

Appendix A from W. H. Ryan, “Temperature-Dependent Growth and Fission Rate Plasticity Drive Seasonal and Geographic Changes in Body Size in a Clonal Sea Anemone”

(Am. Nat., vol. 191, no. 2, p. 210)

Mean \pm SE Monthly Sea Surface Temperature Near Collection Sites in Florida, Georgia, and Massachusetts

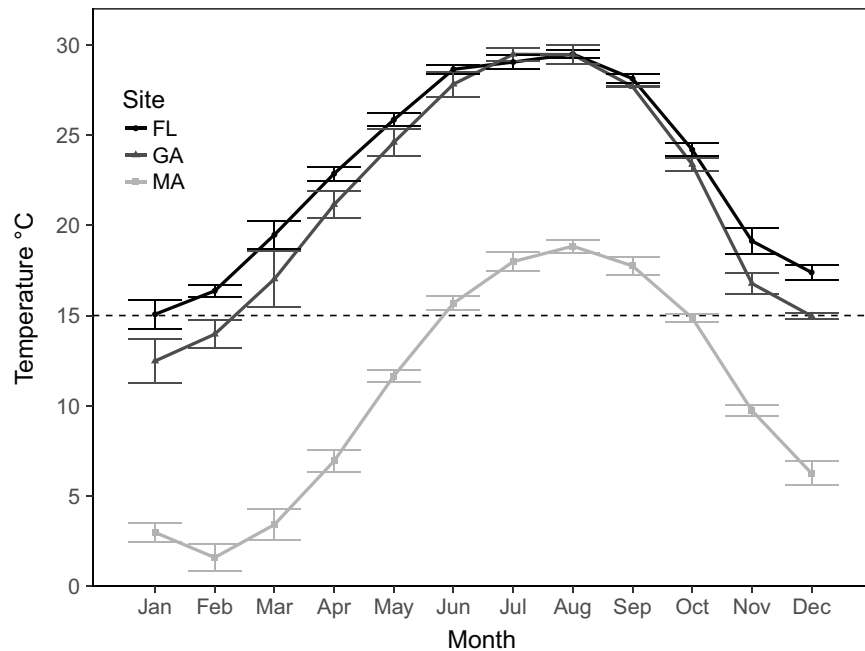


Figure A1: Mean \pm SE sea surface temperature averaged by month from January 2010 to December 2016 for three field sites. Data were collected from the nearest publicly available dock-mounted data station. FL, Florida; GA, Georgia; MA, Massachusetts.

Appendix B from W. H. Ryan, “Temperature-Dependent Growth and Fission Rate Plasticity Drive Seasonal and Geographic Changes in Body Size in a Clonal Sea Anemone” (Am. Nat., vol. 191, no. 2, p. 210)

Regression of Dry Weight on Pedal Disk Area

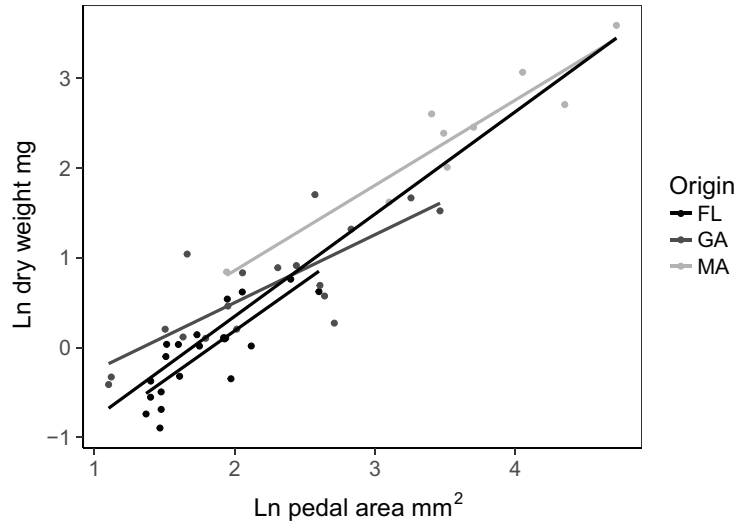


Figure B1: Natural log of pedal disk area (mm²) by natural log of dry weight (mg) for 48 individuals collected from Florida (FL), Georgia (GA), and Massachusetts (MA). Ordinary least squares regression gives a best-fit equation of $y = 1.1388x - 1.9306$, with $R^2 = 0.871$.

Appendix C from W. H. Ryan, “Temperature-Dependent Growth and Fission Rate Plasticity Drive Seasonal and Geographic Changes in Body Size in a Clonal Sea Anemone” (Am. Nat., vol. 191, no. 2, p. 210)

Model Selection Details for GLMM Evaluating Changes in Body Size through Time

Table C1: Set of individual growth curve models compared to find the model that best fit the pattern of lab-measured body size over time

Model	No.	df	AIC	Log likelihood	Model comparison	<i>L</i> ratio	<i>P</i>
Week	1	6	2,979.2	-1,483.6			
Week + week 2	2	7	2,676.4	-1,331.2	1 vs. 2	304.8	<.0001
Week + week 2 + week 3	3	8	2,672.1	-1,328.1	2 vs. 3	6.2	.0127
Week + week 2 + week 3 + week 4	4	9	2,649.2	-1,315.6	3 vs. 4	24.9	<.0001
Week + week 2 + week 3 + week 4 + origin	5	11	2,624.5	-1,301.3	4 vs. 5	28.7	<.0001
Week + week 2 + week 3 + week 4 + week × origin	6	13	2,626.9	-1,300.4	5 vs. 6	1.6	.4391
Week + week 2 + week 3 + week 4 + treatment	7	11	2,609.7	-1,293.8	6 vs. 7	13.2	.0013
Week + week 2 + week 3 + week 4 + week × treatment	8	13	2,561.5	-1,267.7	7 vs. 8	52.2	<.0001
Week + week 2 + week 3 + week 4 + week × origin × treatment	9	25	2,527.3	-1,238.6	8 vs. 9	58.2	<.0001

Note: Best-fit model (last row) includes a fourth-order polynomial describing the relationship of time and size plus the interaction of site of origin and temperature treatment with time. AIC, Akaike information criterion.

