DEFENSIVE TRAITS A.barbata SIBECOL 2025

Andrés Delgado Galán

2025-05-09

A.barbata - PRODUCCIÓN DE FLORES

sqrt(flor) ~ trat + clip + trat:clip
n = **53**

R^2 = **0.2974161**

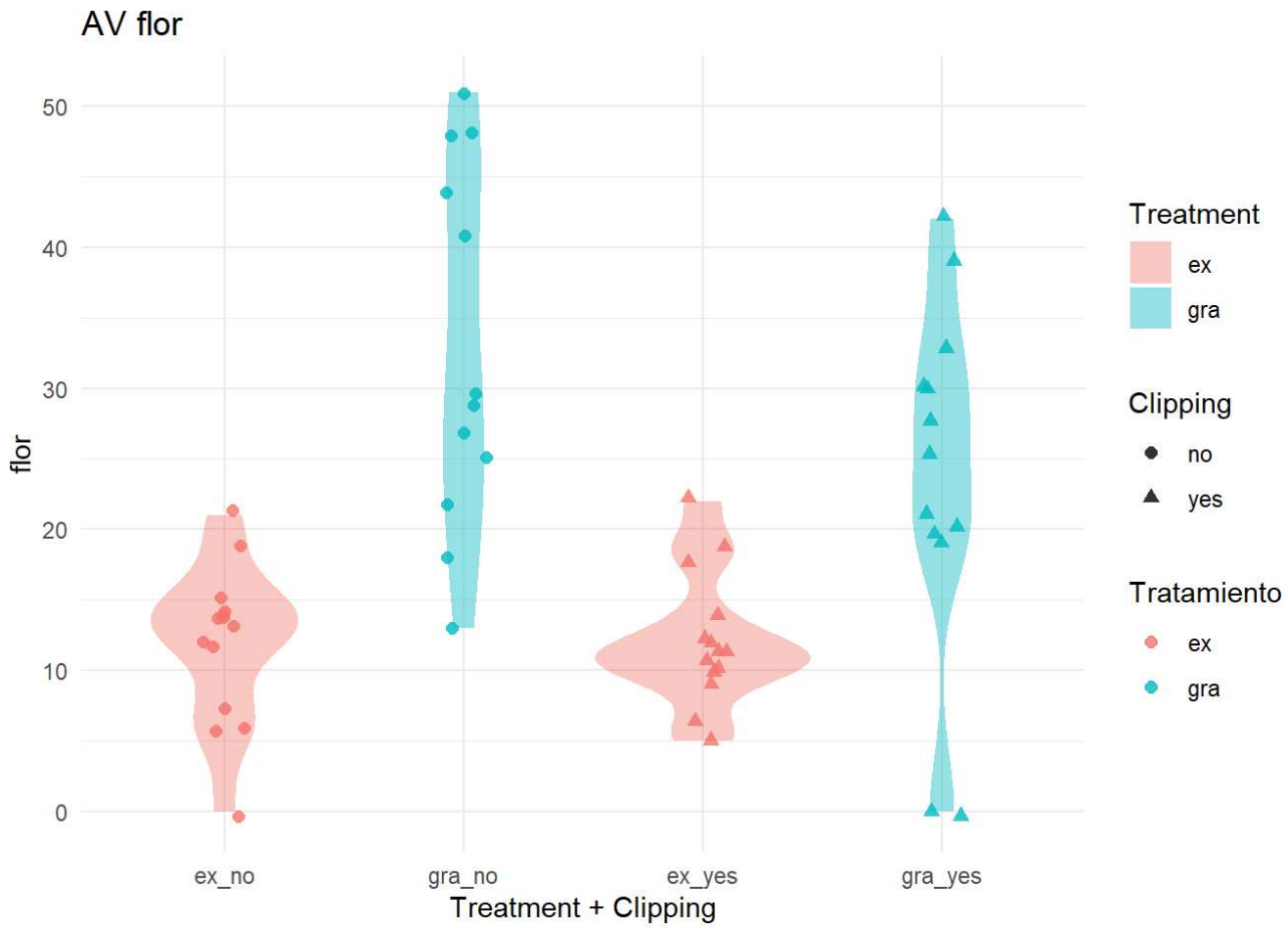
AVflor Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	-0.1473022	0.5103766	49	-0.2886147	0.7740937
no - yes	gra	1.2050234	0.5405644	49	2.2291947	0.0304181

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-2.360263	0.5312168	49	-4.443125	5.06e-05
ex - gra	yes	-1.007937	0.5200989	49	-1.937972	5.84e-02

ANOVA Results for AVflor Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV flor	trat ***	36.811	1	20.188	0.000
AV flor	clip	3.180	1	1.744	0.193
AV flor	trat:clip ·	6.033	1	3.309	0.075
AV flor	Residuals	89.346	49	NA	NA



A.barbata - PRODUCCIÓN DE FRUTOS

sqrt(fruto) ~ trat + clip + trat:clip
n = **53**

R^2 = **0.3064264**

AVfruto Post-hoc Comparisons with Tukeys HSD

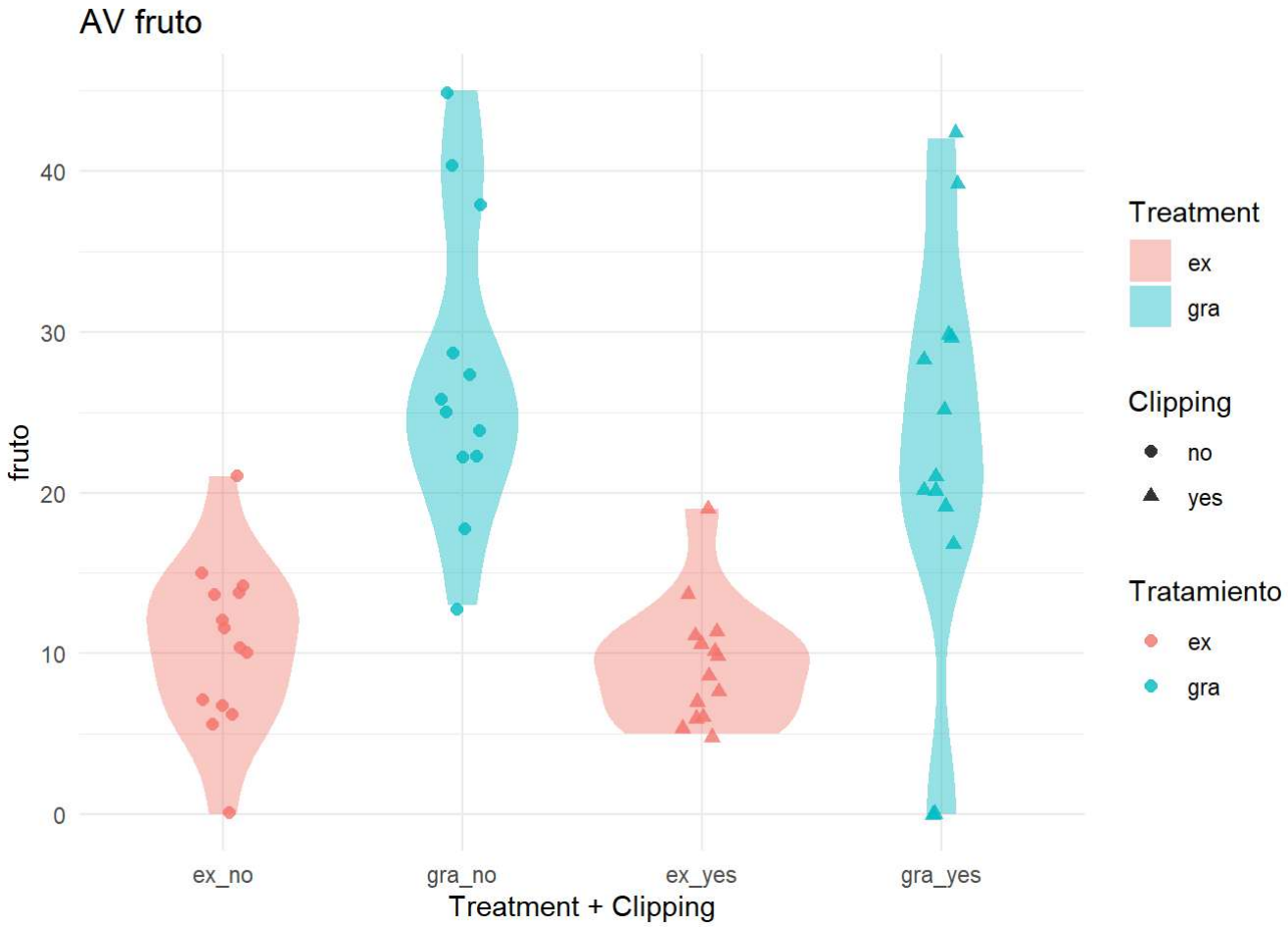
contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	0.0645351	0.4780565	49	0.1349948	0.8931690
no - yes	gra	0.8609303	0.5063327	49	1.7003255	0.0954094

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-2.086857	0.4975770	49	-4.194038	0.0001145
ex - gra	yes	-1.290461	0.4871631	49	-2.648931	0.0108365

ANOVA Results for AVfruto Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV fruto	trat ***	37.273	1	23.299	0.000
AV fruto	clip	2.562	1	1.601	0.212
AV fruto	trat:clip	2.092	1	1.308	0.258

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV fruto	Residuals	78.389	49	NA	NA



