PCA_BioBaes

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```
data("iris")
head(iris)
```

```
##   Sepal.Length Sepal.Width Petal.Length Petal.Width Species
## 1          5.1         3.5          1.4         0.2  setosa
## 2          4.9         3.0          1.4         0.2  setosa
## 3          4.7         3.2          1.3         0.2  setosa
## 4          4.6         3.1          1.5         0.2  setosa
## 5          5.0         3.6          1.4         0.2  setosa
## 6          5.4         3.9          1.7         0.4  setosa
```

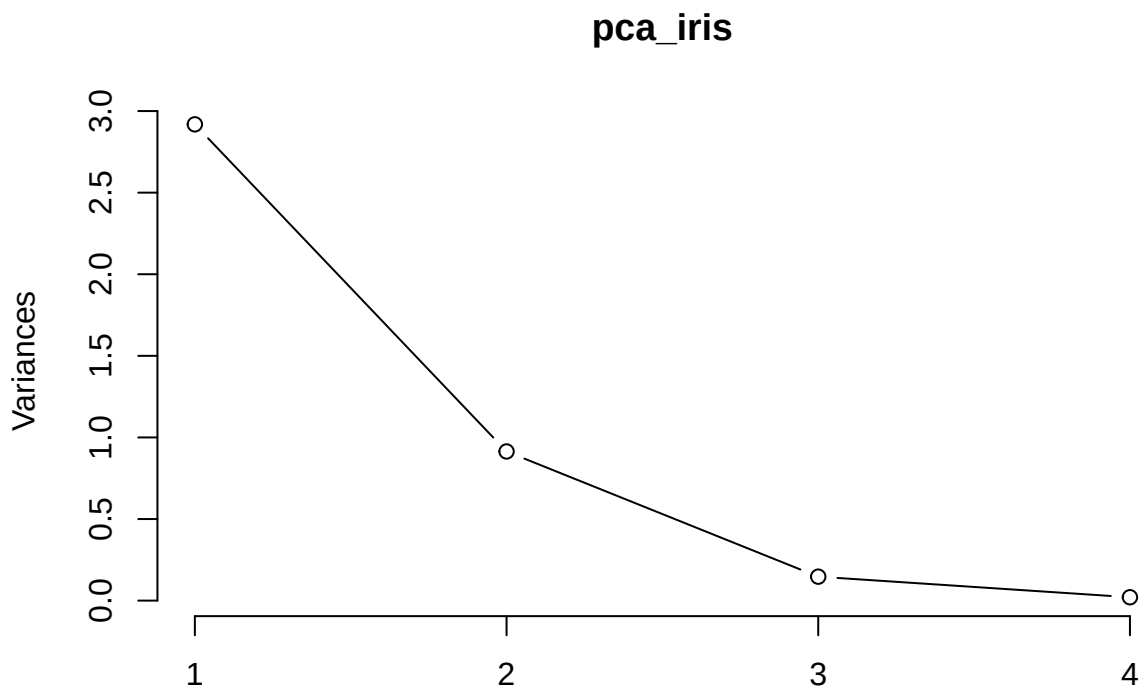
```
pca_iris <- prcomp(iris[,1:4], scale = T, center = T)

