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A Data Manager's Guide to Navigating GenBank

Mike Trizna, SI Barcode Network
Tom Hollowell, NMNH Informatics





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How many of you can tell me how many sequences were produced from your department's collections in the last year?



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How many of you can tell me how many sequences were produced from your department's collections in the last year?

**2458 from all
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NCBI Resources ▾ How To ▾

mike.trizna@gmail.com

Nucleotide

Nucleotide



(collection usnm[Properties] OR collection us[Properties]) AND (2016/07/27 : 2017/07/27[PDAT])



Search

[Create alert](#) [Advanced](#)

Species

Animals (2,232)

Plants (226)

Customize ...

[Summary](#) ▾ [20 per page](#) ▾ [Sort by Date Released](#) ▾

Send to: ▾

[Filters: Manage Filters](#)

Items: 1 to 20 of 2458

[First](#) [Prev](#) [Page 1](#) of 123 [Next](#) [Last](#)[Results by taxon](#)[Top Organisms](#) [\[Tree\]](#)

[https://www.ncbi.nlm.nih.gov/nuccore?
term=\(collection+usnm%5BProperties%5D+OR+collection+us%5BProperties%5D\)
+AND+\(2016%2F07%2F27+
%3A+2017%2F07%2F27%5BPDAT%5D\)&cmd=DetailsSearch](https://www.ncbi.nlm.nih.gov/nuccore?term=(collection+usnm%5BProperties%5D+OR+collection+us%5BProperties%5D)+AND+(2016%2F07%2F27+%3A+2017%2F07%2F27%5BPDAT%5D)&cmd=DetailsSearch)

Don't worry if this looks daunting.
We'll break down this query later on.

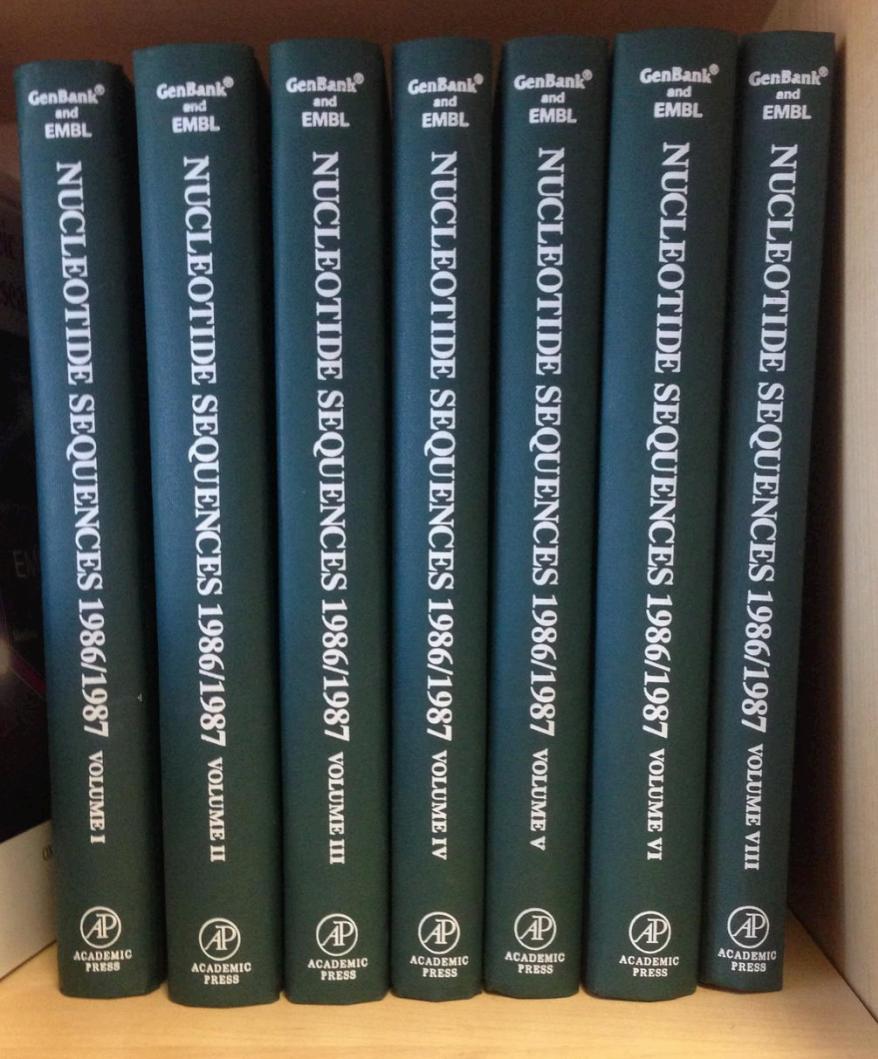


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What is GenBank?

GenBank is an open access database that holds all publicly available DNA sequences.

It has been hosted at the National Center for Biotechnology Information (NCBI) at the National Institutes of Health (NIH) since 1990.

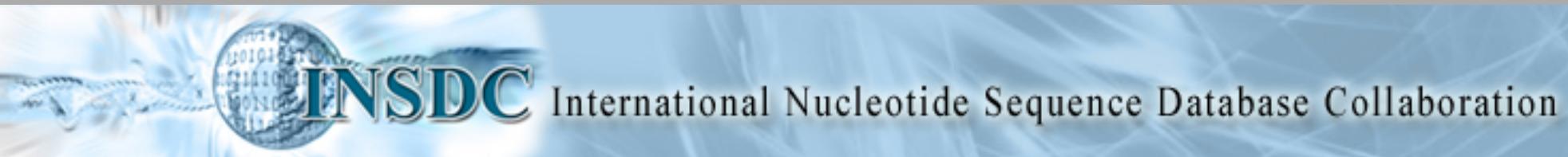




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What is GenBank?

GenBank is a member of the International Nucleotide Sequence Database Collaboration (INSDC), along with EMBL-EBI (European Bioinformatics Institute) and DDBJ (DNA Databank of Japan). They share data daily, so if a record is submitted to GenBank, then it can also be found in EMBL and DDBJ and vice versa.





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What is GenBank?

