

Pangasionodon hypophthalmus Test LUMA

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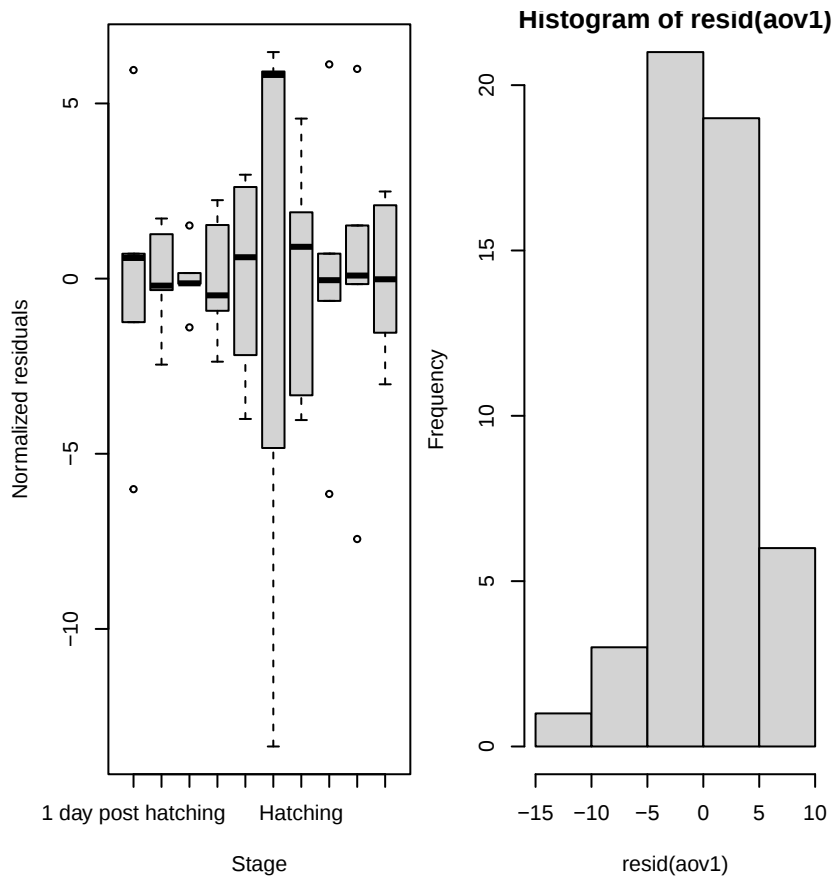
```
##
## Shapiro-Wilk normality test
##
## data: LUMA$Methylation
## W = 0.92161, p-value = 0.002697

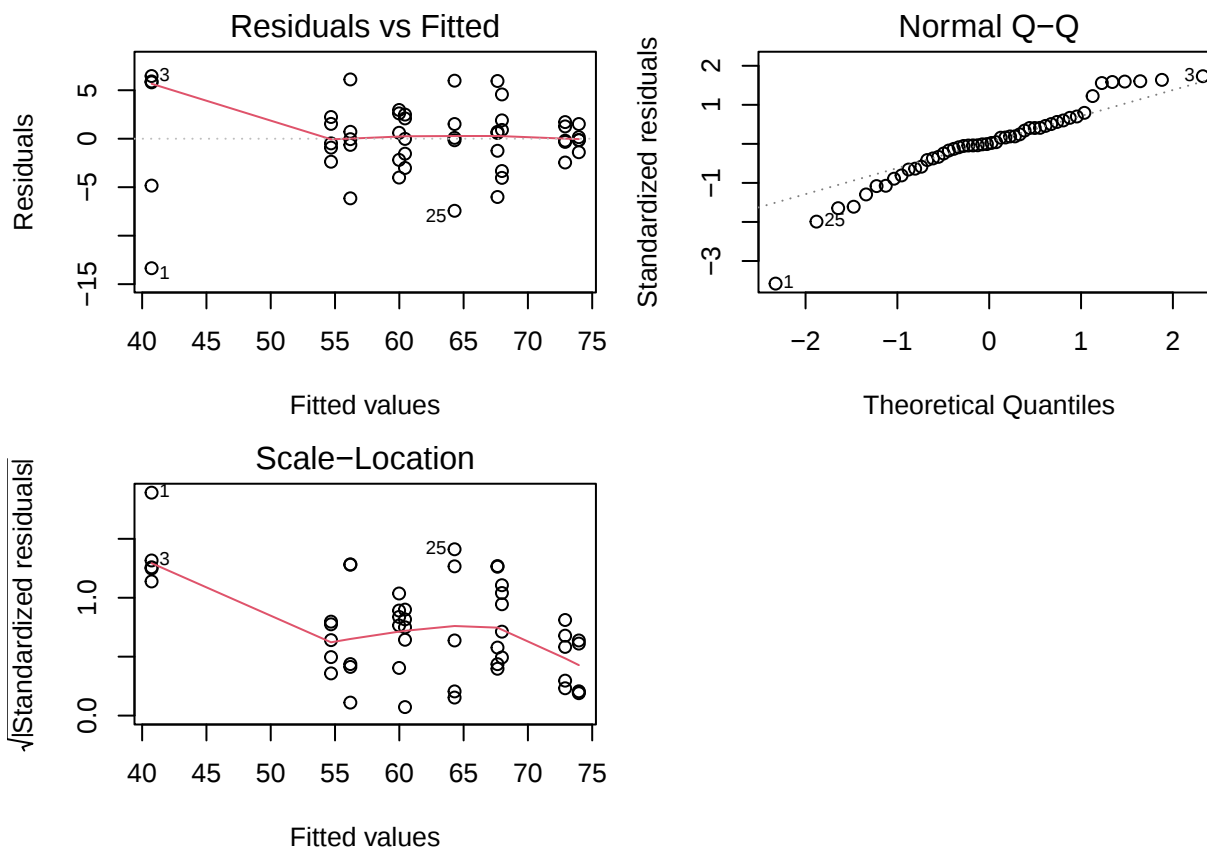
##
## Bartlett test of homogeneity of variances
##
## data: LUMA$Methylation by LUMA$Stage
## Bartlett's K-squared = 23.371, df = 9, p-value = 0.005415

## Levene's Test for Homogeneity of Variance (center = median)
##      Df F value Pr(>F)
## group  9  0.9771 0.4732
##      40

## $stats
##      [,1]      [,2]      [,3]      [,4]      [,5]      [,6]
## [1,] -1.2431592 -2.4554158 -0.1463365 -2.3715034 -4.0061387 -13.355439
## [2,] -1.2431592 -0.3277214 -0.1463365 -0.9187327 -2.1835472 -4.835525
## [3,]  0.5891238 -0.2006723 -0.1347619 -0.4784923  0.6101253  5.812755
## [4,]  0.7109646  1.2680039  0.1584716  1.5298367  2.6144485  5.911884
## [5,]  0.7109646  1.7158057  0.1584716  2.2388916  2.9651121  6.466325
##      [,7]      [,8]      [,9]     [,10]
## [1,] -4.0377454 -0.63634239 -0.15706247 -3.01704357
## [2,] -3.3309303 -0.63634239 -0.15706247 -1.54437813
## [3,]  0.9079437 -0.04532585  0.08722638 -0.01944693
## [4,]  1.8926485  0.71316881  1.51678396  2.09392429
## [5,]  4.5680834  0.71316881  1.51678396  2.48694434
##
## $n
## [1] 5 5 5 5 5 5 5 5 5 5
##
## $conf
##      [,1]      [,2]      [,3]      [,4]      [,5]      [,6]      [,7]
## [1,] -0.7916552 -1.3282078 -0.35013855 -2.208645 -2.780126 -1.781337 -2.783024
## [2,]  1.9699027  0.9268631  0.08061474  1.251661  4.000377 13.406847  4.598911
##      [,8]      [,9]     [,10]
## [1,] -0.9988871 -1.095509 -2.590262
## [2,]  0.9082354  1.269962  2.551368
```

```