names(pca_iris)
```

```
## [1] "sdev"     "rotation" "center"   "scale"    "x"
```

```
summary(pca_iris)
```

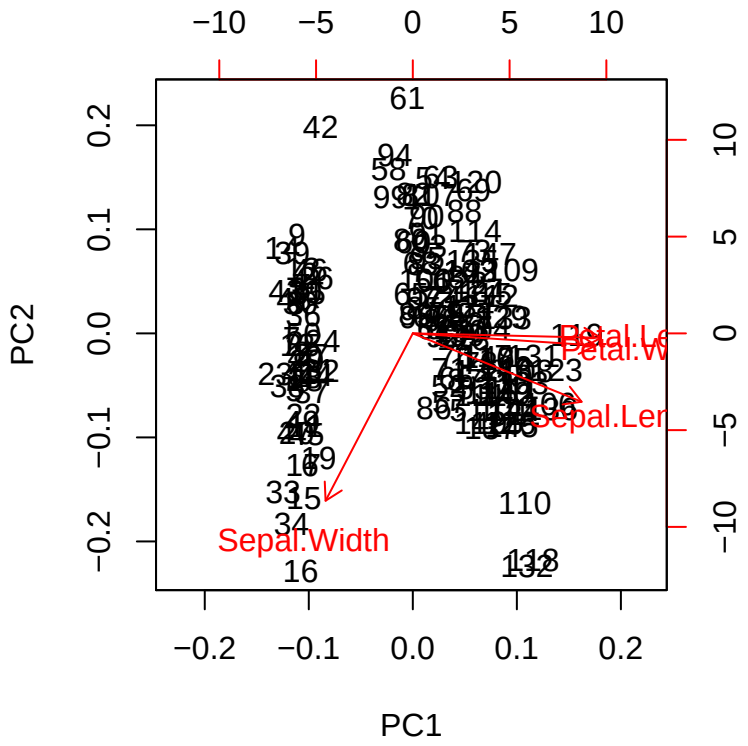
```
## Importance of components:
##                           PC1    PC2     PC3     PC4
## Standard deviation     1.7084 0.9560 0.38309 0.14393
## Proportion of Variance 0.7296 0.2285 0.03669 0.00518
## Cumulative Proportion  0.7296 0.9581 0.99482 1.00000
```

```
plot(pca_iris, type = 'l')
```

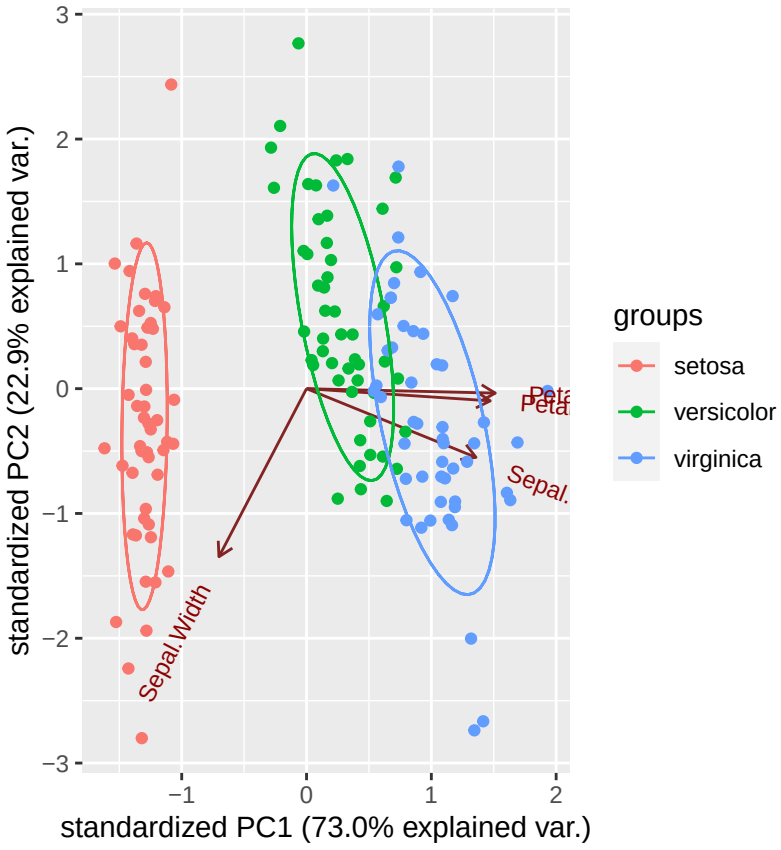



```
biplot(pca_iris)