Within NCBI, GenBank is 1 of many connected databases.
You can find them all at
<https://www.ncbi.nlm.nih.gov/sites/gquery>

NCBI Resources How To Sign in to NCBI

Search NCBI databases

Help

Literature

Books books and reports
MeSH ontology used for PubMed indexing
NLM Catalog books, journals and more in the NLM Collections
PubMed scientific & medical abstracts/citations
PubMed Central full-text journal articles

Health

ClinVar human variations of clinical significance
dbGaP genotype/phenotype interaction studies
GTR genetic testing registry
MedGen medical genetics literature and links
OMIM online mendelian inheritance in man
PubMed Health clinical effectiveness, disease and drug reports

Genomes

Assembly genome assembly information
BioCollections museum, herbaria, and other biorepository collections
BioProject biological projects providing data to NCBI
BioSample descriptions of biological source materials
Clone genomic and cDNA clones
dbVar genome structural variation studies
Genome genome sequencing projects by organism
GSS genome survey sequences
Nucleotide DNA and RNA sequences
Probe sequence-based probes and primers
SNP short genetic variations
SRA high-throughput DNA and RNA sequence read archive
Taxonomy taxonomic classification and nomenclature catalog

Genes

EST expressed sequence tag sequences
Gene collected information about gene loci
GEO DataSets functional genomics studies
GEO Profiles gene expression and molecular abundance profiles
HomoloGene homologous gene sets for selected organisms
PopSet sequence sets from phylogenetic and population studies
UniGene clusters of expressed transcripts

Proteins

Conserved Domains conserved protein domains
Protein protein sequences
Protein Clusters sequence similarity-based protein clusters
Structure experimentally-determined biomolecular structures

Chemicals

BioSystems molecular pathways with links to genes, proteins and chemicals
PubChem BioAssay bioactivity screening studies
PubChem Compound chemical information with structures, information and links
PubChem Substance deposited substance and chemical information



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Why should you care about GenBank?

It is general scientific journal policy to require GenBank "accession numbers" for any genetic sequences cited in a publication.

Probing planetary biodiversity with DNA barcodes: The Noctuoidea of North America
Reza Zahiri, J. Donald Lafontaine, B. Christian Schmidt, Jeremy R. deWaard, Evgeny V. Zakharov, Paul D. N. Hebert

Supporting information				
S1 Dataset.xls				
Log Num	COI-5P Seq. Length	COI-5P Trace Count	COI-5P Accession	Im
617[0n]			AF549724	1
639[0n]			KJ379363	1
658[0n]	6		GU090019	2
658[0n]	4		GU090020	2

Abstract
Introduction
Materials and methods
Results
Discussion
Supporting information
Acknowledgments
Author Contributions
References

Reader Comments (0)
Media Coverage (0)
Figures



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Why should you care about GenBank?

BLAST

Due to ease of use and accessibility, it is the most popular bioinformatics tools in use globally.

Among other uses, BLAST is used to identify unknown DNA sequences. It will compare the unknown against ALL records in GenBank.



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Why should you care about GenBank?

Sequences producing significant alignments:

Select: [All](#) [None](#) Selected:0

	Description	Max score	Total score	Query cover	E value	Ident	Accession
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:647800 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	1214	1214	100%	0.0	100%	KU722436.1
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:647779 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	1214	1214	100%	0.0	100%	KU722416.1
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:647977 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	1208	1208	100%	0.0	99%	KU722527.1
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:647940 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	1208	1208	100%	0.0	99%	KU722505.1
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:647783 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	1208	1208	100%	0.0	99%	KU722420.1
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:647939 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	1203	1203	100%	0.0	99%	KU722504.1
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:647852 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	1147	1147	94%	0.0	100%	KU722482.1
<input type="checkbox"/>	Pycnonotus barbatus bio-material UWBM GAV632 cytochrome c oxidase subunit I (COI) gene, partial cds; mitochondrial	1009	1009	99%	0.0	94%	FJ473231.1
<input type="checkbox"/>	Pycnonotus barbatus isolate BD05 cytochrome oxidase subunit 1 (COX1) gene, partial cds; mitochondrial	1005	1005	99%	0.0	94%	JX160004.1
<input type="checkbox"/>	Pycnonotus leucogenys voucher PSRCEW-BB-WCB01 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	998	998	98%	0.0	95%	HQ168045.1
<input type="checkbox"/>	Pycnonotus leucogenys voucher PSRCEW-BB-WCB03 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	992	992	98%	0.0	94%	HQ168047.1
<input type="checkbox"/>	Pycnonotus leucogenys voucher PSRCEW-BB-WCB02 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	992	992	98%	0.0	94%	HQ168046.1
<input type="checkbox"/>	Pycnonotus leucogenys voucher USNM 645908 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	981	981	99%	0.0	94%	KP252243.1
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:630912 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	981	981	99%	0.0	94%	JQ176056.1
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:630870 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	976	976	99%	0.0	94%	JQ176057.1
<input type="checkbox"/>	Pycnonotus barbatus voucher USNM:Birds:627021 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial	976	976	99%	0.0	94%	JQ176055.1



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What specimen data is in a GenBank record?

- Specimen data fields are a bit of an afterthought, because of GenBank's origin as a human health focused database.
- That being said, you can view the full definition list of "source modifiers" here:

http://www.insdc.org/files/feature_table.html#7.3.1



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Specimen data in GenBank records

Here are all of the specimen fields required or highly recommended by [Barcode Data Standard](#):

Specimen Metadata Field	Required or Recommended?
organism	Required
country	Required
specimen_voucher	Required
identified_by	Recommended
collected_by	Recommended
collection_date	Recommended
lat_lon	Recommended



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Specimen data in GenBank records

[Show a live example of a GenBank record with all of these fields: <https://www.ncbi.nlm.nih.gov/nuccore/KT075276>]



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A Data Manager's Guide to Navigating GenBank

The View From EMu

This portion of the presentation from

Tom Hollowell
NMNH Informatics

27 July 2017



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Diplodus holbrookii



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EMu Gen. Sample 1 Tab

Links

Catalog (1) - Display

File Edit Select View Genetic Sample Tools Tabs Multimedia Window Help

[GS: BioR] 416809; DNA, RNA, Proteins; AC4YL08; ; Whole genomic DNA; ; 355AB1CBC000501 11611381

Primary Sample Type Secondary Tertiary Verbatim Primary Sample

DNA, RNA, Proteins Whole genomic DNA

Parent Record: [GS: BioR] 416809; Tissue & Parts; AC2WM67; ; Unknown tissue sample; Inherit Parent Data

Voucher Location and Storage Information

Record: 416809 : Diplodus holbrookii : : 187 : Spar Location: Biorepository

Type: Specimen Voucher Number: 416809 Temp. C: Medium:

Location: USNM Contact: Biorepository Coordinator - (NMNH) Nat

Other Numbers FreezerPro Details Location ID

Project Code: Field ID No.: FCC 8031 Biorepository ID: AC4YL08 63508

Project/Unit ID: 2D Barcode: 0077279291 RFID: 355AB1CBC00050100000F814

BOLD ID: FCCA031-09 Date Submitted: Location: NMNHB-080UF-00063 (probe 22)->Shelf

Date Submitted: Web: <https://si-freezers.si.edu/location/63508>

Plate Well Plate ID Locked

Gen. Sample 1 Gen. Sample 2 Gen. Sample 3 GenBank Nmbrs Identification Biology Vertebrate (1) Vertebrate (2)

