

CONNECTING NH COLLECTION DATA

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Our challenge

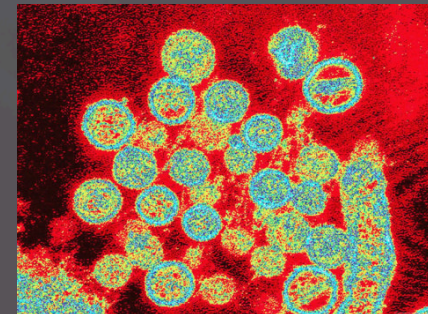
- ▣ Huge digitization efforts underway
- ▣ Need to look outside our own collections
 - What's the big picture
- ▣ Opportunity to do more than just facilitate your collection management of specimens
- ▣ Identify who we need to connect to and what information they need

Paradigm shift

- ▣ Historically
 - NH collections and data limited to subset academia
 - Guarded access
 - Destructive sampling very rare
 - Museums have paid a price
- ▣ Today - future
 - Can't afford to be as restrictive
 - Now creating infrastructure for everyone else
 - Renaissance for NH collections

Significant questions are centered on our ability to assess change.

- ▣ Climate change
 - ▣ Habitat conversion
 - ▣ Pollutants
 - ▣ Emerging pathogens
 - ▣ Introduction of exotics
 - ▣ Loss of biotic diversity
- Baseline or historic information is critical to documenting changing environments.
 - Only NH collections have these samples
 - New questions
 - New technology



Critical time for research and education on biodiversity issues.

- ❑ Build connections
- ❑ Rethink the traditional role of museum's and databases
- ❑ Facilitate use
 - Access allows for creativity, new uses and new ideas
- ❑ Connect Big Data
 - ❑ Cyberinfrastructure for Informatics



Critical time for education on biodiversity issues

- Data resource will keep growing
- Need to develop human resource
- Train Future Investigators
.....to creatively explore, utilize and integrate these vast resources across disciplines and into critical science initiatives.



Connecting to.....

- Wide array of academic researchers
- Federal and state agencies
- Public health organizations
- NGOs / Environmental consultants
- Undergrad education
- K-12 educators
- Artists

Varying levels of needs, questions, complexity

Non-traditional users

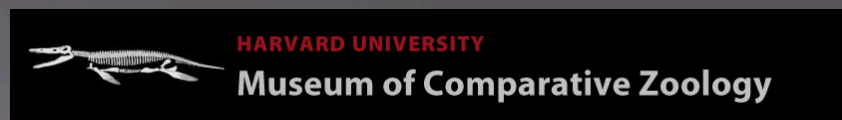
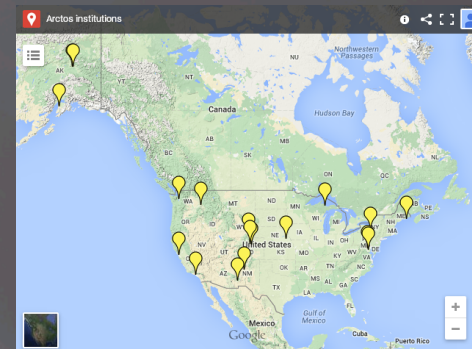
- ▣ Making natural history collections available to non-traditional users
- ▣ Artists provide not only new perspectives, but also are advocates for biodiversity issues



Gendron Jensen lithograph
Last brown bear taken from NM Pecos wilderness in 1917



- Community and comprehensive collection management system
- Open-access specimen database
<http://arctos.database.museum>
- 3M records
- 90 collections, 19 institutions
 - Shared instance - TACC
 - Single instance - MCZbase Harvard



