

Respiration, photosynthesis, daily P:R

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2024-06-24

Load Data

Clean Data

More clean up + combine data frames

Change timepoint to be a continuous variable

Filter data for less than 10% worm damage

RESPIRATION

Full LMM for respiration rates. This is not including the pre-experiment timepoint (day 0/-7). wound, temp, timepoint 3-way interaction is highly non-significant

```
## Type III Analysis of Variance Table with Satterthwaite's method
##              Sum Sq  Mean Sq NumDF   DenDF F value    Pr(>F)
## wound          0.004793 0.002397     2 135.71   0.7232 0.487048
## temp           0.022323 0.022323     1 135.71   6.7361 0.010487 *
## timepoint      0.006360 0.006360     1 136.00   1.9191 0.168223
## wound:temp     0.002717 0.001359     2 135.59   0.4099 0.664509
## wound:timepoint 0.002011 0.001006     2 136.00   0.3034 0.738768
## temp:timepoint  0.036431 0.036431     1 136.00  10.9932 0.001173 **
## wound:temp:timepoint 0.003195 0.001597     2 136.00   0.4820 0.618591
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Reduced LMM for respiration rates. ** Temp and time interaction is significant **

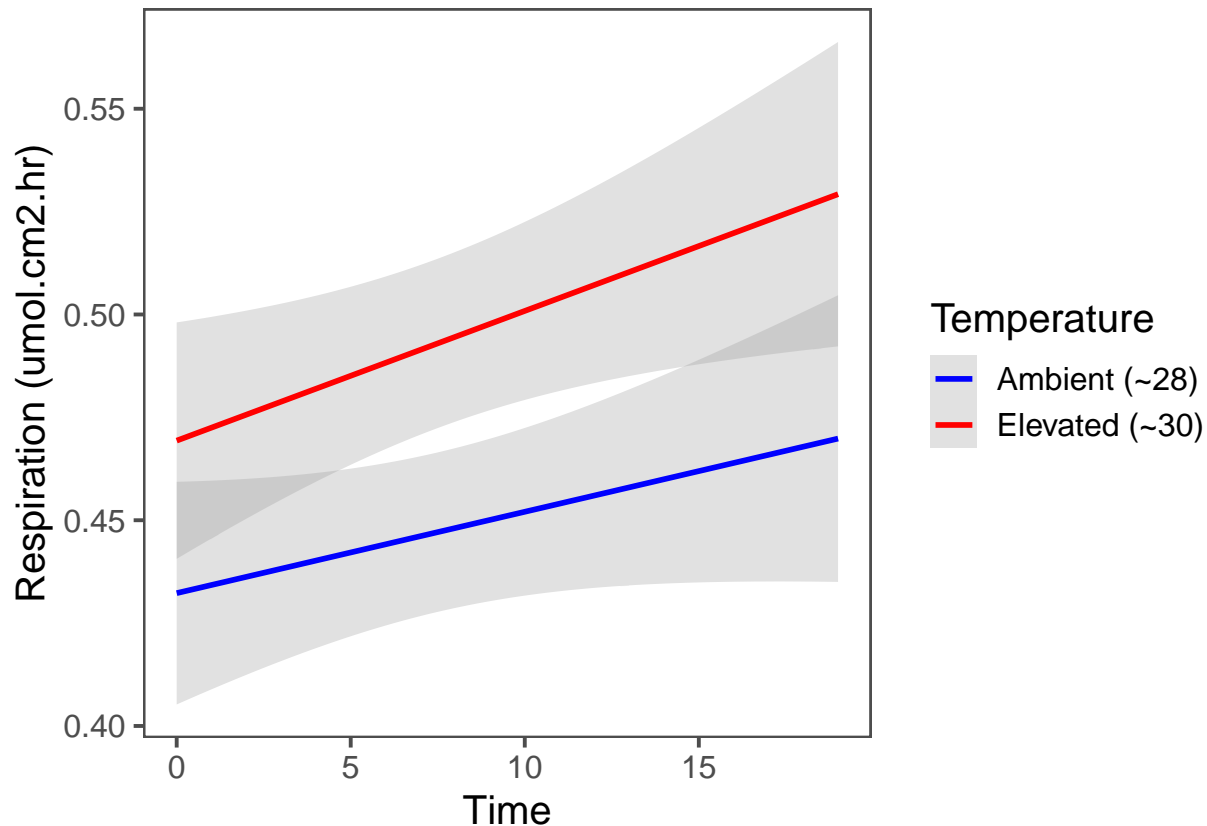
```
## Type III Analysis of Variance Table with Satterthwaite's method
##              Sum Sq  Mean Sq NumDF   DenDF F value    Pr(>F)
## wound          0.004610 0.002305     2  61.335   0.7075 0.496836
## temp           0.021991 0.021991     1 134.945   6.7505 0.010413 *
## timepoint      0.006464 0.006464     1 140.000   1.9844 0.161146
## wound:temp     0.005287 0.002643     2  61.366   0.8114 0.448940
## temp:timepoint  0.036292 0.036292     1 140.000  11.1405 0.001082 **
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Checking respiration rates prior to onset of experiment (day 0/-7). ** no significant differences **

```
## Type III Analysis of Variance Table with Satterthwaite's method
##           Sum Sq   Mean Sq NumDF   DenDF F value Pr(>F)
## wound      0.0007767 0.0003884     2  61.444   0.1113 0.8948
## temp       0.0004670 0.0004670     1  61.436   0.1339 0.7157
## wound:temp 0.0073596 0.0036798     2  61.462   1.0548 0.3545
```

