

Package ‘rphylopic’

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Title Get Silhouettes of Organisms from PhyloPic

Description Work with the PhyloPic Web Service (<<http://api-docs.phylopic.org/v2/>>) to fetch silhouette images of organisms. Includes functions for adding silhouettes to both base R plots and ggplot2 plots.

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add_phylopic	<i>Annotate a ggplot plot with PhyloPics</i>
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Description

Specify existing images, taxonomic names, or PhyloPic uuids to add PhyloPic silhouettes as a separate layer to an existing ggplot plot.

Usage

```
add_phylopic(
  img = NULL,
  name = NULL,
  uuid = NULL,
  filter = NULL,
  x,
  y,
  ysize = Inf,
  alpha = 1,
  color = NA,
  fill = "black",
  horizontal = FALSE,
  vertical = FALSE,
  angle = 0,
  remove_background = TRUE,
  verbose = FALSE
)
```

Arguments

img	A Picture or png array object, e.g., from using get_phylopic() .
name	character. A taxonomic name to be passed to get_uuid() .
uuid	character. A valid uuid for a PhyloPic silhouette (such as that returned by get_uuid() or pick_phylopic()).
filter	character. Filter by usage license if name is defined. Use "by" to limit results to images which do not require attribution, "nc" for images which allows commercial usage, and "sa" for images without a ShareAlike clause. The user can also combine these filters as a vector.
x	numeric. x value of the silhouette center.
y	numeric. y value of the silhouette center.
ysize	numeric. Height of the silhouette. The width is determined by the aspect ratio of the original image. If "Inf", the default, the height will be as tall as will fit within the plot area.
alpha	numeric. A value between 0 and 1, specifying the opacity of the silhouette (0 is fully transparent, 1 is fully opaque).
color	character. Color of silhouette outline. If "original" or NA is specified, the original color of the silhouette outline will be used (usually the same as "transparent"). To remove the outline, you can set this to "transparent".
fill	character. Color of silhouette. If "original" is specified, the original color of the silhouette will be used (usually the same as "black"). If color is specified and fill is NA, color will be used as the fill color (for backwards compatibility). To remove the fill, you can set this to "transparent".
horizontal	logical. Should the silhouette be flipped horizontally?
vertical	logical. Should the silhouette be flipped vertically?
angle	numeric. The number of degrees to rotate the silhouette clockwise. The default is no rotation.
remove_background	logical. Should any white background be removed from the silhouette(s)? See recolor_phylopic() for details.
verbose	logical. Should the attribution information for the used silhouette(s) be printed to the console (see get_attribution())?

Details

One (and only one) of `img`, `name`, or `uuid` must be specified. Use parameters `x`, `y`, and `ysize` to place the silhouette at a specified position on the plot. The aspect ratio of the silhouette will always be maintained.

`x` and/or `y` may be vectors of numeric values if multiple silhouettes should be plotted at once. In this case, any other arguments (except for `remove_background`) may also be vectors of values, which will be recycled as necessary.

When specifying a horizontal and/or vertical flip **and** a rotation, the flip(s) will always occur first. If you would like to customize this behavior, you can flip and/or rotate the image within your own workflow using [flip_phylopic\(\)](#) and [rotate_phylopic\(\)](#).

Note that png array objects can only be rotated by multiples of 90 degrees. Also, outline colors do not currently work for png array objects.

Examples

```
## Not run:
# Put a silhouette behind a plot based on a taxonomic name
library(ggplot2)
ggplot(iris) +
  add_phylopic(x = 6.1, y = 3.2, name = "Iris", alpha = 0.2) +
  geom_point(aes(x = Sepal.Length, y = Sepal.Width))

# Put a silhouette in several places based on UUID
posx <- runif(10, 0, 10)
posy <- runif(10, 0, 10)
sizey <- runif(10, 0.4, 2)
angle <- runif(10, 0, 360)
hor <- sample(c(TRUE, FALSE), 10, TRUE)
ver <- sample(c(TRUE, FALSE), 10, TRUE)
fills <- sample(c("black", "darkorange", "grey42", "white"), 10,
  replace = TRUE)
alpha <- runif(10, 0.3, 1)

p <- ggplot(data.frame(cat.x = posx, cat.y = posy), aes(cat.x, cat.y)) +
  geom_blank() +
  add_phylopic(uuid = "23cd6aa4-9587-4a2e-8e26-de42885004c9",
    x = posx, y = posy, ysize = sizey,
    fill = fills, alpha = alpha, angle = angle,
    horizontal = hor, vertical = ver)
p + ggtitle("R Cat Herd!!")

## End(Not run)
```

