QTL-SRS

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16/10/2021

```
dat <- read_excel("dataset2.XLS")
summary(dat)
```

```
##      Fecha                         Centro             Unidad
##  Min.   :2019-02-09 00:00:00   Length:12825       Length:12825
##  1st Qu.:2019-06-01 00:00:00   Class :character   Class :character
##  Median :2019-07-26 00:00:00   Mode  :character   Mode  :character
##  Mean   :2019-07-25 16:53:46
##  3rd Qu.:2019-09-20 00:00:00
##  Max.   :2019-12-09 00:00:00
##    Subgrupo         Número de peces   Biomasa_kg       Mortalidad
##  Length:12825       Min.   :    0   Min.   :     0   Min.   :   0.000
##  Class :character   1st Qu.:16308   1st Qu.: 23766   1st Qu.:   0.000
##  Mode  :character   Median :28340   Median : 42046   Median :   1.000
##                     Mean   :24143   Mean   : 44360   Mean   :   9.889
##                     3rd Qu.:29028   3rd Qu.: 59946   3rd Qu.:   8.000
##                     Max.   :29209   Max.   :114599   Max.   :1982.000
##  Mortalidad_Biomasa_kg   N_cosecha       Biomasa_cosecha    Alimento_kg
##  Min.   :   0.000      Min.   :    0.0   Min.   :    0.0   Min.   :   0.0
##  1st Qu.:   0.000      1st Qu.:    0.0   1st Qu.:    0.0   1st Qu.: 285.0
##  Median :   2.015      Median :    0.0   Median :    0.0   Median : 446.0
##  Mean   :  27.549      Mean   :   76.9   Mean   :  270.1   Mean   : 440.6
##  3rd Qu.:  17.845      3rd Qu.:    0.0   3rd Qu.:    0.0   3rd Qu.: 604.0
##  Max.   :7671.965      Max.   :22602.0   Max.   :78009.3   Max.   :1560.0
##   Temperatura
##  Min.   : 0.00
##  1st Qu.:10.79
##  Median :11.20
##  Mean   :11.15
##  3rd Qu.:11.70
##  Max.   :15.00
```

```
head(dat)
```

