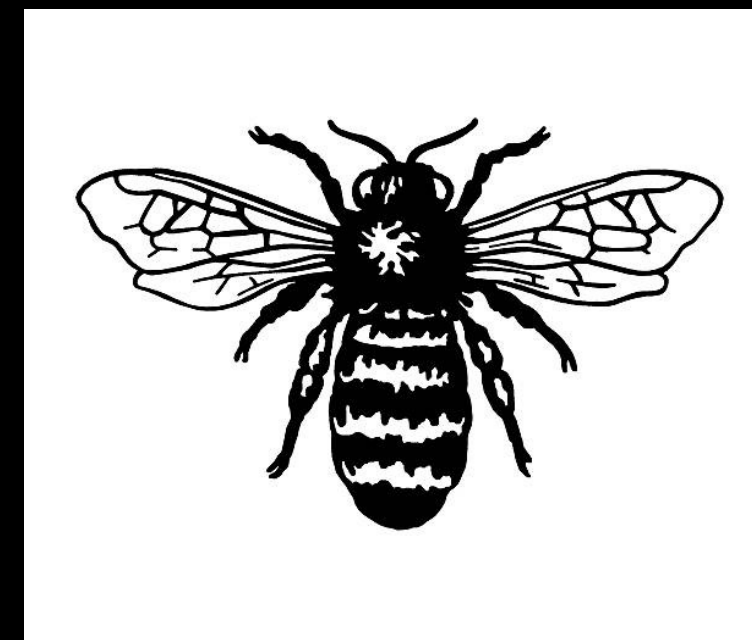


# Native Bee Digitization Project

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## Background

Pollinators are among the most important animals on Earth, playing a key role in the reproduction of most flowering plant species and providing pollination services that enhance the production of over 80 different agricultural crops. Among pollinators, bees are some of the most diverse and abundant flower-visiting insects, with some native bees becoming highly specialized on specific host plants.

The primary objective of our work aims to digitize holdings of bee biodiversity maintained in the TTU Entomology Lab, totaling over 17,000 specimens collected as part of monitoring efforts through the Southern High Plains region of Texas since 2015.

Specimen data will be made available online via the Symbiota Collections of Arthropods Network (SCAN; a specialized platform for biodiversity data) and the Global Biodiversity Information Facility (GBIF).

## Specimen curation

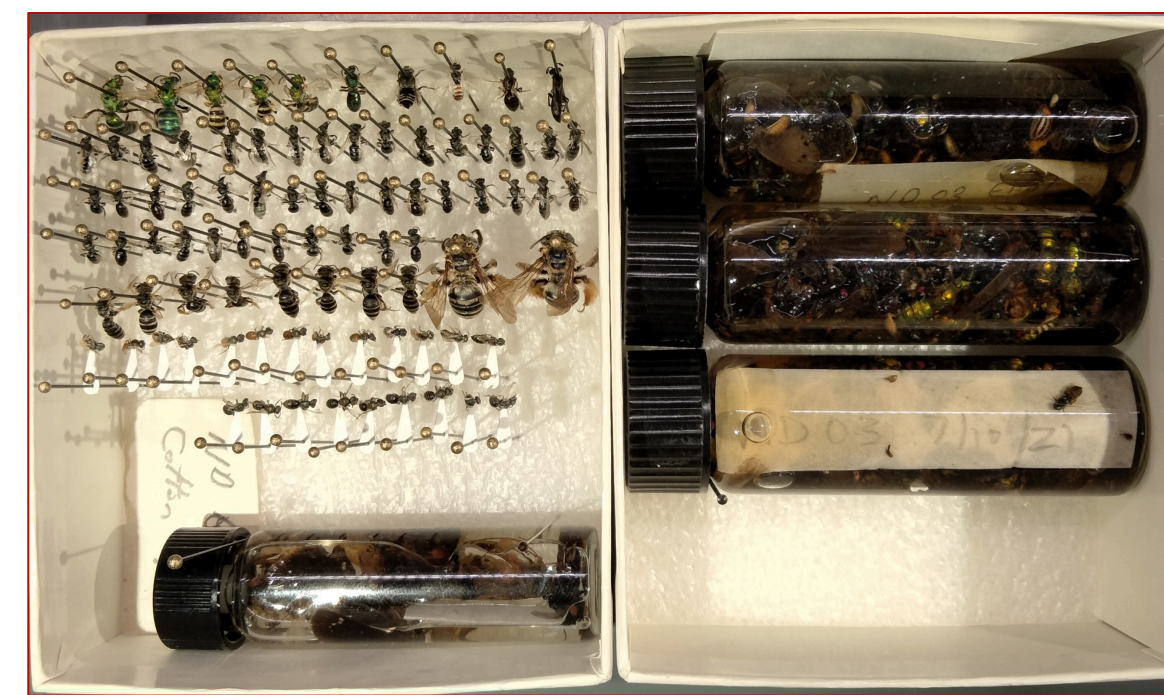
The process of data digitization of native bee specimen data requires several prior steps involving specimen collecting, cleaning where necessary, sorting by morphospecies, pinning, and labeling.

