

Biodiversity Databases

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Specimens are the fundamental particles of biodiversity

- ❖ Only individual organisms, living or in collections, carry biodiversity information.
- ❖ Everything we know about biodiversity ultimately arises from taxonomically and spatially referenced individuals:
 - What they are. Where they are.
 - How many individuals there are and in what density.
 - How many species there are in a place.
 - How many places a species is found.

Kinds of biodiversity databases

- ❖ *Specimen databases*: spatially and taxonomically referenced records of individuals
- ❖ *Species databases*: spatially and taxonomically referenced records of species' presence or approximate abundance
- ❖ *Spatial range databases*: spatially and taxonomically referenced polygons representing species' presence

What is Biota?

- ❖ A biodiversity data and collections management application for taxonomically and spatially referenced specimen data
- ❖ Website: <http://viceroy.eeb.uconn.edu/biota>

Biota's origin

- ❖ Biota was initially developed for *Project ALAS* (The *Arthropods of La Selva* Project).
 - An inventory of 100 families, superfamilies, and orders of insects, mites, and spiders in lowland Costa Rican rainforest
 - Nearly 300,000 specimens in 12,412 species, including 203 holotypes and 1239 paratypes
 - 7 PI's and >100 systematist collaborators from 50 Costa Rican, North American, and European institutions
 - Funded by NSF from 1994 through 2006
 - Website: <http://viceroy.eeb.uconn.edu/alas/alas.html>



Biota's history

- ❖ Early visitors to the ALAS laboratory made clear that a generalized version of Biota would fill unmet needs.
- ❖ Version 1 released for Mac OS in December 1996; for Windows in June 1997.
- ❖ Ten free updates for registered users (1997–2002) each with new features and tools suggested by users.
- ❖ Biota Version 2 was released in later 2003, with major new features.

Who uses Biota today?

- ❖ About a thousand users in more than 30 countries, 44 US States (based on sales and registrations).
- ❖ Individual researchers in ecology, systematics, biogeography, and conservation biology.
- ❖ Biodiversity inventory projects.
- ❖ Natural area and field station managers.
- ❖ Museums, herbaria, botanical gardens, and private collectors/observers.

A few technical details (Biota 2)

- ❖ *Platforms:* Windows 98/2K/ ME/XP/NT4, Mac OS 9/ X (native)
- ❖ *Formats:* Desktop (stand-alone) or multiplatform Client/Server. Onboard web server supports web clients.
- ❖ *Data Files:* Instantly interchangeable between all formats and platforms
- ❖ *Engine:* 4th Dimension 6.8; beta version in 4D 2004 (www.4D.com)

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- ❖ *Documentation*: A 600-page pedagogical Manual with Tutorial plus in-context help
 - ❖ *Support*: By email, normally within 24 hours
 - ❖ *Updates*: Free maintenance updates for registered users.
 - ❖ *Publisher*: Sinauer Associates (since 1996)
(www.sinauer.com)

Financial considerations

- ❖ *Market niche*: An off-the-shelf, low cost (\$200 for desktop version) biodiversity data management solution for individuals, projects, and institutions.
- ❖ *Development costs*: NSF until 1996; University of Connecticut (my salary).
- ❖ *Pricing*: Fair profits for the publisher plus developer royalties sufficient to cover ongoing costs of development tools and engine licensing. (Biota has been self-supporting since 1996).

Biota design objectives

- ❖ Maximize user autonomy (self-training possible and no on-site support required).
- ❖ Minimize structural complexity, while implementing key relational properties of specimen-based data.
- ❖ Flexibility, customizability, and scalability.
- ❖ Open administrative access to all tables and keys.
- ❖ Comprehensive import tools for legacy data.
- ❖ Comprehensive export tools to guarantee future access to data.

Early development based on ALAS needs

- ❖ An industrial approach to specimen preparation and data management
 - Parataxonomists carry out most steps.
 - Specimens individually barcoded and databased.
 - Special tools optimized for inventory work
 - Specimen loan system to track material sent to collaborators and to comply with INBio agreement.

Relational database structure

- ❖ An indented table shares some features with a relational database.
 - Each distinct entry is made only once.
 - Columns correspond to *tables*, rows to *records*.
 - Each record in one table may be linked to one or many records in another table.
 - In a hierarchy of tables, we may speak of parent and child records.
 - The relational model can accommodate any logical structure, not just hierarchies.

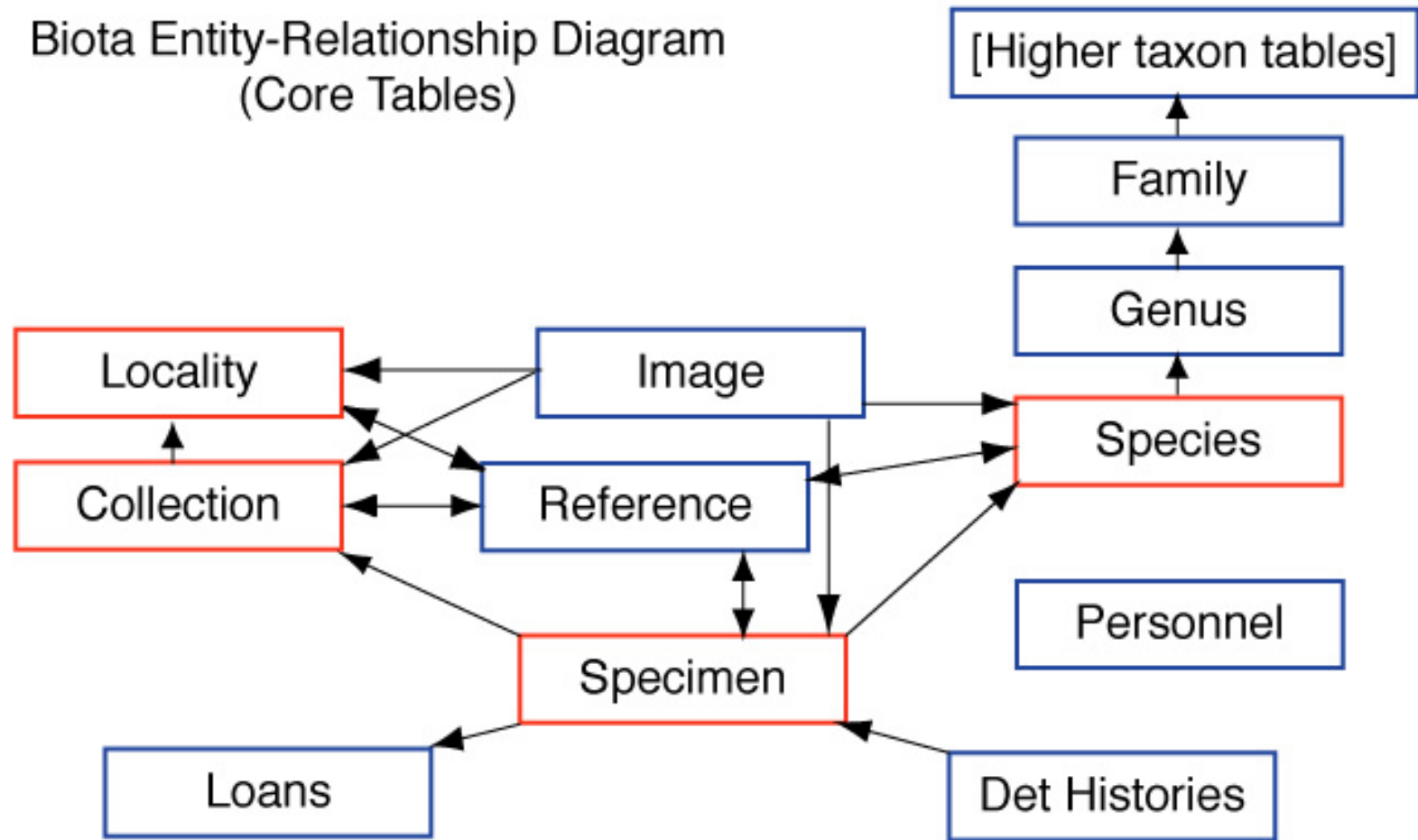
Family	Genus	Specific Name
Campanulaceae	<i>Centropogon</i>	<i>caoutchouc</i>
		<i>erianthus</i>
	<i>Lobelia</i>	<i>laxiflora</i>
		<i>salicifolia</i>
	<i>Siphocampylus</i>	<i>ecuadoriensis</i>
		<i>sanguineus</i>
		<i>scandens</i>
Ericaceae	<i>Anthopterus</i>	<i>verticillatus</i>
	<i>Cavendishia</i>	<i>forreroi</i>
		<i>gilgiana</i>
		<i>leucantha</i>
		<i>lindauiana</i>
	<i>Ceratostema</i>	<i>nodosum</i>
		<i>peruvianum</i>
		<i>reginaldi</i>
	<i>Macleania</i>	<i>bullata</i>
		<i>cf. ericae</i>
		<i>coccoloboides</i>
		<i>glabra</i>