A.barbata - PRODUCCIÓN DE HOJAS

sqrt(hojas) ~ trat + clip + trat:clip
n = **53**

R^2 = **0.4268191**

AVhojas Post-hoc Comparisons with Tukeys HSD

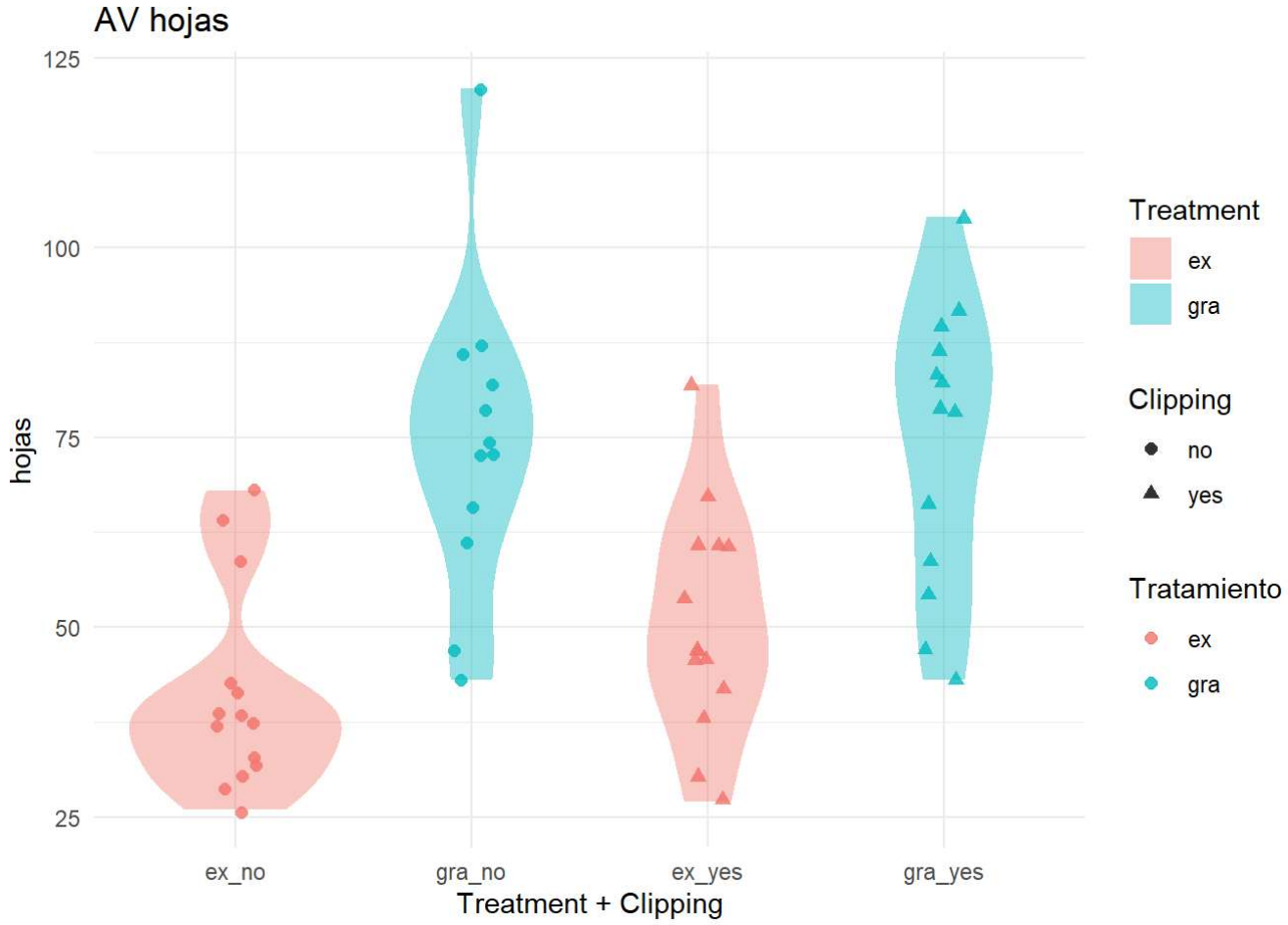
contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	-0.6991982	0.4078563	49	-1.7143247	0.0927887
no - yes	gra	0.0098570	0.4319803	49	0.0228182	0.9818879

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-2.203833	0.4245103	49	-5.191470	0.0000040
ex - gra	yes	-1.494777	0.4156257	49	-3.596451	0.0007487

ANOVA Results for AVhojas Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV hojas	trat ***	44.785	1	38.461	0.000
AV hojas	clip	1.764	1	1.515	0.224
AV hojas	trat:clip	1.659	1	1.424	0.238
AV hojas	Residuals	57.057	49	NA	NA



A.barbata - ALTURA MÁXIMA

sqrt(altura) ~ trat + clip + trat:clip
n = **51**

R^2 = **0.1102157**

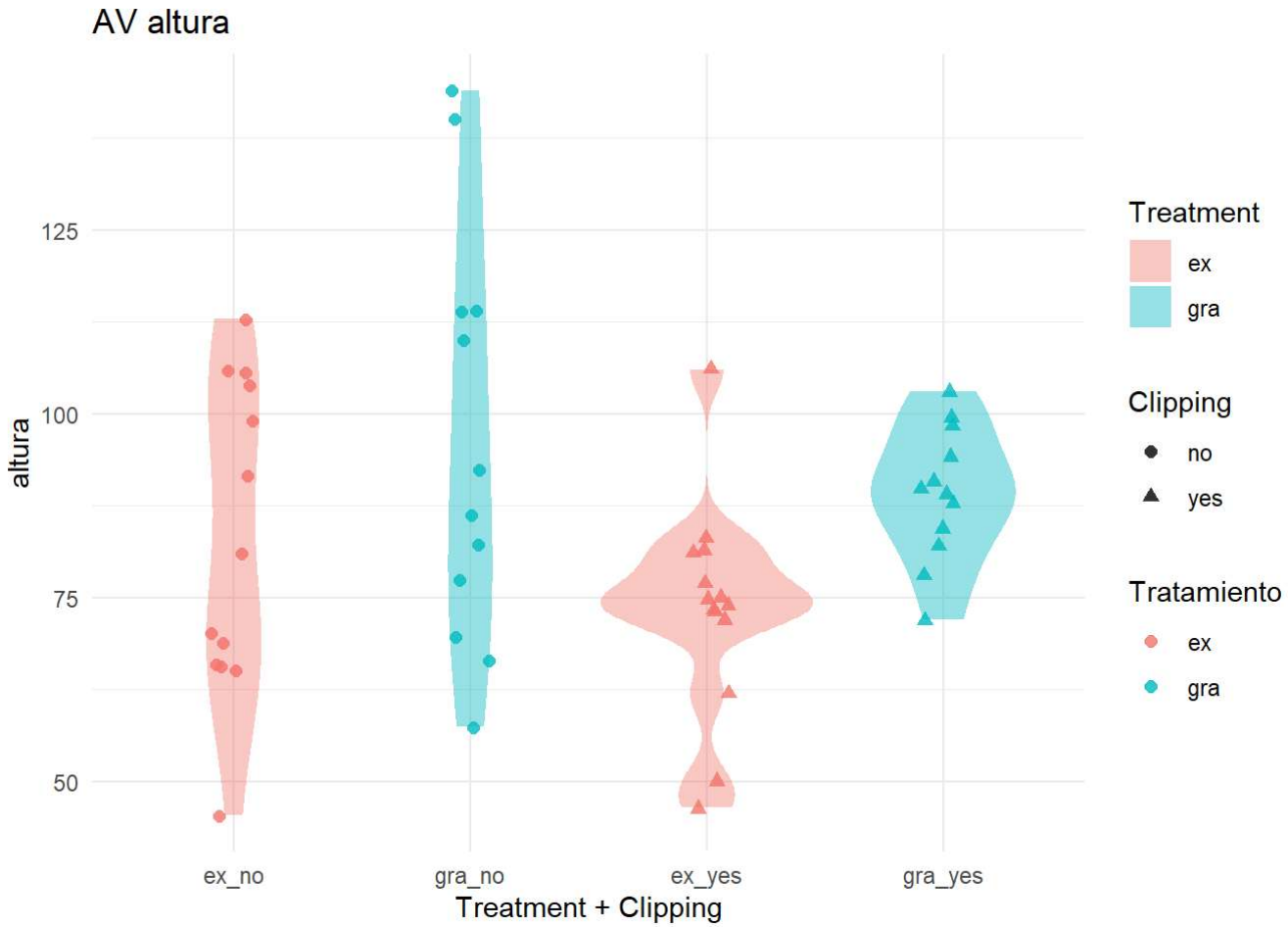
AValtura Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	0.5112305	0.4036647	47	1.266473	0.2115846
no - yes	gra	0.2790845	0.4278573	47	0.652284	0.5173956

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-0.661413	0.4195486	47	-1.576487	0.1216215
ex - gra	yes	-0.893559	0.4122936	47	-2.167288	0.0353129

ANOVA Results for AValtura Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV altura	trat *	7.718	1	7.027	0.011
AV altura	clip	2.058	1	1.874	0.178
AV altura	trat:clip	0.171	1	0.156	0.695
AV altura	Residuals	51.623	47	NA	NA



