Weight Vs Colony Size Results with instar as numeric

Ruth Sharpe

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## Leg Vs. Colony Size

The model with the the lowest AIC value included the two-way interaction colony size by instar age and the three-way interaction colony size by instar age by instar sex as fixed effects, but did not include the instar age by instar sex interaction. Using this as the full model we found, not surprisingly, that leg length was significantly correlated with instar age (lmer; 24 ,7= 4342.93, p = < 0.001 \*\*\* ).

However leg length increases as colony size increases (lmer; 24 ,7= 63.64, p = < 0.001 \*\*\* , figure 1),

but there is a significant two-way interaction between colony size and instar age (lmer; 2~5 ,7~= 53.57, p = < 0.001 \*\*\* )

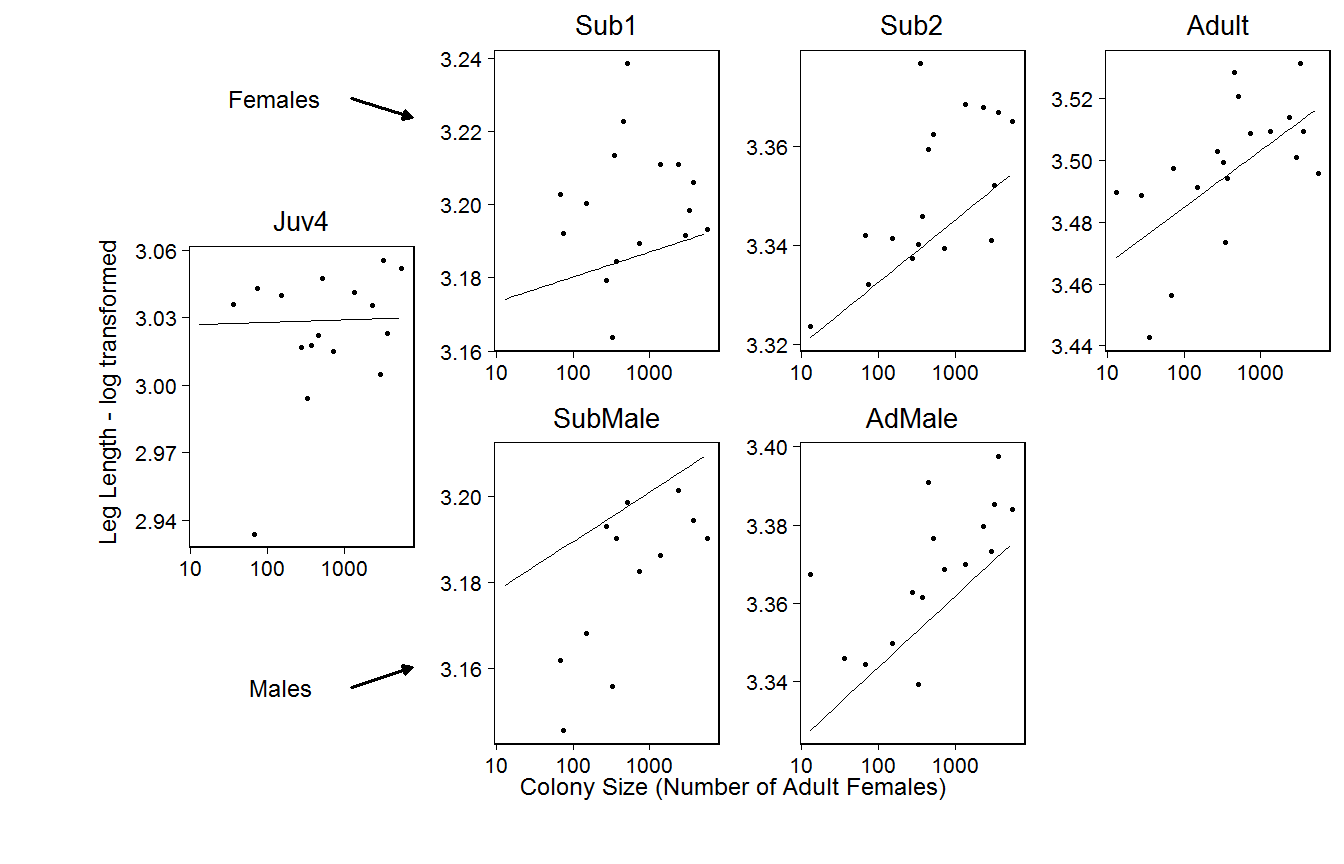
and a significant three-way interaction between colony size, instar age and instar sex (lmer; 26 ,7= 30.4, p = < 0.001 \*\*\* ),

