

## **Mike Arduser's bee keys: Version 3.0      READ THIS FIRST**

These keys have grown out of my interest in the bee fauna of the tallgrass prairie region and greater Midwest US (see below for geographic specifics) over the past several decades. The keys are updated (“improved”) regularly due to user suggestions/corrections, and my own edits. Each key reflects this by having a “Revised” or “Edited” date (e.g., edited December 25, 2019) at the top of the key: users should always use the most recently- dated version. All of the keys in this zipfile are the most recently-edited versions as of October 3, 2020.

**Not all keys include females and males:** gender is indicated at the beginning of the key.

### **Geographic scope:**

this is indicated at the beginning of the key, i.e., “TGP (=tallgrass prairie region) and greater Midwest”. The tallgrass prairie region is that defined by The Nature Conservancy’s ecoregion map, and includes, from north to south, the following ecoregions:

#### **TGP:**

Northern tallgrass prairie region

Central tallgrass prairie region

Osage Plains

Southern tallgrass and cross timbers, *in part* (there are six genera and several dozen species in, or potentially in, the Texas and south-central Oklahoma parts of the Southern tallgrass and cross timbers that are not included in the keys, and I am grateful to Jack Neff for pointing this out).

Coastal prairies, *in part* (see above)

#### **TGP outliers:**

Several eastern states (Arkansas, Mississippi, etc.) have small prairie remnants within their borders and the keys should work for the bees inhabiting these sites.

#### **Greater Midwest:**

This is primarily Transeau’s “Prairie Peninsula”, and the “corn belt”.

Because most of the species in the TGP region and in the greater Midwest occur beyond those geographies to a greater or lesser degree, the keys are to some extent useful outside of the TGP and greater Midwest, but not in any predictable pattern. Using the keys outside of their given geographies should be backed up with additional sources.

### **Extralimital species:**

For many of the keys, species occurring just outside the geographic boundaries given above are included or mentioned in the keys, since they may be present in our region but not yet documented.

### **Introduced (exotic) species:**

All of the introduced species and genera established in our region (that I am aware of as of 10/3/2020) are included in the keys, but this is obviously a moving target.

### **Taxonomy/nomenclature:**

For the most part the generic/subgeneric names and interpretations herein follow Michener (2007) but there are some exceptions, and these exceptions are always mentioned in the keys. For example, species in the *Lasioglossum* subgenera *Evylaeus*, *Sphexodogastra* and *Hemihalictus*, re-defined recently by Gibbs et. al. (2013), are incorporated here into a single key, the “non-metallic *Lasioglossum*, minus *Lasioglossum* s.s. of McGinley”, because of the difficulties involved in separating those re-defined genera.

Species-level taxonomy usually follows the most current revisions or The Ascher/Pickering list, although in a few cases (*Anthidiellum*, *Augochloropsis*) I have recognized sub-species as full species based on my experience with populations in the TGP and Midwest region. Author names are not always included with the species names.

### **Design of the keys:**

Most couplets include more than one option, and these options are separated usually by semicolons (;) - usually only one option needs to be confirmed in order to move to the next couplet (see example below), but not all of the keys are so constructed. For example:

*Hylaeus* females:

1. Omalus carinate; malar space 1/3 to 1/2 as long as broad; clypeal punctures well-defined.....2
- Omalus rounded; malar space shorter, at most 1/5 as long as broad, or absent; clypeal punctures usually obscure or indistinct.....3

Only one of these six options needs to be confirmed in order to move to couplet 2 or 3; multiple options are included because not all specimens have all features easily visible. Usually the lead option (in the case above, omalus carinate or rounded) includes the character states that are the least likely to cause confusion, and are usually the most reliable, but may not always be the easiest to see.

### **Abbreviations used in the keys:**

F = flagellar segment , i.e., F1, F2, etc.  
T = tergite  
S (rarely ST) = sternite  
propodeum = dorsal triangle  
DV = dorso-ventral

### **other terms used in the keys:**

scutum = mesonotum  
pleura = mesopleura  
propodeal triangle = dorsal enclosure of

DL = dorso-lateral  
SM = submarginal

**Comments/suggestions/corrections/questions  
welcomed**

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End10/3/2020

