



Sam Noble Museum

Specify as a database management tool

Roger J. Burkhalter

Sam Noble Oklahoma Museum of Natural History

University of Oklahoma

Databases are the backbone of a connected, digital society.



From essentially all websites....



To online shopping....



To brick and mortar store shopping.

Large corporate databases have a few things in common:

- Tight security (hopefully).
- SQL-based database engines.
- Atomized, relational data schema
- Client-server configuration.
- Years of upgrades to meet growth.
- Configurable.
- Transparent end-user interface.
- Technical support.

Specify is a database platform designed for the needs of biological collections.



- Tight security (multiple levels).
- SQL-based database engine.
- Atomized, relational data schema
- Client-server or stand-alone configuration.
- Years of upgrades (schema modifications and additions).
- Highly customizable.
- Multi-platform (Windows, Mac OS X, and Linux).
- Seamless communication with data aggregators.
- Ongoing technical support.

Specify is has a MySQL data engine and is programmed in Java. Specify, MySQL and Java are free of charge and open-source.



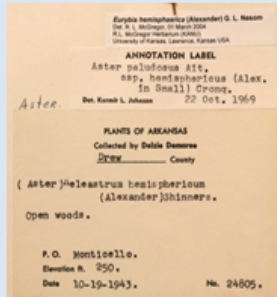
The Specify Software Project can convert existing collection data to Specify, provide training, and support at no cost.

Because Specify is open-source, there is no need for a source escrow, all tables, relationships, and coding are in the public domain. Additionally, because it is based in MySQL, tables can easily be exported in common formats.

Numerous tools are built into Specify to help with database management.

- Importing records
- Queries
- Georeferencing
- Reporting
- Labels
- Taxonomy
- Storage location
- Condition Reports
- Associated images and documents (specimens, localities, etc.)
- .Molecular data
- Web publishing
- GUID's and UUID's
- DwC exporting and publishing

Label image



Specify WorkBench

Specify 6.0

Actions	Category	Family	Genus	Species	FieldNumber	Date	LocalName	Country	State	County	File or URL	Thumbnail	Latitude
Import Data	5	3040	Aster	Aster	AC9-05-12	04222000	Port Laurel	South Carolina	Male	Port Laurel	~A-HEP~	RUJ 7810	-4.02
Import Images	6	3040	Aster	Aster	AC9-05-14	04222000	South of Pa.	South Carolina	Male	~A-HEP~	~A-HEP~	RUJ 7810	-4.61
New Data Set	7	3040	Aster	Aster	AC9-05-14	04222000	South of Pa.	South Carolina	Male	~A-HEP~	~A-HEP~	RUJ 7810	-4.61
Export Data Set	8	3040	Aster	Aster	AC9-05-14	04222000	South of Pa.	South Carolina	Male	~A-HEP~	~A-HEP~	RUJ 7810	-4.61
Export Web Excel Template	9	3040	Aster	Aster	AC9-05-15	04222000	North Part	South Carolina	Male	Conviction	~A-HEP~	RUJ 7810	-4.68
Top 10	10	7007	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7804	-4.79
Data Set Summary	11	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	12	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	13	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	14	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Data Set Summary	15	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	16	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	17	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	18	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Data Set Summary	19	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	20	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	21	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	22	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Data Set Summary	23	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	24	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	25	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	26	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Data Set Summary	27	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	28	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	29	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	30	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Data Set Summary	31	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	32	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	33	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	34	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Data Set Summary	35	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	36	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	37	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	38	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Data Set Summary	39	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	40	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	41	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	42	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Data Set Summary	43	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	44	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	45	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	46	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Data Set Summary	47	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Basic Label	48	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Chart	49	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79
Top 10	50	7011	Aster	Aster	AC9-05-18	04271000	Lee Trce Dr.	South Carolina	Male	Port Gaud	~A-HEP~	RUJ 7802	-4.79