A.barbata - SEMILLAS/FRUTO

sqrt(seedfruto) ~ trat + clip + trat:clip
n = **53**

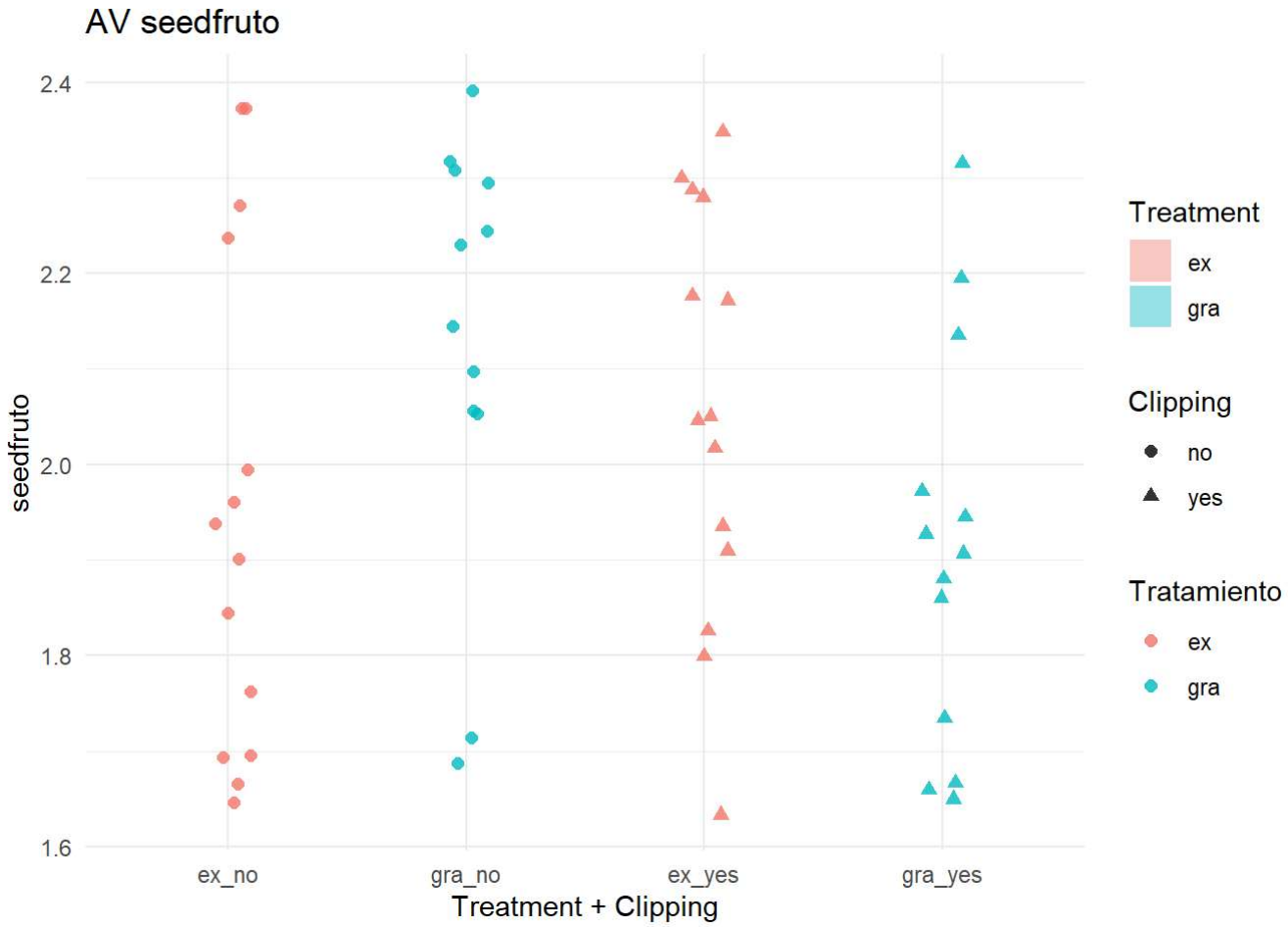
R^2 = **0.4674251**

AVseedfruto Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	0	0	49	0.0	1.0000000
no - yes	gra	0	0	49	1.4	0.1678133

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	0	0	49	0.000000	1.0000000

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	yes	0	0	49	1.455089	0.1520215



A.barbata - PRODUCCIÓN DE SEMILLAS

sqrt(seedtotal) ~ trat + clip + trat:clip
n = **53**

R^2 = **0.3064264**

AVseedtotal Post-hoc Comparisons with Tukeys HSD

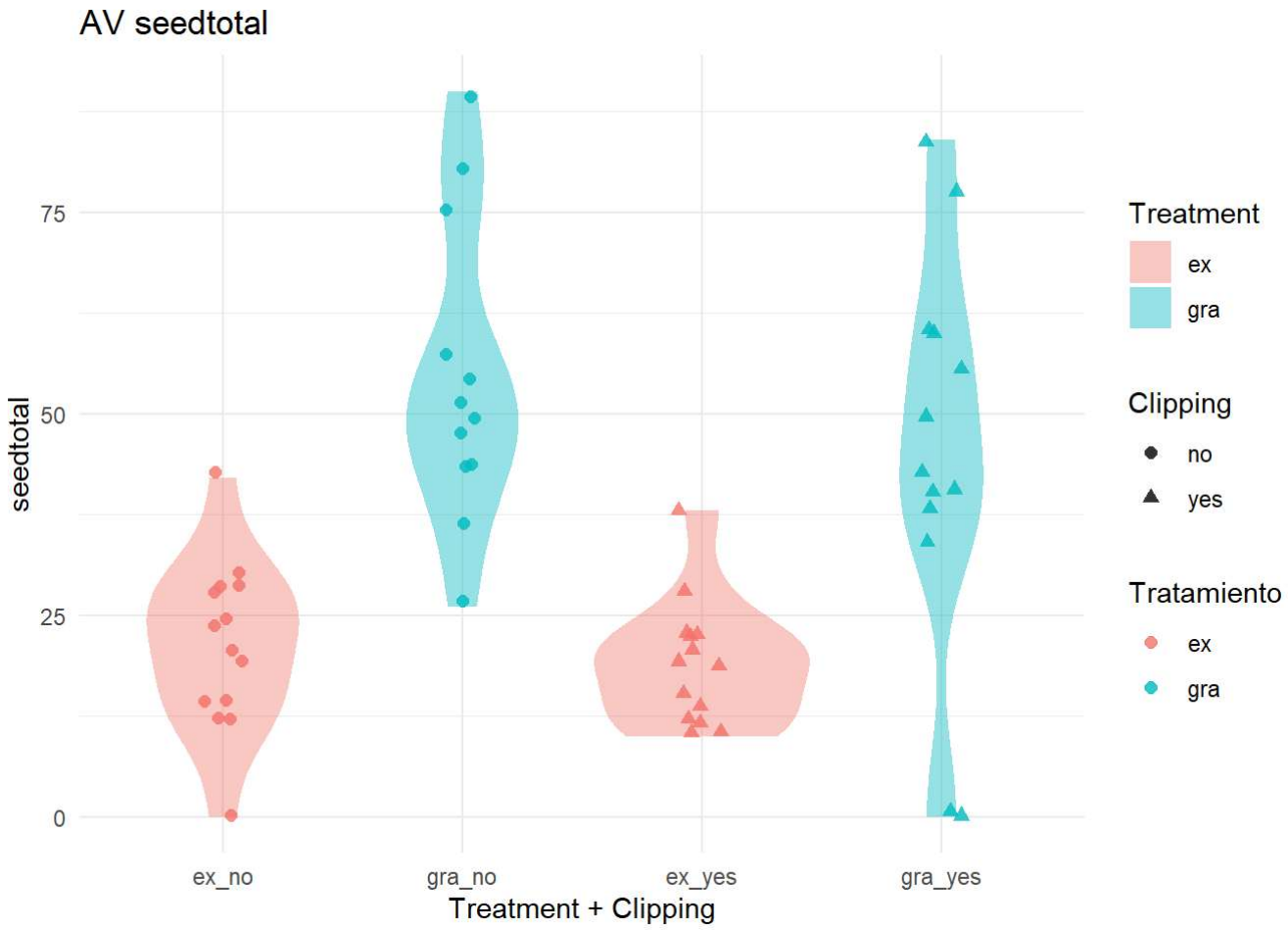
contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	0.0912665	0.6760740	49	0.1349948	0.8931690
no - yes	gra	1.2175394	0.7160625	49	1.7003255	0.0954094

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-2.951261	0.7036801	49	-4.194038	0.0001145
ex - gra	yes	-1.824988	0.6889527	49	-2.648931	0.0108365

ANOVA Results for AVseedtotal Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV seedtotal	trat ***	74.545	1	23.299	0.000
AV seedtotal	clip	5.124	1	1.601	0.212
AV seedtotal	trat:clip	4.185	1	1.308	0.258
AV seedtotal	Residuals	156.777	49	NA	NA



A.barbata - PESO MEDIO DE LAS SEMILLAS

sqrt(massseed) ~ trat + clip + trat:clip
n = **49**

R^2 = **0.815135**

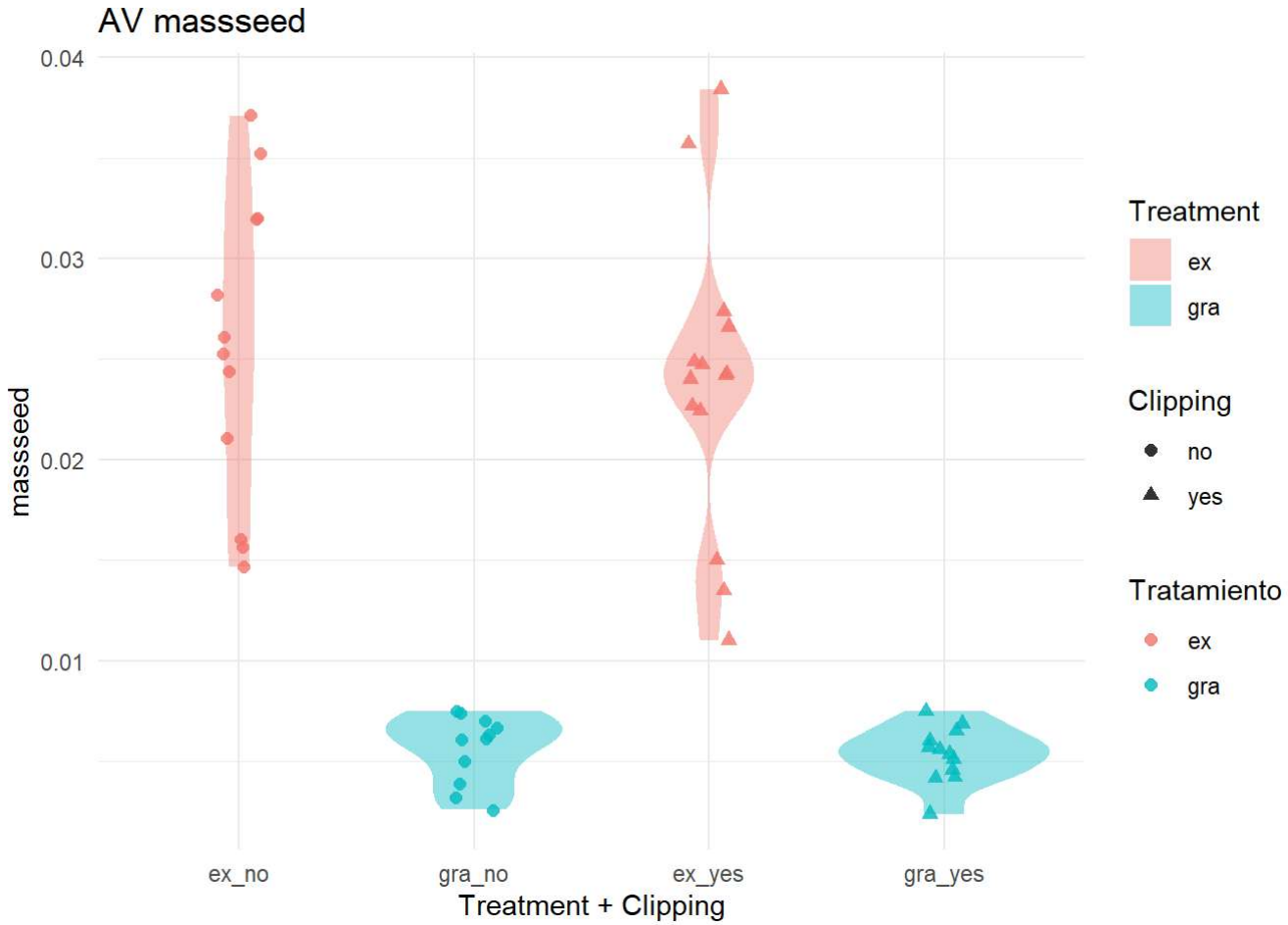
AVmassseed Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	0.0056536	0.0077177	45	0.7325524	0.4676301
no - yes	gra	0.0015894	0.0081890	45	0.1940911	0.8469781