Biota's relational structure: Core Tables

- ❖ Biota is structured around 14 *Core Tables*.
 - **The taxonomic hierarchy** includes the *Specimen* table and a table for each of the seven obligatory taxonomic ranks: *Species*, *Genus*, *Family*, *Order*, *Class*, *Phylum*, and *Kingdom*.
 - **The place hierarchy** has two levels.
 - ◆ The *Collection* table records data for collecting events.
 - ◆ The *Locality* table records the location of one or more collecting events.

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- **Literature references** are recorded in the *References* table.
 - **Names and contact data** for collectors, preparators, borrowers, project participants, and authors of notes are recorded in the *Personnel* table.
 - **To keep track of specimen loans**, the *Loans* table records which specimens have been loaned, borrowed, and returned.
 - **Changes in Specimen identification** are recorded in the *Determination History* table.

Biota Entity-Relationship Diagram (Core Tables)





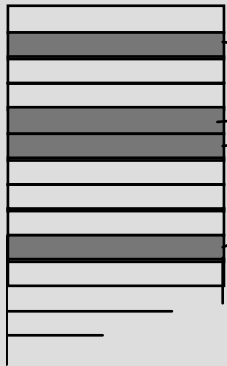
Biota's relational structure: Peripheral Tables

❖ **20 Peripheral Tables** keep track of supporting or ancillary data related to Core Table records.

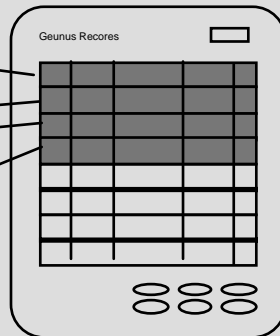
- Auxiliary Fields
- Notes
- Projects
- Linking tables
- ...etc.

Four representations of records

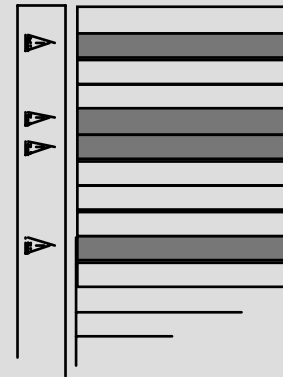
Data Table:
All Records



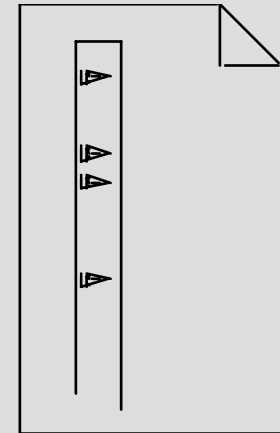
Current
Selection



Record Set



Record Set
Pointer File



Database tasks

- ❖ Entering data
- ❖ Updating records
- ❖ Finding records (queries)
- ❖ Working with Record Sets
- ❖ Importing and exporting data to text files
- ❖ Displaying, printing, and publishing data
- ❖ Maintaining database integrity and security

Database tools

- ❖ Tools carry out specific tasks for
 - Individual records
 - All records in a table
 - A selection of records from a table
 - Linked records in two or more tables
 - A Record Set for a table
 - A pair of Record Sets for a table



Entering data

- ❖ Data can be entered directly in any Core table, or “on the fly” from any table lower in the taxonomic or place hierarchy.
- ❖ We will now take a look at the Input Screens for the four principal Core Tables (“SSC & L”):
 - Specimen
 - Species
 - Collection
 - Locality

Specimen Record

General

Determination

Preparation

Images

Aux Fields

Notes

Refs

Specimen Code

JLL14400

Assign

Species Code

sphbuxi

Assign

Look Up

Classification

Genus

Spherospermum

Species

buxifolium P. & E.

Family

Ericaceae

Show Species Record

Collection Code

JLL14400

Assign

Look Up

Collection Data

Coll. By

J.L. Luteyn

Date

Apr 4, 1992

Locality

Latacunga-Quevedo rd.

Show Collection Record

Stage/Sex

FI-Pickled

Storage

JLL Lab

Medium

FAA

Deposited At

NYBG

Record

Number 1 of 1

Created Oct 23, 1992

Last changed

Changed By

Specimen Custom 1

Specimen Custom 2

Type Status

Abundance

1

This Specimen record

Save

Print

Delete

Carry

Cancel

Navigate records

Previous

First

Next

Last

Species Record

Classification

Subsp/Names

Synonymy

Dist/Types

Images

Aux Fields

Notes

Refs

sphbuxi

Spherospermum buxifolium P. & E.

Species Code

sphbuxi

Assign

Genus

Spherospermum

Specific Name (Specific Epithet)

buxifolium

Species Author (& Date)

P. & E.

Subgenus

Section

Synonymy

Valid Species Code

sphbuxi

A valid Species name with no synonyms in the database

Record

Number 1 of 1

Created

Last changed

Changed By

Classification

Family Ericaceae

Order Ericales

Show Genus Record

Show Specimens (1)

This Species record

Save

Print

Carry

Delete

Cancel

Navigate records

<<<

<<

<

>

>>

>>>

Species Record

☰

Classification

Subsp/Names

Synonymy

Dist/Types

Images

Aux Fields

Notes

Refs

sphbuxi

Sphyrospermum buxifolium P. & E.

Subspecies, Variety, & Common Names

Subspecific Epithet

Subspecies Author (& Date)

 ()

Variety or Cultivar

Variety Author (& Date)

 ()

Common Name

Record

Number 1 of 1

Created

Last changed

Changed By

This Species record

Save

Print

Delete

Carry

Cancel

Navigate records

⏪

⏩

⏴

⏵

Species Record

☰

Classification
Subsp/Names
Synonymy
Dist/Types
Images
Aux Fields
Notes
Refs

sphbuxi
Sphyraspermum buxifolium P. & E.

The name...

Sphyraspermum buxifolium P. & E. Sp. Code: sphbuxi

☒ Is a valid Species name with the following junior synonym in the database:

Genus	Species	Author	Species Code
<i>Sphyraspermum</i>	<i>nigrans</i>	Baker	sphyrnigrans

Record

Number 1 of 1

Created

Last changed

Changed By

☐ Is a junior synonym of...

☐ Is a valid Species name with no synonyms in the database.

Synonymize This Species

Accept New Synonymy

Cancel New Synonymy

This Species record

Save

Print

Delete

Carry

Cancel

Navigate records

⏪

⏩

⏴

⏵

Species Record

Classification

Subsp/Names

Synonymy

Dist/Types

Images

Aux Fields

Notes

Refs

sphbuxi

Sphyrospermum buxifolium P. & E.

Distribution

Ecuadorean highlands and northern highland Peru

Type Locality

Volcan Cotopaxi, Ecuador

Type Depository

Museo Nacional de Historia Natural, Quito

Display Specified Types...

Display Holotype

Display All Types

Record

Number 1 of 1

Created

Last changed Oct 22, 2002

Changed By Administrator

This Species record

Save

Print

Delete

Carry

Cancel

Navigate records

Previous

First

Next

Last

Collection Record

General

Host Record

Georeference

Images

Aux Fields

Notes

Refs

Collection Code

JLL14400

Assign

Locality Code

Latacunga

Assign

Look Up

Locality Data

Locality

Latacunga-Quevedo rd.

State/Prov

Cotopaxi

District

Country

Ecuador

Show Locality Record

Elev.

274-3350m

Lat.

0°58'S

Long.

