**Mike Arduser’s bee keys: Version 5.0 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 or manual are the most recently-edited versions **as of February 29, 2024.**

**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 the one 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 at this point, and I am grateful to Jack Neff for pointing this out).

Coastal prairies, *in part* (see above)

**TGP outliers:**

Several eastern states (Arkansas, Mississippi, Ohio, 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” plus 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 5/17/2023) 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, Sphecodogastra* 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 subgenera. Keys which deviate from the current taxonomy have the most recent revision listed at the top of the key.

Species-level taxonomy usually follows the most current revisions, or The Ascher/Pickering list, although in a few cases (e.g. *Anthidiellum, Dieunomia*) 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, but I’m in the processing of adding them.

**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. Omaulus carinate; malar space 1/3 to ½ as long as broad; clypeal punctures well- defined………………………………………………………………………..……….2

Omaulus 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 readily visible. Usually the lead option (in the case above, omaulus carinate or rounded) includes the character state that is the least likely to cause confusion, and is usually the most reliable, but may not always be the easiest to see.

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

F = flagellar segment , i.e., F1, F2, etc. scutum = mesonotum

T = tergite pleura = mesopleura

S (rarely ST) = sternite propodeal triangle = dorsal enclosure of propodeum

DV = dorso-ventral =metapostnotum *in part*

DL = dorso-lateral =dorsal triangle

SM = submarginal

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

**PLEASE SEND ANY FEEDBACK TO arduser.michael@gmail.com**

End 6/1/24