Weight Vs Colony Size Results with instar as numeric

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13 September, 2016

## Leg Vs. Colony Size

The model with the lowest AIC was (logLeg ~ logCtFm + InstarNumber + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex + (1 | NestID)). Using this as the full model we found that leg length increases as colony size increases (lmer; 24 ,7= 63.64, p = < 0.001 \*\*\* ).

Leg length was significantly correlated with instar age, but that is not surprising due to their different physiology (lmer; 24 ,7= 4342.93, p = < 0.001 \*\*\* ).

In addition, there was a significant interaction with instar sex, logCtFm x InstarNumber x InstarSex, (lmer; 24 ,7= 4342.93, p = < 0.001 \*\*\* ).

However the instar age x nest size interaction was significant (lmer; 25,7 = 53.57, p = < 0.001 \*\*\* ).

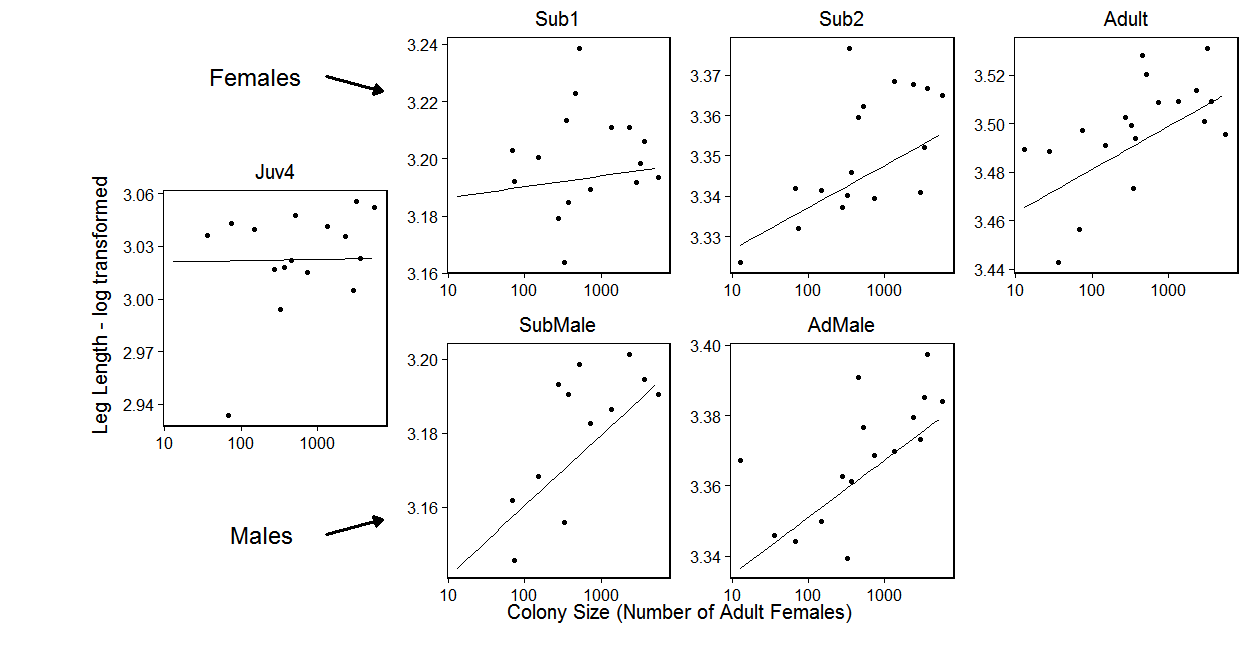
As the effect of colony size on spider size was absent in the youngest instars (Table 1); it was first detectable in subadult males and females.