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	0.0843800	0.0081890	45	10.30400	0
ex - gra	yes	0.0803158	0.0077177	45	10.40668	0

ANOVA Results for AVmassseed Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV massseed	trat ***	0.082	1	214.341	0.000
AV massseed	clip	0.000	1	0.444	0.509
AV massseed	trat:clip	0.000	1	0.130	0.720
AV massseed	Residuals	0.017	45	NA	NA



A.barbata - SLA

sqrt(SLA) ~ trat + clip + trat:clip
n = **44**

R^2 = **0.598101**

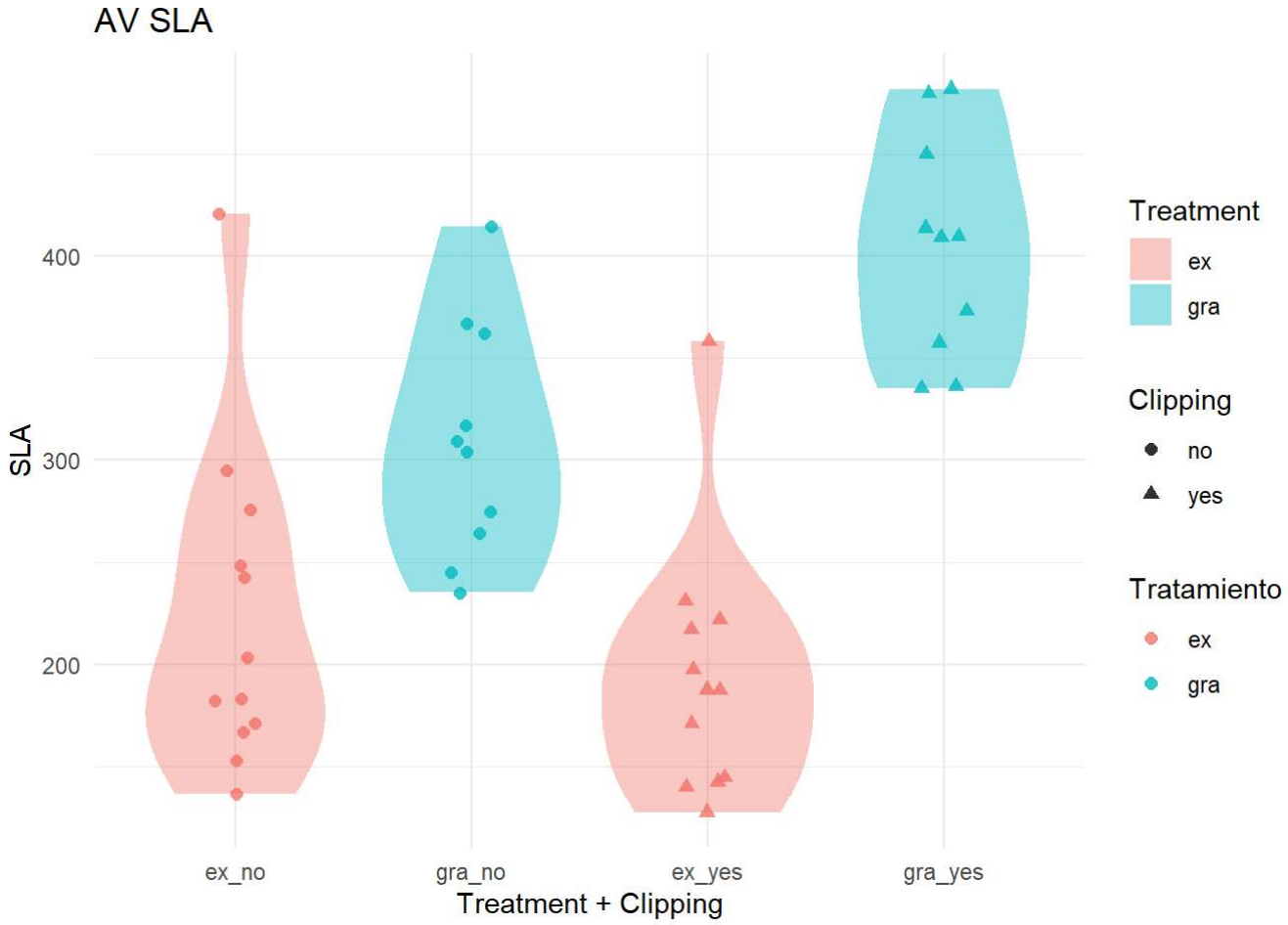
AVSLA Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	0.9650707	0.8066578	40	1.196382	0.2385910
no - yes	gra	-2.5531209	0.8836493	40	-2.889292	0.0062072

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-2.765887	0.8460298	40	-3.269255	0.0022212
ex - gra	yes	-6.284079	0.8460298	40	-7.427728	0.0000000

ANOVA Results for AVSLA Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV SLA	trat ***	223.369	1	57.213	0.000
AV SLA	clip	4.423	1	1.133	0.294
AV SLA	trat:clip **	33.757	1	8.646	0.005
AV SLA	Residuals	156.167	40	NA	NA



A.barbata - LDMC

sqrt(LDMC) ~ trat + clip + trat:clip
n = **42**

R^2 = **0.2843459**

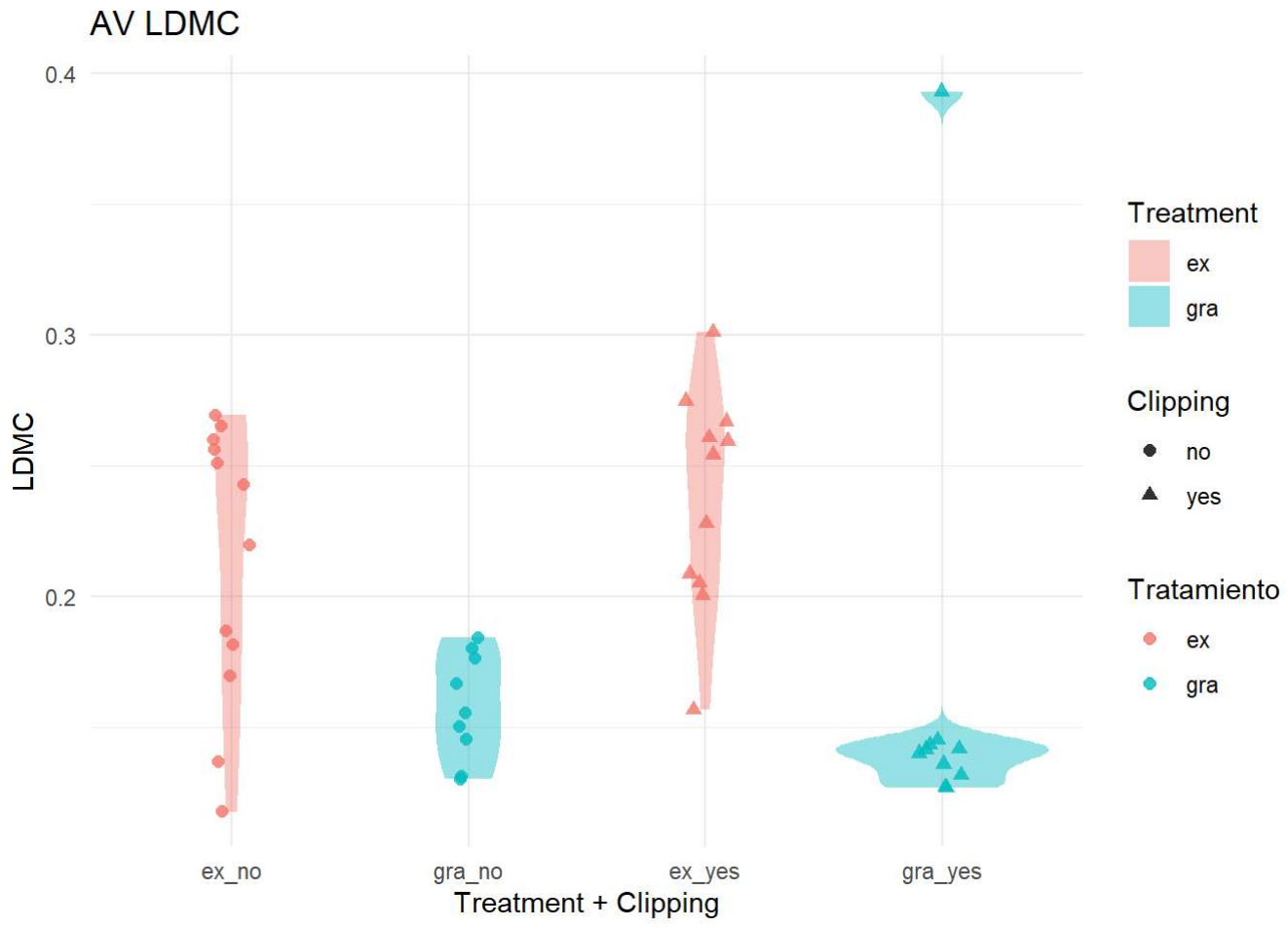
AVLDMC Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	-0.0278450	0.0238993	38	-1.1650971	0.2512416
no - yes	gra	0.0009159	0.0263066	38	0.0348172	0.9724077