# library(devtools)
# install_github("vqv/ggbiplot")
library(ggbiplot)
```

```
## Loading required package: ggplot2

## Loading required package: plyr

## Loading required package: scales

## Loading required package: grid
```



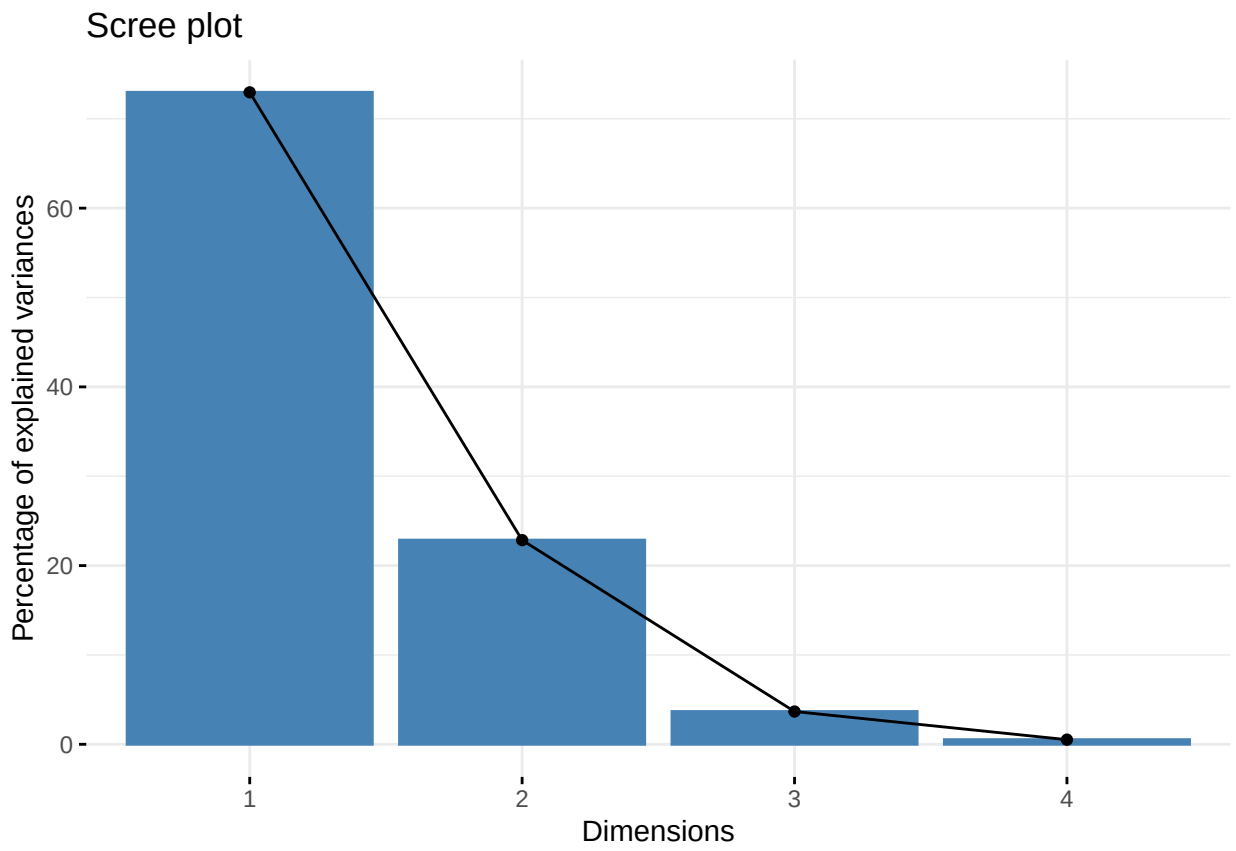

```
ggbiplot(pca_iris, ellipse = T, groups = iris$Species)
