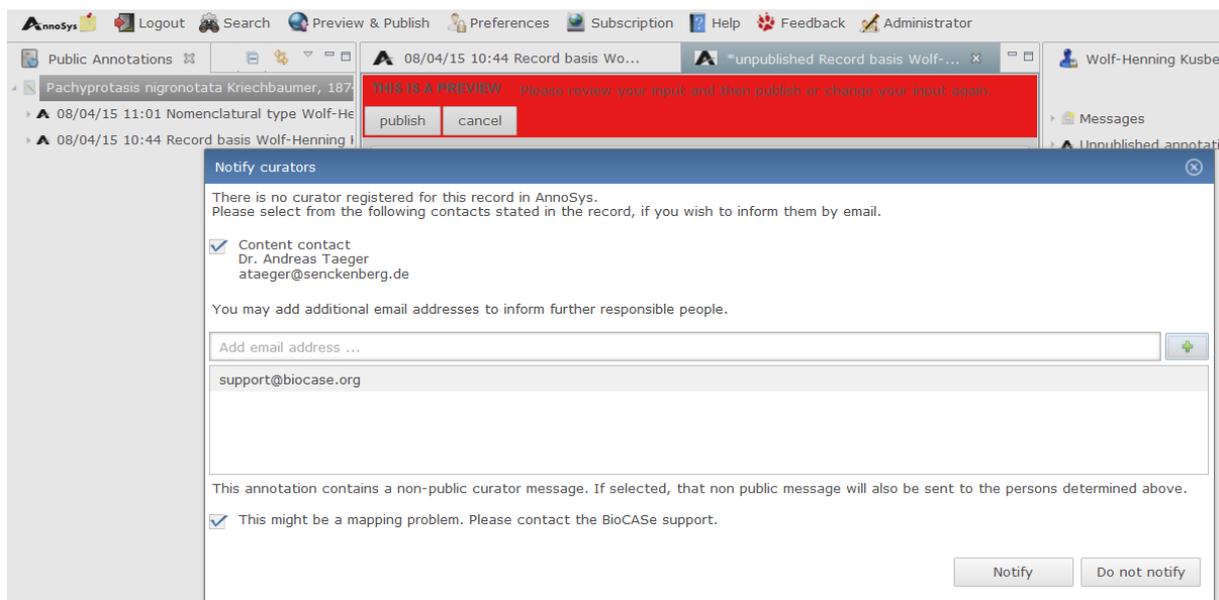


Fig. 38: Dialogue to notify curators and additional contacts.

After you have published your annotation, you will receive an email that summarises your annotation as well as a message in your Messages Box in your profile navigator.

Icon Column

Between the column “Original value” and “New value” there is a column with a tickmark icon, a dustbin and two blue left arrow.

Table 2: Functions of the icons in the annotation editor.

	<p>By clicking the dustbin you suggest the original value to be deleted. You would use this option if you think that the given value is wrong, but don't have an alternative value, or if the value does not belong to the element it currently refers to. By clicking this button you suggest to remove the element and its content.</p>
	<p>By clicking the blue arrow button you can undo an entry you made</p>
	<p>The tick mark is intended for future use to activate verification or proposal functionalities for the entered value. [not implemented yet]</p>

Annotation					
Element	Original value		New value	Comment	Expectation
det./rev./conf					
Higher taxon name	COMPOSITAE		det.		
Full scientific name	Helichrysum arenari		rev.		
Genus	Helichrysum		conf.		

Fig. 39: Adding a new value to an element.

In case that you wish to select an annotation type that is not listed in the combo box or an XML-element that is not listed in the annotation view or simply to examine the original XML-document you can switch to the “**expert modus**”.

XML Expert View

In case that you wish to select an annotation type that is not listed in the combo box or an XML-element that is not listed in the annotation view or simply to examine the original XML-document you can switch to the “expert modus” which gives you the complete XML-view of the record. You will see all elements of the original XML-document in a table.

To get to the XML-view or “expert modus”, click on the “XML-view”-tab at the bottom of the page.



You **must select an annotation type** – at this point it doesn’t matter which one- to get the data of the XML-document displayed.

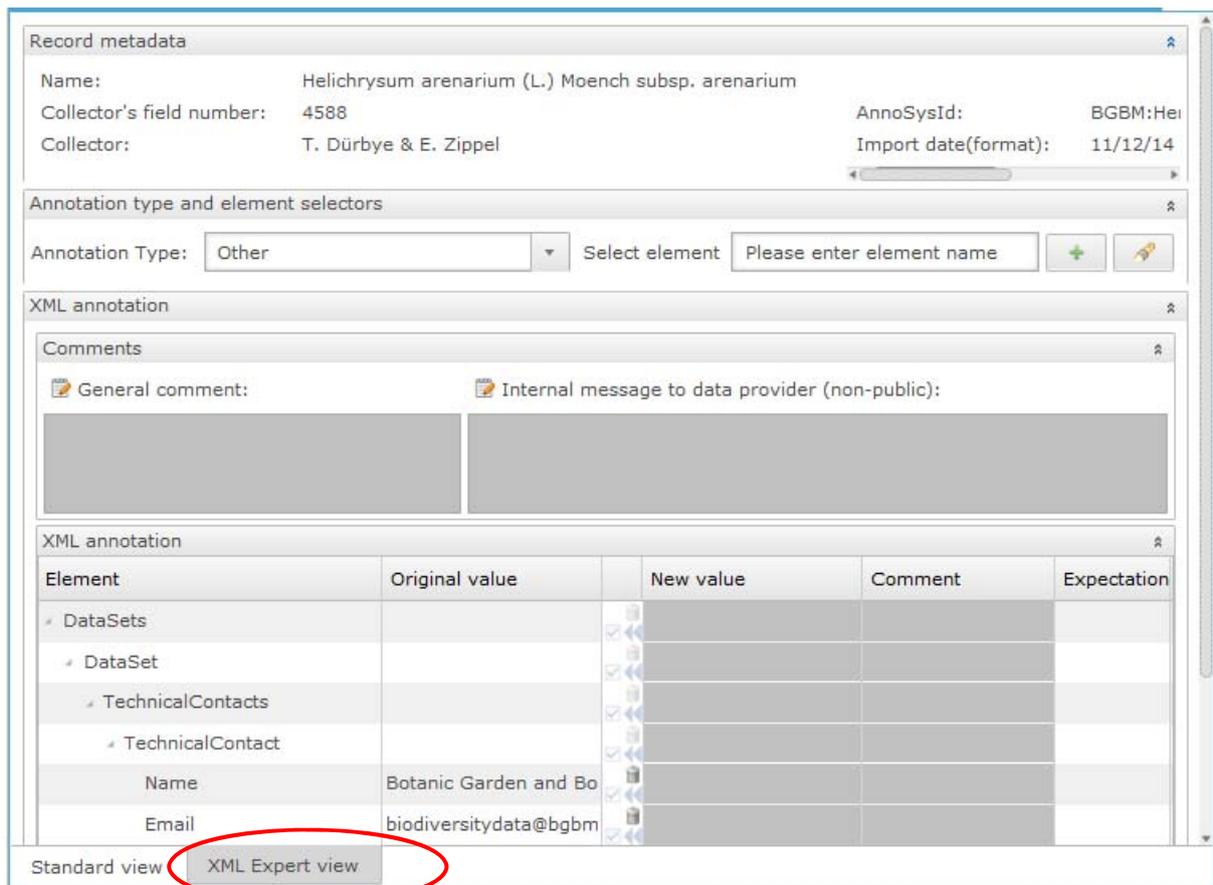


Fig. 40: Click on the “XML Expert View” to get the XML view of a record.

In this view, you can either click through the XML-tree to get to the element you wish to annotate (to do so click on the small arrow left of the element name), or, the more comfortable way, you can use the “Annotation type and element selector”.

If the element you search is not present in the XML-document yet, you can add it by using the “Select element” and “Add”-function.

Annotation type and element selector

The screenshot displays the AnnoSys XML Expert view. The top section, titled "Record metadata", contains the following information:

Name:	Helichrysum arenarium (L.) Moench subsp. arenarium	AnnoSysId:	BGBM:Hei
Collector's field number:	4588	Import date(format):	11/12/14
Collector:	T. Dürbye & E. Zippel		

Below the metadata is the "Annotation type and element selectors" section, which is highlighted with a red border. It features a dropdown menu for "Annotation Type" set to "Determination", a "Select element" button, and a text input field containing "Please enter element name". To the right of the input field are two buttons: a green plus sign and a magnifying glass icon.

At the bottom of the window, the "XML annotation" section is partially visible.

Fig. 40: Window to select annotation type and specific elements (XML Expert view).

"Select element" and "Search element" function

If you are looking for a specific ABCD-element, you can use the "Search element" function. Use the box "annotation type and element selector" and use the "Select element" option. Here, you can type in the element searched for in the box "Select element". It is usually sufficient to type in the last part of the X-path. AnnoSys gives you a list of suggestions of which you can select an element by double-clicking. The left part of the occurring window gives you the X-path to the selected element and its documentation. Please be aware that the same element can be used within different pathes.

Note that you have to select an appropriate annotation type to be able to select an element!