Display Object 1 of 4144 hollowel Admin nmnhlive



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BOLD

File Edit View History Bookmarks Tools Help

BOLD Systems: Management &... x +

www.barcodinglife.org/index.php/Public_RecordView?processid=FC

iker's guide simon pete

Most Visited BBC News | News Fron... Reuters: Top News ProPublica National Museum of... IPT Dev Blog Graphs -> Tree Mode

A Please note: BOLD version 4 (v4.boldsystems.org) will become the production system on July 31, 2017. After the release, the address www.boldsystems.org will no longer be pointing to this version (Version 3). After this transition BOLD V3 can be found at v3.boldsystems.org

BOLD SYSTEMS Databases | Taxonomy | Identification | Workbench | Resources Log In

Public Data Portal - Specimen Record Print

Record Details For FCCA031-09

Back to Search: R feedback

IDENTIFIERS:

Sample ID:	FCC8031	Museum ID:	USNM:FISH:FCC8031
Field ID:	FCC8031	Collection Code:	
Deposited In:	Smithsonian Institution		

Add Tags & Comments 0 Comments: 0 Associated Tags: No Tags

TAXONOMY:

Phylum:	Chordata	Subfamily:	
Class:	Actinopterygii	Genus:	Diplodus
Order:	Spariformes	Species:	Diplodus holbrookii
Family:	Sparidae	Subspecies:	
BIN (Cluster ID):	BOLD:AAB4180		

* Barcode Index Numbers(BIN): cluster barcode sequences to create OTUs that closely reflect species groupings

SPECIMEN DETAILS:

Voucher Status:	Reproduction:
Tissue Descriptor:	Sex:
Brief Note:	FAO-31
Detailed Notes:	27mm: Minnow Trap

Map

NORTH CAROLINA

Charlotte

ATLANTA

ALABAMA

GEORGIA

JACKSONVILLE

Orlando

Tampa

MIAMI

FLORIDA

Specimen Images: N/A

Collection Site:



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EMu Gen. Sample 1 Tab

Links

Catalog (1) - Display

[GS: BioR] 416809; DNA, RNA, Proteins; AC4YL08; ; Whole genomic DNA; ; 355AB1CBC000501 11611381

File Edit Select View Genetic Sample Tools Tabs Multimedia Window Help

Primary Sample Type Secondary Tertiary Verbatim Primary Sample

DNA, RNA, Proteins Whole genomic DNA

Parent Record: [GS: BioR] 416809; Tissue & Parts; AC2WM67; ; Unknown tissue sample; Inherit Parent Data

Voucher Location and Storage Information

Record: 416809 : Diplodus holbrookii :: 187 : Spar
Type: Specimen Voucher Number: 416809
Location: USNM

Location: Biorepository
Temp. C: Medium:

Contact: Biorepository Coordinator - (NMNH) Nat

Other Numbers FreezerPro Details Location ID

Project Code: Field ID No.: FCC 8031
Project/Unit ID: 2D Barcode: 0077379291
BOLD ID: FCCA031-09 
Date Submitted:

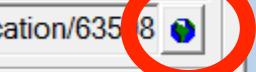
Biorepository ID: AC4YL08 63508
RFID: 355AB1CBC00050100000F814
Location: NMNHBR-080UF-00063 (probe 22)->Shelf
Web: <https://si-freezers.si.edu/location/63508> 

Plate Well Plate ID Locked

Gen. Sample 1 Gen. Sample 2 Gen. Sample 3 GenBank Nmbrs Identification Biology Vertebrate (1) Vertebrate (2)

Display Object 1 of 4144 hollowel Admin nmnhlive



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FreezerPro

File Edit View History Bookmarks Tools Help

FreezerPro Enterprise https://si-freezers.si.edu 90% Search Emufp | Logout

Most Visited BBC News | News Fron... Reuters: Top News ProPublica National Museum of... IPT Dev Blog Graphs -> Tree Mode

SI-Freezers. Smithsonian Institution- FreezerPro

Freezers And Boxes Home 355AB1CBC0005090000A10B

Depleted Samples

- NMNHBR-Freezer Group 01-06
- NMNHBR-Freezer Group 07-20
- NMNHBR-Freezer Group 21-32
- NMNHBR-Freezer Group 33-38
- NMNHBR-Freezer Group 39-42
- NMNHBR-Freezer Group 43-48
- NMNHBR-Freezer Group 49-53
- NMNHBR-Freezer Group 54-55
- NMNHBR-Freezer Group 56-59
- NMNHBR-Freezer Group 64-67
- NMNHBR-Freezer Group 68-77
- NMNHBR-Freezer Group 80-85
- NMNHBR-Numbers For Fieldwo
- NMNHBR-Workroom
- Rack and Box Inventory

Actions Search: Live search requires a minimum of 2 characters.

Plate Scanner

X	1	2	3	4	5	6	7	8	9	10	11	12
A	MOL											
B	MOL											
C	MOL											
D	MOL											
E	MOL											
F	MOL											
G	MOL											
H	MOL											

96 vial(s) in 96 wells

In Progress: FP record will include GUID link to EMu web.

~ > NMNHBR-080UF-00063 (probe 22) > Shelf_1 > H-M-24-000003 > 355AB1CBC0005090000A10B

ID: 333 [GS: BioR] 416809; DNA, RNA, Proteins (Primary Sample Type)
Description: [GS: BioR] 416809; DNA, RNA, Proteins; AC4YL08; Whole genomic DNA;; 355AB1CBC0005010000F81 Voucher: USNM 416809; : Dipl. holbrookii :: 187 : Sparidae : Perciformes : Actinopterygii : Chordata : Atlantic :: United States : - DATA TRUNCATED Biorepository Number: AC4YL08 Barcode: 0077379291 RFID Tag: 355AB1CBC0005010000F81 Volume: 0.0 uL (Total volume of vials: 0.0 uL)
Total number of [GS: BioR] 416809; DNA, RNA, Proteins (Primary Sample Type) vials in all freezers 1 Created: 03/31/2015 Notes: Add



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GenBank numbers can be added to EMu Genetic Sample, Specimen/Lot and other record types.

Summary Results

Summary Report - "Kind of Object"

1	4	Bulky specimen
2	5935	Genetic Sample
3	7	Image
4	1	Lot
5	159	Pressed specimen
6	422	Specimen
7	4977	Specimen/Lot
8	4	Unmounted material
11509 Total		

Close Print Help

Kind of Object summary, all records with GB numbers in main GenBank table (not the read-only child records table).



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Entry in Child Record

Catalog (1) - Display

[GS: BioR] 416809; DNA, RNA, Proteins; AC4YL08; ; Whole genomic DNA; ; 355AB1CBC000501 11611381

File Edit Select View Genetic Sample Tools Tabs Multimedia Window Help

GenBank Numbers

Locus/Loci	GenBank Number	Submitted By	Date Submitted
1	JQ841872		
*			

[Link to NCBI Record](#)

Add NCBI number in EMu to the Parent or Child level record you are certain of.

