Moscas Manova

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Moscas

Pacotes

```
source("funcoes.R")
pacotes <- c("ggplot2",
             "magrittr",
             "gridExtra",
             "xtable",
             "dplyr",
             "purrr",
             "tidyr",
             "car")

ipak(pacotes)
```

```
## Loading required package: ggplot2
## Loading required package: magrittr
## Loading required package: gridExtra
## Loading required package: xtable
## Loading required package: dplyr
##
## Attaching package: 'dplyr'
## The following object is masked from 'package:gridExtra':
##
##     combine
## The following objects are masked from 'package:stats':
##
##     filter, lag
## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
## Loading required package: purrr
##
## Attaching package: 'purrr'
## The following objects are masked from 'package:dplyr':
##
##     contains, order_by
```

```
## The following object is masked from 'package:magrittr':
##
##     set_names
## Loading required package: tidyr
##
## Attaching package: 'tidyr'
## The following object is masked from 'package:magrittr':
##
##     extract
## Loading required package: car
##
## Attaching package: 'car'
## The following object is masked from 'package:purrr':
##
##     some
## The following object is masked from 'package:dplyr':
##
##     recode
##   ggplot2  magrittr gridExtra    xtable     dplyr     purrr     tidyr
##      TRUE      TRUE      TRUE      TRUE      TRUE      TRUE      TRUE
##       car
##      TRUE
```

```
options(xtable.comment = FALSE)
```

Lendo Os Dados

```
dados <- read.table("Dados/Moscas.txt")

nomes_COl <- c("Especie" = "Especie",
               "CompAsa" =  "Comprimento da asa",
               "LargAsa" = "Largura da asa",
               "Comp3Palpo" = "Comprimento do terceiro palpo",
               "Larg3Palpo" =  "Largura do terceiro palpo",
               "Comp4Palpo" = "Comprimento do quarto palpo",
               "Comp12Antena" =
            "Comprimento do 12º segmento\n da antena",
             "Comp13Antena" =  "Comprimento do 13º segmento\n da antena")



colnames(dados) <- c("Especie","CompAsa","LargAsa","Comp3Palpo",          "Larg3Palpo","Comp4Palpo","Co

Especie_chr <- function(x){
  if (x == 0)
    y <- "torrens"
  else
    y <- "carteri"
}
```

```
dados %<>% mutate( Especie_fct =
                     factor(map_chr(Especie,Especie_chr)))
```

Analise Descritiva

Preparação

```
mx <- dados[,2:8] %>% as.matrix()
nvar <- 7
n <- 70
```

Medidas Descritivas

```
descritivas <-
dados %>% select_if(.predicate = is.integer) %>%
  gather(Coluna,valores,-Especie) %>%
  group_by(Coluna,Especie) %>%
  summarise_if(.predicate = function(x) is.numeric(x),
                  .funs = c(Media = "mean",
                     DP = "sd",
                     Var. = "var",
                     Minimo = "min",
                     CV =  "cv",
                     Mediana = "median",
                     Maximo = "max")) %>%
  mutate_if(.predicate = is.numeric,funs(round(.,3))) %>%
  mutate(Espécie =  factor(map_chr(Especie,Especie_chr))) %>%
  select(-Especie)
descritivas <- descritivas[,c(1,9,2:8)]

descritivas_2 <- nest(descritivas)

for(i in 1:7){
  print(xtable(descritivas_2$data[[i]],
         caption = nomes_COl[descritivas_2$Coluna[i]] ))
}
```

	Espécie	Media	DP	Var.	Minimo	CV	Mediana	Maximo
1	torrens	9.57	0.92	0.84	8.00	9.58	9.00	13.00
2	carteri	9.66	1.26	1.58	6.00	13.04	10.00	12.00

Table 1: Comprimento do 12ºsegmento da antena

	Espécie	Media	DP	Var.	Minimo	CV	Mediana	Maximo
1	torrens	9.71	0.89	0.80	8.00	9.20	10.00	13.00
2	carteri	9.37	1.09	1.18	7.00	11.60	9.00	11.00