add_phylopic_base *Add PhyloPics to a base R plot*

Description

Specify existing images, taxonomic names, or PhyloPic uuids to add PhyloPic silhouettes on top of an existing base R plot (like `points()`).

Usage

```
add_phylopic_base(
  img = NULL,
  name = NULL,
  uuid = NULL,
  filter = NULL,
  x = NULL,
```

```

    y = NULL,
    ysize = NULL,
    alpha = 1,
    color = NA,
    fill = "black",
    horizontal = FALSE,
    vertical = FALSE,
    angle = 0,
    remove_background = TRUE,
    verbose = FALSE
)

```

Arguments

img	A Picture or png array object, e.g., from using get_phylopic() .
name	character. A taxonomic name to be passed to get_uuid() .
uuid	character. A valid uuid for a PhyloPic silhouette (such as that returned by get_uuid() or pick_phylopic()).
filter	character. Filter by usage license if name is defined. Use "by" to limit results to images which do not require attribution, "nc" for images which allows commercial usage, and "sa" for images without a ShareAlike clause. The user can also combine these filters as a vector.
x	numeric. x value of the silhouette center. Ignored if y and ysize are not specified.
y	numeric. y value of the silhouette center. Ignored if x and ysize are not specified.
ysize	numeric. Height of the silhouette. The width is determined by the aspect ratio of the original image. Ignored if x and y are not specified.
alpha	numeric. A value between 0 and 1, specifying the opacity of the silhouette (0 is fully transparent, 1 is fully opaque).
color	character. Color of silhouette outline. If "original" or NA is specified, the original color of the silhouette outline will be used (usually the same as "transparent"). To remove the outline, you can set this to "transparent".
fill	character. Color of silhouette. If "original" is specified, the original color of the silhouette will be used (usually the same as "black"). If color is specified and fill is NA, color will be used as the fill color (for backwards compatibility). To remove the fill, you can set this to "transparent".
horizontal	logical. Should the silhouette be flipped horizontally?
vertical	logical. Should the silhouette be flipped vertically?
angle	numeric. The number of degrees to rotate the silhouette clockwise. The default is no rotation.
remove_background	logical. Should any white background be removed from the silhouette(s)? See recolor_phylopic() for details.
verbose	logical. Should the attribution information for the used silhouette(s) be printed to the console (see get_attribution())?

Details

One (and only one) of `img`, `name`, or `uuid` must be specified. Use parameters `x`, `y`, and `ysize` to place the silhouette at a specified position on the plot. If all three of these parameters are unspecified, then the silhouette will be plotted to the full height and width of the plot. The aspect ratio of the silhouette will always be maintained (even when a plot is resized). However, if the plot is resized after plotting the silhouette, the absolute size and/or position of the silhouette may change.

Any argument (except for `remove_background`) may be a vector of values if multiple silhouettes should be plotted. In this case, all other arguments may also be vectors of values, which will be recycled as necessary to the length of the longest vector argument.

When specifying a horizontal and/or vertical flip **and** a rotation, the flip(s) will always occur first. If you would like to customize this behavior, you can flip and/or rotate the image within your own workflow using `flip_phylopic()` and `rotate_phylopic()`.

Note that `png` array objects can only be rotated by multiples of 90 degrees. Also, outline colors do not currently work for `png` array objects.

