BalsamVolExplr.R

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Sun Nov 27 19:22:28 2016

```
library(ggplot2)
library(dplyr)
```

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union
```

```
setwd("D:/Iowa State University/Debinski Lab/Nectar data/MAL")

balsvol15 <- read.csv("nectar analysis/data files/balsvol15.csv", header = T)
balsvol16 <- read.csv("nectar analysis/data files/balsvol16.csv", header = T)
balsvolboth <- rbind(balsvol15,balsvol16)

#Data summaries

summary(balsvol15)
```

```
##          date         plot    treatment     plant        volume
##  2015-06-08:21   CHSR8  :19   C:31      CC6-9  :10   Min.   :0.01818
##  2015-06-11:20   CH5    :16   H:61      CHSR8-4: 9   1st Qu.:0.16364
##  2015-06-03:17   CC6    :12             CH5-6  : 7   Median :0.40909
##  2015-06-06:12   EH4    :11             CHSR8-6: 6   Mean   :0.54012
##  2015-06-10:10   WHSR9  : 9             EHSR1-2: 6   3rd Qu.:0.63636
##  2015-06-02: 6   EHSR1  : 6             CH5-7  : 4   Max.   :3.98182
##  (Other)   : 6   (Other):19             (Other):50
```

```
summary(balsvol16)
```

```
##          date         plot    treatment     plant         volume
##  2016-06-05:19   CC6    :19   C:85      EC3-3  :  8   Min.   :0.01818
##  2016-06-06:34   CHSR8  :19   H:83      WHSR9-2:  8   1st Qu.:0.07273
##  2016-06-07:45   CH5    :18             CC6-10 :  7   Median :0.12727
##  2016-06-08:60   EHSR1  :16             CH5-2  :  6   Mean   :0.15942
##  2016-06-16:10   CSR7   :15             EC3-1  :  6   3rd Qu.:0.20000
##                  EH4    :15             EHSR1-1:  6   Max.   :0.85455
##                  (Other):66             (Other):127
```

```
summary(balsvolboth)
```

```
##          date         plot    treatment     plant         volume
##  2016-06-08:60   CHSR8  :38   C:116     CHSR8-4: 12   Min.   :0.01818
##  2016-06-07:45   CH5    :34   H:144     CC6-9  : 10   1st Qu.:0.09091
##  2016-06-06:34   CC6    :31             CHSR8-6: 10   Median :0.16364
##  2015-06-08:21   EH4    :26             EHSR1-2: 10   Mean   :0.29413
##  2015-06-11:20   WHSR9  :24             CHSR8-2:  9   3rd Qu.:0.33182
##  2016-06-05:19   EHSR1  :22             EC3-3  :  9   Max.   :3.98182
##  (Other)   :61   (Other):85             (Other):200
```

```
summarize(group_by(balsvol15, treatment), meanVol = mean(volume), sdVolume = sd(volume))
```

