

Package ‘bexy’

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Type Package

Title Visualize and Parse the Output of 'BeXY'

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Description Provides functions for summarizing and plotting the output of the command-line tool 'BeXY' (<<https://bitbucket.org/wegmannlab/bexy>>), a tool that performs Bayesian inference of sex chromosome karyotypes and sex-linked scaffolds from low-depth sequencing data.

License GPL-2

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bexy	<i>Accurate Bayesian inference of sex chromosome karyotypes and sex-linked scaffolds from low-depth sequencing data</i>
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Description

Visualization of results produced by BeXY

Usage

```
bexy(path = NULL, readMCMCTrace = FALSE)
```

Arguments

path	The path where all the output files of BeXY are located. If NULL, the example files will be loaded.
readMCMCTrace	If TRUE, read the full trace of the MCMC of all parameters (potentially slow).

Value

An object of type bexy.

getPosteriorMeanRho	<i>Getting posterior mean rho (ploidy ratio parameter) for each scaffold</i>
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Description

Getting posterior mean rho (ploidy ratio parameter) for each scaffold

Usage

```
getPosteriorMeanRho(object)
```

Arguments

object A bexy object.

Value

A numeric vector containing the posterior mean of rho for each scaffold

See Also

[bexy](#)

Examples

```
bex <- bexy()  
getPosteriorMeanRho(bex)
```

getPosteriorModeAutosomalTrisomy

Getting the posterior mode for each autosomal trisomy

Description

Getting the posterior mode for each autosomal trisomy

Usage

```
getPosteriorModeAutosomalTrisomy(  
  object,  
  scaffoldName,  
  threshold_certainty = 0.9  
)
```

Arguments

object A bexy object.

scaffoldName The scaffold name, must be an autosome.

threshold_certainty

The threshold for certainty on the posterior probabilities. All samples that have a posterior probability less than this threshold are classified as 'uncertain'.

Value

A character vector containing the trisomy classification for each sample for the given scaffold

See Also

[bexy](#)

Examples

```
bex <- bexy()  
getPosteriorModeAutosomalTrisomy(bex, "21")
```

getPosteriorModeScaffoldTypes

Getting the posterior mode for each scaffold type

Description

Getting the posterior mode for each scaffold type

Usage

```
getPosteriorModeScaffoldTypes(object, threshold_certainty = 0.9)
```

Arguments

object A bexy object.

threshold_certainty

The threshold for certainty on the posterior probabilities. All scaffolds that have a posterior probability less than this threshold are classified as 'uncertain'.

Value

A character vector containing the scaffold type classification for each scaffold

See Also

[bexy](#)

Examples

```
bex <- bexy()  
getPosteriorModeScaffoldTypes(bex)
```

getPosteriorModeSexKaryotypes

Getting the posterior mode for each sex karyotype

Description

Getting the posterior mode for each sex karyotype

Usage

```
getPosteriorModeSexKaryotypes(object, threshold_certainty = 0.9)
```

Arguments

object A bexy object.

threshold_certainty

The threshold for certainty on the posterior probabilities. All samples that have a posterior probability less than this threshold are classified as 'uncertain'.

Value

A character vector containing the sex karyotype classification for each sample

See Also

[bexy](#)

Examples

```
bex <- bexy()  
getPosteriorModeSexKaryotypes(bex)
```

getSamplesWithAutosomalTrisomy

Getting all samples classified as a certain autosomal trisomy

Description

Getting all samples classified as a certain autosomal trisomy

Usage

```
getSamplesWithAutosomalTrisomy(object, scaffoldName, threshold_certainty = 0.9)
```

Arguments

`object` A bexy object.
`scaffoldName` The scaffold name, must be an autosome.
`threshold_certainty`
 The threshold for certainty on the posterior probabilities. All samples that have a posterior probability less than this threshold are classified as 'uncertain'.

Value

A character vector containing all sample names that are classified as having an autosomal trisomy of scaffold 'scaffoldName'

See Also

[bexy](#)

Examples

```
bex <- bexy()
getSamplesWithAutosomalTrisomy(bex, "21")
```

`getSamplesWithThisKaryotype`

Getting all samples classified as a specific sex karyotype

Description

Getting all samples classified as a specific sex karyotype

Usage

```
getSamplesWithThisKaryotype(object, karyotype, threshold_certainty = 0.9)
```

Arguments

`object` A bexy object.
`karyotype` One specific sex karyotype, can be XY, XX, X0, XXY, XYY, XXX or XXYY.
`threshold_certainty`
 The threshold for certainty on the posterior probabilities. All samples that have a posterior probability less than this threshold are classified as 'uncertain'.

