

Package ‘pmc’

April 15, 2023

Version 1.0.5

Title Phylogenetic Monte Carlo

Description Monte Carlo based model choice for applied phylogenetics of continuous traits. Method described in Carl Boettiger, Graham Coop, Peter Ralph (2012) Is your phylogeny informative? Measuring the power of comparative methods, *Evolution* 66 (7) 2240-51. <[doi:10.1111/j.1558-5646.2011.01574.x](https://doi.org/10.1111/j.1558-5646.2011.01574.x)>.

URL <https://github.com/cboettig/pmc>

BugReports <https://github.com/cboettig/pmc/issues>

License CC0

LazyData true

VignetteBuilder knitr

Suggests covr, gridExtra, knitr, testthat, rmarkdown

Imports dplyr, geiger (>= 2.0.11), ggplot2, parallel, ouch, tidyr, phytools (>= 1.5-1)

RoxygenNote 7.2.3

Encoding UTF-8

NeedsCompilation no

Author Carl Boettiger [aut, cre]

Maintainer Carl Boettiger <cboettig@gmail.com>

Repository CRAN

Date/Publication 2023-04-14 23:30:02 UTC

R topics documented:

anoles	2
pmc	2
pmc_fit	3
simulate.gfit	4
tree	4
update.gfit	4

Index**6**

anoles *The anoles data set*

Description

as from ouch with additional regimes added and minor formatting changes

pmc *pmc*

Description

Performs a phylogenetic monte carlo between modelA and modelB

Usage

```
pmc(
  tree,
  data,
  modelA,
  modelB,
  nboot = 500,
  optionsA = list(),
  optionsB = list(),
  ...,
  mc.cores = parallel::detectCores()
)
```

Arguments

tree	A phylogenetic tree. Can be phylo (ape) or ouch tree
data	The data matrix
modelA	a model from the list, or a custom model, see details
modelB	any other model from the list, or custom model, see details
nboot	number of bootstrap replicates to use
optionsA	additional arguments to modelA
optionsB	additional arguments to modelB
...	additional arguments to both fitting methods
mc.cores	number of parallel cores to use

Details

Simulates data under each model and returns the distribution of likelihood ratio, $L(B)/L(A)$, under for both simulated datasets.

Value

list with the nboot likelihood ratios obtained from fitting both models to data simulated by model A, and the nboot likelihood ratios obtained by fitting both models to simulations from model B, and the likelihood ratio between the original MLE estimated models from the data.

Examples

```
library("geiger")
geo=get(data(geospiza))
tmp=treedata(geo$phy, geo$dat)
phy=tmp$phy
dat=tmp$data[,1]

pmc(phy, dat, "BM", "lambda", nboot = 20, mc.cores=1)
```

pmc_fit

Fit any model used in PMC

Description

The fitting function used by pmc to generalize fitting to both geiger and ouch models.

Usage

```
pmc_fit(tree, data, model, ...)
```

Arguments

tree	a phylogenetic tree. can be ouch or ape format
data	trait data in ape or ouch format
model	the name of the model to fit,
...	whatever additional options would be provided to the model fit

Value

the object returned by the model fitting routine (gfit for geiger, hansen/brown for ouch)

simulate.gfit	<i>simulate gfit</i>
---------------	----------------------

Description

simulate method for gfit objects

Usage

```
simulate.gfit(object, nsim = 1, seed = NULL, ...)
```

Arguments

object	a gfit object
nsim	number of sims
seed	an optional seed for the simulations (not implemented)
...	additional arguments, not implemented for gfit simulations

Value

simulated dataset

tree	<i>The phylogeny for the anoles data set</i>
------	--

Description

The bimaculus phylogeny, as from the ouch package

update.gfit	<i>update gfit</i>
-------------	--------------------

Description

update method for gfit objects

Usage

```
update.gfit(object, ...)
```

Arguments

object	a gfit object
...	additional arguments, such as the data to use to update

update.gfit

5

Value

updated gfit object

Index

* data

anoles, 2

tree, 4

anoles, 2

pmc, 2

pmc_fit, 3

simulate.gfit, 4

tree, 4

update.gfit, 4