Breadth of Collections



Mammals



Birds



Herps



Plants



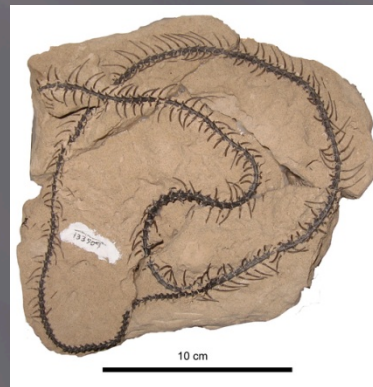
Culture



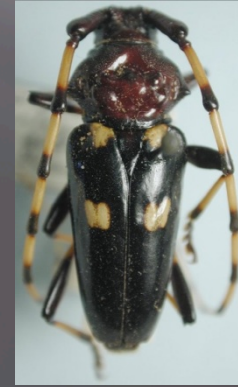
Eggs/Nests



Parasites



Fossils

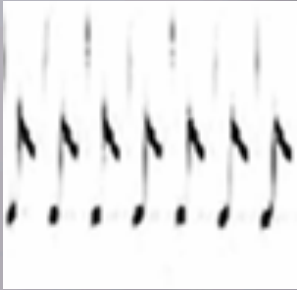


Insects

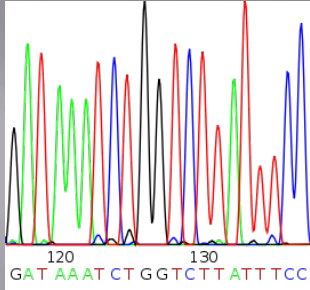


Fishes

Breadth of Data Types in ARCTOS



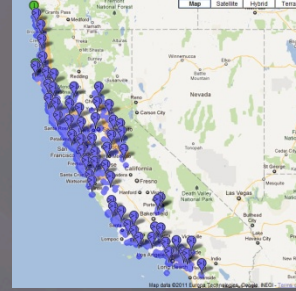
Audio



DNA



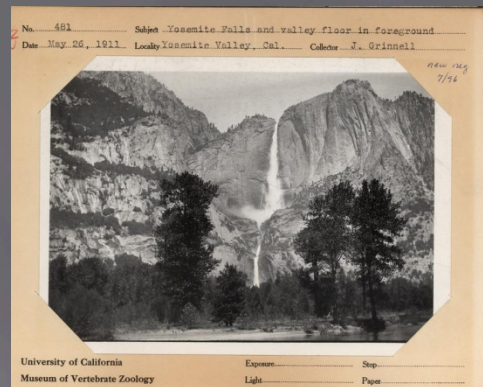
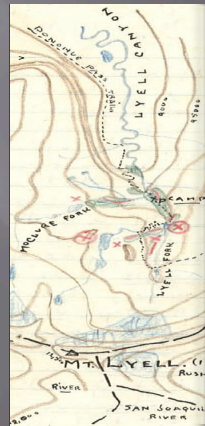
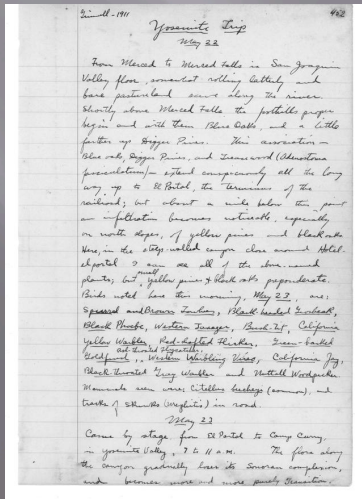
Relations



GIS



Projects/Pubs



Fieldnotes, Maps, and Images



Queryable database

Specimen Search x Jonathan Dunnum - Outlook x

arctos.database.museum/SpecimenSearch.cfm

Some features of this site may not work in your browser. [Learn more](#)

Arctos
Multi-Institution, Multi-Collection Museum Database

Search Enter Data Manage Data Manage Arctos Reports Portals My Stuff About

Access to 328,527 records Saved Searches:

Search Clear Form Use Last Values See results as:

Type: any Require Tissues?

Identifiers Customize Show More Options

Collection: Catalog Number:

NK: **Display Value**

Identification and Taxonomy Show More Options

Identification

Include previous IDs? Match Type

Locality Show More Options

Any Geographic Element: [Select on Google Map](#)

Date/Collector Show More Options

Help

Biological Individual Show More Options

Part Name: Define Add = for exact match

Usage Show More Options

Basis of Citation: Define

Media Show More Options

Media Type: Define

Relationships Show More Options

Relationship:

Curatorial Show More Options

Internal collection management

Connectivity to other databases

Connecting data within a collection

- ▣ Diverse parts and associated data
- ▣ Stored in many places
- ▣ In multiple databases

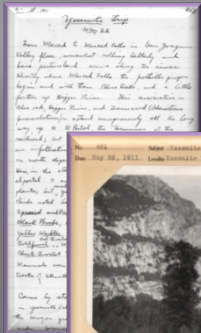
Holistic voucher



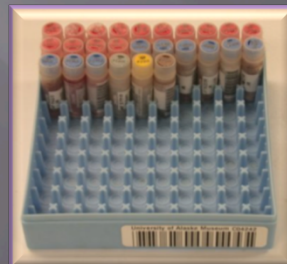
Traditional skin, skeleton or fluid voucher



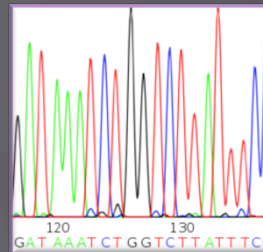
Ecto & endo parasites



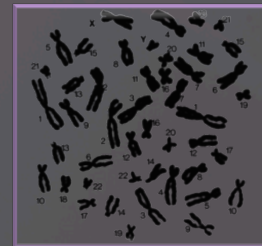
Field notes, ecological data



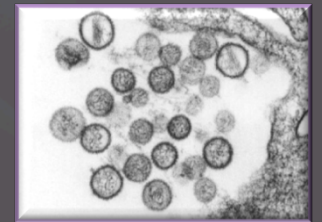
Frozen tissues



Genomic data



Karyotypes



Virus isolates



MSB Mammals 55245

NK: 12402

Andalgalomys pearsoni dorbignyi

<< Return to results
get a DOI

29.5 KM W
ROBORE, 475 M;
18D19'S, 60D02'W
South America,
Bolivia, Santa Cruz
07-Oct-1984

skin; skull; postcranial skeleton; kidney (frozen);
karyotype (frozen); liver (frozen); liver (frozen); heart;
kidney (frozen); liver (frozen) sample; liver (frozen)
sample