Table 2: Comprimento do 13ºsegmento da antena

	Espécie	Media	DP	Var.	Minimo	CV	Mediana	Maximo
1	torrens	35.37	2.20	4.83	31.00	6.21	36.00	39.00
2	carteri	39.31	2.84	8.04	33.00	7.21	39.00	44.00

Table 3: Comprimento do terceiro palpo

	Espécie	Media	DP	Var.	Minimo	CV	Mediana	Maximo
1	torrens	25.63	2.50	6.24	21.00	9.75	26.00	31.00
2	carteri	30.00	4.62	21.29	20.00	15.38	31.00	38.00

Table 4: Comprimento do quarto palpo

Boxplots

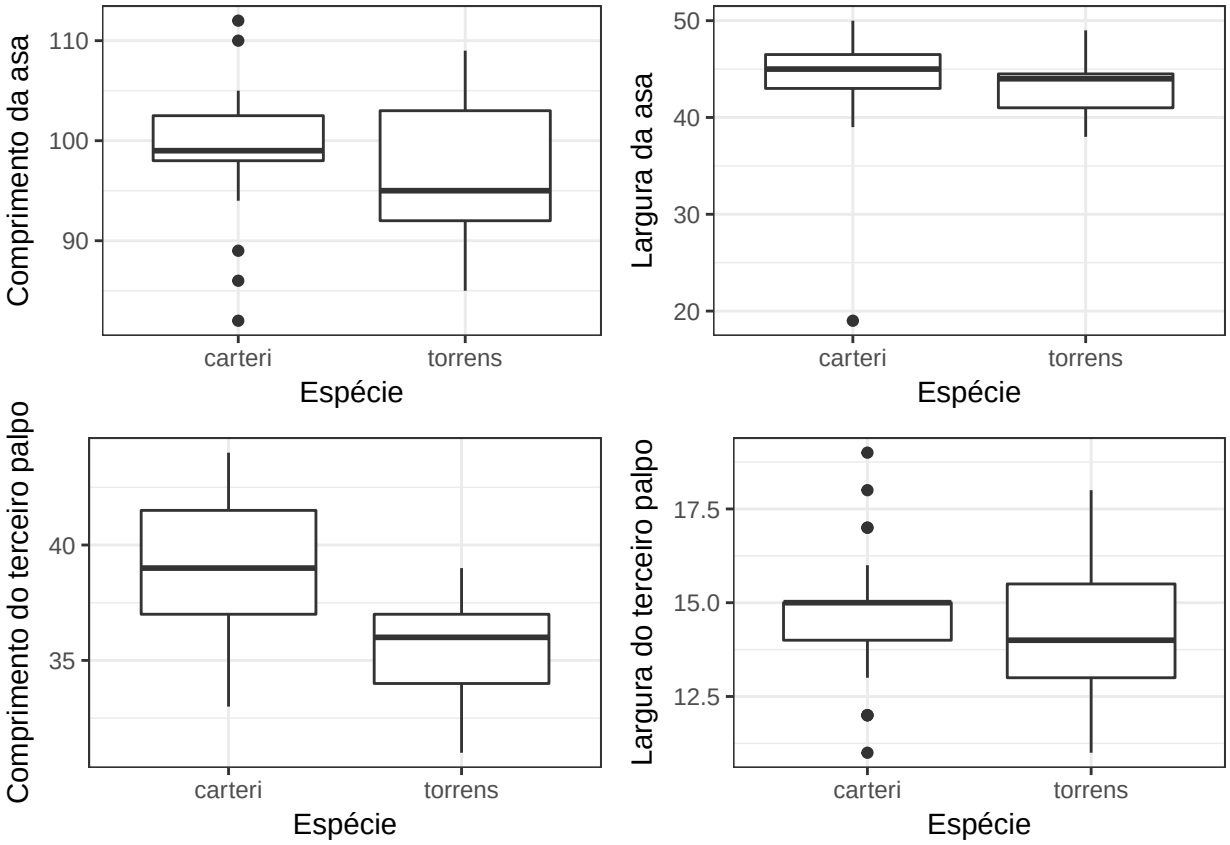
```
##criando funcao para facilitar a criação dos boxplots
boxplots_moscas <- function(coluna){
 qplot(dados$Especie_fct,coluna,geom = "boxplot") + labs(x = "Espécie") + theme_bw()
}

graficos <- apply(dados[,2:8],2,boxplots_moscas)

for(i in 1:7)
 graficos[[i]] <-  graficos[[i]] + labs(y = nomes_COl[i + 1])

##print os boxplots
grid.arrange(graficos[[1]], graficos[[2]],
             graficos[[3]], graficos[[4]])
```

