FinalReport_ReproducingPowell2017

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Task 1) 1. The purpose of this file is to reproduce figures from (Powell et al. 2017). 2. My first task is to reproduce Figure 2, featuring two boxplots of nest-entrance size from data collected in natural colonies (in the field). One plot represents the areas in mmˆ2, while the other is standardized against the head area of a soldier ant, 2.9 mmˆ2.

3. The data were readily available from an associated link alongside the article, and was successfully downloaded as a CSV file. Data is available on GitHub: https://github.com/flightbody/myrepo.git

4. The data reads into R without problems. The code below was added to create a column with the standardized entrance areas, which is necessary for the figure. For this task, the readr and tidyverse libraries are recalled.

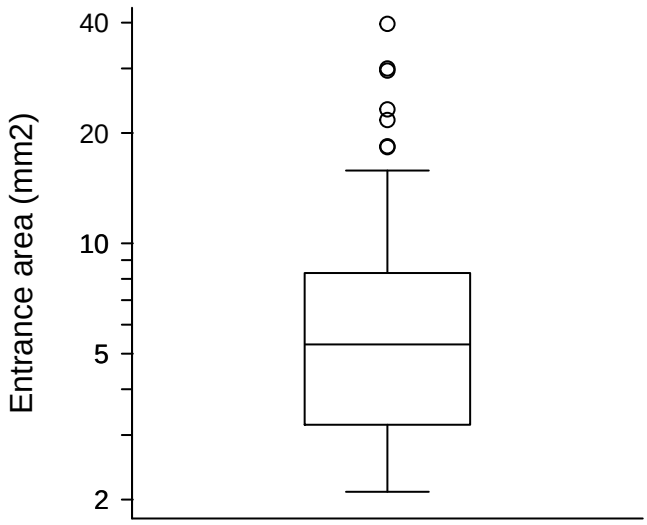
5. Metadata and code associated with this paper were not made available with its data. However, email correspondence with Dr. Powell did easily provide access. The code was initially written using a different dataset than is provided , which initially presented a challenge, but is thoroughly commented which aided in teasing out specific lines needed. Figure 2 was successfully reproduced using the original code, with the addition of the relative entrance area column, Collection_data$rel_area, as discussed in the step above. Some lines are remnants from the original code which have been commented out in the interest of precise reproduction.

```
#By Entrance Area
par(pty="s",bty="l",tcl=0.02,mgp=c(2.4,0.6,0))

boxplot(Collection_data$ent_area_mm, cex.axis=0.8, ylim=c(2,39),las=1,log="y", xant="n", xlab=expressio

  #points(1,mean(Collection_data$ent_area_mm),pch=4,col="black")

ytemptck<-c(2,3,4,5,6,7,8,9,10,20,30,40)
axis(2, at=ytemptck, tck=-0.02, label=F, lwd=0, lwd.ticks=1)
axis(2, at=c(2,5,10,40), label=c(2,5,10,40), mgp=c(3,0.6,0), lwd=0, cex.axis=0.8, las=1)
```



C.rohweri nests

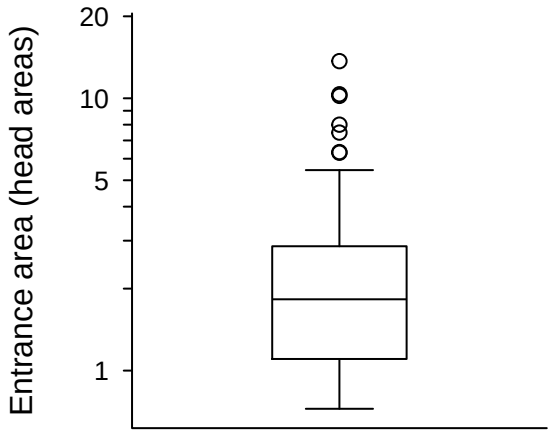
```
summary(Collection_data$ent_area_mm)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   2.100   3.200   5.300   7.562   8.250  39.700
```

```
#By Head Area
par(pty="s", bty="l", tcl=-0.2, mgp=c(2.4, 0.6, 0), fin=c(4.0, 4.0))
boxplot(Collection_data$rel_area, cex.axis=0.8, ylim=c(0.7,18), log="y", xaxt="n", yaxt="n",las=1, xlab=

#points(1,mean(Collection_data$rel_area),pch=4,col="black") #To add a point for the calculated mean

ytemptck <- c(1,2,3,4,5,6,7,8,9,10,20)
axis(2, at=ytemptck, tck=-0.02, label=F, lwd=0, lwd.ticks=1)
axis(2, at=c(1,5,10,20), label=c(1,5,10,20), mgp=c(3,0.6,0), lwd=0, cex.axis=0.8, las=1)
```



C. rohweri nests

```r
summary(Collection_data$rel_area)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##  0.7241  1.1034  1.8276  2.6076  2.8448 13.6897
```

Powell, Scott, Matina Donaldson-Matasci, Augustus Woodrow-Tomizuka, and Anna Dornhaus. 2017. "Context-Dependent Defences in Turtle Ants: Resource Defensibility and Threat Level Induce Dynamic Shifts in Soldier Deployment." Journal Article. *Functional Ecology* 31 (12): 2287–98. https://doi.org/10.1111/1365-2435.12926.