

Package ‘tidytree’

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Title A Tidy Tool for Phylogenetic Tree Data Manipulation

Version 0.4.5

Description Phylogenetic tree generally contains multiple components including node, edge, branch and associated data. 'tidytree' provides an approach to convert tree object to tidy data frame as well as provides tidy interfaces to manipulate tree data.

Depends R (>= 3.4.0)

Imports ape, dplyr, lazyeval, magrittr, methods, rlang, tibble, tidyr, tidyselect, yulab.utils (>= 0.0.4), pillar, cli

Suggests knitr, rmarkdown, prettydoc, testthat, utils

VignetteBuilder knitr

ByteCompile true

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URL <https://www.amazon.com/Integration-Manipulation-Visualization-Phylogenetic-Computational-ebook/dp/B0B5NLZR1Z/>

BugReports <https://github.com/YuLab-SMU/tidytree/issues>

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ancestor

ancestor

Description

access ancestor data

Usage

```
ancestor(.data, .node, ...)
```

```
## S3 method for class 'tbl_tree'
```

```
ancestor(.data, .node, ...)
```

Arguments

.data phylo or tbl_tree object
.node node number
... additional parameters

Value

ancestor data

Author(s)

Guangchuang Yu

Examples

```
library(ape)  
tree <- rtree(4)  
x <- as_tibble(tree)  
ancestor(x, 3)
```

as.treedata *as.treedata*

Description

convert a tree object to treedata object

Usage

```
as.treedata(tree, ...)  
  
## S3 method for class 'tbl_tree'  
as.treedata(tree, ...)
```

Arguments

tree tree object
... additional parameters

Value

treedata object

Examples

```
library(ape)
set.seed(2017)
tree <- rtree(4)
d <- tibble(label = paste0('t', 1:4),
            trait = rnorm(4))
x <- as_tibble(tree)
full_join(x, d, by = 'label') %>% as.treedata
```

| | |
|----------------|-----------------------|
| as.ultrametric | <i>as.ultrametric</i> |
|----------------|-----------------------|

Description

as.ultrametric

Usage

```
as.ultrametric(tree, ...)
```

Arguments

| | |
|------|-----------------------|
| tree | tree object |
| ... | additional parameters |

Value

treedata or phylo object

| | |
|-------|--------------|
| child | <i>child</i> |
|-------|--------------|

Description

access child data

Usage

```
child(.data, .node, ...)

## S3 method for class 'tbl_tree'
child(.data, .node, ...)
```

Arguments

.data phylo or tbl_tree object
.node node number
... additional parameters

Value

child data

Author(s)

Guangchuang Yu

Examples

```
library(ape)  
tree <- rtree(4)  
x <- as_tibble(tree)  
child(x, 4)
```

drop.tip

drop.tip method

Description

drop.tip method

Usage

```
drop.tip(object, tip, ...)  
  
keep.tip(object, tip, ...)  
  
## S4 method for signature 'treedata'  
drop.tip(object, tip, ...)  
  
## S4 method for signature 'phylo'  
drop.tip(object, tip, ...)  
  
## S4 method for signature 'treedata'  
keep.tip(object, tip, ...)  
  
## S4 method for signature 'phylo'  
keep.tip(object, tip, ...)
```

Arguments

object A treedata or phylo object
 tip a vector of mode numeric or character specifying the tips to delete
 ... additional parameters

Value

updated object

Author(s)

Casey Dunn <http://dunnlab.org> and Guangchuang Yu <https://guangchuangyu.github.io>

Source

drop.tip for phylo object is a wrapper method of ape::drop.tip from the ape package. The documentation you should read for the drop.tip function can be found here: [drop.tip](#)

See Also

[drop.tip](#)

Examples

```
library(tidytree)
set.seed(123)
tr <- ape::rtree(6)
da <- data.frame(id=tip.label(tr), value = letters[seq_len(6)])
trda <- tr %>% dplyr::left_join(da, by = c('label'='id'))
tr1 <- drop.tip(tr, c("t2", "t1"))
tr2 <- keep.tip(tr, c("t2", "t1"))
```

get.data

get.data method

Description

get.data method

get.data method

Usage

```
get.data(object, ...)
```

```
## S4 method for signature 'treedata'
get.data(object)
```

