

The Bees of Utah

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Abstract

A lot of researchers have compiled checklists to better understand the richness of bee species in their states. Despite the fact that Utah is a hotspot of bee diversity, no such list exists for our state. To create this list, data was obtained from a public online database (Scan-bugs.org), which compiled specimen records from hundreds of insect collections and natural history museums. We downloaded and filtered bee data to only include specimens collected in Utah. We then validated species names using online sources (e.g., Discoverlife.org and Integrated Taxonomic Information system [ITIS.gov]) and removed or corrected incorrect records. Our final dataset included 1,098 bee species from 68 different genera in Utah. This not only supports the assertion that Utah has a very rich and diverse bee population, but it provides the first checklist of bees from the state.

Introduction

Bees are extremely important to agriculture and natural ecosystems due to the pollination services they provide, yet increasing evidence shows many species are in steep decline. It has been suggested that Utah has a very diverse bee population. This high diversity could be due partly to Utah's unique desert ecosystems. Despite their importance, most people are largely unaware of the diversity of wild bees. A survey conducted at Utah State University, found that "although 99% of respondents believed that bees are critical or important, only 14% were able to guess within 1000 the actual number of bee species in the U.S." Wilson et al. (2017). It is important for people to understand bee diversity so that conservation efforts can be more effective. **The goal of this project is to create a list of bee species that are found in Utah to better inform the public and conservation efforts.**

Discussion

- The majority of published state-level bee lists have been created for States in the Eastern parts of the U.S.
This list shows that Utah has the richest bee fauna among published datasets (Table 2).
There were only a handful of invalid species within the database. This shows that, while there are potential issues with pulling data from large online datasets because they can have errors, it is noteworthy that the errors were few and the data was still usable.

Table 2. Utah's bee species richness compared to other available bee checklists (Scott et al. 2011; Dibble et al. 2017; Gibbs et al. 2017; Veit et al. 2021; Kilpatrick et al. 2020).

Materials and Methods

- Downloaded bee occurrence data from a large online database (Scan-bugs.org).
This database includes specimen records from 225 North American insect collections, natural history museums, and other sources.
Verified each species in the database by comparing specimen entries to trusted online sources containing up-to-date bee species accounts (DiscoverLife.org and Integrated Taxonomic Information system [ITIS.gov]).
Removed duplicate names and corrected outdated species names.

Results

- We documented 1,098 bee species that have been found in Utah (Table 1).
The most species-rich bee family in Utah is Andrenidae followed by Apidae (Fig. 1).
The most species-rich bee genus is Andrena, followed by Perdita (Fig. 2).

Figure 1. Familial Distribution of Utah Bees

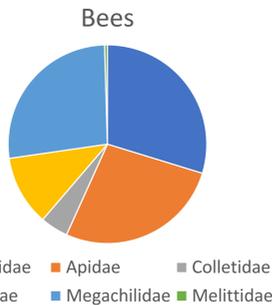


Table 1. Utah Bee Species List.

Table with 10 columns of bee species names and their corresponding scientific names, including families like Andrenidae, Apidae, Halictidae, Megachilidae, and Colletidae.

Future Work

- It would be useful to investigate which counties Utah's bees have been recorded in to get a better idea of the diversity and distribution of species across the state.
Further work could be done comparing this research to unpublished datasets, for example the USDA Pollinating Insect Research Unit database. These datasets are not available for public use but would be valuable as they may expand the total species count for the state.
Our research suggests states in the west have more bee species than eastern states, yet bee species checklists are lacking in the west. We suggest that more research in western states is needed to further direct conservation efforts and expand bee knowledge in the U.S.

