BIOL3712 Integrated Physiology of Plants and Animals

Semester 2, 2023

Snail respiration

data analysis workbook

Use the files provided and your r code to answer the questions on the following pages. Once you have completed this, please save it as a .pdf and submit it to FLO.

A picture containing fruit, bowl, oranges, orange

Description automatically generated

1. **Snails (data standardisation)**

Open the file called “AllSnailData.xlsx”. This contains two sheets – the data we saved as a .csv and imported into R, and the raw data including the calculations (click on each cell to see the formula used). Use this spreadsheet to answer the following questions:

1. How were the final values calculated? /1
2. Why is it important to consider the weight of the snails in our calculations? /1
3. Why is it important to account for the control in our calculations? /1
4. Can you find any references to support that these are important considerations? /2

Open the file called “ws2\_students.R”. Use the code in this file to answer the following questions for your response variable. This will form the basis of your statistical methods and results sections.

1. ***Methods:***
2. What were our predictor and response variables? /2
3. What was our sample size? How about the n for each of the levels of your predictor variable? /2
4. How many values below 0 did we remove, and why did we do this? /2
5. How did you test the assumption that data was normally distributed?
   1. What was the name of the test used? /2
   2. What was the *p*-value for this test? /1
   3. Does this mean the data were normally distributed? /1
   4. If the data were not normally distributed, did you remove outliers? How many, and from which levels? /2
   5. When you re-test for normality, what was the *p-*value? /1
   6. Do the data meet the assumption? If not, is it OK to proceed? Why? Do you have a reference to support this? /2
6. How did you test the assumption that variances are homogenous?
   1. What was the name of the test used? /2
   2. What was the *p*-value for this test? /1
   3. Does this mean that the variances are homogenous? /1
7. Did you need to test the assumption that data are independent? Why/why not? /1
8. What test did you use the see if there was an effect of temperature on respiration? /2
9. If you see an effect, what test did you use to see where the effect was? /1

You will need to combine the above information into the statistical methods section of your poster. You can put a draft of it here if you would like feedback. Dot points or a flow chart are fine for a poster.

1. ***Results:***
2. What were the following outcomes from your ANOVA?
   1. df /2
   2. F-value /2
   3. *p*-value /2
3. Did temperature have a significant effect on DO consumption rate? /10
4. Where were the significant differences between temperature levels? /10

(HINT: you will need to use your summary statistics and the results from your Tukey’s post-hoc test to answer this question).

1. Insert your final means plot below. Include an informative caption. /20

To get a HD on this workbook, you must change the aesthetics of your means plot /16

1. ***Code***

Copy and paste your finished code below. /10