```
## # A tibble: 6 x 12
##   Fecha               Centro Unidad Subgrupo `Número de peces` Biomasa_kg
##   <dttm>              <chr>  <chr>  <chr>                <dbl>      <dbl>
## 1 2019-08-24 00:00:00 A      205    QTL2                 16302     35625.
## 2 2019-08-25 00:00:00 A      205    QTL2                 16302     35879.
## 3 2019-08-26 00:00:00 A      205    QTL2                 16302     36261.
## 4 2019-08-27 00:00:00 A      205    QTL2                 16302     36684.
## 5 2019-08-28 00:00:00 A      205    QTL2                 16302     37100.
## 6 2019-08-29 00:00:00 A      205    QTL2                 16302     37435.
```

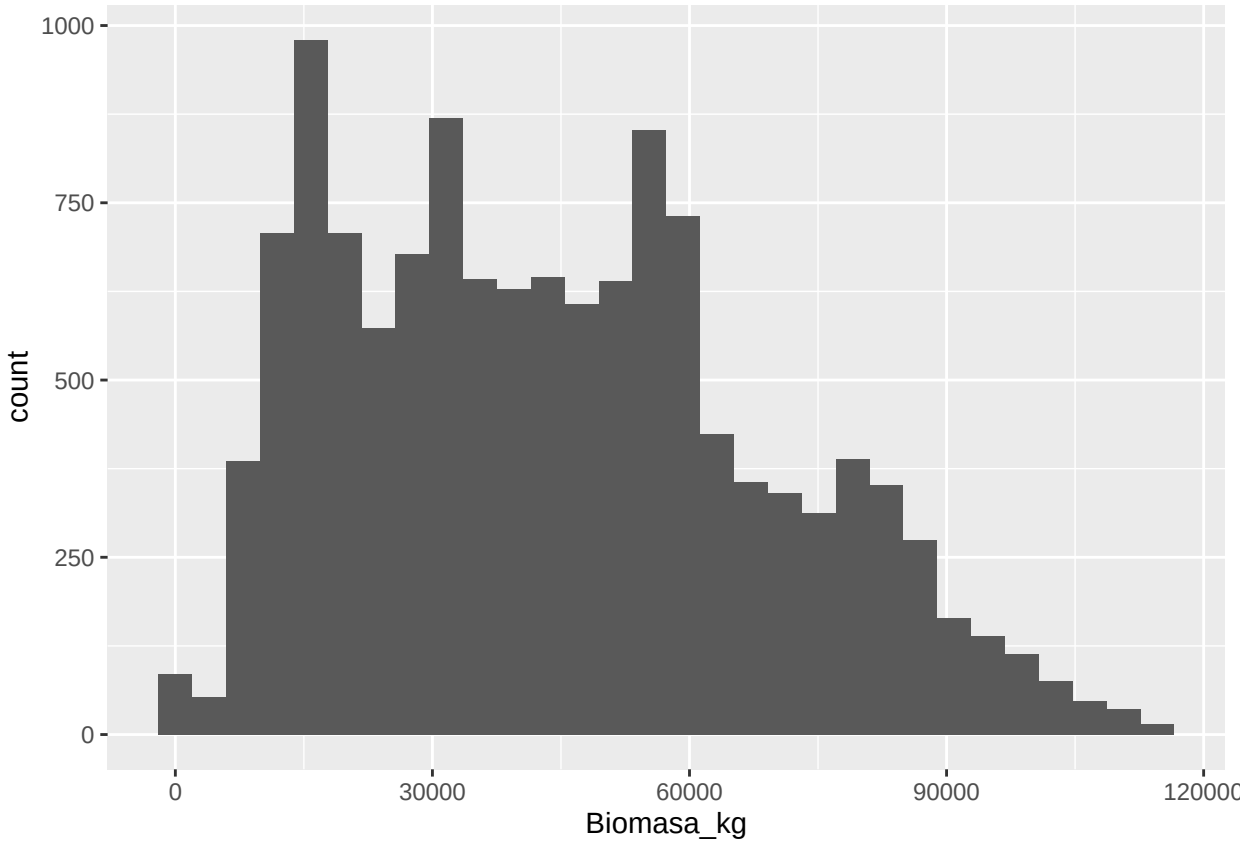
```
## # ... with 6 more variables: Mortalidad <dbl>, Mortalidad_Biomasa_kg <dbl>,
## #   N_cosecha <dbl>, Biomasa_cosecha <dbl>, Alimento_kg <dbl>,
## #   Temperatura <dbl>
```

```
str(dat)
```