78°56'W

Collected By

J.L. Luteyn

Date Collected (or Date Started)

Mo: 4 Dy: 4 Yr: 1992

Today

Date Collection Completed (Optional)

Mo: 0 Dy: 0 Yr: 00

Today

Collection Method

Search

Site

3-14km E Pilaló

Source

Record

Number 1 of 1

Created Nov 20, 1993

Last changed

Changed By

Show Specimens (1)

This Collection record

Save

Print

Carry

Delete

Cancel

Navigate records

❖ Intelligent date handling

- International or US date format for data entry
- International, US, or ANSI date format for export
- Complete or partial dates:
 - ◆ Day-Month-Year (or Month-Day-Year)
 - ◆ Month-Year only
 - ◆ Year only
- Mixed full and partial dates for date ranges
- Automatic recording or record creation and revision dates

Complete date range

Collected By	
C. Darwin	
Date Collected (or Date Started)	Date Collection Completed (Optional)
Mo: 9 Dy: 30 Yr: 1832 Today	Mo: 10 Dy: 3 Yr: 1832 Today

Month only

Collected By	
J.L. Luteyn	
Date Collected (or Date Started)	Date Collection Completed (Optional)
Mo: 1 Dy: 0 Yr: 1985 Today	Mo: 0 Dy: 0 Yr: 00 Today

Year only

Collected By	
J.L. Luteyn	
Date Collected (or Date Started)	Date Collection Completed (Optional)
Mo: 0 Dy: 0 Yr: 1984 Today	Mo: 0 Dy: 0 Yr: 00 Today

Record creation and
revision dates

Record Number 129 of 129 Created May 21, 1996 Last changed Oct 22, 2002 Changed By Administrator

“Host-guest” relationships

- ❖ “Guest” Specimen records can be linked many-to-one with “host” Specimen records
- ❖ Collection data for hosts and their guests is separately recorded
- ❖ Examples: Parasites and hosts, herbivores and plants, DNA and organs, organs and donors
- ❖ Multi-level (recursive) host-guest records are supported

Collection Record

General

Host Record

Georeference

Images

Aux Fields

Notes

Refs

Collection Code: JLL11106H

7-9km NE Pindilíg tow. Rivera, Jan 19, 1985

Host Specimen Code

JLL11106

Look Up Host by Species

Host Species

Species Siphocampylus scandens

Family Campanulaceae

Record

Number 1 of 1

Created Nov 20, 1993

Last changed

Changed By

This Collection record

Save

Print

Delete

Carry

Cancel

Navigate records

<|||

<|||

|||>

|||>

33

❖ Georeferenced locality data

- Multiple input/export formats for latitude and longitude
 - ◆ Degree/Minutes/Seconds
 - ◆ Integer degrees/decimal minutes
 - ◆ Decimal degrees (internal format): up to 6 places (1 cm) accuracy
- Alternate coordinate systems (UTM, Lambert, TRS, State Plane, etc.)

35

Specimen & Collection Input

Specimen

Collection

Determination

Preparation

Images

Aux Fields

Notes

Refs

Specimen Code

SPM1125

Assign

Species Code

cavcuat

Assign

Look Up

Classification

Genus

Cavendishia

Species

cuatrecasasii?

Family

Ericaceae

Show Species Record

Collection Code (assigned automatically)

SPM1125

Input Collection Data

Collection Data

Coll. By

R. Colwell

Date

Locality

Cerro de la Muerte, La Georgina

Stage/Sex

Pupa

Storage

Medium

Deposited At

Record

Number 0 of 0

Created Oct 23, 2002

Last changed Oct 23, 2002

Changed By Administrator

Specimen Custom 1

Specimen Custom 2

Type Status

Abundance

1

This Specimen record

Save

Print

Carry

Cancel

Navigate records



Tools common to Species, Specimen, Collection and Locality tables: References

- ❖ Relational literature reference system
 - Reference table accommodates journal articles, books, book sections, and online resources.
 - “Go to URL” button for any reference.
 - Link any number of Reference records with any number of SSC or L records.
 - Enter References directly or from linked SSC or L records.
 - Display all linked SSC or L records for a given Reference or all References for a given SSC or L record.
 - Import References directly from EndNote and other reference managers (tab-delimited text).



Reference Records

Reference

Links

Reference Number

573

Assign

Journal Article

Record

Number 24 of 44
Created May 2, 2002
Last changed Oct 22, 2002
Changed By Administrator

Author

J. Adis

Year

1987

Title

Extraction of arthropods from neotropical soils with a modified Kempson apparatus

Journal

Journal of Tropical Ecology

Volume

3

Pages

131-138

Go To URL

URL

http://links.jstor.org/sici?sici=0266-4674%28198705%293%3A2%3C131%3AE0AFNS%3E2.0.CO%3B2-M

Full Reference

J. Adis. 1987. Extraction of arthropods from neotropical soils with a modified Kempson apparatus. Journal of Tropical Ecology 3: 131-138.

This Reference record

Save
Print
Carry
Delete
Cancel

Navigate records



Reference Records

Reference

Links (3)

Reference Number

573

Assign

Journal Article

Record

Number 24 of 44

Created May 2, 2002

Last changed Oct 22, 2002

Changed By Administrator

Table	Record Code	Record Content
Collection	JLL13339H	J.L. Luteyn, Nov 15, 1989, Nono-Pto. Quito Rd.
Specimen	JLL12414:04	Rhinoseius richardsoni Hunter 1972; May 22, 1988, 25 km N Yarumal
Specimen	JLL13339:05	Rhinoseius haplophaedia Ohmer et al. 1991; Nov 15, 1989, Nono-Pto. Q

Show Record

Unlink Ref

Full Reference

J. Adis. 1987. Extraction of arthropods from neotropical soils with a modified Kempson apparatus. Journal of Tropical Ecology 3: 131-138.

This Reference record

Save

Print

Carry

Delete

Cancel

Navigate records

First

Previous

Next

Last



Specimen Records

General | **Determination** | **Preparation** | **Images** | **Aux Fields** | **Notes** | **Refs (3)**

Specimen Code: JLL12414:04
Rhinoseius richardsoni Hunter 1972

Record

Number 1 of 193
Created Nov 20, 1993
Last changed Oct 22, 2002
Changed By Administrator

References linked to this Specimen (click to display full text)

Ref No	Author	Year	Title
573	J. Adis	1987	Extraction of arthropods from neotropical soils with a modified Kempson apparatus
403	E. W. Baker;C. E. Yunker	1964	New blattisociid mites (Acarina: Mesostigmata) recovered from Neotropical fleas
404	F. Dusbábek;V. Cerny	1970	The nasal mites of Cuban birds. I. Ascidae, Ereynetidae, Trombiculidae (Acarina)

Link a Ref

New Ref

Unlink Ref

Edit Ref

Full text for the selected Reference

This Specimen record

Save

Print

Carry

Delete

Cancel

Navigate records






Tools common to Species, Specimen, Collection and Locality tables: Images

❖ Image management system: Input

- Link any number of Image records to each SSC or L record.
- Enter images from files, the clipboard, or directly from TWAIN devices (scanners, digital cameras).
- Create a thumbnail in the Biota Data File, linked to a full image file on disk, or import a full image to Biota.

Species Records							
Classification	Subsp/Names	Synonymy	Dist/Types	Images (3)	Aux Fields	Notes	Refs
AL1261366 Copiphora rhinoceros Pictet, 1888				Record Number 1 of 1 Created Sep 26, 1995 Last changed Changed By			
Select name to display Image <div> male male cerci fastigium vertex </div>		Edit or enter Image Name & Image Note <div>male</div>		Image Note <div></div>			
<div>Reorder Images</div>				Data for this Image Width: 360 Vertical Res: 72 Height: 250 Horizontal Res: 72 Depth: 24 Thumbnail, click-> <div>Path</div>			
Get new Image <div>Paste from Clipboard</div>		This Image <div>Zoom</div> <div>Edit</div> <div>Compress</div>		This Image record <div>Print</div> <div>Save</div> <div>Delete</div> <div>Cancel</div> <div>Zoom 4 Images</div>		This Species record <div>Save</div> <div>Print</div> <div>Carry</div> <div>Delete</div> <div>Cancel</div>	
Send this Image <div>Copy to Clipboard</div>				Navigate records <div><<<</div> <div><<</div> <div>>></div> <div>>>></div>			
<div>Check QuickTime</div>							

❖ Image management system: Editing

- Use Biota's onboard Image Editor to crop, enlarge, or apply Photoshop-style filters to images.
- Link, import, or export images in any of 10 QuickTime image formats (including JPEG, TIFF, BMP, & Photoshop), or transform from one format to another.
- Compress image files from within Biota, using any of 14 QuickTime compression codecs.

