# Predator phylogenetic diversity decreases predation rate via antagonistic interactions

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```
## treatment
##         andro       control         elong elong + andro elong + leech
##             5             5             5             5             5
##   elong + tab         leech       tabanid
##             5             5             5

##   eu  Id  wt            name    N   X15N d15N emerged   fine n15.leaves
## 1  1 EU1 5.8              B1 46.9 0.3653 -2.8       0 0.5783         31
## 2  2 EU2 6.2              B6 82.2 0.3713 13.6       0 0.6755         26
## 3  3 EU3 6.2              B7 46.8 0.3694  8.4       0 0.1966          6
## 4  4 EU4 6.2              D6 34.4 0.3714 13.9       1 1.3413          4
## 5  5 EU5 5.9 Romero_Tray1_A1 51.4 0.3700 10.1       4 0.8255         11
## 6  6 EU6 5.8              D7 59.6 0.3733 19.1       2 0.4996         40
##   leaf.mass bromeliad growth     treatment fine.detritus mass.g. decomp
## 1    0.9677         6   5.06         andro             1   1.514 0.3608
## 2    0.9127         9   5.58       tabanid            10   1.498 0.3908
## 3    1.0063        12   6.48       tabanid            18   1.506 0.3319
## 4    1.0193         3   3.50 elong + andro            33   1.504 0.3221
## 5    0.9035        10   3.34       control            20   1.502 0.3985
## 6    0.9469         8  -1.12 elong + andro             8   1.514 0.3748
```

```
##   Culicidae Chironomidae Tipulidae Psychodidae Scirtidae total.surv leech
## 1         0            1         1           0         0          2     0
## 2         0            0         0           0         5          5     0
## 3         1            1         0           0         3          5     0
## 4         0            2         1           1         3          7     0
## 5         3           13         1           1         2         20     0
## 6         0            0         1           0         0          1     0
##   andro tab elong
## 1     1   0     0
## 2     0   1     0
## 3     0   1     0
## 4     1   0     1
## 5     0   0     0
## 6     1   0     1
```

# Introduction

We test three related hypotheses:

1. *species co-occurance*: closely-related predators occur together more frequently than less-related predators, due to their similar habitat requirements. Additionally, very closely related species never co-occur because they are too similar.