```
## tibble [12,825 x 12] (S3: tbl_df/tbl/data.frame)
##  $ Fecha                : POSIXct[1:12825], format: "2019-08-24" "2019-08-25" ...
##  $ Centro               : chr [1:12825] "A" "A" "A" "A" ...
##  $ Unidad               : chr [1:12825] "205" "205" "205" "205" ...
##  $ Subgrupo             : chr [1:12825] "QTL2" "QTL2" "QTL2" "QTL2" ...
##  $ Número de peces      : num [1:12825] 16302 16302 16302 16302 16302 ...
##  $ Biomasa_kg           : num [1:12825] 35625 35879 36261 36684 37100 ...
##  $ Mortalidad           : num [1:12825] 0 0 0 0 0 0 0 1 2 2 ...
##  $ Mortalidad_Biomasa_kg: num [1:12825] 0 0 0 0 0 ...
##  $ N_cosecha            : num [1:12825] 0 0 0 0 0 0 0 0 0 0 ...
##  $ Biomasa_cosecha      : num [1:12825] 0 0 0 0 0 0 0 0 0 0 ...
##  $ Alimento_kg          : num [1:12825] 455 300 450 500 490 396 472 562 435 556 ...
##  $ Temperatura          : num [1:12825] 11.3 11.1 11.1 11.3 10.3 ...
```

```
ggplot(dat, aes(x = Biomasa_kg)) +
  geom_histogram()
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

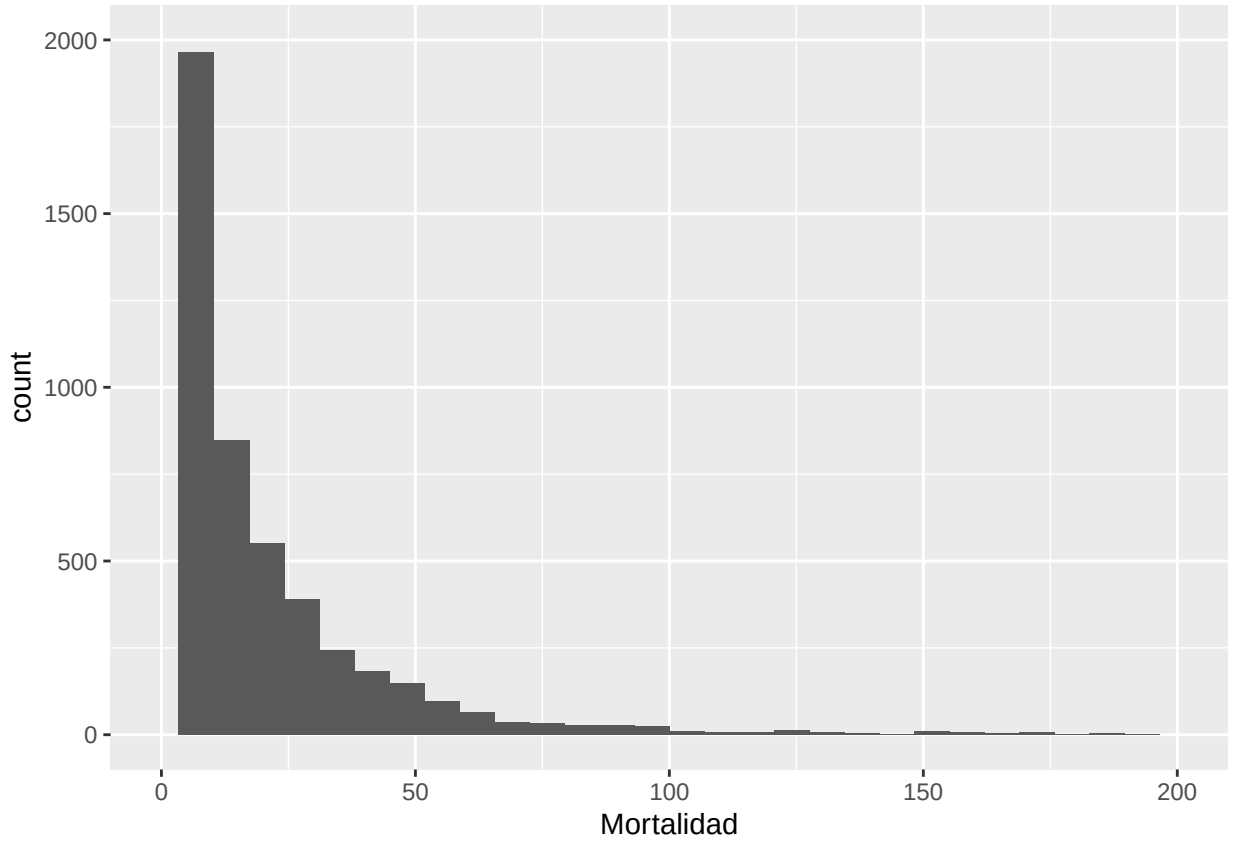



```
ggplot(dat, aes(x = Mortalidad)) +
  geom_histogram()+ scale_x_continuous(limit = c(0,200))+ scale_y_continuous(limit = c(0,2000))
```

```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

```
## Warning: Removed 34 rows containing non-finite values (stat_bin).
```