```
## Source: local data frame [2 x 3]
##
##   treatment   meanVol  sdVolume
##      (fctr)     (dbl)     (dbl)
## 1         C 0.6404692 0.7110573
## 2         H 0.4891207 0.6147382
```

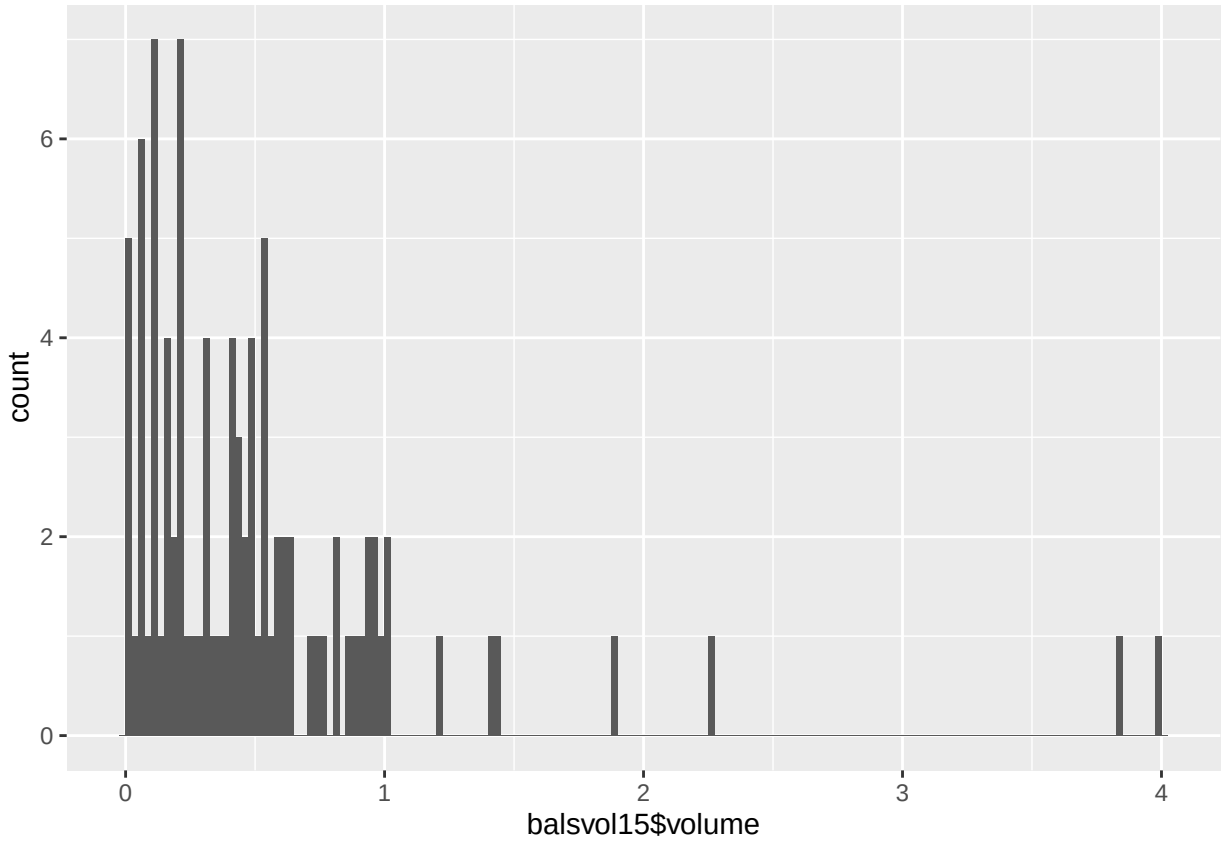
```
summarize(group_by(balsvol16, treatment), meanVol = mean(volume), sdVolume = sd(volume))
```

