Package: popgenr (via r-universe)

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Type Package

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

Version 0.2

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

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`coal` *Simulate and visualize a coalescent process*

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 4Neu.
`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 = 4Neu = 25, theta/4 = 6.25

reps=100

prnt=0

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

`Dcalc` *Calculate and visualize LD*

Description

Calculates the degree of linkage disequilibirum 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)
```

fly *Drosphila melanogaster bw75 data*

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.

genotypes *Genotype data from Aleppo Pines*

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.

moth *Temporal allele frequency shifts*

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.

snp *SNP information for 25 loci*

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)

thirteen *Genotypes across 13 CODIS loci*

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

whale *Genotypes of 246 South Pacific Blue Whales*

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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