Examples

```
## Not run:
# single image
plot(1, 1, type = "n", main = "A cat")
add_phylopic_base(uuid = "23cd6aa4-9587-4a2e-8e26-de42885004c9",
                  x = 1, y = 1, ysize = 0.4)

# lots of images using a uuid
posx <- runif(10, 0, 1)
posy <- runif(10, 0, 1)
size <- runif(10, 0.1, 0.3)
angle <- runif(10, 0, 360)
hor <- sample(c(TRUE, FALSE), 10, TRUE)
ver <- sample(c(TRUE, FALSE), 10, TRUE)
fills <- sample(c("black", "darkorange", "grey42", "white"), 10,
               replace = TRUE)

plot(posx, posy, type = "n", main = "A cat herd")
add_phylopic_base(uuid = "23cd6aa4-9587-4a2e-8e26-de42885004c9",
                  x = posx, y = posy, ysize = size,
                  fill = fills, angle = angle,
                  horizontal = hor, vertical = ver)

# Example using a cat background
cat <- get_phylopic("23cd6aa4-9587-4a2e-8e26-de42885004c9")
# setup plot area
plot(posx, posy, type = "n", main = "A cat herd, on top of a cat",
     xlim = c(0, 1), ylim = c(0, 1))
# plot background cat
add_phylopic_base(img = cat, alpha = 0.2)
# overlay smaller cats
add_phylopic_base(img = cat, x = posx, y = posy, ysize = size, alpha = 0.8)

## End(Not run)
```

browse_phylopic	<i>Browse PhyloPic for a given taxonomic name or uuid</i>
-----------------	---

Description

This function provides a convenient way to browse PhyloPic for a given taxonomic name of uuid.

Usage

```
browse_phylopic(name = NULL, uuid = NULL)
```

Arguments

name	character. A taxonomic name. Various taxonomic levels are supported (e.g. species, genus, family).
uuid	character. A PhyloPic image uuid, as acquired by <code>get_uuid()</code> .

Details

This function returns a PhyloPic url for an input name or uuid and opens the user's default web browser at this url. If no name or uuid is supplied, the base url of PhyloPic images is returned and opened instead.

Value

A character vector of a valid PhyloPic url for the specified name or uuid. If no name or uuid is supplied, the base url of PhyloPic images is returned.

Examples

```
## Not run:  
url <- browse_phylopic(name = "Acropora cervicornis")  
  
## End(Not run)
```

flip_phylopic	<i>Flip a PhyloPic silhouette along its horizontal and/or vertical axis</i>
---------------	---

Description

The picture can be a [Picture](#) or png array object, e.g., from using `get_phylopic()`.

Usage

```
flip_phylopic(img, horizontal = TRUE, vertical = FALSE)
```

Arguments

img	A Picture or png array object, e.g., from using get_phylopic() .
horizontal	logical. Should the silhouette be flipped horizontally?
vertical	logical. Should the silhouette be flipped vertically?

Value

A [Picture](#) or png array object (matching the type of img)

See Also

Other transformations: [recolor_phylopic\(\)](#), [rotate_phylopic\(\)](#)

geom_phylopic

Geom for adding PhyloPic silhouettes to a plot

Description

This geom acts like [ggplot2::geom_point\(\)](#), except that the specified silhouettes are used as points. Silhouettes can be specified by their name, uuid, or image objects (img).

Usage

```
geom_phylopic(
  mapping = NULL,
  data = NULL,
  stat = "identity",
  position = "identity",
  ...,
  na.rm = FALSE,
  show.legend = FALSE,
  inherit.aes = TRUE,
  remove_background = TRUE,
  verbose = FALSE,
  filter = NULL
)
```

Arguments

mapping	Set of aesthetic mappings created by aes() . If specified and <code>inherit.aes = TRUE</code> (the default), it is combined with the default mapping at the top level of the plot. You must supply mapping if there is no plot mapping.
data	The data to be displayed in this layer. There are three options: If <code>NULL</code> , the default, the data is inherited from the plot data as specified in the call to ggplot() .