Performing post-hoc testing, we found that leg length increased with colony size in the older instars, but was not significant for younger instars (Table 1, figure 1).

|  |  |  |  |
| --- | --- | --- | --- |
| Instar | Instar Age | 2 | p value |
| Juv4 | 4 | 1.48 | 0.224 |
| Sub1 Female | 5 | 0.29 | 0.588 |
| Sub2 Female | 6 | 10.66 | < 0.001 \*\*\* |
| Adult Female | 7 | 8.54 | 0.003 \*\* |
| Sub Male | 5 | 6.7 | 0.01 \*\* |
| Adult Male | 6 | 11.8 | < 0.001 \*\*\* |

*Table 1: Results of post-hoc analysis of leg length against colony size for each instar*

Note: If line on graph is blue R could not plot the lmer, plotting a simple lm instead[1] "lmer"



1. *Figure: Leg length against colony size. Overall leg length increased with* *colony size (p = < 0.001 \*\*\* ), but only for the older instars (there was a significant interaction with instar (p = < 0.001 \*\*\* ), n = 19 colonies.*

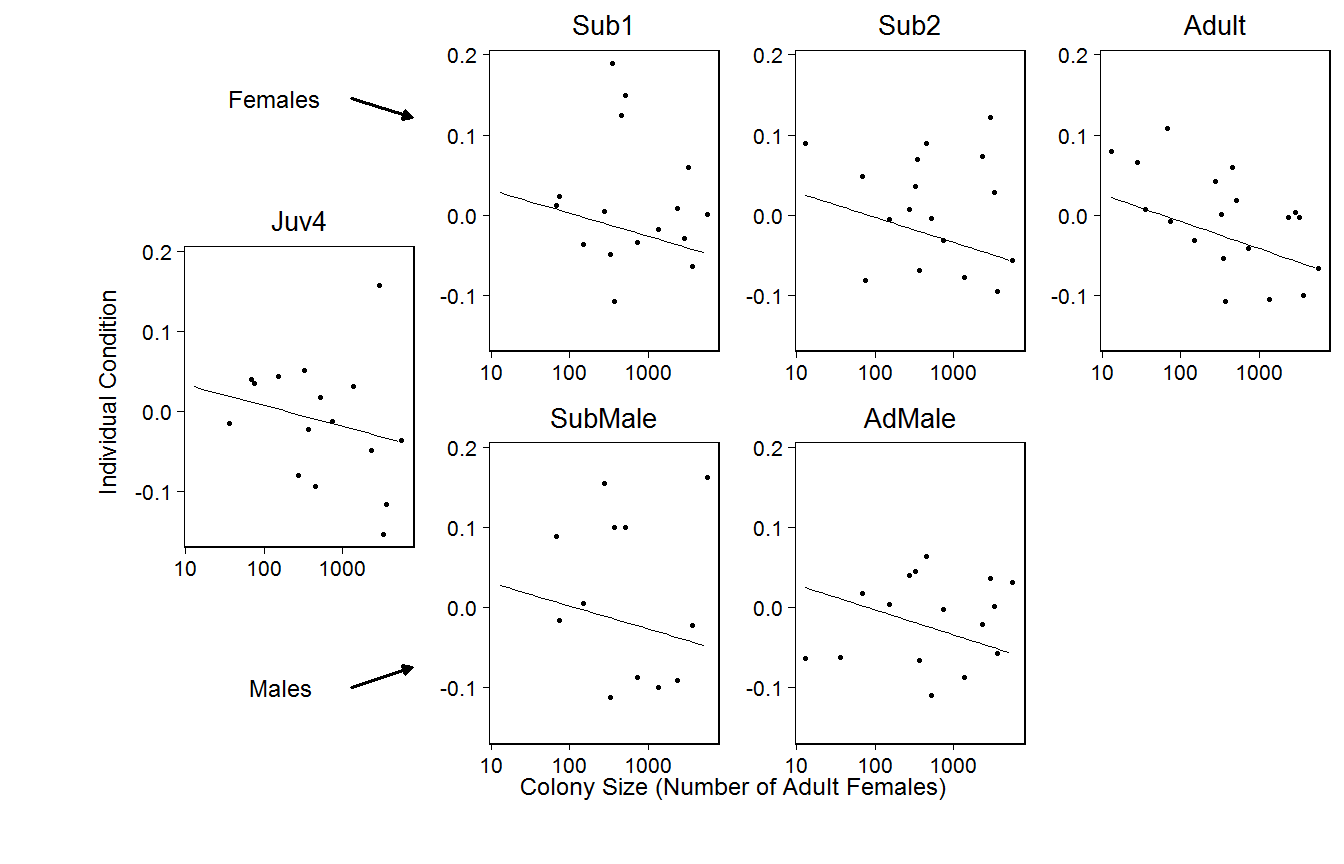
## Condition Vs. Colony Size

The model with the lowest AIC included only one interaction term which was was instar age by colony size interaction and did not include instar sex or instar age. Colony size was significant (lmer; 23,5 = 11.12, p = 0.004 \*\* ) with condition decreasing as colony size increased (figure 2).

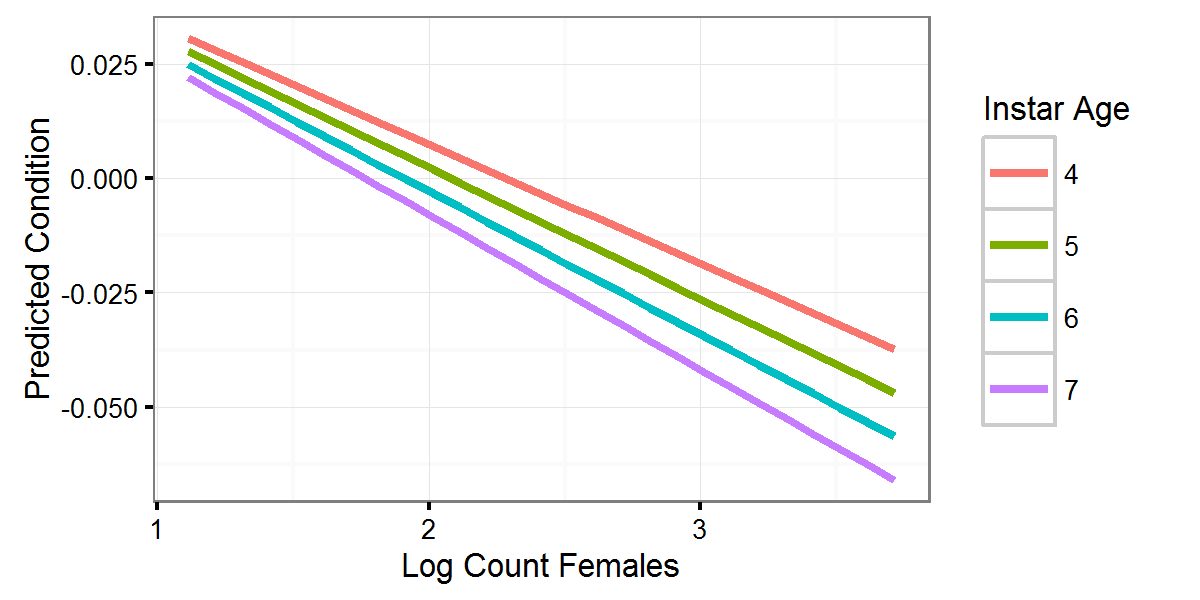
However, there was a significant interaction between instar age and colony size (lmer; 24,5 = 6.76, p = 0.009 \*\* ), with condition appearing to decrease faster with colony size as the instars increase in age (figure 3).