SGR



Scatter Gather Reconcile

Manual Data Entry

OCR



Import into Specify database

Taxonomy is expressed as a tree and is fully editable:

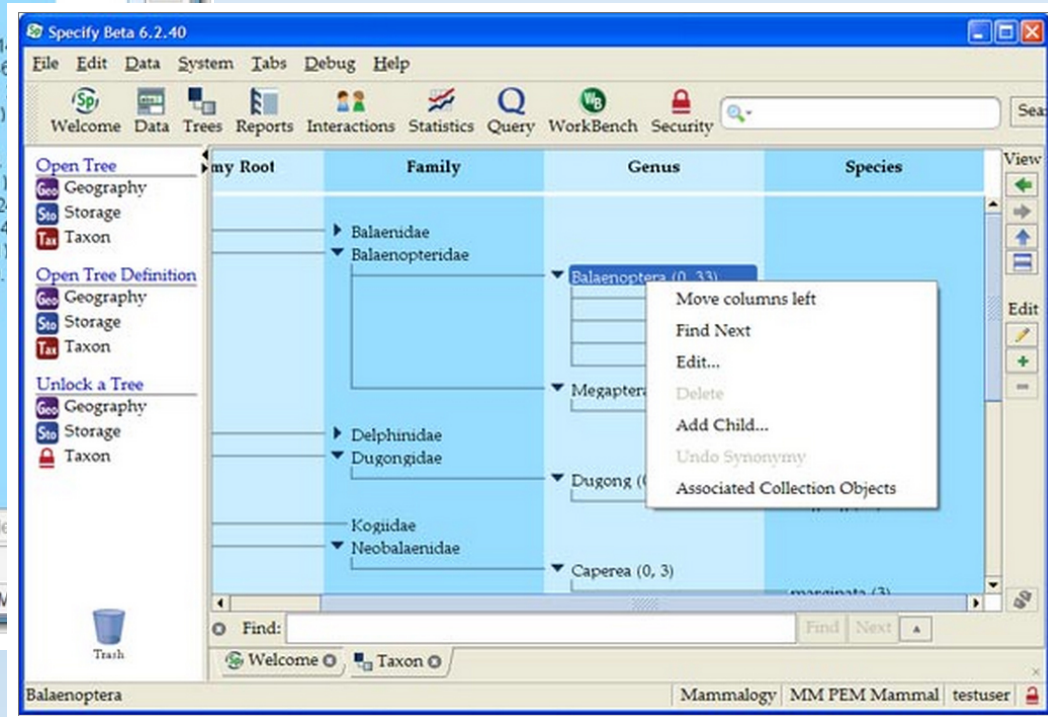
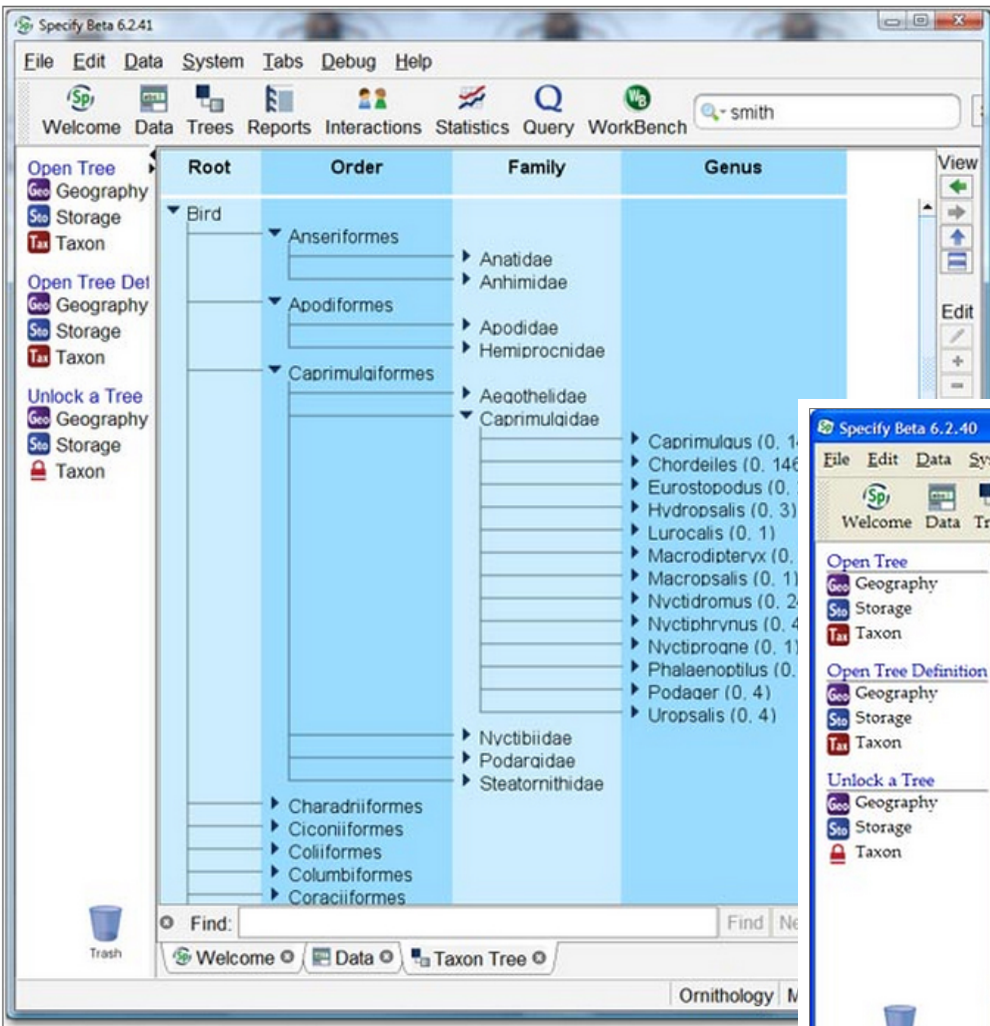
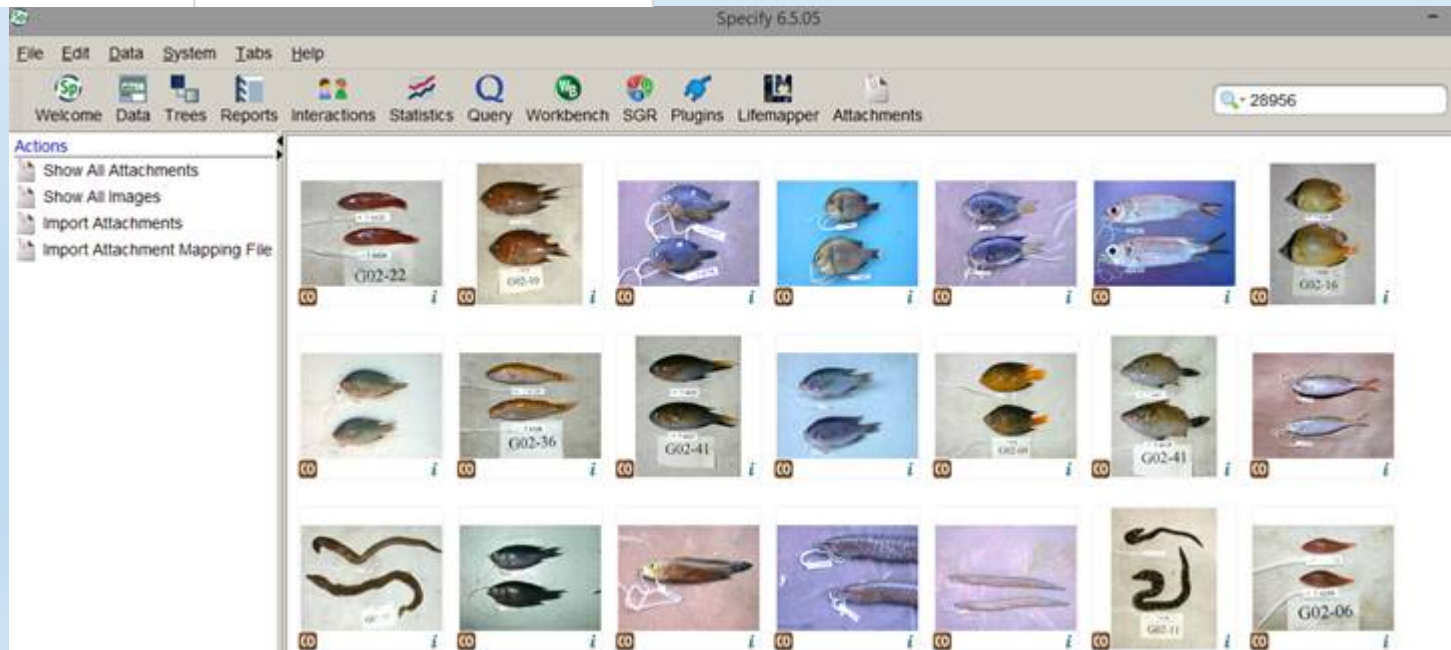