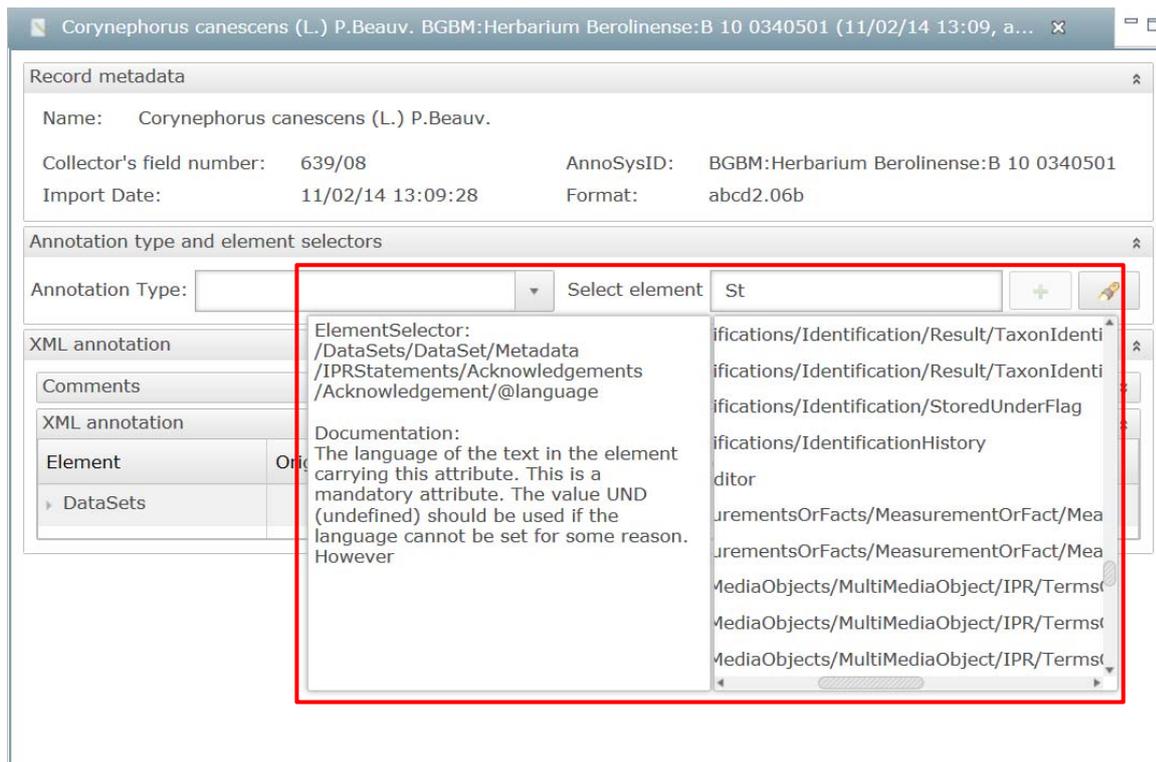


Fig. 41: List of suggestions for a searched element after typing two letters in the “select element” box.

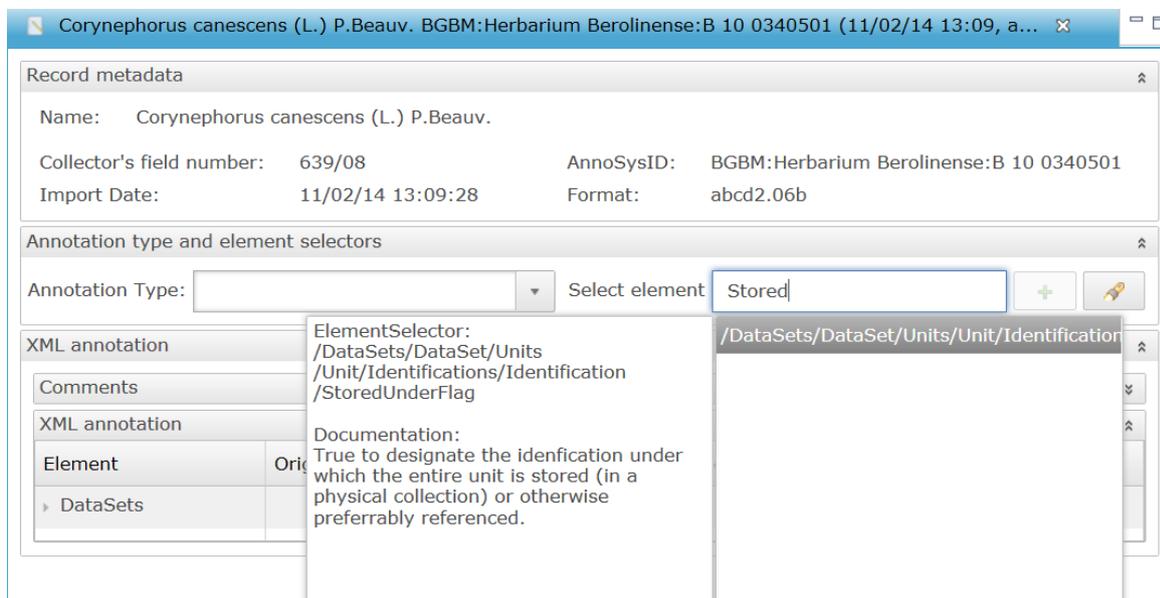


Fig. 42: List of suggestions for a searched element (here: StoredUnderFlag) after typing “Stored” in the “select element” box.

To start the query for the selected element click on the torch-icon right of the “Select element” box.

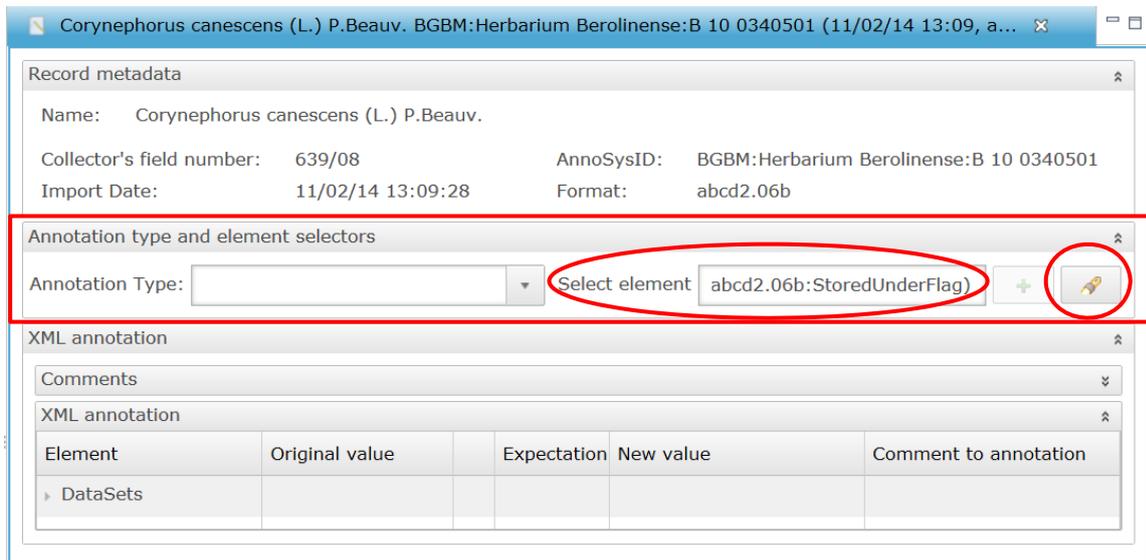


Fig. 43: Search for a specific ABCD element in the XML-view.

If the element you selected is not part of the original XML-document, you will receive an “Element not found”-message.

