

APPENDIX S1. Detailed description of all model parameters. For *shadie* models, there is one generation per life stage (i.e., one gametophyte [haploid] + one sporophyte [diploid] cycle = 2 generations in simulation time). An updated parameter glossary is maintained in the online *shadie* documentation.

Parameter	Description
mutation_rate	Per-site, per-generation mutation rate
recomb_rate	Per-site, per-generation recombination rate
spo_pop_size	Sporophyte population size, implemented as a carrying capacity (actual population size in the simulation will fluctuate around or under this value)
gam_pop_size	Gametophyte population size, implemented as a carrying capacity (actual population size in the simulation will fluctuate around or under this value)
spo_mutation_rate	Per-site, per-generation mutation rate during sporophyte life stage
gam_mutation_rate	Per-site, per-generation mutation rate during gametophyte life stage
spo_female_to_male_ratio	Female-to-male ratio of sporophyte population (dioecious spermatophytes only)
gam_female_to_male_ratio	Female-to-male ratio of gametophyte population; hermaphrodites count as both one female and one male individual
spo_clone_rate	Cloning rate (as probability each given individual will engage in cloning) of sporophyte population
spo_clone_number	Number of clones produced by a sporophyte individual that has engaged in cloning. Clones are added to the next sporophyte generation
gam_clone_rate	Cloning rate (as probability each given individual will engage in cloning) of gametophyte population
gam_clone_number	Number of clones produced by a gametophyte individual that has engaged in cloning. Clones are added to the next gametophyte generation
spo_self_rate_per_egg	Sporophytic selfing rate per gametophyte egg (as probability that any given egg will receive sperm produced by the same sporophyte parent)
gam_self_rate_per_egg	Gametophytic selfing rate per gametophyte egg (as probability that any given egg will receive sperm produced by the same gametophyte)
spo_maternal_effect	Magnitude of sporophyte maternal fitness that will contribute to gametophyte offspring fitness
gam_maternal_effect	Magnitude of gametophyte maternal fitness that will contribute to sporophyte offspring fitness
spo_random_death_chance	Probability any given sporophyte individual will die before reproducing, regardless of fitness
gam_random_death_chance	Probability any given gametophyte individual will die before reproducing, regardless of fitness
spo_spores_per	Number of spores produced by each sporophyte individual
gam_archegonia_per	Number of archegonia (one egg per archegonium) produced by each gametophyte individual
spo_flowers_per	Number of flowers produced by each sporophyte individual (spermatophyte models only)
flower_ovules_per	Number of ovules per flower (spermatophyte models only)
flower_anthers_per	Number of anthers per flower (spermatophyte models only)
anther_pollen_per	Number of pollen produced by each anther (spermatophyte models only)
pollen_comp	Controls whether pollen competition is present or absent in the model (spermatophyte models only)
pollen_comp_stigma_pollen_per	If pollen competition is turned on, number of pollen competing with each other per stigma (number of stigma is assumed to be equal to number of flowers; spermatophyte models only)