```



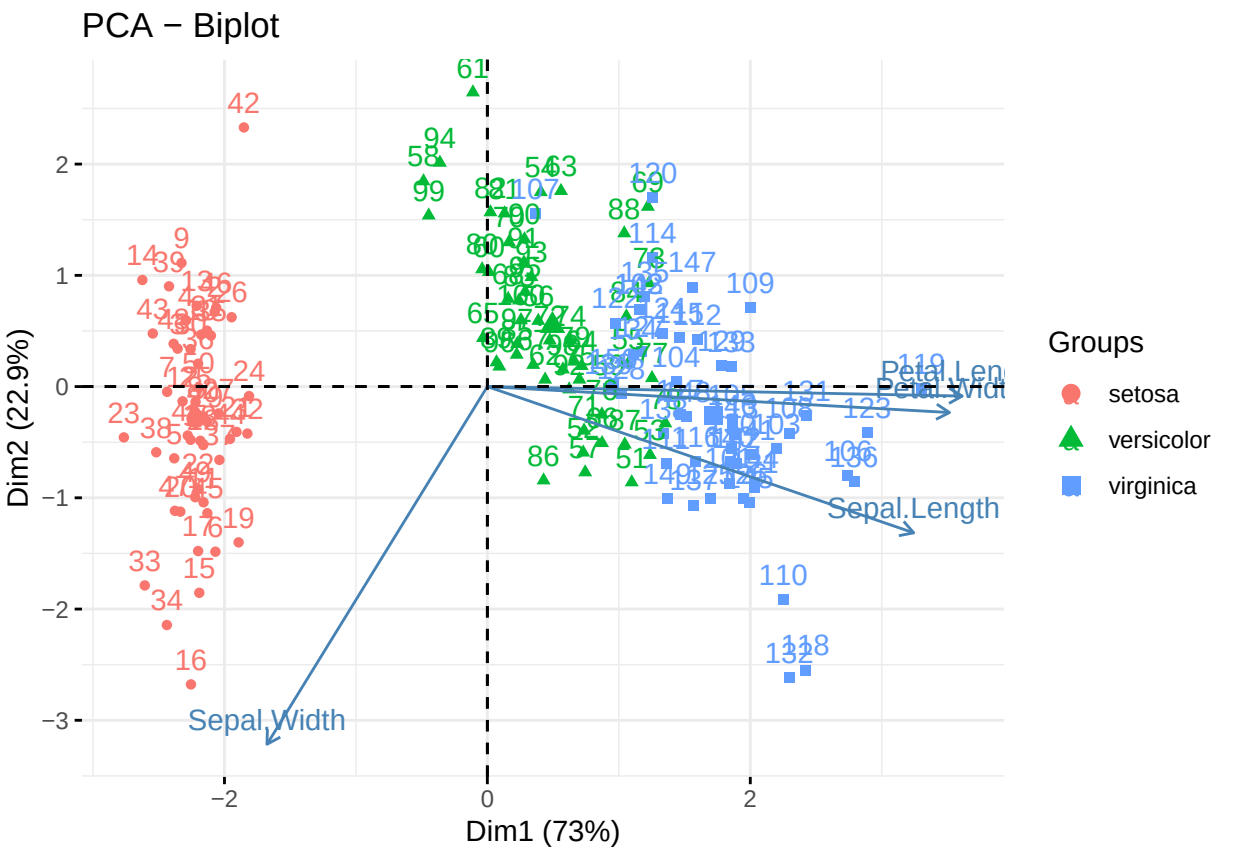

```
# install.packages("factoextra")
library(factoextra)
```

```
## Welcome! Want to learn more? See two factoextra-related books at https://goo.gl/ve3WBa
```

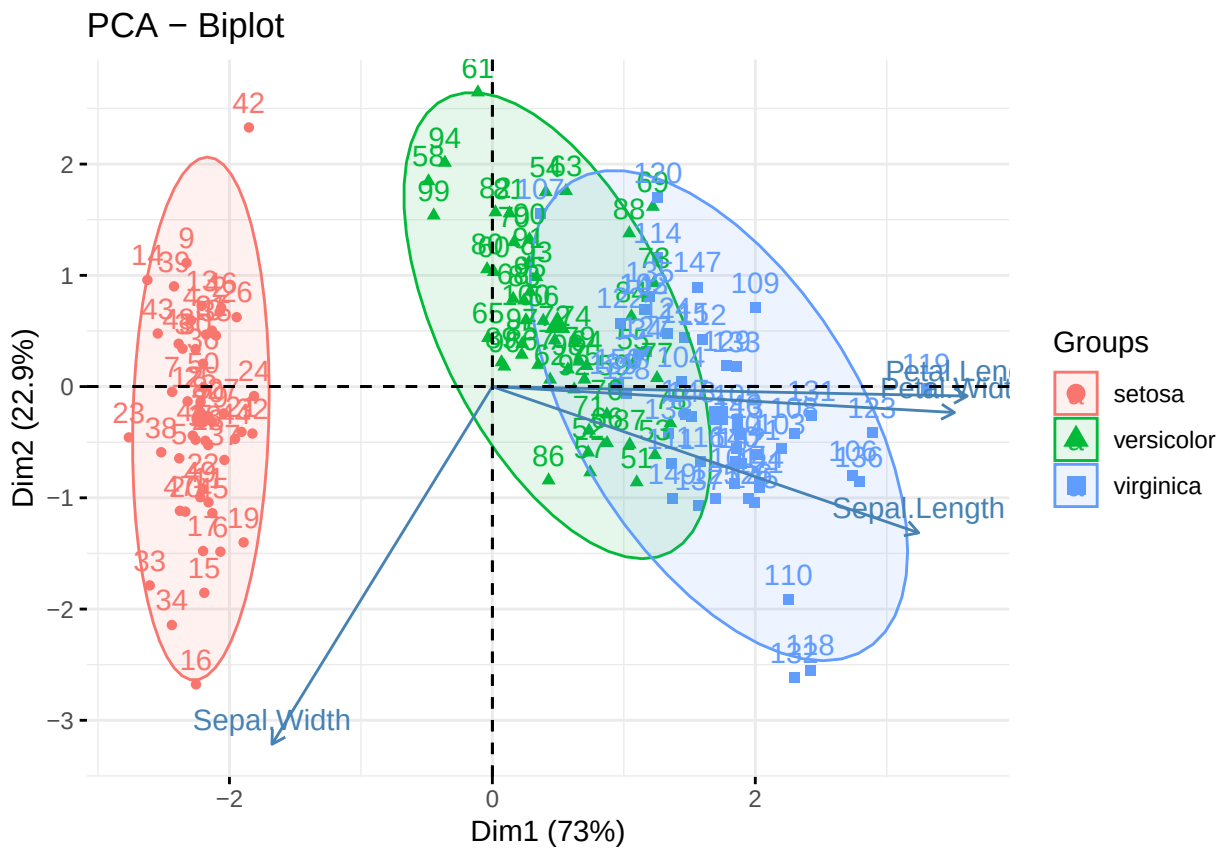
```
fviz_screeplot(pca_iris)
```