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	0.0613633	0.0252468	38	2.430540	0.0199064
ex - gra	yes	0.0901243	0.0250162	38	3.602633	0.0008998

ANOVA Results for AVLDMC Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV LDMC	trat ***	0.060	1	18.232	0.000
AV LDMC	clip	0.002	1	0.704	0.407
AV LDMC	trat:clip	0.002	1	0.655	0.423
AV LDMC	Residuals	0.125	38	NA	NA



A.barbata - ÁREA FOLIAR

sqrt(area.m) ~ trat + clip + trat:clip
n = **45**

R^2 = **0.403981**

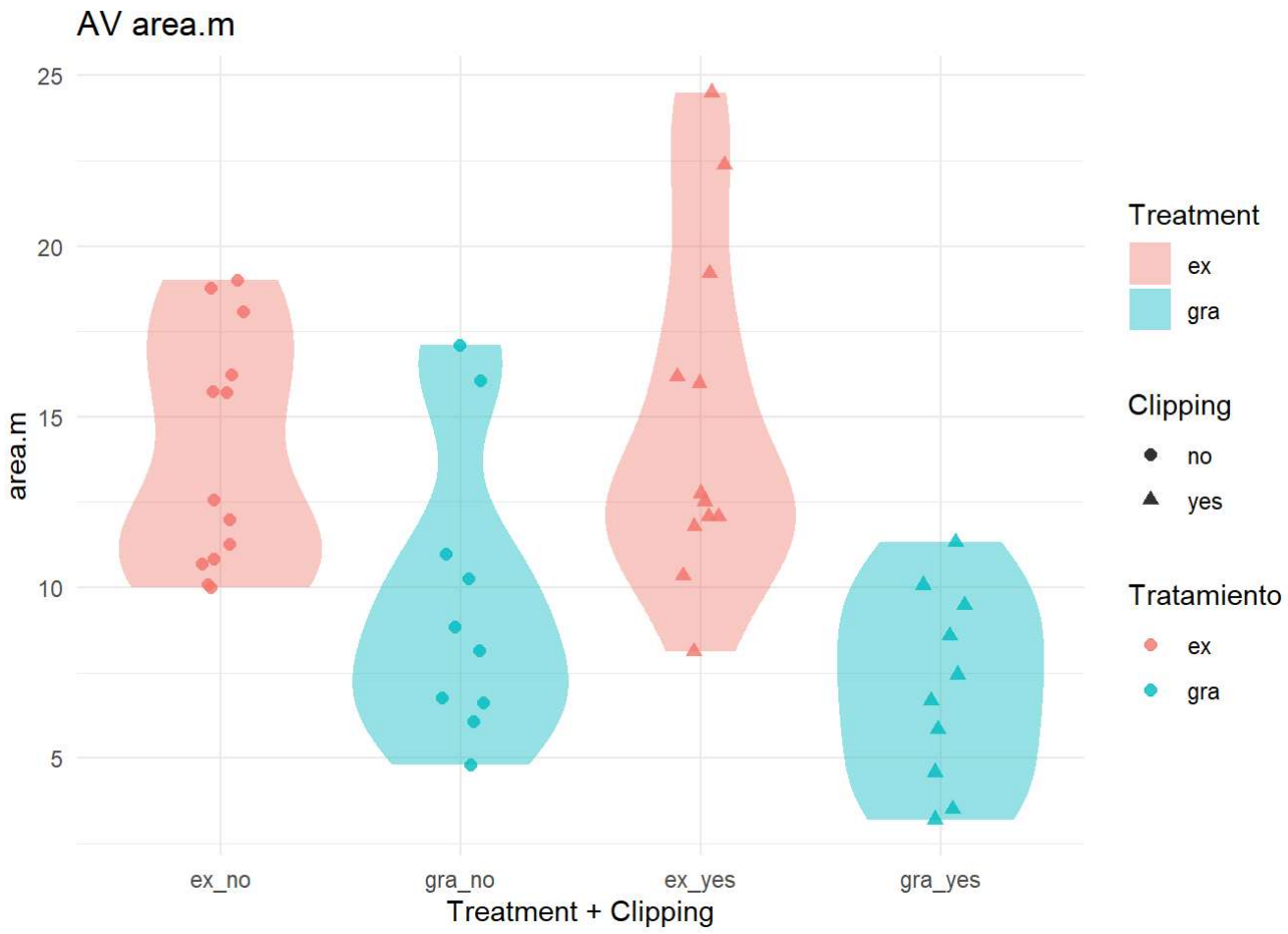
AVarea.m Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	-0.0976012	0.2276380	41	-0.428756	0.6703452
no - yes	gra	0.4234694	0.2543033	41	1.665214	0.1034946

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	0.6737038	0.2391825	41	2.816694	0.0074293
ex - gra	yes	1.1947744	0.2434769	41	4.907136	0.0000151

ANOVA Results for AVarea.m Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV area.m	trat ***	9.598	1	29.683	0.000
AV area.m	clip	0.202	1	0.626	0.433
AV area.m	trat:clip	0.754	1	2.331	0.135
AV area.m	Residuals	13.257	41	NA	NA



A.barbata - TASA FOTOSINTÉTICA

sqrt(Photosyn) ~ trat + clip + trat:clip
n = **30**

```
## qu = 0.25, log(sigma) = -2.490239 : outer Newton did not converge fully.
```

```
##
##  DHARMa: qgam was unable to calculate quantile regression for quantile 0.25. Possibly to f
ew (unique) data points / predictions. The quantile will be ommited in plots and significance
calculations.
```

```
## qu = 0.5, log(sigma) = -2.490239 : outer Newton did not converge fully.
```

```
##
##  DHARMa: qgam was unable to calculate quantile regression for quantile 0.5. Possibly to fe
w (unique) data points / predictions. The quantile will be ommited in plots and significance
calculations.
```

```
## qu = 0.75, log(sigma) = -2.490239 : outer Newton did not converge fully.
```

```
##
##  DHARMa: qgam was unable to calculate quantile regression for quantile 0.75. Possibly to f
ew (unique) data points / predictions. The quantile will be ommited in plots and significance
calculations.
```

R^2 = **-0.0087694**

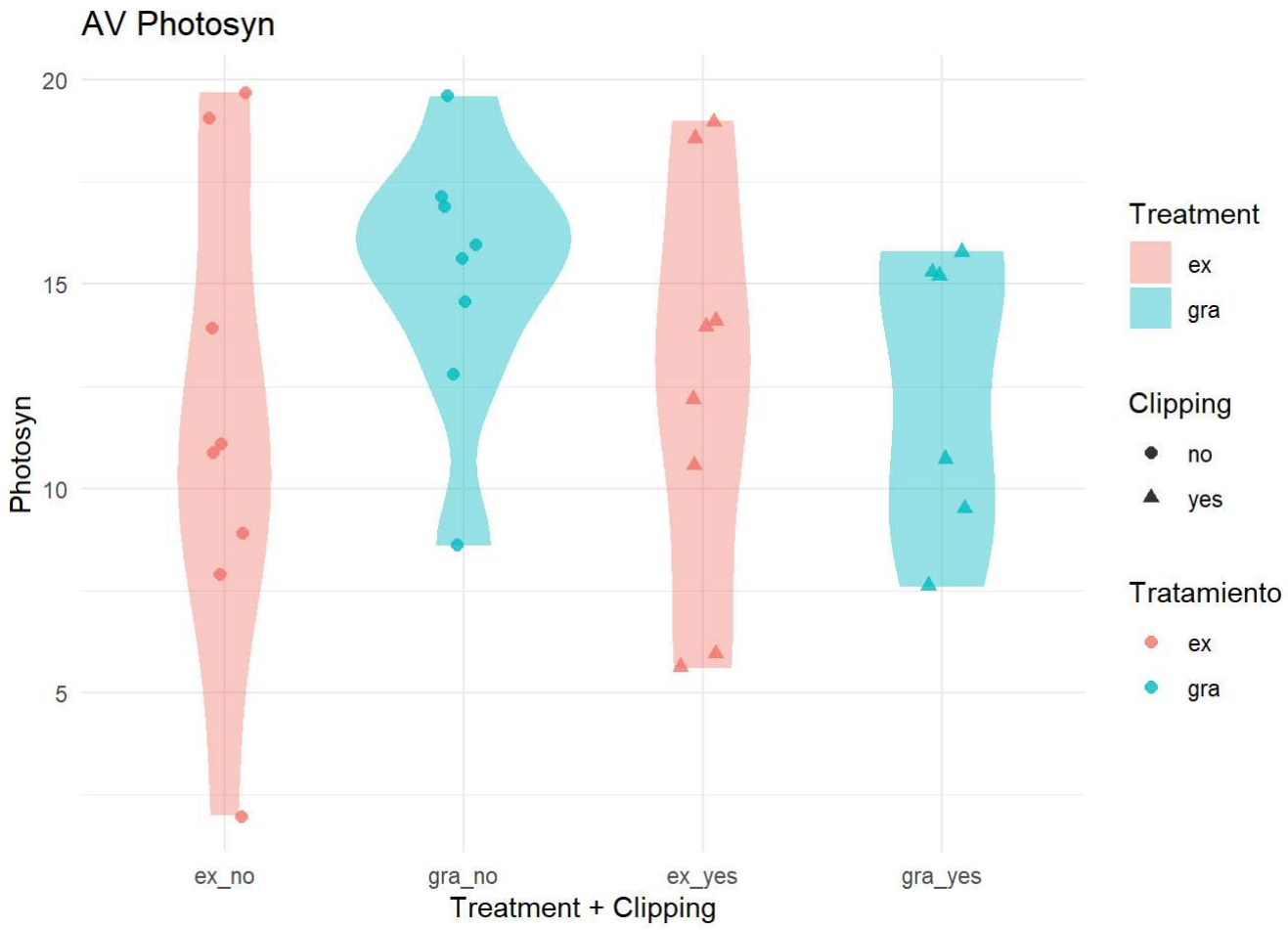
AVPhotosyn Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	-0.1692990	0.3568444	26	-0.4744336	0.6391513
no - yes	gra	0.3867471	0.3854360	26	1.0034015	0.3249148