## Bee Identification

Contributions of specimen data to biodiversity databases requires accurate taxonomic identification. Identifying bees to the species level requires substantial effort and attention to detail.

We use identification keys, morphological diagrams, online literature, and field guides. We also attend specialized training including webinars by the Packer Lab at York University and the USGS Native Bee Lab.

Morphological structures are viewed under the stereomicroscope to find diagnostic features.



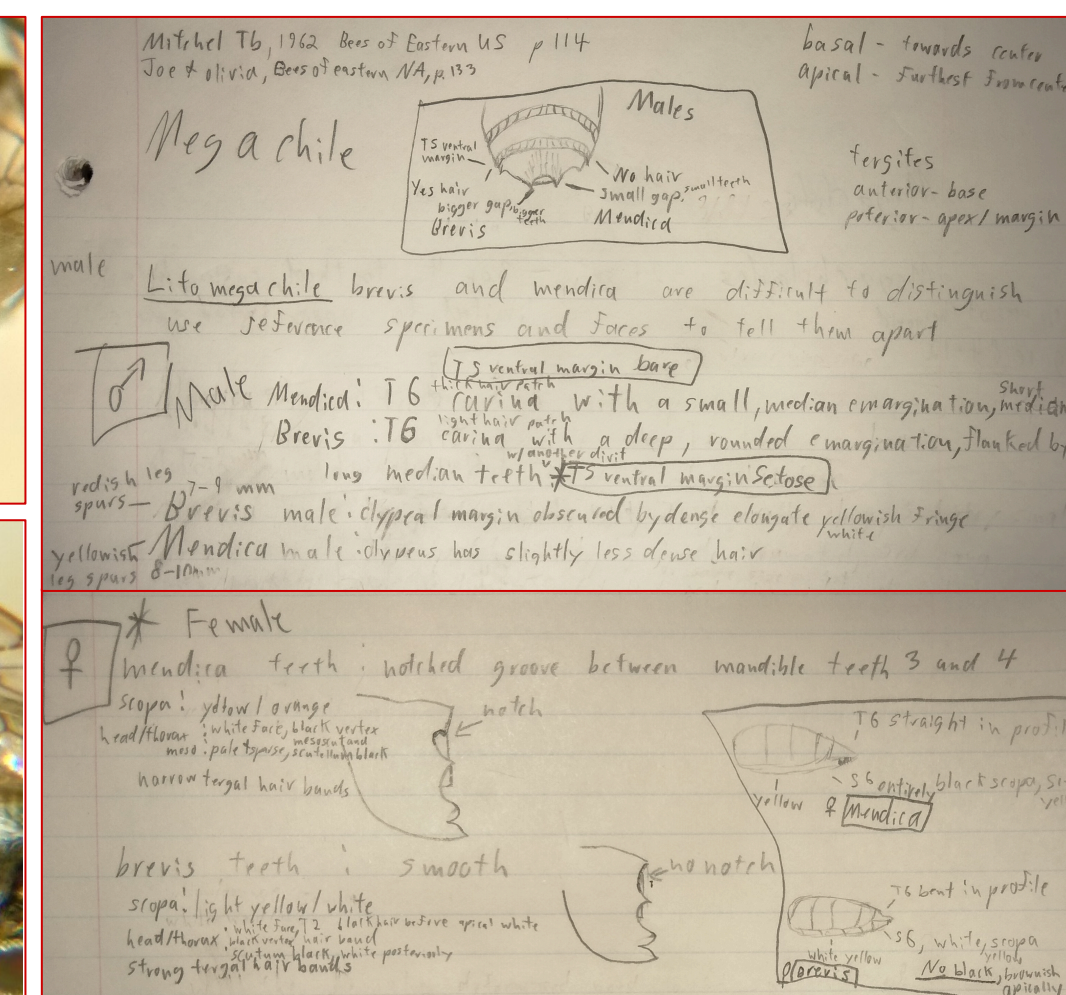
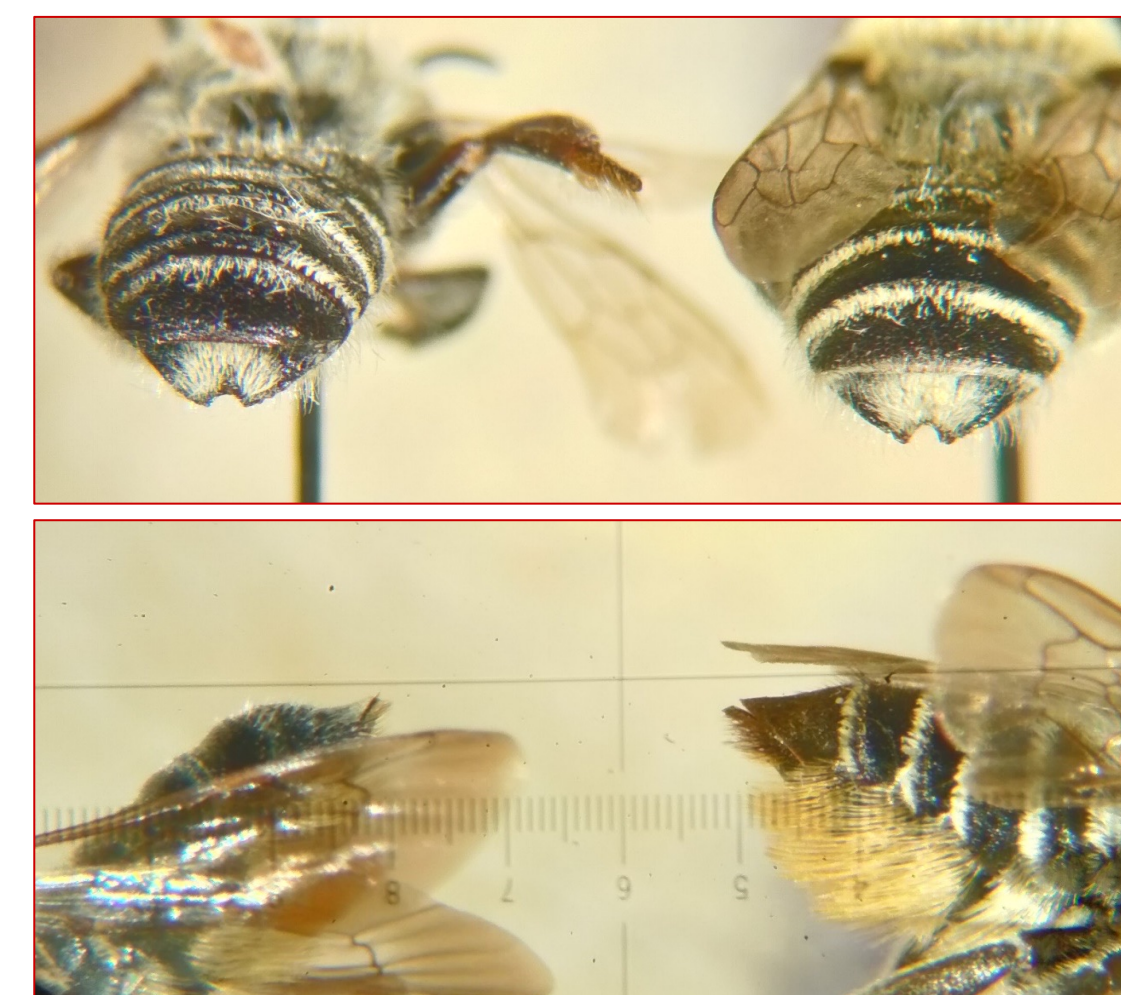
Left: pinned and sorted bees. Right: unsorted specimens.