Respiration figure that pairs with result from final model.

```
## 'geom_smooth()' using formula = 'y ~ x'
```



NET PHOTOSYNTHESIS

Full LMM model for net photosynthetic rates. ** significant 3-way interaction between wound, temp, and time. **

```
## Type III Analysis of Variance Table with Satterthwaite's method
##           Sum Sq   Mean Sq NumDF   DenDF F value   Pr(>F)
## wound      0.008871 0.004435     2  190.18   0.4083 0.66533
## temp       0.004638 0.004638     1  190.17   0.4270 0.51426
## timepoint   0.023261 0.023261     1  136.00   2.1415 0.14567
## wound:temp  0.019685 0.009842     2  190.14   0.9061 0.40582
## wound:timepoint 0.003222 0.001611     2  136.00   0.1483 0.86231
## temp:timepoint 0.061759 0.061759     1  136.00   5.6859 0.01848 *
```

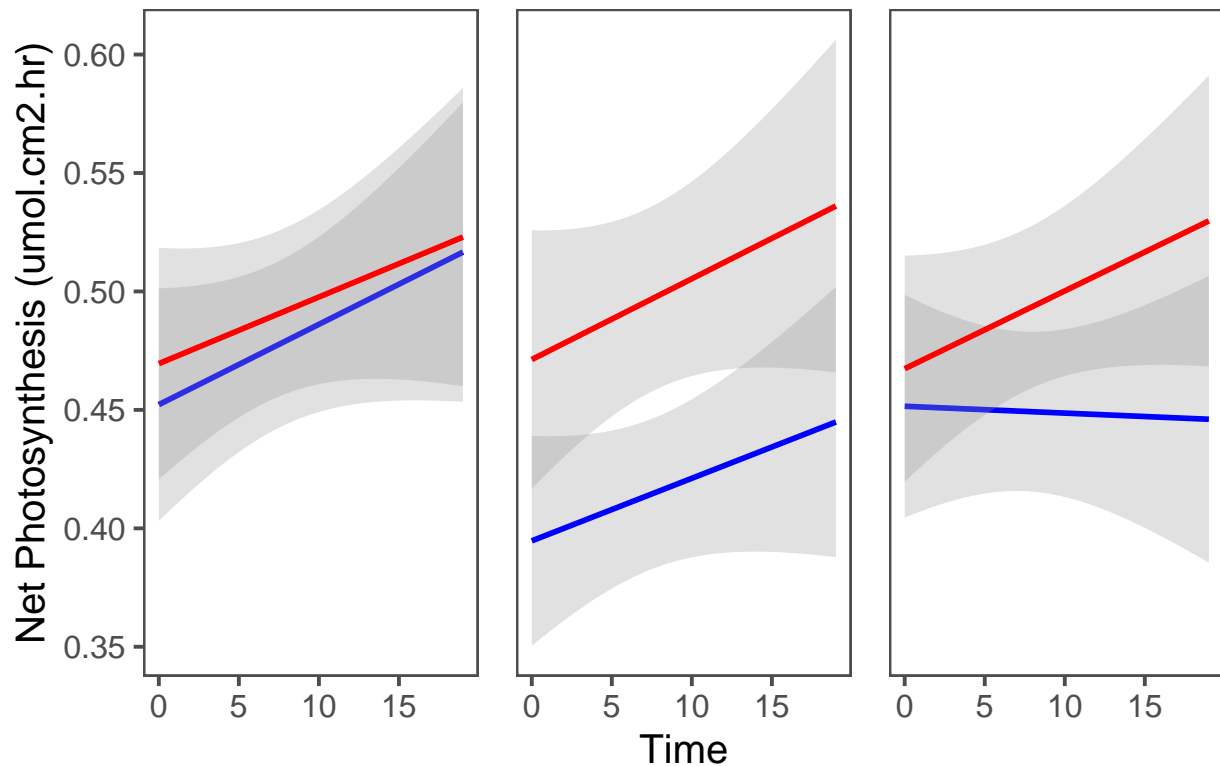
```
## wound:temp:timepoint 0.074741 0.037371      2 136.00  3.4406 0.03486 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Checking net photosynthesis rates prior to onset of experiment (day 0/-7). ** no significant differences **

