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Senior

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Summary:

Title: Analyzing phenotypic color variation in flowering *Mimulus ringens* across location.

Mimulus ringens, a diploid flower species native to North America, exists in both annual and perennial populations. Previous observations indicate that *M. ringens* populations demonstrate variable flower color. Investigating the relationship of flower color and location in *M. ringens*, I predicted darker flowers to occur more frequently in lower latitudes. Preliminary data suggests an association between darker flower color and the annual life history. I expected more annuals in southern latitudes because earlier, hotter summers may favor the reproductive strategies of annuals.

I collected data using crowd-sourced images of *M. ringens* from iNaturalist. The iNaturalist application allows users to contribute wildlife photographs to a citizen scientist dataset. I recorded location data based on the geographic information associated with each iNaturalist observation. For each naturalist photograph, I qualitatively evaluated flower color and used Image (Schneider et al., 2012); to quantitatively evaluate flower color. I tested for relationships between color and both latitude and longitude.

M. ringens of lighter colors are found in larger quantities and over a larger range than darker flowers. It is always more likely to identify a lighter flower than a darker flower. However, as latitude increases, the relative probability of darker flowers increases. Contrary to my prediction, I found significantly more dark flowers in the north than the south. Surprisingly, I found significantly more dark flowers in the west than the east. To draw more concrete conclusions, an ongoing study seeking to evaluate the relationship of flower color and annual/perennial life history in *M. ringens*.

Note: I am a junior, but I am submitting an abstract because I participated in the 2020 President's Fellowship for Summer Research.