

Comparison of extraction methods

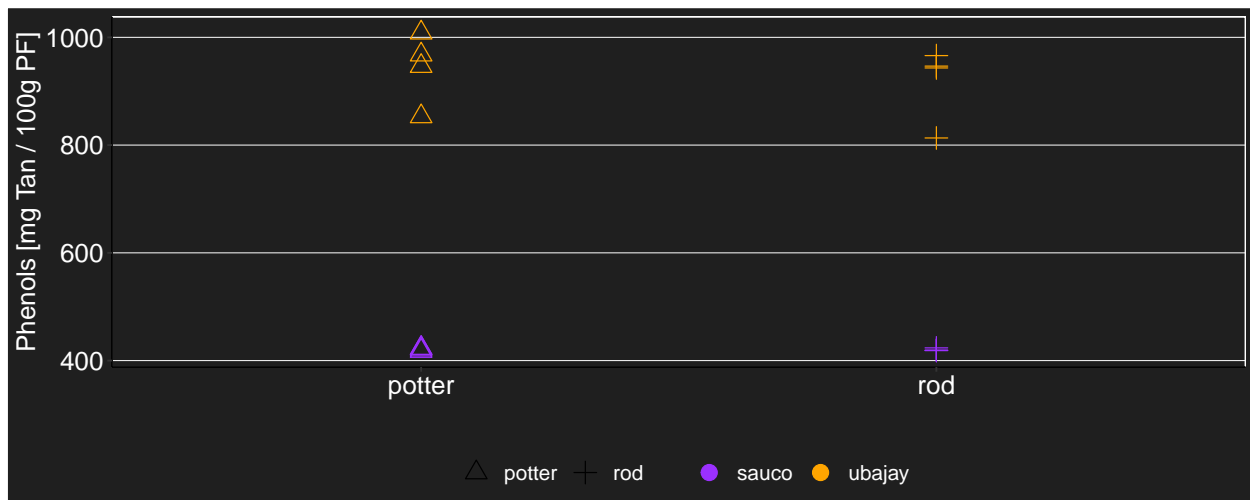
Phenols

The objective is to compare the extraction capacity of secondary metabolites in two native fruit species: *Sambucus australis* and *Hexachlamys edulis*. The methods were: potter homogenizer and another manual with glass rod.

Descriptive table

```
## # A tibble: 4 x 7
## # Groups:   species [2]
##   species method     n mean  min  max   sd
##   <fct>   <fct> <int> <dbl> <dbl> <dbl> <dbl>
## 1 sauco   potter     4  421.  418.  423.  2.56
## 2 sauco   rod       4  420.  419.  424.  2.36
## 3 ubajay potter     4  944.  853. 1009.  65.8
## 4 ubajay rod       4  917.  813.  966.  70.1
```

