# Package 'rorqual.morpho'

October 14, 2022

**Type** Package

**Title** Morphological Allometry of Rorquals

**Version** 0.1.1

**Description** Predicts morphological parameters of rorquals (e.g. body mass, flipper length, maximum engulfment capacity) from body length using allometric equations from Kahane-Rapport and Goldbogen (2018) <doi:10.1002/jmor.20846>.

**License** MIT + file LICENSE

**Depends** R (>= 2.10)

**Imports** dplyr, magrittr

**Encoding** UTF-8

**LazyData** true

**RoxygenNote** 7.0.2

**NeedsCompilation** no

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**Repository** CRAN

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## R topics documented:

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`allometry` *Allometric equations for rorqual morphology*

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## Description

A dataset including the intercepts and slopes of the ordinary least squares allometric regression (in log10 space) of various morphometric parameters against body length. Use the formula 10^intercept * length^slope to predict morphology.

## Usage

```
allometry
```

## Format

A data frame with 5 columns:

**species_code** two letter codes: bw, bp, mn, ba, be, and bs

**binomial** scientific binomials

**morphology** morphological parameter e.g. flipper length, body mass

**slope** slope of the allometric relationship

**intercept** intercept of the allometric relationship

## Source

doi: 10.1002/jmor.20846

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`morph_fun` *Generic morphology function*

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## Description

Generic morphology function

## Usage

```
morph_fun(species, length_m, morph)
```

### Arguments

| | |
|---|---|
| species | a vector of species codes |
| length_m | a vector of lengths in meters |
| morph | name of the morphological measurement (length one character vector) |

### Value

vector of measurements

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## power_law *Power law*

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### Description

Power law

### Usage

```
power_law(a, b, x)
```

### Arguments

| | |
|---|---|
| a | intercept of the log10-log10 relationship |
| b | slope of the log10-log10 relationship |
| x | untransformed values for power law calculation |

### Value

a vector of power law results

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## rorq_bizygomatic *Rorqual bizygomatic skull width*

---

### Description

Rorqual bizygomatic skull width

### Usage

```
rorq_bizygomatic(species, length_m)
```

### Arguments

| | |
|---|---|
| species | a vector of species codes |
| length_m | a vector of lengths in meters |

## Value

a vector of bizygomatic skull widths in m

## Examples

```
# A 22m blue whale
rorq_bizygomatic("bw", 22)

# A 7m minke
rorq_bizygomatic("ba", 7)
```

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# rorq_engulf *Rorqual engulfment capacity*

---

## Description

Rorqual engulfment capacity

## Usage

```
rorq_engulf(species, length_m)
```

## Arguments

| | |
|---|---|
| species | a vector of species codes |
| length_m | a vector of lengths in meters |

## Value

a vector of engulfment capacities in kg of water

## Examples

```
# A 22m blue whale
rorq_engulf("bw", 22)

# A 7m minke
rorq_engulf("ba", 7)
```

## rorq_flipper *Rorqual flipper length*

### Description

Rorqual flipper length

### Usage

```
rorq_flipper(species, length_m)
```

### Arguments

| | |
|---|---|
| species | a vector of species codes |
| length_m | a vector of lengths in meters |

### Value

a vector of flipper lengths in m

### Examples

```
# A 22m blue whale
rorq_flipper("bw", 22)

# A 7m minke
rorq_flipper("ba", 7)
```

## rorq_fluke *Rorqual fluke length*

### Description

Rorqual fluke length

### Usage

```
rorq_fluke(species, length_m)
```

### Arguments

| | |
|---|---|
| species | a vector of species codes |
| length_m | a vector of lengths in meters |

### Value

a vector of fluke lengths in m

## Examples

```
# A 22m blue whale
rorq_fluke("bw", 22)

# A 7m minke
rorq_fluke("ba", 7)
```

---

`rorq_mandible` *Rorqual projected mandible length*

---

## Description

Rorqual projected mandible length

## Usage

```
rorq_mandible(species, length_m)
```

## Arguments

| | |
|---|---|
| `species` | a vector of species codes |
| `length_m` | a vector of lengths in meters |

## Value

a vector of laterally projected mandible lengths in m

## Examples

```
# A 22m blue whale
rorq_mandible("bw", 22)

# A 7m minke
rorq_mandible("ba", 7)
```

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`rorq_mass` *Rorqual mass*

---

## Description

Rorqual mass

## Usage

```
rorq_mass(species, length_m)
```

### Arguments

| | |
|---|---|
| species | a vector of species codes |
| length_m | a vector of lengths in meters |

### Value

a vector of masses in kg

### Examples

```
# A 22m blue whale
rorq_mass("bw", 22)

# A 7m minke
rorq_mass("ba", 7)
```

---

## rorq_massratio *Rorqual engulfed water mass to body mass ratio*

---

### Description

Rorqual engulfed water mass to body mass ratio

### Usage

```
rorq_massratio(species, length_m)
```

### Arguments

| | |
|---|---|
| species | a vector of species codes |
| length_m | a vector of lengths in meters |

### Value

a vector of ratios (engulfed water mass to body mass)

### Examples

```
# A 22m blue whale
rorq_massratio("bw", 22)

# A 7m minke
rorq_massratio("ba", 7)
```

`rorq_vgb` *Rorqual ventral groove blubber length*

## Description

Rorqual ventral groove blubber length

## Usage

```
rorq_vgb(species, length_m)
```

## Arguments

| | |
|---|---|
| `species` | a vector of species codes |
| `length_m` | a vector of lengths in meters |

## Value

a vector of VGB lengths in m

## Examples

```
# A 22m blue whale
rorq_vgb("bw", 22)

# A 7m minke
rorq_vgb("ba", 7)
```

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