New Phytologist

***New Phytologist* Supporting Information Fig. S1, Tables S1 & S2 and Methods S1**

Article title: The scale of local adaptation in *Mimulus guttatus*: comparing life history races, ecotypes, and populations

Authors: Megan L. Peterson, Kathleen M. Kay and Amy L. Angert

Article acceptance date: 16 March 2016

The following Supporting Information is available for this article:

Fig. S1 Photographs of seedlings and rosettes from recruitment plots.

Table S1 Locality information for all populations used in the study.

Table S2 λ and vital rates for all populations in the study.

Methods S1 Results from recruitment plots with details for calculation of *A*.

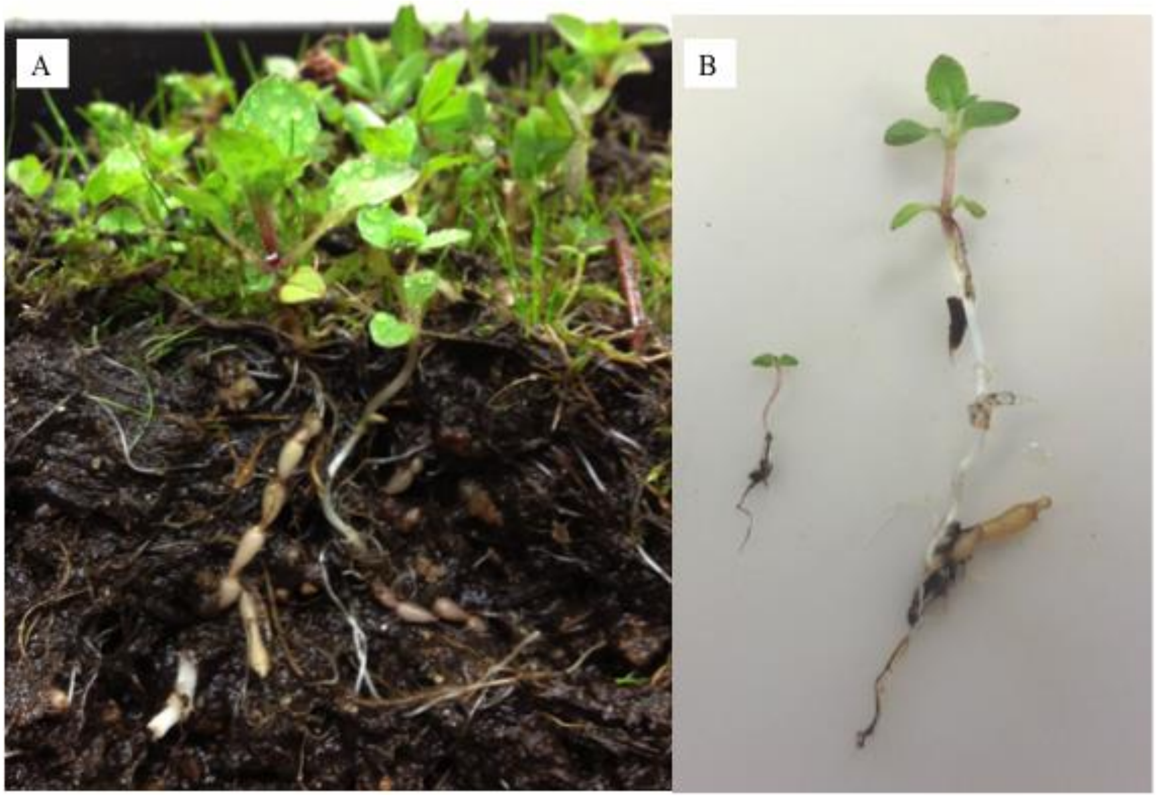

Fig. S1 Most new recruits of *Mimulus guttatus* in soil cores were clonal rosettes derived from belowground rhizomes rather than seedlings (A). Rosettes were much larger than seedlings at the same time period following snowmelt (B).

