Package 'rvertnet'

January 11, 2015

Title Search VertNet archives using R

Version 0.2

Imports plyr, jsonlite, httr, data.table, ggplot2, maps

Published 2015-01-01

Author Scott Chamberlain [aut, cre], Vijay Barve [aut], Chris Ray [aut]

Maintainer Scott Chamberlain <myrmecocystus@gmail.com>

Description Allows R users to retrieve, map and summarize data from the VertNet archives

Depends R (>= 3.1.2)

License MIT + file LICENSE

LazyData true

URL https://github.com/ropensci/rvertnet

BugReports https://github.com/ropensci/rvertnet/issues

R topics documented:

`bigsearch` *Request to download a large number of VertNet records.*

Description

Specifies a term-wise search (like `searchbyterm`) and requests that all available records be made available for download as a tab-delimited text file.

Usage

```
bigsearch(specificepithet = NULL, genus = NULL, family = NULL,
  order = NULL, class = NULL, lim = NULL, compact = FALSE,
  year = NULL, date = NULL, mappable = NULL, error = NULL,
  continent = NULL, cntry = NULL, stateprovince = NULL, county = NULL,
  island = NULL, igroup = NULL, inst = NULL, id = NULL,
  catalognumber = NULL, collector = NULL, type = NULL,
  hastypestatus = NULL, media = NULL, rank = NULL, tissue = NULL,
  resource = NULL, rfile = NULL, email = NULL)
```

Arguments

rfile	A name for the results file that you will download (character)
email	An email address where you can be contacted when your records are ready for download (character)
specificepithet	Taxonomic species (character)
genus	Taxonomic genus (character)
family	Taxonomic family (character)
order	Taxonomic order (character)
class	Taxonomic class (character)
lim	Limit on the number of records returned (numeric)
compact	Return a compact data frame (boolean)
year	Year (numeric) or range of years designated by comparison operators "<", ">", "<=" or ">=" (character)
date	Event date associated with this occurrence record; yyyy-mm-dd or the range yyyy-mm-dd/yyyy-mm-dd (character)
mappable	Record includes valid coordinates in decimal latitude and decimal longitude; 1 = yes, 0 = no (boolean)
error	Coordinate uncertainty in meters (numeric) or range of uncertainty values designated by comparison operators "<", ">", "<=" or ">=" (character)
continent	Continent to search for occurrence (character)
cntry	Country to search for occurrence (character)
stateprovince	State or province to search for occurrence (character)
county	County to search for occurrence (character)
island	Island to search for occurrence (character)
igroup	Island group to search for occurrence (character)
inst	Code name for the provider/institution of record (character)
id	Provider's unique identifier for this occurrence record (character)
catalognumber	Provider's catalog number or other ID for this record (character)
collector	Collector name (character)
type	Type of record; "specimen" or "observation" (character)
hastypestatus	Specimen associated with this record is identified as a holotype, paratype, neotype, etc. (character)

media	Record also references associated media, such as a film or video; 1 = yes, 0 = no (boolean)
rank	TBD (numeric)
tissue	Record is likely to reference tissues; 1 = yes, 0 = no (boolean)
resource	Identifier for the resource/dataset from which the record was indexed (character)

Details

bigsearch allows you to request records as a tab-delimited text file. This is the best way to access a large number of records, such as when your search results indicate that >1000 records are available. You will be notified by email when your records are ready for download.

Examples

```
## Not run:

# replace "big@search.luv" with your own email address
bigsearch(genus = "ochotona", rf = "pikaRecords", email = "big@search.luv")

## End(Not run)
```

---

searchbyterm *Search for records using keywords/terms to control how your query is interpreted.*

Description

Returns only those records in which the targeted input is found in association with the specified search terms.