Arguments

object treedata object
... additional parameter

Value

associated data of phylogeny

get.fields *get.fields method*

Description

get.fields method

Usage

```
get.fields(object, ...)  
  
## S4 method for signature 'treedata'  
get.fields(object)
```

Arguments

object treedata object
... additional parameter

Value

available annotation variables

get.treetext *get.treetext method*

Description

access tree text (newick text) from tree object

Usage

```
get.treetext(object, ...)  
  
## S4 method for signature 'treedata'  
get.treetext(object)
```

Arguments

| | |
|--------|----------------------|
| object | treedata object |
| ... | additional parameter |

Value

phylo object

getNodeNum

getNodeNum

Description

calculate total number of nodes

Usage

```
getNodeNum(tree)
```

Arguments

| | |
|------|-------------|
| tree | tree object |
|------|-------------|

Value

number

Author(s)

Guangchuang Yu

Examples

```
getNodeNum(rtree(30))
```

| | |
|---------------|----------------------|
| get_tree_data | <i>get_tree_data</i> |
|---------------|----------------------|

Description

get associated data stored in treedata object

Usage

```
get_tree_data(tree_object)
```

Arguments

tree_object a treedata object

Value

tbl_df

Author(s)

guangchuang yu

| | |
|------------|-------------------|
| groupClade | <i>groupClade</i> |
|------------|-------------------|

Description

grouping clades

Usage

```
groupClade(.data, .node, group_name = "group", overlap = "overwrite", ...)
```

Arguments

| | |
|------------|--|
| .data | tree object (phylo, treedata, tbl_tree, ggtree etc.) |
| .node | selected nodes |
| group_name | character the name of the group cluster, default is group. |
| overlap | character one of overwrite,origin and abandon, default is overwrite. |
| ... | additional parameter |

Value

updated tree with group information or group index

Author(s)

Guangchuang Yu

| | |
|----------|-----------------|
| group0TU | <i>groupOTU</i> |
|----------|-----------------|

Description

grouping OTUs

Usage

```
group0TU(.data, .node, group_name = "group", ...)
```

Arguments

| | |
|------------|--|
| .data | tree object (phylo, treedata, tbl_tree, ggtree etc.) |
| .node | selected nodes |
| group_name | character the name of the group cluster, default is group. |
| ... | additional parameter |

Value

updated tree with group information or group index

Author(s)

Guangchuang Yu

| | |
|-------|--------------|
| isTip | <i>isTip</i> |
|-------|--------------|

Description

whether the node is a tip

Usage

```
isTip(.data, .node, ...)

## S3 method for class 'tbl_tree'
isTip(.data, .node, ...)

## S3 method for class 'phylo'
isTip(.data, .node, ...)

## S3 method for class 'treedata'
isTip(.data, .node, ...)
```

Arguments

.data phylo, treedata or tbl_tree object
.node node number
... additional parameters

Value

logical value

Author(s)

Guangchuang Yu

MRCA

MRCA

Description

access most recent common ancestor data

Usage

MRCA(.data, ...)

Arguments

.data phylo or tbl_tree object
... additional parameters

Value

MRCA data

Author(s)

Guangchuang Yu

| | |
|----------------|--------------|
| Nnode.treedata | <i>Nnode</i> |
|----------------|--------------|

Description

number of nodes

Usage

```
## S3 method for class 'treedata'
Nnode(phy, internal.only = TRUE, ...)
```

Arguments

| | |
|---------------|-----------------------------------|
| phy | treedata object |
| internal.only | whether only count internal nodes |
| ... | additional parameters |

Value

number of nodes

Author(s)

Guangchuang Yu

Examples

```
Nnode(rtree(30))
```

| | |
|------------|--|
| node.label | <i>extract the node label of phylo, treedata or tbl_tree</i> |
|------------|--|

