



Arthropod Diversity: *In situ* prairie versus prairie-style green roof

Haley Rylander¹, Devin Spencer¹, and Dr. Brooke Byerley Best²

¹Texas Christian University and ²Botanical Research Institute of Texas

Introduction



Prairie



Roof

The success of BRIT's living roof can be estimated by determining its capacity for mimicry of the native systems from which it was designed. Composition of a healthy arthropod community is a reliable indicator of this success. We sampled both the roof and the native prairie it was designed to mimic ("Benbrook Prairie") during the same 6-week period in the Fall of 2012 and compared diversity and proportions of arthropods.

Methods

- Pitfall traps made of plastic cups filled with anti-freeze were placed into the ground in 16 randomly chosen plots on Benbrook Prairie
- Contents were collected weekly from 19 Oct through 27 Nov 2012.
- Samples were examined under a microscope, and arthropods were sorted, identified to the lowest possible taxon, and counted.
- Identified specimens were placed in labeled test tubes and grouped by date.



Results

- By far the most common class on the prairie was **Insecta**, the most common order **Hymenoptera**.
- Substantially **fewer Collembolans** were found in the prairie compared to the roof.
- **Larger insects** such as grasshoppers, field crickets, mantids, and large beetles were much more common on the prairie than on the roof.
- The **4 most abundant arthropod classes were identical** for both the prairie and the roof, but relative proportions were quite different.

Common prairie arthropods



Solenopsis invicta
(Fire Ant)

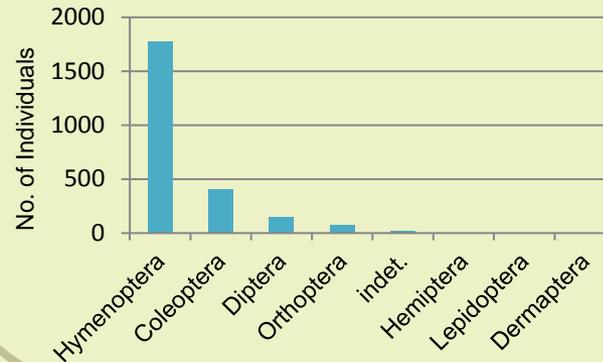


Carabidae

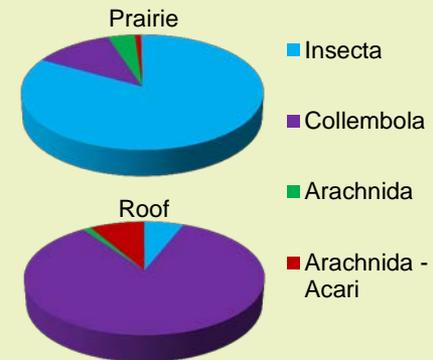


Muscidae

Insecta Orders from Prairie



Arthropoda Classes



Conclusions

Though Benbrook Prairie had different species make-up than the BRIT living roof, many species were common between the two. The most likely cause of species differences is ecosystem age. In particular, Collembolans (springtails) and Acarids (mites), both of which were much more common on the roof than the prairie, are indicators of early succession and are abundant when predators are scarce. However, Collembolans and Acarids are also strongly affected by soil moisture, and the irrigation of the roof could have influenced these counts.

As the man-made ecosystem of the roof matures, arthropod populations and proportions would be expected to more closely mimic that of native prairie.