Usage

```
searchbyterm(specificepithet = NULL, genus = NULL, family = NULL,
  order = NULL, class = NULL, lim = 1000, compact = TRUE, year = NULL,
  date = NULL, mappable = NULL, error = NULL, continent = NULL,
  cntry = NULL, stateprovince = NULL, county = NULL, island = NULL,
  igroup = NULL, inst = NULL, id = NULL, catalognumber = NULL,
  collector = NULL, type = NULL, hastypestatus = NULL, media = NULL,
  rank = NULL, tissue = NULL, resource = NULL)
```

Arguments

specificepithet	Taxonomic species (character)
genus	Taxonomic genus (character)
family	Taxonomic family (character)
order	Taxonomic order (character)
class	Taxonomic class (character)
lim	Limit on the number of records returned (numeric)

compact	Return a compact data frame (boolean)
year	Year (numeric) or range of years designated by comparison operators "<", ">", "<=" or ">=" (character)
date	Event date associated with this occurrence record; yyyy-mm-dd or the range yyyy-mm-dd/yyyy-mm-dd (character)
mappable	Record includes valid coordinates in decimal latitude and decimal longitude; 1 = yes, 0 = no (boolean)
error	Coordinate uncertainty in meters (numeric) or range of uncertainty values designated by comparison operators "<", ">", "<=" or ">=" (character)
continent	Continent to search for occurrence (character)
cntry	Country to search for occurrence (character)
stateprovince	State or province to search for occurrence (character)
county	County to search for occurrence (character)
island	Island to search for occurrence (character)
igroup	Island group to search for occurrence (character)
inst	Code name for the provider/institution of record (character)
id	Provider's unique identifier for this occurrence record (character)
catalognumber	Provider's catalog number or other ID for this record (character)
collector	Collector name (character)
type	Type of record; "specimen" or "observation" (character)
hastypestatus	Specimen associated with this record is identified as a holotype, paratype, neotype, etc. (character)
media	Record also references associated media, such as a film or video; 1 = yes, 0 = no (boolean)
rank	TBD (numeric)
tissue	Record is likely to reference tissues; 1 = yes, 0 = no (boolean)
resource	Identifier for the resource/dataset from which the record was indexed (character)

Details

`searchbyterm` builds a query from input parameters based on Darwin Core (dwc) terms (for the full list of terms, see https://code.google.com/p/darwincore/wiki/DarwinCoreTerms). The query string is appended to the base URL for VertNet search requests. View the query string for specification of dwc terms used in the search.

Value

A data frame of search results

Examples

```
## Not run:

# Find multiple species
out <- searchbyterm(gen = "ochotona", sp = "(princeps OR collaris)")

# Find records in multiple locations
out <- searchbyterm(sp = "mustela nigripes", st = "(wyoming OR south dakota)")
```

```
# Limit the number of records returned to <1000; use bigsearch() for >1000 records
out <- searchbyterm(cl = "aves", st = "california", lim = 10)

# Specifying a single year (no quotes) or range of years (use quotes)
out <- searchbyterm(cl = "aves", st = "california", y = 1976)
out <- searchbyterm(cl = "aves", st = "california", y = ">=1976")

# Specifying a range (in meters) for uncertainty in spatial location (use quotes)
out <- searchbyterm(cl = "aves", st = "nevada", err = "<25")
out <- searchbyterm(cl = "aves", st = "california", y = 1976, err = "<=1000")

# Specifying records by event date (use quotes)
out <- searchbyterm(cl = "aves", st = "california", date = "2009-03-25")
# ...but specifying a date range may not work
out <- searchbyterm(sp = "mustela nigripes", date = "1935-09-01/1935-09-30")

## End(Not run)
```

`spatialsearch` *Find records within some distance of a point given latitude and longitude.*

Description

Searches by decimal latitude and longitude to return any occurrence record within the input distance (radius) of the input point.

Usage

```
spatialsearch(lat = NULL, long = NULL, radius = NULL, lim = 1000,
  compact = TRUE)
```

Arguments

`lat`	Latitude of the central point, in decimal degrees (numeric)
`long`	Longitude of the central point, in decimal degrees (numeric)
`radius`	Radius to search, in meters (numeric)
`lim`	Limit on the number of records returned (numeric)
`compact`	Return a compact data frame (boolean)

Details

`spatialsearch` finds all records of any taxa having decimal lat/long coordinates within a given radius (in meters) of your coordinates.

