Leg Length vs Nest Size

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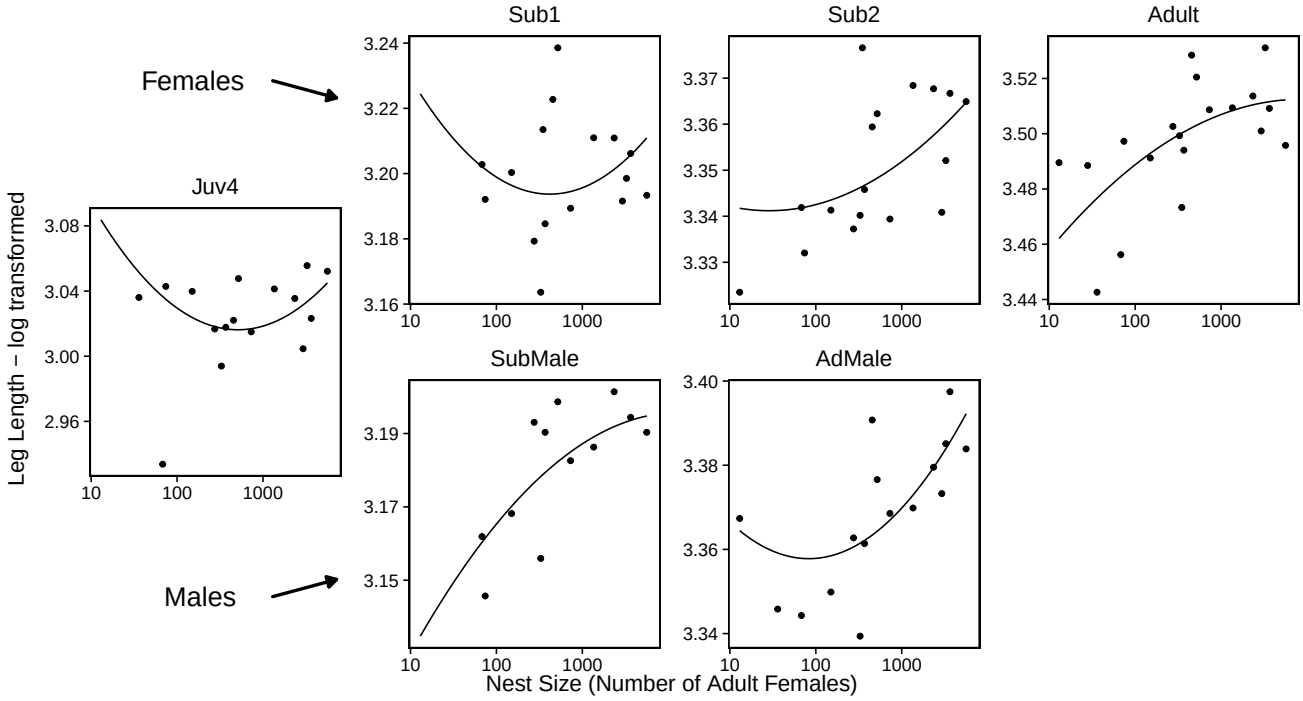
AIC Values of all possible models with instar always included

AIC_Diff	AIC	model	num.predictors
0	-5303	logLeg ~ logCtFm + logCtFm:Instar + I(logCtFmˆ2) + I(logCtFmˆ2):Instar + Instar + (1|NestID)	20
22.24	-5281	logLeg ~ logCtFm + logCtFm:Instar + Instar + (1|NestID)	14
24.03	-5279	logLeg ~ logCtFm + logCtFm:Instar + I(logCtFmˆ2) + Instar + (1|NestID)	15
28.42	-5274	logLeg ~ I(logCtFmˆ2) + I(logCtFmˆ2):Instar + Instar + (1|NestID)	14
30.39	-5272	logLeg ~ logCtFm + I(logCtFmˆ2) + I(logCtFmˆ2):Instar + Instar + (1|NestID)	15
40.14	-5263	logLeg ~ logCtFm + Instar + (1|NestID)	9
40.51	-5262	logLeg ~ I(logCtFmˆ2) + Instar + (1|NestID)	9
42.12	-5261	logLeg ~ logCtFm + I(logCtFmˆ2) + Instar + (1|NestID)	10