##
## $out
##      38      40      46      47      13      14      21      25
## 5.953167 -6.010096 1.515787 -1.393160 6.115794 -6.147295 5.986466 -7.433414
##
## $group
## [1] 1 1 3 3 8 8 9 9
##
## $names
## [1] "1 day post hatching" "3 day post hatching" "6 day post hatching"
## [4] "Early Blastula"      "Early Gastrula"      "Fertilization"
## [7] "Hatching"           "Late Blastula"       "Late Gastrula"
## [10] "Somite development"
```





```
## Best Normalizing transformation with 50 Observations
## Estimated Normality Statistics (Pearson P / df, lower => more normal):
## - arcsinh(x): 1.72
## - Box-Cox: 1.784
## - Center+scale: 1.752
## - Exp(x): 7.128
## - Log_b(x+a): 1.72
## - orderNorm (ORQ): 2.104
## - sqrt(x + a): 1.624
## - Yeo-Johnson: 1.72
## Estimation method: Out-of-sample via CV with 10 folds and 5 repeats
##
## Based off these, bestNormalize chose:
## Standardized sqrt(x + a) Transformation with 50 nonmissing obs.:
## Relevant statistics:
## - a = 0
## - mean (before standardization) = 7.836586
## - sd (before standardization) = 0.6914732
## [1] TRUE
## Analysis of Variance Table
##
## Response: LUMA$Methylation
##           Df Sum Sq Mean Sq F value    Pr(>F)
## LUMA$Stage  9 4402.0   489.11  28.092 1.398e-14 ***
## Residuals  40  696.4    17.41
```

```
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

##	Stage	Methylation	sd	Letters
## 1	1 day post hatching	67.63527	4.299984	def
## 2	3 day post hatching	72.89496	1.637724	ef
## 3	6 day post hatching	73.96143	1.037207	f
## 4	Early Blastula	54.68882	1.874172	b
## 5	Early Gastrula	59.98310	3.033830	bcd
## 6	Fertilization	40.73296	8.836033	a
## 7	Hatching	67.98005	3.628786	def
## 8	Late Blastula	56.19190	4.361988	bc
## 9	Late Gastrula	64.29585	4.832865	cde
## 10	Somite development	60.44212	2.348268	bcd