	Espécie	Media	DP	Var.	Minimo	CV	Mediana	Maximo
1	torrens	96.46	6.38	40.73	85.00	6.62	95.00	109.00
2	carteri	99.34	5.59	31.29	82.00	5.63	99.00	112.00

Table 5: Comprimento da asa

	Espécie	Media	DP	Var.	Minimo	CV	Mediana	Maximo
1	torrens	14.51	1.84	3.38	11.00	12.66	14.00	18.00
2	carteri	14.66	1.64	2.70	11.00	11.22	15.00	19.00

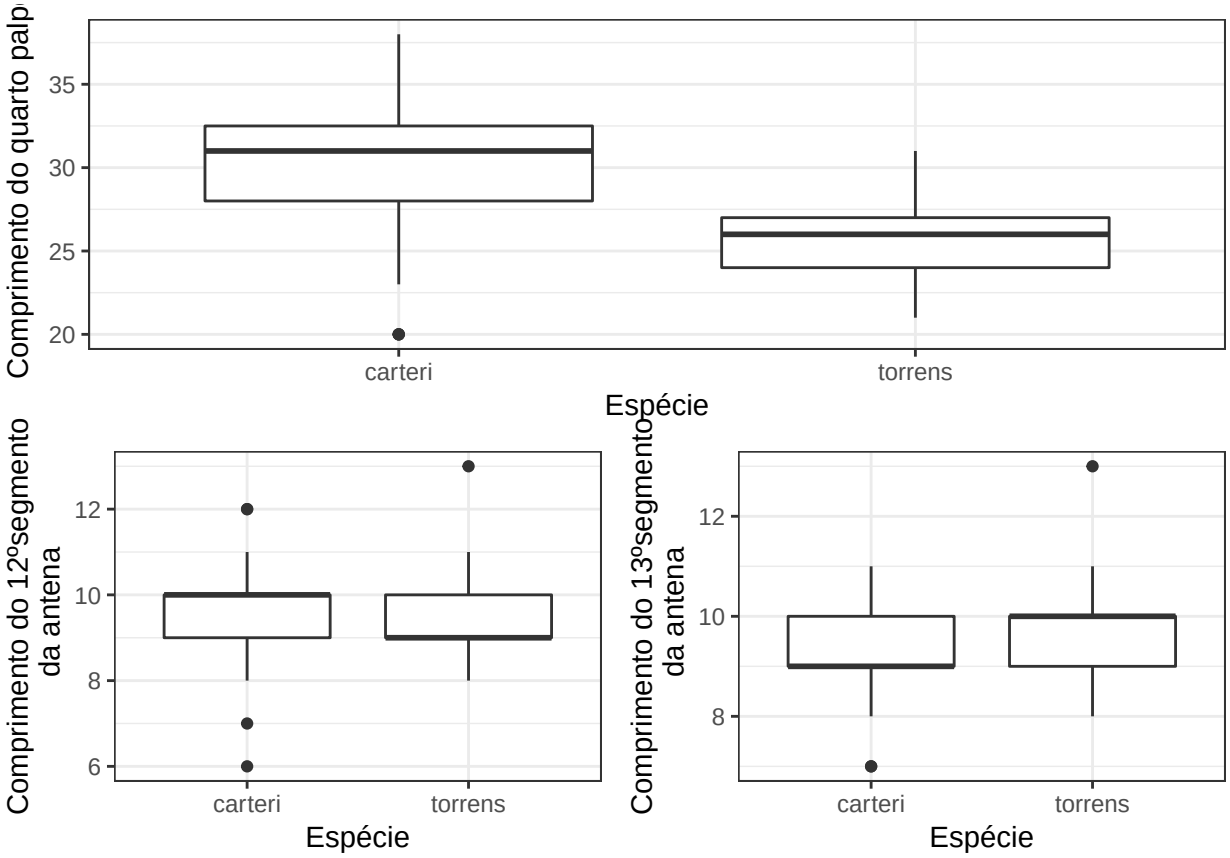
Table 6: Largura do terceiro palpo




```
grid.arrange(graficos[[5]], graficos[[6]],
             graficos[[7]],
             layout_matrix = rbind(c(1,1),c(2,3)))
```