2. *diet similarity*: similarity in diet (as measured by feeding trials) decreases with phylogenetic distance.

3. *ecosystem-level effects*: similarity in the effect of predators on whole ecosystems declines with phylogenetic distance. Additionally, the non-additive effect of predators will have a greater absolute value when their phylogenetic diversity is larger.

# Methods

# Results

### metabolic capacity and phylogenetic distance

Predators which are closer in the phylogeny are more likely to occur in the same bromeliads, and to do so with a similar overall metabolic capacity.($F_{1,89}$=3.9381,P=0.0503).

### diet similarity and phylogenetic distance

Phylogenetic distance was not correlated with similarity in diet ($F_{1,4}$=0.2807,P=0.6243). Indeed, all predators in this system appeared to feed readily on a wide range of prey species.

### Ecosystem-level effects and phylogenetic distance

All increases in predator phylogenetic diversity beyond damselflies resulted in a reduction of prey mortality.

### Figures

# Discussion

# Works Cited

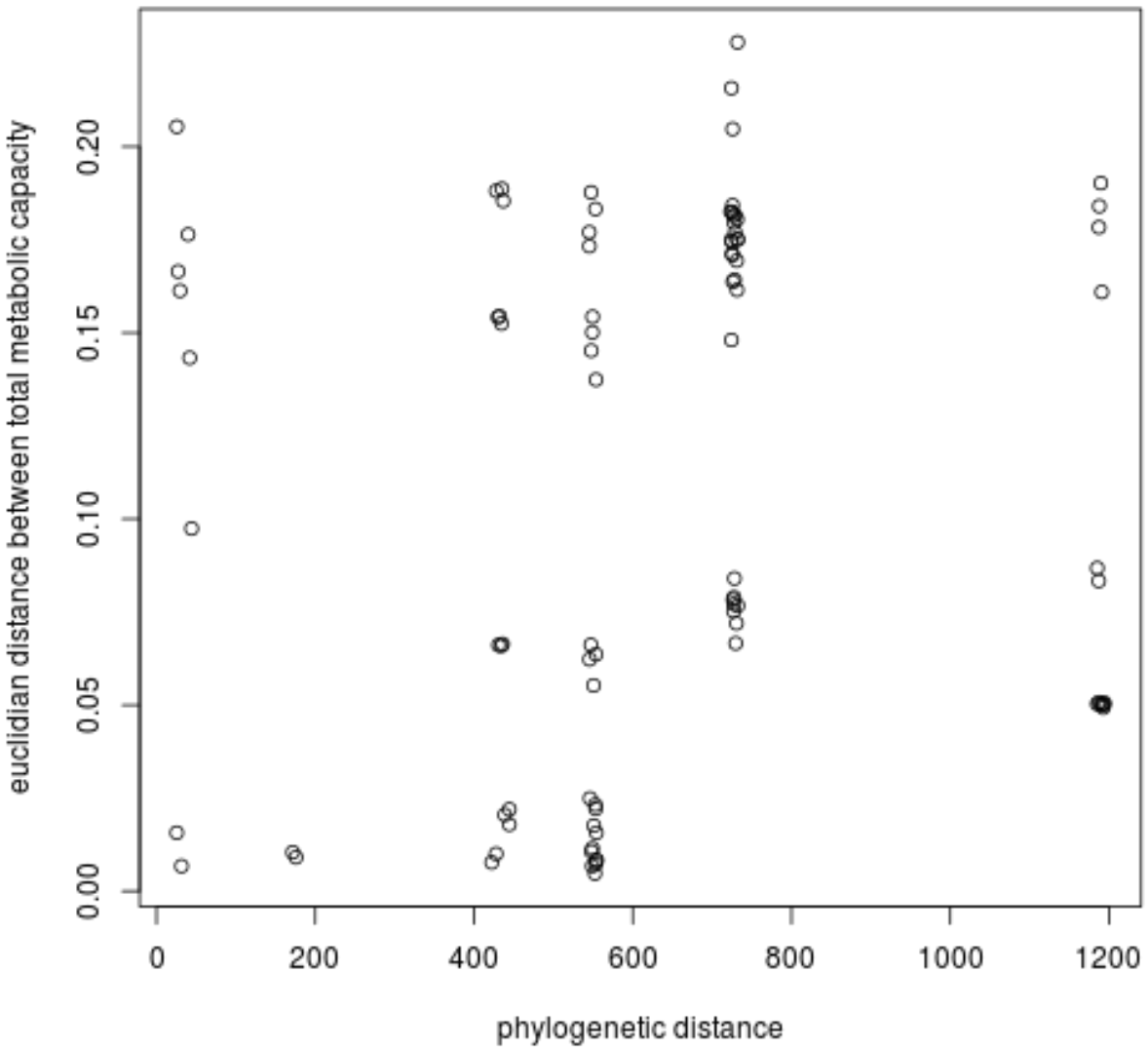


Figure 1: FALSE

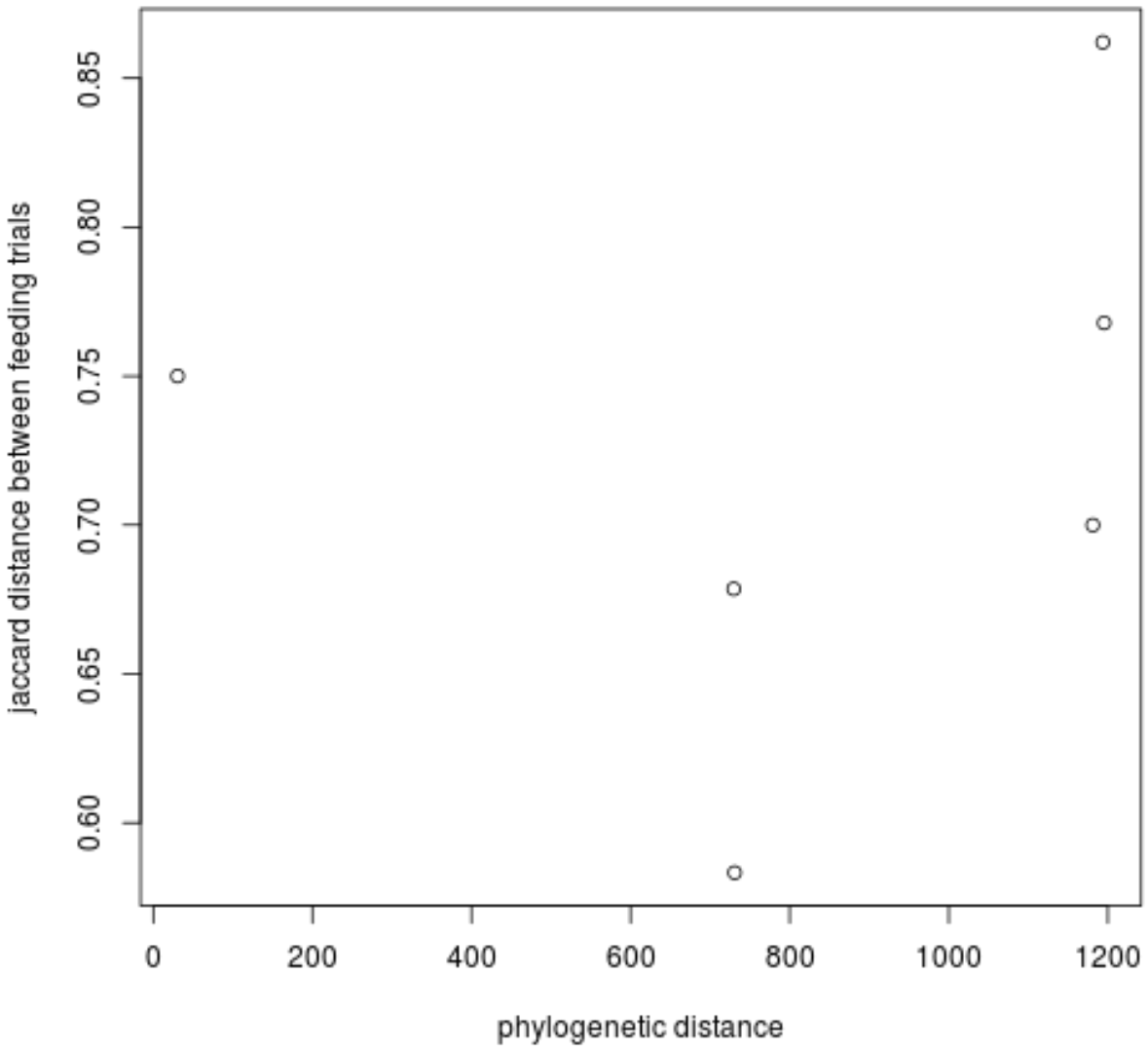


Figure 2: FALSE

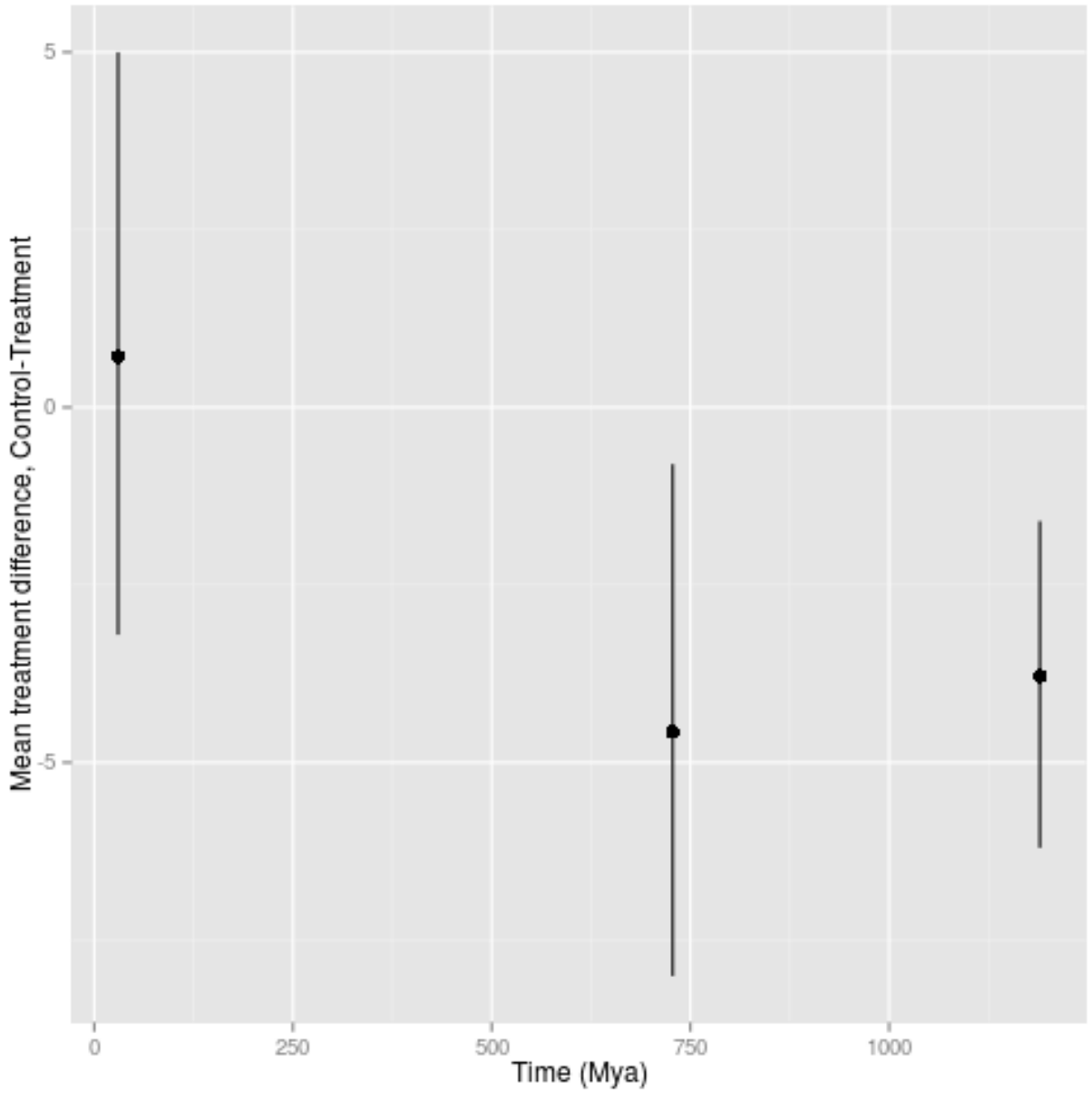


Figure 3: FALSE