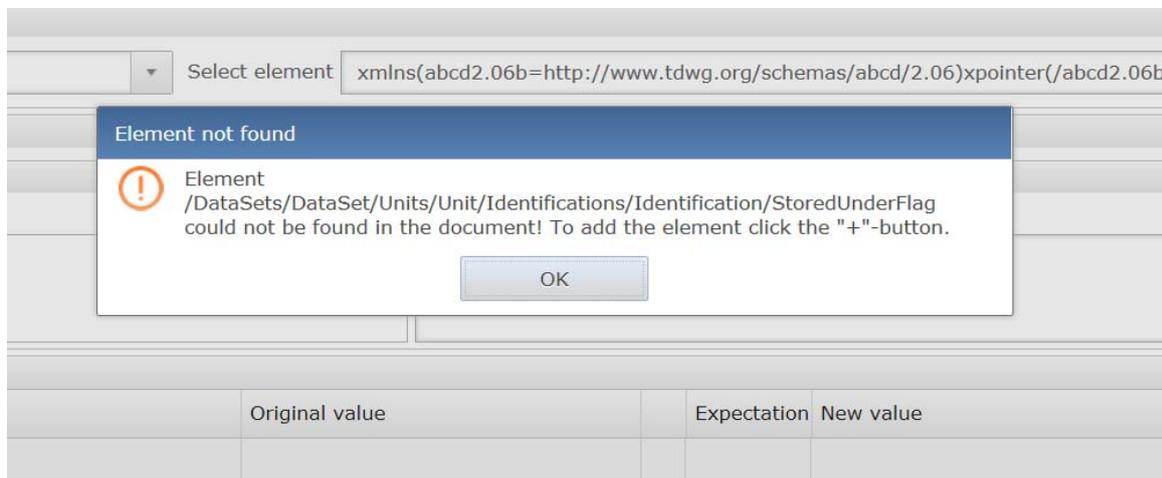


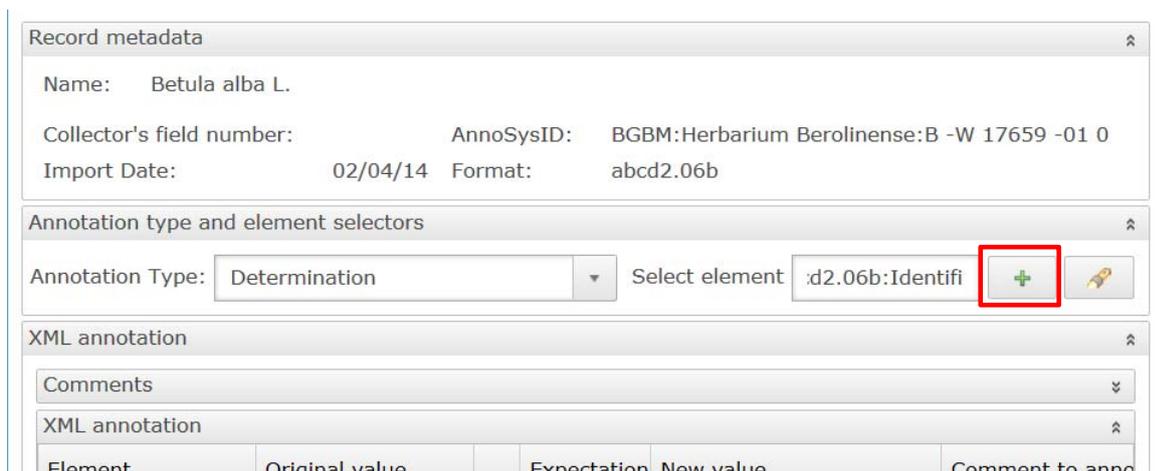
Fig. 44: Message occurring if the element searched for is not part of the original document.

In this case, you can use the “Add element” function to add the element.

“Add element” function

To add an element you must choose the **annotation type** to which the element that is searched for belongs. Choose “Other” if the element searched for does not fit in any of the given categories.

Click the torch-icon to search the element. If the element searched for is not part of the original XML-document, you will receive a message saying „Element ... could not be found in the document. If you want to add this element to the document, click the green “+”-button”.



The screenshot shows the AnnoSys interface with the following sections:

- Record metadata:** Name: Betula alba L., Collector's field number: AnnoSysID: BGBM:Herbarium Berolinense:B -W 17659 -01 0, Import Date: 02/04/14, Format: abcd2.06b
- Annotation type and element selectors:** Annotation Type: Determination, Select element: :d2.06b:Identifi. A red box highlights the green '+' button next to the element selector.
- XML annotation:** Comments, XML annotation table with columns: Element, Original value, Expectation, New value, Comment to anno.

Fig. 45: Add-button for adding a new element.

You can now add a new value into the corresponding field and save your annotation by clicking the “publish”-icon in the top left corner.



Problems and how to circumvent them

Elements: HigherTaxonRank and HigherTaxonName: If you can not annotate these elements in the Standard View, please choose the XML Expert View. If it is not possible to add repeatable ABCD-elements yet, please use the comment field to not lose information.

Search for Annotations

To search for annotations click on the “search” button in the menu.



Fig. 46: “Search” button to start search function.

The search form opens and offers you several search fields. Enter your query into the specific field or fields. You can search for a family, a genus, a species name, collector’s number, a collection, a collector’s name, a identifier’s name, or an annotator. For family names the most common synonyms are implemented, e.g. search for Asteraceae will give back results either for Asteraceae and Compositae.



Note! No wild card search is implemented; you are searching always on the string you entered.



Note! Currently no standardized vocabulary for subscriptions is available for AnnoSys subscriptions. Standard entries for plant and animal families (IPNI, Fauna Europaea) and Gathering countries (English version of ISO country code name) will give best results. For institutions and collections please use institution name and collection name as provided to GBIF although the string might differ from community standards. Because of the different handling of personal names in databases, please simply put in the family name of a person without any wild card.



Note! In the current implementation AnnoSys does not automatically include synonyms in its search for genera and species. To improve your search results expand your search to synonym names.

In the “Annotation Type”-field you can restrict your search to a specific kind of annotation. If you do not select an annotation type, all annotations referring to the data sets you selected will be displayed.

Click the Search-button to start the query.

AnnoSys Logout Search Preview & Publish Preferences Subscription

P Search for annotations

Search filter

Family

Genus

Species

Collector's number

Institution code IBMT

Collection code CCCryo

Catalog number 242-06

Collector name

Identified by

Annotator

Annotation type

Determination Storage locality of duplicates Gathering

Nomenclatural type Sequence Other

Record basis Scientific name

Search

Fig. 47: AnnoSys search form. Example: Triple Id queried (Intitution code, Collection code, Catalogue number)

After you have clicked the search-button, a list of search results will be displayed beneath the search dialogue.

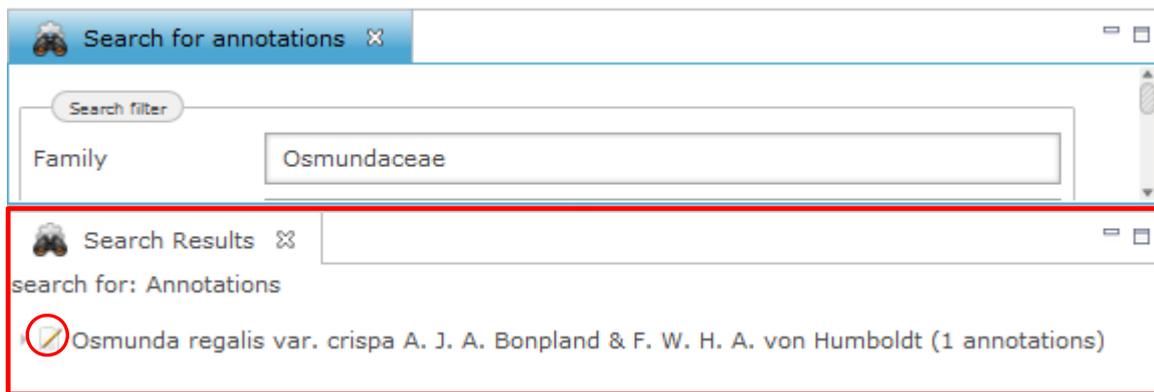


Fig. 48: Search result of a query searching for annotations on *Betulaceae* with one annotation found.

When you click on the little arrow left of a search result, a list of all annotations is displayed.

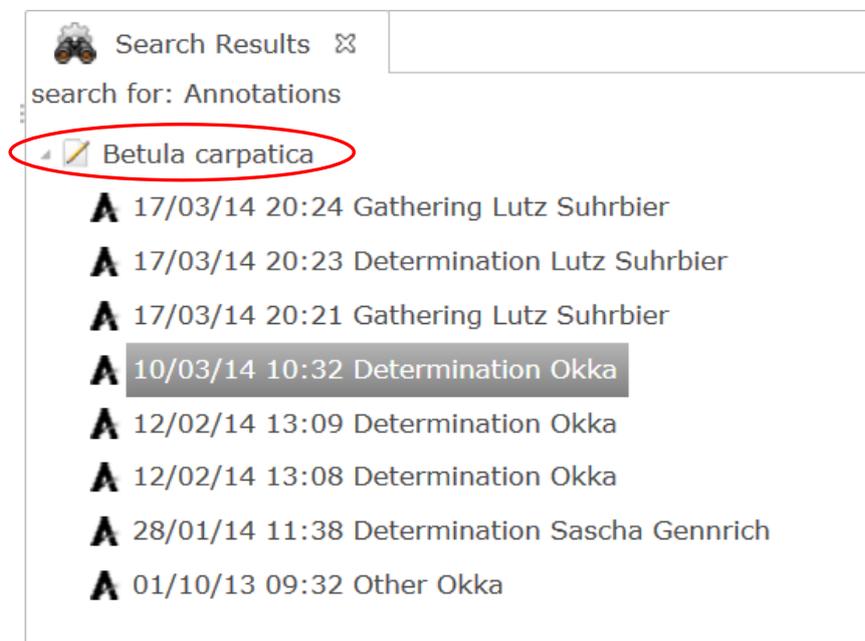


Fig. 50: List of annotations appearing after clicking the little arrow left to the species name.

When you double-click on an annotation (or use the right mouse key and then click open), the annotation view will be displayed (Fig. 49).

