

Package: solong (via r-universe)

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Type Package

Title Allometric Equations for Southern Ocean Taxa

Version 0.3.0

Description Provides allometric equations that relate the body size of Southern Ocean taxa to body part measurements.

URL <https://github.com/SCAR/solong>

BugReports <https://github.com/SCAR/solong/issues>

Depends R (>= 3.3.0)

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Encoding UTF-8

LazyData true

Imports assertthat, digest, dplyr, rlang, units (>= 0.5-0), vctrs

Suggests covr, ggplot2, knitr, rfishbase (>= 3.1.7), testthat, worrms

RoxygenNote 7.2.0

VignetteBuilder knitr

Repository <https://scar.r-universe.dev>

RemoteUrl <https://github.com/SCAR/solong>

RemoteRef HEAD

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allometric_equations *Allometric equation data.*

Description

A dataset containing allometric equations (relationships between the size of an organism and the size of its body parts).

Usage

allometric_equations

Format

A data frame with variables:

equation_id the identifier of this equation

taxon_name name of the taxon

taxon_aphia_id the Aphia ID of the taxon (identifier within the World Register of Marine Species)

equation a function encoding the allometric equation

inputs a data.frame specifying (in order) the inputs to the equation, with columns 'property' (the property name of the measurement needed, e.g. 'lower rostral length'), and 'units' (the units of the measurement needed, e.g. 'mm')

return_property the name of the body size characteristic that is estimated by this equation (e.g. 'mantle length')

return_units the units of measurement of the returned property

reliability a data.frame with indicators of the reliability of the equation: type (a description of how the reliability was assessed, e.g. 'R^2' or 'N' the sample size used by the authors of the equation) and value (its value)

notes notes

reference the source of the equation

solong

solong

Description

Provides allometric equations that relate the body size of Southern Ocean taxa to body part measurements.

sol_allometry	<i>Apply allometric equations</i>
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Description

Apply allometric equations

Usage

```
sol_allometry(data, equation)
```

Arguments

data	data.frame: input data
equation	character or sol_equation object: either the identifier of the equation to apply, or the equation object itself. Can be a single element (this equation will be applied to all rows of the data) or with length matching the number of rows of the data

Value

the input data frame, augmented with columns "allometric_property", "allometric_value", "allometric_value_lower", and "allometric_value_upper"

See Also

[allometric_equations](#)

Examples

```
## Not run:
x <- data.frame(LRL=c(11.3,13.9),species=c("Architeuthis dux"),
  stringsAsFactors=FALSE)
## it doesn't matter what the column names are, but we
## need to set the property types correctly
x$LRL <- sol_set_property(x$LRL,"lower rostral length")

## apply a single equation to all rows
sol_allometry(x,c("342218_ML_Roel2000"))

## apply a different equation to each row
sol_allometry(x,c("342218_ML_Roel2000","342218_ML_Clar1986"))

## End(Not run)
```

sol_equation	<i>Allometric equations</i>
--------------	-----------------------------

Description

Allometric equations

Usage

```
sol_equation(id)
```

```
sol_equations(id)
```

Arguments

id string: the identifier of the equation to return

Value

data.frame

Examples

```
sol_equations()  
sol_equation("342218_ML_Roel2000")
```

sol_fb_length_weight	<i>Create allometric equation from Fishbase</i>
----------------------	---

Description

Experimental. Requires the rfishbase package to be installed.

Usage

```
sol_fb_length_weight(  
  ...,  
  input_properties,  
  return_properties,  
  worms = requireNamespace("worrms", quietly = TRUE)  
)
```

Arguments

... : arguments passed to `rfishbase::length_weight`

`input_properties`
character: an optional vector of properties (see `link{sol_properties}`). Only equations that take an input in `input_properties` will be returned

`return_properties`
character: an optional vector of properties (see `link{sol_properties}`). Only equations that return a value in `return_properties` will be returned

`worms`
logical: if TRUE, and if the `worms` package is installed, try and find the AphiaID for the taxon in the World Register of Marine Species

Value

A tibble of equation(s)

See Also

[sol_equation](#) [sol_equations](#)

Examples

```
## Not run:
library(dplyr)
eq <- sol_fb_length_weight("Electrona antarctica", input_properties = "standard length")
x <- tibble(SL = 10) %>%
  mutate(SL = sol_set_property(SL, "standard length", with_units = "cm"))
sol_allometry(x, eq)

## End(Not run)
```

`sol_make_equation` *Create an allometric equation object*

Description

Create an allometric equation object

Usage

```
sol_make_equation(
  equation_id,
  taxon_name,
  taxon_aphia_id,
  equation,
  inputs,
  return_property,
```

```

    return_units,
    reliability,
    notes,
    reference,
    check_packaged_ids = TRUE,
    warn_recommended = TRUE
  )