Description

extract the node label of phylo, treedata or tbl_tree

Usage

```
node.label(x, node = "internal", ...)
```

Arguments

| | |
|------|--|
| x | object, should be one of treedata, phylo or tbl_tree. |
| node | character, to extract which type node label, default is internal, should be one of internal, external, all, tip. |
| ... | additional parameters. |

Value

label character vector.

| | |
|--------|---------------|
| nodeid | <i>nodeid</i> |
|--------|---------------|

Description

convert tree label to internal node number

Usage

nodeid(tree, label)

Arguments

| | |
|-------|-------------------|
| tree | tree object |
| label | tip/node label(s) |

Value

node number

Author(s)

Guangchuang Yu

| | |
|---------|----------------|
| nodelab | <i>nodelab</i> |
|---------|----------------|

Description

convert internal node number tip/node label

Usage

nodelab(tree, id)

Arguments

| | |
|------|-------------|
| tree | tree object |
| id | node number |

Value

tip/node label(s)

Author(s)

Guangchuang Yu

| | |
|-----------|------------------|
| offspring | <i>offspring</i> |
|-----------|------------------|

Description

access offspring data

Usage

```
offspring(.data, .node, tiponly, self_include, ...)  
  
## S3 method for class 'tbl_tree'  
offspring(.data, .node, tiponly = FALSE, self_include = FALSE, ...)
```

Arguments

| | |
|---------------------------|--|
| <code>.data</code> | phylo or <code>tbl_tree</code> object |
| <code>.node</code> | node number |
| <code>tiponly</code> | whether only return tip nodes |
| <code>self_include</code> | whether include the input node, only applicable for <code>tiponly = FALSE</code> |
| <code>...</code> | additional parameters |

Value

offspring data

Author(s)

Guangchuang Yu

Examples

```
library(ape)  
tree <- rtree(4)  
x <- as_tibble(tree)  
offspring(x, 4)
```

| | |
|--------|---------------|
| parent | <i>parent</i> |
|--------|---------------|

Description

access parent data

Usage

```
parent(.data, .node, ...)  
  
## S3 method for class 'tbl_tree'  
parent(.data, .node, ...)
```

Arguments

| | |
|-------|---------------------------------|
| .data | phylo or <i>tbl_tree</i> object |
| .node | node number |
| ... | additional parameters |

Value

parent data

Author(s)

Guangchuang Yu

Examples

```
library(ape)  
tree <- rtree(4)  
x <- as_tibble(tree)  
parent(x, 2)
```

| | |
|---------------|-------------|
| root.treedata | <i>root</i> |
|---------------|-------------|

Description

re-root a tree

Usage

```
## S3 method for class 'treedata'  
root(phy, outgroup, node = NULL, edgelabel = TRUE, ...)
```

Arguments

| | |
|----------|---|
| phy | tree object |
| outgroup | a vector of mode numeric or character specifying the new outgroup |
| node | node to reroot |
| edglabel | a logical value specifying whether to treat node labels as edge labels and thus eventually switching them so that they are associated with the correct edges. |
| ... | additional parameters passed to ape::root.phylo |

Value

rerooted treedata

| | |
|----------|-----------------|
| rootnode | <i>rootnode</i> |
|----------|-----------------|

Description

access root node data

Usage

```
rootnode(.data, ...)
```

Arguments

| | |
|-------|--------------------------|
| .data | phylo or tbl_tree object |
| ... | additional parameters |

Value

root node data

Author(s)

Guangchuang Yu

| | |
|------|--------------------|
| show | <i>show method</i> |
|------|--------------------|

Description

show method for treedata instance

Usage

```
show(object)
```

Arguments

| | |
|--------|-----------------|
| object | treedata object |
|--------|-----------------|

Value

print info

Author(s)

Guangchuang Yu <https://guangchuangyu.github.io>

| | |
|---------|----------------|
| sibling | <i>sibling</i> |
|---------|----------------|