```
## Type III Analysis of Variance Table with Satterthwaite's method
##              Sum Sq  Mean Sq NumDF  DenDF F value Pr(>F)
## wound         0.023473 0.011737      2 61.412  1.2875 0.2833
## temp          0.022866 0.022866      1 61.389  2.5085 0.1184
## wound:temp     0.021946 0.010973      2 61.489  1.2038 0.3070
```

Net photosynthesis figure that pairs with result from model

```
## 'geom_smooth()' using formula = 'y ~ x'
```



GROSS PHOTOSYNTHESIS

Full LMM model for gross photosynthetic rates. ** timepoint is significant **

```
## Type III Analysis of Variance Table with Satterthwaite's method
##              Sum Sq  Mean Sq NumDF  DenDF F value  Pr(>F)
```

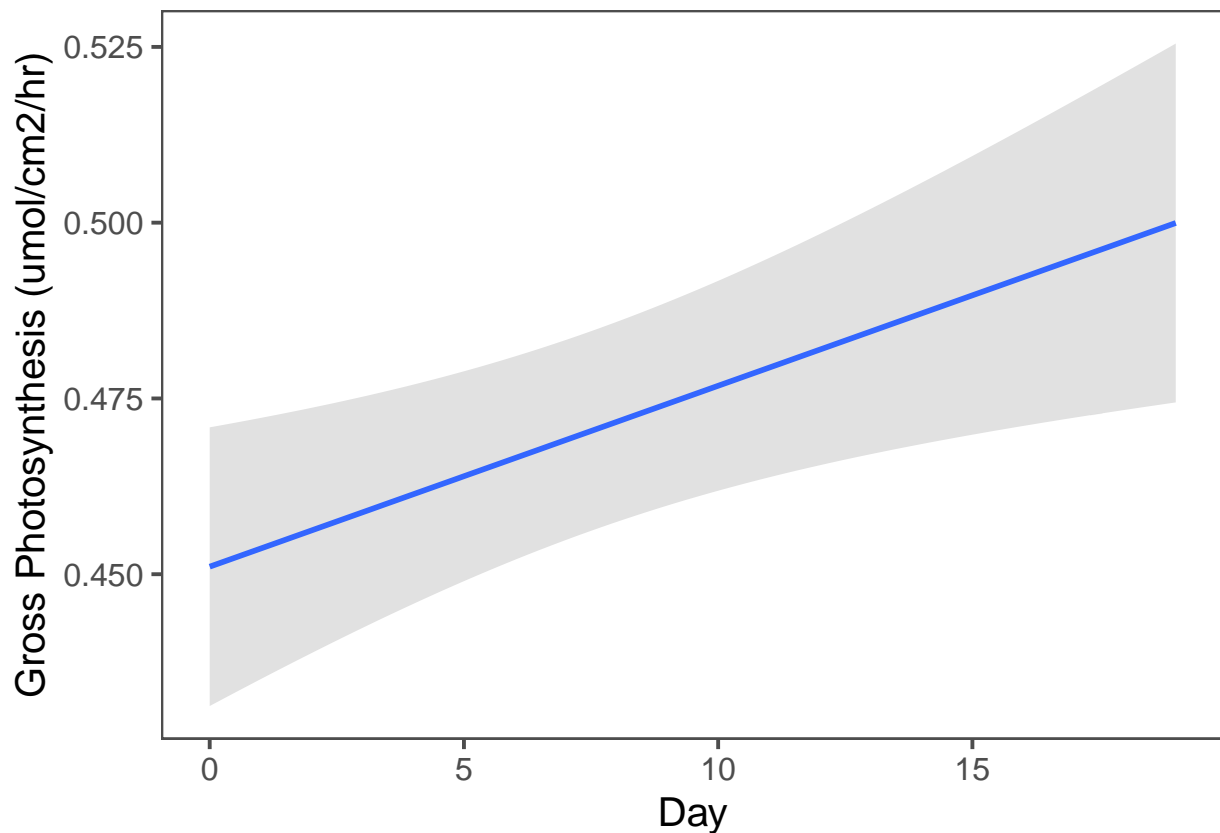
```
## wound          0.023504 0.011752      2 153.56  0.9515 0.38842
## temp           0.047935 0.047935      1 153.57  3.8811 0.05063 .
## timepoint      0.053946 0.053946      1 136.00  4.3678 0.03849 *
## wound:temp     0.021829 0.010915      2 153.40  0.8837 0.41534
## wound:timepoint 0.009863 0.004931      2 136.00  0.3993 0.67160
## temp:timepoint  0.003323 0.003323      1 136.00  0.2690 0.60483
## wound:temp:timepoint 0.047035 0.023518      2 136.00  1.9041 0.15290
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Checking gross photosynthesis rates prior to onset of experiment (day 0/-7) ** no significant differences **

```
## Type III Analysis of Variance Table with Satterthwaite's method
##              Sum Sq  Mean Sq NumDF  DenDF F value    Pr(>F)
## wound        0.033536 0.016768      2 61.158   1.7865 0.17618
## temp         0.030292 0.030292      1 61.147   3.2274 0.07736 .
## wound:temp    0.054202 0.027101      2 61.182   2.8874 0.06335 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Gross Photosynthesis figure that pairs with results from model.

```