Bees roughly sorted in preparation for labeling and identification.



Observation under stereomicroscope is necessary to see very small identifying features.



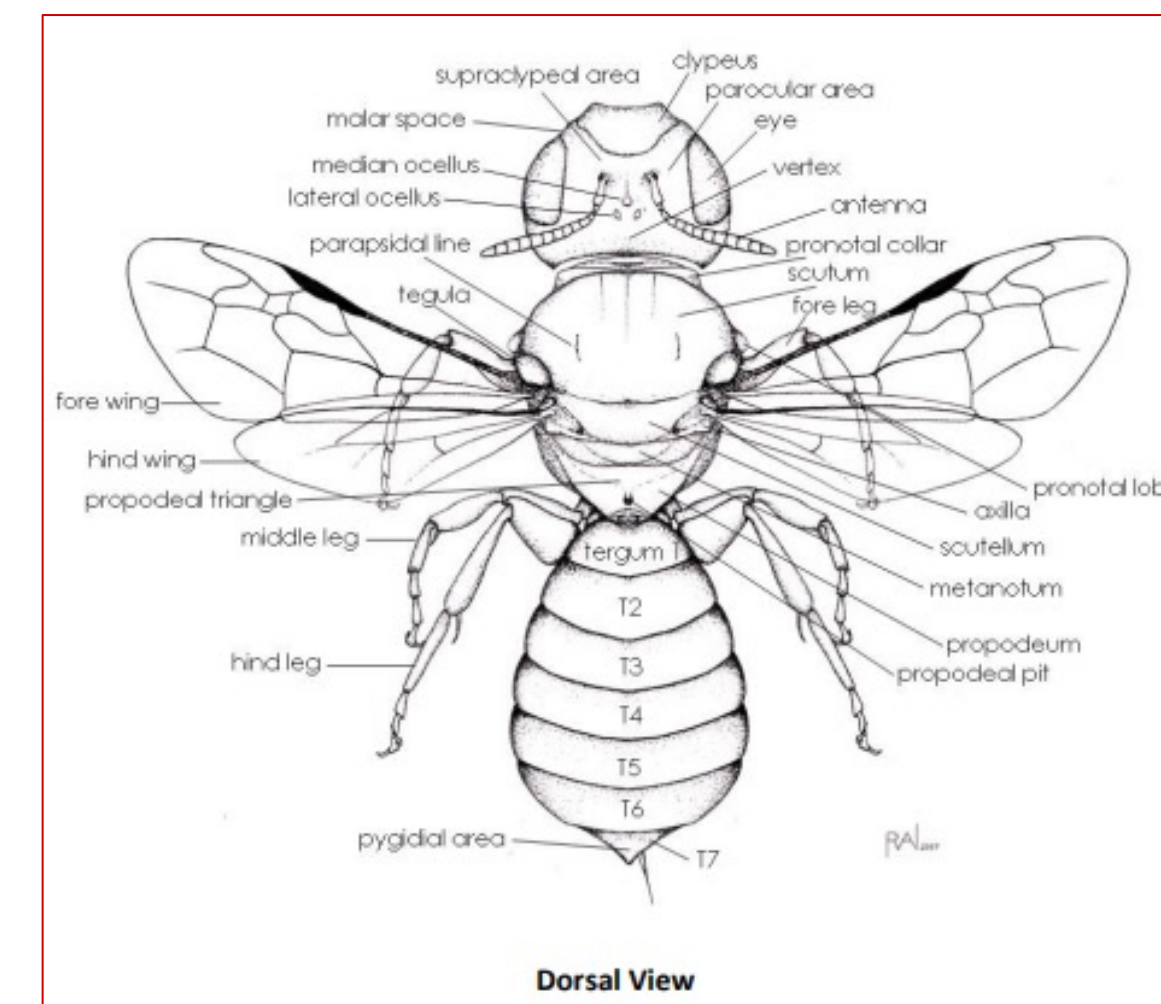
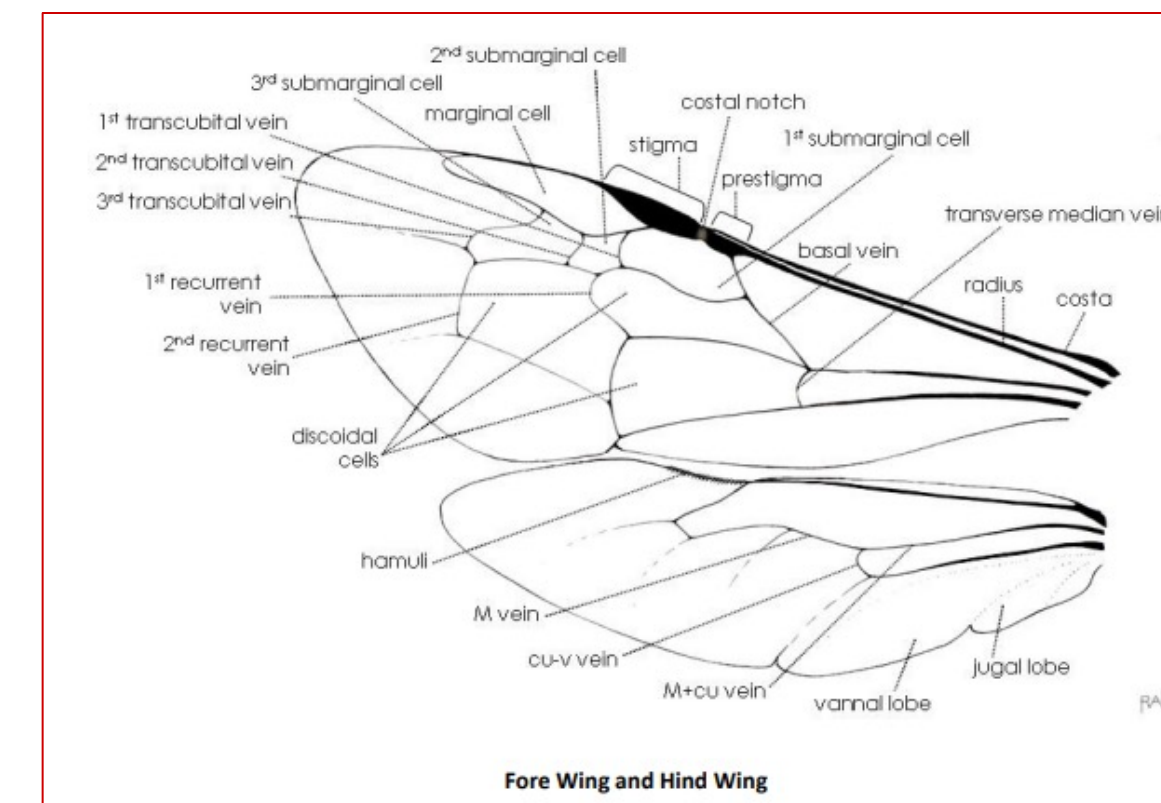
A notebook is used to record key morphological traits to compare across specimens.