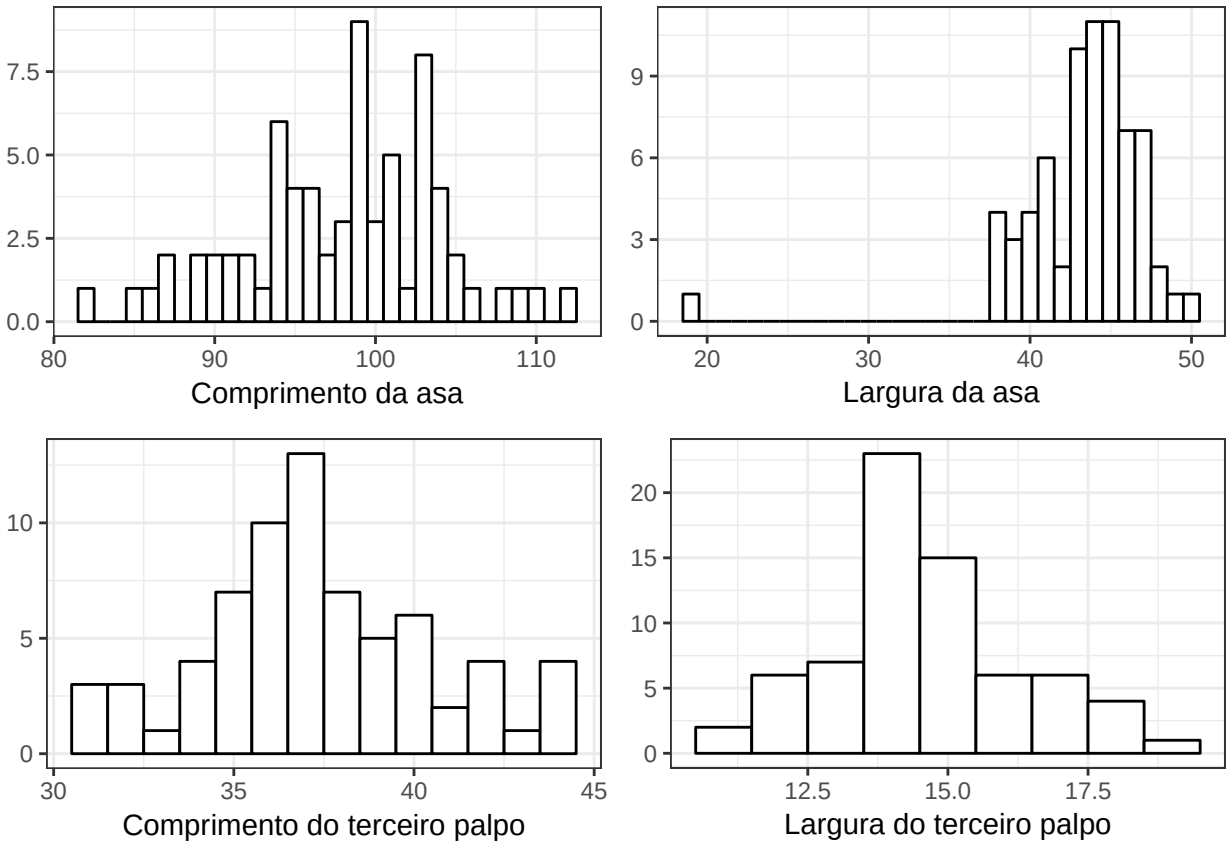
	Espécie	Media	DP	Var.	Minimo	CV	Mediana	Maximo
1	torrens	42.91	2.74	7.49	38.00	6.38	44.00	49.00
2	carteri	43.74	5.08	25.79	19.00	11.61	45.00	50.00