❖ Image management system: Comparison

- Use the Zoom button to display a full image from disk.
- *Input screens*: Compare up to 4 images linked to the same record.
- *Listing screens*: Compare up to 4 images for any selection of records.

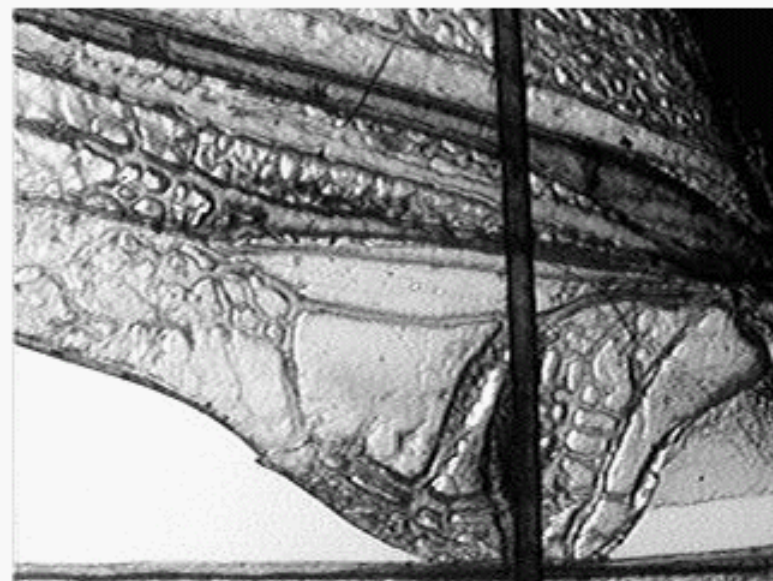
Caulopsis microprora Hebard, 1926 : male

Zoom



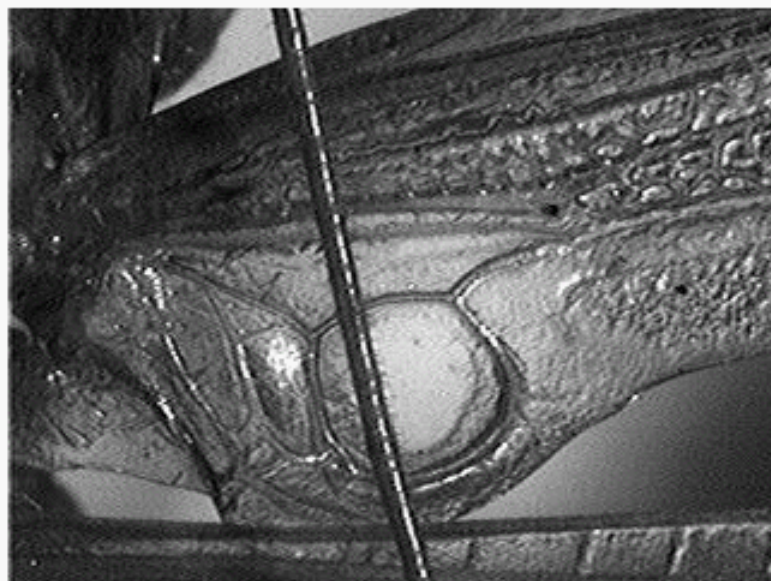
Caulopsis microprora Hebard, 1926 : left mirror area

Zoom



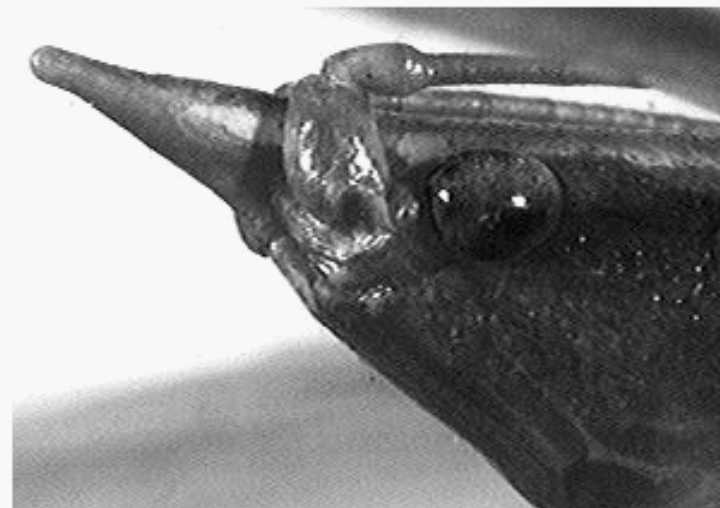
Caulopsis microprora Hebard, 1926 : mirror

Zoom



Caulopsis microprora Hebard, 1926 : fastigium lateral

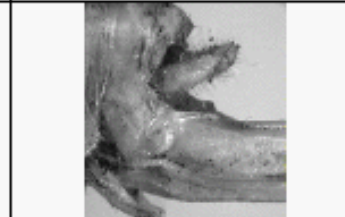
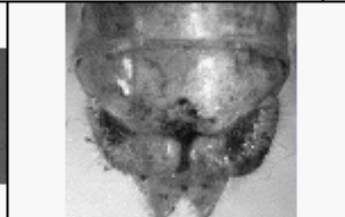
Zoom



Species Records

Lirometopum coronatum Scudder, 1875 (AL1248178)

Tettigoniidae



male



female



male cerci

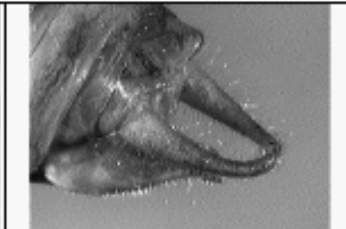


basal part ovipos



Lamprophyllum micans Hebard, 1924 (AL1248088)

Tettigoniidae



male



male cerci



basal m tegmina

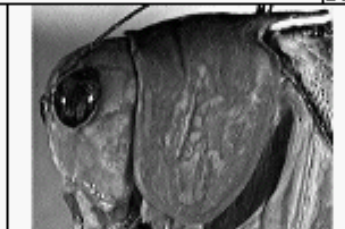


head pronotum lat



Lamprophyllum bugabae Hebard, 1927 (AL1248075)

Tettigoniidae



female (holotype)



basal m tegmina



head pron lata

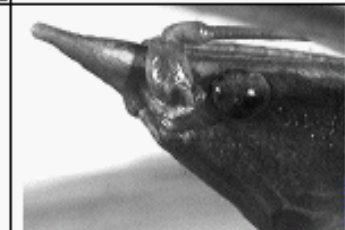
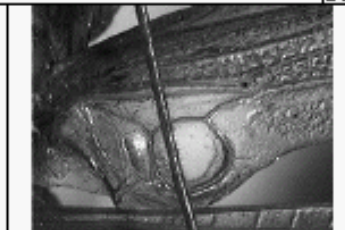
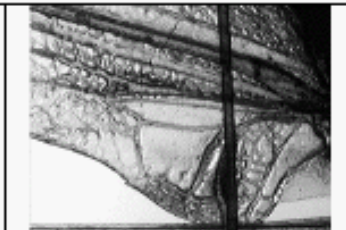


head pron dors



Caulopsis microprora Hebard, 1926 (AL1248169)