Collecting, sorting, pinning, and labeling

Taxonomic identification

Organizing and assigning catalog numbers

Input label data into spreadsheets to upload to SCAN



Sorted, identified, labeled, and digitized bees.

## Digitization

For every single specimen we enter information into spreadsheets including:

- Catalog number
- Locality data
- Identification
- Collecting date

Accession Number	Species	Locality	Collector	Date	Sex	Length	Wing	Weight	Color	Notes
1712-0001	A. ferrugineus	2002-01-15	Longing	2002-01-15	♂	12.5	18.0	0.15	Black	...
1712-0002	A. ferrugineus	2002-01-15	Longing	2002-01-15	♀	11.8	17.5	0.14	Black	...

The compiled data will be uploaded into SCAN and shared globally via GBIF.

## Preliminary results

Approximately 286 species across 59 genera have been documented to occur in the Southern High Plains region. Digitization of this biodiversity data is an important component of advancing what we know about native bees in Texas, while facilitating education and conservation.

## Links of interest



USGS Native Bee Lab



Bees of the Texas Lower Rio Grande Valley region



Texas Parks and Wildlife Species of Greatest Conservation Need



Invertebrate Zoology Collection Museum of Texas Tech



SCAN database, Invertebrate Zoology Collection, Museum of Texas Tech

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