However, when performing ad-hoc tests on the instars individually we found only adult condition decreased significantly 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] "lmer"



1. *Figure : Individual condition against colony size. Overall condition 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 colony size with both sexes combined as instar sex was insignificant. However only adults had a significant effect, n = 19 colonies.*

## Within Colony Variance Vs. colony size

### Leg Length Variance

There was no significant pattern of within colony variance in leg length and colony size

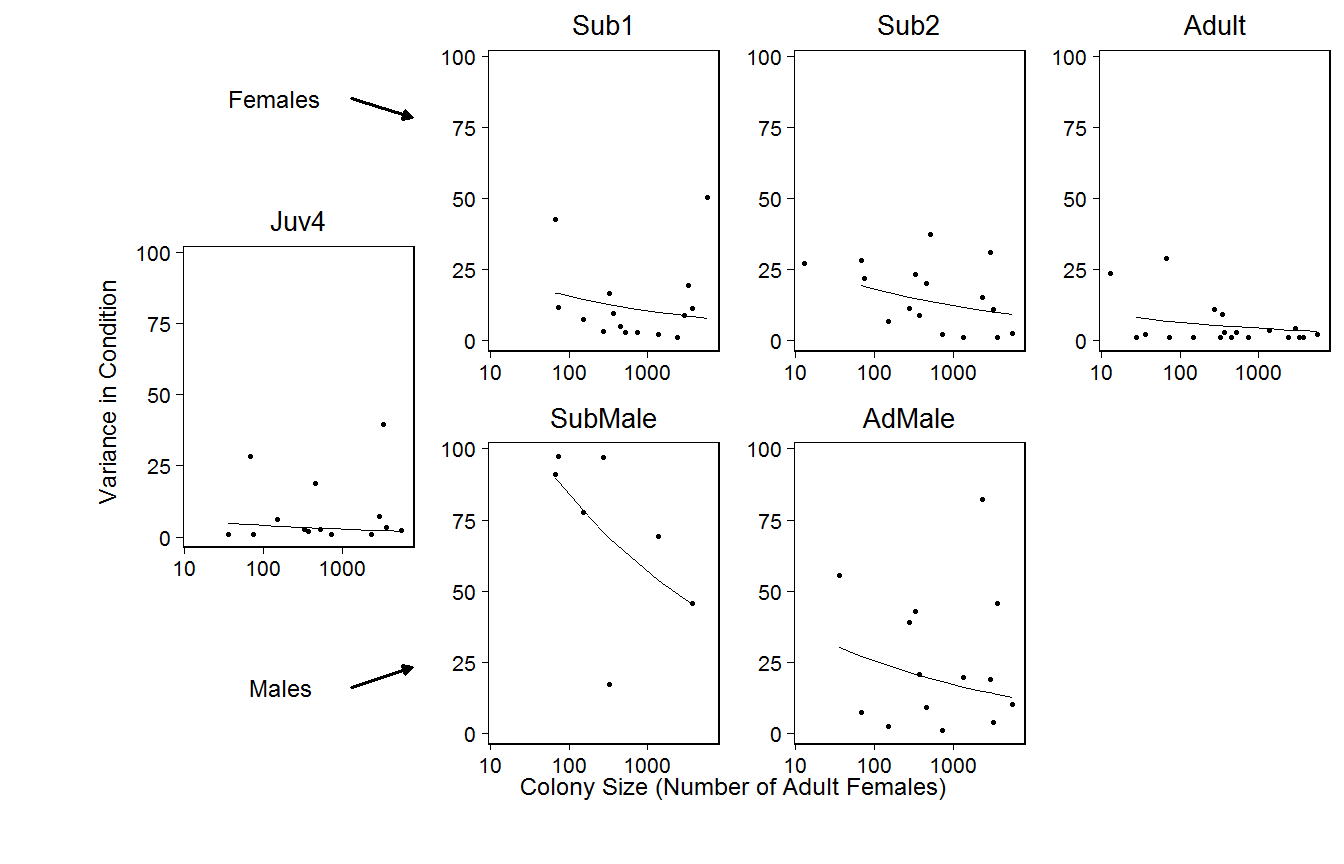
### Condition Variance

The final model included only colony size, the two-way interaction instar age by sex interacion and the two-way interaction instar age squared by instar sex. Colony size was significant (glmmPQR; 21 = 7.244, p = 0.007 \*\* ) as within-colony condition variance decreased with increasing colony size.