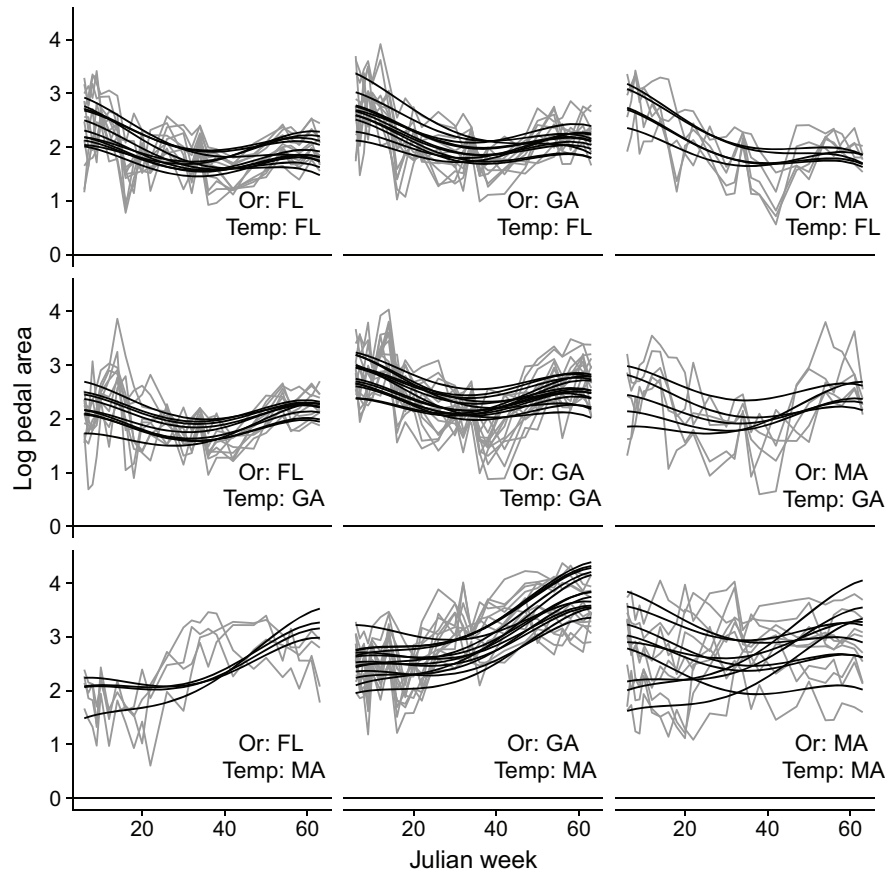


Figure C1: Projection of the best-fit model (black lines) over pedal disk area trajectories over the 52 weeks of the experiment for genets (each genet shown by unique gray lines) displayed by temperature (Temp) treatment (rows) and origin (Or; columns). FL, Florida; GA, Georgia; MA, Massachusetts.

Appendix D from W. H. Ryan, “Temperature-Dependent Growth and Fission Rate Plasticity Drive Seasonal and Geographic Changes in Body Size in a Clonal Sea Anemone” (Am. Nat., vol. 191, no. 2, p. 210)

Detailed Methods for Constructing Body Size and Fission Rate Reaction Norms across Temperature

Between March and September 2015, clonal lines derived from the seasonal temperature experiment were kept at 20°C and fed two times per week. In September 2015, 10 individual ramets were randomly selected from each of the 12 genets (origins: Florida, five; Georgia, four; Massachusetts, three) that had sufficiently large populations. Individual anemones from each genet were wet weighed and measured for pedal disk area and then isolated in a 50-mL Falcon tube of artificial seawater (salinity 32 ppt) and randomly assigned to one of five temperature chambers. This resulted in two clonal replicates from each genet growing at each temperature. The water in each tube was exchanged and anemones fed to repletion on 3-day-old *Artemia* nauplii twice per week. Five temperature treatments were used (6°, 9°, 14°, 21.5°, 29°C) spanning the range of average monthly water temperatures experienced by this species on the east coast of North America.

Mean ramet size and fission rate were calculated for each replicate of each genet after 12 weeks. Individual body size was measured by tracing the outline of the attached pedal disk onto a sheet of acetate, scanning the drawings into a computer, and then using Image J software (National Institutes of Health, Bethesda, MD) to calculate the area of the pedal disk (mm²). Fission rate was calculated as the natural log of the final number of clonal descendants, divided by 12 weeks. The species level mean and standard error were calculated from the mean trait values of each genet.

Seven individuals died soon after being moved into the experiment, rendering three of the 12 genets without enough data to construct a reaction norm. Thus, only nine genets (Florida, five; Georgia, two; Massachusetts, two) were used in subsequent analysis. Otherwise, mortality was fairly low during the experiment.

The sample of genets represented in this portion of the study are likely skewed toward those with higher fission rates and those that do well in laboratory culture because of the amount of material required to construct a reaction norm across five treatment levels. Because the genets in the final sample do not reflect a random sample of the genetic diversity at site of origin, no attempt is made in this study to describe site-specific reaction norms or to compare reaction norms among genets.