

Categorizing the Insect Diversity at Entrada Field Station

Matthew J Mau

Undergraduate

Department of Biology, University of Utah

Introduction

The Entrada Field Station is a property in Southeastern Utah recently acquired by the University of Utah for the purpose of expanding the educational means of the school. It has more than 300 acres of land with several habitats. The property consists of a flat scrub-filled area, a thickly wooded riparian area and a handful of box canyons that extend from the main property. These conditions make for a useful backdrop to study the interaction of organisms within each habitat. The goal of this project is to first create a collection of the insect population of Entrada, and to study differences in the insect population between the three habitats.

Materials and Methods

Four collections were taken from the Entrada Field Station during the summer of 2009, in May (4th-8th) June (2nd-5th) July (3rd-6th) and August (1st-4th). All specimens were then transported to the University of Utah where identifications could be made.

Several trapping methods were used to sample the diversity at four separate times during the months of May-August. First, six transects of pitfall traps were placed throughout the Entrada property. Two were placed on the bottom land (Bot1A-D & Bot2A-D), one within the densely populated tamarisk trees (Tam1A-D), one on the banks of the Delores River (Rip1A-C), one inside the Line Canyon wash and one against the higher walls of Line Canyon (Can1A-C & Can2A-D). Each transect consisted of 3-4 traps placed 10-15 feet apart and filled with a killing agent. Each pitfall trap was then allowed 72 hours to collect before samples were retrieved. Second, two malaise traps were used to collect flying insects, one by the Delores River (Rip Mal), and one within Line Canyon (Can Mal). These two traps were set up during the entire summer from May 4th-August 4th. As a result, two collections were taken each month, one from the previous month's sampling as well as a 72-hour collection during the time spent at Entrada. Third, net sweeps were performed consisting of 100 swings of a butterfly net while walking a straight line through the scrubs of the bottom area. Two of these samples were taken on consecutive days during each of the months. Fourth, three white pan traps made up of a white bowl filled with soapy water were placed on the property: one near the housing buildings, and one in each of the Quiet Canyon and Line Canyon washes. Fifth, a U.V. light was used for 30 minutes at night to collect nocturnal insects. Collecting these samples consisted of gathering individual insects attracted to the light. Finally, insects were hand collected each day for the duration of one hour.

Preliminary Results

All numbers following are current as of December 2009. From the August collection 19 out of a total of 21 transects have been sorted with 2172 specimens from 14 orders. 12 transects from July yielded 522 individuals from 12 orders. The collection from May had 10 orders from 9 transects with 212 insects. Transects from the month of June have not yet been processed.

Comparisons between transects in different months were difficult to make, due to the incomplete sorting from month to month. However, there was some overlap between the more completed months of July and August for some surface comparisons to be made. The number of specimens gathered in each month in shared transects varied by 141, with August averaging 50.3 insects per pitfall trap and July averaging 36.2 per trap. The most abundant order from all three months was Hymenoptera, the majority of which came from the family of Formicidae. In May there were 92 individuals from Hymenoptera (87 from Formicidae), with the second most abundant being Diptera with 47. July had 264 Hymenopterans (198 Formicidae) with 94 Dipterans and 87 Collembolans. From August there were 878 Hymenopterans (798 Formicidae) compared to 221 Hemipterans.

Discussion

Although not all transects have been processed, it would seem from the preliminary results that there was a great increase in abundance of insects in the month July. Hymenoptera seem to be the most successful order, with the Dipterans coming in a distant second. However, there was a large influx of Hemipterans in the August collection, especially in the riparian and tamarisk transects. The orders of Diptera and Hymenoptera were successful in the cooler months as well and the increase in their numbers is most likely due to an increase in temperature and overall resource increase. The increase in Hemipterans found in traps, is probably related to an increase in the plant production along the Delores River. Hemipterans mostly feed on plants, which is reflected in the greater numbers seen in the plant-rich areas of the tamarisk and riparian, opposed to the dry, vegetation sparse canyon transects.

Future Goals

Several goals will need to be attained to complete the Entrada Field Station insect collection. First, the rest of the traps will need to be organized by either order or family. Second, the current specimens will need to be further identified to family, and then ideally to genus and species. From this information changes in abundance and diversity can be assessed between transects within the same month, the same transect in different months, the collection as a whole compared to future collections, etc.