



# iDigBio API

Richard Garand

Search Portal Developer

Advanced Computing and Information Systems Lab (ACIS)

ECE, UF

[rjgarand@acis.ufl.edu](mailto:rjgarand@acis.ufl.edu)



*iDigBio is funded by grants from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. All images used with permission or are free from copyright.*



# The iDigBio Search Portal

- The search portal is pretty cool, but how did all that data get there?

### Specimen Record

Plantae > Tracheophyta > Magnoliopsida > Sapindales > Sapindaceae

***Acer spicatum*** Lam.

From Albert R. Hodgdon Herbarium, University of New Hampshire

Country	North America	Institution Code	
	United States	Collection Code	
State/Province	Maine	Catalog Number	
County/Parish	Kennebec	Collected By	
		Date Collected	

### Publisher Summary

Publisher Name	Araceae	Acorus calamus
MorphoSource RSS feed	Acrobolibaceae	Acroboletus rhizo
TORCH Portal Danish Core Archive rss feed	Lembophyllaceae	Acrocladium aur
xBio IPT in the Museum of Biological Diversity at the Ohio State University	Acroporidae	acropora millepo
InvertNet iDigBio Feed	Acroporidae	Acropora samoe
CU Museum of Natural History IPT	Ulotrachaceae	Spongomorpha :
	Meloidae	Actenodia mirab

Total records searched: 39671068705540	
Total records seen:	560685559
Total specimen records viewed:	106034962
Total records downloaded:	704253847
Total media records viewed:	14476820

### Media

### From Recordset

Albert R. Hodgdon Herbarium, University of New Hampshire

<http://www.unh.edu/herbarium/>

The NHA herbarium comprises approximately 200,000 specimens of vascular plants, 500 bryophytes and lichens. The collection recently collected specimens, including 97 nonindigenous species representing taxonomic, ecological and biogeographic research. The collections emphasize northeastern North America, representing freshwater and marine habitats. An additional strength is our collection of rare and endangered species.

Name	Role	Email
Albert R. Hodgdon	Curator	ahodgdon@unh.edu
Patricia Swenson	Curator	pswenson@unh.edu

### Data Usage

Fabaceae	Aeschynomene l
----------	----------------



# The iDigBio API

- Application Programming Interface (defined)
  - An *application program interface* (**API**) is a set of routines, protocols and tools for building software applications. Basically, an API specifies how software components should interact<sup>[1]</sup>.
- In practice, you make a request using the defined API and then process the result.
- Returns JSON (JavaScript Object Notation), "similar" to XML in purpose, but not in layout. "human readable".

[1] webopedia <https://www.webopedia.com/TERM/A/API.html>



# iDigBio Specimen Record Page

```
GET {0}/v2/search/records/?rq={rq}&limit={limit}
```

```
http://search.idigbio.org/v2/search/records?rq={"uuid":"f4c5d799-9bba-4780-b7f8-8a38096042c3"}
```

```

uuid: "7644703a-ce24-4f7b-b800-66ddf8812f86",
itemCount: 1,
name: "Albion R. Hodgdon Herbarium, University of New Hampshire",
description: "The NHA herbarium comprises approximately 200,000 specimens (120,000 vascular plants, 80,000 marine algae, and 850 bryophytes and lichens). The collection contains a combination of historic and recently collected specimens, including 97 nonredundant type specimens and voucher specimens supporting taxonomic, ecological, and biogeographic research. While our specimens represent plant species worldwide, the collections emphasize northeastern North America and are especially strong in representing freshwater and marine habitats. An additional strength is our extensive collection of Neotropical aquatic species."
logo: "http://portal.neherbaria.org/portal/images/collicons/NHA_logo_60px.gif",
url: "http://www.unh.edu/herbarium/",
emllink: "http://portal.neherbaria.org/portal/collections/datasets/dwc/universityofnewhampshire",
archivelink: "http://portal.neherbaria.org/portal/collections/datasets/dwc/universityofnewhampshire",
contacts: [
  - {
    email: "patrick.sweeney@yale.edu"
  },
  - {
    email: "patrick.sweeney@yale.edu"
  },
  - {
    first_name: "Janet R. Sullivan",
    email: "janets@unh.edu"
  },
  - {
    first_name: "General"
  },
  - {
    first_name: "Janet R. Sullivan",