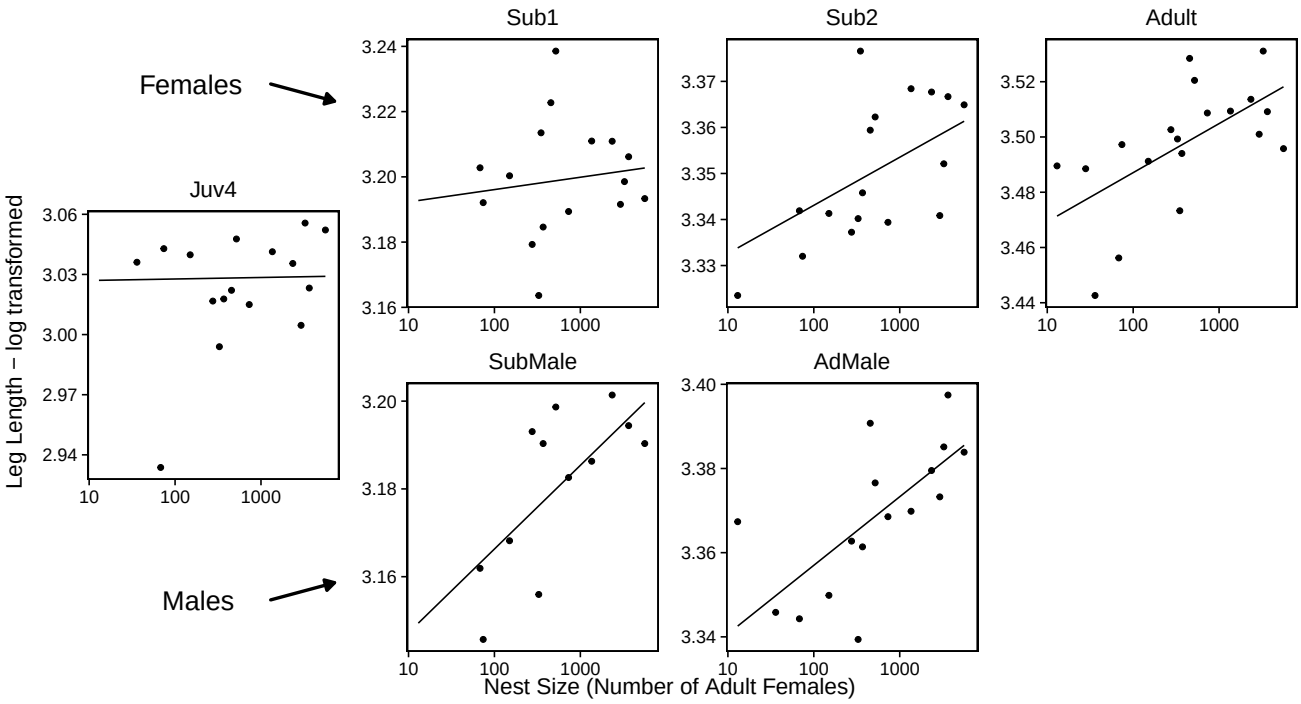
Graph with lowest AIC model superimposed

```
Model:
logLeg ~ I(logCtFm^2) + logCtFm + Instar + logCtFm:Instar + I(logCtFm^2):Instar + (1 | NestID)
```



Graph with model without squared values of nest size

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



Statistics using model without squared values as the full model

(seems too complicated to include the squared vaules, esp as the patter is not clear)

Anova of full model alone

-Model: logLeg ~ logCtFm + Instar + logCtFm:Instar + (1 | NestID)

	Sum Sq	Mean Sq	NumDF	DenDF	F.value	Pr(>F)
logCtFm	0.0070212	0.0070212	1	28.02529	8.104301	0.0081720
Instar	1.5667263	0.3133453	5	1253.68897	361.680468	0.0000000
logCtFm:Instar	0.0244845	0.0048969	5	1258.43604	5.652278	0.0000367

—Testing Individual Variables, (Anova of full vs reduced model)—

Testing Nest Size

-Full Model: logLeg ~ logCtFm + Instar + logCtFm:Instar + (1 | NestID)

-Reduced Model: logLeg ~ Instar + (1 | NestID)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	8	-5256.000	-5214.826	2636.000	-5272.000	NA	NA	NA
object	14	-5280.617	-5208.562	2654.309	-5308.617	36.61687	6	2.1e-06

Testing Instar Term

-Full Model: logLeg ~ logCtFm + Instar + logCtFm:Instar + (1 | NestID)

-Reduced Model: logLeg ~ logCtFm + (1 | NestID)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	4	-894.656	-874.0689	451.328	-902.656	NA	NA	NA
object	14	-5280.617	-5208.5625	2654.309	-5308.617	4405.961	10	0

Testing Interaction Term

-Full Model: logLeg ~ logCtFm + Instar + logCtFm:Instar + (1 | NestID)

-Reduced Model: logLeg ~ logCtFm + Instar + (1 | NestID)

	Df	AIC	BIC	logLik	deviance	Chisq	Chi Df	Pr(>Chisq)
..1	9	-5262.710	-5216.389	2640.355	-5280.710	NA	NA	NA
object	14	-5280.617	-5208.562	2654.309	-5308.617	27.90702	5	3.8e-05

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