	A <code>data.frame</code> , or other object, will override the plot data. All objects will be fortified to produce a data frame. See <code>fortify()</code> for which variables will be created.
	A function will be called with a single argument, the plot data. The return value must be a <code>data.frame</code> , and will be used as the layer data. A function can be created from a formula (e.g. <code>~ head(.x, 10)</code>).
<code>stat</code>	The statistical transformation to use on the data for this layer, either as a <code>ggproto</code> <code>Geom</code> subclass or as a string naming the stat stripped of the <code>stat_</code> prefix (e.g. "count" rather than "stat_count")
<code>position</code>	Position adjustment, either as a string naming the adjustment (e.g. "jitter" to use <code>position_jitter</code>), or the result of a call to a position adjustment function. Use the latter if you need to change the settings of the adjustment.
<code>...</code>	Other arguments passed on to <code>layer()</code> . These are often aesthetics, used to set an aesthetic to a fixed value, like <code>colour = "red"</code> or <code>size = 3</code> . They may also be parameters to the paired geom/stat.
<code>na.rm</code>	If <code>FALSE</code> , the default, missing values are removed with a warning. If <code>TRUE</code> , missing values are silently removed.
<code>show.legend</code>	logical. Should this layer be included in the legends? <code>FALSE</code> , the default, never includes, <code>NA</code> includes if any aesthetics are mapped, and <code>TRUE</code> always includes. It can also be a named logical vector to finely select the aesthetics to display.
<code>inherit.aes</code>	If <code>FALSE</code> , overrides the default aesthetics, rather than combining with them. This is most useful for helper functions that define both data and aesthetics and shouldn't inherit behaviour from the default plot specification, e.g. <code>borders()</code> .
<code>remove_background</code>	logical. Should any white background be removed from the silhouette(s)? See <code>recolor_phylopic()</code> for details.
<code>verbose</code>	logical. Should the attribution information for the used silhouette(s) be printed to the console (see <code>get_attribution()</code>)?
<code>filter</code>	character. Filter by usage license if using the name aesthetic. Use "by" to limit results to images which do not require attribution, "nc" for images which allows commercial usage, and "sa" for images without a ShareAlike clause. The user can also combine these filters as a vector.

Details

One (and only one) of the `img`, `name`, or `uuid` aesthetics must be specified. The `img` aesthetic can be `Picture` objects or `png` array objects, e.g., from using `get_phylopic()`. Use the `x` and `y` aesthetics to place the silhouettes at specified positions on the plot. The `size` aesthetic specifies the height of the silhouettes in the units of the `y` axis. The aspect ratio of the silhouettes will always be maintained.

The `color` (default: `NA`), `fill` (default: "black"), and `alpha` (default: 1) aesthetics can be used to change the outline color, fill color, and transparency (outline and fill) of the silhouettes, respectively. If `color` is specified and `fill` is `NA` `color` will be used as the fill color (for backwards compatibility). If "original" is specified for the `color` aesthetic, the original color of the silhouette outline will be used (usually the same as "transparent"). If "original" is specified for the `fill` aesthetic, the original color of the silhouette body will be used (usually the same as "black"). To remove the fill or outline, you can set `fill` or `color` to "transparent", respectively.

The `horizontal` and `vertical` aesthetics can be used to flip the silhouettes. The `angle` aesthetic can be used to rotate the silhouettes. When specifying a horizontal and/or vertical flip **and** a rotation, the flip(s) will always occur first. If you would like to customize this behavior, you can flip and/or rotate the image within your own workflow using `flip_phylopic()` and `rotate_phylopic()`.

Note that `png` array objects can only be rotated by multiples of 90 degrees. Also, outline colors do not currently work for `png` array objects.

Aesthetics

`geom_phylopic` understands the following aesthetics:

- `x` (required)
- `y` (required)
- **`img/uuid/name`** (one, and only one, required)
- `size`
- `color/colour`
- `fill`
- `alpha`
- `horizontal`
- `vertical`
- `angle`

Learn more about setting these aesthetics in `add_phylopic()`.

Examples

```
## Not run:
library(ggplot2)
df <- data.frame(x = c(2, 4), y = c(10, 20),
                 name = c("Felis silvestris catus", "Odobenus rosmarus"))
ggplot(df) +
  geom_phylopic(aes(x = x, y = y, name = name),
               fill = "purple", size = 10) +
  facet_wrap(~name) +
  coord_cartesian(xlim = c(1,6), ylim = c(5, 30))

## End(Not run)
```

get_attribution

Get PhyloPic attribution data

Description

This function provides a convenient way to obtain attribution data for PhyloPic images via an image uuid returned by `get_uuid()`.