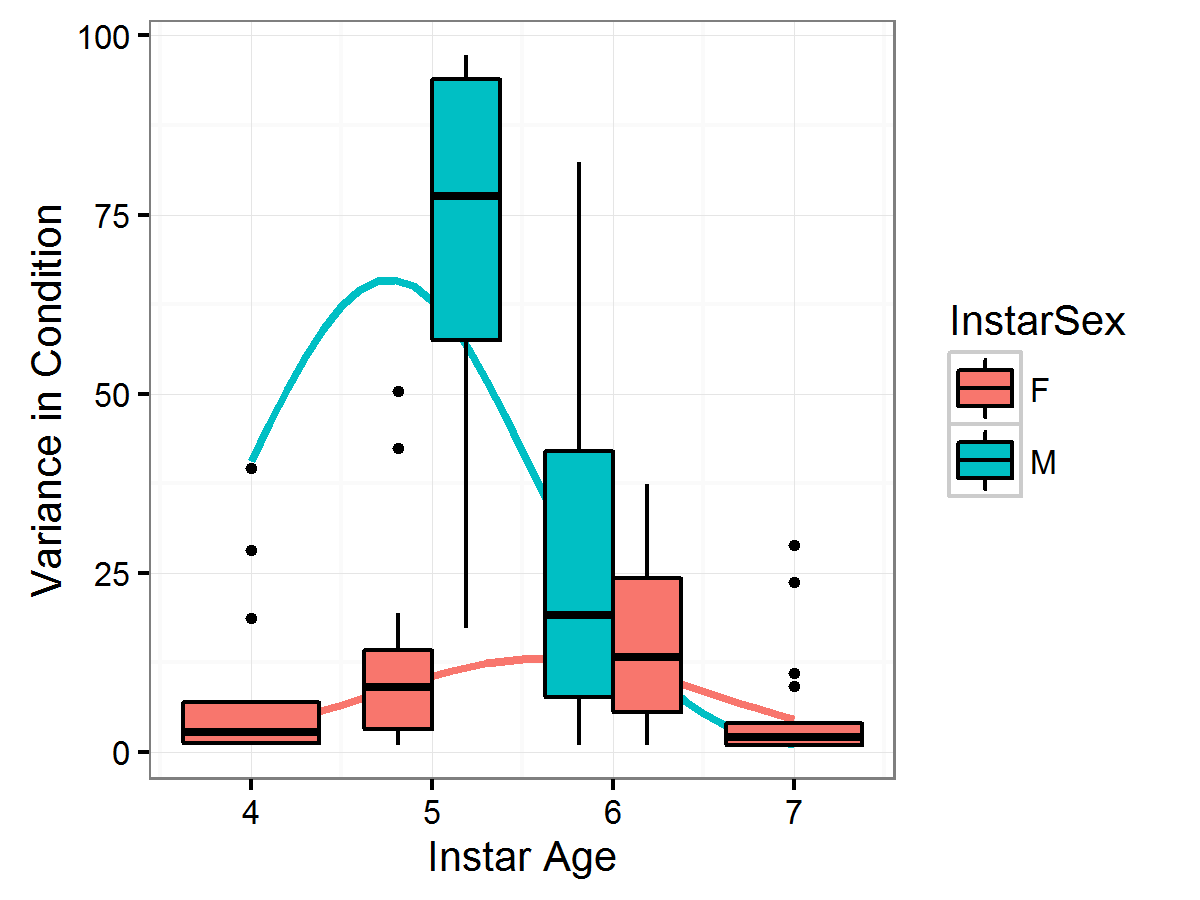
The interaction instar age by sex was significant (glmmPQR; 22 = 30.525, p < 0.001 \*\*\* , figure 5) as was instar age squared crossed with sex (glmmPQR; 22 = 25.315, p < 0.001 \*\*\* , figure 5), with the within-colony variance in condition peaking at intermediate instar ages and being larger for males.