Plot

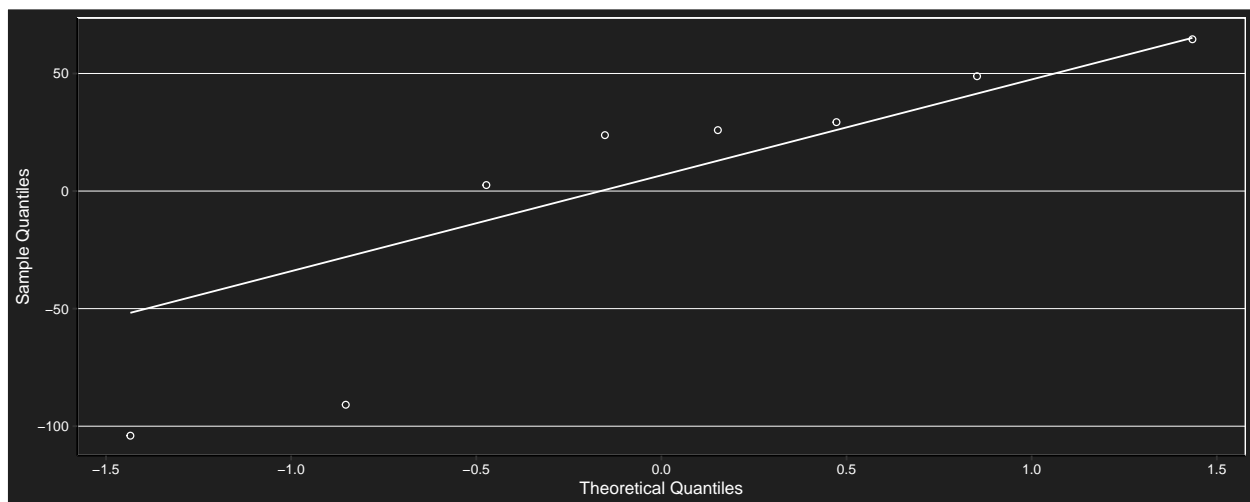
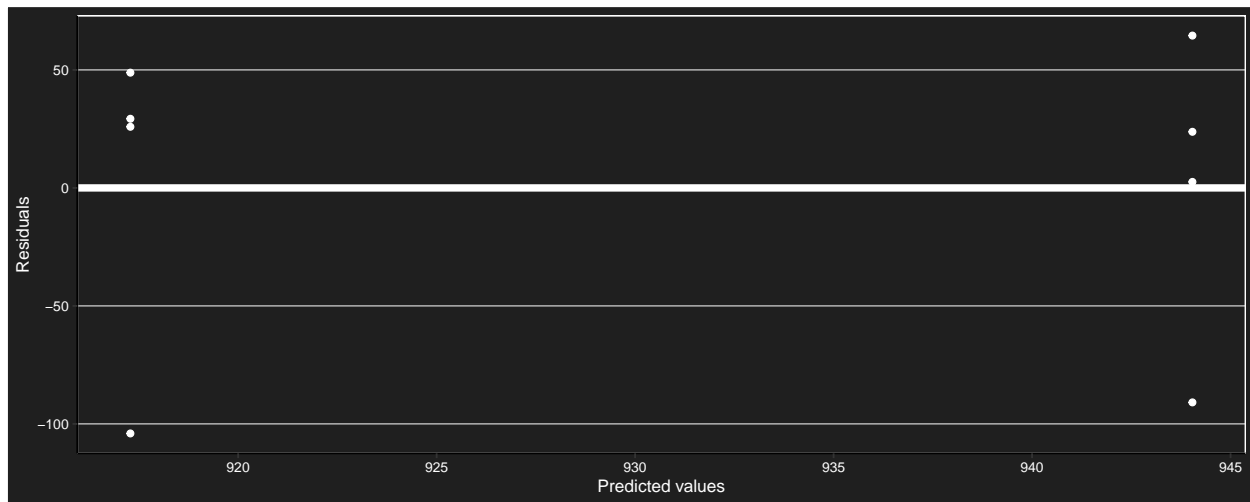


Models

```
## lm(formula = phenols ~ method, data = ubajay)
```

```
## lm(formula = phenols ~ method, data = sauco)
```

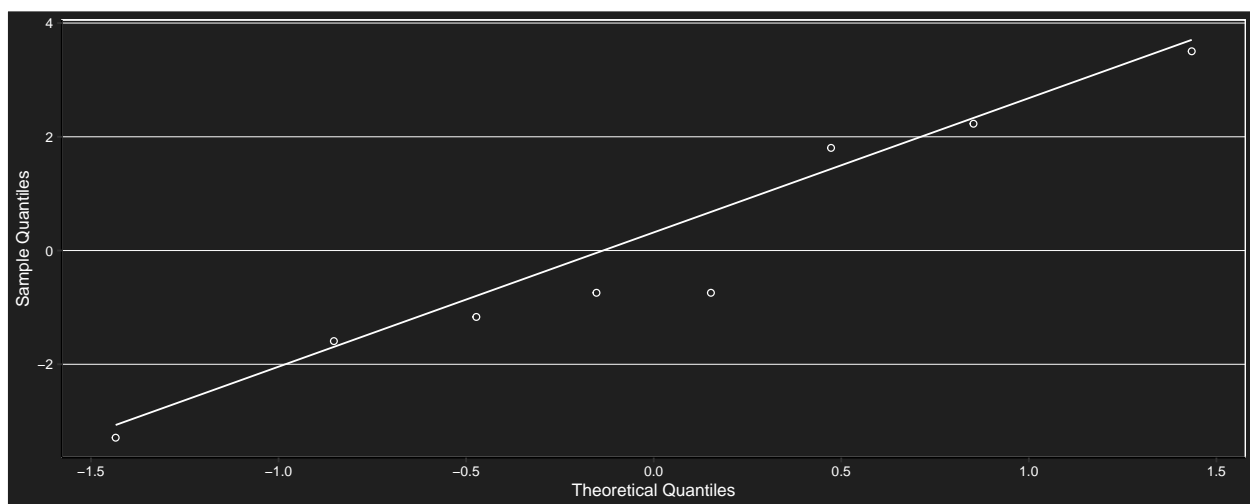
Assumptions ubajay



```
##
##  Shapiro-Wilk normality test
##
## data:  e
## W = 0.8221, p-value = 0.04909

## Levene's Test for Homogeneity of Variance (center = median)
##      Df F value  Pr(>F)
## group 1  5.0874 0.04063 *
##      14
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Assumptions sauco