Value

A character vector containing all sample names that are classified as the sex karyotype given by argument 'karyotype'.

See Also

[bexy](#)

Examples

```
bex <- bexy()  
getSamplesWithThisKaryotype(bex, "XX")
```

getScaffoldsWithThisType

Getting all scaffolds classified as a specific scaffold type

Description

Getting all scaffolds classified as a specific scaffold type

Usage

```
getScaffoldsWithThisType(object, type, threshold_certainty = 0.9)
```

Arguments

object	A bexy object.
type	One specific scaffold type, can be Autosome, Y-linked, X-linked or Different.
threshold_certainty	The threshold for certainty on the posterior probabilities. All scaffolds that have a posterior probability less than this threshold are classified as 'uncertain'.

Value

A character vector containing all scaffold names that are classified as the scaffold type given by argument 'type'.

See Also

[bexy](#)

Examples

```
bex <- bexy()  
getScaffoldsWithThisType(bex, "X-linked")
```

`plot.bexy`*Plotting a bexy object*

Description

Plotting a bexy object

Usage

```
## S3 method for class 'bexy'  
plot(  
  x,  
  colors = c("turquoise3", "darkorange", "royalblue4"),  
  sampleNamesToHighlight = c(),  
  label = TRUE,  
  addSquares = TRUE,  
  ...  
)
```

Arguments

<code>x</code>	A bexy object.
<code>colors</code>	A vector of length three with the colors for aneuploid, XX and XY samples, respectively.
<code>sampleNamesToHighlight</code>	A vector of sample names that should be highlighted. If empty, samples are automatically highlighted based on the posterior probabilities.
<code>label</code>	Boolean indicating whether samples should be labeled.
<code>addSquares</code>	Boolean indicating whether 7-cell posterior probability square plots should be drawn.
<code>...</code>	Other parameters used for plotting.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()  
plot(bex)
```

plotAutosomalTrisomy *Plotting the autosomal trisomies*

Description

Plotting the autosomal trisomies

Usage

```
plotAutosomalTrisomy(  
  x,  
  scaffoldName,  
  colors = c("deepskyblue4", "darkred"),  
  sampleNamesToHighlight = c(),  
  label = TRUE,  
  ...  
)
```

Arguments

x	A bexy object.
scaffoldName	The name of the scaffold to plot (has to be an autosome)
colors	A vector of length two with the colors for diploid and triploid samples, respectively.
sampleNamesToHighlight	A vector of sample names that should be highlighted. If empty, samples are automatically highlighted based on the posterior probabilities.
label	Boolean indicating whether samples should be labeled.
...	Other parameters used for plotting.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()  
plotAutosomalTrisomy(bex, "21")
```

`plotAutosomalTrisomyCounts`*Plotting the autosomal trisomies: counts on that scaffold*

Description

Plotting the autosomal trisomies: counts on that scaffold

Usage

```
plotAutosomalTrisomyCounts(  
  x,  
  scaffoldName,  
  colors = c("deepskyblue4", "darkred"),  
  sampleNamesToHighlight = c(),  
  label = TRUE,  
  ...  
)
```

Arguments

<code>x</code>	A bexy object.
<code>scaffoldName</code>	The name of the scaffold to plot (has to be an autosome)
<code>colors</code>	A vector of length two with the colors for diploid and triploid samples, respectively.
<code>sampleNamesToHighlight</code>	A vector of sample names that should be highlighted. If empty, samples are automatically highlighted based on the posterior probabilities.
<code>label</code>	Boolean indicating whether samples should be labeled.
<code>...</code>	Other parameters used for plotting.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()  
plotAutosomalTrisomyCounts(bex, "21")
```

plotAutosomalTrisomyPosteriorProbabilities
Plotting the autosomal trisomies: posterior probabilities

Description

Plotting the autosomal trisomies: posterior probabilities

Usage

```
plotAutosomalTrisomyPosteriorProbabilities(  
  x,  
  scaffoldName,  
  colors = c("deepskyblue4", "darkred"),  
  sampleNamesToHighlight = c(),  
  label = TRUE,  
  ...  
)
```

Arguments

x	A bexy object.
scaffoldName	The name of the scaffold to plot (has to be an autosome)
colors	A vector of length two with the colors for diploid and triploid samples, respectively.
sampleNamesToHighlight	A vector of sample names that should be highlighted. If empty, samples are automatically highlighted based on the posterior probabilities.
label	Boolean indicating whether samples should be labeled.
...	Other parameters used for plotting.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()  
plotAutosomalTrisomyPosteriorProbabilities(bex, "21")
```

plotMCMCTrace *Plot the MCMC trace for a specific parameter*

Description

Plot the MCMC trace for a specific parameter

Usage

```
plotMCMCTrace(object, parameterName, maxNumPlots = 20)
```

Arguments

object A bexy object.
parameterName The name of the parameter to plot (e.g. rho, logSigma, epsilon, s, t, a, f, ...)
maxNumPlots The maximum number of plots to plot, default 20.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy(readMCMCTrace = TRUE)
plotMCMCTrace(bex, "rho", maxNumPlots = 1)
```

plotTernary *Plotting the ternary of a bexy object*

Description

Plotting the ternary of a bexy object

Usage