```
fviz_pca_biplot(pca_iris, habillage=iris$Species)
```



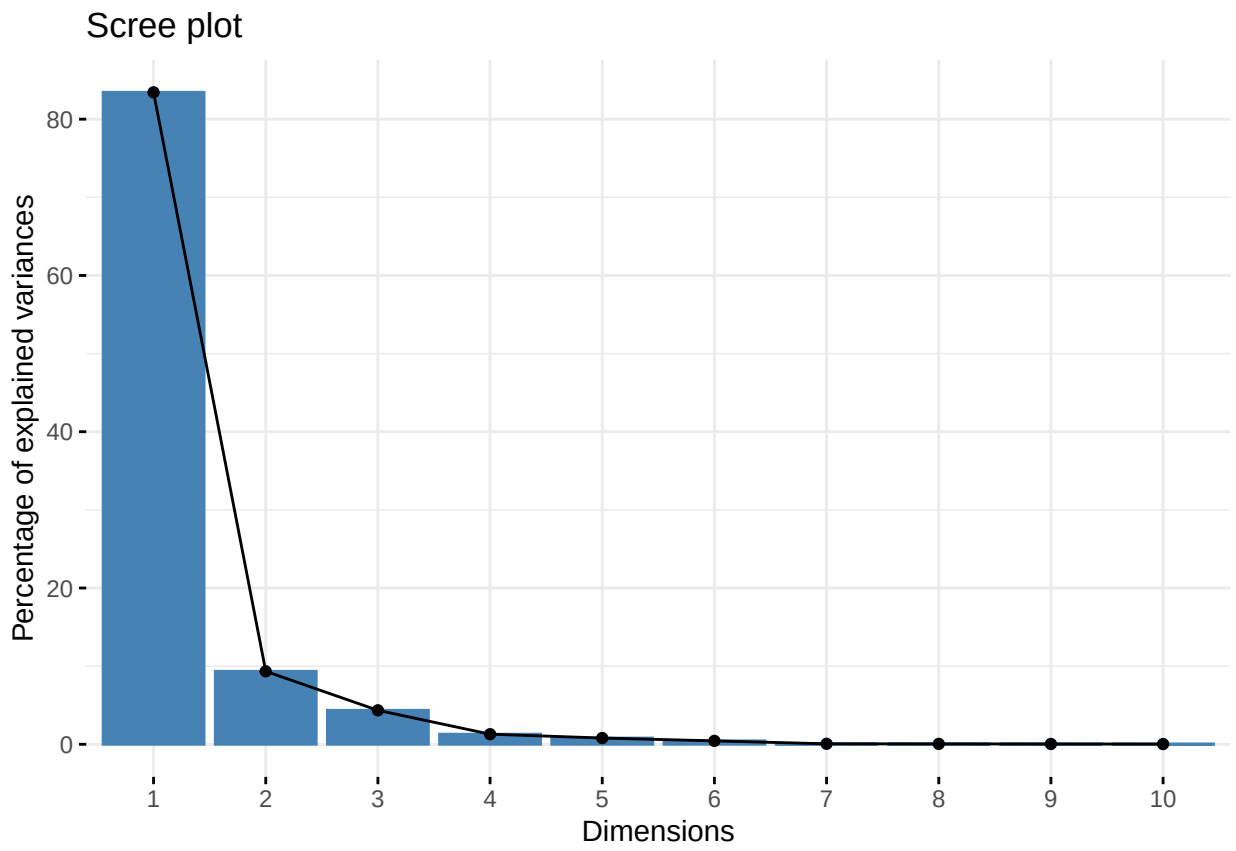