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-0.5719823	0.3568444	26	-1.602890	0.1210398
ex - gra	yes	-0.0159363	0.3854360	26	-0.041346	0.9673359

ANOVA Results for AVPhotosyn Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV Photosyn	trat	0.739	1	1.450	0.239
AV Photosyn	clip	0.057	1	0.111	0.741
AV Photosyn	trat:clip	0.571	1	1.121	0.300
AV Photosyn	Residuals	13.243	26	NA	NA



A.barbata - CONDUCTANCIA ESTOMÁTICA

sqrt(Conductance) ~ trat + clip + trat:clip
n = **30**

```
## We had to increase `err` for some of the quantiles. See fit$calibr$err
```

```
## qu = 0.5, log(sigma) = -2.412532 : outer Newton did not converge fully.
```

```
## qu = 0.5, log(sigma) = -3.396103 : outer Newton did not converge fully.
```

```
## qu = 0.5, log(sigma) = -3.322889 : outer Newton did not converge fully.
```

```
## qu = 0.75, log(sigma) = -2.412532 : outer Newton did not converge fully.
```

```
##
##  DHARMa: qgam was unable to calculate quantile regression for quantile 0.75. Possibly to f
ew (unique) data points / predictions. The quantile will be ommited in plots and significance
calculations.
```

R^2 = **0.0786166**

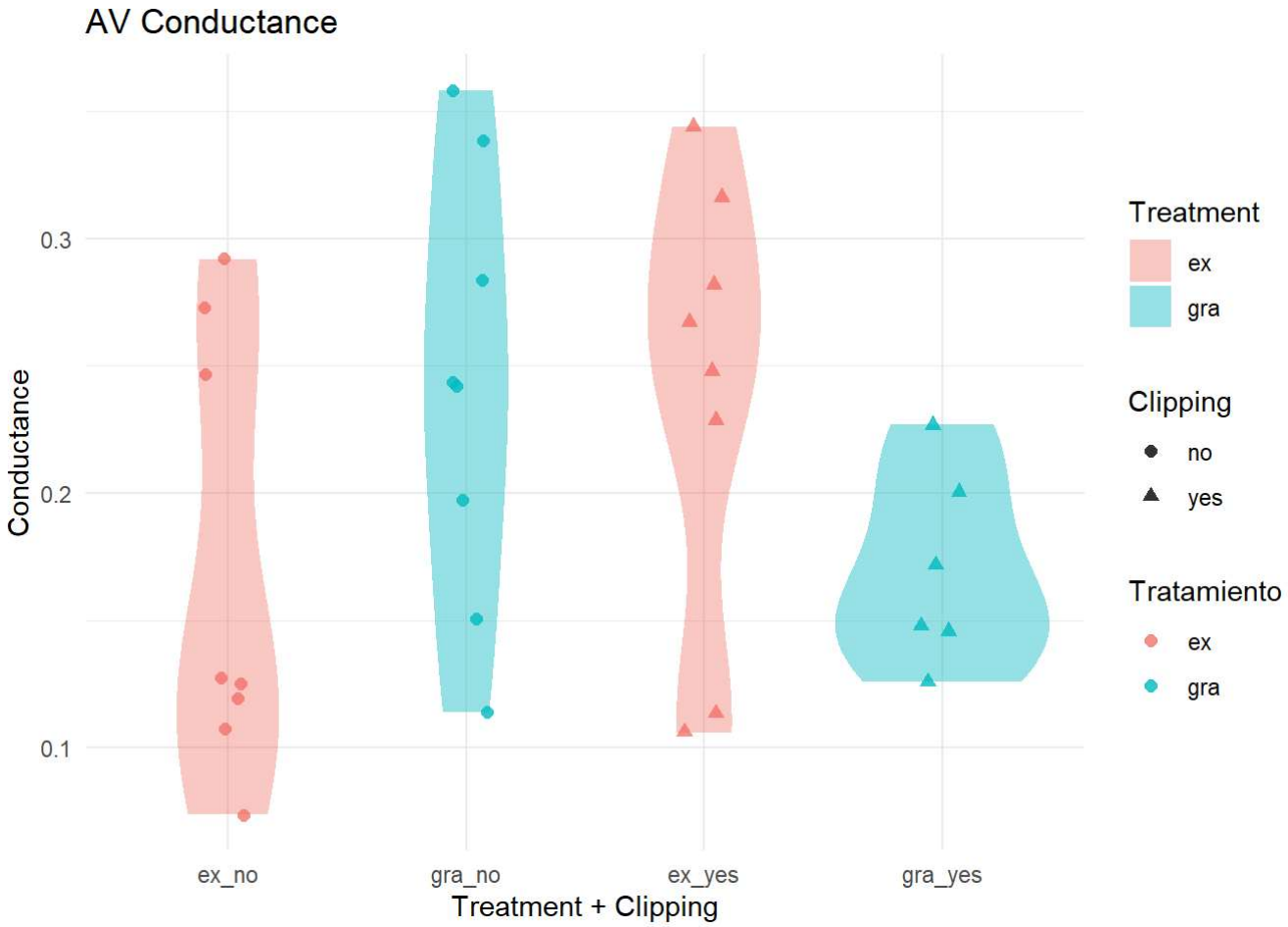
AVConductance Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	-0.0776101	0.0446133	26	-1.739618	0.0937534
no - yes	gra	0.0734693	0.0481878	26	1.524644	0.1394208

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-0.0817718	0.0446133	26	-1.832904	0.0782927
ex - gra	yes	0.0693075	0.0481878	26	1.438278	0.1622843

ANOVA Results for AVConductance Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV Conductance	trat	0.001	1	0.135	0.716
AV Conductance	clip	0.000	1	0.058	0.812
AV Conductance	trat:clip *	0.042	1	5.293	0.030
AV Conductance	Residuals	0.207	26	NA	NA



A.barbata - EFICIENCIA DEL FOTOSISTEMA II

sqrt(PhiPS2) ~ trat + clip + trat:clip
n = **30**

R^2 = **0.1932264**

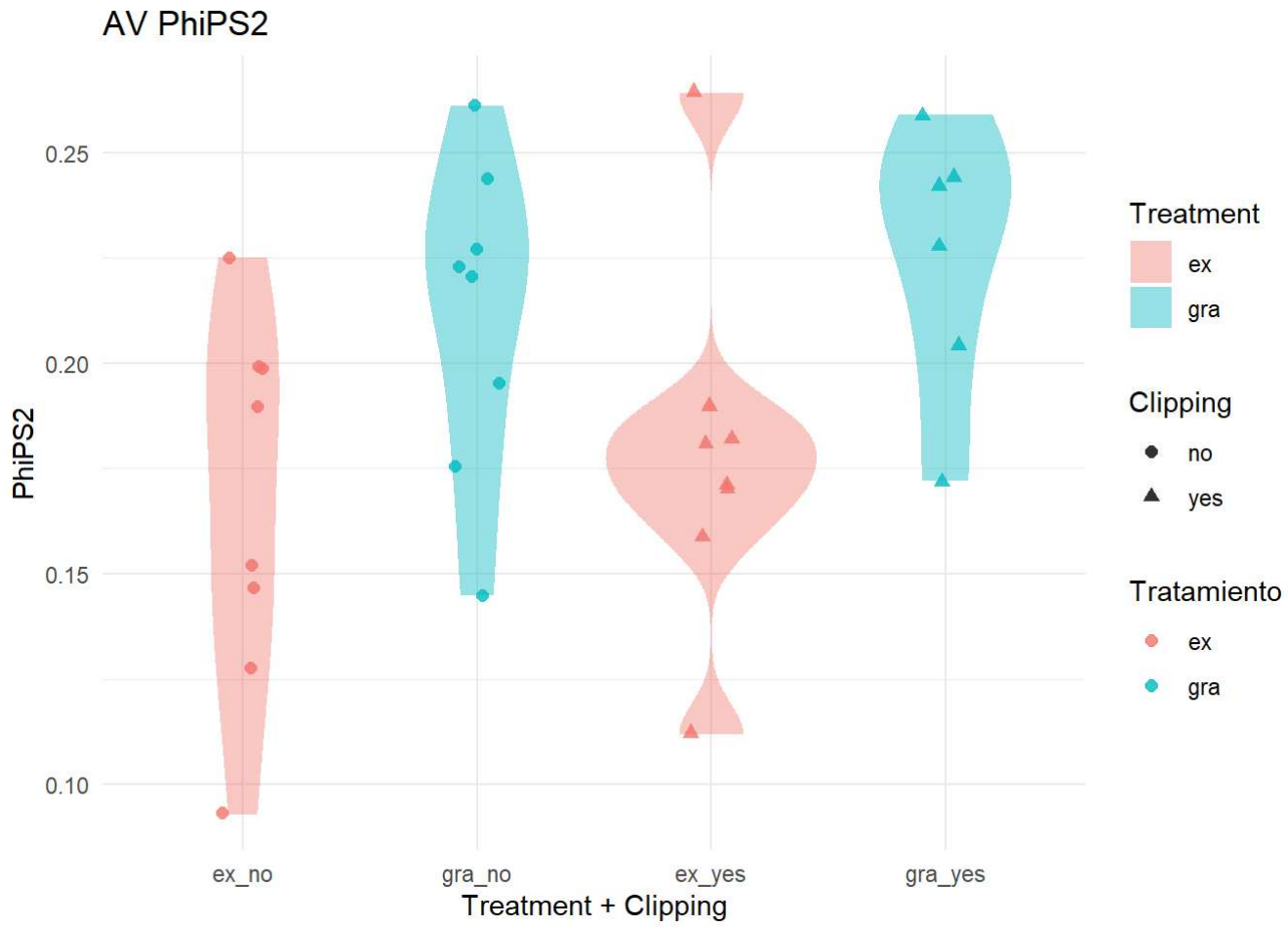
AVPhiPS2 Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	-0.0153214	0.0235102	26	-0.6516936	0.5203185
no - yes	gra	-0.0149268	0.0253939	26	-0.5878088	0.5617318