GenBank Numbers (child records)

Locus/Loci	GenBank Number	Submitted By	Date Submitted

Gen. Sample 1 Gen. Sample 2 Gen. Sample 3 GenBank Nmbrs Identification Biology Vertebrate (1) Vertebrate (2) Display Object 1 of 4144 hollowel Admin nmnhlive



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Display in Parent Record

Catalog (3) - Display

File Edit Select View Genetic Sample Tools Tabs Multimedia Window Help

416809 : Diplodus holbrookii : 187 : Sparidae : Perciformes : Actinopterygii : Chordata : Atlantic 10745997

GenBank Numbers

Locus/Loci	GenBank Number	Submitted By	Date Submitted
*			

GenBank Numbers (child records)

Locus/Loci	GenBank Number	Submitted By	Date Submitted
1	JQ841872		

Read-only NCBI number(s), from all Children down the hierarchy.

Link to NCBI Record

GenBank Nmbrs Identification Biology Vertebrate (1) Vertebrate (2) Measurements Accession Legacy

Display Object 1 of 3 hollowel Admin nmnhlive

NCBI Results



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File Edit View History Bookmarks Tools Help

JQ841872 - GQuery: Global... +

https://www.ncbi.nlm.nih.gov/gquery?term=JQ841872

Search

Most Visited BBC News | News Fron... Reuters: Top News ProPublica National Museum of ... IPT Dev Blog Graphs -> Tree Mode

NCBI Resources How To Sign in to NCBI

Help

Search NCBI databases

JQ841872

Results found in 1 database for "JQ841872"

Results page via EMu link usually displays GenBank Nucleotide / Next Gen. BioSample summary at top.

Diplodus holbrookii voucher FCC8031 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial
618 bp genomic DNA.
Country: USA: Florida, Brevard County, Port Canaveral Trident Basin, west Revetment. Lat_Lon: 28.41 N 80.59 W. Collection_date: 02-Apr-2008. Collected_by: E. Reyier. Identified_by: Eric A. Reyier.
Accession: JQ841872.1 GI: 386687081
[GenBank](#) [FASTA](#) [Graphics](#)

Literature		Genes			
Books	0	books and reports	EST	0	expressed sequence tag sequences
MeSH	0	ontology used for PubMed indexing	Gene	0	collected information about gene loci
NLM Catalog	0	books, journals and more in the NLM Collections	GEO DataSets	0	functional genomics studies
PubMed	0	scientific & medical abstracts/citations	GEO Profiles	0	gene expression and molecular abundance profiles
PubMed Central	0	full-text journal articles	HomoloGene	0	homologous gene sets for selected organisms
Health		Proteins			
ClinVar	0	human variations of clinical significance	PopSet	0	sequence sets from phylogenetic and population studies
dbGaP	0	genotype/phenotype interaction studies	UniGene	0	clusters of expressed transcripts
GTR	0	genetic testing registry	Proteins		
MedGen	0	medical genetics literature and links	Conserved Domains	0	conserved protein domains
OMIM	0	online mendelian inheritance in man			



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NCBI GenBank Record

File Edit View History Bookmarks Tools Help

Diplodus holbrookii vouch... x +

https://www.ncbi.nlm.nih.gov/nucleotide/386687081/

Search

Most Visited BBC News | News Front... Reuters: Top News ProPublica National Museum of ... IPT Dev Blog Graphs -> Tree Mode

NCBI Resources How To Sign in to NCBI

Nucleotide Nucleotide Search Advanced

GenBank Change region shown

Diplodus holbrookii voucher FCC8031 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial

GenBank: JQ841872.1

FASTA Graphics

Go to: ▾

LOCUS JQ841872 618 bp DNA linear VRT 24-JUL-2012

DEFINITION Diplodus holbrookii voucher FCC8031 cytochrome oxidase subunit 1 (COI) gene, partial cds; mitochondrial.

ACCESSION JQ841872

VERSION JQ841872.1

KEYWORDS .

SOURCE mitochondrion *Diplodus holbrookii* (spottail pinfish)

ORGANISM *Diplodus holbrookii*
Eukaryota; Metazoa; Chordata; Craniata; Vertebrata; Euteleostomi;
Actinopterygii; Neopterygii; Teleostei; Neoteleostei;
Acanthomorphata; Eupercaaria; Spariformes; Sparidae; Diplodus.

REFERENCE 1 (bases 1 to 618)

AUTHORS Weigt,L.A., Baldwin,C.C., Driskell,A., Smith,D.G., Ormos,A. and Reyier,E.A.

TITLE Using DNA barcoding to assess Caribbean reef fish biodiversity:
expanding taxonomic and geographic coverage

JOURNAL PLoS ONE 7 (7), E41059 (2012)

PUBMED 22815912

REMARK Publication Status: Online-Only

REFERENCE 2 (bases 1 to 618)

AUTHORS Weigt,L.A., Baldwin,C., Driskell,A.C., Smith,D.G. and Ormos,A.

TITLE Direct Submission

JOURNAL Submitted (28-MAR-2012) Laboratories of Analytical Biology,
National Museum of Natural History, Smithsonian Inst., 4210 Silver

Help

Analyze this sequence

Run BLAST

Pick Primers

Highlight Sequence Features

Find in this Sequence

Related information

Full text in PMC

Protein

PubMed

Taxonomy

LinkOut to external resources

Genetic Sample USNM 416809 [NMNH Collections, Smithsonian]

Voucher USNM 416809 [NMNH Collections, Smithsonian]

NCBI LinkOut to NMNH Collections Web on the right.



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NCBI GenBank Record

File Edit View History Bookmarks Tools Help

Diplodus holbrookii vouch... x +

https://www.ncbi.nlm.nih.gov/nuccore/386687081/

Most Visited BBC News | News Fron... Reuters: Top News ProPublica National Museum of ... IPT Dev Blog Graphs -> Tree Mode

expanding taxonomic and geographic coverage
JOURNAL PLoS ONE 7 (7), E41059 (2012)
PUBMED 22815912
REMARK Publication Status: Online-Only
REFERENCE 2 (bases 1 to 618)
AUTHORS Weigt, L.A., Baldwin, C., Driskell, A.C., Smith, D.G. and Ormos, A.
TITLE Direct Submission
JOURNAL Submitted (28-MAR-2012) Laboratories of Analytical Biology,
National Museum of Natural History, Smithsonian Inst., 4210 Silver
Hill Rd, Suitland, MD 20746, USA
FEATURES source