[Report Bad Data
(1 annotation)
MSB Mammals
first prevnext
Record 2

Specimen record

Taxa Accn Locality Agents Parts Part Locn. Attributes Other IDs Media Encumbrances

Andalgalomys pearsoni dorbignyi
Animalia Chordata Mammalia Rodentia Cricetidae Andalgalomys pearsoni dorbignyi
Olds, Anderson and Yates, 1987
sensu Olds et al. 1987
Identified by Terry L. Yates, Sydney Anderson, Nancy Olds on 1987-09-04
Nature of ID: type specimen

Andalgalomys pearsoni
sensu D'elia et al. 2005
Identified by Phil Myers, Ulises F. J. Pardinas, Guillermo D'Elia on 2005
Nature of ID: molecular data

Andalgalomys pearsoni
sensu D'elia et al. 2003
Identified by Ulises Pardifias, Guillermo D'Elia on 2003
Nature of ID: molecular data

Andalgalomys pearsoni
sensu Martinez et al. 2012
Identified by
Nature of ID: molecular data

Andalgalomys pearsoni
sensu Weir and Schluter 2007
Identified by
Nature of ID: molecular data
Remarks: Weir and Schuller 2007

Andalgalomys pearsoni
sensu Steppan et al 2007
Identified by Scott J. Steppan
Nature of ID: molecular data
Remarks: ID from citation in Salazar-Bravo et al. 2001.

Andalgalomys pearsoni
sensu Salazar-Bravo et al 2003
Identified by Terry L. Yates, Jorge Salazar-Bravo, Luis F. Aguirre
Nature of ID: published referral

Andalgalomys pearsoni
sensu Salazar-Bravo et al 2003

Identifiers
GenBank: AY963176
GenBank: AF159285
NK: 12402
original identifier: NK 12402
preparator number: 1457

Part Name	Condition	Disposition	Qty	Label	Remarks
heart, kidney (frozen)	unchecked	in collection	1		
karyotype (frozen)	unchecked	in collection	1		
kidney (frozen)	unchecked	in collection	1		
liver (frozen)	unchecked	in collection	1		
liver (frozen)	unchecked	on loan	1		
liver (frozen)	unchecked	in collection	1		
liver (frozen)	good	on loan	1		
postcranial skeleton	good	in collection	1		moved to type case
skin	excellent	in collection	1		moved to type case
skull	excellent	in collection	1		moved to type case

Parts

sex: male
Joseph A. Cook, 1984-10-07
voucher of *Andalgalomys pearsoni*, page 308 in Steppan et al 2007
voucher of *Andalgalomys pearsoni dorbignyi* Olds, Anderson and Yates, 1987, page 1101 in Musser and Carleton 2005
voucher of *Graomys pearsoni dorbignyi*, page 461 in Anderson 1997
voucher of *Andalgalomys pearsoni* in Weir and Schluter 2007
voucher of *Andalgalomys pearsoni* in Martinez et al. 2012
voucher of *Andalgalomys pearsoni*, page 241 in D'elia et al. 2005
voucher of *Andalgalomys pearsoni*, page 356 in D'elia et al. 2003

Citations

DB needs to keep everything connected

Determination Type: accepted place of collection
assigned by Satya M. Witt on 2003-10-10
Higher Geography: South America, Bolivia, Santa Cruz

Joseph A. Cook, 1984-10-07

Std. Meas.

total length	tail length	hind foot	efn	weight
246 mm	123 mm	27 mm	24 mm	45 g

reproductive data: T=11mm
Joseph A. Cook, 1984-10-07

Remarks: PLUS ET, ENDO, CHROM
Entered By: Dusty L. McDonald on 2005-02-17
Last Edited By: JLDUNNUM on 2013-09-24

Accession
1985.097.Mamm

Usage
Loan History: [Click for loan list](#)

Media



image (image/jpeg)
Media Details
Media Preview Image



image (image/jpeg)
Media Details
Media Preview Image



image (image/jpeg)
Media Details
Media Preview Image



image (image/jpeg)
Media Details
Joseph A. Cook field catalog page (JAC 1457)



image (image/jpeg)
Media Details
Media Preview Image



image (image/jpeg)