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-0.0533873	0.0235102	26	-2.270816	0.0316758
ex - gra	yes	-0.0529926	0.0253939	26	-2.086825	0.0468527

ANOVA Results for AVPhiPS2 Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV PhiPS2	trat **	0.021	1	9.511	0.005
AV PhiPS2	clip	0.002	1	0.770	0.388
AV PhiPS2	trat:clip	0.000	1	0.000	0.991
AV PhiPS2	Residuals	0.057	26	NA	NA



A.barbata - FENOLOGÍA DE FLORACIÓN

sqrt(dias_flor) ~ trat + clip + trat:clip
n = **16**

R^2 = **0.0294803**

AVdias_flor Post-hoc Comparisons with Tukeys HSD

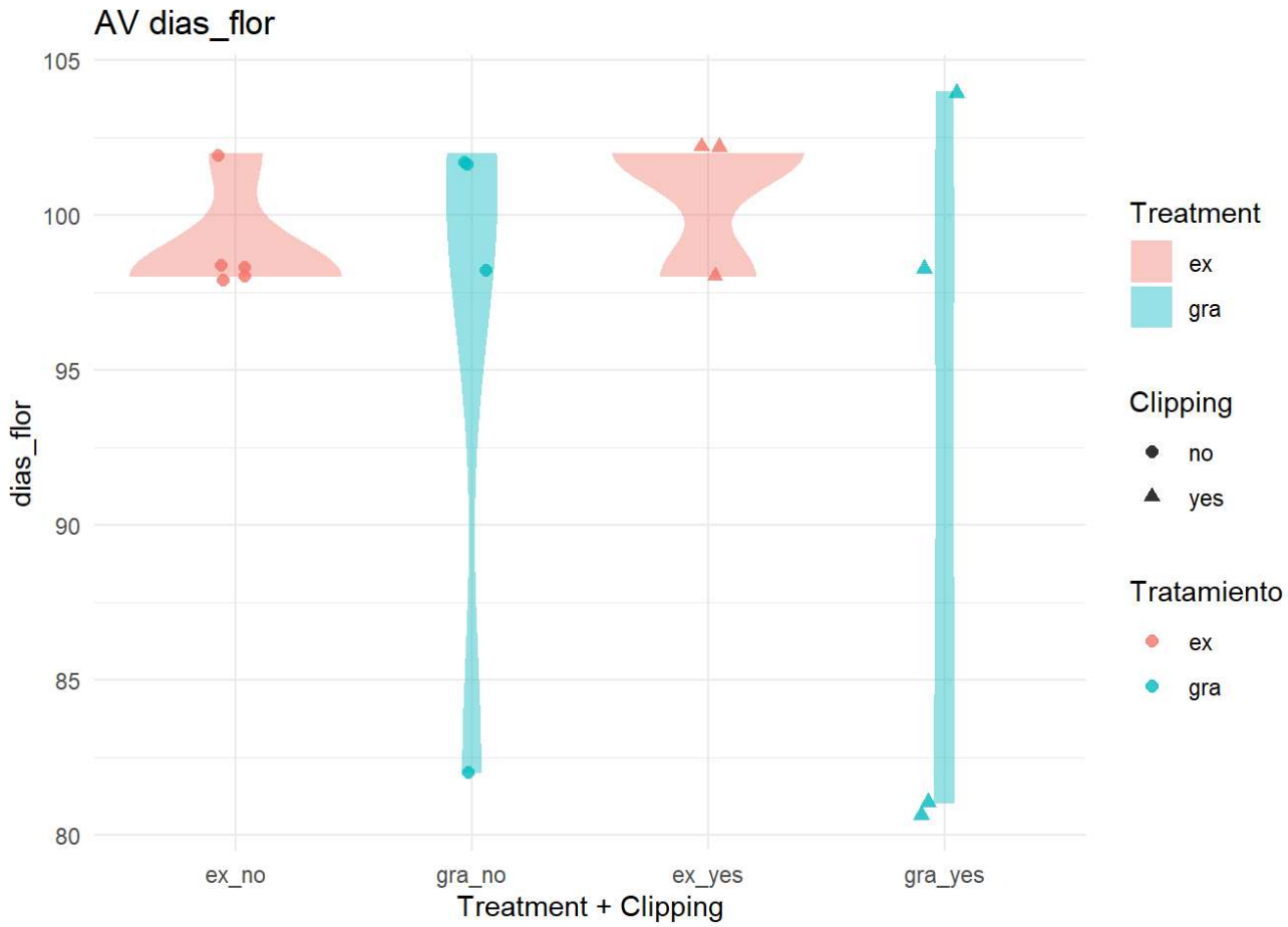
contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	-0.093338	0.2941182	12	-0.3173486	0.7564328
no - yes	gra	0.264089	0.2847787	12	0.9273480	0.3720223

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	0.1510244	0.2701648	12	0.5590085	0.5864371
ex - gra	yes	0.5084514	0.3075962	12	1.6529835	0.1242376

ANOVA Results for AVdias_flor Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV dias_flor	trat	0.370	1	2.283	0.157
AV dias_flor	clip	0.032	1	0.198	0.664

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV dias_flor	trat:clip	0.124	1	0.762	0.400
AV dias_flor	Residuals	1.946	12	NA	NA