Usage

```
get_attribution(uuid = NULL, img = NULL, text = FALSE)
```

Arguments

uuid	character. A vector of valid uuid(s) for PhyloPic silhouette(s) such as that returned by <code>get_uuid()</code> or <code>pick_phylopic()</code> .
img	A <code>Picture</code> or png array object from <code>get_phylopic()</code> . A list of these objects can also be supplied. If img is supplied, uuid is ignored. Defaults to NULL.
text	logical. Should attribution information be returned as a text paragraph? Defaults to FALSE.

Details

This function returns image uuid specific attribution data, including: contributor name, contributor uuid, contributor contact, image uuid, license, and license abbreviation. If text is set to TRUE, a text paragraph with the contributor name, year of contribution, and license type is returned.

Value

A list of PhyloPic attribution data for an image uuid or a text output of relevant attribution information.

Examples

```
## Not run:
# Get valid uuid
uuid <- get_uuid(name = "Acropora cervicornis")
# Get attribution data for uuid
attri <- get_attribution(uuid = uuid)

# Get list of valid uuids
uuids <- get_uuid(name = "Scleractinia", n = 5)
# Get attribution data for uuids
get_attribution(uuid = uuids, text = TRUE)

## End(Not run)
```

get_phylopic

Retrieve an image for a given PhyloPic uuid

Description

This retrieves a PhyloPic silhouette as a vectorized or rasterized object.

Usage

```
get_phylopic(uuid = NULL, format = "vector", height = 512, preview = FALSE)

## S3 method for class 'Picture'
print(x, ...)

## S3 method for class 'phylopic'
print(x, ...)
```

Arguments

uuid	character. A PhyloPic image uuid.
format	character. Format of the image. To return a vectorized image, use "vector". To return a rasterized image, use "raster" and specify a desired height.
height	numeric. If format is "raster", this is the desired height of the raster image in pixels. This is ignored if format is "vector".
preview	logical. If preview is TRUE, the returned image is plotted. Defaults to FALSE.
x	A Picture or png array object, e.g., from using get_phylopic() .
...	Ignored

Details

The height argument is ignored if the format argument is not set to "raster". If format is "raster", the height argument specifies the height of the desired raster object. The width of this raster object will be determined by the original aspect ratio of the silhouette. If a pre-rendered raster exists with the desired dimensions, it will be downloaded from PhyloPic. If not, the vector image from PhyloPic will be used to render a raster object of the desired size.

Value

If format is "vector", a [Picture](#) object is returned. If format is "raster", a png array representing the rasterized image is returned. Either way, the uuid and download url are included as the "uuid" and "url" attributes, respectively.

Examples

```
## Not run:
# uuid
uuid <- "9fae30cd-fb59-4a81-a39c-e1826a35f612"

# Get data for an image
img_svg <- get_phylopic(uuid, format = "vector") # vector format
img_png <- get_phylopic(uuid, format = "raster") # raster format

## End(Not run)
```

get_uuid	<i>Get a PhyloPic uuid</i>
----------	----------------------------

Description

This function provides a convenient way to obtain a valid uuid or image url for an input taxonomic name. As multiple silhouettes can exist for each species in PhyloPic, this function extracts the primary image.

Usage

```
get_uuid(name = NULL, img = NULL, n = 1, filter = NULL, url = FALSE)
```

Arguments

name	character. A taxonomic name. Various taxonomic levels are supported (e.g. species, genus, family). NULL can also be supplied which will skip the taxonomic filtering of the PhyloPic database.
img	A Picture or png array object from get_phylopic() . A list of these objects can also be supplied. If img is supplied, name and n are ignored. Defaults to NULL.
n	numeric. How many uuids should be returned? Depending on the requested name, multiple silhouettes might exist. If n exceeds the number of available images, all available uuids will be returned. This argument defaults to 1.
filter	character. Filter uuid(s) by usage license. Use "by" to limit results to image uuids which do not require attribution, "nc" for image uuids which allow commercial usage, and "sa" for image uuids without a ShareAlike clause. The user can also combine these filters as a vector.
url	logical. If FALSE (default), only the uuid is returned. If TRUE, a valid PhyloPic image url of the uuid is returned.