Testing each instar separately, the only juvenile stage 4 and subadult stage 1 spiders did not show a significant decrease in leg length with colony size (table 1).

|  |  |  |
| --- | --- | --- |
| Instar | 2 | p value |
| Juv4 | 1.48 | 0.224 |
| Sub1 | 0.29 | 0.588 |
| Sub2 | 10.66 | < 0.001 \*\*\* |
| Adult | 8.54 | 0.003 \*\* |
| Sub Male | 6.7 | 0.01 \*\* |
| Adult Male | 11.8 | < 0.001 \*\*\* |

Table 1: Statistical results of leg length against colony size for each instar tested individually

Note: If line on graph is blue R could not plot the lmer, plotting a simple lm instead



1. Figure: Leg length against colony size. The overlaid model is logLeg ~ logCtFm + Instar + logCtFm:Instar + (1 | NestID). Overall leg length decreases with colony size (p = < 0.001 \*\*\* ) and there was a significant interaction with instar (p = < 0.001 \*\*\* ).

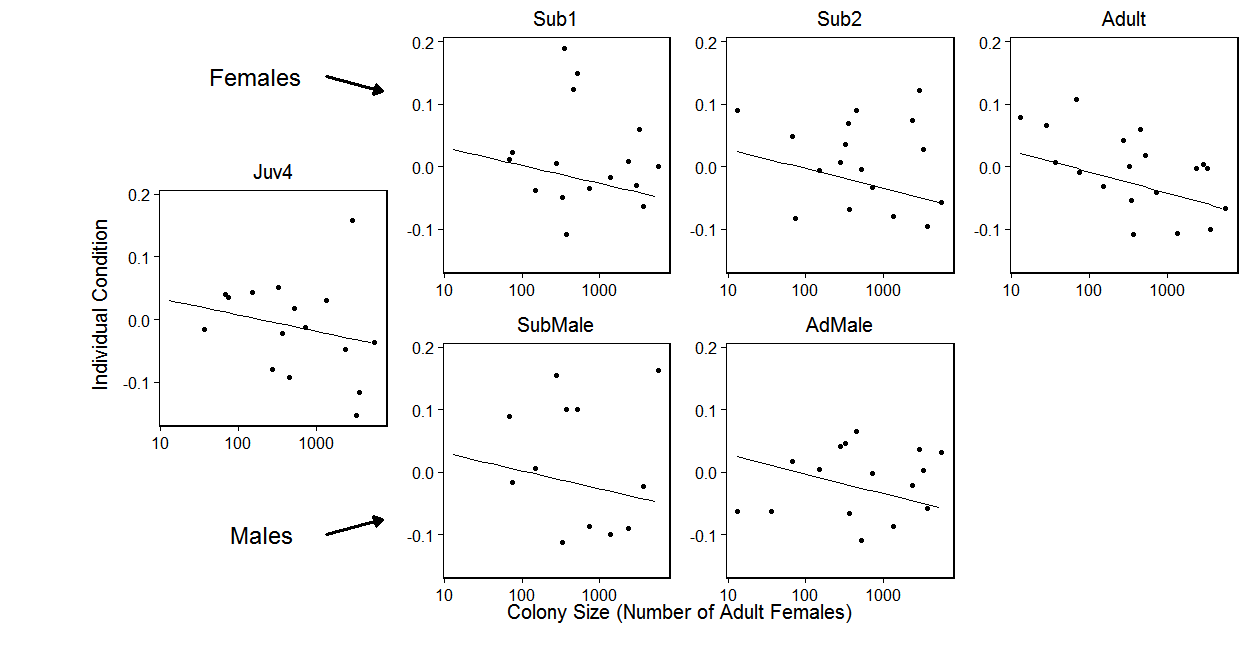
## Condition Vs. Colony Size

The model with the lowest AIC included colony size and instar x colony size interaction. Nest size combined with the nest size x instar interaction was significant (lmer; 23 ,5= 11.12, p = 0.004 \*\* ).