Table S1 Locality and life history information for all populations in this study

Population	Elevation (m above sea level)	Latitude	Longitude	Habitat	Life-history and ecotype
Red Hills	313	37.857	-120.457	Serpentine seep	Annual
Bald Mountain	1693	38.137	-120.094	Gravelly seep	Annual
Peoria Basin	293	37.933	-120.520	Creek in grassland	Annual
Traverse Creek	681	38.873	-120.818	Serpentine creek	Annual
Sprague Rd	842	37.819	-120.152	Creek in mixed woodland	Annual
Big Oak Flat	1225	37.829	-119.958	Marshy meadow	Annual
Kyburz	1371	38.768	-120.290	Stream in pine forest	Low elevation perennial
Girard Creek	1515	38.731	-120.240	Stream in pine forest	Low elevation perennial
Silver Fork	1959	38.664	-120.219	Stream banks and surrounding meadow	Montane perennial
Eagle Meadows	2046	38.320	-119.920	Small stream in meadow	Montane perennial
Silver Creek	2066	38.588	-119.786	Marshy meadow	Montane perennial

Table S2 Demographic parameters for each population and year

Year	Life history	Pop	λ	G	O	F	S	R	n	$e_{sd,sdl}$	$e_{sdl,sdl}$	$e_{sd,ros}$	$e_{sdl,ros}$	$e_{ros,sdl}$	$e_{ros,ros}$
2012	Annual	Red Hills	0.831 (0.628, 1.089)	.599 (.077) [96]	286.9 (61.9) [11]	5.28	0	0	39	.191 (.157, .225)	.552 (.432, .647)	0	0	0	0
	Annual	Bald Mountain	0.915 (0.672, 1.190)	.818 (.053) [96]	170.9 (59.2) [12]	8.60	0	0	40	.095 (.075, .124)	.798 (.731, .844)	0	0	0	0
	Annual	Peoria Basin	2.816 (2.117, 3.561)	.740 (.065) [96]	616.8 (47.8) [21]	8.62	0	0	40	.047 (.037, .061)	.904 (.874, .923)	0	0	0	0
	Annual	Traverse Creek	1.546 (1.169, 1.978)	.717 (.067) [96]	260.1 (51.2) [16]	11.00	0	0	40	.088 (.071, .113)	.814 (.756, .853)	0	0	0	0
	Annual	Sprague Rd	1.412 (0.732, 2.294)	.740 (.065) [96]	535.5 (68.4) [9]	4.72	0	0	40	.089 (.057, .153)	.813 (.654, .882)	0	0	0	0
	Annual	Big Oak Flat	2.248 (1.593, 3.034)	.774 (.060) [96]	305.0 (47.8) [20]	13.25	0	0	40	.051 (.038, .070)	.895 (.854, .922)	0	0	0	0
	Low elevation perennial	Kyburz	3.462 (2.296, 4.892)	.705 (.069) [96]	589.1 (49.7) [18]	9.07	.150	0.78	40	.026 (.014, .048)	.555 (.325, .766)	.008 (.004, .013)	.160 (.066, .225)	.168 (.070, .235)	.048 (.006, .163)

	Low elevation perennial	Girard Creek	2.65 (1.496, 4.256)	.599 (.077) [96]	653.3 (59.2) [12]	4.67	.175	1.30	40	.020 (.004, .073)	.229 (.057, .564)	.019 (.013, .038)	.220 (.203, .234)	.239 (.234, .245)	.230 (.026, .554)
	Montane perennial	Silver Fork	0.984 (0.403, 2.017)	.552 (0.079) [96]	803.1 (118.5) [3]	0.40	.100	0.82	40	.006 (.000, .121)	.019 (.001, .104)	.031 (.005, .085)	.098 (.041, .151)	.129 (.038, .198)	.668 (.073, .920)
	Montane perennial	Eagle Meadows	1.714 (0.588, 3.665)	.469 (.079) [96]	613.9 (118.6) [3]	0.64	.179	1.56	39	.001 (.000, .067)	.006 (.000, .062)	.013 (.002, .079)	.066 (.019, .126)	.079 (.020, .180)	.818 (.213, .957)
	Montane perennial	Silver Creek	0.841 (0.449, 1.687)	.410 (.078) [96]	649.5 (118.6) [3]	0.63	.158	0.66	38	.016 (.001, .153)	.026 (.002, .113)	.056 (.013, .089)	.094 (.054, .143)	.151 (.070, .196)	.542 (.020, .893)
2013	Annual	Red Hills	0.271 (0.252, 0.291)	.599 (.077) [96]	107.5 (47.1) [11]	1.30	0	0	40	.166 (.131, .197)	.044 (.024, .073)	0	0	0	0
	Annual	Bald Mountain	0.300 (0.257, 0.347)	.818 (.053) [96]	75.3 (27.8) [31]	4.85	0	0	40	.219 (.201, .235)	.457 (.385, .518)	0	0	0	0
	Annual	Peoria Basin	0.597 (0.465, 0.744)	.740 (.065) [96]	212.8 (33.8) [21]	4.28	0	0	40	.179 (.151, .208)	.589 (.492, .663)	0	0	0	0
	Annual	Traverse Creek	0.468 (0.359, 0.609)	.717 (.067) [96]	173.3 (34.7) [20]	3.76	0	0	41	.219 (.187, .244)	.459 (.330, .563)	0	0	0	0
	Annual	Sprague Rd	0.798 (0.576, 1.087)	.740 (.065) [96]	221.3 (30.4) [26]	5.92	0	0	39	.144 (.111, .181)	.682 (.579, .761)	0	0	0	0