```

## Specimen Record

Plantae > Tracheophyta > Magnoliopsida > Sapindales > Sapindaceae

### *Acer spicatum* Lam.

From Albion R. Hodgdon Herbarium, University of New Hampshire

Continent	North America	Institution Code	University Of New Hampshire
Country	United States	Collection Code	Nha
State/Province	Maine	Catalog Number	Nha-503572
County/Parish	Kennebec	Collected By	A. H. Norton
		Date Collected	1913-00-13

#### Media



#### From Recordset

Albion R. Hodgdon Herbarium, University of New Hampshire

<http://www.unh.edu/herbarium/>



The NHA herbarium comprises approximately 200,000 specimens (120,000 vascular plants, 80,000 marine algae, and 850 bryophytes and lichens). The collection contains a combination of historic and recently collected specimens, including 97 nonredundant type specimens and voucher specimens supporting taxonomic, ecological, and biogeographic research. While our specimens represent plant species worldwide, the collections emphasize northeastern North America and are especially strong in representing freshwater and marine habitats. An additional strength is our extensive collection of Neotropical aquatic species.

#### Contacts

Name	email	Name	email
Role		Role	
Email	patrick.sweeney@yale.edu	Email	patrick.sweeney@yale.edu

uuid:d426

name": "acer  
/commons/e  
stium robert  
bastaurde

m\_jpg11.jp  
stium robert  
bastaurde

orship": "1  
f.

record": ["



# So, why use the iDigBio API?

- The iDigBio API allows your system to easily retrieve information aggregated by iDigBio in new and novel ways.
  - Query iDigBio's DQ flags to fill in your missing data or find issues your home system is hiding.
  - Quickly compare your collections to other museums.
  - Create an image of the day banner
  - Make charts that go up.
  - Our system may be more responsive, robust, flexible, accessible and dependable than yours.
  - In some instances you can query data easier via the API than via the portal, even querying fields currently unavailable via the search portal.



# You can use the iDigBio API to...

- Create
  - Websites
  - Databases
  - Phone Apps
  - Visualizations. Charts, Choropleths, Node-Links, Chord Diagrams, Collapsible Trees
- Integrate with other APIs
  - Data mashups! Tweets, weather trends, geo loc
- Special Queries
- Anything connected to the internet



# Invoking the API

Its easy! Do it your own way

- Your favorite web browser
- Almost any modern language, not just JavaScript. Python, C#, R.
- With a stand alone app (e.g. Postman)
- From the command line (e.g. curl)

Use the API across a spectrum of uses from ad-hoc queries to large automated systems that process the results