```
## Source: local data frame [2 x 3]
##
##   treatment   meanVol  sdVolume
##      (fctr)     (dbl)     (dbl)
## 1         C 0.1659893 0.1328342
## 2         H 0.1526835 0.1127952
```

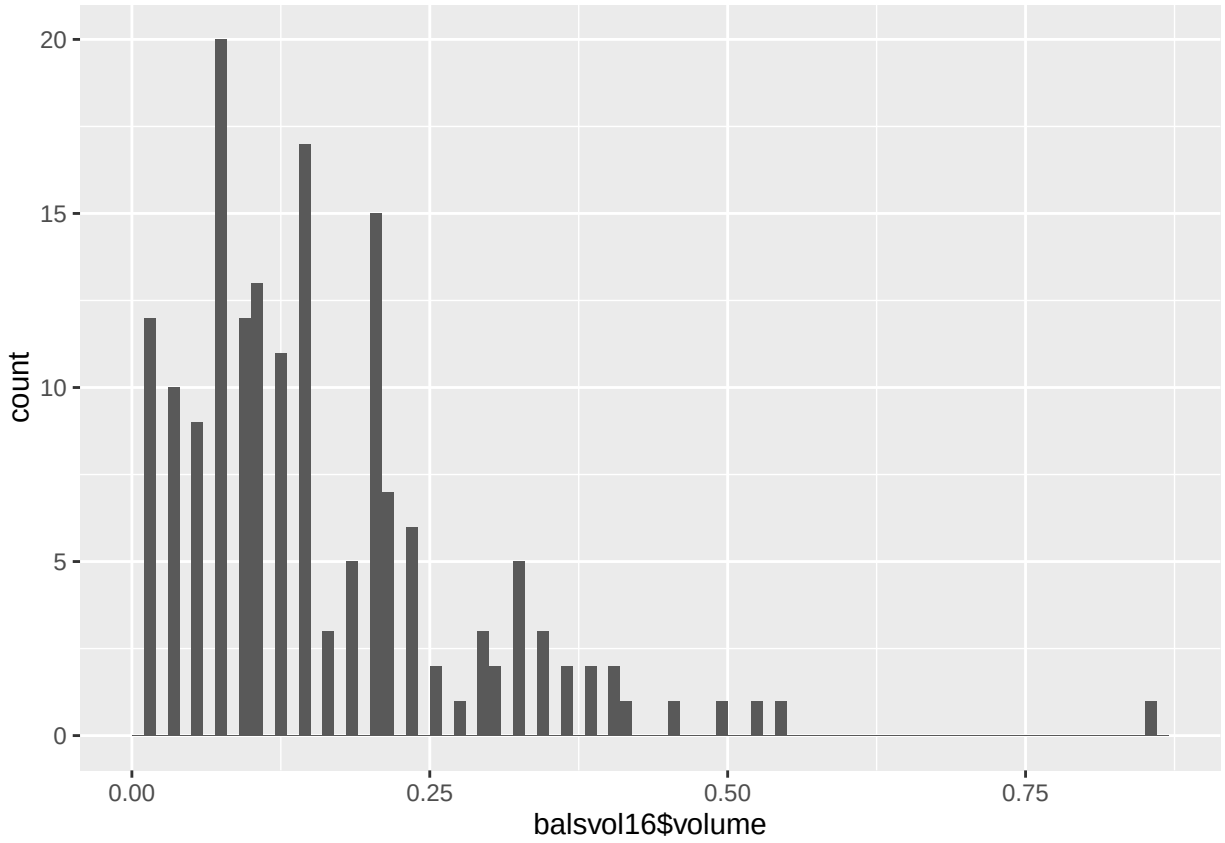
```
summarize(group_by(balsvolboth, treatment), meanVol = mean(volume), sdVolume = sd(volume))
```