```
## Warning: Removed 2 rows containing missing values (geom_bar).
```

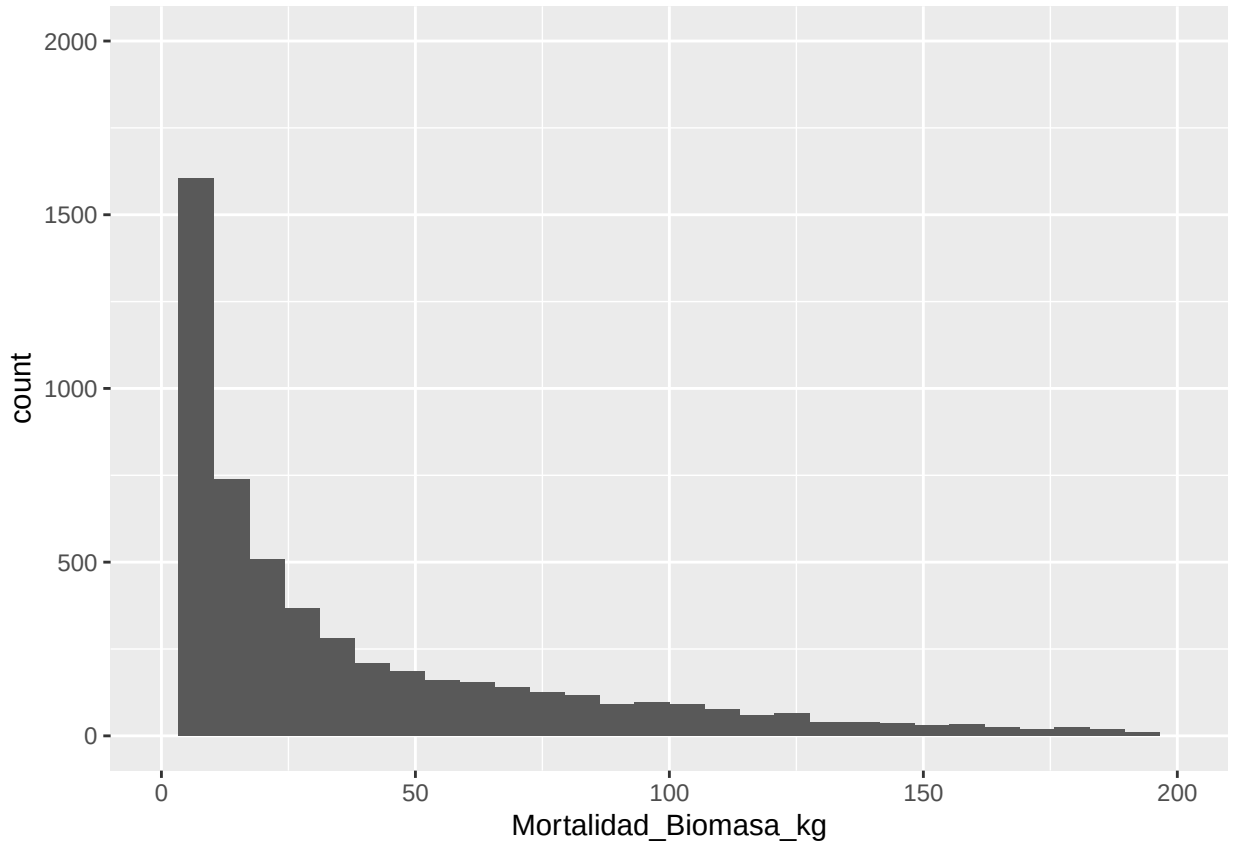



```
ggplot(dat, aes(x = Mortalidad_Biomasa_kg)) +
  geom_histogram()+ scale_x_continuous(limit = c(0,200))+ scale_y_continuous(limit = c(0,2000))
```

