

Introduction

Anthophilous Bees (Hymenoptera: Apoidea: Anthophila) provide key ecosystem services pollinating more than 80% of all flowering plants and about one third of all the food we eat (FAO). There are more than 20,000 species of bees worldwide, belonging to nine different families: Andrenidae, Apidae, Colletidae, Dasypodidae, Halictidae, Megachilidae, Meganomiidae, Melittidae and Stenotritidae (Michener 2007). United States has an estimated 4,000 species of native bees, and the state of Texas has an estimated 900 species (Asher and Pickett 2016). However, the number of species occurring in the High Plains Region of Texas (Figure 1) and the potential changes in biodiversity attributed to widespread conversion of native lands to agriculture, remains unclear.

Loss of natural habitat, excessive use of pesticides, invasive species, diseases and climate change are causing managed and wild bee populations to decline worldwide. The loss of bee populations puts at risk pollination services in natural ecosystems, native plant diversity, and agricultural production. The objective of this study was to catalogue and develop an annotated checklist of the bee species occurring on the High Plains Region of Texas.

Materials and Methods

Data Collection. Historical occurrences of bees was obtained from online databases, the Symbiota Collections Arthropods Network (SCAN), Discover life, the USGS Northern Prairie wildlife research center Pollinator Library ,specimens collected by the authors, and uncatalogued museum specimens from the Invertebrate Collection of the Museum of Texas Tech University.

Bees not found or catalogued in online databases, were identified to genus level using published dichotomous keys (Michener et al. 1994). Bees from each genera were then grouped into morpho-species based on morphological characteristics.

Results

We found a total of 72 species of bees, belonging to 27 genera, and 5 families (Andrenidae, Apidae, Colletidae, Halictidae and Megachilidae) (Table 1). We found historical records of bees for only 30 of the 41 counties of the High Plains Region of Texas. Briscoe County had the highest number of bee species reported with 14, Lubbock County with 12, followed by Carson, Hartley and Hockley counties with 11 species each (Table 2).

Figure 1. Total number of antophilous bee species found on each county from High Plains region of Texas

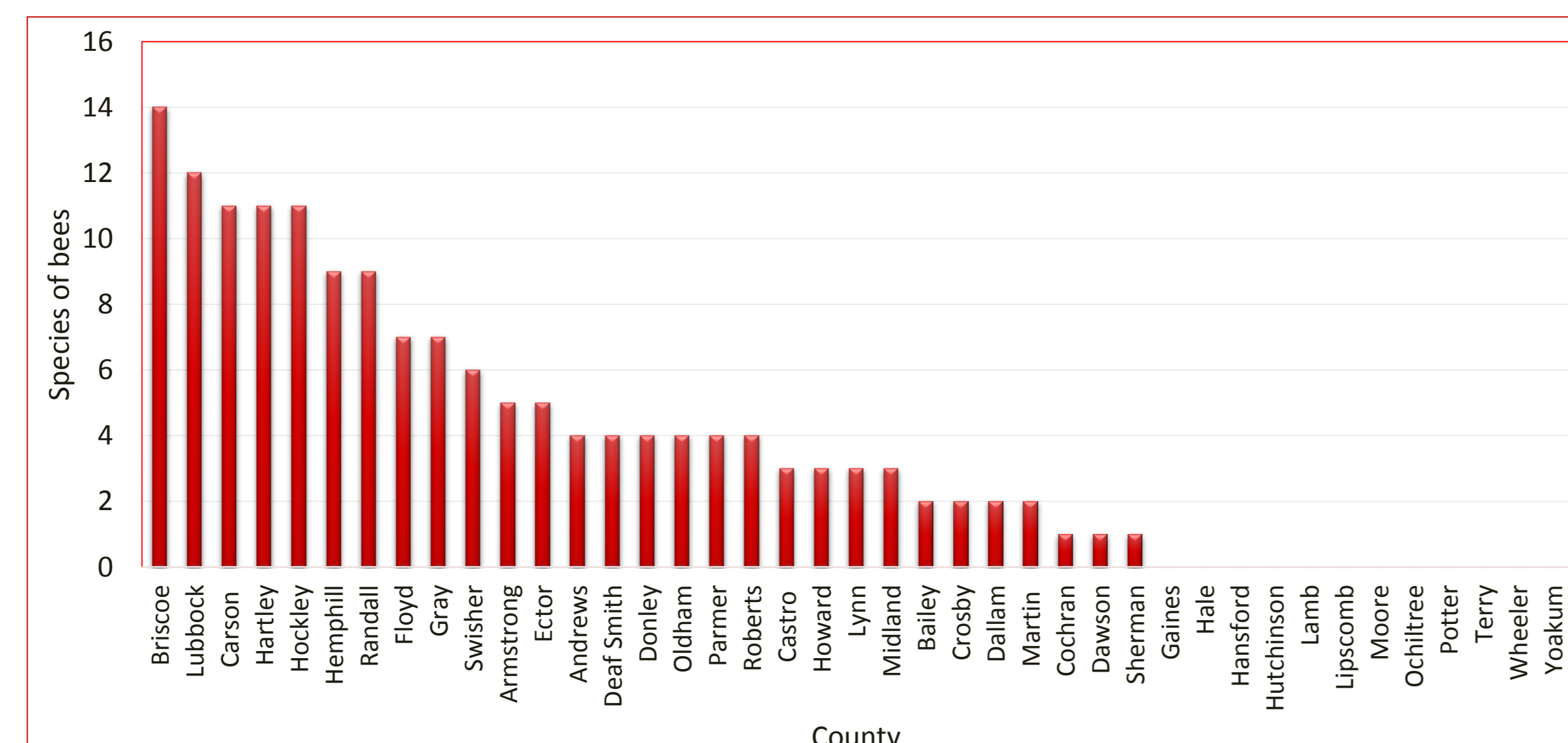


Table 1. Number of species and Genera by each bee family.