Table 7: Largura da asa

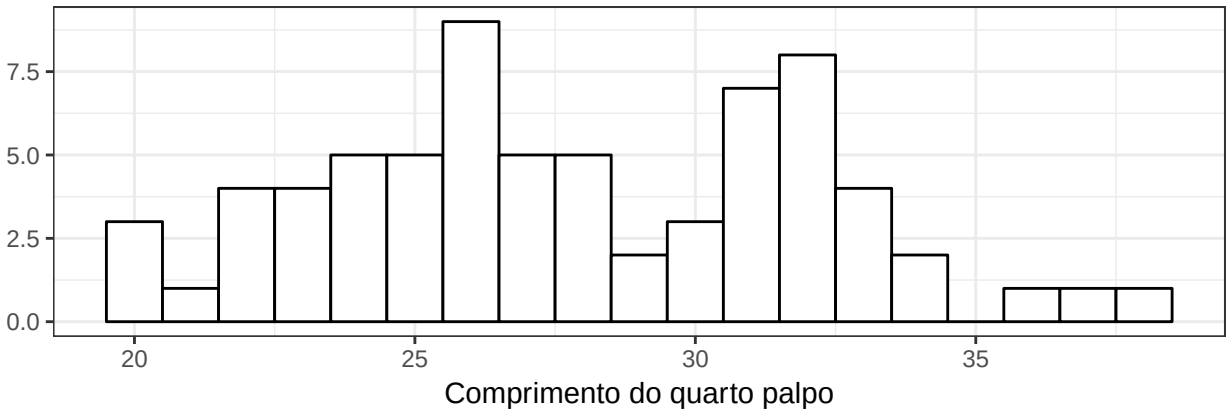


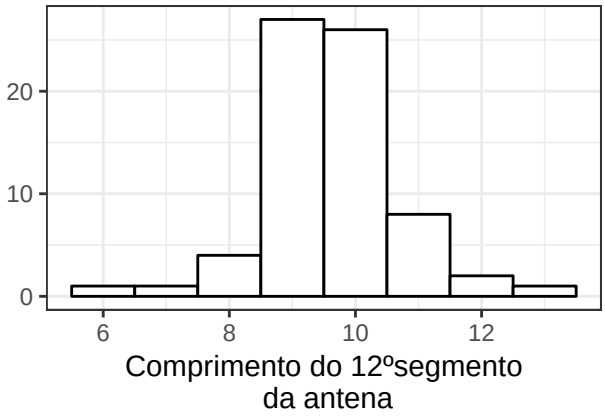
Histograma

```
##criando funcao para facilitar a criação dos boxplots
hist_moscas <- function(coluna){
 qplot(coluna,geom = "histogram",col = I("black"),fill = I("white"),
       binwidth = 1) + theme_bw()
}

graficos <- apply(dados[,2:8],2,hist_moscas)

for(i in 1:7)
 graficos[[i]] <-  graficos[[i]] + labs(x = nomes_COl[i+1],y = NULL)

##print os boxplots
grid.arrange(graficos[[1]], graficos[[2]],
             graficos[[3]], graficos[[4]])
```




```
grid.arrange(graficos[[5]], graficos[[6]],
             graficos[[7]],
            layout_matrix = rbind(c(1,1),c(2,3)))
```