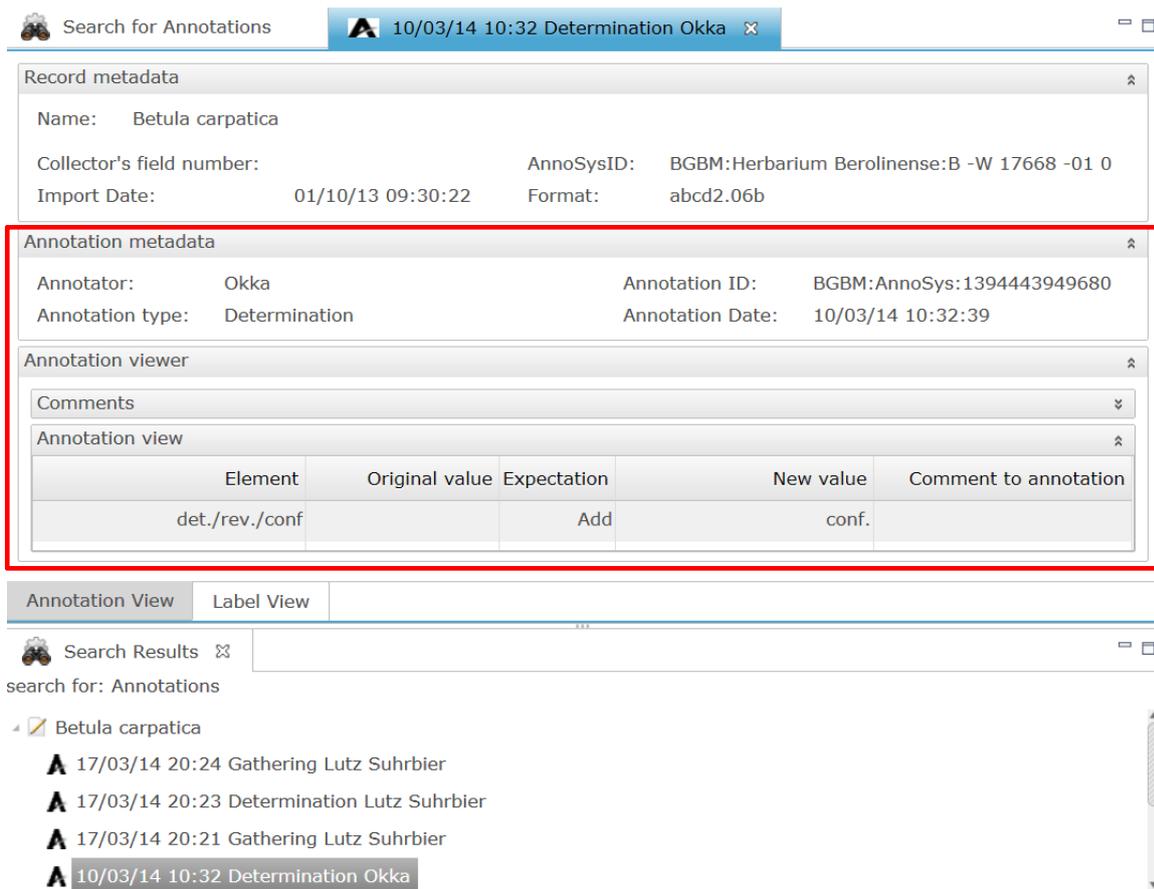


Fig. 49: Annotation view of an annotation.

When you click on the “Label View” button, you see a summary of the most important specimen data displayed in a label-like view. Original data are displayed in black, while the annotations are displayed in colour, similar to a “track change modus” (test implementation under evaluation).



Fig. 50: Label Preview of an annotation.

When you double-click on the species name (or use the right mouse key and then click open), the annotation editor opens (Fig. 51), and you can make a new annotation to that record. (See chapters “[Making annotations](#)” and “[Saving annotations](#)”).

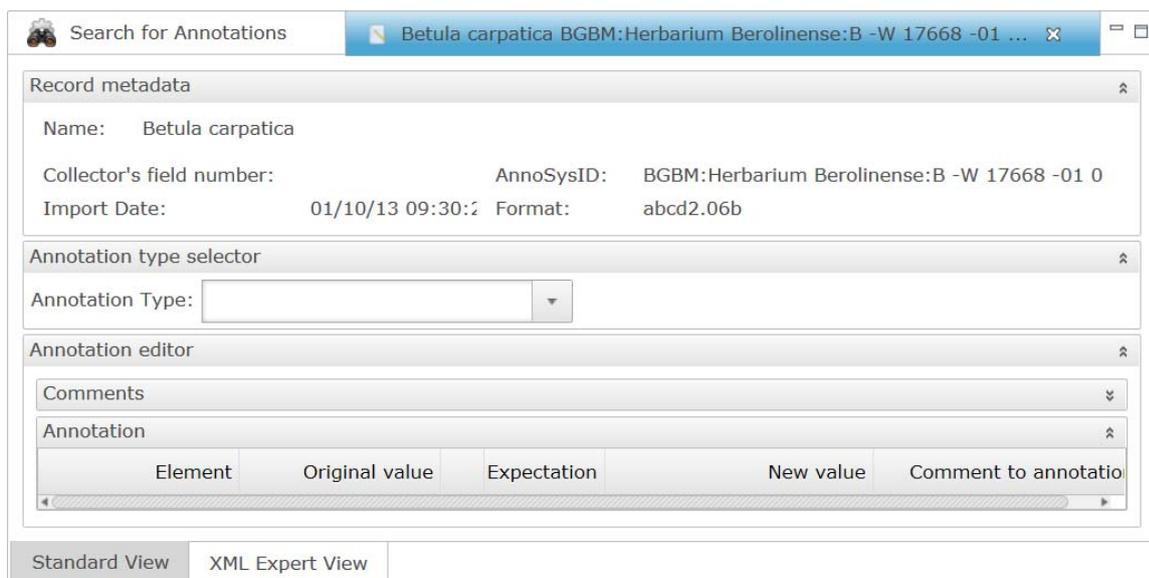


Fig. 51: The Annotation editor is displayed when you double-click on the species name.

Subscription function

To subscribe to a message service that informs you about new annotations about a specific taxon, institute, collection, object ID or gathering country, click on the Subscription button in the header.

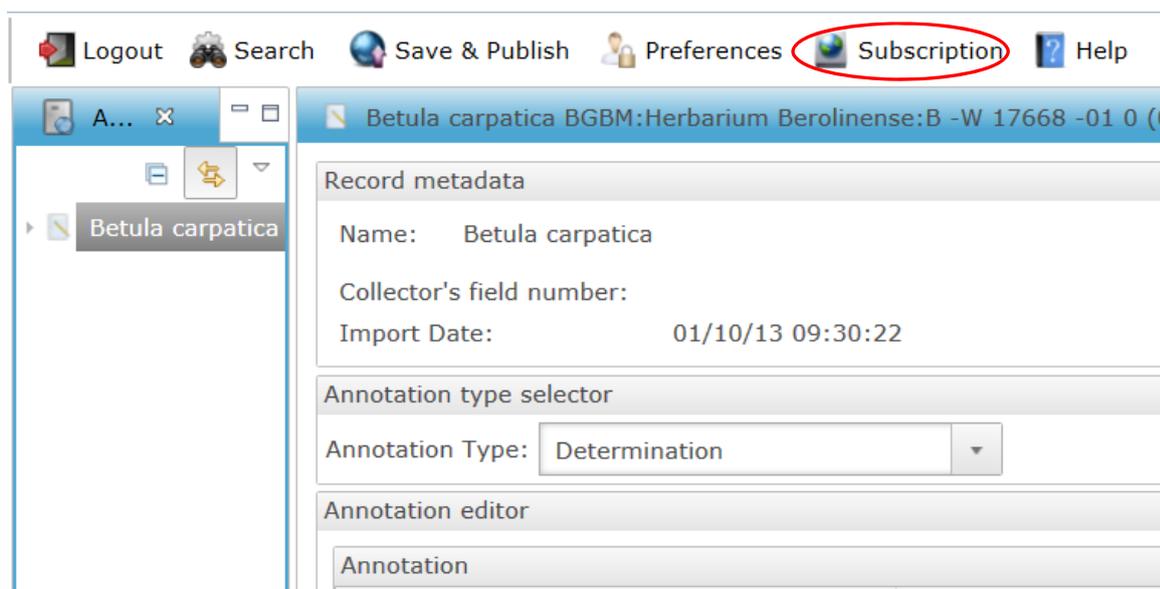


Fig. 52: Subscription button to open the subscription dialogue.

The subscription dialogue opens and you are prompted to give your subscription a display name. This name is used in your list of subscriptions in your “My AnnoSys” section.

Create New Subscription

Displayname

Choose criterion type

Criteria

<none>

Fig. 53: Subscription dialogue.

Next, you can choose criteria for you subscription from the dropdown menu (Fig. 54) by selecting a criterion and entering a value in the box next to the chosen criterion (e.g. a scientific name).