```
## Source: local data frame [2 x 3]
##
##   treatment  meanVol  sdVolume
##      (fctr)    (dbl)     (dbl)
## 1         C 0.292790 0.4350334
## 2         H 0.295202 0.4400984
```

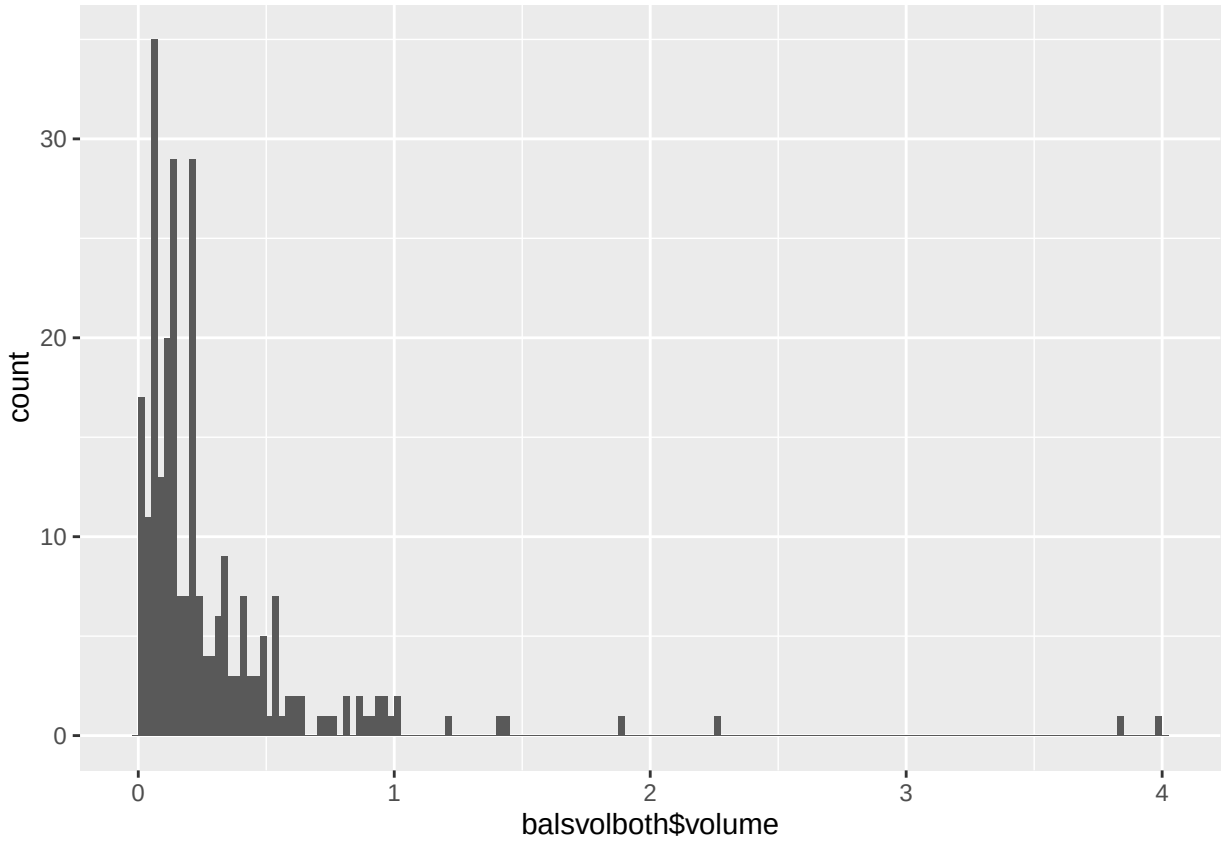
```
qplot(balsvol15$volume, binwidth = .025)
```



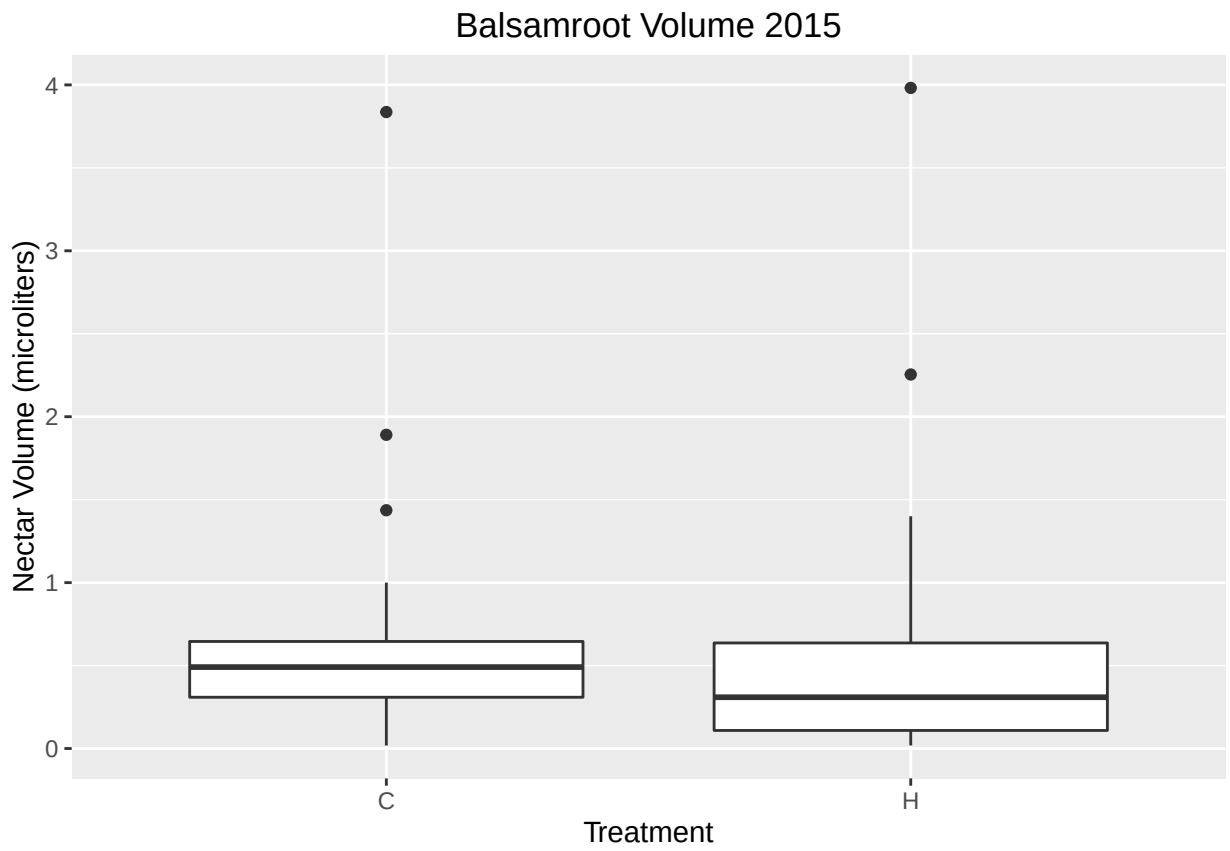