# Invoking the API...

- In your browser

```

https://search.idigbio.org/v2/
https://search.idigbio.org/v2/search/records?rq={"uuid":"74c5d799-9bbe-4780-b7f8-8a38096042c3"}

{
  itemCount: 1,
  lastModified: "2016-02-26T07:59:53.955Z",
  - items: [
    - {
      uuid: "74c5d799-9bbe-4780-b7f8-8a38096042c3",
      type: "records",
      etag: "c14af304de7042a8a4823a56699fe46a89a05216",
      - data: {
        dwc:specificEpithet: "spicatum",
        dwc:county: "Kennebec",
        dwc:recordedBy: "A. H. Norton",
        dwc:order: "Sapindales",
        dcterms:references: "http://portal.neherbaria.org/portal/collections/individual/index.nbp?occid=692102",
        dwc:scientificNameAuthorship: "Lam.",
        dwc:occurrenceID: "urn:uuid:d42607b4-37ef-4d0a-9988-69ef3142565b",
        id: "692102",
        sybiota:recordEnteredBy: "J. Hoy",
        dwc:stateProvince: "Maine",
        dwc:eventDate: "1913-08-13",
        dwc:collectionID: "urn:isidbiocool.org:col:14576",
        dwc:country: "United States of America",
        idigbio:recordId: "urn:uuid:3eaf959-defe-41e1-a0aa-24021481e69",
        dwc:collectionCode: "MHA",
        dcterms:rightsHolder: "Albion Hodgdon Herbarium, University of New Hampshire",
        dwc:kingdom: "Plantae",
        dwc:basisOfRecord: "PreservedSpecimen",
        dwc:genus: "Acer",
        dwc:family: "Sapindaceae",
        dcterms:rights: "https://creativecommons.org/licenses/by-nc/3.0/",
        dwc:municipality: "Waterville",
        dwc:phylum: "Charophyta",
        dwc:institutionCode: "University of New Hampshire",
        dwc:class: "Equisetopsida",
      }
    }
  ]
}