Create New Subscription

Displayname

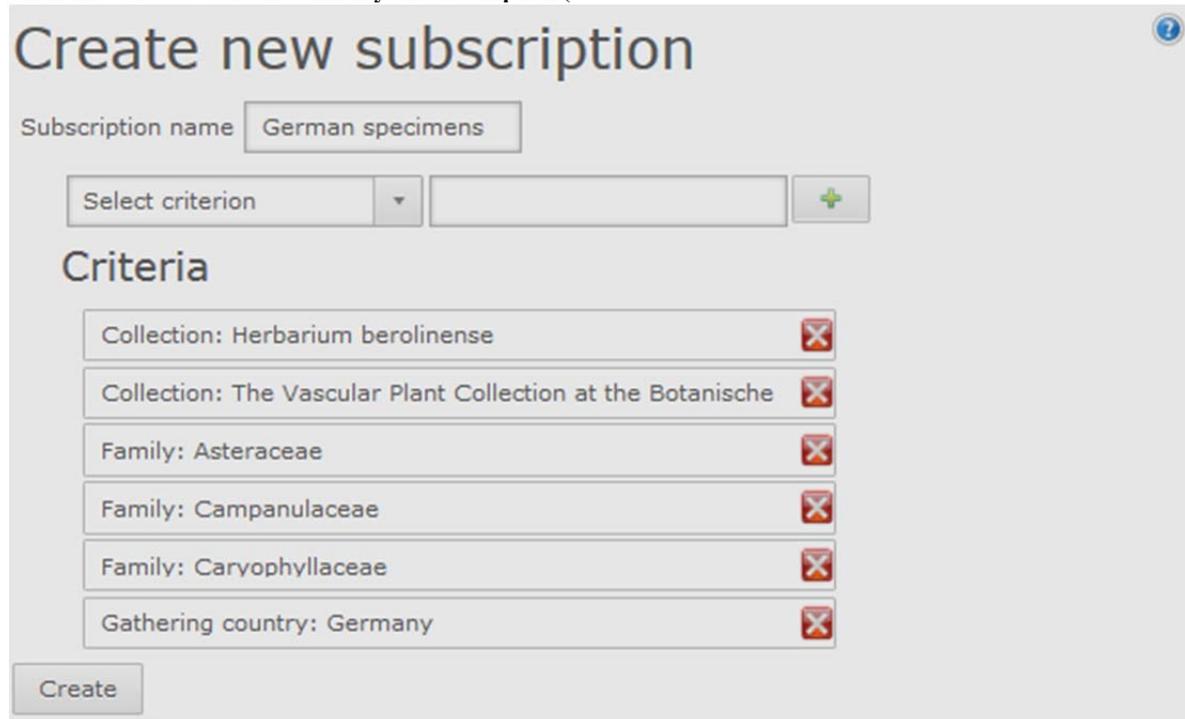
Choose criterion type

Institute
Collection
Object ID
Family
Scientific name

Fig. 54: Dropdown menu to subscribe for specific criteria.

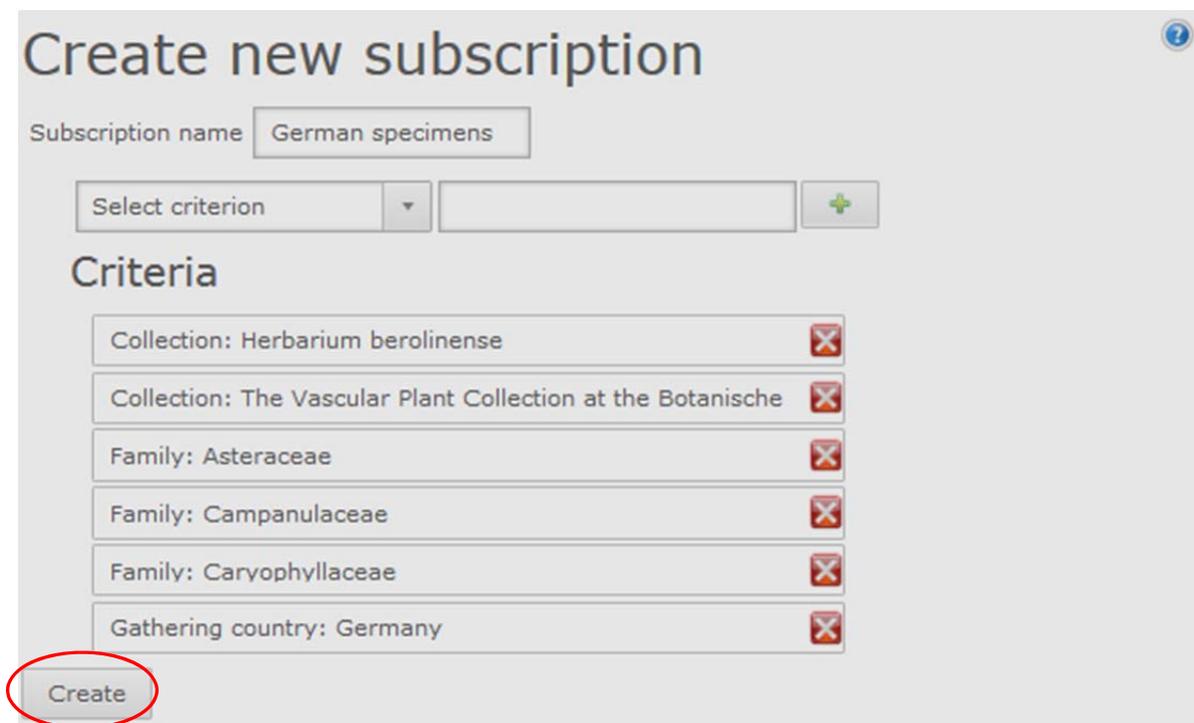
Klick the button with the green “+” to add the criterion and its value. You can add further criteria by selecting them and clicking on the green “plus”. If you want to delete a criterion click on the red cross at the end of the line.

Click the “Create”-button to finish your subscription (



The screenshot shows a web interface for creating a new subscription. At the top, the title "Create new subscription" is displayed. Below it, the "Subscription name" field contains the text "German specimens". A "Select criterion" dropdown menu is followed by an empty input field and a green plus sign button. Under the "Criteria" section, there are six criteria listed, each with a red 'X' button to its right: "Collection: Herbarium berlinense", "Collection: The Vascular Plant Collection at the Botanische", "Family: Asteraceae", "Family: Campanulaceae", "Family: Caryophyllaceae", and "Gathering country: Germany". At the bottom left, a "Create" button is highlighted with a red circle.

Fig. 55).



This screenshot is identical to the one above, showing the "Create new subscription" form. The "Create" button at the bottom left is circled in red, indicating it is the button to click to finish the subscription.

Fig. 55: Create button to finish subscription.

Next, a message informing you about the successful creation of your subscription will be displayed.



Fig. 56: Message informing you about the successful creation of your subscription.



Note! Currently no standardized vocabulary for subscriptions is available for AnnoSys subscriptions. Standard entries for plant and animal families (IPNI, Fauna Europaea) and Gathering countries (English version of ISO country code name) will give best results. For institutions and collections please use institution name and collection name as provided to GBIF although the string might differ from community standards. Because of the different handling of personal names in databases, please simply put in the family name of a person without any wild card.

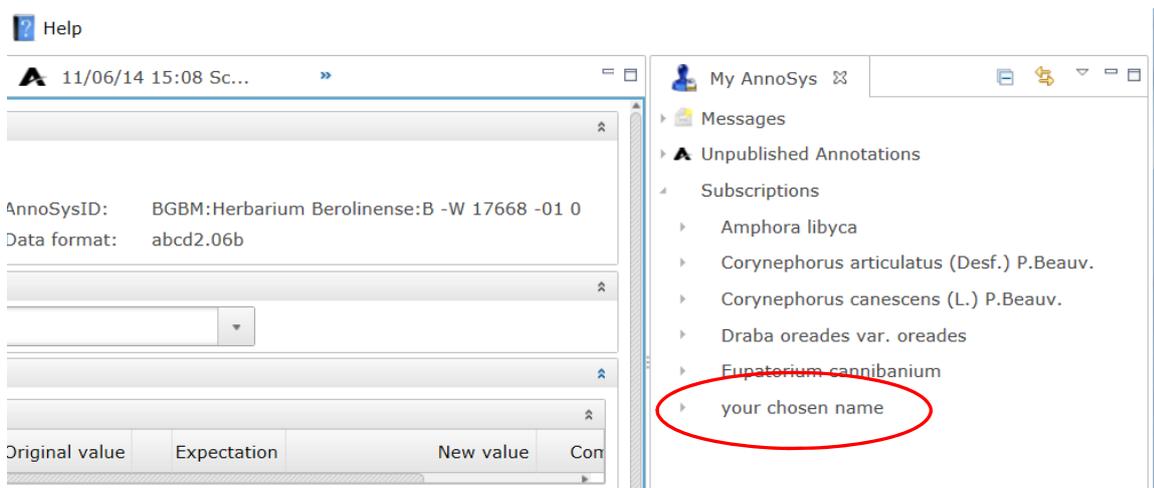


Fig. 57: List of subscriptions in your “My AnnoSys”-section.

If you wish to delete a subscription, right-click it with your mouse and click “Remove” (see [Deletion of subscriptions](#)).

Mass Annotations

To add one annotation to several records simultaneously, i.e. to make a mass or bulk annotation, tick the Select/Deselect all data box in the top left corner of the search results table or select the records you wish to annotate by ticking the small boxes in the left column and then click on “See details for the selected units”.