Image and document associations

1	Catalog number	File name
2	12354	Acipenses dorsal.jpg
3	12354	Acipenses frontal.JPGEG
4	12355	Alosa mediocris.pdf
5	12356	Clupea pallasii.jpg
6	12357	Clupea bentincki.jpg
7	12360	Sardina pilchardus frontal.jpg
8	12360	Sardina pilchardus dorsal.jpg
9	12360	Sardina pilchardus left lateral.jpg
10	12360	Sardina pilchardus right lateral.jpg
11	40052	IMG_457451.jpg
12	40053	IMG_487548.png
13	50000	IMG_124578.docx



DwC export filters

The screenshot displays the Specify 6.5.05 software interface. The main window is titled "DwC export filters" and is used for configuring data exports. The interface includes a menu bar (File, Edit, Data, System, Tabs, Help) and a toolbar with various icons for navigation and actions. A left sidebar contains a "Create Mapping" section with options like "Create New Mapping" and "Import Schema", and a "Mappings" section with "DwCfish" and "Symbiotafish".

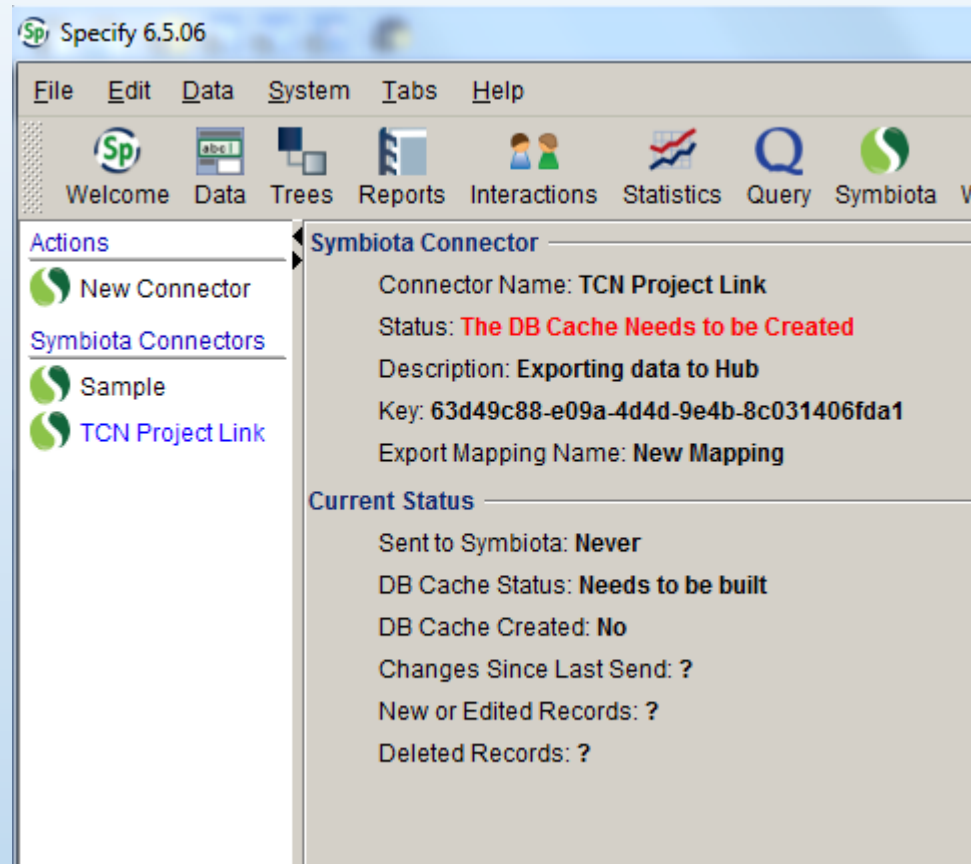
The main area is divided into two panes: "Collection Object" and "Collection Object At Attachment". The "Collection Object" pane lists attributes such as "Accession #", "Cat #", "Cat Date", "Cat Date (Day)", "Cat Date (Month)", "Cat Date (Year)", "Cataloger", and "Col Obj Attribute". The "Collection Object At Attachment" pane is currently empty.