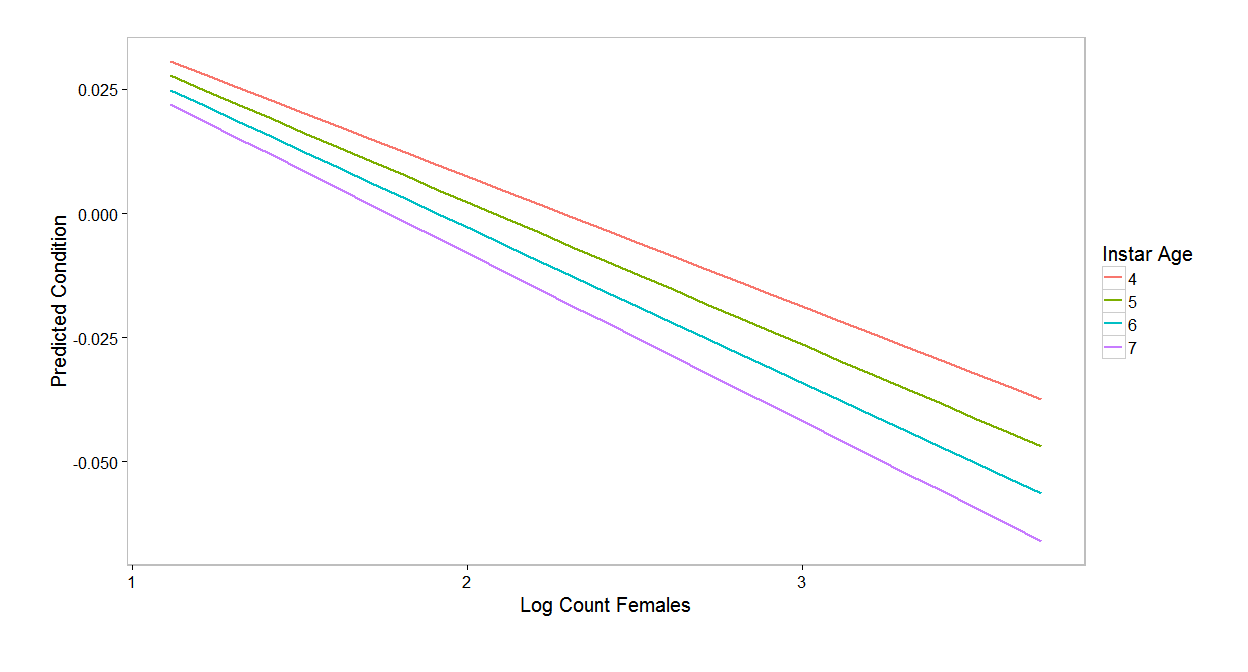
There was a significant interaction between instar and colony size (lmer; 24,5 = 1.15, p = 0.284 ), with condition appearing to decrease faster with nest size as the instars increase in age (figure???).

However, when performing ad-hoc tests on the instars individually we find that only adult condition decreases with colony size (lmer; 23,4 = 7.64, p = 0.006 \*\* ).

Note: If line on graph is blue R could not plot the lmer, plotting a simple lm instead



1. Figure : Individual condition against colony size. The overlaid model is condResiduals ~ logCtFm + logCtFm:InstarNumber + (1 | NestID). Overall leg length decreases with colony size (p = 0.004 \*\* ) and there was a significant interaction with instar(p = < 0.001 \*\*\* ).



1. Figure : The results of the linear model showing individual condition of each instar age against nest size. However only adults had a significant effect.