Tettigoniidae



male



left mirror area



mirror



fastigium lateral



Help

Zoom 4 Images

Sub-Select Species

Prev 4 Records

Next 4 Records

Done

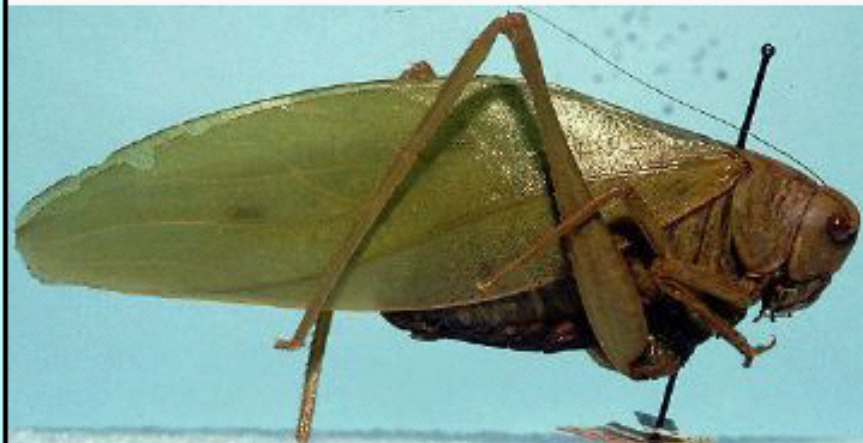
Lirometopum coronatum Scudder, 1875 (AL1248178) [Rec](#) [Img](#)



Lamprophyllum micans Hebard, 1924 (AL1248088): [Rec](#) [Img](#)



Lamprophyllum bugabae Hebard, 1927 (AL1248075): [Rec](#) [Img](#)



Caulopsis microprora Hebard, 1926 (AL1248169): m [Rec](#) [Img](#)





Tools common to Species, Specimen, Collection and Locality tables: Notes

❖ Notes

- Link any number of Notes records to each Species, Specimen, Collection, Locality or Loan record.
- Note Records, like all other alphanumeric records, are searchable and exportable.



Collection Record

General

Host Record

Georeference

Images

Aux Fields

Notes (2)

Refs

Collection Code: JLL14708H

Yilcabamba-Yalladoli. Oct 23. 1992

Record

Number 1 of 1

Created Nov 20, 1993

Last changed

Changed By

Collection Notes

Click a note below to display its full text

Oct 23, 1992	J.L. Luteyn	Steep slopes, montane forest.
Oct 5, 1994	RKC	This is the Host Plant Collection record for mite specimens.

Note By

J.L. Luteyn

Note Date

Mo: 10

Dy: 23

Yr: 1992

Steep slopes, montane forest.

New Note

Save Note

Delete Note

This Collection record

Save

Print

Delete

Carry

Cancel

Navigate records

Previous

Previous

Next

Next

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Customizing Biota: Projects and Auxiliary Fields

- ❖ Define and name any number of additional fields (Auxiliary Fields, each 80 characters in length) for SSC or L tables.
- ❖ Define any number of Projects within a Data File, each with its own set of Aux Fields.
- ❖ Each Aux Field can belong to just one Project or be shared by many Projects.
- ❖ Compare Aux Field data for any selection of records in matrix format.



Project Records

Double Click a Line to View or Modify a Record 3 Records

Project Short Name	Project Name	Active?
Global Project	Global Project	<input type="checkbox"/>
Luteyn Mites	Luteyn Mite Collections	<input checked="" type="checkbox"/>
Useful Plants of Rio Blanco	Useful Plants of Rio Blanco	<input type="checkbox"/>

Add Record

Sort

Print

Delete Selection

Sub-Selection

Done



Project Records

General

Auxiliary Field Set

Select a Table from the Popup List

Species

Species Auxiliary Field Names for the Project:
Useful Plants of Rio Blanco

Global List of Field Names

1	anal shield
2	coxa IV spur
3	dorsal shield
4	exopodal plates
5	genital setae
6	genital shield
7	metapodal plates
8	opisthoventral setae
9	peritrematic plates
10	podonotal setae
11	setae z1
12	oral shield
13	house construction
14	thatch
15	timber
16	medicine
17	fiber
18	resins
19	arrow poison
20	food

Field Names for this Project

1	house construction
2	thatch
3	timber
4	medicine
5	fiber
6	resins
7	arrow poison
8	food

Record

Number 3 of 3
Created Oct 22, 2002
Last changed Oct 22, 2002
Changed By Administrator

Sort Global Fields By...

Number

Name

Edit Project Field Names

Show Projects for a Field

Help

This Project record

Save

Print

Delete

Carry

Cancel

Navigate records

Select a Field Name then use these buttons

Append >>>

Insert >>>

All >>>

<<< Remove



Project Records

General

Auxiliary Field Set

Select a Table from the Popup List

Species

Species Auxiliary Field Names for the Project:
Luteyn Mite Collections

Global List of Field Names

1	anal shield
2	coxa IV spur
3	dorsal shield
4	exopodal plates
5	genital setae
6	genital shield
7	metapodal plates
8	opisthoventral setae
9	peritrematic plates
10	podonotal setae
11	setae z1
12	oral shield
13	house construction
14	thatch
15	timber
16	medicine
17	fiber
18	resins
19	arrow poison
20	food

Field Names for this Project

1	anal shield
2	coxa IV spur
3	dorsal shield
4	exopodal plates
5	genital setae
6	genital shield
7	metapodal plates
8	opisthoventral setae
9	peritrematic plates
10	podonotal setae
11	coxa IV spur
11	setae z1

Record

Number 2 of 3
Created Oct 24, 2000
Last changed Oct 1, 2002
Changed By Administrator

Sort Global Fields By...

Number

Name

Edit Project Field Names

Show Projects for a Field

Help

This Project record

Save

Print

Delete

Carry

Cancel

Select a Field Name then use these buttons

Append >>>

Insert >>>

All >>>

<<< Remove



Navigate records

<<<<

<<<

>>>

>>>>



Species Record

Classification
Subsp/Names
Synonymy
Dist/Types
Images (4)
Aux Fields (11)
Notes
Refs

rhinhaplo

Rhinoseius haplophaedia Ohmer et al. 1991

Field	Field Name	Field Value
1	metapodal plates	1
2	opisthoventral setae	0
3	exopodal plates	1
4	genital shield	1
5	genital setae	1
6	anal shield	0
7	dorsal shield	2
8	peritrematic plates	1
9	setae z1	0
10	podonotal setae	1
11	coxa IV spur	1

Record

Number 1 of 1

Created

Last changed

Changed By

Auxiliary Fields for Project:

Luteyn Mites

Save Changes

Cancel Changes

Edit Field Names

This Species record

Save





Print

Delete

Carry

Cancel

Navigate records

Species Records
12 Auxiliary Fields

**Double Click a Field Record (Row) to Display its Values
For All Selected Species Records**

Field	Genus Species Sp.Code	<i>Rhinoseius richardsoni</i> rhinrich	<i>Rhinoseius haplophaedia</i> rhinhaplo			
1 anal shield		0	0			
2 coxa IV spur		1	1			
3 dorsal shield		2	2			
4 exopodal plates		1	1			
5 genital setae		1	1			
6 genital shield		1	1			
7 metapodal plates		1	1			
8 opisthoventral se		1	0			
9 peritrematic plat		1	1			
10 podonotal setae		1	1			