```

<https://github.com/iDigBio/idigbio-search-api/wiki/Code-Samples#browser>



# Invoking the API...

- In your terminal

```

Richards-MacBook-Pro:~ rjg$ curl http://search.idigbio.org/v2/view/records/f4c5d799-9bba-4780-b7f8-8a38096042c3
{"uuid":"f4c5d799-9bba-4780-b7f8-8a38096042c3","type":"records","etag":"c14af304de7042a8a4823a56699fe46a89a05216","data":{"dwc:specificEpithet":"spicatum","dwc:county":"Kennebec","dwc:recordedBy":"A. H. Norton","dwc:order":"Sapindales","dcterms:references":"http://portal.neherbaria.org/portal/collections/individual/index.php?occid=692102","dwc:scientificNameAuthorship":"Lam.","dwc:occurrenceID":"urn:uuid:d42607b4-37ef-4d0a-9988-69ef3142565b","id":"692102","sybiota:recordEnteredBy":"J. Hoy","dwc:stateProvince":"Maine","dwc:eventDate":"1913-08-13","dwc:collectionID":"urn:lsid:biocol.org:col:14576","dwc:country":"United States of America","idigbio:recordId":"urn:uuid:3e0af959-defa-41e1-a0aa-240214631e69","dwc:collectionCode":"NHA","dcterms:rightsHolder":"Albion Hodgdon Herbarium, University of New Hampshire","dwc:kingdom":"Plantae","dwc:basisOfRecord":"PreservedSpecimen","dwc:genus":"Acer","dwc:family":"Sapindaceae","dc:rights":"http://creativecommons.org/licenses/by-nc/3.0/","dwc:municipality":"Waterville","dwc:phylum":"Tracheophyta","dwc:institutionCode":"University of New Hampshire","dwc:class":"Equisetopsida","dwc:catalogNumber":"NHA-505972","dwc:identification":[{"coreid":"692102","dwc:identificationRemarks":"0","idigbio:recordId":"urn:uuid:38441d5a-b325-4524-bfc8-d8b20b538a07","dwc:scientificName":"Acer spicatum Lam.,"dwc:scientificNameAuthorship":"Lam."},"dwc:month":"8","dcterms:modified":"2015-10-21 15:58:43","dwc:scientificName":"Acer spicatum","dwc:day":"13","dwc:year":"1913"},"indexTerms":{"family":"sapindaceae","recordset":"7644703a-ce24-4f7b-b800-66ddf8812f86","stateProvince":"maine","municipality":"waterville","county":"kennebec","phylum":"tracheophyta","catalogNumber":"nha-505972","startdateofyear":225,"taxonrank":"species","specificEpithet":"spicatum","continent":"north america","uuid":"f4c5d799-9bba-4780-b7f8-8a38096042c3","countrycode":"usa","basisOfRecord":"preservedspecimen","collector":"a. h. norton;","institutionCode":"university of new hampshire","mediarecords":["5fc2151a-509e-41ba-87c7-9e99bef5f101"],"dateModified":"2016-02-26T07:59:53.955804+00:00","dateCollected":"1913-08-13T00:00+00:00","etag":"c14af304de7042a8a4823a56699fe46a89a05216","hasMedia":true,"hasImage":true,"kingdom":"plantae","collectionid":"urn:lsid:biocol.org:col:14576","taxonid":"3189848","scientificname":"acer spicatum","indexData":{"flag_dwc_taxonrank_added":true,"dwc:multimedia":[{"dcterms:license":"creative commons attribution share alike 3.0 unported","dcterms:title":"blätter","dcterms:references":"http://commons.wikimedia.org/wiki/file:acer_spicatum_jpg11.jpg","coreid":"3189848","dcterms:identifier":"http://upload.wikimedia.org/wikipedia/commons/e/e3/acer_spicatum_jpg11.jpg","dcterms:source":"german wikipedia - species pages","dcterms:description":"français : feuilles d'érable à épis ou plaine bâtarde - acer spicatum année de plantation : 1998 position exacte : arboretum robert lenoir (s28 - 2968) - rendez (belgique). english: hornbeam maple acer spicatum leaves planting date : 1998 precise location : arboretum robert lenoir (s28 - 2968) rendez (belgium). walon: foyes di bastarde plane acer carpinifolium annéye do plantis' : 1998 place rêcta : arboretum robert lenoir (s28 - 2968) - rindeu (bêljike).","dcterms:creator":"jean-pol grandmont","dcterms:publisher":"wikimedia commons"},{"dcterms:license":"creative commons attribution share alike 3.0 unported","dcterms:references":"http://commons.wikimedia.org/wiki/file:acer_spicatum_jpg11.jpg","coreid":"3189848","dcterms:identifier":"http://upload.wikimedia.org/wikipedia/commons/e/e3/acer_spicatum_jpg11.jpg","dcterms:source":"english wikipedia - species pages","dcterms:

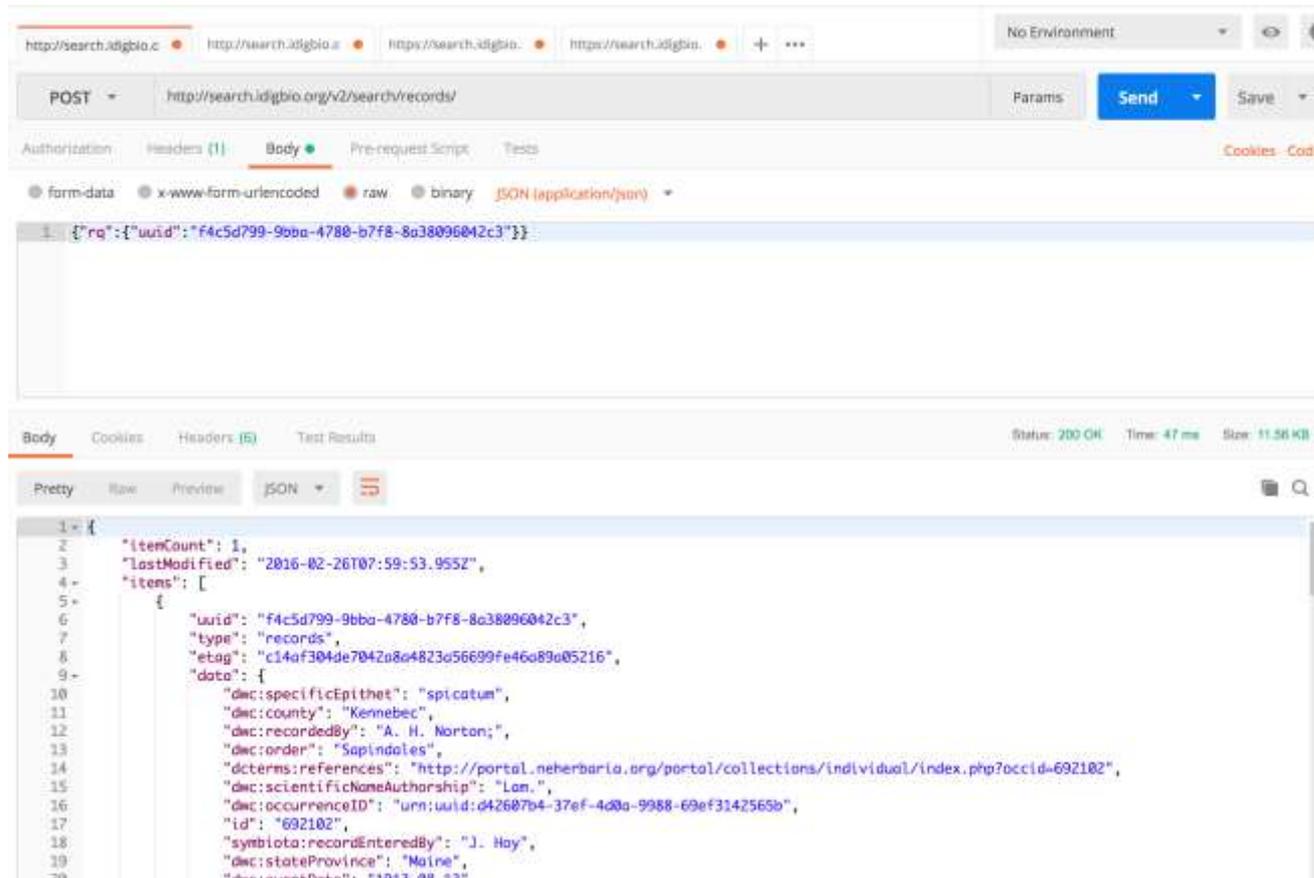
```

