

## Read.me File

*database reference:* Denéchère, Rémy; van Denderen, P. Daniël; Andersen, Ken Haste (2021), Deriving population scaling rules from individual-level metabolism and life history traits - Code and Data, Dryad, Dataset, <https://doi.org/10.5061/dryad.kkwh70s5v>

Description of the scripts:

1. Base\_run function: contains all the scripts of the figures in Denéchère et al 2021.
2. Parameters function: Data are loaded and processed from the parameter function that contains information about each data file: value, units, and definition of all the parameters.
3. Pop\_growth\_rate: Contains the Rmax equation and associated parameters for each taxon.
4. Grid function: used to create a log scale
5. Ciplot function is used to create shadow areas. Created by: Raymond Reynolds 24/11/06; updated by Pham Thai Binh 12/06/2017.

Description of the Data: The main data used are summarised in the following table. A more complete description is also available in the "Parameters" function.

Description of the main parameters contained in the database.  $K$  is the von Bertalanffy growth parameter,  $A$  is the somatic growth rate,  $M_0$  the offspring size,  $M$  the adult size in mass,  $L$  the asymptotic length.

Group	File name	Trait	Unit	Val. range	References
Bivalves	Growth_data_Bivalve	$K$	$\text{yr}^{-1}$	$1E - 2\cdot 3$	(1)
		$L$	cm	0.2 - 41	(1)
Egg_size_data_Benthos		$M_0$	g	$2.08E - 08 - 1.28E - 05$	(2)
		$M$	g	0.02 - 20695	(2)
Teleosts	Growth_data_Teleost	$A$	$\text{g}^{-1/4} \text{ yr}^{-1}$	$0.7 - 62$	(3) (4) (5)
		$L$	cm	3-375	(3) (4) (5)
Egg_size_data_Teleost		$M_0$	g	$6.5E - 05 - 7E - 03$	(6) (4)
		$L$	cm	8 - 158	(6) (4)
r_max_Teleost_Hutchings2012		$r_{\max}$	$\text{yr}^{-1}$	0.03 - 11	(3)
		$M$	g	$280 - 6.8E5$	(3)
Elasmobranches	Growth_data_Elasmodbranch	$K$	$\text{yr}^{-1}$	0.04 - 1	(4)
		$L$	cm	42 - 388	(4)
Egg_size_data_Elasmodbranch		$M_0$	g	1.8 - 3742	(6) (4)
		$M$	g	881 - 513000	(6) (4)
r_max_Elasmodbranch_Zhou2011		$r_{\max}$	$\text{yr}^{-1}$	0.01 - 0.57	(7)
		$M$	g	$3E + 3 - 2E + 6$	(7)
Copepods	Growth_data_Copepod	$A$	$\text{g}^{-1/4} \text{ yr}^{-1}$	$4E - 1 - 30$	(8) (9)

	$M$	g	$3E - 5 - 1$	(8) (9)
Egg_size_data_Copepods	$M_0$	mg	$2E - 6 - 6E - 03$	(6)
	$M$	mg	$2..30E - 04 - 0.757$	(6)
Mammals	$M_0$	g	$54.4 - 272000$	(6)
	$M$	g	$1220 - 3940000$	(6)
r_max_Mammalia_Hutchings2012	$r_{\max}$	$\text{yr}^{-1}$	0 - 16	(3)
	$M$	m	$10 - 5E7$	(3)

References: (1) Moss et al. (2016); (2) Kooijman (2009); (3) Hutchings et al. (2012); (4) Andersen (2019); (5) (Froese and Pauly, 2018) (6) Neuheimer et al. (2015); (7) Zhou et al. (2012); (8) Kiørboe and Hirst (2014); (9) Serra-Pompei et al. (2020)

## References of the Data

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