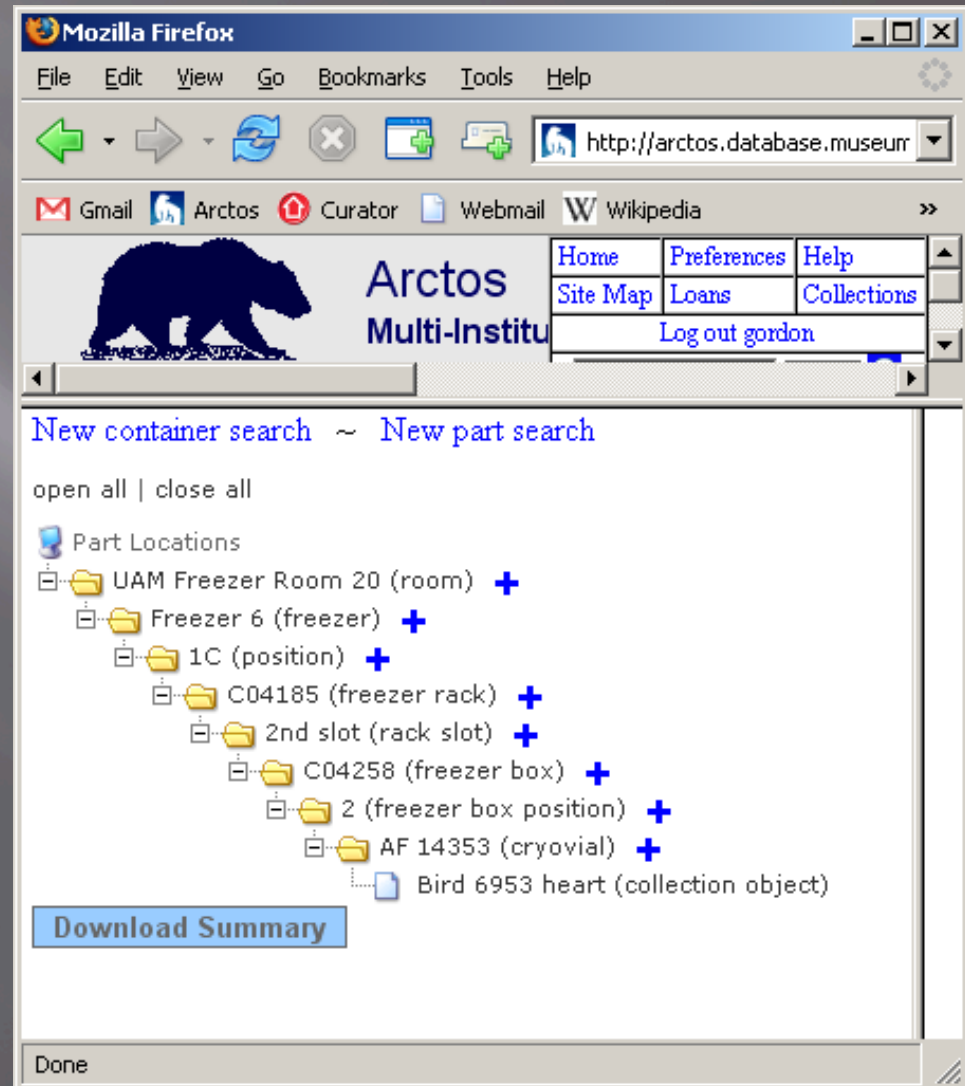
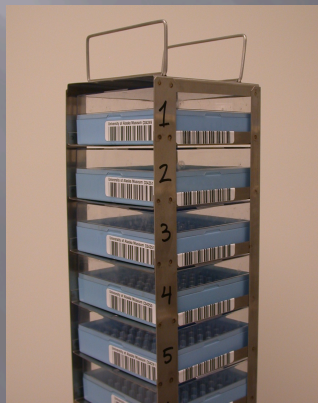
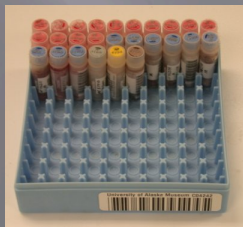
Images

Fieldnotes

Hierarchical data structure (containers within containers)

Every container is within a parent container

Recorded dimensions and logic prevent placement of a large container into a smaller parent.



The screenshot shows a Mozilla Firefox browser window displaying the Arctos Multi-Institutional Database website. The address bar shows the URL <http://arctos.database.museum>. The page features a navigation menu with links for Home, Preferences, Help, Site Map, Loans, Collections, and Log out gordon. Below the navigation menu, there are two search options: [New container search](#) and [New part search](#). The main content area displays a hierarchical tree structure of container locations:

- Part Locations
 - UAM Freezer Room 20 (room) +
 - Freezer 6 (freezer) +
 - 1C (position) +
 - C04185 (freezer rack) +
 - 2nd slot (rack slot) +
 - C04258 (freezer box) +
 - 2 (freezer box position) +
 - AF 14353 (cryovial) +
 - Bird 6953 heart (collection object)

At the bottom of the tree structure, there is a blue button labeled [Download Summary](#). The browser's status bar at the bottom indicates "Done".

Projects

Project Title
Evolution, Phylogeny, and Systematics of the Family Caviidae (Mammalia: Rodentia).

Start Date 2003-05-01 **End Date** 2009-05-01

Description [Minimum 100 characters to show up in search.](#)
Ph.D. dissertation in Zoology at Texas Tech University. Major advisor Jorge Salazar-Bravo.