Print

Core Fields

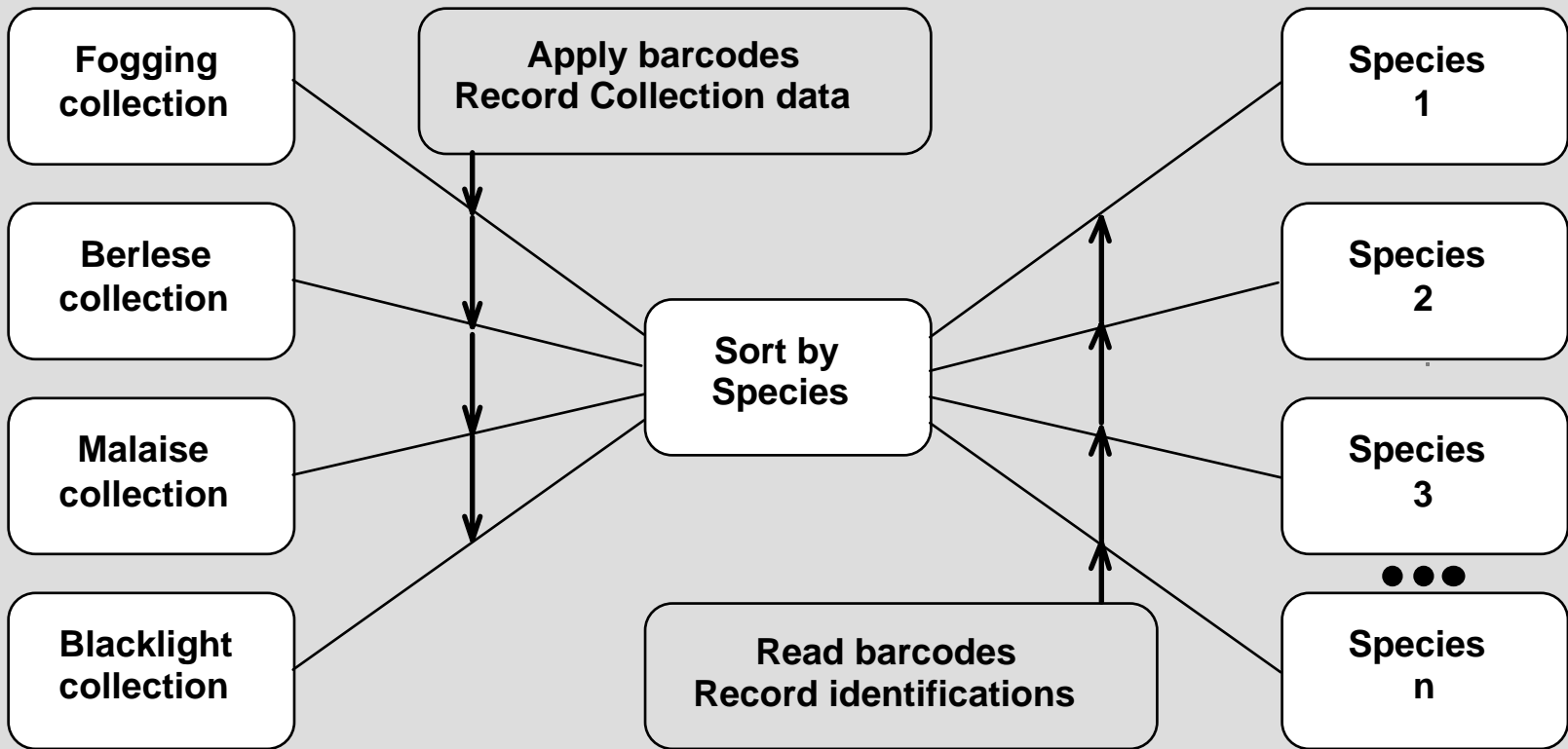
Done

Special tools for inventories

- ❖ Support for automated entry of collecting data and specimen determinations
- ❖ A system for recording partial determinations
- ❖ Automatic recording and updating of determination histories
- ❖ Software tools for handling barcodes

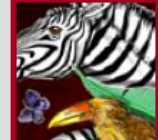
Automated entry of collecting data and specimen determinations

- ❖ Rapid input of new records for specimens that share collection data
- ❖ Rapid addition of identifications for specimens that share determination data





Input Specimen Series			
Primary Fields		Other Fields	
Specimen Code Series			
First Specimen Code	Last Specimen Code	Prefix	Last Code used
XYZMHNH1234	XYZMHNH1255		
Collection Code			
JLL14787H	Assign	Look Up Collection	Show Collection Record
Coll. By J.L. Luteyn Date Nov 17, 1992 Locality Calacalí- Nanegalito Rd.			
Prepared By		Stage/Sex	Records Created on
J.L. Luteyn		Adult female	Oct 22, 2002
Date Prepared		Medium	Next Integer Counter Value
Mo: 10 Dy: 22 Yr: 2002	Today	Hoyer's	1124
		Storage	
		Box 776	
			Record Series
			Save
			Carry
			Cancel



Specimen Records

Double Click a Specimen to View or Modify Record

22 Records

Var Field 1 Var Field 2

Specimen Code	Genus	Species	Collection Code	Collector	Loc. Code	Stage/Sex	Host	Storage	Deposited	Aux
XYZMHNH1234			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1235			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1236			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1237			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1238			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1239			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1240			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1241			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1242			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1243			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1244			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1245			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1246			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1247			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1248			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1249			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1250			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1251			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1252			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1253			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1254			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0
XYZMHNH1255			JLL14787H	J.L. Luteyn	Calacalí-Nan	Adult femal	JLL1	Box 776		0

Change Var Fields

Add New Series

Sort

Print

Delete Selection

Sub-Selection

Done

Find & Identify Specimen Series						
Primary Fields		Other Fields				
Enter Specimen Codes to be Found						
<input checked="" type="radio"/> In any order	Any Specimen Code <input type="text" value="JLL12414:04"/>	Last Code found <input type="text" value="XYZMHNH1246"/>				
<input type="radio"/> In consecutive order (by integer counter)	First Specimen Code <input type="text"/>	Last Specimen Code <input type="text"/>	<input type="text" value="Prefix"/>			
Or						
<input type="radio"/> Use the Specimen Record Set						
Species Code to be Entered in Specimen Records Found						
<input type="text" value="rhinhaplo"/>	<input type="button" value="Assign"/>	<input type="button" value="Look Up Species"/>	<input type="button" value="Show Species Record"/>			
<table border="1"> <tr> <td>Genus Rhinoseius</td> <td>Species haplophaedia</td> <td>Family Ascidae</td> </tr> </table>				Genus Rhinoseius	Species haplophaedia	Family Ascidae
Genus Rhinoseius	Species haplophaedia	Family Ascidae				
Other Data to be Entered in Specimen Records Found						
Last Determined by <input type="text" value="E. Lindquist"/>	<input type="button" value="X"/>	Stage/Sex <input type="text"/>	Individual Records <i>Auto Carry is ON. Click the "Auto Carry" button to turn it off.</i> <input type="button" value="Auto Carry"/> <input type="button" value="Auto Carry Help"/>			
Date Last Determined Mo: <input type="text" value="10"/> Dy: <input type="text" value="22"/> Yr: <input type="text" value="2002"/>	<input type="button" value="Today"/>	Medium <input type="text"/>				
		Storage <input type="text"/>				
			Individual Records or Record Series <input type="button" value="Save"/> <input type="button" value="Carry"/> <input type="button" value="Done"/>			

A system for recording partial determinations

- ❖ Partial identifications (ID's above the species level) are important data
- ❖ Linking Specimen records with higher taxa:
 - An undetermined ant is recorded as Genus (Formicidae), Species (Formicidae), Family Formicidae
 - Temporary taxon (parenthetical) records can be generated automatically from input or import

Automatic recording and updating of determination histories

- ❖ Biota can record all stages of identification, from partial to definitive determination.
- ❖ Determination history records are updated automatically:
 - By whom changed
 - Date changed
 - Where changed: specimen, species, genus

Specimen Record

General | Determination | Preparation | Images | Aux Fields | Notes | Refs

Specimen Code: JLL14712

Cavendishiana sleumerianella A.C. Smith

Record

Number 1 of 1
Created Oct 23, 1992
Last changed Oct 22, 2002
Changed By Administrator

Determination History records listed newest to oldest, current record first

Historical Data						Record Change Data		
Species Code	Genus	Species	Sp. Author	Determined By	Date Detrmd.	Where	Date	By Whom
macsleu	Cavendishiana	sleumerianella	A.C. Smith	R. Colwell	Oct 22, 2002	← Current Record		
macsleu	Macleania	sleumerianella	A.C. Smith	R. Colwell	Oct 22, 2002	Genus Rec	Oct 22, 2002	Administrat
macsleu	Macleania	sleumeriana	A.C. Smith	R. Colwell	Oct 22, 2002	Species Rec	Oct 22, 2002	Administrat
macpube	Macleania	puberula	Bentham	J.L. Luteyn	Oct 24, 1992	Spom Rec	Oct 22, 2002	Administrat

Double Click a Record for Longer Fields

Last Determined by

R. Colwell



Date Last Determined

Mo: 10 Dy: 22 Yr: 2002

Today

This Specimen record

Save

Print

Carry

Delete

Cancel

Navigate records





Set operations for working with Record Sets

- ❖ Assignment of records to a Set
- ❖ Reduction of a Set to a Subset
- ❖ Union of two Sets (in either A or B)
- ❖ Difference between two Sets (in A but not in B)
- ❖ Intersection of two Sets (shared records)
- ❖ Intersection complement (unshared records)
- ❖ Saving Record Set pointers to a disk file



**What do you want to do
with this Selection of records?**


- ☒ **Make it the Specimen Record Set.**
- ☐ **Add it to the existing Specimen Record Set.**
- ☐ **Save it to disk as a Record Set Pointer File.**
- ☐ **Dismiss it.**

More Choices

*To bypass this option window, press Command
& Hyphen while the record listing screen is open.*

Cancel

OK



Selection

Rec Set

☒ Make it the Specimen Record Set.

