Leg Length vs Nest Size with sex and instar as numeric

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09 September, 2016

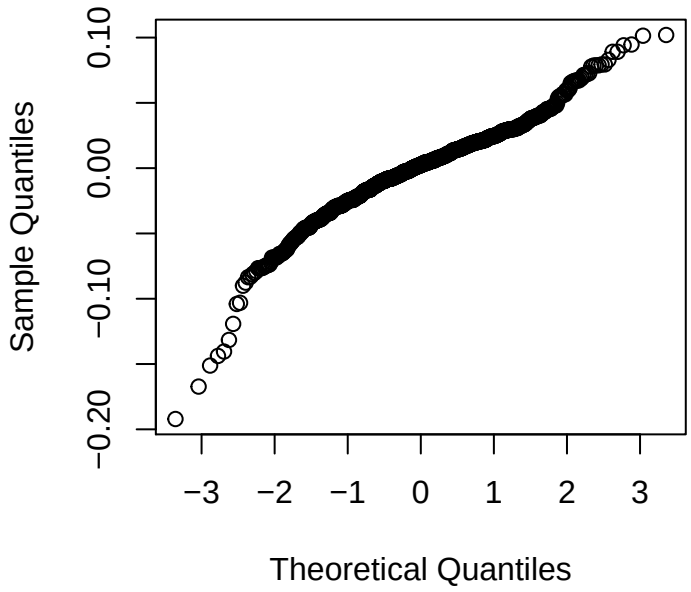
Contents

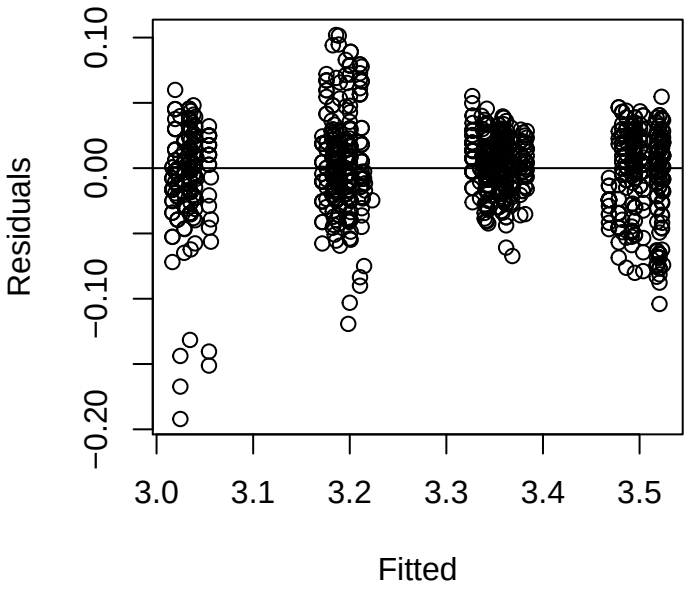
AIC Values of all possible models with instar always included

AIC_Diff	AIC	model	num.predictors
0	-5232	logLeg ~ logCtFm + InstarNumber + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex + (1|NestID)	7
1.6	-5230	logLeg ~ logCtFm + InstarNumber + InstarNumber:InstarSex + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex + (1|NestID)	8
1.6	-5230	logLeg ~ logCtFm + InstarNumber:InstarSex + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex + (1|NestID)	8
3.05	-5229	logLeg ~ logCtFm + InstarNumber + InstarNumber:InstarSex + logCtFm:InstarNumber + (1|NestID)	7
23.88	-5208	logLeg ~ logCtFm + InstarNumber + InstarNumber:InstarSex + (1|NestID)	6
28.4	-5203	logLeg ~ logCtFm + InstarNumber + logCtFm:InstarNumber + (1|NestID)	6
49.57	-5182	logLeg ~ logCtFm + InstarNumber + (1|NestID)	5
1072	-4159	logLeg ~ logCtFm + logCtFm:InstarNumber + logCtFm:InstarNumber:InstarSex + (1|NestID)	6
1072	-4159	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + (1|NestID)	6
1082	-4150	logLeg ~ logCtFm + logCtFm:InstarNumber + (1|NestID)	5