```
qplot(balsvol16$volume, binwidth = .01)
```



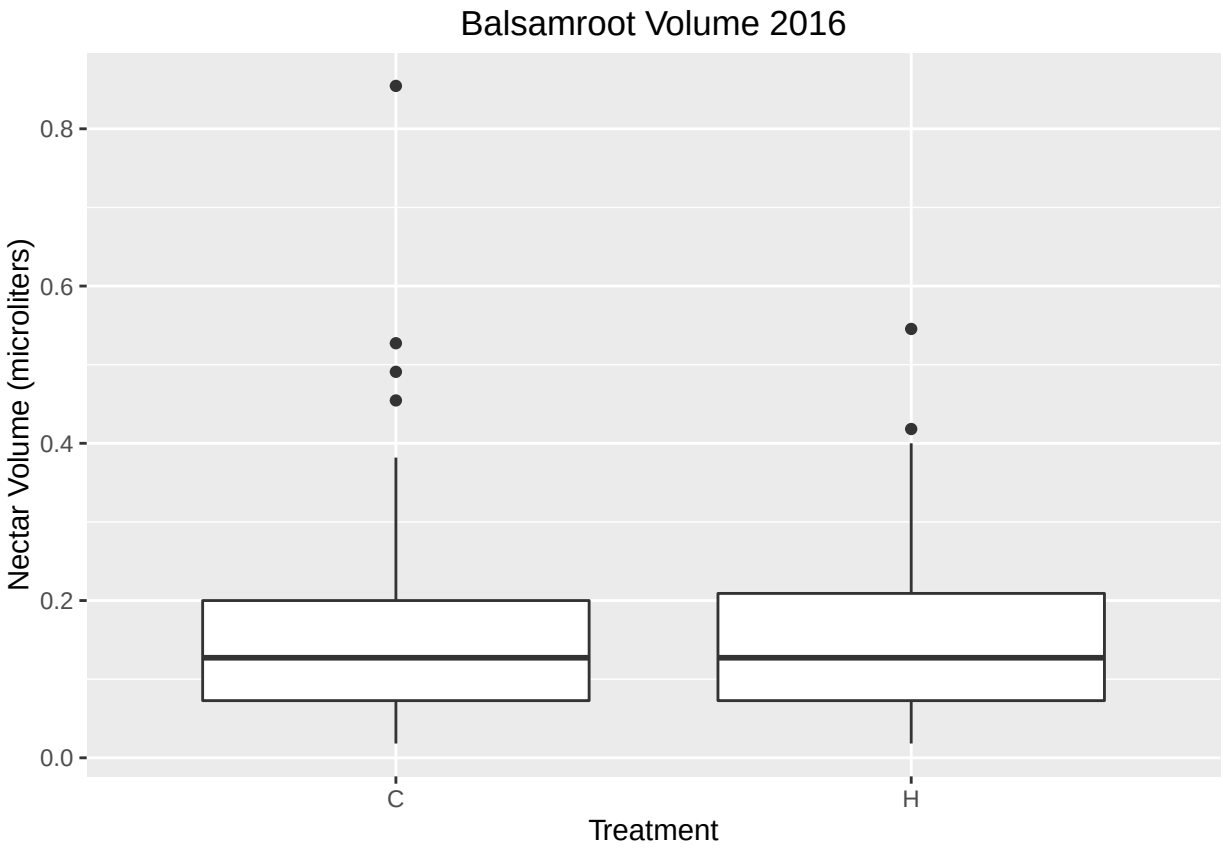

