



R and the iDigBio API: Enabling Exploration and Discovery

A non-technical overview of the iDigBio Application Programming Interface (APIs) and example use cases



R and the iDigBio API: Enabling Exploration and Discovery

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This Session Today

- Some *very* brief slides about APIs in general
- Not focusing on code itself
- 3 technical terms (and 3 only)
- Demos / Examples
- Questions / Discussion



Briefly: What is an API?

Ron's tech term #1: *API*

Application Programming Interface

- An organization has a system...
- That they would like to allow others to interact with...
- And so they make it available on the web via an “endpoint”
- Some will require an account, others won't



Endpoint: Odd Name, Same Thing

Ron's tech term #2: *endpoint*

- An *endpoint* is a web address for the API

For instance, iDigBio:

- <https://search.idigbio.org/v2/search/>
- <https://search.idigbio.org/v2/mapping/>

National Park Service:

- <https://developer.nps.gov/api/v1/alerts>



A point of comparison...

Family	Scientific Name	Date Collected	Country	Insti
"	" "	1997-11-14	Brasil	IAC
Herpetod	Acanthopneuste	1945	United States	US

	A	B	C	D
1	coreid	idigbio:associa	idigbio:barcod	dwc:basisOfRe
2	339de871-6d36-4d7f-82af-249ee327174			preservedspec
3	44a2dcaa-c35e-4e8b-8c8b-9b38f928579e			preservedspec
4	5295dd2c-ef39-4e59-b8bd-967c20f41b71			preservedspec
5				
6				
7				
8				



Talking With an API

Ron's tech term #3: *request*

A human or a computer makes a request to the API

- Asking for an interaction
- “Please search for these terms and return the results...”
- “Please download this file...”
- “Please count how many results match my query...”



Browser address bar: <https://search.idigbio.org/v2/search>

JSON Raw Data Headers

Save Copy Collapse All Filter JSON

```

itemCount: 2962007
lastModified: "2019-09-23T00:44:42.997Z"
▼ items:
  ▼ 0:
    uuid: "c4cb63b8-7726-4bbe-ac97-471103071026"
    type: "records"
    etag: "01924f8b387a8c4984d2b4897f8b78e126bd537f"
    ▶ data: {...}
  ▼ indexTerms:
    individualcount: 1
    ▶ geopoint: {...}
    family: "scarabaeidae"
    recordset: "77e77e52-6927-46bc-b3e8-b1b043f2f3c7"
    doc: 0 5217301304347826
  
```

<https://search.idigbio.org/v2/search/records?rq={%22stateprovince%22:%22Florida%22}&limit=1000>



API and R: What Is It Good For?

AUTOMATE ALL THE THINGS!



Originally from: <http://hyperboleandahalf.blogspot.com/2010/06/this-is-why-ill-never-be-adult.html>



API and R: What Is It Good For?

Besides automation, there are other benefits:

- Self-documenting procedures
- Repeatable for yourself
- Reproducible for others!
- Bring your own programming language
- More coming up later...



(Example #1)



(Example #2)



API and R: What (Else) Is It Good For?

You don't have to wait for iDigBio to implement features you need

You can bring data from different sources together:

- Multiple APIs
- Downloaded data sets
- Your own data



A Few Other Thoughts

Don't re-invent the wheel:

- Check the API documentation
 - <https://github.com/iDigBio/idigbio-search-api/wiki>
- Email data@idigbio.org*



A Few Other Thoughts

How to learn more?

- Software and Data Carpentries
 - <https://carpentries.org/>
- Hadley Wickham's books online:
 - <http://hadley.nz/>
- Your community!



A Few Other Thoughts

Links to the projects shown today

- <https://github.com/roncanepa/idigbio-results-in-national-parks>
- <https://github.com/ekrimmel/idigbio-api-dq-geo>
- You can find more links in the project READMEs



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