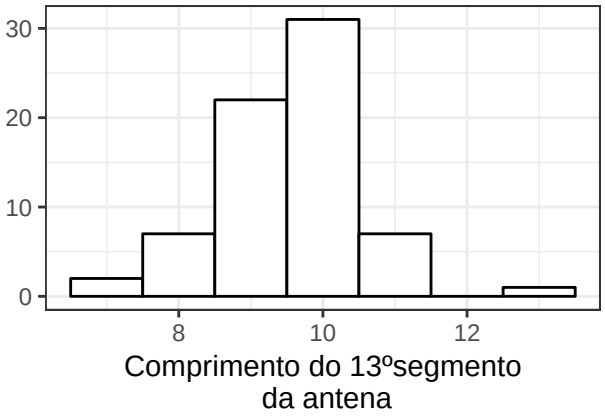
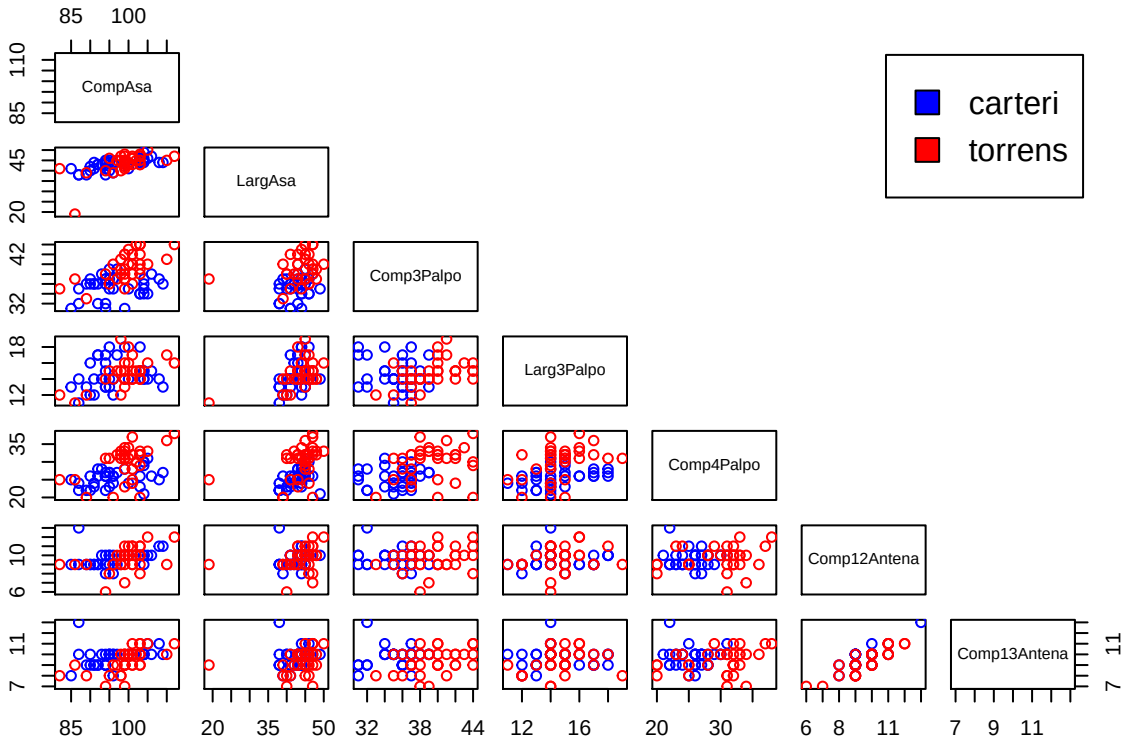