Location/Qualifiers
1..618
/organism="Diplodus holbrookii"
/organelle="mitochondrion"
/mol_type="genomic DNA"
/specimen_voucher="FCC8031"
/db_xref="BOLD:FCCA031-00.COI-5P"
/db_xref="taxon:119713"
/country="USA: Florida, Brevard County, Port Canaveral
Trident Basin, West Revetment"
/lat_lon="28.41 N 80.59 W"
/collection_date="02-Apr-2008"
/collected_by="E. Reyier"
/identified_by="Eric A. Reyier"
/PCR_primers="fwd_seq: tcaacyaatcayaagatatyggcac,
rev_seq: acttcyyggtgcccraataatca"
<1..>618
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<1..>618
/gene="co"
/codon_start=2
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/protein_id="AFJ20862.1"
/translation="LYLVFGAWAGMVGVTALSLIRAEELSQPGALLGDDQIYNVIVTAH
AFVMIFFMVMPIMIGGFGNWLIPLMIGAPDMXXPRMNNMSFWLLPPSFLLLASSGVE

LinkOut to external resources

Genetic Sample USNM 416809
[NMNH Collections, Smithsonian]

Voucher USNM 416809
[NMNH Collections, Smithsonian]

Recent activity

Turn Off Clear

Diplodus holbrookii voucher FCC8031 cytochrome oxidase Nucleotide

Proctacanthus coquillettii voucher USNM:ENT:00914502 cytochrome oxidase Nucleotide

BioSample Links for BioProject (Select 343047) (2) BioSample

Assassin fly Proctacanthus coquillettii biosample

Hypsilema unaocularis isolate WP312 NADH dehydrogenase Nucleotide

See more...

FEATURES > source > /specimen_voucher
Submitters could repeat this element, ex. add EMu GUID (fide NCBI)



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NCBI LinkOut

LinkOut providers submit up to 3 links for any record in certain NCBI databases.
NMNH Informatics currently submits links for NCBI Nucleotide and BioSample databases.

The screenshot shows a web browser window with the following details:

- Menu Bar:** File, Edit, View, History, Bookmarks, Tools, Help.
- Title Bar:** LinkOut: General Information.
- Address Bar:** https://www.ncbi.nlm.nih.gov/projects/linkout/
- Toolbar:** Back, Forward, Stop, Refresh, Search (with placeholder "Search"), Favorites, Home, Stop, Download, etc.
- Bookmark Bar:** Most Visited, BBC News | News Fron..., Reuters: Top News, ProPublica, National Museum of ..., IPT Dev Blog, Graphs -> Tree Mode.
- Content Area:**
 - Header:** NCBI Logo, LinkOut Logo (a red sphere with a crossed-out arrow), and the text "LINKOUT" and "LINKING TO A WORLD OF RESOURCES".
 - Navigation:** HOME, HELP, FAQ, Provider Lists, Journal Lists, File Validation, Links Finder, Library Submission.
 - Tabs:** Welcome (selected), Libraries, Full-Text Providers, Institutional Repositories, Other Providers.
 - Text Content:**

LinkOut is a service that allows you to link directly from PubMed and other NCBI databases to a wide range of information and services beyond the NCBI systems. LinkOut aims to facilitate access to relevant online resources in order to extend, clarify, and supplement information found in NCBI databases. [Examples of LinkOut Resources](#) include full-text publications, biological databases, consumer health information, research tools, and more.

All links are specially assigned to specific database records. When accessing a link through LinkOut, no additional searching should be necessary to access the relevant resource that has been linked to the record. Online resources that may be valuable to users of PubMed and other NCBI databases are encourage to participate in LinkOut.



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LinkOut Resource File Placed on NCBI FTP server

C:\EMU\FTP\NCBI_Linkout\Files_For_NCBI_FTP\NMNH_Informatics_Linkout_Nucleotide.csv - Notepad++

File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?

NMNH_GUDI_LinkName

If a GenBank number is in an Emu record, it gets linked.