Remarks
Includes the following loans not yet in Arctos: DGR 2002.113.Mamm Cavia & Galea addition to 113 2003 Galea additon to 2006.317.Mamm (Salazar)Galea


| Project Agents | Agent Role | Remark |
|--------------------------|------------------|----------------------|
| # 1 Jonathan L. Dunnun | Graduate Student | <input type="text"/> |
| # 2 Jorge Salazar-Bravo | Academic Advisor | <input type="text"/> |
| # 3 <input type="text"/> | Academic Advisor | <input type="text"/> |
| # 3 <input type="text"/> | Academic Advisor | <input type="text"/> |
| # 3 <input type="text"/> | Academic Advisor | <input type="text"/> |

[Save Updates](#) -not deleteable-

Publications

Jonathan L. Dunnun and Jorge Salazar-Bravo. 2010. Molecular systematics, taxonomy and biogeography of the genus Cavia (Rodentia: Caviidae). Journal of Zoological Systematics and Evolutionary Research 48(4):376-388.

- Annotate
- 21 Cited Specimens
- Edit
- Manage Citations



text (application/pdf)
[Media Details](#)
PDF of publication

Project Accessions [[Add Accession](#)]

Project Loans [[Add Loan](#)]

DGR:Mamm 2004.205.Mamm [[Remove](#)]
Frozen Caviidae tissue samples. - For investigation of phylogenetic relationships within the family Caviidae by Jon Dunnun for PhD research

DGR:Mamm 2004.226.Mamm [[Remove](#)]
Frozen liver tissue from Hydrochoerus hydrochaeris - For Jon Dunnun dissertation research investigating taxonomy, systematics, and biogeography

MSB:Mamm 2006.20339.Mamm [[Remove](#)]
T. Galea musteloides -

Project Publications [[add Publication](#)]

J. L. Dunnun and J. Salazar-Bravo. 2006. Karyotypes of some members of the genus Cavia (Rodentia: Caviidae) from Bolivia. Mammalian Biology 71(1):243-259.

[[Edit Publication](#)] [[Remove Publication](#)]
Jonathan L. Dunnun and Jorge Salazar-Bravo. 2010. Phylogeny, evolution, and systematics of the Galea musteloides complex (Rodentia: Caviidae). Mammalogy 91(1):243-259.

Arctos Collaborative Collection Management Solution

Search Enter Data Manage Data Manage Arctos Reports Portals My Staff About/Help

Edit Loan DGR:Mamm 2004.205.Mamm Entered by Andrew G. Hope (38 items)

Loan Number: DGR:Mamm 2004.205.Mamm 5

| Agent Name | Add Row | Role | Define | Delete? | CloneAs | Rank | Use@> |
|---------------------|--------------------------|------------------|--------------------------|--------------------------|--------------------------|------------|--------------------------|
| Terry L. Yates | <input type="checkbox"/> | authorized by | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Rank Use@> | <input type="checkbox"/> |
| Cheryl A. Parmenter | <input type="checkbox"/> | in-house contact | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Rank Use@> | <input type="checkbox"/> |
| Jorge Salazar-Bravo | <input type="checkbox"/> | outside contact | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Rank Use@> | <input type="checkbox"/> |
| Jonathan L. Dunnun | <input type="checkbox"/> | received by | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Rank Use@> | <input type="checkbox"/> |
| Jorge Salazar-Bravo | <input type="checkbox"/> | received by | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Rank Use@> | <input type="checkbox"/> |

Loan Type: consumable Define Loan Status: closed Define
Transaction Date: 2004-07-21 Due Date:

Nature of Material (31 characters): Frozen Caviidae tissue samples.

Description (106 characters): For investigation of phylogenetic relationships within the family Caviidae by Jon Dunnun for PhD research.

Instructions (0 characters):

Projects associated with this loan:

- Evolution, Phylogeny, and Systematics of the Family Caviidae (Mammalia: Rodentia). [[unlike](#)]

Type part of Project name to Pick a Project to associate with this loan

Create a project from this loan

Project Agent:

Project Agent Role: Academic Advisor

Project Title:

Project Start Date: 2004-07-21

Project End Date:

Project Description (100 characters for visibility): For investigation of phylogenetic relationships within the family Caviidae by Jon Dunnun for PhD research.

Project Remark:

Check to create project with save - Click the project in the list above to add more information after save

Ties projects, specimens, permits, loans, publications together

Conversion of catalog numbers to GUIDs

- ▣ URL and Darwin core triplet
- ▣ <http://arctos.database.museum/guid/MSB:Mamm:123456>
- ▣ Unique and standardized
- ▣ Can go around VPDs
- ▣ Allows your data to go out and play with others

Between collections – within and among Institutions

- Integrated collections
 - Host / parasites
 - Division of parts between institutions

Mammal Collection
Museum of Southwestern Biology


Search Enter Data Manage Data Manage Arctos Reports Portals My Stuff About/Help

MSB:Mamm:140960 **Sevilleta NWR, Five Points Larrea, Web 2** skin; skull; postcranial skeleton [Report Bad Data] MSB Mammals