```
fviz_pca_biplot(pca_iris, habillage=iris$Species, addEllipses = TRUE)
```



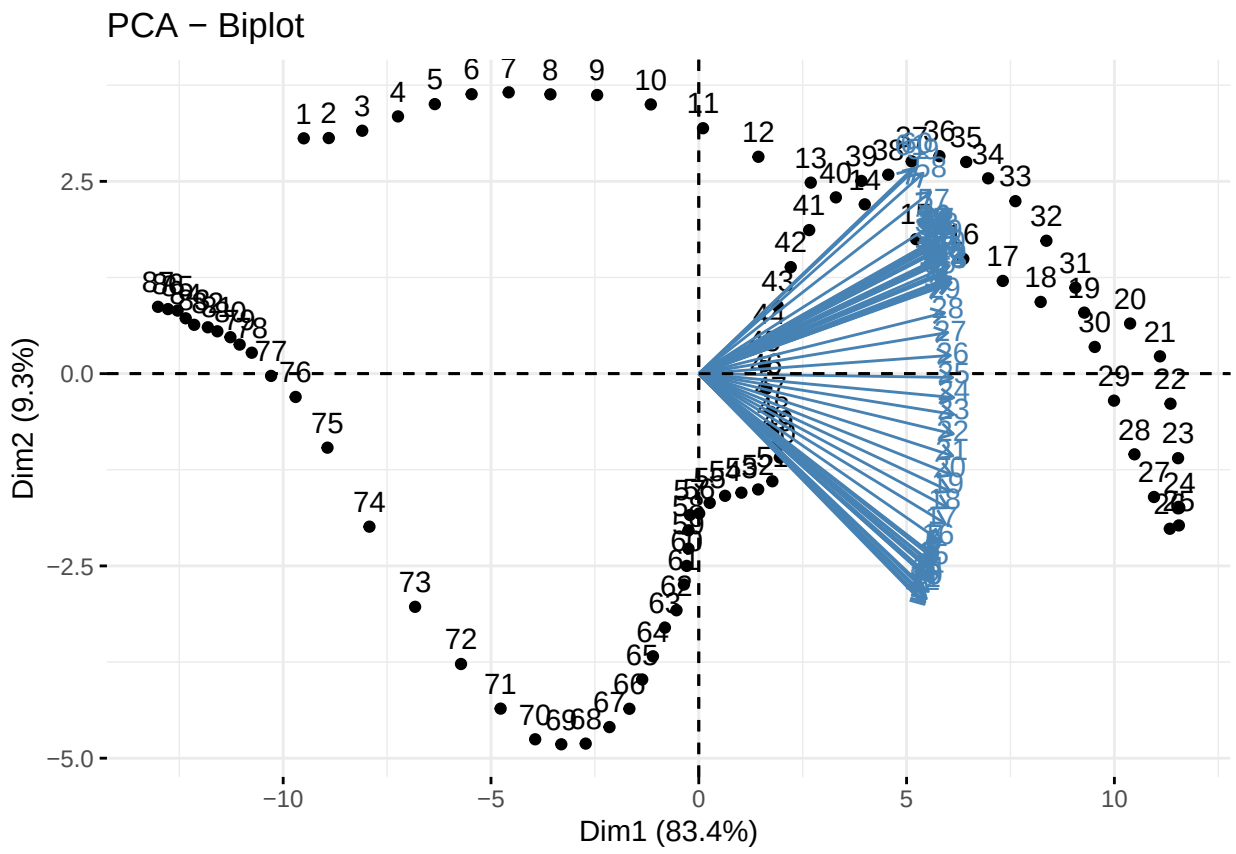