```

Arguments

equation_id string: a unique identifier for the equation (required)

taxon_name string: the taxon name that the equation applies to (required)

taxon_aphia_id numeric: the AphiaID of the taxon that the equation applies to (recommended)

equation function: the equation. Must return a data.frame or tibble, with at least the column "allometric_value", and optionally also "allometric_value_lower" and "allometric_value_upper" (required)

inputs data.frame: the inputs needed by the equation. Must have columns "property" and "units", with entries that match those in sol_properties. Optionally also "sample_minimum" and "sample_maximum" if known (describing the range of the data used to generate the equation) (required)

return_property string: the name of the allometric property that the equation returns (required)

return_units string: the units of measurement of the allometric property that the equation returns. Will be parsed by units::as_units (required)

reliability data.frame: indicators of reliability of the equation. Must have columns "type" and "value"; see examples (recommended)

notes string: any notes that users should be aware of (optional)

reference bibentry: the source of the equation (recommended)

check_packaged_ids logical: if TRUE, check the equation_id against the package-bundled equations. A warning will be issued if there is a packaged equation with the same ID as equation_id

warn_recommended logical: issue a warning if "recommended" informations is not supplied?

Value

equation object

See Also

[sol_equation](#) [sol_equations](#) [sol_properties](#)

Examples

```

library(dplyr)
my_ref <- bibentry(bibtype="Article",key="Lake2003",
  author=c(person("S","Lake"),person("H","Burton"),
    person("J","van den Hoff")),
  year=2003,
  title="Regional, temporal and fine-scale spatial variation in
    Weddell seal diet at four coastal locations in east Antarctica",
  journal="Marine Ecology Progress Series",
  volume=254,pages="293-305",doi="10.3354/meps254293")

eq <- sol_make_equation(equation_id="my_equation_id",
  taxon_name="Chorismus antarcticus",
  taxon_aphia_id=369214,
  equation=function(L)
    tibble(allometric_value=0.000943*(L^2.976)),
  inputs=tibble(property="carapace length",units="mm",
    sample_minimum=6,sample_maximum=16),
  return_property="wet weight",
  return_units="g",
  reliability=tribble(~type,~value,
    "N",35,
    "R^2",0.976),
  reference=my_ref)

```

sol_properties

Properties

Description

Properties

Usage

```
sol_properties(prop)
```

Arguments

prop string: if provided, return only the property matching this name

Value

data.frame

See Also

[sol_set_property](#)

Examples

```
sol_properties() ## all properties that solong knows about
```

```
sol_properties_data  Properties relating to allometric equations.
```

Description

Properties relating to allometric equations.

Usage

```
sol_properties_data
```

Format

A data frame with variables:

property the property name

units its units of measurement

class_name the corresponding class name used internally by the solong package

notes notes, including a specific definition of the property if appropriate

```
sol_set_property  Set or get the property name
```

Description

Set or get the property name

Usage

```
sol_set_property(x, prop, with_units, ...)
```

```
sol_get_property(x)
```

Arguments

x	vector: data
prop	string: property name
with_units	string: units of measurement to use. If missing, the default units for the property will be used
...	: extra arguments, currently ignored

Value

x with additional class set

See Also

[sol_properties](#)

Examples

```
x <- data.frame(LRL=c(11.3,13.9),species=c("Architeuthis dux"),
  stringsAsFactors=FALSE)
## it doesn't matter what the column names are, but we
## need to set the property types correctly
x$LRL <- sol_set_property(x$LRL,"lower rostral length")

## remove the property
x$LRL <- sol_set_property(x$LRL,NULL)
```

sol_vonbert

Von Bertalanffy growth equation with optional propagation of uncertainty

Description

Intended for use inside of sol_equation objects.

Usage

```
sol_vonbert(
  t,
  Linf,
  k,
  t0,
  Linf_se,
  k_se,
  t0_se,
  reps = 1000L,
  ci = 0.95,
  method = "monte carlo"
)
```

Arguments

t	numeric: prediction times
Linf	numeric: Linf parameter estimate
k	numeric: k parameter estimate

t0	numeric: t0 parameter estimate
Linf_se	numeric: Linf parameter standard error estimate
k_se	numeric: k parameter standard error estimate
t0_se	numeric: t0 parameter standard error estimate
reps	integer: number of Monte-Carlo samples to draw
ci	numeric: confidence level
method	string: method to use for uncertainty propagation (only "monte carlo" supported at the moment)

Value

A tibble with columns `allometric_value`, `allometric_value_lower`, `allometric_value_upper`. If any of the standard error inputs are missing, NULL, or NA, the upper and lower estimates will be NA_real_

Examples

```
sol_vonbert(0:7, Linf = 80.7, Linf_se = 0.82, k = 0.25, k_se = 0.01, t0 = -2.31, t0_se = 0.01)
```

strip_units	<i>Remove the units from an object</i>
-------------	--

Description

A convenience function to remove the units assigned to an object.

Usage

```
strip_units(x)
```

Arguments

x object: with units

Value

x, with units removed

Examples

```
x <- data.frame(LRL=c(11.3,13.9),species=c("Architeuthis dux"),
  stringsAsFactors=FALSE)
x$LRL <- sol_set_property(x$LRL,"lower rostral length")
## apply an allometric equation
xa <- sol_allometry(x,c("342218_ML_Roel2000"))

strip_units(xa$allometric_value)
```

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