## Within Colony Variance Vs. colony size

### Leg Length Variance

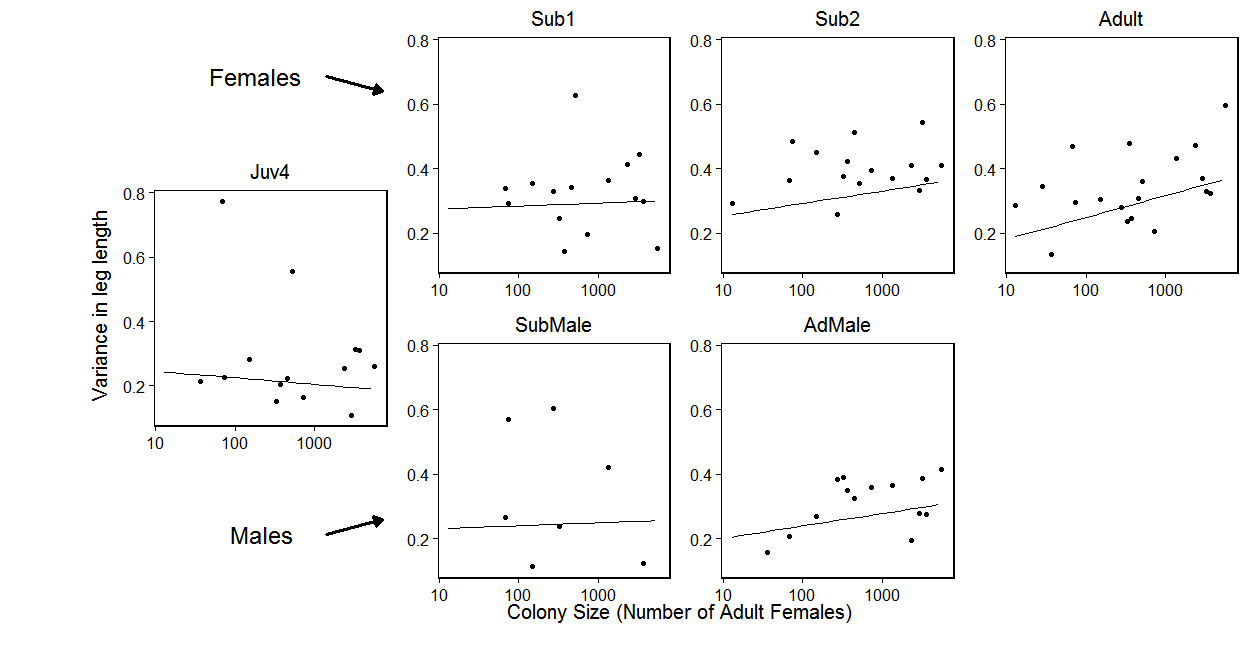
The model with the lowest AIC value was logCtFm + InstarNumber + InstarNumber:InstarSex + logCtFm:InstarNumber + instar age squared.

Nest size (and nest size x instar age interaction) was significant (lmer; 26 ,8= 6.8, p = 0.033 \* )

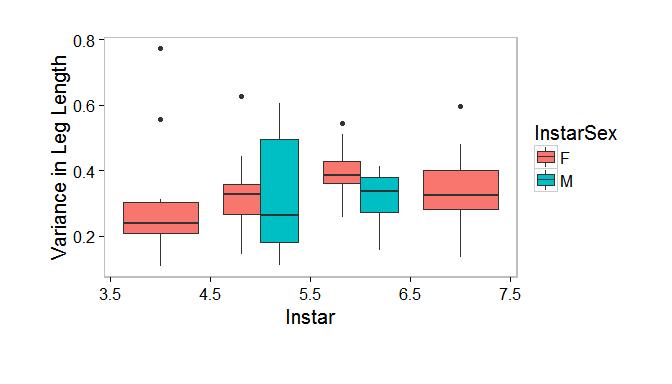
Tested together all the instar age terms, including the square of the instar age, were significant(lmer; 24 ,8= 16.24, p = 0.003 \*\* ).

However, even though it was included in the lowest AIC model the instar age x instar sex interaction was not significant (lmer; 27 ,8= 2.15, p = 0.143 ). Doing adhoc tests on each instar age, none were significant.

Note: If line on graph is blue R could not plot the lmer, plotting a simple lm instead