Table with 3 columns: Family, Number of genera, Number of species. Rows include Andrenidae (4 genera, 15 species), Apidae (11 genera, 36 species), Colletidae (1 genus, 2 species), Halictidae (6 genera, 12 species), and Megachilidae (5 genera, 8 species).

Table 2. Checklist of antophilous bee species found on each county of High Plains region of Texas.

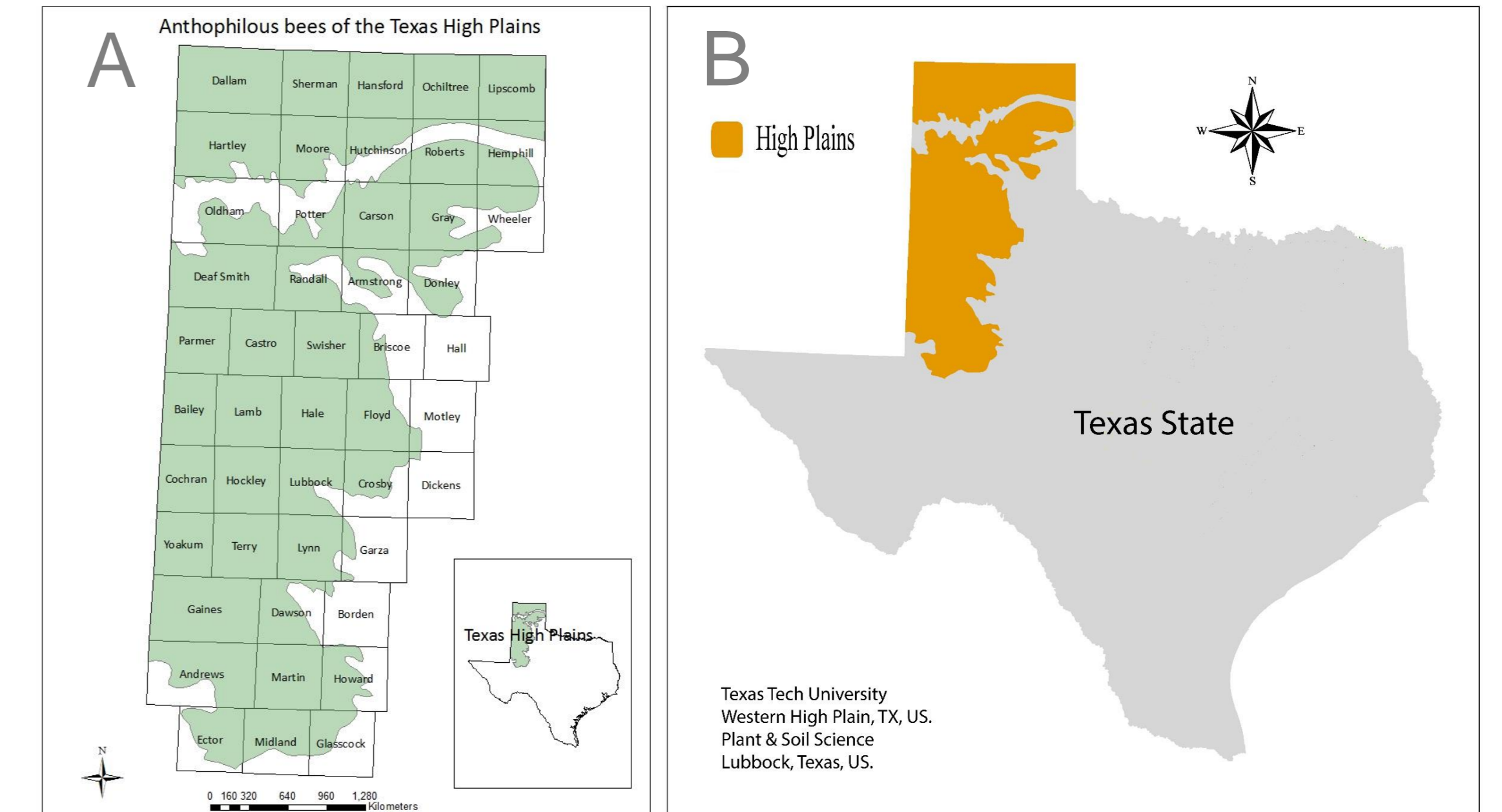
Large checklist table showing the presence of 72 bee species across 41 counties. The table is organized with species names on the left and county names on the top. Black squares indicate the presence of a species in a specific county.

Figure 2. Photographies taken from Dino-lite Microscope, lab PSS, Texas Tech University.



Agapostemon texanus Cresson, 1872; Megachile brevis Say, 1837; Halictus ligatus Say, 1837

Figure 3. A: Counties from Texas into High Plain región. B: High Plain region map of Texas.



Conclusions

This study provides an initial evaluation of the native bee species Texas of High Plains region. Future studies will involve comparing this historical records with current ongoing surveys in the region. Species richness information from this study will serve as background information to further assess bee communities, while providing data to facilitate comparisons of species richness regionally within our area of interest.

Additional analyses will involve classifying bees into functional guilds based on differences in habitat, phenology, body size, eusocial behavior, and foraging patterns. Thus, we will improve our understanding of the bee communities and their habitat resource needs in the region, which will improve actions to restore and reclaim native habitats to support native bee communities.

References

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