Selection

Rec Set

☐ Add it to the existing Specimen Record Set.

Selection

Rec Set

☐ Subtract it from the Specimen Record Set.

Selection

Rec Set

☐ Make shared records the new Record Set.

Selection

Rec Set

☐ Make unshared records the new Record Set.

☐ Save it to disk as a Record Set Pointer File.

☐ Dismiss it.

Fewer Choices


Cancel

OK

Tools for queries and data retrieval

- ❖ Ad-hoc searches based on record content
- ❖ Finding child records and the parent record
- ❖ Place-by-taxon and taxon-by-place queries: the real payoff for relational design

Query





Query Editor


	CollectedBy	is equal to	C. Darwin
And	[Locality]Country	is equal to	Chile
Or	[Locality]Country	is equal to	Ecuador


Available Fields :


Related Tables

 Alternate Coordinate 3

 16 AuxiliaryFields

 Country

 District

 Elevation (m)

Comparisons :

is equal to

is not equal to

is greater than

is greater than or equal to

is less than

is less than or equal to

contains

does not contain

Value

Ecuador

And

Or

Except

Clear All

Del Line

Insert Line

Add Line

Save...

Load...

Cancel

Query in selection

Query

70

Find all...

1. Select a Lower Taxon

☐ Specimens
 ☒ Species
 ☐ Genera
 ☐ Families
 ☐ Orders
 ☐ Classes
 ☐ Phyla/Divs.

...for the...

2. Select a Higher Taxon

☐ Species
 ☐ Genus
 ☐ Family
 ☐ Order
 ☒ Class
 ☐ Phylum/Div.
 ☐ Kingdom

3. Choose an Option or Use the Default

☒ ...Class named:

☐ ...Class Record Set.

4. Create Intervening Record Sets?

☒ Create a Record Set for the Lower Taxon & each intervening taxonomic level.

Record Set Help

Query

Find all Species for the Class Aves.

Cancel

Find

Find Higher Taxa for a Set of Lower Taxa

1. Select a Higher Taxon

Find all...

☐ Species

☐ Genera

☐ Families

☒ Orders

☐ Classes

☐ Phyla/Divs.

☐ Kingdoms

2. Select a Lower Taxon

...for the...

☐ Specimen

☒ Species

☐ Genus

☐ Family

☐ Order

☐ Class

☐ Phylum/Div.

3. Create Intervening Record Sets?

☒

Create a Record Set for the Higher Taxon & each intervening taxonomic level.

Record Set Help

...Record Set.

Query

Find all Orders for the Species Record Set.

Cancel

Find

Find Places for Specimens or Species

1. Select a Target Table

Find all...

☐ Specimens
 ☒ Collections
 ☒ Localities

2. Select a Record Set

...for the...

☒ Species
 ☐ Specimen
 ☒ Collection

...Record Set.

Query

Find all Localities for the Species Record Set.

3. Create Intervening Record Sets?

☒ Create a Record Set for the Target Table & each intervening related table.

Record Set Help

Cancel

Find

Find Specimens or Species for Places

1. Select a Target Table

Find all...

☒ Species
 ☐ Specimens
 ☐ Collections

2. Select a Record Set

...for the...

☐ Specimen
 ☐ Collection
 ☒ Locality

...Record Set.

Query

Find all Species for the Locality Record Set.

3. Create Intervening Record Sets?

☒ Create a Record Set for the Target Table & each intervening related table.

Record Set Help

Cancel

Find

Tools for importing text and images

- ❖ Importing by tables and fields from a delimited text file
 - New records
 - Updating existing records
 - Merging records from two Biota data files
- ❖ Importing images in batch mode
 - Relies on a text file containing a table of
 - ◆ Image filenames
 - ◆ Parent table for each Image
 - ◆ Parent Record Code for each Image

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Import Images

This tool imports Images automatically from a list of image disk files to create Image Records in the Biota Data File. (Click the Help button below for details.)

1. Choose a strategy

☒ Import a thumbnail image to the Biota Data File, with a link to the image file.

☐ Import the image itself into the Biota Data File.

2. Find the Folder containing the image files to be imported

Find the Image Folder

3. Open the list of Image Files

Open the Image File List

Image Import Help

Cancel OK

Tools for exporting text and images

- ❖ Exporting by tables and field to a delimited text file
- ❖ Exporting images in batch mode
 - Writes a log file containing a table of
 - ◆ Image filenames
 - ◆ Parent table for each Image
 - ◆ Parent Record Code for each Image
 - ◆ The same images can be imported in batch mode to a different Biota Data File, using the log file.

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Export Images

Create image files on disk for the ... **Specimen** ...Record Set, including:

1. Choose a strategy

☒ All images for each Specimen record in the Specimen Record Set.
 ☐ Only the first image for each Specimen record in the Specimen Record Set.

2. Specify the which images to export

☒ Export full images and thumbnails.
 ☐ Export full images only; skip thumbnails.

3. Choose the Image format and find or create the destination folder

JPEG

Set Folder

Colibri:!!!Biota Development:
Biota2b20ab:Biotalmages:

Image Export Help

Cancel

OK

Special export tools 1

- ❖ Specimen flatfiles (any field in the database for any set of Specimen records)
- ❖ Taxonomic flatfiles (higher classification for any set of Specimen records)
- ❖ Custom flatfiles based on any table
- ❖ Notes, Auxiliary Fields, formatted References


Special export tools 2

❖ *For systematists:*

- Near-publication-ready “Specimens Examined” or “Exsiccatae” text for any set of Specimen records
- NEXUS formatted Auxiliary Field matrices

❖ *For ecologists:* Collection x Taxon and Locality x Taxon tables

- Incidence or abundance tables for any taxonomic rank
- *Option:* EstimateS input or Cornell Condensed Format



Export Localities by... **Family** ...Table for...

☒ The Locality Record Set.
☐ The Collection Record Set.
☐ The Specimen Record Set.
☐ The Family Record Set.
☐ The Family & Locality Record Sets

Data Options

☒ Use incidence (presence/absence) data.
☐ Use abundance data (number of individuals per species per locality).
☐ Interrupt to flag zero Abundances.

Format Options

☐ Export in EstimateS format.
☐ Export in Cornell Condensed Format.

Other Options

☐ Interrupt to flag orphan Specimens.
☐ Include Localities with no Specimens.
☐ Include Families with no Specimens.

Database maintenance tools

❖ Database integrity

- Automatic parent record creation
- One-step updates of child record linking fields
- Deletion control for parent records
- Orphan and childless record finders

❖ Database security

- Multi-level password/privilege system
- Data File password protection



Customizing Biota: Re-naming Core Fields

- ❖ Many fields in the Core Tables can be re-named to suit your needs.
- ❖ These “Field Aliases” appear throughout the database and on reports and labels.

Set Core Field Aliases

1. Select a Field

Internal Field Name	Long Alias	Short Alias
[Specimen]StageSex	Stage/Sex	Stage/Sex
[Specimen]Medium	Medium	Medium
[Specimen]Storage	Storage	Storage
[Specimen]Deposited	Deposited At	Deposited
[Specimen]TypeStatus	Type Status	Type Status
[Specimen]SpecimenCustom1	Specimen Custom 1	Spcm Cust 1
[Specimen]SpecimenCustom2	Specimen Custom 2	Spcm Cust 2
[Collection]Site	Slope and aspect	Slope and aspect
[Collection]Source	Source	Source
[Collection]Method	Collection Method	Method
[Locality]LocalityName	Locality Name	Locality Name
[Locality]District	District	District
[Locality]StateProvince	State/Province	State/Prov
[Locality]Country	Country	Country

2. Edit Aliases for the selected Field Name (Be sure to set both a Long and a Short version)

Internal Field Name	Long Alias	Short Alias
[Collection]Site (Cannot be edited)	Slope and aspect (25-30 characters maximum)	Slope and aspect (13-15 characters maximum)

Alias Help

Display Current Aliases

Reset to Defaults

Cancel

Save

Customizing Biota: Automatic generation of Record Codes

- ❖ Applies to the Species, Specimens, Collections, and Localities tables.
- ❖ Alphanumeric prefix can match barcode prefixes.
- ❖ Full control over format of Record Codes.