1. Figure : Variance in leg length against colony size

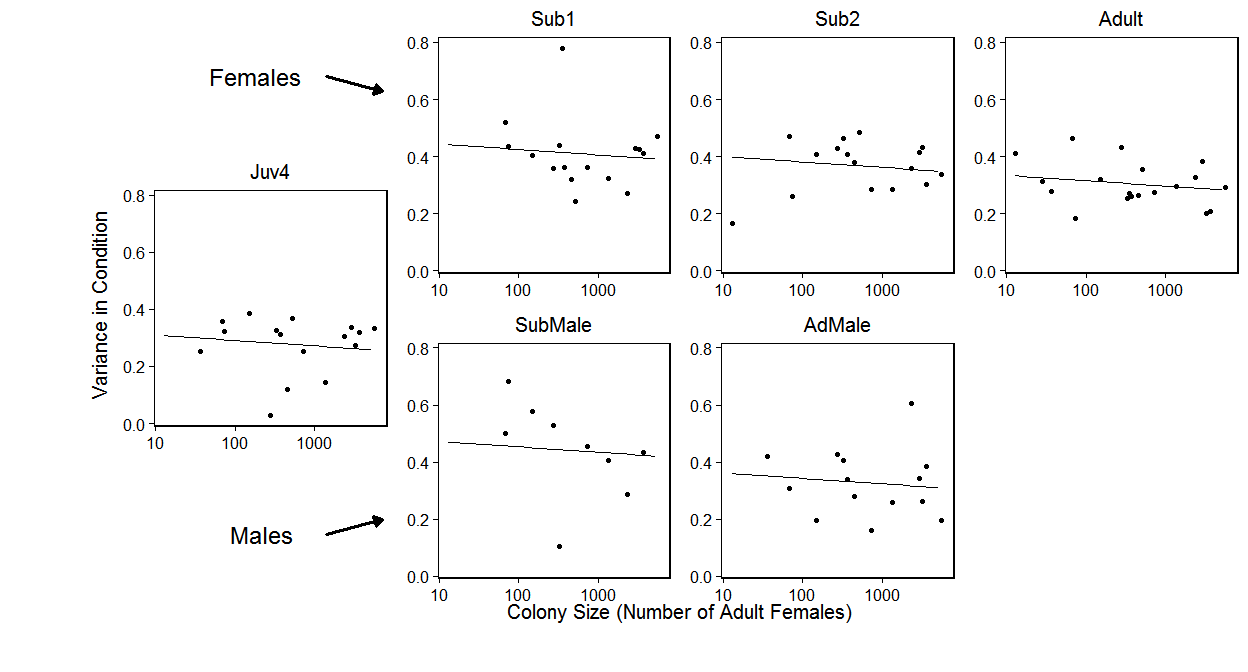


1. Figure :Leg length variance within colonies by instar is a humped function

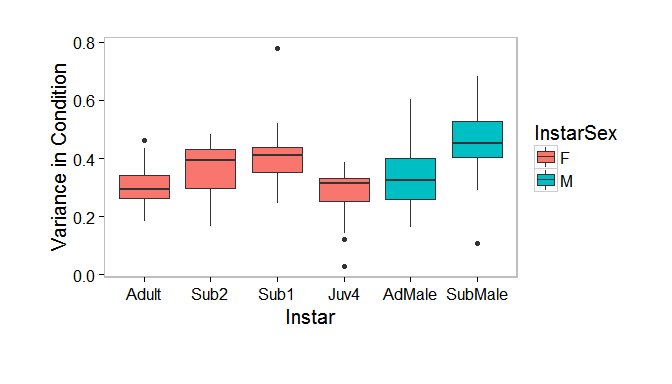
### Condition Variance

The model with the lowest AIC value only included colony size and instar as explanatory factors. Instar was significant (lmer; 24 ,9= 21.9, p = < 0.001 \*\*\* ), however colony size was not (lmer; 28 ,9= 1.32, p = 0.25 ).

Note: If line on graph is blue R could not plot the lmer, plotting a simple lm instead



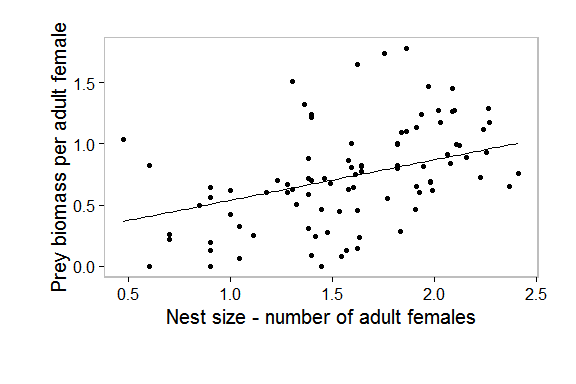
1. Figure : Variance in condition against colony size



1. Figure :Condition variance within colonies by instar. I am not sure yet whether this is a real results and/or intereseting to the story

# Biomass per capita vs colony size

Again the model with the lowest AIC included colony size, instar and instar x colony size interaction. Condition decreases as colony size increases (lmer; 24 ,5= 5.86, p = 0.015 \* ).

