Package 'DEBtoolAnimal'

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Type Package

Title DEB functions fot an animal

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Description DEB based functions for the std and abj models for animals.

License GPL

LazyData TRUE

NeedsCompilation no

R topics documented:

`beta0` *Particular incomplete beta function*

Description

particular incomplete beta function:

Usage

```
beta0(x0, x1)
```

Arguments

x0	scalar with lower boundary for integration
x1	scalar with upper boundary for integration

Value

scalar with particular incomple beta function

See Also

Other miscellaneous functions: C2K; K2C

Examples

```
beta0(0.1, 0.2)
```

C2K *Conversion of Celsius to Kelvin*

Description

Computes Kelvin from temperatures defined in Celsius

Usage

```
C2K(C)
```

Arguments

C	numeric temperature in degrees Celsius

Value

temperature in Kelvin

See Also

Other miscellaneous functions: K2C; beta0

Examples

```
C2K(20)
```

dget_lbarb2 *Computes derivative d delta/dx*

Description

Obtains the derivative d delta/dx from lbarb, xb and k.

Usage

```
dget_lbarb2(x, delta, pars)
```

Arguments

x	scalar x = g/(g + e)
delta	scalar delta = x e_H/ (1 - kap)g
pars	data.frame with lbarb, xb, xb3 (xb^1/3), k

Value

scalar with derivative value d delta/ dx

See Also

Other scaled get functions: `fnget_lbarb2`; `get_lbarb2`; `get_lbarb`; `get_lb`; `initial_scaled_reserve`

Examples

```
dget_lbarb2(10^(-6), 0, c(lbarb = 0.003, xb = 10/11, xb3 = (10/11)^(1/3), k = 1))
```

fnget_lbarb2 *Computes f using the ode solver for delta(x), for finding lbarb*

Description

Computes f using the ode solver for delta(x), for finding lbarb.

Usage

```
fnget_lbarb2(lbarb, pars)
```

Arguments

lbarb	scalar with scaled length at birth (lbarb = lb/ g)
pars	data.frame with lbarb, xb, xb3 (xb^1/3), k

Value

scalar with function f which when zero indicates lbarb

See Also

Other scaled get functions: `dget_lbarb2`; `get_lbarb2`; `get_lbarb`; `get_lb`; `initial_scaled_reserve`

Examples

```
fnget_lbarb2(0.03, c(xb = 10/11, xb3 = (10/11)^(1/3), vbarHb = 0.001, k = 1))
```

`get_lb` *Computes scaled length at birth*

Description

Obtains scaled length at birth, given the scaled reserve density at birth.

Usage

```
get_lb(pars, eb = 1, lb0 = as.numeric(pars[3]^(1/3)))
```

Arguments

`pars`	3-vector with parameters: g, k, v_H^b
`eb`	optional scalar with scaled reserve density at birth (default eb = 1)
`lbarb0`	optional scalar with initial estimate for scaled length at birth (default lb0: lb for k = 1)

Value

scalar with scaled length at birth (lb) and indicator equals 1 if successful, 0 otherwise (info)

See Also

Other scaled get functions: `dget_lbarb2`; `fnget_lbarb2`; `get_lbarb2`; `get_lbarb`; `initial_scaled_reserve`

Examples

```
get_lb(c(g = 10, k = 1, vHb = 0.5), 1)
```

get_lbarb *Computes scaled length at birth lbarb*

Description

Obtains scaled length at birth, given the scaled reserve density at birth.

Usage

```
get_lbarb(pars, eb = 1, lbarb0 = NA)
```

Arguments

pars	3-vector with parameters: g, k, vbar_H^b
eb	optional scalar with scaled reserve density at birth (default eb = 1)
lbarb0	optional scalar with initial estimate for scaled length at birth (default lbarb0: lbarb for k = 1)

Value

scalar with scaled length at birth (lbarb) and indicator equals 1 if successful, 0 otherwise (info)

See Also

Other scaled get functions: dget_lbarb2; fnget_lbarb2; get_lbarb2; get_lb; initial_scaled_reser

Examples

```
get_lbarb(c(g = 10, k = 1, vbarHb = 0.0005), 1)
```

get_lbarb2 *Computes initial scaled reserve*

Description

Obtains scaled length at birth, given the scaled reserve density at birth. Like get_lbarb, but uses a shooting method in 1 variable.