Search
 Simple search
 Advanced search

Registry

About
 Click on a scientific name to get all the full details about this unit.
 To display other columns, or to increase the number of results shown per page, go to the Preferences page.

Contributors

Results
 Show/Hide query

Your search returned **14** hits - [Download all details](#)
 There are 0 multimedia item(s).

» [See the details for the selected units](#) 
 » [Download the details for the selected units](#) 

<input checked="" type="checkbox"/>	Taxon name	Author	Genus	Family	Country	Locality	Collection	Institution	Coll
<input type="checkbox"/>	Select/Deselect all data	L.	Lythrum	Lythraceae	Greece	Ahaia, NW Diakopto, [38° 12' 11"N/22° 11' 20"E], alt. 1 m, Strandnahe Krautfluren, Bachbett, Schilfgürtel.	Herbarium Willing	BGBM	2005
<input checked="" type="checkbox"/>	Lythrum salicaria	L.	Lythrum	Lythraceae	Greece	Ahaia, SO Diakopto, [38° 08' 41"N/22° 13' 43"E], alt. 230 m, Krautfluren, Weinkulturen.	Herbarium Willing	BGBM	2005
<input checked="" type="checkbox"/>	Lythrum salicaria	L.	Lythrum	Lythraceae	Greece	Ahaia, Paralia Porovitsis, [38°	Herbarium Willing	BGBM	2005

Fig. 60: To conduct a mass annotation select the specific records and click the “see details” link.

You will then get to the details page of the first record. On the left side, there is a list of all records you selected.

Selected units :
 1. Lythrum salicaria
 2. Lythrum salicaria
 3. Lythrum salicaria
 4. Lythrum salicaria
 5. Lythrum salicaria
 6. Lythrum salicaria
 7. Lythrum salicaria
 8. Lythrum salicaria
 9. Lythrum salicaria
 10. Lythrum salicaria
 11. Lythrum salicaria
 12. Lythrum salicaria
 13. Lythrum salicaria
 14. Lythrum salicaria
 > Download all 
 > Annotate all 

Name: Lythrum salicaria

Taxonomy: DICOTYLEDONEAE (classis) ;

Genus: Lythrum

FirstEpithet: salicaria

Gathering

Code: Aha 303

Locality	Collector(s)	Other info
Country: Greece (GR)	Willing	Date:
Locality: Ahaia, NW Diakopto, [38° 12' 11"N/22° 11' 20"E], alt. 1 m, Strandnahe Krautfluren, Bachbett, Schilfgürtel.		DateTimeBegin: 2005-09-21
Coordinates (Lat Lon): 38.2030555556, 22.1888888889 Map!		

Data specific to herbarium specimens

Exsiccatum: 142555

Dataset summary

Fig. 58: “Annotate all” option to import records for a mass annotation to AnnoSys.

Click “Annotate all”. The records will then be imported to AnnoSys and the following “Record Selection” dialogue will be displayed:

Record Selection ⊞ ×

The imported document contains multiple records.
Please select the records to be annotated by using the following checkboxes.
Then, you may annotate the selected records uniformly (mass annotation), or individually by pushing the appropriate button.

- Lythrum salicaria BGBM:Herbarium Willing:B 10 0227306 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria BGBM:Herbarium Willing:B 10 0227307-08 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria BGBM:Herbarium Willing:B 10 0227309 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria BGBM:Herbarium Willing:B 10 0227310 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria BGBM:Herbarium Willing:B 10 0227311 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria BGBM:Herbarium Willing:B 10 0227312 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria L. BGBM:Herbarium Berolinense:B 10 0356713 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria L. BGBM:Herbarium Berolinense:B 18 0013905 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria L. BGBM:Herbarium Berolinense:B 18 0013906 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria L. BGBM:Herbarium Berolinense:B 18 0014719 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria L. BGBM:Herbarium Berolinense:B 18 0015863 (28/08/14 11:02, abcd2.06b)
- Lythrum salicaria L. BGBM:Herbarium Berolinense:B 18 0017064 (28/08/14 11:02, abcd2.06b)

Select All
Deselect All

Mass annotation
Individual annotation

Fig. 59: Record selection for a mass annotation.

To make a mass annotation click “Select All” and then “Mass annotation”. You can also select specific records by ticking the checkboxes left of the record.

The selected records are displayed in the Record metadata box. You can now select an annotation type and annotate the records as described in section “[Annotation](#)”.

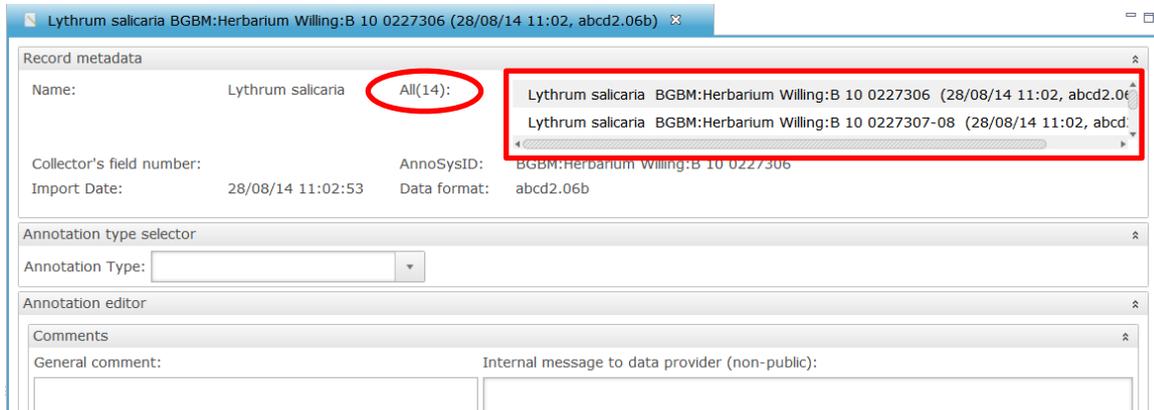


Fig. 60: Annotation editor for mass annotations.

To publish your annotation click the “preview & publish” button.

Curator interface

The curator interface is visible only for registered curators of specific collections or data sets. If you are a curator and want to curate or respond to an annotation, i.e. accept or reject the annotation, please send an email to

annosys@bgbm.org

to apply for curation rights. After your identity has been verified, AnnoSys will register you as the curator for the specific collection or data set.

Once you are registered as curator the following dialogue opens whenever you open an annotation referring to your collection:

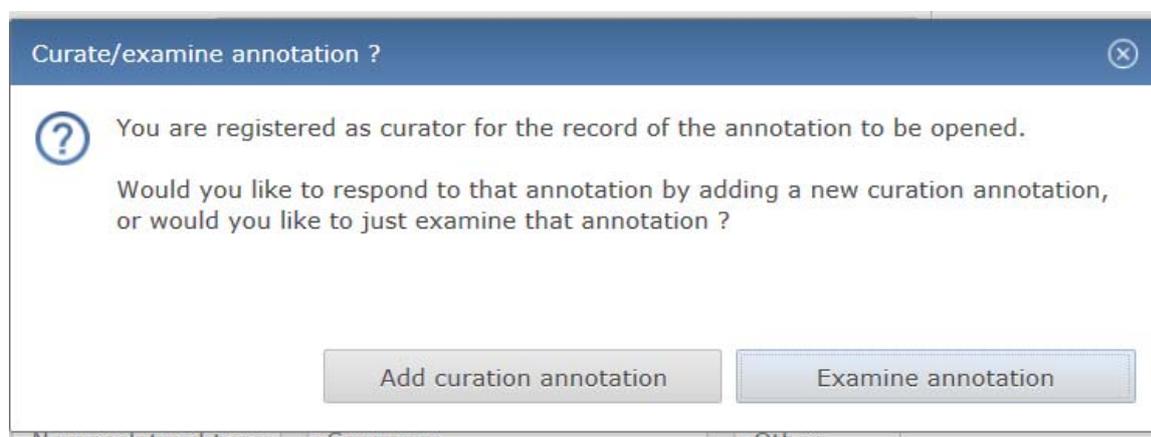


Fig. 61: Dialogue opening to curator when opening an annotation referring to his collection.

If you only want to see the annotation without commenting on it click the “Examine annotation” button.

If you want to accept or reject the annotation, or inform the annotator and the AnnoSys users that you updated the record according to the annotation, click the “Add curation annotation” button. The following interface will appear, displaying the annotation. In the left column of the “Curation annotation editor” there is a drop-down list from which you can choose “Accepted”, “Rejected”, “Undecided” or “Updated”. If you have made your choice click on the “preview & publish” button to publish your curation annotation. When you are happy with the preview click “publish” again. Your annotation will then be visible in the AnnoSys interface and the portals and subscribers will be notified about it.