NK: 44279
Dipodomys merriami
<< Return to results
get a DOI

Identification Accn Locality Agents Parts Part Locn. Attributes Other IDs Media Encumbrances

Dipodomys merriami
Animalia, Chordata, Mammalia, Rodentia, Heteromyidae, Dipodomysinae, Dipodomys merriami
Merriam's kangaroo rat, Rata-canguero de Merriam
Identified by unknown on 2005-03-03
Nature of ID: legacy

Determination Type: accepted place of collection assigned by unknown on 2012-07-08
Higher Geography: North America, United States, New Mexico, Socorro County
Verbatim Locality: Sevilleta NWR, 5 points Larrera, Web 2, Trap 48
Specific Locality: Sevilleta NWR, Five Points Larrea, Web 2
Collecting Source: wild caught
Event Date: 1997-06-03
Verbatim Date: 03-Jun-1997
Verification Status: unverified
Coordinates: 34.331126 / -106.732365
Verbatim Coordinates: 34.331126/-106.732365
Datum: World Geodetic System 1984
Error: 100 m
Georeference Source: GPS (transcribed)
Georeference Protocol: not recorded

No Media Found

Identifiers
NK: 44279

Relationships
host of MSB Para:8630

Part Name Condition Disposition Qty Label
postcranial skeleton unchecked unchecked 1
skin unchecked unchecked 1
skull unchecked unchecked 1

sex: female
unknown, 2005-02-03
verbatim collector: W. Callahan
Dusty L. McDonald, 2014-12-17
Remark: Automated insertion from agent merger process - W. William G. Callahan for collector role preparator

Entered By: Gabor R. Racz on 2005-03-07
Last Edited By: UAM on 2014-12-17

Accession
0000.000 Mamm
No Media Found

Arctos Collaborative Collection Management Solution


Search Enter Data Manage Data Manage Arctos Reports Portals My Stuff About/Help

MSB:Para:8630 **Sevilleta National Wildlife Refuge, Five Points Larrea, Web 2** whole organism [Report Bad Data] MSB Parasites

NK: 44279
Fahrenholzia pinnata
<< Return to results
get a DOI

Identification Accn Locality Agents Parts Part Locn. Attributes Other IDs Media Encumbrances

Fahrenholzia pinnata
Animalia, Arthropoda, Insecta, Phthiraptera, Polyplacidae, Fahrenholzia pinnata Kellogg and Ferris 1915
Identified by Wade D. Wilson on 2000-01-01
Nature of ID: legacy
Remarks: IDs made by Murray Daily, Wade Wilson, Michael Patrick and others.

Determination Type: accepted place of collection assigned by Mariel L. Campbell on 2012-11-15
Higher Geography: North America, United States, New Mexico, Socorro County, Sevilleta National Wildlife Refuge
Verbatim Locality: 5plarrea, web 2, trap 113
Specific Locality: Sevilleta National Wildlife Refuge, Five Points Larrea, Web 2
Event Remarks: mlc: some trap numbers have been truncated from original value, check locality, date, and trap number against MSB Mammal host record
Locality Remarks: mlc: georeference from LTER database refers to center stake of sampling web
Collecting Source: wild caught
Event Date: 1997-06-03
Verbatim Date: 1997, season 1, trapnight 1
Verification Status: unverified
Coordinates: 34.331126 / -106.732365
Error: 100 m


Identifiers
NK: 44279

Relationships
parasite of MSB Mamm:140960

Part Name Condition Disposition Qty Label Remarks
whole organism unchecked unknown 1 actual count = 1

verbatim host ID: Dipodomys merriami
unknown, 1997-06-03
verbatim host sex: female
unknown, 1997-06-03
location in host: body surface
unknown, 1997-06-03

Remarks: louse on neck
Entered By: Mariel L. Campbell on 2012-11-19
Last Edited By: UAM on 2015-02-28

Accession
2012.003 Para
No Media Found

Usage
Contributed By Project: Sevilleta Long Term Ecological Research
Contributed By Project: Sevilleta Long Term Ecological Research

Linkage to publications

Symbiotype example

MSB:Mamm:96073
symbiotype(2) 101588

GenBank=DQ285046;
GenBank=DQ285047;
GenBank=EU192164;
GenBank=EU192190;
NK=101588; preparator
number=444

arctos.database.museum/guid/MSB:Mamm:96073

Search Enter Data Manage Data Manage Arctos Reports Portals My Stuff About/Help

MSB:Mamm:96073 LAS TABLAS; 7D46.068M N, 80D17.060M W skull; carcass (alcohol); liver (frozen); liver (frozen)
NK: 101588 Central America, Panama, Los Santos
Oligoryzomys fulvescens 06-Mar-2000

<< Return to results
get a DOI

Identification Accn Locality Agents Parts Part Locn. Attributes Other IDs Media Encumbrances

Oligoryzomys fulvescens
Animalia; Chordata; Mammalia; Rodentia; Cricetidae; Sigmodontinae; Oligoryzomys fulvescens
fulvous pygmy rice rat
Identified by unknown on 2005-02-15
Nature of ID: legacy

Oligoryzomys fulvescens
fulvous pygmy rice rat
Identified by James N. Mills, David S. Tinnin, Luis A. Ruedas on 2000
Nature of ID: legacy

Oligoryzomys fulvescens
fulvous pygmy rice rat
Identified by Jerry W. Dragoo, Blas Armién, Anibal Armién, Juan M. Pascale, Fred Koster, Randin Nelson, Raul Canate
Nature of ID: type specimen
Remarks: ID from citation in Nelson et al. 2010.