Checking full model fit

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

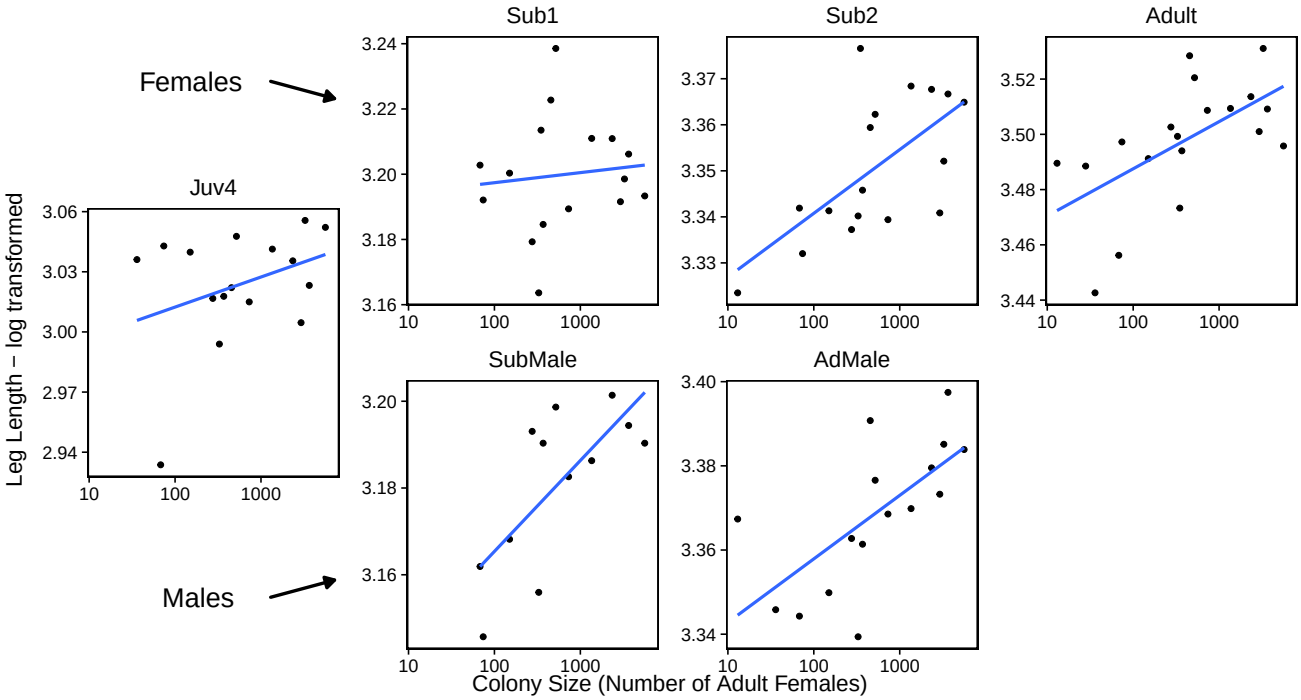




Graph with lowest AIC model superimposed

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

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


Females
Males
Juv4
Sub1
Sub2
Adult
SubMale
AdMale
Leg Length – log transformed
Colony Size (Number of Adult Females)
3.06
3.03
3.00
2.97
2.94
3.24
3.22
3.20
3.18
3.16
3.37
3.36
3.35
3.34
3.33
3.52
3.50
3.48
3.46
3.44
3.40
3.38
3.36
3.34
10
100
1000

Statistics

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

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

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)
object	7	-5,231.582	-5,195.554	2,622.791	-5,245.582			
..1	9	-5,251.046	-5,204.725	2,634.523	-5,269.046	23.465	2	0.00001

Reduced Model: logLeg = logCtFm + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1 | Ne

Nest size x Instar Number against full model. - NOT significant

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
object	7	-5,231.582	-5,195.554	2,622.791	-5,245.582			
..1	7	-5,224.411	-5,188.384	2,619.205	-5,238.411	0	0	1

Reduced Model: logLeg = logCtFm + logCtFm:InstarNumber + InstarNumber + InstarSex + (1 | NestID)

Spider Sex 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 + logCtFm:InstarNumber + InstarNumber + (1 | NestID)

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

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	6	-5,223.471	-5,192.590	2,617.735	-5,235.471			
object	7	-5,231.582	-5,195.554	2,622.791	-5,245.582	10.111	1	0.001

Reduced Model: logLeg = InstarSex:InstarNumber + InstarNumber + InstarSex + (1 | NestID)

Testing Individual Instars

As the 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

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-895.4806	-880.0403	450.7403	-901.4806	NA	NA	NA
object	4	-894.6560	-874.0689	451.3280	-902.6560	1.175376	1	0.2782993

Sub2

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-895.4806	-880.0403	450.7403	-901.4806	NA	NA	NA
object	4	-894.6560	-874.0689	451.3280	-902.6560	1.175376	1	0.2782993

Sub1

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-895.4806	-880.0403	450.7403	-901.4806	NA	NA	NA
object	4	-894.6560	-874.0689	451.3280	-902.6560	1.175376	1	0.2782993

Juv4

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-895.4806	-880.0403	450.7403	-901.4806	NA	NA	NA
object	4	-894.6560	-874.0689	451.3280	-902.6560	1.175376	1	0.2782993

AdMale

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-895.4806	-880.0403	450.7403	-901.4806	NA	NA	NA
object	4	-894.6560	-874.0689	451.3280	-902.6560	1.175376	1	0.2782993

SubMale

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	3	-895.4806	-880.0403	450.7403	-901.4806	NA	NA	NA
object	4	-894.6560	-874.0689	451.3280	-902.6560	1.175376	1	0.2782993