```
##
##  Shapiro-Wilk normality test
##
## data:  e
## W = 0.93875, p-value = 0.5988
```

Mean comparison ubajay

```
## Analysis of Variance Table
##
## Response: phenols
##      Df Sum Sq Mean Sq F value Pr(>F)
## method  1 1431.6   1431.6   0.3097  0.598
## Residuals 6 27737.6   4622.9
```

Mean comparison sauco

```
## Analysis of Variance Table
##
## Response: phenols
##           Df Sum Sq Mean Sq F value Pr(>F)
## method      1  1.443   1.4428   0.2382 0.6428
## Residuals    6 36.339   6.0565
```

There is no evidence of differences between the extraction methods.

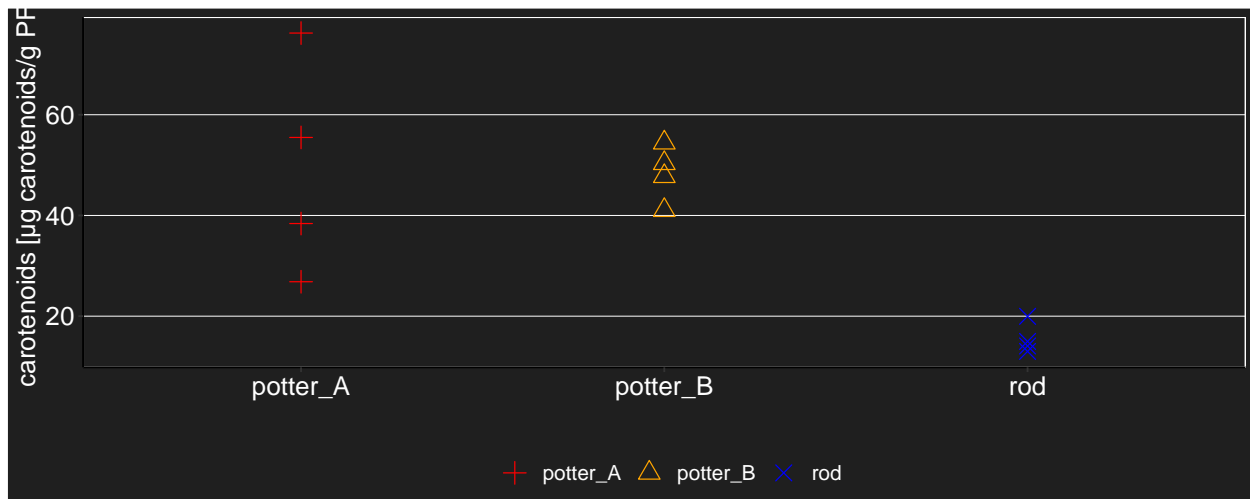
Carotenoids