Record metadata

Name: Aulacoseira crassipunctata Krammer

Collector's field number: AnnoSysID: BGBM:Algoterra Types:7593

Import Date: 16/07/14 10:48:07 Data format: abcd2.06b

Curation Metadata

Curator: Okka Tschöpe Curation Id: BGBM:AnnoSys:1409224245072

Annotation Type: Curation Curation Date: unpublished

Curated Annotation Metadata

Annotator: Wolf-Henning Kusber Annotation Id: BGBM:AnnoSys:1405500525803

Annotation Type: Nomenclatural type Annotation Date: 16/07/14 11:14:06

Curation annotation editor

Comments

Curation comment: Annotation comment

Holotype cited in AlgaTerra as: Slide 540A in coll. Krammer, Meerbusch; Collection Krammer, Inst. Oberflächenanalyse (IOK). The private collection of K. Krammer was incorporated into BRM.

Curation annotation viewer

Decision	Reason	Expectation	Element	Original value	New value	C
Undecided		Add	URI of nomenclatural reference	http://www.algoterra.org/ATDB/Names/NamesMain.cf		
Accepted						
Rejected						
Undecided						
Updated						

65a

Comments

Curation comment: Annotation comment

Data and identification confirmed.

Curation annotation viewer

Decision	Reason	Expectation	Element	Original value	New value	Comment
Undecided		Add	det./rev./conf		conf.	

65b

Fig. 62: Curator interface with decision column and drop-down list to accept or reject an annotation. 65a. General design. 65b. revised version: all editable fields are highlighted in a different grey colour and marked with an icon.

References

Berendsohn, W. G. (ed.) 2005–. ABCD Schema 2.06 – ratified TDWG Standard. TDWG Task Group on Access to Biological Collection Data, Botanic Garden and Botanical Museum Berlin-Dahlem. <http://www.bgbm.org/tdwg/codata/schema/>

Tschöpe O., Macklin J.A., Morris R.A., Suhrbier L. & Berendsohn W. G. 2013. Annotating Biodiversity Data via the Internet. *Taxon* 62: 1248-1258. <http://dx.doi.org/10.12705/626.4>

Appendix : AnnoSys Terms of Use

General terms of use

By using this AnnoSys website and the content available on and through it, you are agreeing to be bound by these Terms of Use.

Registration

In order to submit or use content on the AnnoSys website or to utilise the AnnoSys services you are required to register to establish an account and a user profile with the AnnoSys.

When registering, a genuine email address, name and institution must be provided. Personal information will be managed in accordance with the AnnoSys Privacy Policy. You will ensure that any registration information you give to the AnnoSys is accurate, correct and up to date.

Contributing or uploading Content

At the time of adding your content you state that users can use the data under the creative commons „Attribution-Share Alike” license.

Using the Content

If you use or download content from the AnnoSys website you agree to acknowledge, reference or attribute the relevant data provider in any derived work that is based on the relevant content.

Posting information

You are responsible for your contributions and you should be aware that your contributions may remain online indefinitely.

Data privacy

When you register or publish content on our web page, we record your name, email address and institution. Your name will be published with any annotation you make. Your email address will not be publicly available or visible for other users.

With respect to data privacy, the agent database, personal profile stores and other system relevant configuration files are stored in a location on the server inaccessible for unauthorised AnnoSys agents or external services.

<https://annosys.bgbm.fu-berlin.de/terms-of-use>

Appendix 2

Table 3: List of ABCD elements belonging to the specific annotations types (taken from <http://wiki.tdwg.org/twiki/bin/view/ABCD/AbcdConcepts>)

Annotation Type	Element Name	Content
Determination	det./ref./conf.	An indication of the nature of the taxonomic verification (e.g. "conf." for a confirmation event or "det." for an identification for which full credit goes to the identifier).
	Higher taxon name	A generic or higher taxon name (monomial) in accordance with rules of nomenclature and associated with the identified taxon. This is not necessarily the result of the identification event, but a classification added to the result of the identification in the source database.
	Higher taxon rank	The rank designation of the associated higher taxon (above the rank of genus). The fully spelled out rank value (in latin but for the "unranked" term and the "group" levels). This can be used as metadata for any name for a taxon of rank above the genus-level.
	Full scientific name	A concatenated scientific name given as the result of the unit identification, preferably formed in accordance with a Code of Nomenclature as fully as possible.
	Genus	The genus as part or only result of an identification, or a higher taxon name representing that result.
	First epithet	The first epithet in a botanical name combination identified for the unit (species epithet or the epithet of the subdivision of a genus).
	Infraspecific epithet	The final epithet of a botanical name of infraspecific rank identified for the unit. Subtaxa can be used to store any additional taxonomic identifier, in latin.. Example value: subsp. fuscum

Annotation Type	Element Name	Content
	Rank	The rank of the name identified for the unit, where needed to form it. (i.e. in infraspecies and in names of a rank between genus and species).
	Hybrid flag	A flag indicating that the unit identified is a named hybrid or a graft chimaera.
	Author team of basionym	Author team of the basionym of a combination identified for the unit.
	Author team	The author(s) who published the full name as it stands that was identified for the unit.
	Cultivar name	A cultivar name identified for the unit, as specified by the ICNCP.
	Identification made by	The name of person as normally used representing the unit identifier.
	Identifier (free text)	Alternative text indicating the person, person team, or organisation that made the identification.
	Identification date (YYYY-MM-DD)	The beginning of the unit identification period, or exact date, expressed in a modified ISO/ANSI structured format. Example values: 2005-04-10 , 2005-04 , 2005
	Identification date (free text)	The date of the unit identification event in text format. This element is meant for use when the date is imprecise, ambiguous or not in a form that satisfies the standard structured date format. Example values: 25 [?] 1925, 3/9/45 day month?, End of 19th Century , Spring 1912
	References used in identification	A formal citation for a paper or electronic publication that was used as the base for the identifier's taxon identification.
	Reference URI	An URL to an electronic source of the reference that was used as the base for the identifier's taxon identification.

Annotation Type	Element Name	Content
Gathering event	Collector's field number	The original number assigned to the unit by the collector or observer. The entire designation is normally composed of the name or initials of the collector(s) followed by a number.
	Gathering locality (text)	The original gathering locality data as appearing on a label or in an original entry, as a text string. Example value: New South Wales, Central Tablelands 12 km SW or Armidale.
	Country	The full name of the country or major region where the specimen was collected or the observation made.
	Country code (ISO 3166)	A 2- or 3-letter (ISO3166-1) or 4-letter (ISO3166-3) code for representation of the name of the country or origin.
	Gathering area name	Name of the gathering area (a geographic, geomorphological, geoecological, or administrative area). Example values: Atlantic coast , Weinheim , Andes
	Gathering area class	Allows the recording of classification categories for the class of the gathering named area (local or national subdivision levels, geomorphological units, protected areas, etc.) Example values: County, Island group, Water body, National park
	Gathering site relation to a different named place	The relation of the gathering site to a different named place, preferably by distance and directional point. Example values: 10 Km N of , near to
	Gathering site latitude (decimal degrees)	The latitude of the gathering site, expressed in decimal degrees.
	Gathering site longitude (decimal degrees)	The longitude of the gathering site, expressed in decimal degrees.
	Coordinate precision (meters)	An estimate of how tightly the collecting locality was specified, expressed as a distance in meters corresponding to a radius around the Lat/Long coordinates.

Annotation Type	Element Name	Content
	Altitude in m above sea level (lower or only value)	The lower or only value of the gathering site altitude.
	Altitude in m above sea level (upper value)	The upper value for the measured gathering site altitude, where there is a range.
	Altitude (text)	A free text representation of the gathering site altitude measurement (an alternative to the atomised version).
	Biotope name	The name of the gathering site biotope.
	Biotope (free text)	A free text field that can be used for an informal record of the gathering site biotope.
	Collector's full name	String of the preferred form of personal name for display representing the gathering agent.
	Collectors (free text)	Free text details about an individual gathering agent, as an alternative to the atomised version.
	Collector information	A free text representation or concatenated version of those responsible for collecting or recording.
	Start of gathering event (YYYY-MM-DD)	The exact date (and time) or beginning of a period representing the gathering event, expressed in a modified ISO/ANSI 8601 standard structured date format.
	End of gathering event (YYYY-MM-DD)	The end of the gathering event expressed in a modified ISO/ANSI 8601 standard structured date format.
	Date (text)	The date of the gathering event in text format.
Labels and inscriptions	Text transcription of inscription	A text transcription of the inscription on the unit.
	Author of label or inscription	The name of the person who created the label, writing or inscription that is on the unit.
	Comment on label text or inscription	A summary, interpretation or opinion of the text that is marked on the unit.

Annotation Type	Element Name	Content
Nomenclatural Type	Type status	A full term designating the status of the nomenclatural type designation.
	Typified name	The name based on the specimen.
	Person assigning/verifying the type status	String of the preferred form of personal name for display representing the type status verifier.
	Title citation of nomenclatural reference	A formal citation for a paper or electronic publication that is a nomenclatural reference.
	URI of nomenclatural reference	An URL to an electronic source of the nomenclatural reference.
	Verification date	The date of the verification of the type status of the specimen.
Record basis	Record basis	An indication of what the unit record describes.
Scientific Name	Full scientific name	A concatenated scientific name formed in the unit identification.
	Genus	The genus as part or only result of an identification, or a higher taxon name representing that result.
	First epithet	The first epithet in a botanical name combination that was identified for the unit (i.e. the epithet of a genus subdivision or a species epithet).
	Infraspecific epithet	The infraspecific epithet (i.e. the epithet following the indication of the infraspecific rank in the name string (trinomial)).
	Rank	The rank of the name identified for the unit, where needed to form it. (i.e. in infraspecies and in names of a rank between genus and species).
	Author Team of Basionym	Author team of the basionym of a combination identified for the unit.
	Author Team	The author(s) who published the full name as it stands that was identified for the unit.