Annual	Big Oak Flat	0.889 (0.694, 1.091)	.774 (.060) [96]	155.3 (28.7) [29]	9.40	0	0	40	.117 (.098, .143)	.747 (.683, .792)	0	0	0	0
Low elevation perennial	Kyburz	1.166 (0.766, 1.769)	.705 (.069) [96]	509.9 (38.8) [16]	6.41	0	0	38	.115 (.080, .162)	.735 (.633, .831)	0	0	0	0
Low elevation perennial	Girard Creek	0.964 (0.730, 1.311)	.599 (.077) [96]	479.3 (33.0) [22]	4.33	0	0	39	.169 (.136, .205)	.615 (.507, .701)	0	0	0	0
Montane perennial	Silver Fork	0.384 (0.239, 0.784)	.552 (.079) [96]	634.5 (79.1) [4*]	0.29	.048	0.17	38	.091 (.000, .242)	.055 (.000, .241)	.084 (.077, .090)	.050 (.000, .145)	.134 (.000, .206)	.124 (.000, 1.000)
Montane perennial	Eagle Meadows	0.464 (0.336, 0.790)	.469 (.079) [96]	479.0 (90.1) [3]	0.29	.122	0.31	42	.034 (.002, .126)	.021 (.003, .062)	.086 (.067, .090)	.055 (.019, .093)	.140 (.109, .175)	.357 (.011, .848)
Montane perennial	Silver Creek	0.581 (0.339, 1.672)	.410 (.078) [96]	525.0 (90.2) [3]	0.27	.083	0.46	42	.008 (.000, .110)	.007 (.000, .038)	.054 (.014, .089)	.045 (.017, .087)	.099 (.041, .169)	.648 (.001, .980)

λ and elasticities (stage t+1, stage t) and 95% bias-corrected confidence intervals (from 10,000 bootstrap samples) for each population and year. Estimates of G and O from generalized and linear mixed models, respectively, for each population and year; SE is given in parentheses and sample sizes (number of seeds and number of flowers sampled for ovule number, respectively) are given in brackets. F, S, and R estimates from observed seedling transition rates for each population and year based on *n* individuals. Note that the germination rate G was estimated in 2012 and did not vary between years in matrix models.*In 2013, we were only able to collect a single flower from the Silver Fork population, so we also used the 3 flowers collected in 2012 from this population to better estimate a mean value.

Methods S1 Results from recruitment plots with details for calculation of A.

Recruitment plots: To translate individual-level observations of flower production into estimates of viable seed set, we estimated two additional parameters: ovule number per flower (*O*), and a retention rate *A* that captures the transition from ovule to viable seed. Ovule production per plant is certainly an overestimate of viable seed production due to pollen and resource limitations on seed development, seed predation, and safe-site limitation. We examined natural recruitment dynamics in the native *Mimulus guttatus* population to estimate the proportional recruitment success of ovules relative to rosettes. The majority of new recruits in each plot were vegetative rosettes derived from belowground rhizomes, rather than newly germinated seedlings (Fig. S1). Most rosettes were physiologically independent from other rosettes within each core; only three out of 368 belonged to ramets with more than one rosette. Soil cores from each plot yielded a total of 38 seedlings and 200 rosettes on 1 May and 24 seedlings and 168 rosettes on 16 May. The proportion of seedlings decreased over time, but this difference was not statistically significant ($\chi^2 = 1.13$, df = 1, $P = 0.288$), so we pooled all cores to estimate a mean relative recruitment rate of 0.168 seedlings per rosette. We multiplied seedling: rosette recruitment with rosette: ovule production in the native Eagle Meadows population in 2012 to estimate an ovule to seedling transition rate for this site, *A*, as:

$$(0.168 \text{ seedlings / rosette}) \times (1.56 \text{ rosettes / 392 ovules}) = 6.7 \times 10^{-4} \text{ seedlings per ovule}$$