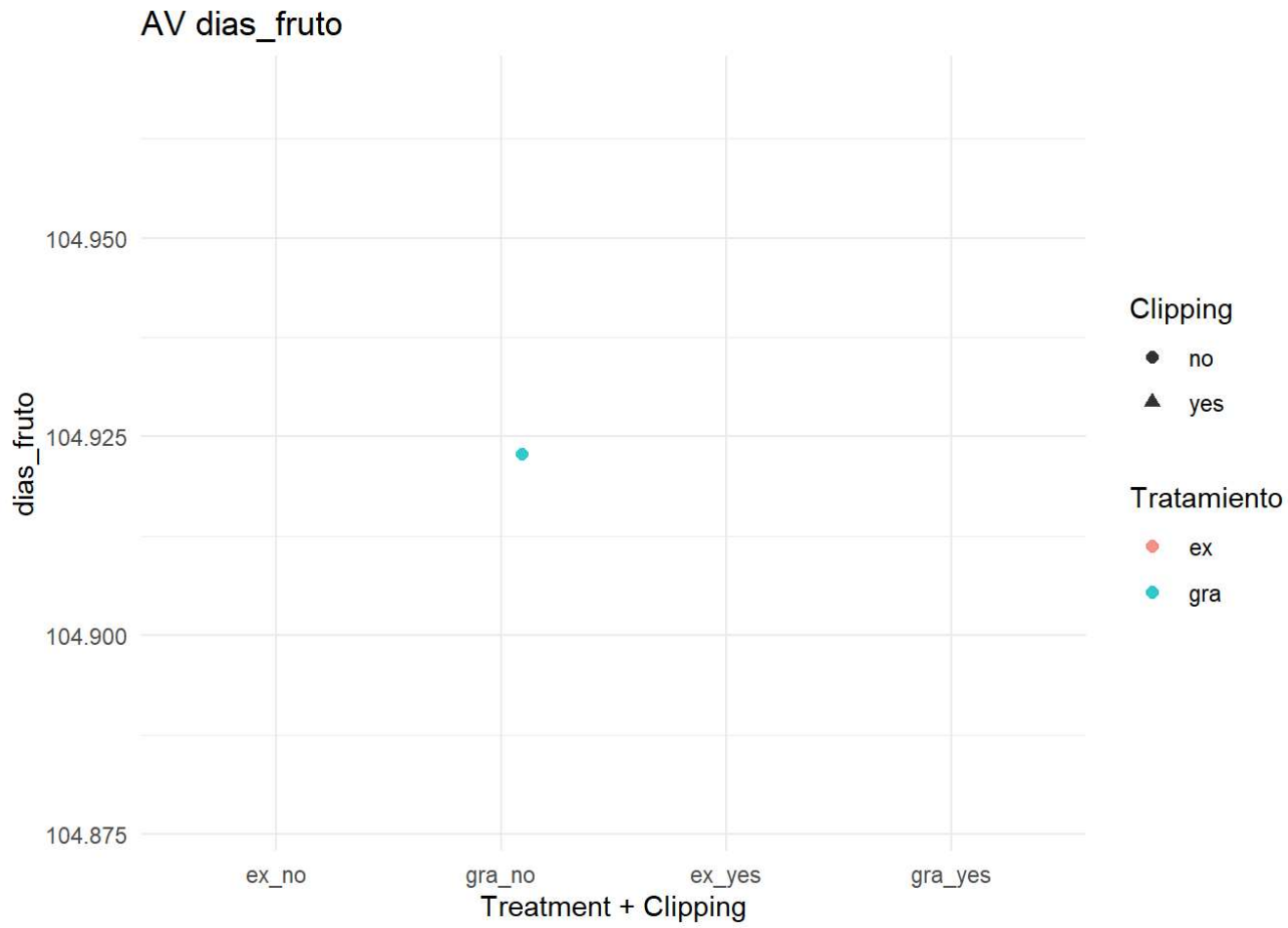


A.barbata - FENOLOGÍA DE FRUCTIFICACÓN

sqrt(dias_flor) ~ trat + clip + trat:clip
n = **16**

R^2 = **0.0294803**

AVdias_fruto Post-hoc Comparisons with Tukeys HSD

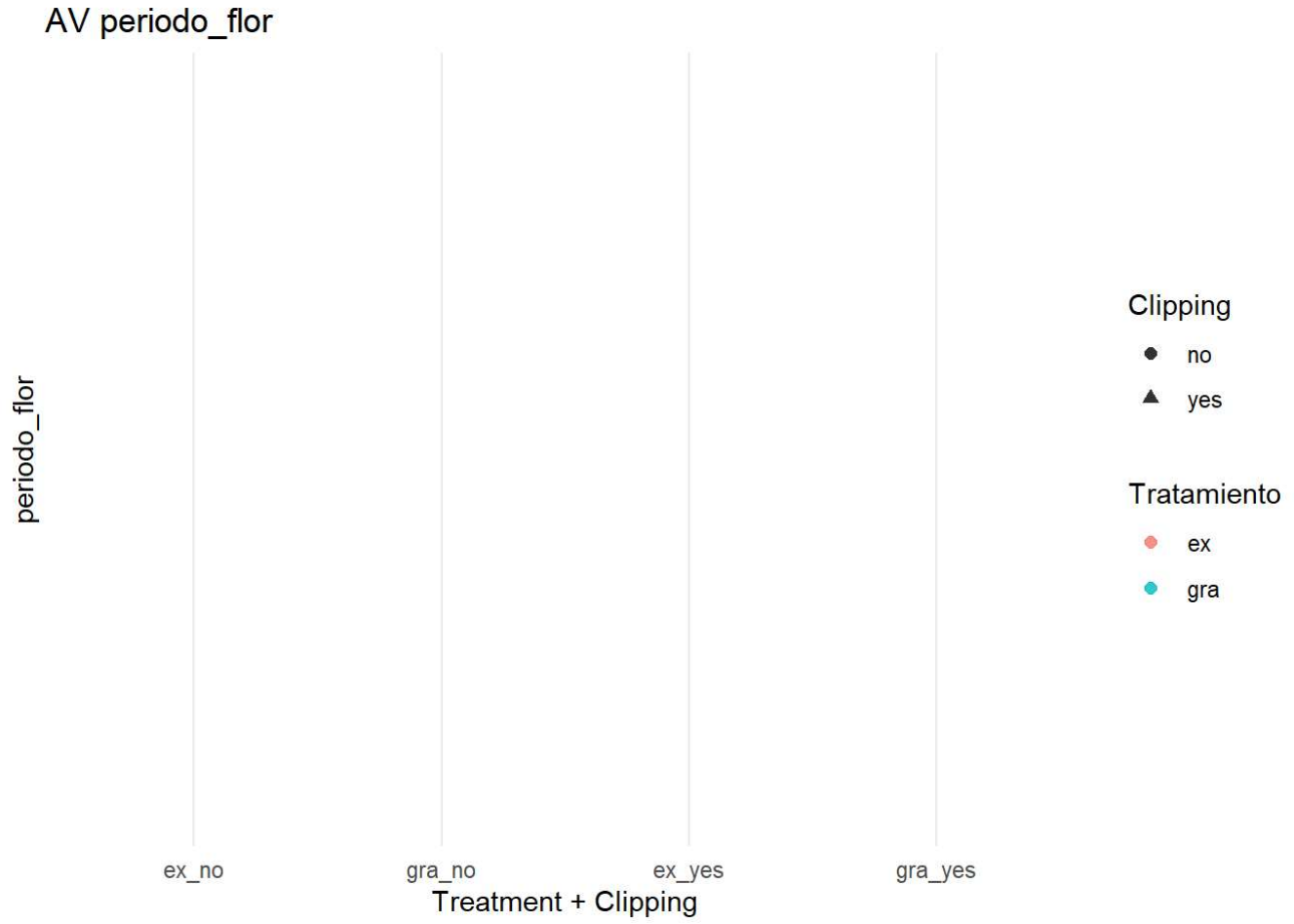


A.barbata - PERIODO DE FLORACIÓN

sqrt(dias_flor) ~ trat + clip + trat:clip
n = **0**

R^2 = **0.0294803**

AVperiodo_flor Post-hoc Comparisons with Tukeys HSD



A.barbata - PERIODO DE FRUCTIFICACIÓN

A.barbata - ESPERANZA DE VIDA

sqrt(dias_muerte) ~ trat + clip + trat:clip
n = **10**

R^2 = **0.0294299**

AVdias_muerte Post-hoc Comparisons with Tukeys HSD

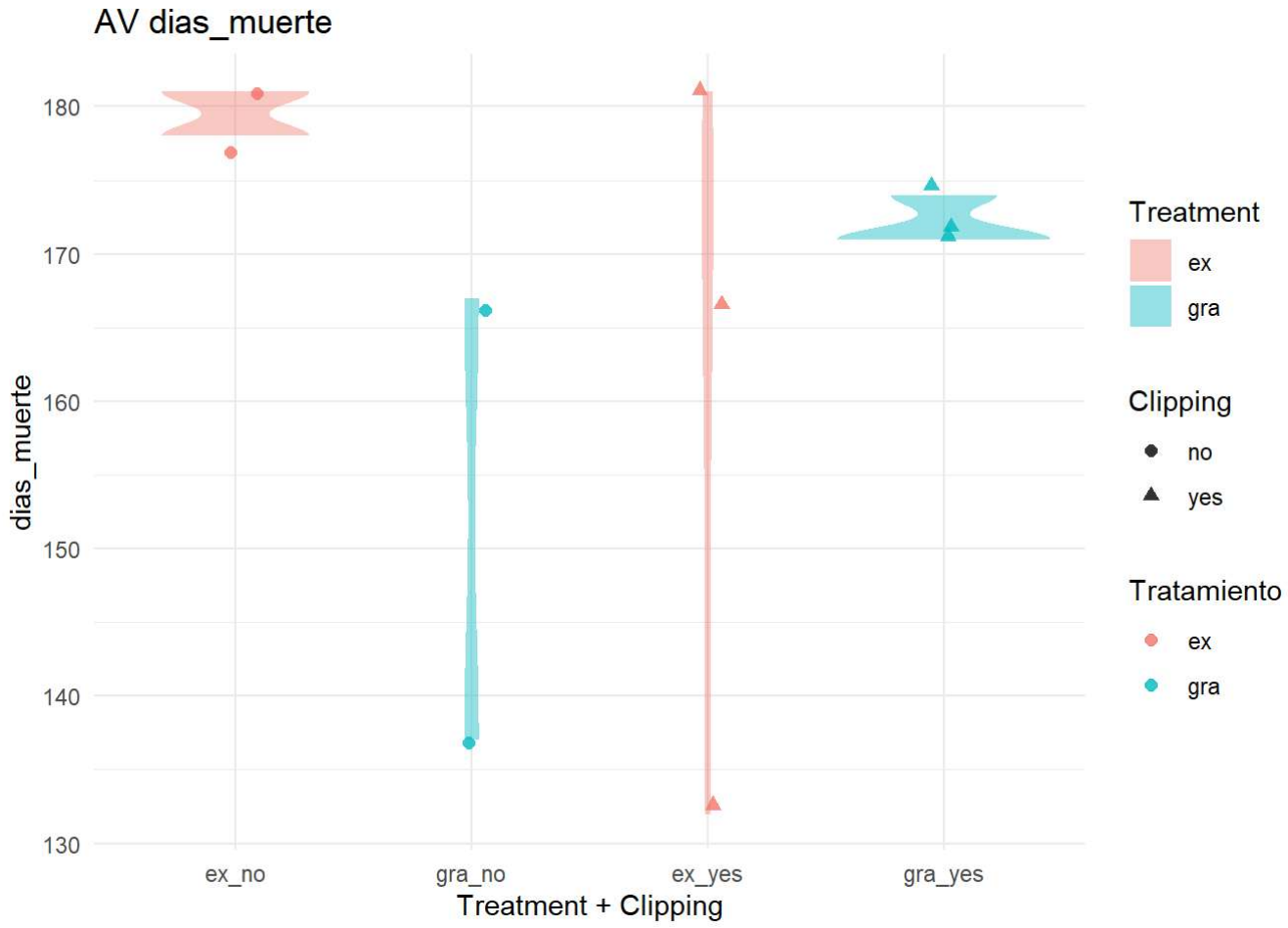
contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	0.7757783	0.6261011	6	1.239062	0.2615918
no - yes	gra	-0.8009926	0.6261011	6	-1.279334	0.2480236

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	1.0838701	0.6858594	6	1.580309	0.1651180
ex - gra	yes	-0.4929008	0.5600019	6	-0.880177	0.4126257

ANOVA Results for AVdias_muerte Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV dias_muerte	trat	0.047	1	0.101	0.761

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV dias_muerte	clip	0.000	1	0.001	0.978
AV dias_muerte	trat:clip	1.492	1	3.171	0.125
AV dias_muerte	Residuals	2.822	6	NA	NA



A.barbata - FENOLES

sqrt(fenoles) ~ trat + clip + trat:clip
n = **49**

R^2 = **0.2166304**

AVfenoles Post-hoc Comparisons with Tukeys HSD

contrast	trat	estimate	SE	df	t.ratio	p.value
no - yes	ex	0.0136868	0.2358611	45	0.0580291	0.9539824
no - yes	gra	0.3027243	0.2398194	45	1.2623012	0.2133433

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	no	-0.7988494	0.2358611	45	-3.386949	0.0014767

contrast	clip	estimate	SE	df	t.ratio	p.value
ex - gra	yes	-0.5098120	0.2398194	45	-2.125817	0.0390402

ANOVA Results for AVfenoles Model

Response	Predictor	Sum Sq	Df	F value	Pr(>F)
AV fenoles	trat ***	5.227	1	15.252	0.000
AV fenoles	clip	0.294	1	0.858	0.359
AV fenoles	trat:clip	0.253	1	0.738	0.395
AV fenoles	Residuals	15.421	45	NA	NA