Below these panes is a table for defining filter criteria. The table has columns for "Schema Concept", "Not Operator", "Criteria", "Sort", "Show", "Allow", and "Null". The criteria are defined as follows:

Schema Concept	Not Operator	Criteria	Sort	Show	Allow	Null
associatedMedia		Collection Object Attachments [Aggregated]		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
associatedReferences		Collection Object Citations [Aggregated]		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
associatedSequences		DNA Sequences [Aggregated]		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
basisOfRecord	<input type="checkbox"/>	Collection Type	Contains	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
catalogNumber	<input type="checkbox"/>	Cat #	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
class	<input type="checkbox"/>	Class	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
collectionCode	<input type="checkbox"/>	Collection/Code	Contains	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
continent	<input type="checkbox"/>	Continent	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
coordinateUncertaintyInMeters	<input type="checkbox"/>	Max Uncertainty Est	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
country	<input type="checkbox"/>	Country	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
county	<input type="checkbox"/>	County	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
dateIdentified	<input type="checkbox"/>	Determinations/Date	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
day	<input type="checkbox"/>	Date (Day)	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
decimalLatitude	<input type="checkbox"/>	Latitude1	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
decimalLongitude	<input type="checkbox"/>	Longitude1	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
dynamicProperties	<input type="checkbox"/>	Size	Contains	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
eventDate	<input type="checkbox"/>	Field No.:Locality/Date	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
eventRemarks	<input type="checkbox"/>	Field No.:Locality/Remarks	Contains	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
family	<input type="checkbox"/>	Family	=	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

At the bottom of the table, there are checkboxes for "Series", "Search Synonyms", and "Count", along with "Preview" and "Save" buttons. The status bar at the bottom shows the current user as "testuser" and the current location as "Ichthyology | KUFishvoucher".

Symbiota Connector



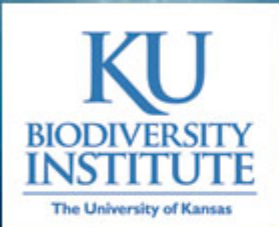
Pushes data to Symbiota, later point release (Fall 2014) allows a 2-way connection.

