Leg Length vs Nest Size with sex and instar as numeric

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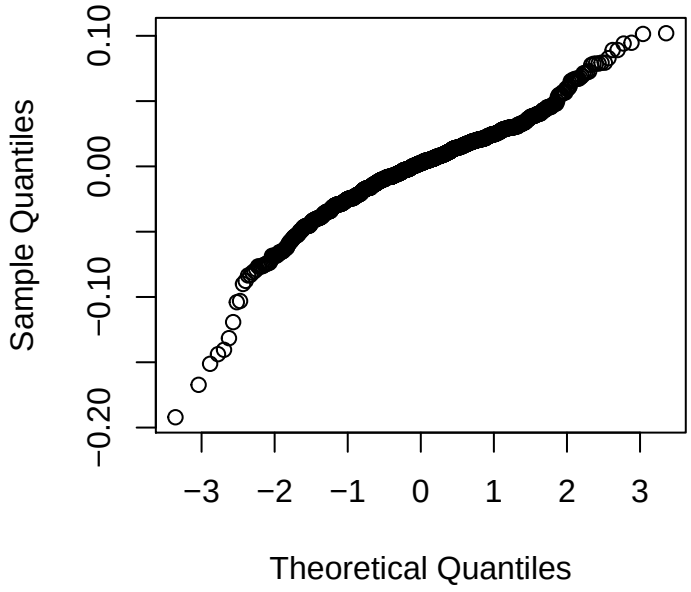
Contents

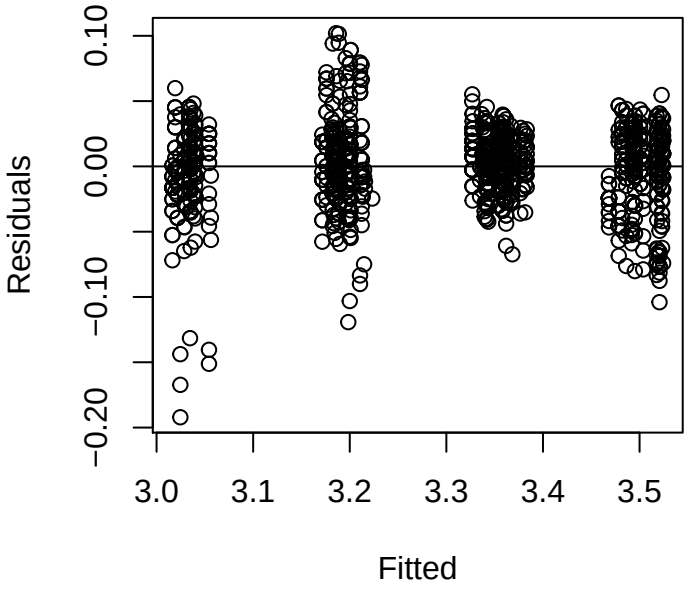
AIC Values of all possible models with instar always included

AIC_Diff	AIC	model	num.predictors
0	-5232	logLeg ~ logCtFm + InstarNumber + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex	7
1.6	-5230	logLeg ~ logCtFm + InstarNumber + InstarNumber:InstarSex + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex	8
3.05	-5229	logLeg ~ logCtFm + InstarNumber:InstarSex + logCtFm:InstarNumber	7
3.05	-5229	logLeg ~ logCtFm + InstarNumber + InstarNumber:InstarSex + logCtFm:InstarNumber	7
23.88	-5208	logLeg ~ logCtFm + InstarNumber + InstarNumber:InstarSex	6
28.4	-5203	logLeg ~ logCtFm + InstarNumber + logCtFm:InstarNumber	6
49.57	-5182	logLeg ~ logCtFm + InstarNumber	5
1072	-4159	logLeg ~ logCtFm + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex	6
1082	-4150	logLeg ~ logCtFm + logCtFm:InstarNumber	5

Checking full model fit

```
logLeg=logCtFm + InstarAge + (1|Nest) + logCtFm:InstarAge + logCtFm:InstarAge:InstarSex
```

