# Male Aedes aegypti: Biotic Effects of Chilling Associated With an SIT Program

Mariano, Kadie (School: Wildwood High School)

The purpose of this study is to evaluate the optimal chilling temperature and time for Aedes aegypti mosquitoes for use as part of a sterile insect technique release program. This is crucial in releasing sterile males, to in turn decrease the population, and limit the spread of diseases. The following groups were investigated : 4 C - 30 min, 4 C - 120 min, 10 C - 30 min, 10 C - 120 min, 28 C - 30 min, and 28 C - 120 min. The mortality group consisted of 30 male Aedes aegypti each in 18 Bug dorm cages. On days zero, one, two, and five the mortality rate was calculated after chilling. The fertility group consisted of one male with 10 females in each vial, with 60 vials total. The 24 hour/48 hour mortality, sex, number of spermathecae inseminated 0 - 3, and wing length was calculated after chilling. The survivorship group revealed that 4 C had a significant difference in percent survivorship compared to 10 C and 28 C, rapidly declining over time on day 1, 2, and 5 with 94.98% compared to other groups of 98.54% survivorship overall. (F (2, 30) = 7.9754, P = 0.001669) Time chilled had no impact on survivorship with 10 C and 28 C being similar with 98.35% survivorship over 5 days. The fertility group's results were inconclusive, leading the expectations that lower temperatures result in lower fertility rate. To conclude, the survivorship of the 4 C chilling group needs further research in relation to the fertility rate, as this can be an important factor in the released Aedes aegypti using SIT.

**Awards Won:**