Annotation Type	Element Name	Content
	Higher taxon name	A generic or higher taxon name (monomial) in accordance with rules of nomenclature and associated with the identified taxon.
	Higher taxon rank	The rank designation of the associated higher taxon (above the rank of genus).
Sequence	Database	The database holding a sequence derived from the unit.
	ID in Database	The ID of a sequence derived from the unit, within the database.
	Method	A description of the method used to achieve the unit sequence.
	Sequenced part	A description of the actually sequenced material derived from the unit (DNA/RNA/Protein, Gene or part of gene, completeness, etc.).
	Title citation	A formal citation for a paper or electronic publication where the sequence derived from the unit was published.
	URI	An URL to an electronic source of the reference that published the sequence derived from the unit.
Storage Locality of Duplicates	Duplicates distributed to	A free text field to note the known other recipients of a duplicate of the unit
	Associated Unit ID	Fully qualified identifier of the related item within the specified dataset.
	Comments about association	Further information about the association with another unit.

Table 4: List of X-paths to ABCD elements used in the different annotation types.

Annotation Type	Element Name	X-path
Determination	det./ref./conf.	DataSets/DataSet/Units/Unit/Identifications/Identification/Identifiers/IdentifierRole
	Higher taxon name	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/HigherTaxa/HigherTaxon/HigherTaxonName
	Higher taxon rank	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/HigherTaxa/HigherTaxon/HigherTaxonRank
	Full scientific name	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/FullScientificNameString
	Genus	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/GenusOrMonomial
	First epithet	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/FirstEpithet
	Infraspecific epithet	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/InfraspecificEpithet
	Rank	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/Rank
	Hybrid flag	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/HybridFlag
	Author team of basionym	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/AuthorTeamParenthesis
	Author team	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/AuthorTeam
	Cultivar name	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/CultivarName
	Identification made by	DataSets/DataSet/Units/Unit/Identifications/Identification/Identifiers/Identifier/PersonName/FullName
	Identifier (free text)	DataSets/DataSet/Units/Unit/Identifications/Identification/Identifiers/IdentifiersText

Annotation Type	Element Name	X-path
Determination	Identification date (YYYY-MM-DD)	DataSets/DataSet/Units/Unit/Identifications/Identification/Date/ISODateTimeBegin
	Identification date (free text)	DataSets/DataSet/Units/Unit/Identifications/Identification/Date/DateText
	References used in identification	DataSets/DataSet/Units/Unit/Identifications/Identification/References/Reference/TitleCitation
	Reference URI	DataSets/DataSet/Units/Unit/Identifications/Identification/References/Reference/URI
Gathering event	Collector's field number	DataSets/DataSet/Units/Unit/CollectorsFieldNumber
	Gathering locality (text)	DataSets/DataSet/Units/Unit/Gathering/LocalityText
	Country	/DataSets/DataSet/Units/Unit/Gathering/Country/Name
	Country code (ISO 3166)	/DataSets/DataSet/Units/Unit/Gathering/Country/ISO3166Code
	Gathering area name	/DataSets/DataSet/Units/Unit/Gathering/NamedAreas/NamedArea/AreaName
	Gathering area class	DataSets/DataSet/Units/Unit/Gathering/NamedAreas/NamedArea/AreaClass
	Gathering site relation to a different named place	DataSets/DataSet/Units/Unit/Gathering/NearNamedPlaces/NamedPlaceRelation/NearNamedPlaceRelationTo
	Gathering site latitude (decimal degrees)	/DataSets/DataSet/Units/Unit/Gathering/SiteCoordinateSets/SiteCoordinates/CoordinatesLatLong/LatitudeDecimal
	Gathering site longitude (decimal degrees)	/DataSets/DataSet/Units/Unit/Gathering/SiteCoordinateSets/SiteCoordinates/CoordinatesLatLong/LongitudeDecimal
	Coordinate precision (meters)	/DataSets/DataSet/Units/Unit/Gathering/SiteCoordinateSets/SiteCoordinates/CoordinatesLatLong/CoordinateErrorDistanceInMeters
	Altitude in m above sea level (lower or only value)	/DataSets/DataSet/Units/Unit/Gathering/Altitude/MeasurementOrFactAtomised/LowerValue
	Altitude in m above sea level (upper value)	/DataSets/DataSet/Units/Unit/Gathering/Altitude/MeasurementOrFactAtomised/UpperValue
	Altitude (text)	DataSets/DataSet/Units/Unit/Gathering/Altitude/MeasurementOrFactText
	Biotope name	DataSets/DataSet/Units/Unit/Gathering/Biotope/Name

Annotation Type	Element Name	X-path
Gathering event	Biotope (free text)	DataSets/DataSet/Units/Unit/Gathering/Biotope/Text
	Collector's full name	/DataSets/DataSet/Units/Unit/Gathering/Agents/GatheringAgent/Person/FullName
	Collectors (free text)	DataSets/DataSet/Units/Unit/Gathering/Agents/GatheringAgent/AgentText
	Collector's information	DataSets/DataSet/Units/Unit/Gathering/Agents/GatheringAgentsText
	Start of gathering event (YYYY-MM-DD)	DataSets/DataSet/Units/Unit/Gathering/DateTime/ISODateTimeBegin
	End of gathering event (YYYY-MM-DD)	DataSets/DataSet/Units/Unit/Gathering/DateTime/ISODateTimeEnd
	Date (text)	DataSets/DataSet/Units/Unit/Gathering/DateTime/DateText
Labels and inscriptions	Text transcription of inscription	DataSets/DataSet/Units/Unit/SpecimenUnit/Marks/Mark/MarkText
	Author of label or inscription	DataSets/DataSet/Units/Unit/SpecimenUnit/Marks/Mark/MarkAuthor
	Comment on label text or inscription	DataSets/DataSet/Units/Unit/SpecimenUnit/Marks/Mark/MarkComment
Nomenclatural Type	Type status	DataSets/DataSet/Units/Unit/SpecimenUnit/NomenclaturalTypeDesignations/NomenclaturalTypeDesignation/TypeStatus
	Typified name	DataSets/DataSet/Units/Unit/SpecimenUnit/NomenclaturalTypeDesignations/NomenclaturalTypeDesignation/TypifiedName
	Person assigning/verifying the type status	DataSets/DataSet/Units/Unit/SpecimenUnit/NomenclaturalTypeDesignations/NomenclaturalTypeDesignation/Verifier/FullName
	Title citation of nomenclatural reference	DataSets/DataSet/Units/Unit/SpecimenUnit/NomenclaturalTypeDesignations/NomenclaturalTypeDesignation/NomenclaturalReference/TitleCitation
	URI of nomenclatural reference	DataSets/DataSet/Units/Unit/SpecimenUnit/NomenclaturalTypeDesignations/NomenclaturalTypeDesignation/NomenclaturalReference/URI
	Verification date	DataSets/DataSet/Units/Unit/SpecimenUnit/NomenclaturalTypeDesignations/NomenclaturalTypeDesignation/VerificationDate
	Record basis	Record basis

Annotation Type	Element Name	X-path
Scientific Name	Full scientific name	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/FullScientificNameString
	Genus	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/GenusOrMonomial
	First epithet	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/FirstEpithet
	Infraspecific epithet	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/InfraspecificEpithet
	Rank	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/Rank
	Author team of basionym	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/AuthorTeamParenthesis
	Author team	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/ScientificName/NameAtomised/Botanical/AuthorTeam
	Higher taxon name	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/HigherTaxa/HigherTaxon/HigherTaxonName
	Higher taxon rank	DataSets/DataSet/Units/Unit/Identifications/Identification/Result/TaxonIdentified/HigherTaxa/HigherTaxon/HigherTaxonRank
Sequence	Database	DataSets/DataSet/Units/Unit/Sequences/Sequence/Database
	ID in Database	DataSets/DataSet/Units/Unit/Sequences/Sequence/ID-in-Database
	Method	DataSets/DataSet/Units/Unit/Sequences/Sequence/Method
	Sequenced part	DataSets/DataSet/Units/Unit/Sequences/Sequence/SequencedPart
	Title citation	DataSets/DataSet/Units/Unit/Sequences/Sequence/Reference/TitleCitation
	URI	DataSets/DataSet/Units/Unit/Sequences/Sequence/Reference/URI

Annotation Type	Element Name	X-path
Storage Locality of Duplicates	Duplicates distributed to	DataSets/DataSet/Units/Unit/HerbariumUnit/DuplicatesDistributedTo
	Associated Unit ID	DataSets/DataSet/Units/Unit/Associations/UnitAssociation/AssociatedUnitID
	Comments about association	DataSets/DataSet/Units/Unit/Associations/UnitAssociation/Comment