ProviderID	Database	Query	URL	IconUrl	UrlName	SubjectType	CRLF		
9604	Nucleotide	AP462456 [Accession]	http://n2t.net/ark:/65665/3c61096a7-1f9a-489e-bc0e-d7a05de33b52,		Voucher	USNM	391560	herbarium/museum.collections	CRLF
9604	Nucleotide	AF00469 [Accession]	http://n2t.net/ark:/65665/3cd89757-3d2b-45be-a6a0-8df6fe33b1c,		,, Voucher	USNM	1114192	herbarium/museum.collections	CR
9604	Nucleotide	AF055930 [Accession]	http://n2t.net/ark:/65665/3e70f224a-18ae-439a-924b-0cd3aae14bce,		Voucher	USNM	321912	herbarium/museum.collections	CRLF
9604	Nucleotide	AF055962 [Accession]	http://n2t.net/ark:/65665/3c5825d54-d2fc-4163-83bb-3bfa07f5fc8b,		Voucher	USNM	498030	herbarium/museum.collections	CRLF
9604	Nucleotide	AF108673.2 [Accession]	http://n2t.net/ark:/65665/34f465c60-14bd-4d36-ab38-86465f31ad4,		,, Voucher	USNM	321864	herbarium/museum.collections	CR
9604	Nucleotide	AF108680 [Accession]	http://n2t.net/ark:/65665/3cd98cc10-36a4-40d7-9a9b-3db4fbfd130db,		Voucher	USNM	560658	herbarium/museum.collections	CRLF
9604	Nucleotide	AF108695 [Accession]	http://n2t.net/ark:/65665/84a62ce-be12-3225-82b7-e38c1a253,		Voucher	USNM	549548	herbarium/museum.collections	CRLF
9604	Nucleotide	AF143918 [Accession]	http://n2t.net/ark:/65665/84cef41b-f4e6-446c-bef9a9bd5198-6,		Voucher	USNM	583154	herbarium/museum.collections	CRLF
9604	Nucleotide	AF143919 [Accession]	http://n2t.net/ark:/65665/3b8e8a10-1fde-408b5fe631c8871e7,		Voucher	USNM	583155	herbarium/museum.collections	CRLF
9604	Nucleotide	AF143926 [Accession]	http://n2t.net/ark:/65665/3d53e1a7-fc3-466-3d4b-9d6617d0e,		Voucher	USNM	575170	herbarium/museum.collections	CRLF
9604	Nucleotide	AF143935 [Accession]	http://n2t.net/ark:/65665/3234d40c7-2ad1-4613-9236-74468e7f400d,		Voucher	USNM	241947	herbarium/museum.collections	CRLF
9604	Nucleotide	AF143936 [Accession]	http://n2t.net/ark:/65665/3234d40c7-2ad1-4613-9236-74468e7f400d,		Voucher	USNM	241947	herbarium/museum.collections	CRLF
9604	Nucleotide	AF149990 [Accession]	http://n2t.net/ark:/65665/384a8dc2a-9c1a-4fe3-920f-ba4850b7f6f0,		Voucher	USNM	327557	herbarium/museum.collections	CRLF
9604	Nucleotide	AF149996 [Accession]	http://n2t.net/ark:/65665/3b58ca055-3d06-4edd-a7f5-53be9a8d91a9,		Voucher	USNM	327564	herbarium/museum.collections	CRLF
9604	Nucleotide	AF150002 [Accession]	http://n2t.net/ark:/65665/31a50a9a7-efd0-4120-9f7f-fe5482f3b3e4,		Voucher	USNM	327560	herbarium/museum.collections	CRLF
9604	Nucleotide	AF150646 [Accession]	http://n2t.net/ark:/65665/384a8dc2a-9c1a-4fe3-920f-ba4850b7f6f0,		Voucher	USNM	327557	herbarium/museum.collections	CRLF
9604	Nucleotide	AF150651 [Accession]	http://n2t.net/ark:/65665/3b58ca055-3d06-4edd-a7f5-53be9a8d91a9,		Voucher	USNM	327554	herbarium/museum.collections	CRLF
9604	Nucleotide	AF150657 [Accession]	http://n2t.net/ark:/65665/31a50a9a7-efd0-4120-9f7f-fe5482f3b3e4,		Voucher	USNM	327556	herbarium/museum.collections	CRLF
9604	Nucleotide	AF152123 [Accession]	http://n2t.net/ark:/65665/384a8dc2a-9c1a-4fe3-920f-ba4850b7f6f0,		Voucher	USNM	327557	herbarium/museum.collections	CRLF
9604	Nucleotide	AF152129 [Accession]	http://n2t.net/ark:/65665/3b58ca055-3d06-4edd-a7f5-53be9a8d91a9,		Voucher	USNM	327564	herbarium/museum.collections	CRLF
9604	Nucleotide	AF152135 [Accession]	http://n2t.net/ark:/65665/31a50a9a7-efd0-4120-9f7f-fe5482f3b3e4,		Voucher	USNM	327560	herbarium/museum.collections	CRLF
9604	Nucleotide	AF152150 [Accession]	http://n2t.net/ark:/65665/384a8dc2a-9c1a-4fe3-920f-ba4850b7f6f0,		Voucher	USNM	327557	herbarium/museum.collections	CRLF
9604	Nucleotide	AF152156 [Accession]	http://n2t.net/ark:/65665/3b58ca055-3d06-4edd-a7f5-53be9a8d91a9,		Voucher	USNM	327564	herbarium/museum.collections	CRLF
9604	Nucleotide	AF152162 [Accession]	http://n2t.net/ark:/65665/31a50a9a7-efd0-4120-9f7f-fe5482f3b3e4,		Voucher	USNM	327560	herbarium/museum.collections	CRLF
9604	Nucleotide	AF153293 [Accession]	http://n2t.net/ark:/65665/384a8dc2a-9c1a-4fe3-920f-ba4850b7f6f0,		Voucher	USNM	327557	herbarium/museum.collections	CRLF
9604	Nucleotide	AF153299 [Accession]	http://n2t.net/ark:/65665/3b58ca055-3d06-4edd-a7f5-53be9a8d91a9,		Voucher	USNM	327564	herbarium/museum.collections	CRLF
9604	Nucleotide	AF15330 [Accession]	http://n2t.net/ark:/65665/31a50a9a7-efd0-4120-9f7f-fe5482f3b3e4,		Voucher	USNM	327560	herbarium/museum.collections	CRLF
9604	Nucleotide	AF15539 [Accession]	http://n2t.net/ark:/65665/393d2407-71-4cd-44-0-c6fb3b1a,		Voucher	USNM	32599	herbarium/museum.collections	CRLF
9604	Nucleotide	AF15843 [Accession]	http://n2t.net/ark:/65665/3c56aeb9-2-6-41b-4eb-0-1154-4-3,		Voucher	USNM	30634	herbarium/museum.collections	CRLF
9604	Nucleotide	AF158439 [Accession]	http://n2t.net/ark:/65665/35c094392-b38b-4a2c-af77-785956e052c4,		Voucher	USNM	335891	herbarium/museum.collections	CRLF
9604	Nucleotide	AF158440 [Accession]	http://n2t.net/ark:/65665/3927d970a-d95a-4875-9985-eaba9b2f343e,		Voucher	USNM	328394	herbarium/museum.collections	CRLF
9604	Nucleotide	AF15844 [Accession]	http://n2t.net/ark:/65665/31c5aba71-d4c9-4a1d-88e3-671175f167,		Voucher	USNM	323878	herbarium/museum.collections	CRLF
9604	Nucleotide	AF158441 [Accession]	http://n2t.net/ark:/65665/3-ad3010-72be4-1-920-38e-8-0,		Voucher	USNM	32389	herbarium/museum.collections	CRLF
9604	Nucleotide	AF158442 [Accession]	http://n2t.net/ark:/65665/352d0f8d4-23e9-4a5-ab-2-4-0-88-1,		Voucher	USNM	2024	herbarium/museum.collections	CRLF
9604	Nucleotide	AF158446 [Accession]	http://n2t.net/ark:/65665/3bb031a62-4f2b-4014-b044-5b8c19d105,		Voucher	USNM	306336	herbarium/museum.collections	CRLF
9604	Nucleotide	AF158447 [Accession]	http://n2t.net/ark:/65665/34fa75164-64f4-4e84-89db/c7d1933cb6a,		Voucher	USNM	329438	herbarium/museum.collections	CRLF
9604	Nucleotide	AF158448 [Accession]	http://n2t.net/ark:/65665/16665f12-620-514-10b-45e2507d121,		Voucher	USNM	222162	herbarium/museum.collections	CRLF

length : 2,446,062 lines : 15,907 Ln:1 Col:1 Sel:0 | 0 Windows (CR LF) ANSI INS



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Links from NMNH Collections Web

File Edit View History Bookmarks Tools Help

Diplodus holbrookii vouch... Fishes Collections Search

collections.nmnh.si.edu/search/fishes/?ark=ark:/65665/3a61fac44f9c242b1

Most Visited BBC News | News Front... Reuters: Top News ProPublica National Museum of ... IPT Dev Blog Graphs -> Tree Mode

Diplodus holbrookii : Sparidae : Perciformes : Actinopterygii : Chordata

Genetic Sample

Catalog Number:	USNM 416809
Sample Type:	Whole genomic DNA
Preservation Method:	Tris-EDTA
Identification:	Diplodus holbrookii
Family:	Sparidae
Date Collected:	2 Apr 2008
Ocean:	Atlantic
Country:	United States
Province/State:	Florida
District/County:	Brevard County
Precise Locality:	Florida, Brevard County, Port Canaveral Trident Basin, west revetment
Centroid Latitude:	28.41
Centroid Longitude:	-80.59
Collector(s):	Reyier, E.
Specimen/Sample Number:	Specimen voucher field number FCC 8031
Expedition:	Florida Cape Canaveral 2007-2008
Collection Method:	Rotenone
Depth (m):	3
Accession Number:	2070271
EZID:	http://n2t.net/ark:/65665/3a61fac44-f9c2-42bb-938b-d6598c288ee8
Biorepository Number:	AC4Y101 (GGBN)
GenBank Numbers:	JQ841872
BOLD Number:	FCCA031-09
Sample Tree:	Diplodus holbrookii_416809 416809, Unknown tissue sample 416809, Whole genomic DNA

To GGBN
To NCBI

Both are linking back to this page,
via the provided GUID.