Web Portal

File Edit View History Bookmarks Tools Help

Web Portal

KU Fish Web Portal Demo



Search Tools

Geo Coords Images

Express

Advanced

rightSideRels: =

Cat #: =

Class: =

Continent: =

Country: FIJI =

County: =

Latitude1: =

Longitude1: =

Date: =

Family: =


Records Images Map

			Cat #	Genus	Species	Locality Name
1	Q		32000	Abudefduf	sexfasciatus	Talai harbor, S side of Yadua Island
2	Q		31988	Abudefduf	sexfasciatus	Patch reef behind barrier reef off Suva Point
3	Q		32580	Acanthurus	lineatus	Barrier reef off Suva Point
4	Q		31991	Acanthurus	nigrofuscus	Barrier reef off Suva Point north of Suva Point
5	Q		31885	Acanthurus	nigrofuscus	Yagaga Island, reef to the East and South of Suva Point
6	Q		31901	Acanthurus	triestegus	Makuluva Island off Suva Point
7	Q		31824	Amblyglyphidodon	aureus	Charybdis reef, NW of Rakiraki, Suva
8	Q		31909	Amblyglyphidodon	curacao	Barrier reef off Suva Point inside lagoon
9	Q		31998	Amblyglyphidodon	curacao	Nananui-i-cake Island, reef to the East of Suva Point
10	Q		31821	Amblyglyphidodon	curacao	Great Sea reef lagoon, S of Kia Island
11	Q			ygobius	decussatus	Nukulau Island off Suva Point
12	Q			ygobius	phalaena	Nukulau Island off Suva Point
13	Q			iprion	chrysopterus	Charybdis reef, NW of Rakiraki, Suva
14	Q			iprion	melanopus	Charybdis reef, NW of Rakiraki, Suva
15	Q			iprion	melanopus	Patch reef behind barrier reef off Suva Point
16	Q			on	aureus	Great Sea reef, SW of Kia Island
17	Q			on	crassiceps	Pascoe reefs, 3rd reef West of Yadua Island
18	Q			on	crassiceps	Barrier reef off Suva Point north of Suva Point
19	Q			on	crassiceps	Barrier reef off Suva Point north of Suva Point
20	Q			on	crassiceps	Nukulau Island off Suva Point
21	Q			on	crassiceps	Barrier reef off Suva Point north of Suva Point
22	Q			on	crassiceps	Yadua Island, south side
23	Q		38210	Apogon	doryssa	Suva, South of "Fish Patch", south of Suva Point

Detail

Specimen Images Map

Preview





KU Fish Web Portal Demo



Search Tools

Geo Coords Images

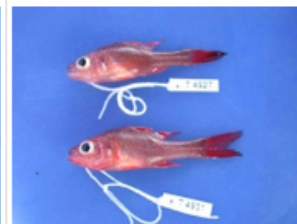
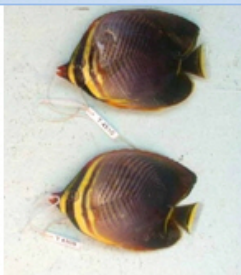
Express

Advanced

rightSideReIs:		=	▼
Cat #:		=	▼
Class:		=	▼
Continent:		=	▼
Country:	Fiji	=	▼
County:		=	▼
Latitude1:		=	▼
Longitude1:		=	▼
Date:		=	▼
Family:		=	▼
Field Number:		=	▼
Genus:		=	▼
Count Amount:		=	▼
Subspecies:		=	▼
Kingdom:		=	▼
Locality Name:		=	▼
Max Depth:		=	▼
Min Depth:		=	▼
Order:		=	▼
Phylum:		=	▼
preparations:		=	▼

Records Images Map

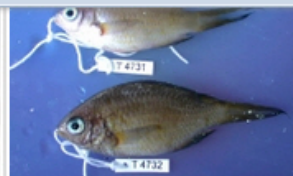
Preview (page 1 of 1)