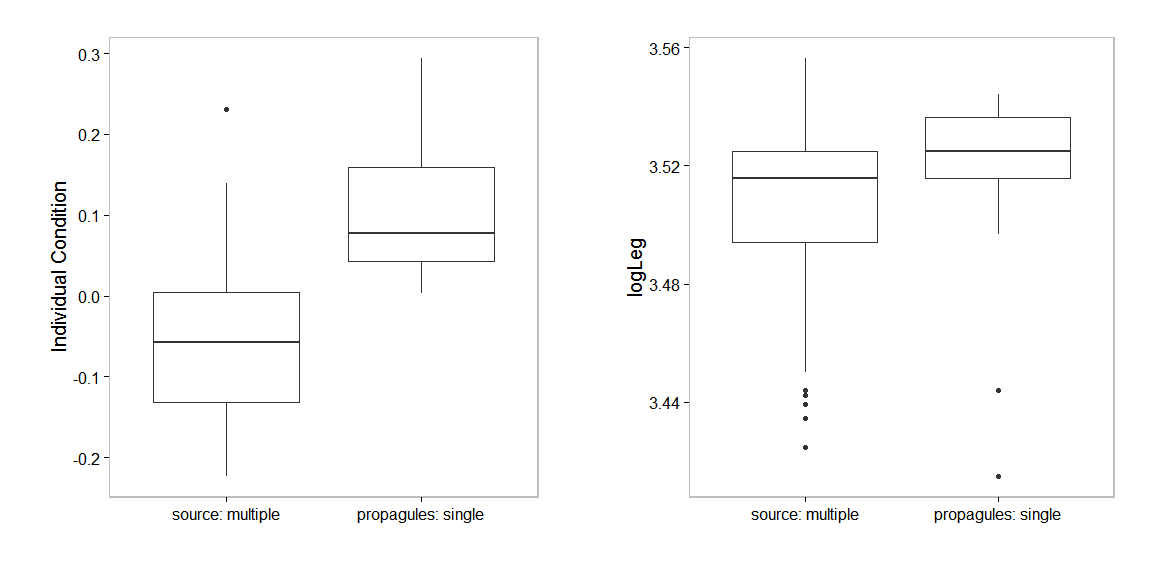


1. Figure : Variance in condition against colony size

## Original Colony Vs Propagule

Leg length was larger in propagules compared to the source colony (lmer; 24,5= 3.9, p = 0.048 \* ).

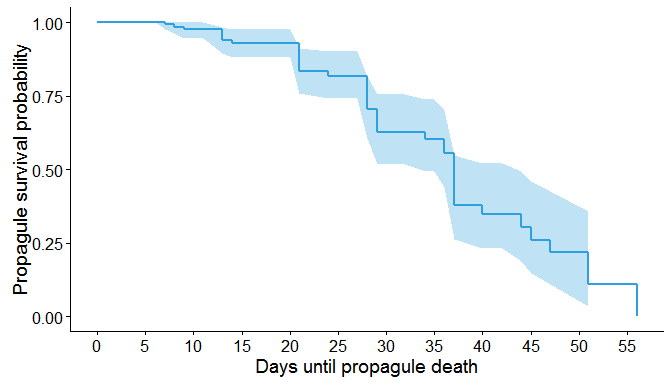
Individuals in propagules have better condition compared to those in the original nests (lmer; 24,5= 9.45, p = 0.002 \*\* ).



1. Figure: Condition and leg length of adult females in propagues and their source nest

## Propagule survival

We found that nests with single females spiders had a very low survival rate (figure 5).



1. Figure: The survival function of 40 propagules from 10 source nests.