```
qplot(balsvolboth$volume, binwidth = .025)
```



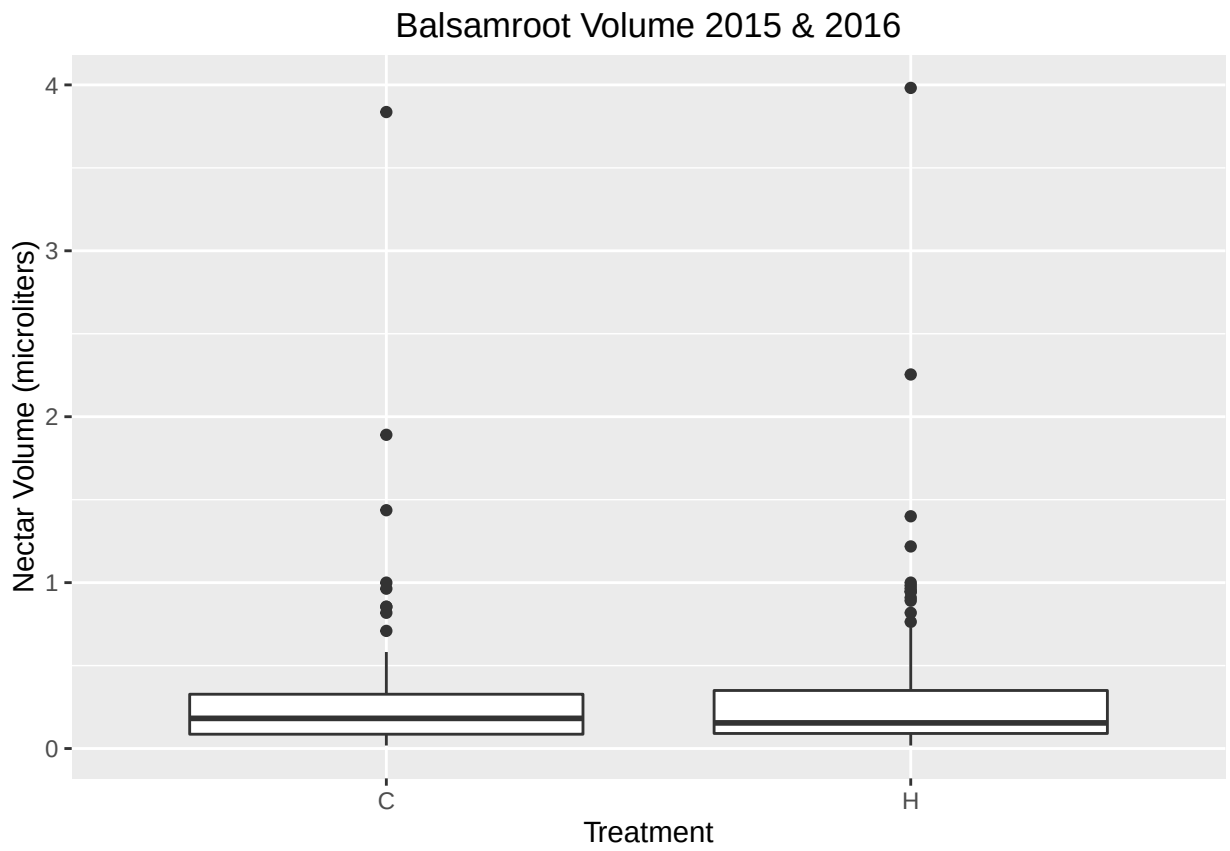

