**Provenance and Parentage: How the Collection Locations of Seeds affect the Flower, Fruit, and Seed Traits of their Offspring in a Common (Community) Garden**

**Overview and Introduction**

*Background*

* Phenology
  + Timing of life events
  + Subject to the same gene flow that other traits are subject to
  + Extremely plastic within species (Elzinga et al., 2007)
* Flower, fruit, and seed characteristics
  + Seed size (mass) has been shown to be related to success of the seedling (due to an increase in the nutrients that the seedling has to survive) (Ambika, Manonmani, & Somasundaram, 2014)

*Aims and Objectives*

1. Discover correlations between latitude and a variety of flower, fruit and seed characteristics.
   1. Seed size (mass, length, width) and collection site of the parents
   2. Fruit size (mass, length, width) and collection site of the parents
   3. Flower size (mass, length, width) and collection site of the parents
2. Discover correlations between collection date and flower, fruit, and seed characteristics.
   1. Seed size (mass, length, width) and collection date
   2. Fruit size (mass, length, width) and collection date
   3. Flower size (mass, length, width) and collection date
3. Discover correlations between plant size and seed and fruit size
4. (Hopefully) present linear trends that show correlations with these characteristics

*Hypotheses*

1. I expect that:
   1. Seed size will decrease as latitudes of collections move northwards (Moles & Westoby, 2003). Further away from the tropics, the seed size has been seen to grow smaller, most likely in relation to the shorter growing season.
   2. Fruit size will decrease as latitudes of parental collection move northwards. I cannot find sources, Cat. Nothing talks about fruit size and latitude. I’m basing this on that there are shorter growing seasons further north, meaning that there will be smaller fruits from the seeds further north since they have adapted for their seeds to survive with less fruit.
2. I expect that the later in the season the samples are collected, the larger that they will be. This is due to the fact that they will have had more time to grow. \
3. It has been shown that larger, older plants produce larger seeds (Leishman, Westoby, & Jrado, 1995), and many of the plants that I will be collecting from are around a similar age. Therefore, I would expect that the larger plants (in width and height) would show larger flowers, fruits, and seeds.

*Significance and Implications*

Because phenology is multifaceted and affected by many different things, it is difficult to study exactly what affects it. This study aims to pinpoint how seed provenance can affect the flower, fruit, and seed traits and ELEPHANTS. By gathering samples from a common garden, we assume that these

**Plan for Research**

*Design*

Using a common (community?) garden, I hope to establish that flower, fruit, and seed traits are at least partially determined genetically based on their provenance. By having these plants whose seeds came from different locations