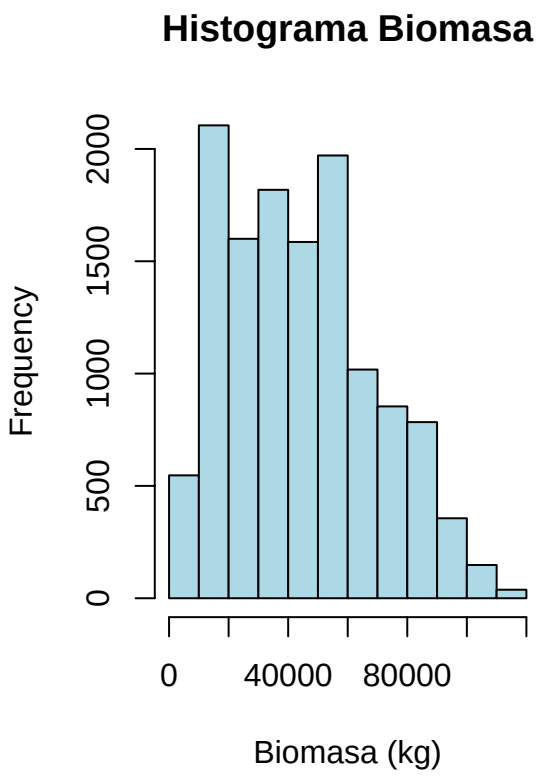
```
## `stat_bin()` using `bins = 30`. Pick better value with `binwidth`.
```

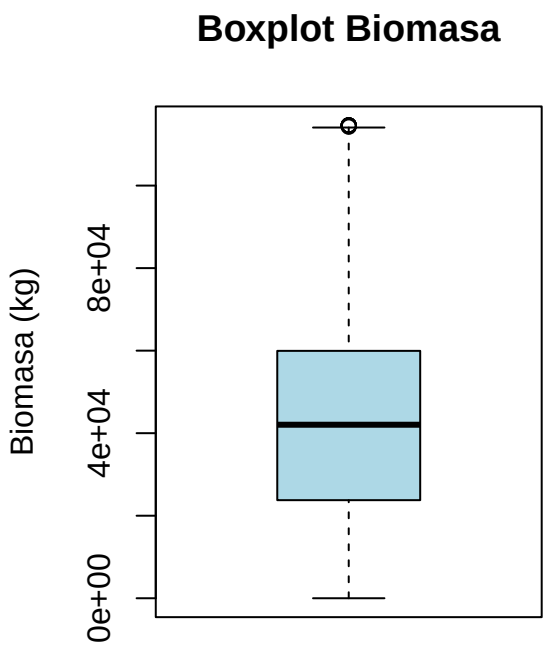
```
## Warning: Removed 254 rows containing non-finite values (stat_bin).
```

```
## Warning: Removed 2 rows containing missing values (geom_bar).
```

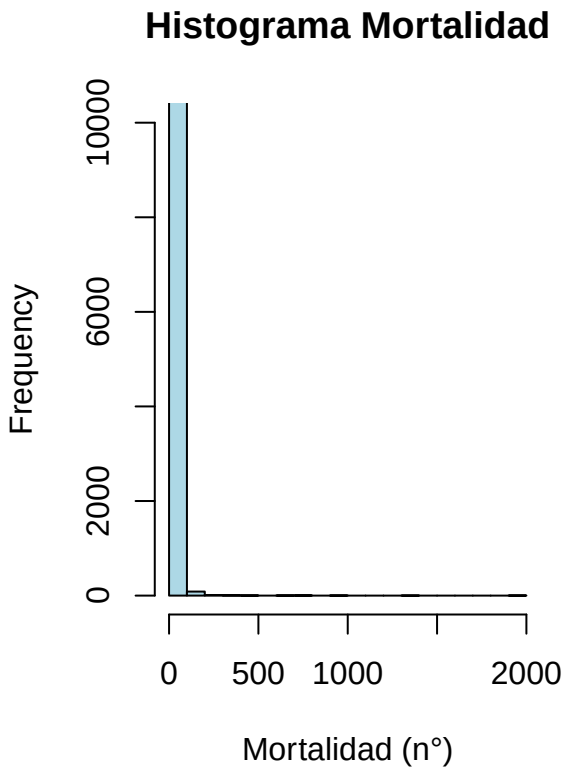


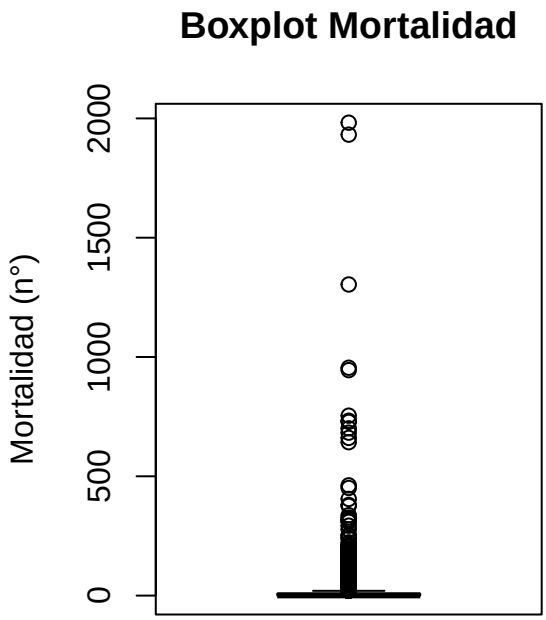

```
par(mfrow=c(1,2))
hist(dat$Biomasa_kg, col="light blue", main = "Histograma Biomasa", xlab = "Biomasa (kg)")
boxplot(dat$Biomasa_kg, col="light blue", main = "Boxplot Biomasa", ylab = "Biomasa (kg)")
```






```
par(mfrow=c(1,2))
hist(dat$Mortalidad, col="light blue", main = "Histograma Mortalidad", xlab = "Mortalidad (n°)",
     xlim = c(0, 2000),
     ylim = c(0, 10000))
boxplot(dat$Mortalidad, col="light blue", main = "Boxplot Mortalidad", ylab = "Mortalidad (n°)")
```





```
table(dat$Subgrupo)
```

```
##
## QTL1 QTL2 SQTL
## 3256 9078  491
```

```
table(dat$Centro)
```

```
##
##    A    B    C    D
## 4130 3222 2217 3256
```

```
dat$Centro <- as.factor(dat$Centro)
dat$Subgrupo <- as.factor(dat$Subgrupo)
str(dat)
```

```