```
dim(volcano)
```

```
## [1] 87 61
```

```
View(volcano)

pca_vol <- prcomp(volcano, scale = TRUE)
fviz_screeplot(pca_vol)
```




```
fviz_pca_biplot(pca_vol)
```




```
summary(pca_vol)
```

```
## Importance of components:
##                           PC1    PC2     PC3     PC4    PC5     PC6     PC7
## Standard deviation     7.1341 2.3870 1.62844 0.88846 0.6985 0.51652 0.19751
## Proportion of Variance 0.8344 0.0934 0.04347 0.01294 0.0080 0.00437 0.00064
## Cumulative Proportion  0.8344 0.9277 0.97123 0.98417 0.9922 0.99654 0.99718
##                           PC8     PC9     PC10     PC11     PC12     PC13     PC14
## Standard deviation     0.17906 0.15857 0.13896 0.13137 0.11775 0.08713 0.08347
## Proportion of Variance 0.00053 0.00041 0.00032 0.00028 0.00023 0.00012 0.00011
## Cumulative Proportion  0.99770 0.99812 0.99843 0.99872 0.99894 0.99907 0.99918
##                           PC15    PC16    PC17    PC18    PC19    PC20    PC21
## Standard deviation     0.07835 0.07302 0.06734 0.06422 0.06060 0.05009 0.04876
## Proportion of Variance 0.00010 0.00009 0.00007 0.00007 0.00006 0.00004 0.00004
## Cumulative Proportion  0.99928 0.99937 0.99944 0.99951 0.99957 0.99961 0.99965
##                           PC22    PC23    PC24    PC25    PC26    PC27    PC28
## Standard deviation     0.04487 0.04214 0.04154 0.04097 0.03654 0.03594 0.03304
## Proportion of Variance 0.00003 0.00003 0.00003 0.00003 0.00002 0.00002 0.00002
## Cumulative Proportion  0.99969 0.99971 0.99974 0.99977 0.99979 0.99981 0.99983
##                           PC29    PC30    PC31    PC32    PC33    PC34    PC35
## Standard deviation     0.03161 0.02873 0.02747 0.02727 0.02541 0.02400 0.02318
## Proportion of Variance 0.00002 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001
## Cumulative Proportion  0.99985 0.99986 0.99987 0.99989 0.99990 0.99991 0.99991
##                           PC36    PC37    PC38    PC39    PC40    PC41    PC42
## Standard deviation     0.02249 0.02214 0.02116 0.02024 0.01931 0.01853 0.01692
```

```
## Proportion of Variance 0.00001 0.00001 0.00001 0.00001 0.00001 0.00001 0.00000
## Cumulative Proportion  0.99992 0.99993 0.99994 0.99995 0.99995 0.99996 0.99996
##                           PC43    PC44    PC45    PC46    PC47    PC48    PC49
## Standard deviation     0.01631 0.01569 0.01489 0.01452 0.01342 0.01303 0.01214
## Proportion of Variance 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000 0.00000
## Cumulative Proportion  0.99997 0.99997 0.99997 0.99998 0.99998 0.99998 0.99999
##                           PC50    PC51    PC52   PC53     PC54     PC55
## Standard deviation     0.01186 0.01119 0.01091 0.0102 0.009974 0.008944
## Proportion of Variance 0.00000 0.00000 0.00000 0.0000 0.000000 0.000000
## Cumulative Proportion  0.99999 0.99999 0.99999 1.0000 0.999990 1.000000
##                            PC56    PC57     PC58     PC59     PC60     PC61
## Standard deviation     0.007627 0.00686 0.006422 0.006061 0.005221 0.005089
## Proportion of Variance 0.000000 0.00000 0.000000 0.000000 0.000000 0.000000
## Cumulative Proportion  1.000000 1.00000 1.000000 1.000000 1.000000 1.000000
```