T4815_and_4860.jpg



Standard size Associated Specimens



Specify 7

Welcome | Specify WebApp - Mozilla Firefox

File Edit View History Bookmarks Tools Help

Welcome | Specify WebApp

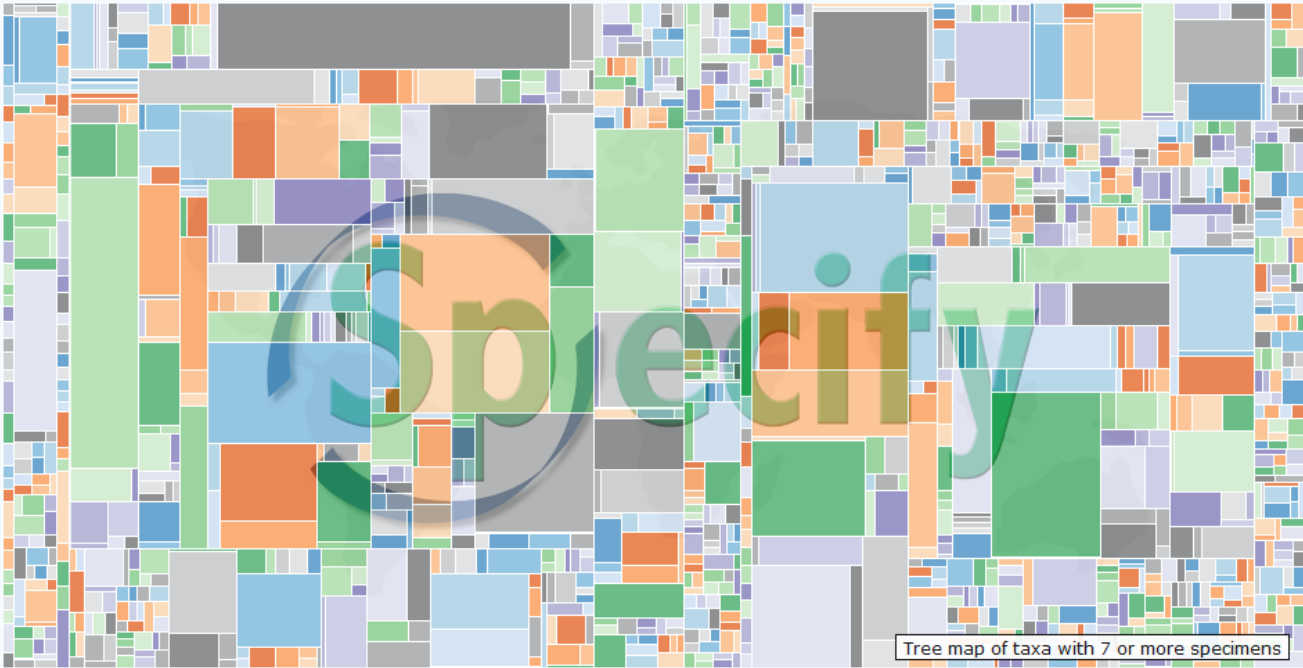
dhwd99p1.nhm.ku.edu/specify/

testuser | KUFishvoucher | Log out

Welcome Data Query Attachments

Search

Welcome to Specify



Tree map of taxa with 7 or more specimens

Recent Activity

- CO 32581
-- Modified by User, Test C at 2013-09-13T17:15:29
- CO 32581

The image shows a screenshot of a web browser displaying the Specify WebApp. The browser window title is 'Welcome | Specify WebApp - Mozilla Firefox'. The address bar shows the URL 'dhwd99p1.nhm.ku.edu/specify/'. The page header includes a navigation menu with 'Welcome', 'Data', 'Query', and 'Attachments', and a search bar. The main content area features a large tree map visualization of taxa with 7 or more specimens, overlaid with a large 'Specify' watermark. Below the tree map, there is a section titled 'Recent Activity' listing two entries for 'CO 32581', with the first entry indicating it was modified by 'User, Test C' on '2013-09-13T17:15:29'.



Specify

specify@ku.edu

www.specifysoftware.org



The Specify Software Project is funded by the U.S. NSF Award DBI-0960913 and by the U. of Kansas Center for Research.