## 'geom_smooth()' using formula = 'y ~ x'
```



DAILY P:R RATIO

wrangle data frame and calculate ratio

Full LMM model for daily P:R ** significant interaction between temp and time **

```
## Type III Analysis of Variance Table with Satterthwaite's method
##              Sum Sq Mean Sq NumDF  DenDF F value    Pr(>F)
## wound          0.02447  0.01224     2 177.87  0.5577  0.573511
## temp           0.00640  0.00640     1 177.83  0.2919  0.589699
## timepoint      0.36788  0.36788     1 207.00 16.7688 6.055e-05 ***
## wound:temp      0.01132  0.00566     2 177.91  0.2579  0.772931
## wound:timepoint 0.00790  0.00395     2 207.00  0.1801  0.835315
## temp:timepoint  0.18860  0.18860     1 207.00  8.5969  0.003746 **
## wound:temp:timepoint 0.09310  0.04655     2 207.00  2.1219  0.122400
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Checking daily P:R prior to onset of experiment (day 0/-7) ** no significant differences **

```
## Type III Analysis of Variance Table with Satterthwaite's method
##              Sum Sq  Mean Sq NumDF  DenDF F value Pr(>F)
## wound          0.028468 0.014234     2 61.510  0.9705 0.3846
## temp           0.033345 0.033345     1 61.487  2.2735 0.1367
## wound:temp      0.017805 0.008903     2 61.597  0.6070 0.5482
```

Daily P:R figure that pairs with result from model

```
## 'geom_smooth()' using formula = 'y ~ x'
```