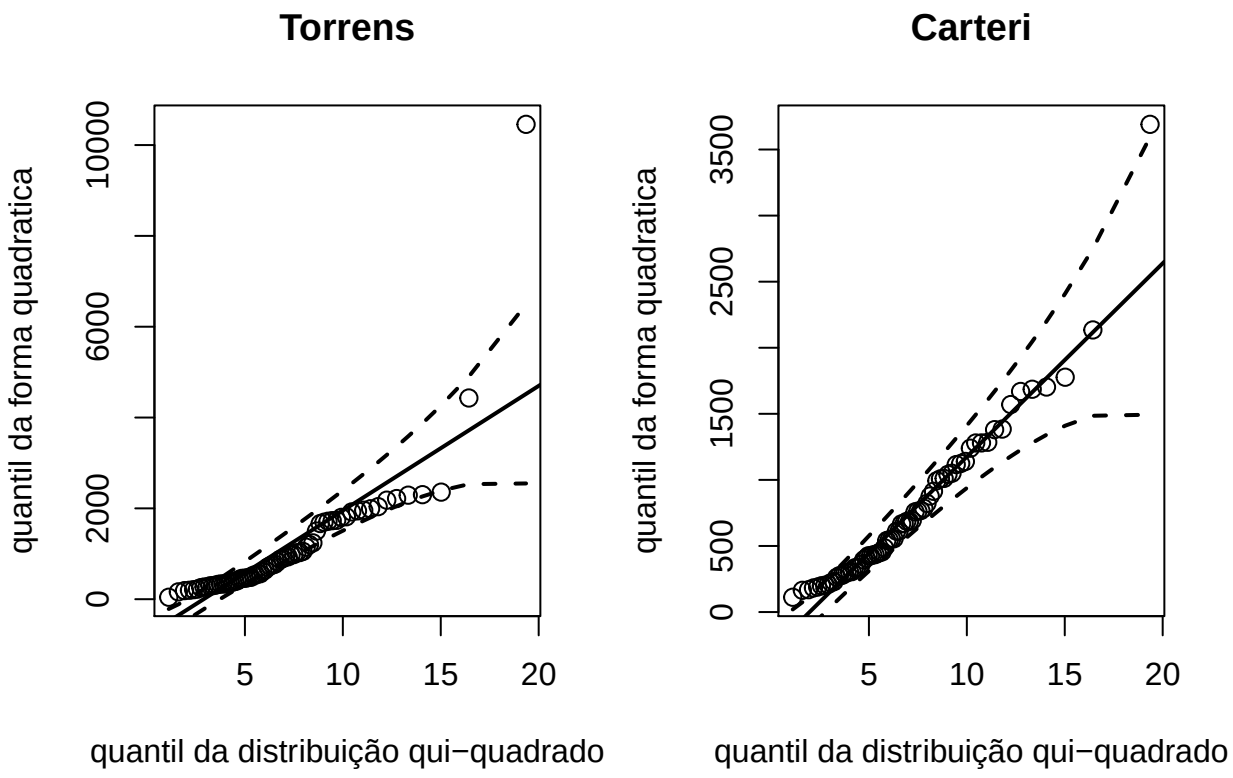
Diagrama Dispersao

```
cols <- character(nrow(dados))
cols[] <- "black"

cols[dados$Especie_fct == "carteri"] <- "red"
cols[dados$Especie_fct == "torrens"] <- "blue"
pairs(dados[,2:8],col=cols,upper.panel = NULL)
par(xpd = T)
legend("topright", legend = c(levels(dados$Especie_fct)),
       fill = c("blue","red"))
```



Distancia de Mahalanobis

```
par(mfrow = c(1,2))

# Envelopes para a forma quadratica
#
mu <- apply(dados[dados$Especie == 0, 2:8], 2, mean)
s2 <- cov(dados[dados$Especie == 0,2:8])
vQ <- n*mahalanobis(mx,center = mu,cov = s2)
qqPlot(vQ, dist = "chisq", df = nvar, col.lines = 1, grid = "FALSE", xlab = "quantil da distribuição qu

##

mu <- apply(dados[dados$Especie == 1, 2:8],2,mean)
s2 <- cov(dados[dados$Especie == 1,2:8])
vQ <- n*mahalanobis(mx,center = mu,cov = s2)

qqPlot(vQ, dist = "chisq", df = nvar, col.lines = 1, grid = "FALSE", xlab = "quantil da distribuição qu
```


Torrens
quantil da forma quadratica
0
2000
6000
10000
5
10
15
20
quantil da distribuição qui−quadrado
Carteri
quantil da forma quadratica
0
500
1500
2500
3500
5
10
15
20
quantil da distribuição qui−quadrado