Description

access sibling data

Usage

```
sibling(.data, ...)
```

Arguments

| | |
|-------|--------------------------|
| .data | phylo or tbl_tree object |
| ... | additional parameters |

Value

sibling

Author(s)

Guangchuang Yu

| | |
|-----------------|---|
| td-label-assign | <i>the tip or internal node label assign of tbl_tree phylo and treedata</i> |
|-----------------|---|

Description

the tip or internal node label assign of tbl_tree phylo and treedata

Usage

```
tip.label(x) <- value

node.label(x) <- value

## S3 replacement method for class 'phylo'
node.label(x) <- value

## S3 replacement method for class 'treedata'
node.label(x) <- value

## S3 replacement method for class 'tbl_tree'
node.label(x) <- value

## S3 replacement method for class 'phylo'
tip.label(x) <- value

## S3 replacement method for class 'treedata'
tip.label(x) <- value

## S3 replacement method for class 'tbl_tree'
tip.label(x) <- value
```

Arguments

| | |
|-------|--|
| x | object, should be one of tbl_tree, phylo or treedata |
| value | character, the character vector |

| | |
|-----------|--|
| tip.label | <i>extract the tip label of phylo treedata or tbl_tree</i> |
|-----------|--|

Description

extract the tip label of phylo treedata or tbl_tree

Usage

```
tip.label(x, ...)
```

Arguments

x object, should be one of treedata, phylo or tbl_tree.
 ... additional parameters.

| | |
|----------|-----------------|
| treedata | <i>treedata</i> |
|----------|-----------------|

Description

treedata object constructor

Usage

treedata(...)

Arguments

... parameters

Value

treedata object

Author(s)

guangchuang yu

| | |
|----------------|--|
| treedata-class | <i>Class "treedata" This class stores phylogenetic tree with associated data</i> |
|----------------|--|

Description

Class "treedata" This class stores phylogenetic tree with associated data

Slots

file tree file
 treetext newick tree string
 phylo phylo object for tree structure
 data associated data
 extraInfo extra information, reserve for merge_tree
 tip_seq tip sequences
 anc_seq ancestral sequences

seq_type sequence type, one of NT or AA
tipseq_file tip sequence file
ancseq_file ancestral sequence file
info extra information, e.g. metadata, software version etc.

Author(s)

Guangchuang Yu <https://guangchuangyu.github.io>

tree_subset

Subset tree objects by related nodes

Description

This function allows for a tree object to be subset by specifying a node and returns all related nodes within a selected number of levels

Usage

```
tree_subset(  
  tree,  
  node,  
  levels_back = 5,  
  group_node = TRUE,  
  group_name = "group",  
  root_edge = TRUE  
)  
  
## S3 method for class 'phylo'  
tree_subset(  
  tree,  
  node,  
  levels_back = 5,  
  group_node = TRUE,  
  group_name = "group",  
  root_edge = TRUE  
)  
  
## S3 method for class 'treedata'  
tree_subset(  
  tree,  
  node,  
  levels_back = 5,  
  group_node = TRUE,  
  group_name = "group",  
  root_edge = TRUE  
)
```

Arguments

| | |
|-------------|---|
| tree | a tree object of class phylo |
| node | either a tip label or a node number for the given tree that will be the focus of the subsetted tree |
| levels_back | a number specifying how many nodes back from the selected node the subsetted tree should include |
| group_node | whether add grouping information of selected node |
| group_name | group name (default 'group') for storing grouping information if group_node = TRUE |
| root_edge | If TRUE (by default), set root.edge to path length of original root to the root of subset tree |

Details

This function will take a tree and a specified node from that tree and subset the tree showing all relatives back to a specified number of nodes. This function allows for a combination of ancestor and offspring to return a subsetted tree that is of class phylo. This allows for easy graphing of the tree with ggtree

Examples

```
set.seed(123)
tree <- ape::rtree(6)
sub_tree <- tree_subset(tree, node = "t1", levels_back = 2)
```

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