<https://github.com/iDigBio/idigbio-search-api/wiki/Code-Samples#curl>



# Invoking the API...

- In Postman



The screenshot shows the Postman interface for a POST request to `http://search.idigbio.org/v2/search/records/`. The request body is a JSON object: `{ "rq": { "uuid": "f4c5d799-9bba-4780-b7f8-8a38096042c3" } }`. The response status is 200 OK, with a time of 47 ms and a size of 11.56 KB. The response body is displayed in JSON format:

```

1- {
2   "itemCount": 1,
3   "lastModified": "2016-02-26T07:59:53.955Z",
4   "items": [
5     {
6       "uuid": "f4c5d799-9bba-4780-b7f8-8a38096042c3",
7       "type": "records",
8       "etag": "c14af304de7042a8a4823a56699fe46a89a05216",
9       "data": {
10        "dwc:specificEpithet": "spicatum",
11        "dwc:county": "Kennebec",
12        "dwc:recordedBy": "A. H. Norton",
13        "dwc:order": "Sapindales",
14        "dcterms:references": "http://portal.neherbaria.org/portal/collections/individual/index.php?occid=692102",
15        "dwc:scientificNameAuthorship": "Lan.",
16        "dwc:occurrenceID": "urn:uuid:d42607b4-37ef-4d0a-9988-69ef3142565b",
17        "id": "692102",
18        "symlota:recordEnteredBy": "J. Hay",
19        "dwc:stateProvince": "Maine",
20        "dwc:stateProvince": "1017-02-12"
          }
        }
      ]
    }
  
