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

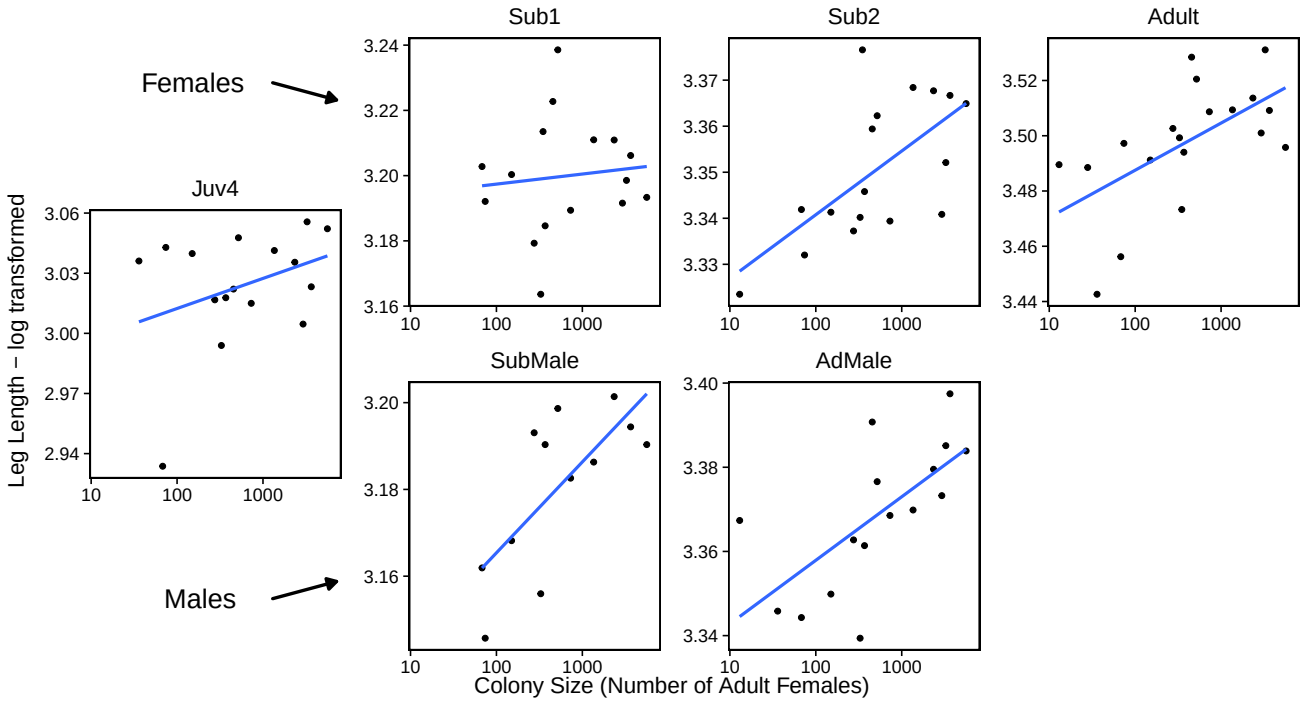
AIC_Diff	AIC	model	num.predictors
0	-5253	logLeg ~ logCtFm + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	9
0.22	-5253	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	9
0.43	-5253	logLeg ~ logCtFm + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	8
1.14	-5252	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	10
1.14	-5252	logLeg ~ logCtFm:InstarNumber:InstarSex + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	10
3.63	-5250	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	9
3.63	-5250	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	9
5.96	-5248	logLeg ~ logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	8
6.08	-5247	logLeg ~ logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	7
6.11	-5247	logLeg ~ logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	8
7.5	-5246	logLeg ~ logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	9
8.99	-5244	logLeg ~ logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	8
19.1	-5234	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarNumber + InstarSex + (1|NestID)	8
19.1	-5234	logLeg ~ logCtFm + logCtFm:InstarNumber:InstarSex + InstarNumber + InstarSex + (1|NestID)	8
21.78	-5232	logLeg ~ InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	8
21.78	-5232	logLeg ~ logCtFm + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	8

AIC_Diff	AIC	model	num.predictors
22.39	-5231	logLeg ~ logCtFm + InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	7
24.8	-5229	logLeg ~ logCtFm:InstarNumber:InstarSex + logCtFm:InstarNumber + InstarNumber + InstarSex + (1|NestID)	7
27	-5226	logLeg ~ logCtFm + logCtFm:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	8
29.07	-5224	logLeg ~ logCtFm + logCtFm:InstarNumber + InstarNumber + InstarSex + (1|NestID)	7
30.01	-5223	logLeg ~ InstarSex:InstarNumber + InstarNumber + InstarSex + (1|NestID)	6
32.46	-5221	logLeg ~ logCtFm:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	7
34.12	-5219	logLeg ~ logCtFm:InstarNumber + InstarNumber + InstarSex + (1|NestID)	6
47.6	-5206	logLeg ~ logCtFm + InstarSex:logCtFm + InstarNumber + InstarSex + (1|NestID)	7
49.85	-5204	logLeg ~ logCtFm + InstarNumber + InstarSex + (1|NestID)	6

Graph with lowest AIC model superimposed

```
Model:
logLeg ~ logCtFm + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarS

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



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 + logCtFm:InstarNumber + InstarSex:InstarNumber + InstarSex:logCtFm + InstarNumber + InstarSex + (1 | NestID)

Anova of full model alone

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
logCtFm	0.005	0.005	1	297.756	5.498	0.020
InstarNumber	1.097	1.097	1	1,267.432	1,229.216	0
InstarSex	0.026	0.026	1	1,254.995	29.208	0.00000
logCtFm:InstarNumber	0.021	0.021	1	1,247.335	24.044	0.00000
InstarNumber:InstarSex	0.026	0.026	1	1,255.364	29.345	0.00000
logCtFm:InstarSex	0.002	0.002	1	1,257.957	2.434	0.119

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

Three way interaction against full model. - NOT significant

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
object	9	-5,253.477	-5,207.156	2,635.738	-5,271.477			
..1	9	-5,251.046	-5,204.725	2,634.523	-5,269.046	0	0	1

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

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

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	7	-5,224.411	-5,188.384	2,619.205	-5,238.411			
object	9	-5,253.477	-5,207.156	2,635.738	-5,271.477	33.066	2	0.00000

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	9	-5,253.477	-5,207.156	2,635.738	-5,271.477	56.290	3	0

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	9	-5,253.477	-5,207.156	2,635.738	-5,271.477	36.006	3	0.00000

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	-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

	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

	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

	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

	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

	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