Equations for AJB-00205

2022-10-31

Mertensia fusiformis: 100 individuals, 4 sites

Delphinium nuttallianum: 84 individuals, 4 sites

Potentilla pulcherrima: 67 individuals, 7 sites

*5 fixed effects:*

* “flowers” number of flowers on the plant
* “deviation” number of days an individuals blooming peak is from the population peak
* “early/late” before or after the population peak bloom
* “conspecifics” number of conspecific plants blooming at the same time
* “treatment” plot treatment, either accelerated snowmelt or natural

*2 response variables:*

* “dev.seed” number of developed seeds
* “cbind(dev.seed,undev.seeds)” proportion of developed seeds to undeveloped seeds

## Distributions used:

Mertensia, Delphinium, and Potentilla developed seed counts: negative binomial

Mertensia proportion of developed seeds: binomial

Delphinium proportion of developed seeds: betabinomial

## R models look like this:

mert.glmmtmb<-glmmTMB(dev.seed ~ flowers:(deviation\*early.late) + flowers:number.conspecifics/plot.treat + (1|site), ziformula=~1, family = “nbinom2”, data = mert.open)

Mert.prop.glmmtmb<-glmmTMB(cbind(dev.seed,undev.seeds) ~ flowers:(deviation \* early.late) + flowers:number.conspecifics/plot.treat + (1|site), family = binomial, data = mert.open)

## Mathematical notation

### Terms

is the intercept

is regression coefficient for fixed effects

F = flowers

D = deviation

E = early/late

C = conspecifics

T = treatment

z = site (as random effect)

u = random effect regression coefficients

### Mertensia count model:

PMF for negative binomial, with linear model as x

y =

linear model

M =

### Mertensia proportion model:

PMF for binomial, with linear model as x

y =

linear model

M =

### Delphinium proportion model:

PMF for betabinomial, with linear model as x

y = +

linear model

D =