Note: If line on graph is blue R could not plot the lmer, plotting a simple lm instead[1] "glmmpql"

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1. *Figure : Variance in condition against colony size with the linear model superimposed, n = 19 colonies.*

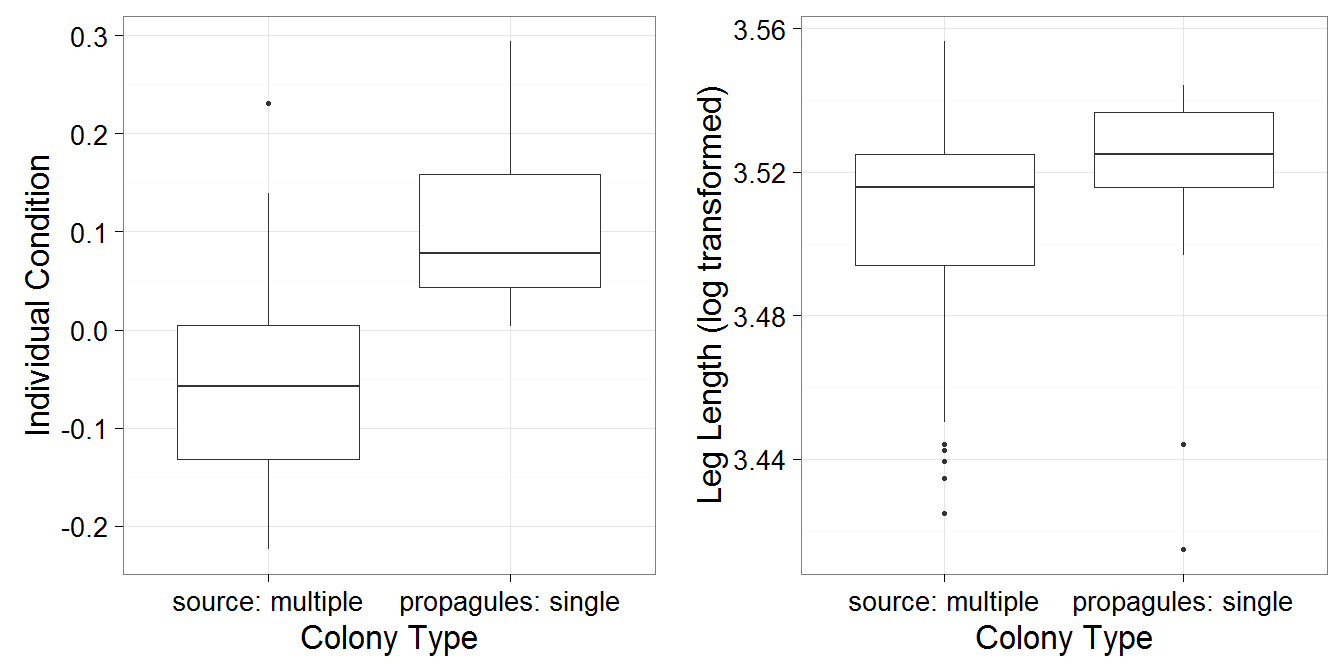


1. *Figure :Within-colony condition variance by instar. Overlaid is the linear model with a significant quadratic term.*