The objective is to compare the extraction capacity of carotenoids. The methods were: potter homogenizer with 5ml solution (potter_A), potter homogenizer with 9ml solution (potter_B) and another manual with glass rod.

Descriptive table

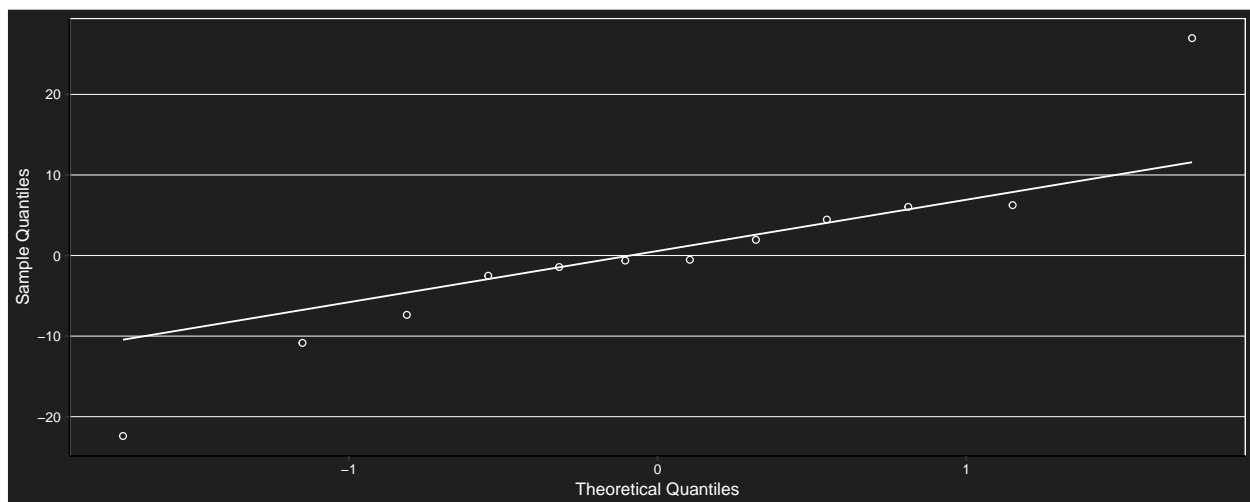
```
## # A tibble: 3 x 6
##   method      n Mean   min   max   sd
##   <fct>    <int> <dbl> <dbl> <dbl> <dbl>
## 1 potter_A      4  49.2  26.8  76.2 21.5
## 2 potter_B      4  48.4  41.0  54.4  5.63
## 3 rod           4  15.5  13.0  20.0  3.08
```

Plot



Models

Assumptions ubajay



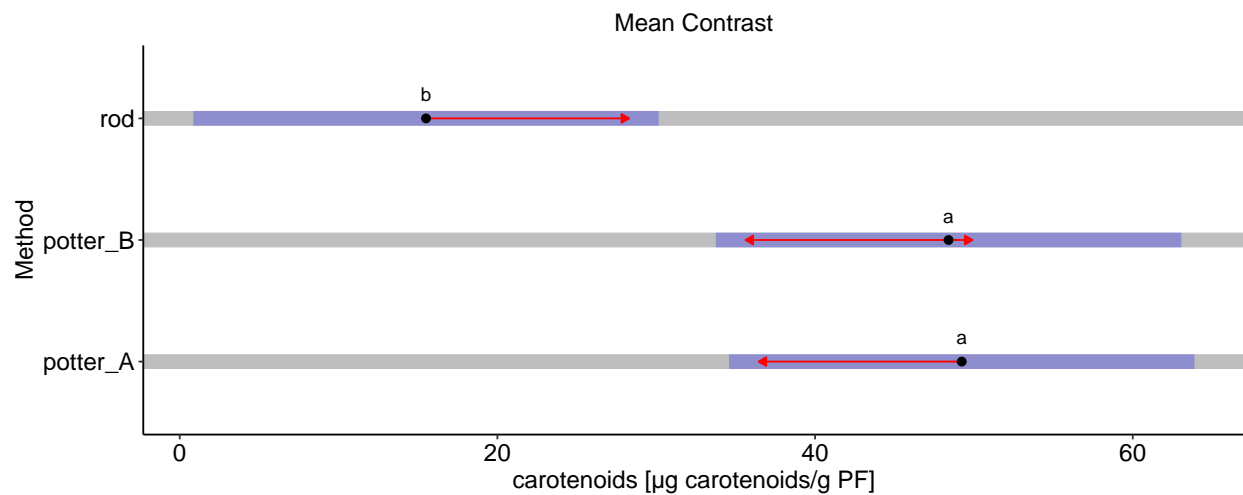
```
##  
##  Shapiro-Wilk normality test  
##  
## data:  e  
## W = 0.92074, p-value = 0.2921
```

Mean comparison sauco

