

# Package ‘thermgRad’

March 7, 2022

**Title** Tools for germination analysis on thermal gradient plate

**Version** 0.0.1

**Description** It is a long established fact that a reader will be distracted by the readable content of a page when looking at its layout. The point of using Lorem Ipsum is that it has a more-or-less normal distribution of letters, as opposed to using 'Content here, content here', making it look like readable English.

**License** GPL (>= 3)

**Encoding** UTF-8

**Roxygen** list(markdown = TRUE)

**RoxygenNote** 7.1.2

**Suggests** knitr,  
rmarkdown,  
testthat (>= 3.0.0)

**Config/testthat/edition** 3

**Imports** utils,  
dplyr,  
magrittr,  
ggplot2,  
readr

**VignetteBuilder** knitr

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coolbear

*Obtain T50 values***Description**

Obtain T50 values using Coolbear et al. (1984) formula modified by Farooq et al.(2005). Vector containing scoring days must have same length than vector containing cumulative germination data

**Usage**

```
coolbear(
  day = "vector containing scoring days",
  cumulative = "vector containing cumulative germination for each day",
  n = "total number of viable seeds"
)
```

**Arguments**

day	A vector containing scoring days
cumulative	A vector containing the cumulative germination for each day
n	Number of viable seeds in the Petri dish (Total sown seeds - empty seeds)

**Value**

t50 value in days

**Examples**

```
coolbear(seq(1,10,1),c(0,0,0,0,0,6,12,15,18,20),20)
```

petri\_grid

*Obtain T50, Germination Rate for each Petri dish in the thermal gradient***Description**

This function transform an excel spreadshit cumulative germination data from every Petri dish into a grid containing petri dish label, T50 and Germination rate. See details to format the input data correctly. The last column must be the total number of viable seeds of each petri dish (germinated + fresh & mouldy after cut test). It does not have to be (necessarily) a 13 by 13 Petri dish grid

**Usage**

```
petri_grid(x)
```

**Arguments**

x	A data.frame, probably imported from an excel spreadsheet. See details for formatting
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## Details

Input for this function is a data frame with this format. Please note this table has a header and is relevant for the function for "Days" to be the header and not a row. This is because thermal plate germination data is probably recorded in a excel spreadsheet with this format

Day	1	3	6	8	12	15	17	22	Total
A1	0	0	0	6	10	12	17	17	21
A2	0	0	0	3	10	10	10	11	19
A3	0	0	0	3	4	5	5	5	20
A4	0	12	15	15	18	20	20	20	20
...	...	...	...	...	...	...	...	...	...
M11	0	0	0	8	13	14	17	19	20
M12	0	0	0	1	1	5	8	20	20
M13	0	0	0	1	5	10	10	15	21

## Value

A data frame with thermal plate T50 and GR values

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plot_tempgrad	<i>Plots thermal gradient temperature for each Petri dish</i>
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## Description

Taking into account thermal gradient plate corner temperatures this function return a graph with the temperatures of each Petri dish. Using the "precise" method returns a more accurate estimated grid of temperatures across the thermal plate, while with the adjust parameter is possible to estimate the temperature at the center of each Petri dish

## Usage

```
plot_tempgrad(
  x = "output dataframe from tempgrad function",
  toplot = "tbdescribed"
)
```

## Arguments

x	a dataframe outputted by tempgrad function
toplot	Decides between plotting average Petri dish temperature (="average) or fluctuation (="fluctuation)

## Value

A graph with average Petri dish temperature or temperature fluctuation

## Examples

```
x<-tempgrad(dayBL=0,dayBR=0,dayTL=40,dayTR=40,nightBL=0,nightBR=40,nightTL=0,nightTR=40,petri=13)
plot_tempgrad(x,toplot="average")
plot_tempgrad(x,toplot="fluctuation")
x%>%plot_tempgrad(toplot="average")
#'
```

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tempgrad

*Generate temperature gradient grid*


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## Description

Taking into account thermal gradient plate corner temperatures this function return a data frame with day and night temperatures for each petri dish, their average temperature and the temperature fluctuation. Using the "precise" method returns a more accurate estimate of temperatures across the thermal plate, while with the adjust parameter is possible to estimate the temperature at the center of each Petri dish

## Usage

```
tempgrad(
  dayBL = "Diurnal bottom left temperature",
  dayBR = "Diurnal bottom right temperature",
  dayTL = "Diurnal top left temperature",
  dayTR = "Diurnal top right temperature",
  nightBL = "Nocturnal bottom left temperature",
  nightBR = "Nocturnal bottom right temperature",
  nightTL = "Nocturnal top left temperature",
  nightTR = "Nocturnal top right temperature",
  petri = "Number of petri in a column or row",
  method = "tbd",
  adjust = "tbd"
)
```

## Arguments

dayBL	Average diurnal temperature at the bottom left side of the thermal gradient plate
dayBR	Average diurnal temperature at the bottom left side of the thermal gradient plate
dayTL	Average diurnal temperature at the bottom left side of the thermal gradient plate
dayTR	Average diurnal temperature at the bottom left side of the thermal gradient plate
nightBL	Average diurnal temperature at the bottom left side of the thermal gradient plate
nightBR	Average diurnal temperature at the bottom left side of the thermal gradient plate
nightTL	Average diurnal temperature at the bottom left side of the thermal gradient plate
nightTR	Average diurnal temperature at the bottom left side of the thermal gradient plate
petri	Number of Petri dishes in a column or a row.
method	Leave blank to use average corner temperature values or use "precise" to create a temperature gradient based in individual corner temperatures
adjust	tbd, but will be used to center temperature into Petri dish

**Value**

A data frame with day and night temperatures, average temperature and temperature fluctuation for each Petri dish

**Examples**

```
tempgrad(dayBL=0,dayBR=0,dayTL=40,dayTR=40,nightBL=0,nightBR=40,nightTL=0,nightTR=40,petri=13)
```

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`tg_example`*Load example*

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**Description**

Loads a dataframe which can be used as an example to try out the functions

**Usage**

```
tg_example()
```

**Value**

an example data frame

**Examples**

```
df<-tg_example()
```

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