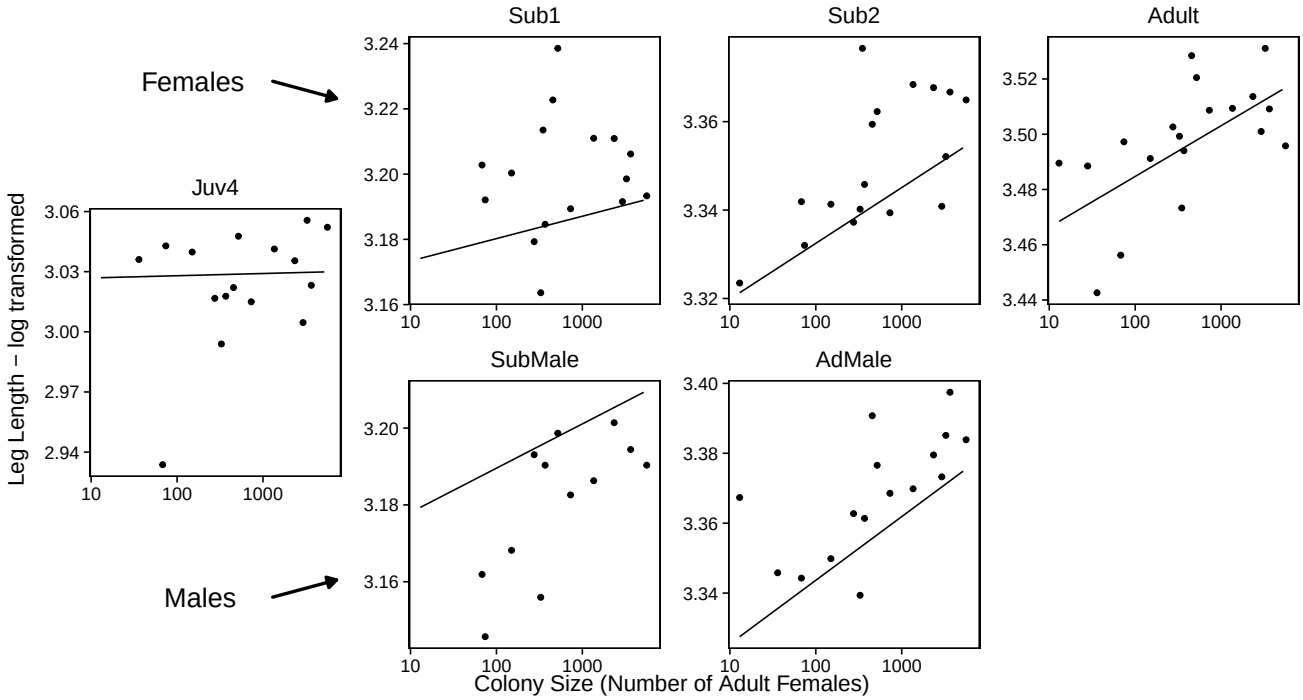




Graph with full model superimposed

```
Model:
logLeg ~ logCtFm + InstarNumber + (1 | NestID) + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex
```

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



Statistics

Note: There is no point testing instar number against leg length as it will vary of course, same with instar size

```
Warning in summary.merMod(model, ddf = "lme4"): additional arguments
ignored
```

Full Model: logLeg ~ logCtFm + InstarNumber + (1 | NestID) + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex

Anova of full model alone

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
logCtFm	0.007	0.007	1	282.208	7.319	0.007
InstarNumber	1.559	1.559	1	1,228.259	1,712.068	0
logCtFm:InstarNumber	0.024	0.024	1	1,245.657	26.666	0.00000
logCtFm:InstarNumber:InstarSex	0.028	0.028	1	1,255.232	30.765	0.00000

Testing Individual Variables by preforming an Anova of full vs reduced model

Three way interaction against full model. - $p < 0.001$ SIGNIFICANT ***

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	6	-5,203.186	-5,172.306	2,607.593	-5,215.186			
object	7	-5,231.582	-5,195.554	2,622.791	-5,245.582	30.395	1	0.00000

Reduced Model: logLeg=logCtFm + InstarAge + (1|Nest) + logCtFm:InstarAge

Nest size x Instar Number against full model. - $p < 0.001$ SIGNIFICANT ***

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	5	-5,182.014	-5,156.280	2,596.007	-5,192.014			
object	7	-5,231.582	-5,195.554	2,622.791	-5,245.582	53.568	2	0

Reduced Model: logLeg=logCtFm + InstarAge + (1|Nest)

Instar age against full model. - $p < 0.001$ SIGNIFICANT ***

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	4	-894.656	-874.069	451.328	-902.656			
object	7	-5,231.582	-5,195.554	2,622.791	-5,245.582	4,342.926	3	0

Reduced Model: logLeg=logCtFm + (1|Nest)