Record Code Settings

Assignment

Recognition

Default Prefixes and Integer Counters for assigning new Record Codes

	Alphanumeric Prefix	Next value of Integer Counter	Number of digits	User-Defined Counter	Assign Code without asking
Specimen Codes	SPM	0000	4	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Species Codes	SPP	0201	4	<input type="checkbox"/>	<input type="checkbox"/>
Collection Codes	COL	0328	4	<input type="checkbox"/>	<input type="checkbox"/>
Locality Codes	LOC	0101	4	<input type="checkbox"/>	<input type="checkbox"/>

Prefix & Counter Help

Reset to Biota's Initial Defaults

Cancel

Save



Customizing Biota: Entry Choice Lists

- ❖ Available for most Core fields.
- ❖ Set up pick-lists for repetitive entries.
- ❖ Import and use Authority Lists.
- ❖ Type-ahead lookup
- ❖ Easy drag-and-drop rearrangement of list items.

Set Entry Choice Lists

Check the box next to each field for which you want an Entry Choice List to appear (2 Screens)

- | | | |
|--|---|--|
| <input checked="" type="checkbox"/> [Specimen] Stage/Sex | <input type="checkbox"/> [Locality] Locality Name | <input type="checkbox"/> [Species] Section |
| <input type="checkbox"/> [Specimen] Medium | <input type="checkbox"/> [Locality] District | <input type="checkbox"/> [Species] Subspecies Author |
| <input checked="" type="checkbox"/> [Specimen] Storage | <input type="checkbox"/> [Locality] State/Province | <input type="checkbox"/> [Species] Variety Author |
| <input type="checkbox"/> [Specimen] Deposited At | <input checked="" type="checkbox"/> [Locality] Country | <input type="checkbox"/> [Species] Common Name |
| <input type="checkbox"/> [Specimen] Type Status | <input type="checkbox"/> [Locality] Elevation (m) | <input type="checkbox"/> [Species] Distribution |
| <input type="checkbox"/> [Specimen] Specimen Custom 1 | <input checked="" type="checkbox"/> [Locality] LatLong Accuracy | <input type="checkbox"/> [Species] Type Locality |
| <input type="checkbox"/> [Specimen] Specimen Custom 2 | <input type="checkbox"/> [Locality] Alternate Coordinate 1 | <input type="checkbox"/> [Species] Type Depository |
| <input checked="" type="checkbox"/> [Collection] Collection Method | <input type="checkbox"/> [Locality] Alternate Coordinate 2 | <input type="checkbox"/> [ImageArchive] Image Name |
| <input type="checkbox"/> [Collection] Site | <input type="checkbox"/> [Locality] Alternate Coordinate 3 | <input type="checkbox"/> [Genus] Tribe |
| <input type="checkbox"/> [Collection] Source | <input type="checkbox"/> [Species] Specific (Species) Name | <input type="checkbox"/> [Genus] Subfamily |
| <input type="checkbox"/> [Collection] LatLong Accuracy | <input type="checkbox"/> [Species] Species Author | <input type="checkbox"/> [Genus] Genus Custom 1 |
| <input type="checkbox"/> [Collection] XYAccuracy | <input type="checkbox"/> [Species] Subgenus | <input type="checkbox"/> [Genus] Genus Custom 2 |

Screen 1 of 2

Delete Checked Lists

Turn Off All Lists

Second Screen of Fields...

Delete All Lists

Revert to Saved

Cancel

Save List Settings



Stage/Sex

Type to match or select from the List _____

pu

- Female
- Male
- Adult, sex unknown
- Juvenile
- Pupa**
- Larva
- Protonymph
- Deutonymph

Modify

Cancel

OK



Type to match. Append or Insert to add. To re-order, drag and drop items or use Sort button.

Done

Done



Special tools: Loan Record System

- ❖ Automated loans and returns system, with barcode support.
- ❖ Loan documents include an ID-ready spreadsheet file, with all collection information for each specimen.
- ❖ Identifications recaptured by specimen code, whether specimens are returned or deposited elsewhere.



Special tools: Labels

- ❖ Automated label printing/text export for
 - pinned insect specimens
 - slide-mounted specimens
 - fluid-preserved specimens
 - herbarium specimens
 - custom labels

Slide Determination Label Options

Sort Options

- ☒ Sort selection by Specimen Code
- ☐ Sort selection taxonomically
- ☐ Use the Sort Editor to sort the records

Data Options

- ☒ Include Specimen Code on each label
- ☐ Include Family on each label

Output Options

- ☒ Send labels to printer
- ☐ Save labels as a text file

Print Layout Options

- ☒ Use layout for plain label stock
- ☐ Use layout for address label stock

Herbarium Label Options

Sort Options
Data Options
Format Options
Output Options

Data Options

☒ Use STATE/PROVINCE as principal label heading

☒ Include Specimen Code ☒ Include Family

☐ Append the first Locality Note to Locality description

☐ Append [Collection]Site field to Locality description

☐ Use the first Specimen Note as field description of plant

☒ Use [Collection]CollectionCode as Collector's Number

Variable Field Options

Select Field

Field 1 Determined by ☒ Check the box to insert the Field Name before each Field Value on the labels.

Field 2 Locality Code ☒

Field Label Options

Select Text to Insert

Insert Collector: before Collector's name.

Insert Collection Date: before Collection Date.

Insert Collector's Number: before Collector's Number.

☒ Save Herbarium Label settings between sessions

Cancel
Sort & Output Labels

Web publishing options 1

- ❖ Dynamic pages using Biota's onboard web server:
 - *Web Browser Mode*: Choose the tables and fields you want to make accessible (stateless)
 - *Database Client Mode*: Choose which tools from the desktop version to make accessible (state maintained)
 - *Example*: [The ALAS Specimen Database](http://viceroy.eeb.uconn.edu/ALAS/ALAS.html)
(<http://viceroy.eeb.uconn.edu/ALAS/ALAS.html>)

Web publishing options 2

- ❖ Exported static web pages, using any web server
 - Choose the taxa, records, and fields you want to include
 - Images supported
 - *OBFS Field Station example:* <http://mlbs.org/data.html>
 - *Museum-based entomological example:*
http://cumuseum.colorado.edu/Research/Entomology/ento_databases.html
 - *Researcher-based entomological example with images:*
<http://cgic.ucol.mx/~mabl/indexe.htm>



Web Browser Mode homepage

Project ALAS: Arthropods of La Selva

Select the table you want to search

Locality
Collection
Specimen
Species
Genus
Family
Order
Class
Phylum
Kingdom
Personnel
Reference



Database Client Mode homepage



Project ALAS: Arthropods of La Selva

Database Client

Find

Using the Query Editor
Specimens for a Species
Lower Taxa for a Higher Taxon
Localities or Collecting Events for Species or Specimens
Species or Specimens for Localities or Collecting Events

All Specimens
All Collections
All Localities
All Species
All Genera
All Families
All Orders
All Classes
All Phyla
All Kingdoms

All References
All Personnel

Display Set

Locality Set
Collection Set
Specimen Set

Species Set
Genus Set
Family Set
Order Set
Class Set
Phylum Set
Kingdom Set

Reference Set
Personnel Set



Biota's onboard DiGIR Server (beta)

- ❖ *Darwin Core*: A standard designed to facilitate the exchange of information about the geographic occurrence of species
<http://wiki.tdwg.org/twiki/bin/view/DarwinCore/WebHome>
- ❖ *DiGIR*: Distributed Generic Information Retrieval
<http://digir.sourceforge.net/>
- ❖ *A DiGIR portal*: Natural History Collections Portal <http://digirportal.berkeley.edu/>