```
ggplot(balsvol15, aes(x=treatment, y=volume)) + geom_boxplot() +
  xlab("Treatment") +
  ylab("Nectar Volume (microliters)") + ggtitle("Balsamroot Volume 2015")
```




```
ggplot(balsvol16, aes(x=treatment, y=volume)) + geom_boxplot() +
  xlab("Treatment") +
  ylab("Nectar Volume (microliters)") + ggtitle("Balsamroot Volume 2016")
```




```
ggplot(balsvolboth, aes(x=treatment, y=volume)) + geom_boxplot() +
  xlab("Treatment") +
  ylab("Nectar Volume (microliters)") + ggtitle("Balsamroot Volume 2015 & 2016")
```




```
# Homoscedastic?

var15C <- sd(balsvol15$volume[balsvol15$treatment=="C"])^2
var15H <- sd(balsvol15$volume[balsvol15$treatment=="H"])^2
ratio15 <- var15H/var15C
ratio15
```

```
## [1] 0.7474313
```

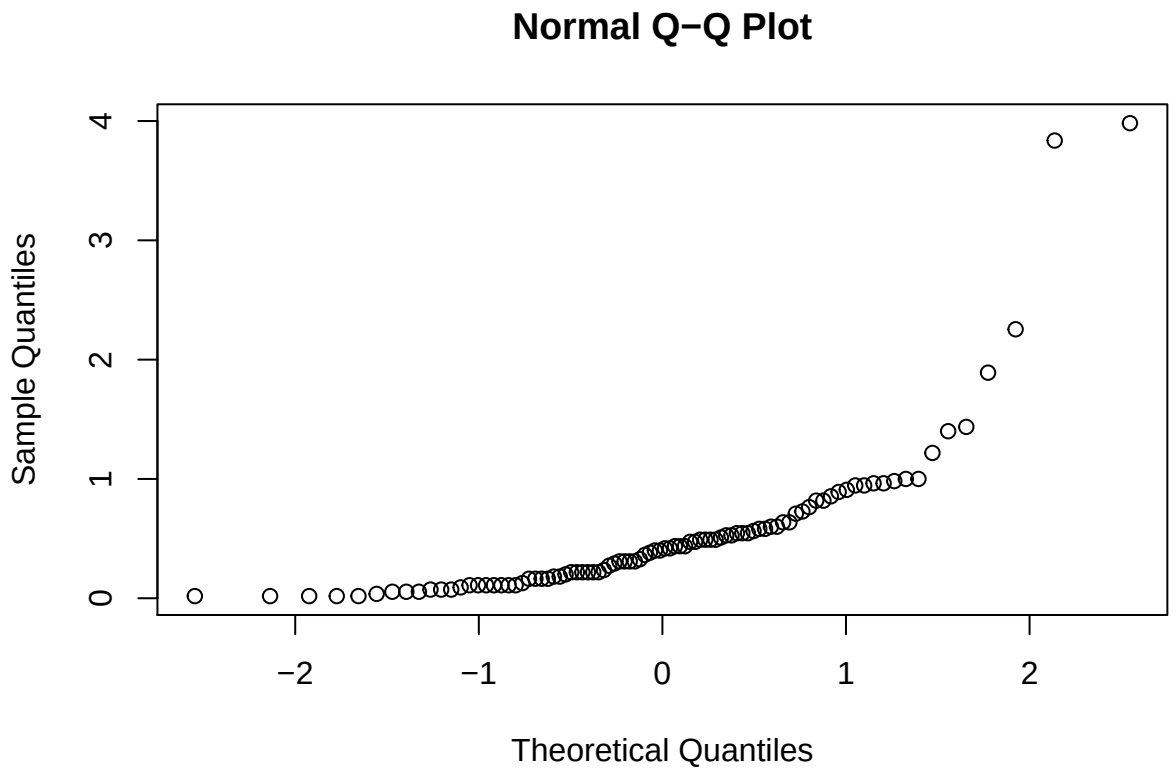
```
var16C <- sd(balsvol16$volume[balsvol16$treatment=="C"])^2
var16H <- sd(balsvol16$volume[balsvol16$treatment=="H"])^2
ratio16 <- var16C/var16H
ratio16
```

```
## [1] 1.38688
```

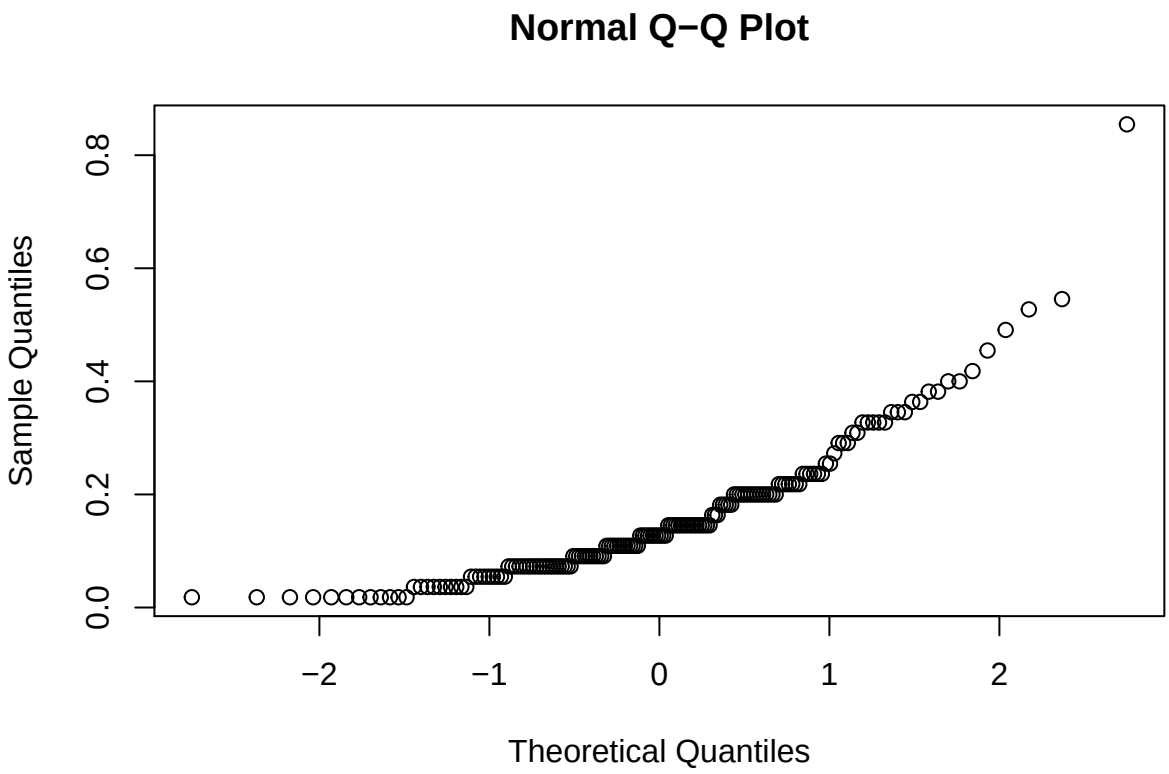
```
varbothC <- sd(balsvolboth$volume[balsvolboth$treatment=="C"])^2
varbothH <- sd(balsvolboth$volume[balsvolboth$treatment=="H"])^2
ratioboth <- varbothH/varbothC
ratioboth
```