Details

This function returns uuid(s) or image url (svg) for an input name. If a specific image is desired, the user can make use of [pick_phylopic](#) to visually select the desired uuid/url.

Value

A character vector of a valid PhyloPic uuid or svg image url.

Examples

```
## Not run:  
uuid <- get_uuid(name = "Acropora cervicornis")  
uuid <- get_uuid(name = "Dinosauria", n = 5, url = TRUE)  
  
## End(Not run)
```

phylopic_key_glyph *Use PhyloPics as legend key glyphs*

Description

Specify existing images, taxonomic names, or PhyloPic uuids to use PhyloPic silhouettes as legend key glyphs in a ggplot plot.

Usage

```
phylopic_key_glyph(img = NULL, name = NULL, uuid = NULL)
```

Arguments

img	A Picture or png array object, e.g., from using get_phylopic() .
name	character. A taxonomic name to be passed to get_uuid() .
uuid	character. A valid uuid for a PhyloPic silhouette (such as that returned by get_uuid() or pick_phylopic()).

Details

One (and only one) of `img`, `name`, or `uuid` must be specified.

This argument may also be a vector/list of valid values if multiple silhouettes should be used as key glyphs. In this case, the specified silhouettes will be used as ordered as key glyphs one by one, with recycling as necessary.

Note that the sizes of the silhouettes in the legend are currently maximized based on the size of the key. This size can be modified using the `legend.key.size` argument in [ggplot2::theme\(\)](#). Therefore, the silhouettes will not reflect the size aesthetic, and this function should not be used for size legends.

Examples

```
## Not run:
library(ggplot2)
df <- data.frame(x = c(2, 4), y = c(10, 20),
                 name = c("Felis silvestris catus", "Odobenus rosmarus"))
ggplot(df) +
  geom_phylopic(aes(x = x, y = y, name = name, color = name), size = 10,
               show.legend = TRUE,
               key_glyph = phylopic_key_glyph(name =
                                             c("Felis silvestris catus",
                                             "Odobenus rosmarus"))) +
  coord_cartesian(xlim = c(1,6), ylim = c(5, 30))

## End(Not run)
```

pick_phylopic	<i>Pick a PhyloPic image from available options</i>
---------------	---

Description

This function provides a visually interactive way to pick an image and valid uuid for an input taxonomic name. As multiple silhouettes can exist for each organism in PhyloPic, this function is useful for choosing the right image/uuid for the user.

Usage

```
pick_phylopic(  
  name = NULL,  
  n = 5,  
  uuid = NULL,  
  view = 1,  
  filter = NULL,  
  auto = NULL  
)
```

Arguments

name	character. A taxonomic name. Different taxonomic levels are supported (e.g. species, genus, family).
n	numeric. How many uuids should be viewed? Depending on the requested name, multiple silhouettes may exist. If n exceeds the number of available images, all available uuids will be returned. Defaults to 5. Only relevant if name supplied.
uuid	character. A vector (or list) of valid PhyloPic silhouette uuids, such as that returned by get_uuid() or resolve_phylopic() .
view	numeric. Number of silhouettes that should be plotted at the same time. Defaults to 1.
filter	character. Filter uuid(s) by usage license. Use "by" to limit results to image uuids which do not require attribution, "nc" for image uuids which allow commercial usage, and "sa" for image uuids without a ShareAlike clause. The user can also combine these filters. Only relevant if name supplied.
auto	numeric. This argument allows the user to automate input into the menu choice. If the input value is 1, the first returned image will be selected. If the input value is 2, requested images will be automatically cycled through with the final image returned. If NULL (default), the user must interactively respond to the called menu.

Details

This function allows the user to visually select the desired image from a pool of silhouettes available for the input name.