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GGBN Record

File Edit View History Bookmarks Tools Help

Diplodus holbrookii vouch... Fishes Collections Search GGBN Portal

www.ggbn.org/ggbn_portal/search/record?institutioncode=USNM&colle

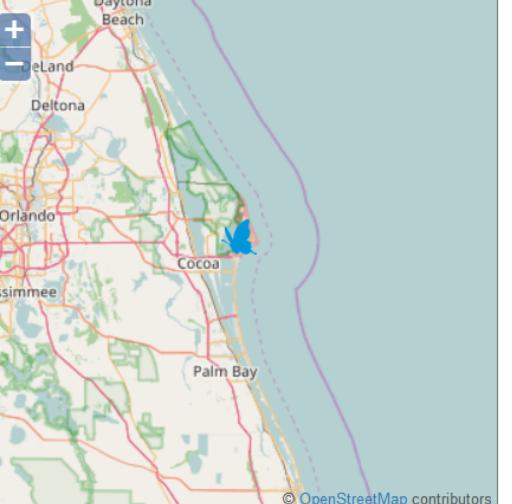
Most Visited BBC News | News Fron... Reuters: Top News ProPublica National Museum of ... IPT Dev Blog Graphs -> Tree Mode

Search

Gathering Event

Country: United States
State/Province: Florida
Locality: Florida, Brevard County, Port Canaveral Trident Basin, west revetment
Coordinates (lat|lon): 28.40999847412 | -80.58999633789

Collector(s): E. Reyier
Collector's number: FCC 8031
Collection Date: 2 Apr 2008



[Feedback!](#)

[f](#) [t](#) [in](#) [g+](#)

DNA Sequences Specimen

Catalog Number: AC4YL08 Fishes (USNM)
Record Basis: Material Sample
GUID/Occurrence ID: <http://n2t.net/ark:/65665/3a61fac44-f9c2-42bb-938b-d6598c288ee8>

NMNH GUID links back to our Genetic Sample Web Record

Data manager's GUID





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NCBI is helping to identify GenBank records likely having **USNM** vouchers.

A result of conversations at the April 2017 GGBN Workshop at NMNH.

Possible to enrich EMu with some Locus data too.

Accession Number Report from NCBI

FromNCBI_USNM_20170501.xlsx - Excel

ACCESSION	VOUCHER	GENE	TAXNAME	LINEAGE
2498	EU407522	USNM:FN	tRNA cluster	Ctenosaura similis
2499	EU407523	USNM:FN	tRNA cluster	Ctenosaura similis
2500	EU407524	USNM:FN	tRNA cluster	Ctenosaura similis
2501	EU407525	USNM:FN	tRNA cluster	Ctenosaura similis
2502	EU431986	USNM:390497	cytB	Tesia olivea
2503	EU431987	USNM:535403	cytB	Tesia olivea
2504	EU431992	USNM:535403	ND2	Tesia olivea
2505	EU431993	USNM:390497	ND2	Tesia olivea
2506	EU433916	USNM:147843	16S	Procambarus gibbus
2507	EU443175	USNM:514547	tRNA cluster	Pristimantis ridens
2508	EU477492	USNM:unknown	RAG-1	Caranx latus
2509	EU522490	USNM:B2313	ornithine decarboxylase	Manacus aurantiacus
2510	EU522491	USNM:B2315	ornithine decarboxylase	Manacus aurantiacus
2511	EU522492	USNM:B1920	ornithine decarboxylase	Manacus candei
2512	EU522493	USNM:B1924	ornithine decarboxylase	Manacus candei
2513	EU522499	USNM:B9197	ornithine decarboxylase	Manacus manacus
2514	EU522500	USNM:B9770	ornithine decarboxylase	Manacus manacus
2515	EU522501	USNM:B9771	ornithine decarboxylase	Manacus manacus
2516	EU522502	USNM:B11782	ornithine decarboxylase	Manacus manacus
2517	EU522507	USNM:B1251	ornithine decarboxylase	Manacus vitellinus
2518	EU522508	USNM:B1858	ornithine decarboxylase	Manacus vitellinus
2519	EU522509	USNM:B1862	ornithine decarboxylase	Manacus vitellinus
2520	EU522511	USNM:B1084	ornithine decarboxylase	Pipra mentalis
2521	EU522512	USNM:B5013	ornithine decarboxylase	Pipra pipra
2522	EU522513	USNM:B5065	ornithine decarboxylase	Lepidothrix suavissima
2523	EU522517	USNM:B2313	RH1 opsin	Manacus aurantiacus

About 29K Records



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The Text Slide

- ❑ Collaboration with NCBI may add several thousand legacy GenBank numbers to EMu, and thereby new **LinkOut** links with NCBI records.
- ❑ Identifying and matching to our Botany records is harder, due to their “**US**” collection code. However NCBI is trying. Botany may be even more dependent on researcher efforts to find and submit legacy GenBank accession numbers.
- ❑ For the future, we should build our genetic sample workflows to incorporate import of GenBank / Next Gen. numbers to EMu records as they are submitted to NCBI. And for numbers from loaned samples?



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A trial adding about
650 GenBank
numbers with locus
values to nearly 200
EMu Catalog records.
These needed to be
matched by Collector
and Collector No.

Legacy Botany Data from Researcher

Screenshot of Microsoft Excel showing a spreadsheet of botanical data. The data includes columns for Authority, Locality, Date, Collector, and various specimen details like Herb, Sample, ITS, trnL, ndhF, matK, psbA, and Comments. The 'Comments' column contains notes such as 'have DNA labeled', 'cf.', and '1/2 tube delivered'. The 'Collector' column is highlighted in green, and the entire row for collector 'Oelofsen, O.N.' is also highlighted.

