

Package ‘coda.plot’

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Type Package

Title Plots for Compositional Data

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Description Provides a collection of easy-to-use functions for creating visualizations of compositional data using 'ggplot2'. Includes support for common plotting techniques in compositional data analysis.

Depends R (>= 3.5), coda.base (>= 1.0.0)

License GPL

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Imports ggplot2 (>= 3.5.0)

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NeedsCompilation no

Author Marc Comas-Cufí [aut, cre] (ORCID:
<<https://orcid.org/0000-0001-9759-0622>>)

Maintainer Marc Comas-Cufí <mcomas@imae.udg.edu>

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balance_dendrogram *Compositional Balance Dendrogram*

Description

Plots a balance dendrogram based on a compositional data set and a corresponding balance matrix. This visualization helps interpret the structure of balances in compositional data analysis.

Usage

```
balance_dendrogram(X, B, group = NULL)
```

Arguments

X	A numeric matrix or data frame representing the compositional data. Rows are observations and columns are components (must be strictly positive).
B	A numeric matrix representing the balance basis (e.g., an isometric log-ratio (ilr) balance matrix).
group	Show boxplot by groups

Details

The dendrogram shows the hierarchical structure of balances derived from the balance matrix B. Each internal node corresponds to a balance, and the height or color may reflect the variance explained or other statistics.

Value

A 'ggplot2' object representing the balance dendrogram.

Examples

```
# Simulated compositional data and balances
X = matrix(runif(50, 1, 10), ncol = 5)
colnames(X) = LETTERS[1:5]
B = pb_basis(X, method = 'exact')
balance_dendrogram(X, B)
```

clr_biplot	<i>Compositional CLR Biplot</i>
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Description

Generates a centered log-ratio (CLR) biplot for compositional data.

Usage

```
clr_biplot(
  X,
  group = NULL,
  biplot_type = "covariance",
  alpha = NULL,
  shape_group = NULL,
  return_data = FALSE
)
```

Arguments

X	A matrix or data frame containing compositional data.
group	factor used to color the observations.
biplot_type	Character string specifying the type of biplot. Either "covariance" (default) or "form".
alpha	Optional numeric value between 0 and 1. If provided, this overrides biplot_type. Controls the type of biplot: <ul style="list-style-type: none"> • 0 = covariance biplot • 1 = form biplot
shape_group	Optional factor used to assign shapes to the observations.
return_data	Should the data (observations and variables) be returned

Value

A ggplot object displaying the biplot. If return_data is TRUE, a list containing dataframes with observations and variables and the ggplot object is returned.

coda.plot	<i>coda.plot</i>
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Description

Easy to run function to built visualisations by means of 'ggplot2' objects.

Author(s)

Marc Comas-Cufí

`geometric_mean_barplot`*Geometric Mean Barplot for Compositional Data*

Description

Generates a barplot based on the geometric mean of compositional parts. Optionally, it can compare groups, display the parts on the x-axis, overlay boxplots, or use centered log-ratio (clr) transformation.

Usage

```
geometric_mean_barplot(  
  X,  
  group,  
  x_show_parts = TRUE,  
  include_boxplot = FALSE,  
  clr_scale = FALSE  
)
```

Arguments

<code>X</code>	A numeric matrix or data frame representing compositional data. Each row is an observation and each column is a part (must be strictly positive).
<code>group</code>	An optional factor or character vector indicating group membership for each observation.
<code>x_show_parts</code>	Logical. If TRUE, the x-axis displays parts instead of group labels. Default is TRUE.
<code>include_boxplot</code>	Logical. If TRUE, a boxplot is overlaid on top of the barplot. Default is FALSE.
<code>clr_scale</code>	Logical. If TRUE, the data are transformed to clr coordinates before computing geometric means. Default is FALSE.

Details

The function computes geometric means for each compositional part, optionally stratified by groups. If `clr_scale = TRUE`, the data are transformed using the centered log-ratio transformation before computing means. Overlaying a boxplot can help visualize within-group variability.

Value

A 'ggplot2' object representing the geometric mean barplot.

Examples

```
# Example with simulated compositional data
X = matrix(runif(30, 1, 10), ncol = 3)
colnames(X) = c("A", "B", "C")
group = rep(c("G1", "G2"), each = 5)
geometric_mean_barplot(X, group, include_boxplot = TRUE)
```

ternary_diagram	<i>Ternary Diagram</i>
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Description

Generates a ternary diagram from compositional data, with options to center, scale, and color the points by group. Optionally overlays principal components.

Usage

```
ternary_diagram(  
  X,  
  group = NULL,  
  center = FALSE,  
  scale = FALSE,  
  show_pc = FALSE  
)
```

Arguments

X	A numeric matrix or data frame of compositional data with exactly three columns.
group	A factor or character vector indicating groups for color coding (optional).
center	Logical. Should the data be centered before plotting? Default is FALSE.
scale	Logical. Should the data be scaled to unit variance? Default is FALSE.
show_pc	Logical. If TRUE, principal components are overlaid. Default is FALSE.

Value

A ggplot plot object (inherits from ggplot).

Examples

```
X = milk_cows[,5:7]  
group = milk_cows$group  
ternary_diagram(X, group = group)
```

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