NestSize against full model. - $p < 0.001$ SIGNIFICANT ***

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	4	-5,173.946	-5,153.359	2,590.973	-5,181.946			
object	7	-5,231.582	-5,195.554	2,622.791	-5,245.582	63.636	3	0

Reduced Model: logLeg=InstarAge + (1|Nest)

Testing Individual Instars

As the three way interaction is significant testing instar individually

note: pops up saying 'refitting model(s) with ML (instead of REML)' but if make anova refit = FALSE results don't make sense

Adult * SIGNIFICANT *

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-1496.660	-1484.952	751.3299	-1502.660	NA	NA	NA
object	4	-1503.201	-1487.591	755.6007	-1511.201	8.541558	1	0.0034713

Sub2 * SIGNIFICANT *

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-1228.262	-1217.709	617.1308	-1234.262	NA	NA	NA
object	4	-1236.919	-1222.849	622.4595	-1244.919	10.65751	1	0.0010962

Sub1 not significant

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-1112.989	-1102.042	559.4943	-1118.989	NA	NA	NA
object	4	-1111.281	-1096.685	559.6407	-1119.281	0.2927162	1	0.5884852

Juv4 not significant

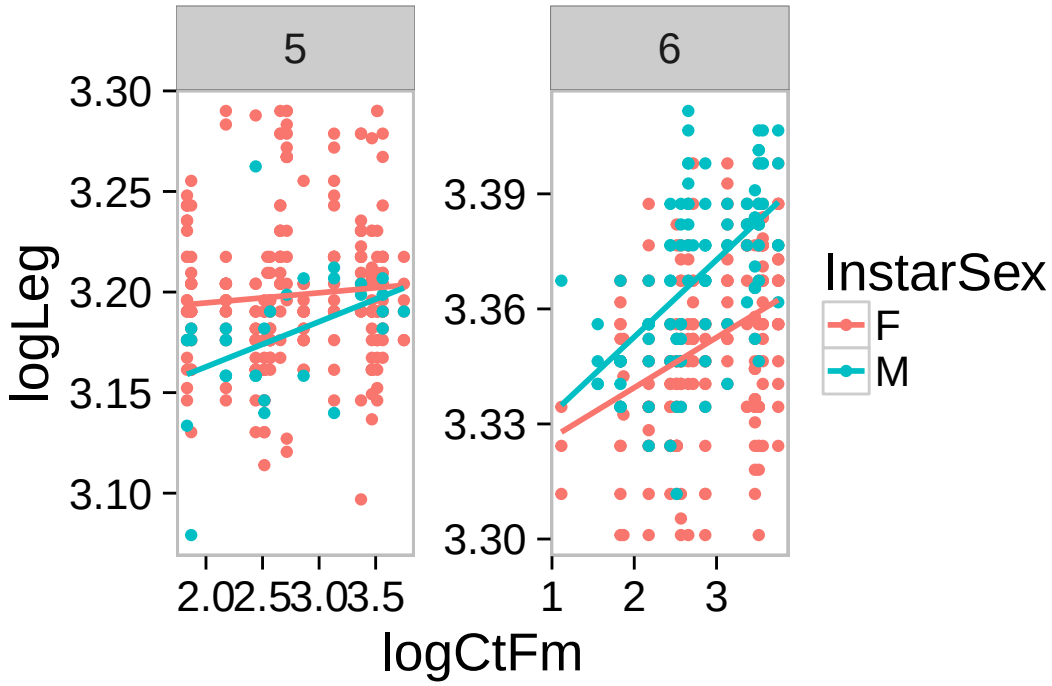
	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-922.1183	-911.7652	464.0592	-928.1183	NA	NA	NA
object	4	-921.5977	-907.7935	464.7988	-929.5977	1.47934	1	0.2238779

AdMale * SIGNIFICANT *

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-547.1792	-539.1889	276.5896	-553.1792	NA	NA	NA
object	4	-556.9807	-546.3269	282.4903	-564.9807	11.80143	1	0.0005919

SubMale * SIGNIFICANT *

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-125.0124	-120.6152	65.50620	-131.0124	NA	NA	NA
object	4	-129.7154	-123.8524	68.85769	-137.7154	6.702965	1	0.0096253


5
6
3.30
3.25
3.20
3.15
3.10
3.39
3.36
3.33
3.30
logLeg
2.0
2.5
3.0
3.5
1
2
3
logCtFm
InstarSex
F
M