Genetic Variation of Phormia regina in the United States

Alhaffar, Dana

Criminal investigators and forensic scientists utilize insects in many parts of their research and studies. Insects can be vital tools in learning about a corpse by examining the genetics of a certain species. The purpose of my project was to study genetic variation in Phormia regina by documenting genetic differences between populations from different states. This study could potentially allow forensic scientists to pinpoint the original location of a corpse. To conduct the experiment I had to gather from the lab, about 10 fly samples from six different states. I used six primers to do PCR and then went on to place the samples in the genetic analyzer. The genetic analyzer graphed out the peaks of each allele from the DNA samples. After completing several rounds of PCR and genotyping the DNA, I found that the data supported both parts of my hypothesis, there was genetic variation. The primers peaked at varying levels in each state and had varying amounts of unique alleles. I then used the data I gathered and inputted the results into an equation to measure the heterozygosity of each population. I found that the states had varying levels of heterozygosity ranging anywhere from 0.50 to 0.77. From these results I concluded that there is a degree of variation between the populations, especially in states like Alabama and Connecticut, which had extensive differences. This study, along with more intensive research, can allow forensic scientists to trace the original location of a corpse incase it had been moved, washed through a storm, or had come from another region.