## tibble [12,825 x 12] (S3: tbl_df/tbl/data.frame)
##  $ Fecha                : POSIXct[1:12825], format: "2019-08-24" "2019-08-25" ...
##  $ Centro               : Factor w/ 4 levels "A","B","C","D": 1 1 1 1 1 1 1 1 1 1 ...
##  $ Unidad               : chr [1:12825] "205" "205" "205" "205" ...
##  $ Subgrupo             : Factor w/ 3 levels "QTL1","QTL2",..: 2 2 2 2 2 2 2 2 2 2 ...
##  $ Número de peces      : num [1:12825] 16302 16302 16302 16302 16302 ...
##  $ Biomasa_kg           : num [1:12825] 35625 35879 36261 36684 37100 ...
##  $ Mortalidad           : num [1:12825] 0 0 0 0 0 0 0 1 2 2 ...
##  $ Mortalidad_Biomasa_kg: num [1:12825] 0 0 0 0 0 ...
##  $ N_cosecha            : num [1:12825] 0 0 0 0 0 0 0 0 0 0 ...
##  $ Biomasa_cosecha      : num [1:12825] 0 0 0 0 0 0 0 0 0 0 ...
##  $ Alimento_kg          : num [1:12825] 455 300 450 500 490 396 472 562 435 556 ...
##  $ Temperatura          : num [1:12825] 11.3 11.1 11.1 11.3 10.3 ...
```

```
table(dat$Subgrupo,dat$Centro)
```

```
##
##           A    B    C    D
##   QTL1    0    0    0 3256
##   QTL2 4130 3222 1726    0
##   SQTL    0    0  491    0
```

```
tabla1 <- with(dat,table(Subgrupo,Centro))
prop.table(tabla1)
```

```
##         Centro
## Subgrupo         A         B         C         D
##     QTL1 0.0000000 0.0000000 0.0000000 0.2538791
##     QTL2 0.3220273 0.2512281 0.1345809 0.0000000
##     SQTL 0.0000000 0.0000000 0.0382846 0.0000000
```

Los datos no están balanceados. Hay más observaciones para el Subgrupo QTL2 (70,7%) que para otros subgrupos