Usage

```
get_lbarb2(pars, eb = NA)
```

Arguments

pars	3-vector with parameters: g, k, vbar_H^b
eb	optional scalar with scaled reserve density at birth (default eb = 1)

Value

scalar with scaled length at birth (lbarb) and indicator equals 1 if successful, 0 otherwise (info)

See Also

Other scaled get functions: dget_lbarb2; fnget_lbarb2; get_lbarb; get_lb; initial_scaled_reserv

Examples

```
get_lbarb2(c(g = 10, k = 1, vbarHb = 0.01), 1)
```

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get_ubarE0 *Computes initial scaled reserve density at birth*

Description

Obtains the initial scaled reserve given the scaled reserve density at birth. Function get_ue0 does so for eggs, get_ue0_foetus for foetuses. Specification of length at birth as third input by-passes its computation, so if you want to specify an initial value for this quantity, you should use get_lb directly.

Usage

```
get_ubarE0(g = NA, k = NA, vbarHb = NA, eb = 1, lbarb = NA)
```

Arguments

eb:	optional scalar with scaled reserbe density at birth
x1	scalar with upper boundary for integration

Value

scalar with particular incomple beta function

See Also

Other get functions: get_ue0

Examples

```
get_ubarE0(g = 10, lbarb = 0.01)
get_ubarE0(g = 10, k = 0.7, vbarHb = 5e-4)
```

`get_ue0` *Computes initial scaled reserve*

Description

Obtains the initial scaled reserve given the scaled reserve density at birth. Function get_ue0 does so for eggs, get_ue0_foetus for foetuses. Specification of length at birth as third input by-passes its computation, so if you want to specify an initial value for this quantity, you should use get_lb directly.

Usage

```
get_ue0(pars, eb = 1, lb0 = NA)
```

Arguments

`pars`	1 or 3 -vector with parameters g, k_J/ k_M, v_H^b, see get_lb
`eb`	optional scalar with scaled reserbe density at birth (default: eb = 1)
`lb0`	optional scalar with scaled length at birth (default: lb is optained from get_lb)

Value

uE0 scalar with scaled reserve at t=0: $U_E^0 g^2 k_M^3/ v^2$ with $U_E^0 = M_E^0/ {J_EAm}$, lb scalar with scaled length at birth and info indicator equals 1 if successful, 0 otherwise

See Also

Other get functions: `get_ubarE0`

Examples

```
get_ue0(pars = c(0.42, 1, 0.066), eb = 1, lb0 = 0.4042)
```

`initial_scaled_reserve` *Gets initial scaled reserve*

Description

Gets initial scaled reserve.

Usage

```
initial_scaled_reserve(f, pars, Lb0 = NA)
```

Arguments

`f`	n-vector with scaled functional responses
`pars`	5-vector with parameters: VHb, g, kJ, kM, v
`Lb0`	optional n-vector with lengths at birth

Value

n-vector with initial scaled reserve: M_E^0/ J_EAm (U0), n-vector with length at birth (Lb) and n-vector with 1's if successful, 0's otherwise (info)

See Also

Other scaled get functions: `dget_lbarb2`; `fnget_lbarb2`; `get_lbarb2`; `get_lbarb`; `get_lb`

Examples

```
initial_scaled_reserve(f = c(1, 0.9), pars = c(VHb = .8, g = .42, kJ = 1.7, kM = 1.7, v =
```

K2C *Conversion of Kelvin to Celsius*

Description

Computes Celsius from temperatures given in Kelvin

Usage

```
K2C(K)
```

Arguments

`K`	numeric temperature in degrees Kelvin

Value

temperature in Kelvin

See Also

Other miscellaneous functions: `C2K`; `beta0`

Examples

```
K2C(293.15)
```

`tempcorr` *Conversion of Kelvin to Celsius*

Description

Calculates the factor with which physiological rates should be multiplied to go from a reference temperature to a given temperature

Usage

```
tempcorr(Temp, T_1, Tpars)
```

Arguments

`Temp`	vector with new temperatures
`T_1`	scalar with reference temperature
`Tpars`	1-, 3- or 5-vector with temperature parameters

Details

This is a test θ

$$\dot{\theta}(T) = \dot{\theta}(T_1) \exp\left(\frac{T_A}{T_1} - \frac{T_A}{T}\right)$$

Value

vector with temperature correction factors that affect all rates

Examples

```
tempcorr(c(330, 331, 332), 320, c(12000, 277, 318, 20000, 190000))
```