```
plotTernary(
  x,
  colors = c("turquoise3", "darkorange", "royalblue4"),
  sampleNamesToHighlight = c(),
  label = TRUE,
  addSquares = TRUE,
  ...
)
```

Arguments

x	A bexy object.
colors	A vector of length three with the colors for aneuploid, XX and XY samples, respectively.
sampleNamesToHighlight	A vector of sample names that should be highlighted. If empty, samples are automatically highlighted based on the posterior probabilities.
label	Boolean indicating whether samples should be labeled.
addSquares	Boolean indicating whether 7-cell posterior probability square plots should be drawn.
...	Other parameters used for plotting.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()
plotTernary(bex)
```

plotXY

Plotting the counts of a bexy object, colored by sex karyotype

Description

Plotting the counts of a bexy object, colored by sex karyotype

Usage

```
plotXY(
  x,
  colors = c("turquoise3", "darkorange", "royalblue4"),
  sampleNamesToHighlight = c(),
  label = TRUE,
  ...
)
```

Arguments

x	A bexy object.
colors	A vector of length three with the colors for aneuploid, XX and XY samples, respectively.
sampleNamesToHighlight	A vector of sample names that should be highlighted. If empty, samples are automatically highlighted based on the posterior probabilities.
label	Boolean indicating whether samples should be labeled.
...	Other parameters used for plotting.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()
plotXY(bex)
```

print.bexy

Printing a bexy object

Description

Printing a bexy object

Usage

```
## S3 method for class 'bexy'
print(x, ...)
```

Arguments

x	A bexy object.
...	Additional parameters passed to print functions.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()
print(bex)
```

`summary.bexy`*Summarizing a bexy object*

Description

Summarizing a bexy object

Usage

```
## S3 method for class 'bexy'
summary(object, ...)
```

Arguments

<code>object</code>	A bexy object.
<code>...</code>	Additional parameters passed to summary functions.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()
print(bex)
```

`writePosteriorModeAutosomalTrisomies`*Write a file with the posterior mode for each autosomal trisomy*

Description

Write a file with the posterior mode for each autosomal trisomy

Usage

```
writePosteriorModeAutosomalTrisomies(  
  object,  
  scaffoldName,  
  file,  
  threshold_certainty = 0.9  
)
```

Arguments

<code>object</code>	A bexy object.
<code>scaffoldName</code>	The scaffold name, must be an autosome.
<code>file</code>	The name of the output file.
<code>threshold_certainty</code>	The threshold for certainty on the posterior probabilities. All samples that have a posterior probability less than this threshold are classified as 'uncertain'.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()  
tf <- tempfile(fileext = ".txt")  
writePosteriorModeAutosomalTrisomies(bex, "21", tf)
```

`writePosteriorModeScaffoldTypes`*Write a file with the posterior mode for each scaffold type*

Description

Write a file with the posterior mode for each scaffold type

Usage

```
writePosteriorModeScaffoldTypes(object, file, threshold_certainty = 0.9)
```

Arguments

`object` A bexy object.

`file` The name of the output file.

`threshold_certainty`

The threshold for certainty on the posterior probabilities. All scaffolds that have a posterior probability less than this threshold are classified as 'uncertain'.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()
tf <- tempfile(fileext = ".txt")
writePosteriorModeScaffoldTypes(bex, tf)
```

`writePosteriorModeSexKaryotypes`*Write a file with the posterior mode for each sex karyotype*

Description

Write a file with the posterior mode for each sex karyotype

Usage

```
writePosteriorModeSexKaryotypes(object, file, threshold_certainty = 0.9)
```

Arguments

<code>object</code>	A <code>bexy</code> object.
<code>file</code>	The name of the output file.
<code>threshold_certainty</code>	The threshold for certainty on the posterior probabilities. All samples that have a posterior probability less than this threshold are classified as 'uncertain'.

Value

No return value, called for side effects.

See Also

[bexy](#)

Examples

```
bex <- bexy()
tf <- tempfile(fileext = ".txt")
writePosteriorModeSexKaryotypes(bex, tf)
```

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