Note that while the view argument can be any positive integer, weaker/older computers may have issues displaying very large numbers of images at the same time (i.e. view > 9). If no images are displayed in your plotting environment, try decreasing the value of view.

Value

A [Picture](#) object is returned. The uuid of the selected image is saved as the "uuid" attribute of the returned object and is also printed to console.

Examples

```
## Not run:
# Defaults pane layout
img <- pick_phylopic(name = "Canis lupus", n = 5)
# 3 x 3 pane layout
img <- pick_phylopic(name = "Scleractinia", n = 9, view = 9)

## End(Not run)
```

plot.Picture

Preview a PhyloPic silhouette

Description

Preview a raster or vector representation of a PhyloPic silhouette. This will plot the silhouette on a new page in your default plotting device.

Usage

```
## S3 method for class 'Picture'
plot(x, ...)

## S3 method for class 'phylopic'
plot(x, ...)
```

Arguments

x A [Picture](#) or png array object, e.g., from using [get_phylopic\(\)](#).

... Other arguments passed on to [grImport2::grid.picture\(\)](#) or [grid::grid.raster\(\)](#).

recolor_phylopic	<i>Recolor a PhyloPic image</i>
------------------	---------------------------------

Description

Function to recolor and change alpha levels of a PhyloPic image.

Usage

```
recolor_phylopic(  
  img,  
  alpha = 1,  
  color = NULL,  
  fill = NULL,  
  remove_background = TRUE  
)
```

Arguments

<code>img</code>	A Picture or png array object, e.g., from using get_phylopic() .
<code>alpha</code>	numeric. A value between 0 and 1, specifying the opacity of the silhouette.
<code>color</code>	character. Color to make the outline of the silhouette. If NULL, the outline color is not changed.
<code>fill</code>	character. Color to make the body of the silhouette. If NULL, the body color is not changed.
<code>remove_background</code>	logical. Should any white background be removed? Only useful if <code>img</code> is a Picture object. See details.

Details

Some PhyloPic silhouettes do not have a transparent background. Consequently, when color is used with vectorized versions of these images, the entire image—including the background—is recolored. Setting `remove_background` to TRUE (the default) will remove any white parts of the image (which should only be the background).

Value

A [Picture](#) or png array object (matching the type of `img`)

See Also

Other transformations: [flip_phylopic\(\)](#), [rotate_phylopic\(\)](#)

resolve_phylopic	<i>Use a taxonomic name from another database to get a PhyloPic image UUID</i>
------------------	--

Description

This function takes a supplied taxonomic name, queries it via the specified external API, resolves the API's returned taxonomic ID to the PhyloPic taxonomic node database, then retrieves PhyloPic image uuids (or urls) for that node.

Usage

```
resolve_phylopic(
  name,
  api = "gbif.org",
  hierarchy = FALSE,
  max_ranks = 5,
  n = 1,
  filter = NULL,
  url = FALSE
)
```

Arguments

name	character. A full or partial taxonomic name to be queried via the specified api.
api	character. The API in which to query name. See Details for the available options.
hierarchy	logical. Whether the taxonomic hierarchy of name should be retrieved from the API and used to get several sets of PhyloPic image uuids (or urls).
max_ranks	numeric. The maximum number of taxonomic ranks that should be included if hierarchy is TRUE.
n	numeric. How many uuids should be returned? Depending on the requested name, multiple silhouettes might exist. If n exceeds the number of available images, all available uuids will be returned. This argument defaults to 1.
filter	character. Filter uuid(s) by usage license. Use "by" to limit results to image uuids which do not require attribution, "nc" for image uuids which allow commercial usage, and "sa" for image uuids without a ShareAlike clause. The user can also combine these filters as a vector.
url	logical. If FALSE (default), only the uuid is returned. If TRUE, a valid PhyloPic image url of the uuid is returned.

Details

If `hierarchy` is `FALSE`, the specified name is queried via the specified `api`. The matched id is then resolved to the matching taxonomic node in the PhyloPic database. If `hierarchy` is `TRUE`, the full taxonomic hierarchy for `name` is retrieved from the specified `api`, those taxonomic names are subset to `max_ranks` ranks (starting from the specified name and ascending the hierarchy). Then each of those names is resolved to the matching taxonomic node in the PhyloPic database (where possible). In either case, `get_uuid()` is then used to retrieve `n` image UUID(s) for each taxonomic name.