# Original Colony Vs Propagule

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

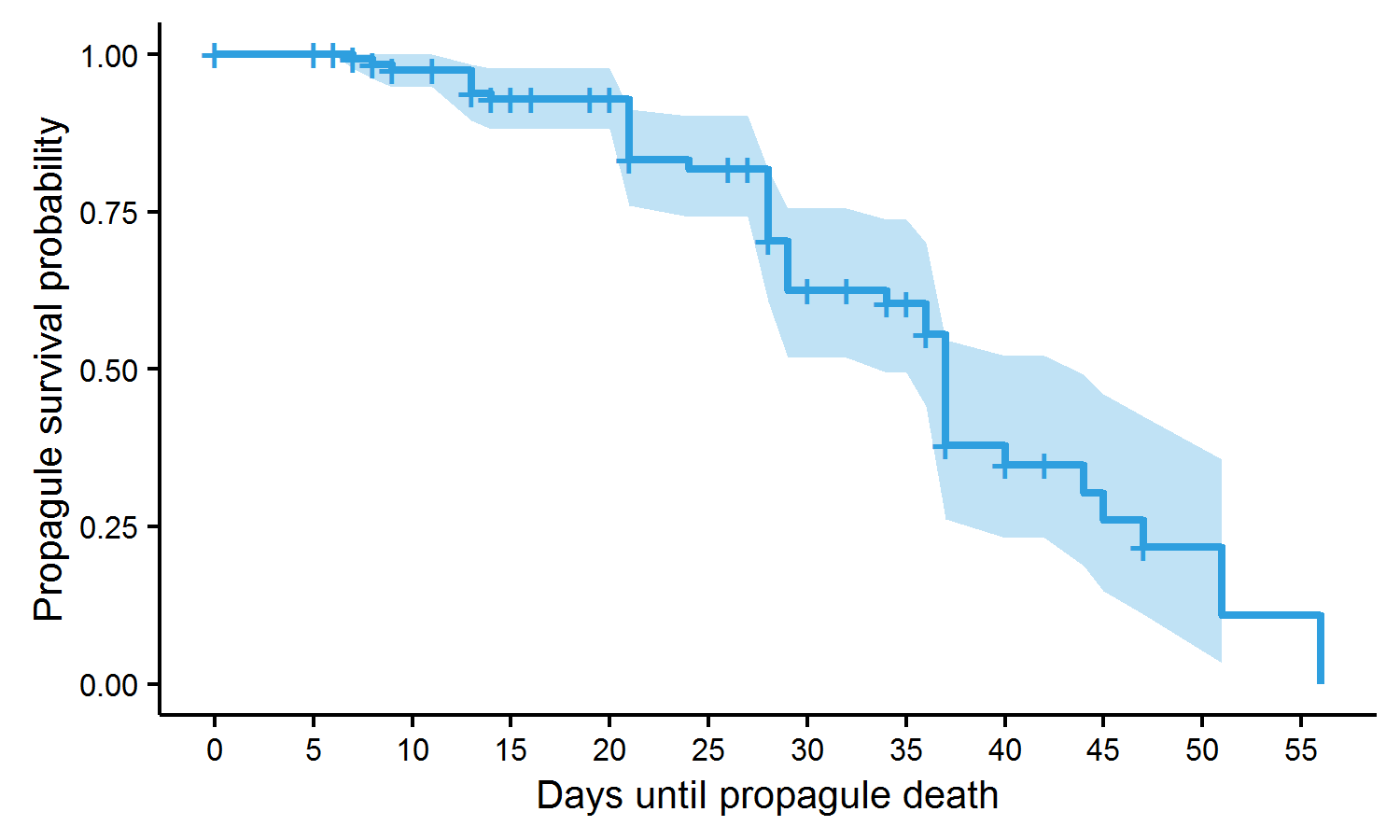
as was condition (lmer; 24,5= 9.45, p = 0.002 \*\* ), with those in propagules having a greater condition compared to those in the source colony.



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

## Propagule survival

We found that colony with single female spiders had a very low survival rate, with there being only around a 15% chance that the single colony would survive to 50 days after establishment. (figure 5).



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

## List of full models used

|  |  |
| --- | --- |
| test | fullModel |
| Leg length | logLeg=logCtFm + InstarAge + logCtFm:InstarAge + logCtFm:InstarAge:InstarSex + (1|Nest) |
| Condition | condResiduals=logCtFm + logCtFm:InstarAge + (1|Nest) |
| Condition Variance | Variance=logCtFm + InstarAge:InstarSex + InstarSex:sqr(InstarAge) |
| Single nest leg | logLeg=type + (1|Nest) + (1|OrigNst) |
| Single nest condition | condResiduals=type + (1|Nest) + (1|OrigNst) |