```
## Denom. DF: 9  
##           numDF    F-value p-value  
## (Intercept)      1 307.36183 <.0001  
## method           2  55.51686 <.0001
```

Tukey

```
## $emmeans
## method    emmean    SE df lower.CL upper.CL t.ratio p.value
## potter_A   49.2  6.48  9   34.584    63.9    7.602  <.0001
## potter_B   48.4  6.48  9   33.754    63.1    7.474  <.0001
## rod        15.5  6.48  9    0.856    30.2    2.394  0.0403
##
## Confidence level used: 0.95
##
## $contrasts
## contrast          estimate    SE df lower.CL upper.CL t.ratio p.value
## potter_A - potter_B      0.83  9.16  9   -24.74    26.4    0.091  0.9955
## potter_A - rod          33.73  9.16  9    8.15    59.3    3.682  0.0126
## potter_B - rod          32.90  9.16  9    7.33    58.5    3.592  0.0145
##
## Confidence level used: 0.95
## Conf-level adjustment: tukey method for comparing a family of 3 estimates
## P value adjustment: tukey method for comparing a family of 3 estimates
```



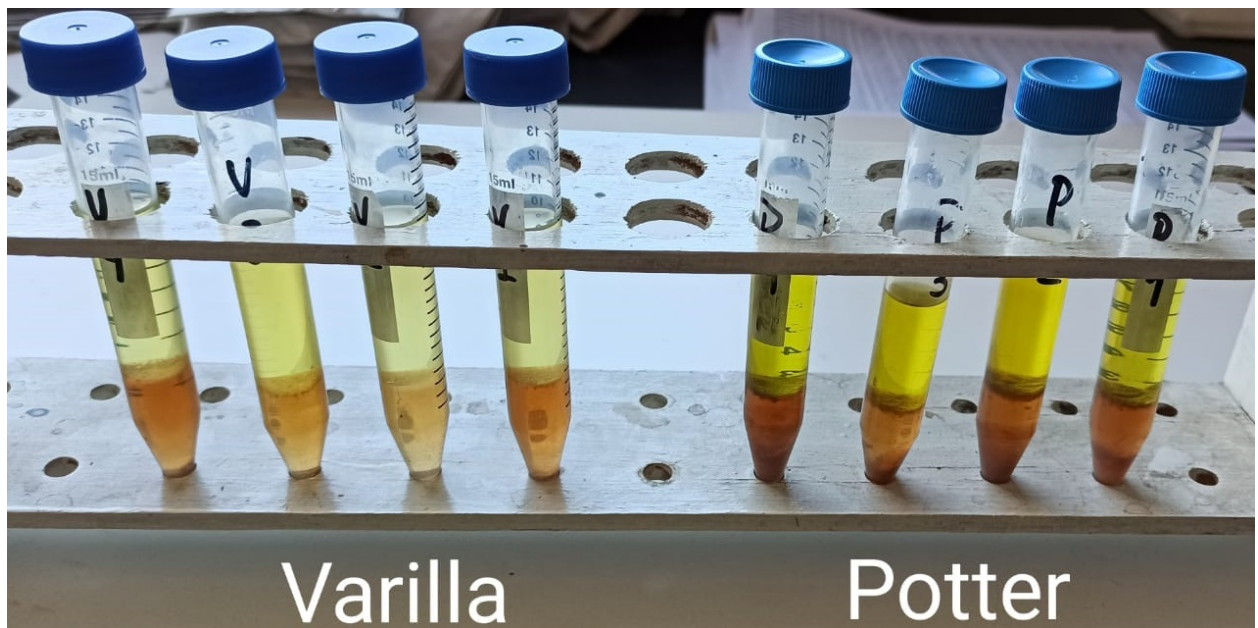


Figure 1: Comparision