Citations

symbiotype of **Oligoryzomys fulvescens** in Vincent et al. 2000
not specifically cited but one of the positives from the group that was subsequently sequenced in Nelson et al 2010
symbiotype of **Oligoryzomys fulvescens** page 2 in Nelson et al 2010
Choclo virus positive

Determination Type: accepted place of collection
assigned by unknown on 2012-07-08

Higher Geography: Central America, Panama, Los Santos
Verbatim Locality: LAS TABLAS; 7D46.068M N, 80D17.060M W, Las Tablas
Specific Locality: LAS TABLAS; 7D46.068M N, 80D17.060M W
Collecting Source: wild caught
Event Date: 2000-03-06
Verbatim Date: 06-Mar-2000
Verification Status: unverified

Identifiers

GenBank: [DQ285047](#)
GenBank: [DQ285046](#)
GenBank: [EU192190](#)
GenBank: [EU192164](#)
NK: 101588
preparator number: 444

| Part Name | Condition | Disposition | Qty | Label | Remarks |
|-------------------|-----------|---------------|-----|-------|---------|
| carcass (alcohol) | unchecked | unchecked | 1 | | |
| liver (frozen) | good | in collection | 1 | | Choclo |
| liver (frozen) | good | on loan | 1 | | Choclo |
| skull | good | in collection | 1 | | |

sex: male
unknown, 2005-02-15

Remarks: Symbiotype of Choclo Hantavirus
Entered by: Dusty L. McDonald on 2005-02-17
Last Edited By: JLDUNNUM on 2015-02-24

Accession
2000.768.Mamm
No Media Found

Usage
Loan History: [Click for loan list](#)

Media
No Media Found

NCBI Resources How To Sign in to NCBI

Nucleotide Nucleotide Advanced Search Help

Display Settings: GenBank

Send: Change region shown Customize view Analyze this sequence Run BLAST Pick Primers Highlight Sequence Features Find in this Sequence

LinkOut to external resources MSB Mammals 96073 [Arctos Specimen Database] [LANL Hemorrhagic Fever Virus sequence database] [VPR - Virus Pathogen Resource]

Related information Full text in PMC Protein Taxonomy

Rapid Communication

Hantavirus Pulmonary Syndrome in Panama: Identification of Novel Hantaviruses and Their Likely Reservoirs

Martin J. Vincent,* Evelia Quiroz,† Fernando Garcia,† Angela J. Sanchez,† Thomas G. Kaizsek,* Paul T. Kitsutani,* Luis A. Ruedas,† David S. Tinnin,† Lorenzo Caceres,† Arsenio Garcia,† Pierre E. Rollin,† James N. Mills,* G. J. Peters,† and Stuart T. Nichol*

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Hantavirus pulmonary syndrome (HPS), a severe respiratory disease with high mortality caused by rodent-borne hantaviruses, has previously been identified in the United States and Canada as well as central and southern South America. In late 1999 and early 2000, an outbreak of acute illness compatible with HPS was reported in Los Santos, Panama, with the death of 3 of the 12 (25%) suspected cases. Hantavirus-specific antibodies were detected in patient sera, and virus RNA was detected by reverse transcriptase-polymerase chain reaction. Sequence analysis of virus genome N, G1, and G2-encoding fragments showed this to be a novel hantavirus, Choclo virus. Serologic and virus genetic analyses of rodents trapped in the area showed *Oligoryzomys fulvescens* to be the likely reservoir for the HPS-associated Choclo virus. In addition, *Oryzomys brevicauda* rodents were shown to harbor another genetically unique hantavirus, Calabazo virus. © 2000 Academic Press

Introduction. The genome organization of hantaviruses is typical of other members of *Bunyavirus*, consisting of three negative-stranded RNA segments, large (L), medium (M), and small (S), which encode the virus L glycoprotein, the G1 and G2 glycoproteins, and the nucleocapsid protein, respectively (5, 7). Hantaviruses in the world, such as Hantaan, Seoul, Puumala, and Dobrava viruses, are associated with hemorrhagic fever with renal syndrome (HFRS) and are prevalent in Asia and Europe (1, 9). The New World hantaviruses are associated with hantavirus pulmonary syndrome (HPS) (13, 15, 17). HPS is characterized by abrupt onset of fever, headache, myalgia, hypotension, and thrombocytopenia, followed by bilateral pulmonary infiltrates and rapid progression to respiratory failure. The mortality rate associated with HFRS ranges from less than 1 to 7% and from 40 to 50% for HPS. Each specific hantavirus is associated with a specific rodent that serves as host and vector, and the New World hantaviruses are hosted by various members of the subfamily Sigmodontinae.

