

# Package ‘popgenr’

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**Type** Package

**Title** Accompaniment to Population Genetics with R: An Introduction for Life Scientists

**Version** 0.2

**Author** Aki Jarl Laruson; Floyd Reed

**Maintainer** Aki Jarl Laruson <akijarl@gmail.com>

**Description** Provides several data sets and functions to accompany the book “Population Genetics with R: An Introduction for Life Scientists” (2021, ISBN:9780198829546).

**License** CC0

**Encoding** UTF-8

**LazyData** true

**NeedsCompilation** no

**Depends** R (>= 3.5.0)

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coal *Simulate and visualize a coalescent process*

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### Description

A function that provides a simple starting off point to simulate a coalescent process.

### Usage

```
coal(length, number, muscale, reps, prnt)
```

### Arguments

length	Length of sequence to simulate.
number	Number of starting lineages.
muscale	Mutation rate, scaled by $4N\mu$ .
reps	Number of replicates to run.
prnt	Whether to print calculation output to the terminal (prnt=1), or not (prnt=0).

### Examples

```
#assign genotype counts
length=250

number=8

muscale=6.25 # theta = 4Nμ = 25, theta/4 = 6.25

reps=100

prnt=0

#run function
coal(length, number, muscale, reps, prnt)
```

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Dcalc *Calculate and visualize LD*

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### Description

Calculates the degree of linkage disequilibrium between two biallelic diploid loci and plots the results.

### Usage

```
Dcalc(AABB, AaBB, aaBB, AABb, AaBb, aaBb, AAbb, Aabb, aabb)
```

**Arguments**

AABB	Count of A and B double homozygotes.
AaBB	Count of A heterozygotes, B homozygotes.
aaBB	Count of a and B double homozygotes.
AABb	Count of A homozygotes, B heterozygotes.
AaBb	Count of double heterozygotes.
aaBb	Count of a homozygotes, B heterozygote.
AAbb	Count of A and b double homozygotes.
Aabb	Count of A heterozygotes, b homozygotes.
aabb	Count of a and b double homozygotes.

**Examples**

```
#assign genotype counts
AABB=2
AaBB=0
aaBB=0
AABb=0
AaBb=1
aaBb=0
AAbb=1
Aabb=0
aabb=0

#run function
Dcalc(AABB, AaBB, aaBB, AABb, AaBb, aaBb, AAbb, Aabb, aabb)
```

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 fly

*Drosophila melanogaster bw75 data*


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**Description**

A matrix of observed allele counts from Buri (1956). Each row contains observations starting at generation 1 in the first row, across 107 replicates of the number of bw75 allele.

**Usage**

```
fly
```

**Source**

Buri, P. (1956). Gene frequency in small populations of mutant *Drosophila*. *Evolution*, 10, 367-402.

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genotypes	<i>Genotype data from Aleppo Pines</i>
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**Description**

Multiple sampled alleles from Aleppo Pine (*Pinus halepensis*) in the Eastern Mediterranean. Adapted from Gershberg et al. 2016.

**Usage**

genotypes

**Source**

Gershberg, A., Ne'eman, G., Ben-Shlomo, R. (2016). Genetic structure of a naturally regenerating post-fire seedling population: *Pinus halepensis* as a case study. *Frontiers in Plant Science* 7: 549.

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moth	<i>Temporal allele frequency shifts</i>
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**Description**

Change in allele frequency over eight generations in the scarlet tiger moth (*Callimorpha dominula*).

**Usage**

moth

**Source**

Fisher, R. A. and E. B. Ford (1947). The Spread of a Gene in Natural Conditions in a Colony of the Moth *Panaxia dominula*. *Heredity* 1: 143-174.

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snp	<i>SNP information for 25 loci</i>
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**Description**

Single Nucleotide Polymorphism data for 25 loci. Includes information on allele frequency, homozygosity, heterozygosity, chromosome location, and functional location of SNP.

**Usage**

snp

**Source**

1,000 Genomes Project (<http://www.internationalgenome.org>)

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thirteen	<i>Genotypes across 13 CODIS loci</i>
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**Description**

Genotypes of 1,036 individuals across 13 core CODIS (Combined DNA Index System) loci, collected in the USA.

**Usage**

thirteen

**Source**

Hill, C.R., Duewer, D.L., Kline, M.C., Coble, M.D., and Butler, J.M. (2013) U.S. population data for 29 autosomal STR loci. *Forensic Sci. Int. Genet.* 7: e82-e83. Accessed from: <https://strbase.nist.gov/fbicore.htm>

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whale

*Genotypes of 246 South Pacific Blue Whales*

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**Description**

Data frame of genotypes collected from 264 individual blue Whales (*Balaenoptera musculus*) across seven distinct loci. Adapted from Attard et al. 2012.

**Usage**

whale

**Source**

Attard, C. R., Beheregaray, L. B., Jenner, K. C. S., Gill, P. C., Jenner, M. N., Morrice, M. G., Robertson, K.M. and Moller, L. M. (2012). Hybridization of Southern Hemisphere blue whale subspecies and a sympatric area off Antarctica: impacts of whaling or climate change? *Molecular Ecology*, 21(23), 5715-5727.

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