```



# Invoking the API...

- In code

```

241 async.parallel([
242   function(callback){
243     idbapi.publishers({"fields":["data.name","data.base_url"],"limit":maxRecordsets},function(resp){
244       resp.items.forEach(function(item){
245         if(!_isUndefined(pubs[item.uuid])){
246           pubs[item.uuid] = defpub();
247         }
248
249         if(!_isEmpty(item.data.name)){
250           pubs[item.uuid].name = item.data.base_url;
251         }else{
252           pubs[item.uuid].name = item.data.name;
253         }
254       })
255       callback();
256     });
257   },
258   function(callback){
259     idbapi.recordsets({"fields":["data.collection_name","publisher"],"limit":maxRecordsets},function(resp){
260       resp.items.forEach(function(item){
261         if(!_isUndefined(pubs[item.indexTerms.publisher])){
262           pubs[item.indexTerms.publisher]=defpub();
263         }
264         if(!_isUndefined(item.data)){
265           pubs[item.indexTerms.publisher].recordsets[item.uuid]=item.data.collection_name;
266         }
267       });
268       callback();
269     });
270   },
271   function(callback){
272     idbapi.summary("stats/api",{inverted:"true",minDate:"now-1d"},function(resp){
273       .forEach(resp.recordsets,function(val,key){

```

<https://github.com/iDigBio/idigbio-search-api/wiki/Code-Samples#javascript--jquery>



# Data Accessible via the iDigBio API

There are several categories including

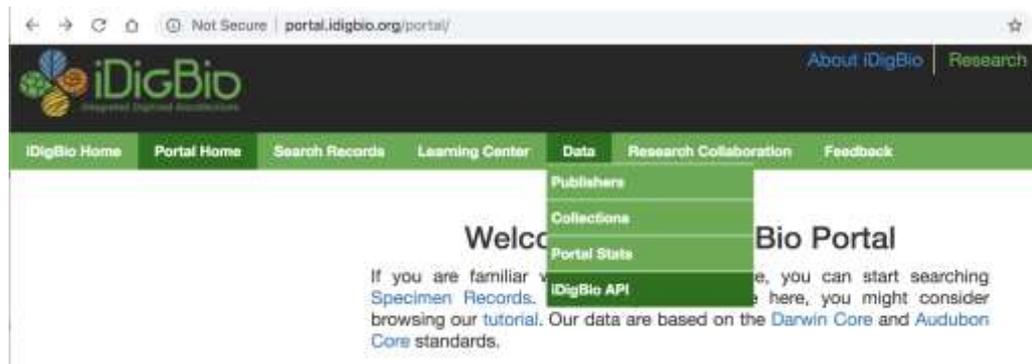
- Records / Recordsets
- Publishers
- Media
- Stats / Summary
- Maps
- Meta data

<https://github.com/iDigBio/idigbio-search-api/wiki/Examples>



# iDigBio API Documentation

- In the Search Portal under “Data”



- iDigBio API Wiki  
[https://www.idigbio.org/wiki/index.php/IDigBio\\_API](https://www.idigbio.org/wiki/index.php/IDigBio_API)
- iDigBio API Documentation on GitHub  
<https://github.com/idigbio/idigbio-search-api/wiki>



# iDigBio API on GitHub

- Want to learn even more?
  - iDigBio Search API:  
<https://github.com/iDigBio/idigbio-search-api>



# Thank you!

**Richard Garand**  
**rjgarand@acis.ufl.edu**



**www.idigbio.org**



[facebook.com/iDigBio](https://facebook.com/iDigBio)



[twitter.com/iDigBio](https://twitter.com/iDigBio)



[vimeo.com/idigbio](https://vimeo.com/idigbio)



[idigbio.org/rss-feed.xml](https://idigbio.org/rss-feed.xml)



[webcal://www.idigbio.org/events-calendar/export.ics](http://webcal://www.idigbio.org/events-calendar/export.ics)



*iDigBio is funded by grants from the National Science Foundation's Advancing Digitization of Biodiversity Collections Program. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation. All images used with permission or are free from copyright.*