Note that while the names of the returned list are the taxonomic names as reported by the specified `api`, the PhyloPic images that are returned are associated with whatever taxonomic node that taxonomic name resolves to in the PhyloPic database. This means that, if `hierarchy` is `TRUE`, the same images may be returned for multiple taxonomic names. Also, if a particular taxonomic name does not resolve to any node in the PhyloPic database, no images will be returned for that name.

The following APIs are available for querying (`api`):

- "eol.org": the [Encyclopedia of Life](#) (note: `hierarchy = TRUE` is not currently available for this API) ("eol" is also allowed)
- "gbif.org": the [Global Biodiversity Information Facility](#) ("gbif" is also allowed)
- "marinespecies.org": the [World Register of Marine Species](#) ("worms" is also allowed)
- "opentreeoflife.org": the [Open Tree of Life](#) ("otol" is also allowed)
- "paleobiodb.org": the [Paleobiology Database](#) ("pbdb" is also allowed)

Value

A list where each value is `n` (or fewer) PhyloPic image uuids (or urls if `url = TRUE`) and each name is the taxonomic name as matched and reported by the specified `api`. If `hierarchy` is `FALSE`, the list has length 1. If `hierarchy` is `TRUE`, the list has maximum length `max_ranks`.

Examples

```
## Not run:
# get a uuid for a single name
resolve_phylopic(name = "Canis lupus")
# get uuids for the taxonomic hierarchy
resolve_phylopic(name = "Velociraptor mongoliensis", api = "paleobiodb.org",
                 hierarchy = TRUE, max_ranks = 3)

## End(Not run)
```

rotate_phylopic

Rotate a PhyloPic silhouette

Description

The picture can be a [Picture](#) or png array object, e.g., from using `get_phylopic()`. Note that png array objects can only be rotated by multiples of 90 degrees.

Usage

```
rotate_phylopic(img, angle = 90)
```

Arguments

`img` A [Picture](#) or png array object, e.g., from using [get_phylopic\(\)](#).
`angle` numeric. The number of degrees to rotate the silhouette clockwise.

Value

A [Picture](#) or png array object (matching the type of `img`)

See Also

Other transformations: [flip_phylopic\(\)](#), [recolor_phylopic\(\)](#)

save_phylopic	<i>Save a PhyloPic image</i>
---------------	------------------------------

Description

`save_phylopic` is a convenient function for saving a PhyloPic silhouette fetched via [get_phylopic](#). Available formats for saving are those available in the [grDevices](#) package (i.e. pdf, png, svg, tiff, jpeg, and bmp).

Usage

```
save_phylopic(img = NULL, path = NULL, bg = "transparent", ...)
```

Arguments

`img` picture. A [Picture](#) object. For PhyloPic silhouettes, this is generated by [get_phylopic](#) and [pick_phylopic](#).
`path` character. The output file path. The name of the file and file extension should be included (e.g. `./phylopic.png`). If this argument is NULL (default), the file is automatically saved in the current working directory as a png file.
`bg` character. The desired background color. By default this argument is set to "transparent". Note: .jpeg files are always exported with a background colour.
`...` Additional arguments available for the called [grDevices](#) function. The called function is determined by the file extension used in `path` (e.g. [png](#)).

Details

This function can be used to save a PhyloPic image obtained via the [get_phylopic](#) or any object of class `Picture` from the [grImport2](#) package. Any file format available in the [grDevices](#) package can be used (i.e. pdf, png, svg, tiff, jpeg, and bmp).

Value

An image is saved. Nothing is returned to the R interface.

Examples

```
## Not run:  
# Get image data  
img <- get_phylopic("27356f15-3cf8-47e8-ab41-71c6260b2724")  
# Save file  
save_phylopic(img = img, path = "./phylopic.png",  
              width = 500, height = 500)  
  
## End(Not run)
```

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