```
## [1] 1.023421
```

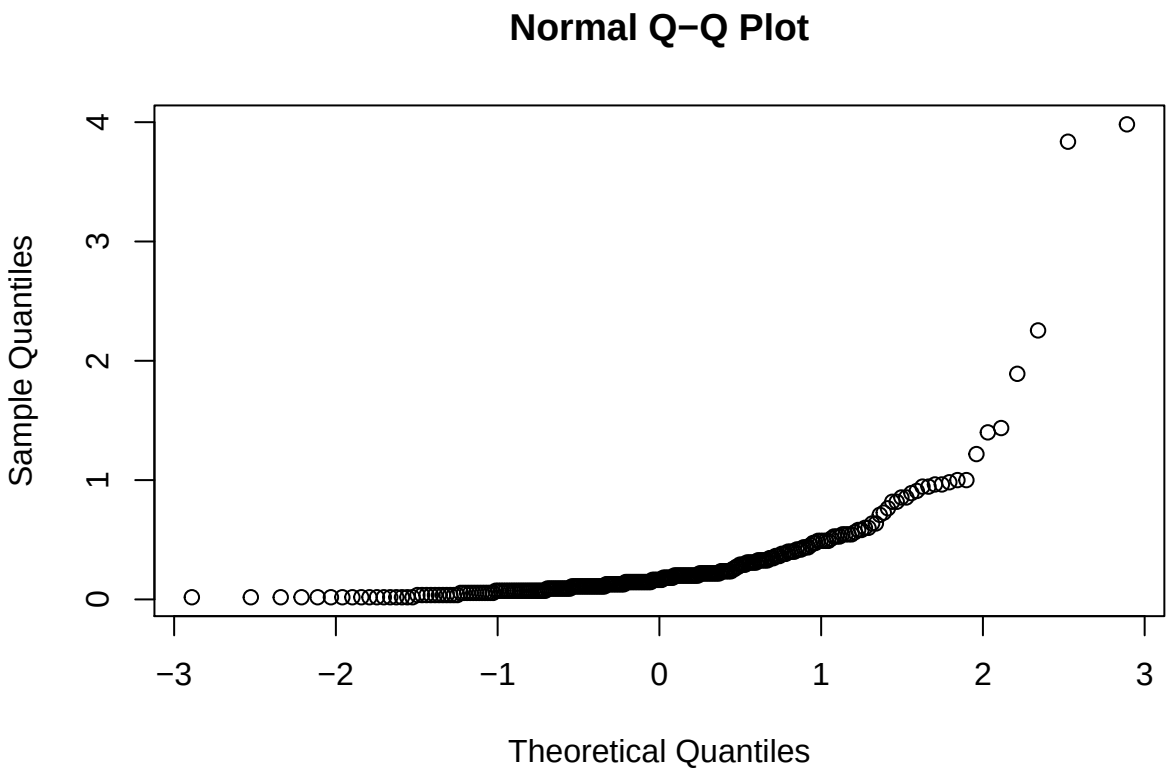
```r
# Q-Q plots

qqnorm(balsvol15$volume)
```




```r
qqnorm(balsvol16$volume)
```




```
qqnorm(balsvolboth$volume)
```


Normal Q−Q Plot
Sample Quantiles
Theoretical Quantiles
0
1
2
3
4
−3
−2
−1
0
1
2
3