Value

A data frame of search results

Examples

```
## Not run:

res <- spatialsearch(lat = 33.529, lon = -105.694, rad = 2000, lim = 10)

## End(Not run)
```

---

vertmap *Make a simple map to visualize VertNet data.*

Description

Plots record locations on a world or regional map using latitude/longitude data returned by a VertNet search.

Usage

```
vertmap(input = NULL, mapdatabase = "world", region = ".",
  geom = geom_point, jitter = NULL)
```

Arguments

input	A data.frame, e.g., one generated by calling vertsearch; must include columns "decimallatitude" and "decimallongitude"
mapdatabase	The base map on which your data are displayed; what you choose here determines what you can choose in the region parameter; one of: county, state, usa, world, world2, france, italy, or nz
region	The region in which your data are displayed; to see region names for the "world" database layer, run `sort(unique(map_data("world")$region))` after loading packages maps and ggplot2; to see region names for the US "state" layer, run `sort(unique(map_data("state")$region))`
geom	Specifies the type of object being plotted; one of: geom_point or geom_jitter (do not use quotes)
jitter	If geom = geom_jitter, the amount by which to jitter points in width, height, or both

Details

vertmap uses decimal latitude and longitude data in records generated by an rvertnet search to display returned records on a specified base map. Taxa are color-coded by scientific name, if available. Adapt the vertmap code to construct maps according to your own specfications.

Value

Map of record locations displayed on the selected base map

Examples

```
## Not run:

out <- vertsearch("Junco hyemalis") # get occurrence records
vertmap(out)                        # map occurrence records

# Records are color coded by dwc term "scientificname" - sometimes unavailble
out <- vertsearch("mustela nigripes")
vertmap(input = out, mapdatabase = "state")

# Use searchbyterm() to match records with mapped region
spec.out <- searchbyterm(sp = "ochotona princeps", st = "california")
vertmap(input = spec.out, mapdatabase = "state", region = "california")

# Many species
splist <- c("Accipiter erythronemius", "Aix sponsa", "Haliaeetus leucocephalus",
"Corvus corone", "Threskiornis molucca", "Merops malimbicus")
out <- lapply(splist, function(x) vertsearch(t=x, lim=500))
vertmap(out)

## End(Not run)
```

---

vertsearch *Find records using a global full-text search of VertNet archives.*

Description

Returns any record containing your target text in any field of the record.

Usage

```
vertsearch(taxon = NULL, ..., lim = 1000, compact = TRUE)
```

Arguments

taxon	Taxonomic identifier or other text to search for (character)
...	Additional search terms (character)
lim	Limit on the number of records returned; up to 1000 (numeric)
compact	Return a compact data frame (boolean)

Details

vertsearch performs a nonspecific search for your input within every record and field of the VertNet archives. For a more specific search, try searchbyterm().

Value

A data frame of search results

Examples

```
## Not run:

out <- vertsearch(taxon = "aves", "california")

# Limit the number of records returned (under 1000)
out <- vertsearch("(kansas state OR KSU)", lim = 200)
# Use bigsearch() to retrieve >1000 records

# Find multiple species using searchbyterm():

# a) returns a specific result
out <- searchbyterm(gen = "mustela", sp = "(nivalis OR erminea)")
vertmap(out)

# b) returns a non-specific result
out <- vertsearch(tax = "(mustela nivalis OR mustela erminea)")
vertmap(out)

# c) returns a non-specific result
splist <- c("mustela nivalis", "mustela erminea")
out <- lapply(splist, function(x) vertsearch(t=x, lim=500))
vertmap(out)

## End(Not run)
```

---

vertsummary *Summarize a set of records downloaded from VertNet.*

Description

Creates a simple summary of data returned by a VertNet search.

Usage

```
vertsummary(input = NULL)
```

Arguments

input	A data frame as generated by calling vertsearch(), searchbyterm() or spatialsearch()

Details

vertsummary provides information on the sources, types and extent of data returned by a VertNet search.

Value

A list of summary statistics

Examples

```
## Not run:

recs <- vertsearch("Junco hyemalis")  # get occurrence records
recsum <- vertsummary(out)            # summarize occurrence records

rs <- vertsummary(vertsearch("Oncorhynchus clarki henshawi"))

## End(Not run)
```

Index