In North America, most of the HPS cases have been reported from the western United States and Canada; sporadic occurrences have also been reported in other

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Results. Detection of Hantavirus Infection in Samples. Seven patients were found to be positive for the presence of hantavirus-specific antibodies, on initial

Data Harvesting

- ▣ In format that can be accessed and served by other databases.
 - IDigBio
 - GBIF
 - VertNet
- ▣ Active links back to Arctos



Other Big Data

- ▣ GIS
- ▣ GenBank
- ▣ IsoBank

Linkage to GenBank

- ❑ Reciprocal links in Arctos and GenBank
- ❑ Darwin Core triplet (MSB:Mamm:123456)
- ❑ Cat # in voucher and definition fields
- ❑ Tying genes to time and space – only vouchered material

Arctos database interface showing specimen details for MSB:Mamm:55245. The specimen is identified as *Andalgalomys pearsoni* dorbigny. The interface includes a navigation menu, specimen information, and a table of parts.

MSB:Mamm:55245
NK: 12402
Andalgalomys pearsoni dorbigny!
07-Oct-1984

29.5 KM W ROBORE, 475 M; 18D19'S, 60D02'W
South America, Bolivia, Santa Cruz

skin, skull, postcranial skeleton, kidney (frozen), karyotype (frozen), liver (frozen), liver (frozen), heart, kidney (frozen), liver (frozen) sample, liver (frozen) sample

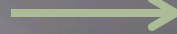
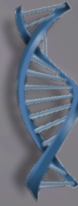
GenBank AY963176
GenBank AF159285
GenBank KC953341
GenBank KC953155
GenBank KC953355

| Part Name | Condition | Disposition | Qty | Label | Remarks |
|------------------------|-----------|---------------|-----|-------|--------------------|
| heart, kidney (frozen) | unchecked | in collection | 1 | | |
| karyotype (frozen) | unchecked | in collection | 1 | | |
| kidney (frozen) | unchecked | in collection | 1 | | |
| liver (frozen) | unchecked | in collection | 1 | | |
| liver (frozen) | unchecked | on loan | 1 | | |
| liver (frozen) | unchecked | in collection | 1 | | |
| liver (frozen) | good | on loan | 1 | | |
| postcranial skeleton | good | in collection | 1 | | moved to type case |
| skin | excellent | in collection | 1 | | moved to type case |

NCBI GenBank interface showing the entry for *Andalgalmys pearsoni* dorbigny isolate 55245 RAG1 protein (RAG1) gene, partial cds. The entry includes accession number AY963176.1 and a detailed description.

Andalgalmys pearsoni dorbigny isolate 55245 RAG1 protein (RAG1) gene, partial cds
GenBank AY963176.1

LOCUS AY963176 767 bp DNA linear ROD 09-SEP-2013
DEFINITION *Andalgalmys pearsoni* dorbigny isolate 55245 RAG1 protein (RAG1) gene, partial cds.
ACCESSION AY963176
VERSION AY963176.1 GI:65306977
KEYWORDS .
SOURCE *Andalgalmys pearsoni* dorbigny
ORGANISM *Andalgalmys pearsoni* dorbigny
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi; Mammalia; Eutheria; Euarchontoglires; Glires; Rodentia; Sciurognathi; Muroidea; Cricetidae; Sigmodontinae; *Andalgalmys*.
REFERENCE 1 (bases 1 to 767)
AUTHORS Steppan, S.J., Ramirez, O., Banbury, J., Huchon, D., Pacheco, V., Walker, L. and Spatorno, A.O.
TITLE A molecular reappraisal of the systematics of the leaf-eared mice *Phyllotis* and their relatives
JOURNAL Univ. Calif. Publ. Zool. 134, 799-820 (2007)
REFERENCE 2 (bases 1 to 767)
AUTHORS Steppan, S.J., Ramirez, O., Banbury, J., Huchon, D., Pacheco, V., Walker, L.I. and Spatorno, A.E.
TITLE Direct Submission
JOURNAL Submitted (16-SEP-2005) Department of Biological Sciences, Florida State University, Conradi 211, Tallahassee, FL 32306-1100, USA
FEATURES
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DNA sequence submitted to GenBank
AF159285

Andalgalomys pearsoni dorbignyi (MSB 55245)

GENETIC DATA

MORPHOLOGIC DATA

1. OLDS ET AL. 1987.
2. ANDERSON 1993.

TAXONOMIC REFERENCES

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6. STEPPAN ET AL. 2007.
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11. SCHENK ET AL. 2013
12. VENTURA ET AL. 2013
13. PARDINAS ET AL. 2014
14. ZEBALLOS ET AL. 2014

22 publications using data from a single specimen collected in 1984

Google Scholar Profile

MSB Division of Mammals:



Use recognized metrics to demonstrate value

Questions?

Demos?