Methods for the Pathway Analysis of Three Fruit Fly Pest Species

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Abstract

With over 200 species of Tephritidae considered of economic importance, some have the potential for devastating losses to American agriculture. A few of these make their way into the US. These occasional finds have been reported in California, Florida, and the Rio Grande Valley in Texas. Maintaining fly-free areas in the US is costly because it may require strategies that include trapping and surveying as well as more intense methods for eradication of infestations such as the sterile insect technique (SIT). While classical methods that rely on morphology generally work well to identify to species-level, these methods cannot identify the origin of a capture. Knowing the source of an infestation would provide programs and managers with critical information that they could then use to target specific areas responsible for infestations. Conventional as well as use of SIT methods might then be used more effectively to reduce the opportunity for future infestations. Informative methods that target DNAs that identify the source of pest fruit flies are being developed for various species at the USDA CPHST Mission Lab. These include: the Mediterranean fruit fly, *Ceratitis capitata*; the Mexican fruit fly, *Anastrepha ludens*; and the West Indian fruit fly, *Anastrepha obliqua.* We summarize the work and progress for each of these serious pests.