E	F	G	H	I	J	K	L	M	N	O	P	Q	
1	Authority	Locality	Date	Collector	No.	Herb	Sample	ITS	trnL	ndhF	matK	psbA	Comments
2	(L.) Levyns		19-Sep-88	Oelofsen, O.N.	236								have DNA labeled
3	(L.) Levyns	South Africa; NW Cape	21-Aug-99	Trinder-Smith	143	US	•	DQ889629	DQ889645	DQ889661	JN837378		cf.; have DNA labeled
4	(L.) Levyns	South Africa		Trinder-Smith	297								have DNA labeled
5	(Berg) T. Nol.		23-Apr-80	Williams, S.L.	239	MO	•	-----	-----	-----	-----		have DNA labeled
6		South Africa	14-Sep-00	Koekemoer & Funk	s.n.								
7	Thunb.	South Africa; W Cape	12-Sep-00	Koekemoer & Funk	1922	PRE	•	DQ889630	DQ889646	DQ889662			1/2 tube delivered
8	Berg.	South Africa; W Cape	13-Sep-00	Koekemoer & Funk	1926	PRE	•	AY504704	AY504786	AY504746	JN837380		1/2 tube delivered
9	(L.) Levyns	South Africa; W Cape	14-Sep-00	Koekemoer & Funk	1933	PRE							have DNA labeled
10	Jacq.	South Africa; W Cape	14-Sep-00	Koekemoer & Funk	1939	PRE	•	DQ889631	DQ889647	DQ889663	JN837381		1/2 tube delivered
11		South Africa; N Cape	15-Sep-00	Koekemoer & Funk	1948	PRE	•	DQ889632	DQ889648	DQ889664			1/2 tube delivered
12	Hutchinson	South Africa		Trinder-Smith	56		•	DQ889633	DQ889649	DQ889665			have DNA labeled
13	Dummer	South Africa		Trinder-Smith	205		•	DQ889634	DQ889650	DQ889666			have DNA labeled
14	Jacq.	South Africa	25-Aug-99	Trinder-Smith	238	US	•	AY504705	AY504787	AY504747	JN837382		have DNA labeled
15	Thunb.	South Africa		Trinder-Smith	342		•	DQ889635	DQ889651	DQ889667			have DNA labeled
16	(Sond. & Harv.)	South Africa; Transvaal	28-Apr-91	Balkwill et al.	6451	MO	•	EU527193	EU527243	EU527293			6451a; CK, could
17	Roessl.	South Africa; Transvaal	26-Apr-84	Balkwill et al.	1460	MO	•	EU527194	EU527244	EU527294			CK, put # and coll
18	Welw. Ex O. Hc	South Africa; Transvaal	27-Mar-85	Bourell et al.	2689	MO	•	AY504709	AY504791	AY504751			subsp. magalisno
19	(Thunb.) Bolus&	Western Australia	12-Dec-99	Funk, V.	12211	US	•	EU527195	EU527245	EU527295			thistle; have DNA
20	(Houtt.) Merrill	South Africa; W Cape	09-Sep-00	Funk, V.	12273	US							have DNA labeled
21	Ehrh.	South Africa; W Cape	14-Sep-00	Koekemoer & Funk	1937	PRE							have DNA labeled
22		South Africa; N Cape	15-Sep-00	Koekemoer & Funk	1946	PRE	•	EU527196	EU527246	EU527296			1/2 tube delivered
23	Ehrh.	South Africa; N Cape	16-Sep-00	Koekemoer & Funk	1955	PRE	•	EU527197	EU527247	EU527297			1/2 tube delivered
24	Willd.	South Africa; N Cape	18-Sep-00	Koekemoer & Funk	1962	PRE	•	AY504710	AY504792	AY504752			1/2 tube delivered
25	Less.	South Africa; N Cape	19-Sep-00	Koekemoer & Funk	1966	PRE	•	AY504724	AY504806	AY504764			1/2 tube delivered
26	(Harv.) Roessler	Tanzania	06-May-87	Lovett, Keeley, & Lys	2112	MO	•	EU527198	EU527248	EU527298			subsp. echinopso
27	Ehrh.	South Africa		Trinder-Smith	53	US	•	EU527199	EU527249	EU527299			1/2 tube delivered
28	Willd.	South Africa	30-Aug-99	Trinder-Smith	346	US	•	EU527200	EU527250	EU527300	JN837386	KF990027	have DNA labeled
29	dc	South Africa		Trinder Smith	347	US	•	EU527201	EU527251	EU527301			have DNA labeled



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Get those GenBank numbers into EMu!

Thanks to:

At NMNH

Diane Pitassy

Mike Trizna

Dan Mulcahy

Vicki Funk

+ Departmental Data Managers!

At NCBI

Lu Sun (*Sulu*)

Kathy Kwan

Stacy Ciufo

Conrad Schoch





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Searching GenBank

[Follow along with the examples at

<https://github.com/SmithsonianWorkshops/GenBank-for-Data-Managers>



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Downloading from GenBank

Unfortunately, the default options for downloading from GenBank are not very helpful for collections managers.

Summary ▾ 20 per page ▾ Sort by Date Released ▾

Format

- Summary
- GenBank
- GenBank (full)
- FASTA
- FASTA (text)
- ASN.1
- Revision History
- Accession List
- GI List

0662

[Phasmastocerus zaleucus voucher USNM 0662](#)

A

4.1 GI: 1215708439

[Graphics](#) [PopSet](#)

Phasmastocerus zaleucus voucher USNM 0662



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Request for beta testers

Mike is currently developing software to allow for
downloading search results in spreadsheet format.

You can sign up to help test and provide feedback here:

<https://goo.gl/forms/WLAxBDXEP6A53Hzx1>



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MyNCBI

MyNCBI has features for saved searches and search history

NCBI Resources How To Sign in to NCBI

My NCBI

Customize this page | NCBI Site Preferences | Video Overview | Help

Search NCBI databases

Search : PubMed

Hint: clicking the "Search" button without any terms listed in the search box will transport you to that database's homepage.

Search

Saved Searches

Search Name	What's New	Last Searched
Nucleotide Searches dbxref bold[prop] NOT barcode[keyword] AND COI[...]	0	yesterday

[Manage Saved Searches »](#)

My Bibliography

Your bibliography contains **no items**.

[Manage My Bibliography »](#)

Collections

Collection Name	Items	Settings/Sharing	Type
Favorites	edit 0	Private	Standard
My Bibliography	edit 0	Private	Standard
Other Citations	edit 0	Private	Standard

[Manage Collections »](#)

Recent Activity



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GenBank's edit policy

Only listed "sequence authors" are able to make changes to GenBank records



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GenBank's edit policy

However, there is a semi-secret "Consortium" field that allows for organizations to edit records.

REFERENCE	2 (bases 1 to 552)
AUTHORS	Trizna, M.G. Jr.
CONSRTM	Consortium for the Barcode of Life
TITLE	Direct Submission
JOURNAL	Submitted (06-NOV-2015) CBOL, Smithsonian, 10th and Constitution Ave NW, Washington, DC 20004, USA

Homework assignment: Decide amongst yourselves on what level Consortium should be.



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Uploading to GenBank

There are several different methods of uploading sequence records to GenBank:

- NCBI [BankIt](#)
- NCBI [Sequin](#)
- NCBI [tbl2asn](#)
- BOLD ["Submit to GenBank"](#)
- Geneious [GenBank Submission Plug-in](#)



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Future Brown Bag?

Are there any aspects of the LAB process or sequence data QC and analysis that you are interested in learning about?



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Questions?

