Determining the Identity and Possible Origins of a Collembola Pest of Lettuce and Tree Seedlings

Alejandra Flores, Molecular and Cellular Biology
Research Mentor: Rosanna Giordano

Abstract

Lettuce farmers in the Salinas Valley of California have reported debilitating losses to their crop as a result of damage to the roots of lettuce plants. Similar symptoms have also been reported by maple and poplar tree nurseries in Oregon. A study of the arthropods associated with the damaged lettuce and tree seedling roots indicated that feeding by a Collembola is the likely cause of the damage. Using morphological evidence the Collembola were identified as Protaphorura fimata. We used molecular tools, the mitochondrial gene cytochrome oxidase I (COI), to confirm the identity of this pest as well as to determine the genetic relationship between the California and Oregon P. fimata populations to each other and with a population from Europe. The goals of this research are as follows: 1) Confirm species identity of California and Oregon P. fimata populations. 2) Determine genetic relationship of California, Oregon and European P. fimata populations in order to assess whether P. fimata is an invasive species.